



Focused Remedial Investigation Report

Freeway Landfill and Freeway Dump

Prepared for
Minnesota Pollution Control Agency

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Focused Remedial Investigation Report Freeway Landfill and Freeway Dump

Contents

1.0	Introduction	1
1.1	Purpose	1
1.2	Organization of Report.....	1
2.0	Site Background	3
2.1	Site Location and Setting.....	3
2.2	Topography.....	4
2.3	Geology	5
2.4	Site Ownership and Operating History	5
3.0	Regulatory History and Previous Investigations	8
3.1	Freeway Dump	8
3.1.1	1987 Preliminary Assessment.....	8
3.1.2	1992 Screening Site Inspection Report.....	8
3.1.3	1997 Groundwater Investigation.....	8
3.2	Freeway Landfill.....	9
3.2.1	1978 Impact of Seepage Study.....	9
3.2.2	1984 Preliminary Assessment.....	9
3.2.3	1988 Remedial Investigation.....	9
3.2.4	1991 Supplemental RI.....	9
3.2.5	1993 Closure Report.....	10
3.2.6	1998 Gas extraction system conceptual design.....	10
3.2.7	2005 Subsurface Investigation	10
3.2.8	2015 Groundwater Investigation.....	10
4.0	Waste Material Investigation	11
4.1	Summary of Investigation Activities.....	11
4.1.1	Soil borings.....	11
4.1.2	Test Excavations.....	12
4.1.3	Sample Analysis	13
4.1.4	Surveying	14
4.2	Summary of Subsurface Conditions.....	14
4.2.1	Solid Media Definitions.....	14

4.2.2	Freeway Dump.....	15
4.2.3	Freeway Landfill.....	17
4.2.4	Landfill Gas Monitoring	18
4.3	Waste Extent.....	18
4.3.1	Freeway Dump.....	19
4.3.2	Freeway Landfill.....	20
4.4	Summary of Analytical Results	21
4.4.1	Analytical Results – Waste to Energy.....	23
4.4.2	Analytical Results – Crushed Bedrock	23
4.4.3	Analytical Results – Soil Gas.....	23
5.0	Cover Soil Investigation	25
5.1	Summary of Investigation Activities.....	25
5.1.1	Soil Borings.....	25
5.1.2	Sample Collection	25
5.2	Summary of Investigation Results.....	25
5.2.1	Field Screening Results	26
5.2.2	Potential Reuse Criteria.....	26
5.2.3	Analytical Results.....	26
6.0	Groundwater Investigation.....	28
6.1	Monitoring Well Network.....	28
6.1.1	Existing Monitoring Wells	28
6.2	Summary of Investigation Activities.....	29
6.2.1	Monitoring Well Installation	29
6.2.1.1	Direct-Push / Hollow Stem Auger	30
6.2.1.2	Rotasonic and Diamond Core	30
6.2.1.3	Well Development	31
6.2.2	Physical Site Data Collection.....	31
6.2.2.1	Surveying	31
6.2.2.2	River Level Measurements.....	32
6.2.2.3	Groundwater Level Measurements	32
6.2.3	Borehole Geophysical Logging	32
6.2.4	Sample Collection	32
6.2.5	Investigation Derived Waste.....	33
6.3	Summary of Analytical Results	33

7.0	Conceptual Site Model and Potential Pathways/Receptors	37
7.1	Waste Materials and Subsurface Conditions	37
7.1.1	Direct Contact Pathway	37
7.1.2	Vapor Pathway	38
7.2	Hydrogeology	38
7.2.1	Current Conditions	39
7.2.1.1	Groundwater Pathway	40
7.2.1.2	Surface Water Pathway	40
7.2.2	Periodic Flood Conditions	41
7.2.3	Modeled Future Conditions	41
8.0	Conclusions and Recommendations	43
8.1	Waste Material Investigation	43
8.2	Cover Soil Investigation	43
8.3	Groundwater Investigation	43
8.4	Vapor Intrusion Investigation	44
9.0	References	45

List of Tables

Table 1	Laboratory Analytical Parameter List
Table 2	Soil Boring Matrix
Table 3	Test Excavation Matrix
Table 4	Landfill Gas Screening Results
Table 5a	Summary of Exceedances – Municipal Solid Waste / Construction Debris
Table 5b	Summary of Exceedances – Ash
Table 5c	Summary of Exceedances – Native Sediment
Table 6	Summary of Analytical Results – Crushed Bedrock
Table 7	Summary of Analytical Results – Soil Gas
Table 8	Summary of Analytical Results – Cover Soil
Table 9	Monitoring Well Network Matrix
Table 10a	Water Level Measurements - Dump
Table 10b	Water Level Measurements - Landfill
Table 11	Summary of Exceedances – Water (Phase A)
Table 12	Summary of Exceedances – Water (Phase B)

List of Figures

Figure 1	Site Overview
Figure 2	Investigation Locations – Freeway Dump
Figure 3	Investigation Locations – Freeway Landfill
Figure 4	Waste Extent – Freeway Dump
Figure 5	Waste Extent – Freeway Landfill
Figure 6	Cross Section Locations
Figure 6A-6G	Cross Sections A-A' to G-G'
Figure 7	Cover Soil Investigation Locations
Figure 8	Monitoring Well Network
Figure 9	Regional Water Table GW Elevation Contours – Freeway Landfill; April 9, 2019
Figure 10	Regional Water Table GW Elevation Contours – Freeway Dump; June 17, 2019
Figure 11	Regional Water Table GW Elevation Contours – Freeway Landfill; June 17, 2019
Figure 12	Historical Aerial Photographs – Astleford Dump

List of Appendices

Appendix A	Boring Logs
	Appendix A-1 Waste Investigation Boring Logs
	Appendix A-2 Cover Soil Investigation Boring Logs
	Appendix A-3 Monitoring Well Boring Logs
Appendix B	Laboratory Analytical Data Tables
Appendix C	Laboratory Analytical Reports
	Appendix C-1 Solid Media – Phase A
	Appendix C-2 Water – Phase A
	Appendix C-3 Solid Media – Phase B
	Appendix C-4 Water – Phase B
	Appendix C-5 Soil Gas – Phase B
Appendix D	Data Quality Review
Appendix E	Laboratory Analytical Data Tables
Appendix F	Minnesota River Elevations and Monthly Precipitation
Appendix G	Downhole Geophysical Survey Field Logs

Certifications

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

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October 8, 2019

Date

Acronyms

Acronym	Description
µg/L	Micrograms per Liter
ASTM	American Society for Testing and Materials
B(a)P	Benzo(a)pyrene
Bgs	Below Ground Surface
BTU/lb	British Thermal Units per Pound
CD	Construction Debris
CDM	Camp Dresser & McKee
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CLP	Closed Landfill Program
CRA	Conestoga-Rovers & Associates
DDT	Dichlorodiphenyltrichloroethane
DRO	Diesel Range Organics
FEMA	Federal Emergency Management Agency
FES	Fuller Engineering Services
FFS	Focused Feasibility Study
ft/d	Feet per Day
ft/ft	Feet per Feet
GPS	Global Positioning System
GRO	Gasoline Range Organics
HERC	Hennepin Energy Recovery Center
HIG	Historic Information Gatherers
IDW	Investigation Derived Waste
ISV	Intrusion Screening Values
LIDAR	Light Detection and Ranging
MCL	Maximum Contaminant Limit
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources
mg/L	Milligrams per Liter
MGS	Minnesota Geologic Survey
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MSL	Mean Sea Level

Acronyms (cont.)

Acronym	Description
MSW	Municipal Solid Waste
MVTL	Minnesota Valley Testing Laboratories, Inc.
NAD	North American Datum
NAVD	North American Vertical Datum
NWS	National Weather Service
PA	Preliminary Assessment
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PCE	Tetrachloroethane
PE	Professional Engineer
PFAS	Per- and Polyfluoroalkyl Substances
PFHxS	Perfluorohexane Sulfonate
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonate
PID	Photoionization Detector
PLP	Permanent List of Priorities
PVC	Polyvinyl Chloride
QAPP	Quality Assurance Project Plan
RQD	Rock Quality Designation
RI	Remedial Investigation
SLV	Soil Leaching Value
SRV	Soil Reference Value
SVOC	Semi-volatile Organic Compound
TCE	Trichloroethylene
US EPA	United States Environmental Protection Agency
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
UTM	Universal Transverse Mercator
VC	Vinyl Chloride
VOC	Volatile Organic Compound

1.0 Introduction

1.1 Purpose

This focused remedial investigation (RI) report has been prepared by Barr Engineering Co. (Barr) on behalf of the Minnesota Pollution Control Agency's (MPCA) Closed Landfill Program (CLP). This report provides a summary of investigation findings and results at the Freeway Dump and Freeway Landfill (the Site) located in Burnsville, Dakota County, Minnesota ([Figure 1](#)).

The purpose of the investigation is to characterize Site conditions in support of future remedial design. Improved waste containment or removal of the waste from the Site will be an important component of the future remedial design. Therefore, the focus of this RI report is the condition of waste material at the Site and associated potential receptors and risk pathways. In addition to the evaluation of the waste material, cover soil and groundwater investigation activities were conducted and are summarized and discussed in this report. Potential risks associated with current or future groundwater conditions is beyond the scope of the focused RI. If it is determined that it is necessary to conduct additional groundwater investigation, the results would be summarized in a follow-up supplemental RI report.

The initial phase (Phase A) of the investigation was conducted in the spring of 2018 and generally followed the conceptual *Investigation & Sampling Plan*, written by MPCA ([MPCA, 2017](#)). The MPCA plan was informed by findings from previous investigations at both the Freeway Landfill and Freeway Dump and outlined a work scope that included sampling of soil, waste material, and groundwater, as well as screening of landfill gas. The results of Phase A were summarized in *Phase A Investigation Report* (Barr, 2018) and several data gaps were identified in the report. Focused RI activities were conducted in the spring of 2019 (Phase B) to address these data gaps and included evaluations of waste extent, cover soil, and groundwater.

1.2 Organization of Report

The report is organized as follows:

- 1.0 Introduction:** describes the content and objectives of this report.
- 2.0 Site Background:** provides general Site background information including a description of the setting, topography, geology, and brief operating history of each project area.
- 3.0 Regulatory History and Previous Investigation:** provides historical background of the Site from a regulatory perspective through brief summaries of previous investigations.
- 4.0 Waste Material Investigations:** includes a discussion of the activities completed to evaluate the extent of waste material as well as solid media quality. Describes the results of the investigation, including a description subsurface conditions as well as solid media analytical results.
- 5.0 Cover Soil Investigation:** includes a discussion of the activities conducted to further characterize the cover soil present at the Site for potential reuse as part of a remedial action. Describes analytical results.

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- 6.0 Groundwater Investigation:** includes a discussion of the activities completed to evaluate the groundwater conditions at the Site. Describes the results of the investigation, including groundwater sampling analytical results.
 - 7.0 Conceptual Site Model:** provides a summary of the current understanding of the Site subsurface conditions.
 - 8.0 Potential Receptors / Risk Assessment:** identifies potential receptors and evaluates the risk to human health and the environment.
 - 9.0 Conclusions:** provides a recommendation for additional action based on the findings of the investigations.
 - 10.0 References:** includes a summary of references cited in the report.

2.0 Site Background

The Site comprises two project areas ([Figure 1](#)), referred to in this report as the Freeway Dump (Dump) and the Freeway Landfill (Landfill). 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 Family Irrevocable Trust Agreement dated October 22, 1997. For the remainder of this report, those various entities will be referred to as the Site Owner. Property boundaries and ownership in the vicinity of the Site are shown on [Figures 1 to 5](#).

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 on [Figures 2 and 3](#). The following sections describe the two project areas.

2.1 Site Location and Setting

Freeway Dump

The Dump is an unpermitted, inactive waste disposal area located at 11937 Interstate 35W (Parcel ID: 02-03410-38-010), just north of the east service road for Interstate 35W and the Cliff Road interchange. The Dump is unlined, with a vegetated soil-cover, encompasses approximately 28 acres, and is currently being used as a golf driving range. Two office trailers and one small building are located on the Property.

Based on review of historical aerial photographs and the recent investigation, the extent of waste at the Dump is believed to extend onto several adjacent properties as shown on [Figure 1](#), including:

- Allstate Self Storage facility owned by Burnsville Storage Company (Burnsville Storage) – MN LP, located south of the Dump. A Subaru auto dealership is located south of Burnsville Storage.
- Interstate 35W (I-35W) right of way, located west of the Dump. Edward Kraemer and Sons quarry (Kraemer Quarry) is located west of I-35W.
- Vacant land/wetlands owned by Northern States Power Company (Xcel Energy) and US Fish and Wildlife Service (USFWS), located north and east of the Dump.

The area of waste associated with the Dump (including waste present on neighboring properties) is approximately 34 acres and the estimated volume of waste is approximately 790,000 cubic yards. The inferred waste extent of the Dump is presented on in [Figure 4](#).

Freeway Landfill

The Landfill is an MPCA-permitted unlined, soil-covered, inactive waste disposal area located just south of the Minnesota River ([Figure 1](#)).

The Landfill consists of several parcels, totaling approximately 189 acres located primarily on the following property parcels: 037-02-15600-00-010; 037-02-15600-00-060; 037-02-15600-00-020, 037-02-15600-02-010; 037-02-15600-00-030; 037-02-15600-00-040; and 037-02-15600-00-050.

Within the Landfill area is the Freeway Transfer Station which is located at 11501 Embassy Road (parcel ID: 02-15600-01010). The Transfer Station is located on the east side of the Landfill property, approximately 1,500 feet south of the Minnesota River, and currently operates as a waste processing, recycling, and hauling facility. A quarry to the west is also owned by the Site Owner and the western edge of the Landfill extends into this parcel. Other commercial activities on the Landfill properties appear to be a gravel crushing operation in the quarry located to the west of the Landfill and a dumpster storage operation that is present on top of the Landfill.

The surrounding properties include Kraemer Quarry, located to the south, I-35W to the east, and a salt storage and barge unloading facility (U.S. Salt) owned by Port Marilyn LLC, located north of the Landfill. Based on review of historical aerial photographs and recent investigations, the extent of waste at the north end of the Landfill extends onto the U.S. Salt property.

The area of waste associated with the Landfill (including waste present on neighboring properties) is approximately 140 acres and the estimated volume of waste is approximately 5,300,000 cubic yards. The inferred waste extent of the Landfill is presented on [Figure 5](#).

Minnesota River

The average water level for the Minnesota River located north of the Landfill is approximately 692 feet above mean sea level (feet MSL; calculated from 2015-present elevation data obtained from the US Army Corps of Engineers). The 100-year flood elevation is 715 feet MSL ([FEMA, 2016](#)), and the recorded historical river level extremes at the nearby Savage river gage are 719.40 feet on April 15, 1965 and 687.05 feet on October 29, 1976 ([NWS, 2018](#)). It is recognized that river elevation sources are based on different vertical datum (i.e., 1912 Mean Sea Level Datum, North American Vertical Datum (NAVD) 1929, and NAVD 1988). The difference between those data for the Minnesota River elevation is 0.54 feet.

Kraemer Quarry

The Kraemer Mining and Materials quarry is located approximately 1,000 feet west of the Dump and immediately south and southwest of the Landfill. The resource being mined in the quarry is the Prairie du Chien Group dolostone. Dewatering in the quarry captures groundwater in the Prairie du Chien aquifer beneath the Site, significantly depressing the water table from what it would be under natural conditions. Except for near the northern edge, waste is generally not currently in contact with groundwater at the Landfill, but groundwater models completed for the Landfill predict that condition will change when Kraemer Quarry operations and pumping end ([Barr, 2015](#)).

2.2 Topography

Freeway Dump

The majority of the Dump is a generally flat-top mound that sits above the surrounding wetland at elevations ranging from approximately 720 feet to 725 feet MSL. The tee-box area of the driving range sits a little higher at approximately 730 feet MSL. 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 feet MSL along the north perimeter to about 710 feet MSL to the southeast of the Dump.

Freeway Landfill

Prior to waste disposal operations commencing, the topography of the Landfill area likely varied from 696 to 705 feet MSL (Liesch, 1991). According to current LIDAR survey data (Fugro and MDNR, 2011), the maximum elevation of the Landfill is approximately 750 feet MSL at its peak near the center of the property. The ground surface slopes downward in all directions to an elevation of approximately 700 feet MSL 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.

The Transfer Station is located in a topographically depressed area at approximately 710 feet MSL. Surrounding the Transfer Station to the north, south, and east is a berm feature that rises to approximately 745 feet MSL, and to the west is the access road that rises out from the station to Landfill grade of approximately 735 feet MSL.

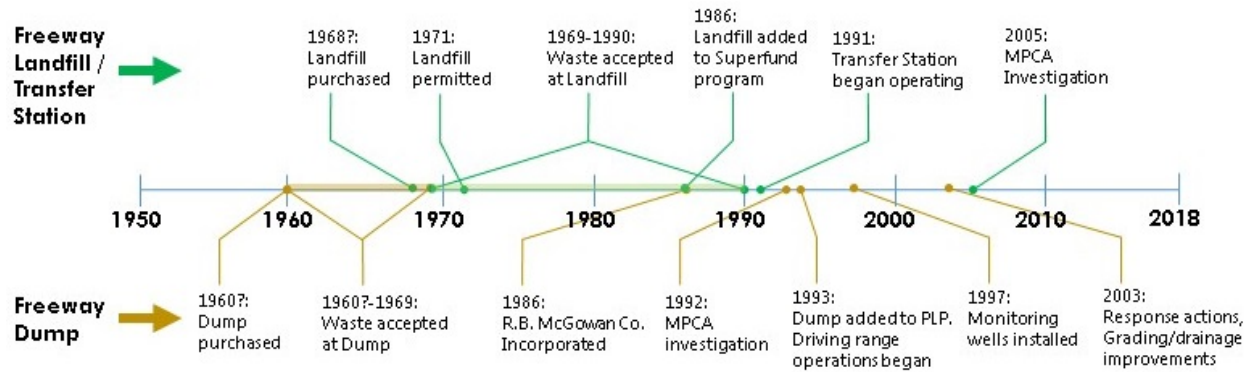
2.3 Geology

The surficial geology of the area is generally characterized by glaciofluvial sediments associated with the Minnesota River Valley. Peat and organic silts and clays are found in adjacent bottomland areas (MPCA, 1992). The Landfill and Dump areas consist of waste material (municipal solid waste/construction debris/ash) dumped on former wetlands and overlain by cover soil fill (Liesch, 1991).

The uppermost bedrock unit is the dolostone of the Prairie du Chien group. The surface of the Prairie du Chien is typically weathered and friable and slopes north toward the Minnesota River. The Jordan Sandstone underlies the Prairie du Chien. The St. Lawrence Formation, a dolomitic shale and siltstone unit, underlies the Jordan Sandstone (MPCA, 1992).

2.4 Site Ownership and Operating History

A review was conducted of historical landfill records, files, and historical aerial imagery. The MPCA provided Barr with a list of archived project files for the Dump and Landfill, which included files dating back to the early 1960's. Historical aerial imagery was obtained from Historic Information Gathers (HIG). These aerial images were used to evaluate historical disturbance limits and approximate operational dates for the Landfill (aerial photos are found in Appendix A of the *Phase A Investigation Report*, Barr, 2018). The disturbance limits shown on the aerial photography were evaluated to identify historical dumping as well as current waste limits. 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 (Barr, 2018).



Pre-Operations History

From the Black Dog Preserve 1984 Resource Inventory (MDNR, 1984)

Up until the year 1853 the area around Black Dog Lake was inhabited by about 250 Dakota native people and their chief, Black Dog. The Dakota were hunter gatherers and left no discernible impact upon the land. Following European settlement of the area in the mid-1800's, ownership of the land began and bottomland meadows were used to provide hay for domesticated animals. Row crops were planted in the area and north-south drainage ditches were placed on the far southern portion of Site. Agricultural use in the general area continued until the early 1960's when light industrial and commercial development of the area commenced.

Freeway Dump

The Dump property was purchased by Richard McGowan and his business partner sometime around 1960. It is uncertain exactly when the Dump became active and started receiving waste, with some reports indicating that dumping began as early as 1960. A review of historical aerial photographs indicate that the Dump was active between 1960 and 1969. The Dump initially accepted ash from a nearby power plant and later accepted other refuse including municipal solid waste and construction waste (MPCA, 2017). After the Dump ceased operating in 1969, the property remained unused until 1993, when the driving range operations began. An irrigation system is present at the driving range. Based on a review of aerial photographs, the storage facility buildings south of the dump were constructed between 1970 and 1979, and the storage facility buildings at the southeast corner of the dump were constructed between 1984 and 1990.

Freeway Landfill

The Landfill property is comprised of multiple parcels that were purchased from several different owners in the 1960s by Richard McGowan. Prior to the Landfill operating, the area was mostly wetland and undeveloped, with the exception of farming activities visible in the 1937 aerial photo and a few small structures located north of the frontage road on the south bank of the Minnesota River, visible in the 1966 aerial photo.

The Landfill began accepting waste in July 1969 under a conditional use permit issued by the City of Burnsville. In October 1971, the MPCA issued the Landfill a solid waste permit (No. SW 57). From a review of historical aerial photos, it appears that Landfill operations began in the northeast corner of the property

and then expanded to the south. In the late 1970s and 1980s, environmental regulations were significantly updated in response to evolving knowledge about environmental contaminants and associated risks to human health and the environment. Landfill regulations were updated to require engineered liners and caps for new landfills. Based on concerns at the Site, the Landfill was added to the Superfund National Priorities List in 1986 ([MPCA, 2015](#)). Under the new regulations, landfill owners were requested to either make necessary upgrades to their facilities or to stop accepting waste. In 1990, Freeway Landfill stopped accepting waste.

The Transfer Station was constructed in the late 1980s and operates on a 12-acre parcel bounded by the Freeway Landfill to the north, south, and west. The Transfer Station is currently in operation and has been since 1991 ([Liesch, 1993](#)).

3.0 Regulatory History and Previous Investigations

Previous investigations have been conducted at the Freeway Dump and Freeway Landfill properties. The following section provides a brief summary of previous investigations limited to details that are pertinent to this report.

3.1 Freeway Dump

Relevant previous investigation activities at the Dump are briefly summarized below. Previous investigations at the Dump were generally limited in scope and were conducted at the edges of the Dump. Therefore, prior to the recent investigation little was known of the conditions of waste material within the Dump.

3.1.1 1987 Preliminary Assessment

A Preliminary Assessment (PA) was conducted in 1987 by the MPCA (MPCA, 1987). The PA was prompted by concerns from the USFWS, whose property abuts the Dump to the east. USFWS had observed stressed vegetation, erosion, and waste materials at the eastern edge of the landfill. MPCA identified dichlorodiphenyltrichloroethane (DDT) and polycyclic aromatic hydrocarbons (PAHs) in soil samples collected from the perimeter of the Dump and concluded there were exposure risks from the Dump, including the groundwater and surface water migration pathways. Following the Preliminary Assessment, the Dump was placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) inventory of potentially hazardous waste sites.

3.1.2 1992 Screening Site Inspection Report

A subsequent investigation was conducted in early 1992, as documented in the Screening Site Inspection Report (MPCA, 1992), to evaluate the Freeway Dump as a potential candidate for the National Priorities List. The investigation included completion of four soil borings, installation of two monitoring wells (including existing well OFMW-1), and analysis of soil, surface water, and groundwater samples. Tetrachloroethane (PCE), acetone, and phthalates were detected in soil samples and metals such as arsenic, cadmium, chromium, and selenium were detected in soil, surface water, and groundwater samples. Additional investigation was recommended.

3.1.3 1997 Groundwater Investigation

An additional investigation was conducted in 1997 and 1998 by the MPCA. Nine monitoring wells were installed around the perimeter of the Dump (existing wells MW-97-1 to MW-97-9). Groundwater sample results indicated the presence of arsenic, boron, manganese and low levels of volatile organic compounds (VOC) and polychlorinated biphenyls (PCB). In the fall of 2003, response actions including grading and drainage improvements were completed as noted in a correspondence between the MPCA and the Site Owner (MPCA, 2004).

3.2 Freeway Landfill

Previous investigations have been conducted at the Landfill, including remedial investigations conducted on behalf of the Site Owner and environmental assessments conducted on behalf of the MPCA. Relevant investigation activities at the Landfill are briefly summarized below.

3.2.1 1978 Impact of Seepage Study

In 1978, Barr prepared a report in response to a request from the MPCA to assess the impact of the Landfill on the water quality in the Minnesota River and to evaluate whether a new groundwater monitoring network was needed. Five new monitoring wells were constructed for the investigation. Sampling activities included soil sampling of the monitoring well borings, three groundwater sampling events, and five surface water sampling events. The report recommended continued monitoring program for the landfill included quarterly groundwater and surface water sampling (Barr, 1978).

3.2.2 1984 Preliminary Assessment

In 1984, a "Potential Hazardous Waste Site – Preliminary Assessment" was prepared for the EPA by MPCA (EPA, 1984). Information compiled in this report was sourced from MPCA files and previous inspection reports. Following this in 1986 the Landfill was added to the Superfund National Priorities List.

3.2.3 1988 Remedial Investigation

Conestoga-Rovers & Associates (CRA) was retained by R.B. McGowan Company in 1988 to conduct an RI of the Site for the MPCA in accordance with a Request for Response Action. Four new monitoring wells were constructed as part of the investigation. Investigation activities included well installation, water level measurement, slug testing, and water quality sampling. Sampling activities included two sampling events at seven groundwater locations and one surface water location for metals and VOCs. Additional wells and surface water locations were identified in the plan but could not be sampled due to insufficient water volume due to dewatering activities at the adjacent quarry. CRA recommended that no remedial action was warranted and the Site be delisted from the National Priorities List (CRA, 1988).

3.2.4 1991 Supplemental RI

A Supplemental RI was conducted in 1991. Bruce A. Liesch Associates (Liesch) was retained by R.B. McGowan Company to complete additional RI activities required by MPCA after review of the initial 1988 RI Report. The purpose of Supplemental RI investigation was to further define the extent and magnitude of landfill impacts and hydrogeological conditions. Four new monitoring wells were constructed as part of the investigation. Investigation activities included well installation, water level measurement, slug testing, and water quality sampling. Sampling activities included two sampling events at ten groundwater locations and three surface water locations for metals and VOCs. One sampling round was conducted while the quarry well was in operation and the second was conducted when the well was not in use. A post-RI monitoring plan was outlined, which included three sampling events per year and annual reporting (Liesch, 1991).

3.2.5 1993 Closure Report

In 1993, a closure report was prepared by Liesch on behalf of R.B. McGowan Company to provide documentation of landfill closure activities for certification of overall final closure by the MPCA. The landfill closure was required by a Court Order issued by the Dakota County District Court. Final closure activities included completion of additional final cover soil permeability testing, final cover modeling, installation of eight landfill gas monitoring probes, maintenance of the final cover, and surveying (Liesch, 1993). Additionally, Camp Dresser & McKee (CDM) submitted a Final Human Health and Ecological Risk Assessment (Risk Assessment) to the MPCA. The Risk Assessment found landfill gas exposure risks to workers and nearby residents below threshold risks and the ecological risk of leachate contact was considered unlikely (CDM, 1993).

3.2.6 1998 Gas extraction system conceptual design

Woodward-Clyde Consultants were retained by the MCPA to prepare cover system and gas extraction system conceptual design in 1998. A pre-design field investigation was conducted in 1997 that included a topographic survey, an existing cover evaluation, a waste thickness evaluation, and landfill gas monitoring. Twenty-four soil borings were advanced through the landfill cover, five of which were further advanced to refusal to determine the vertical extent of waste. Four landfill gas monitoring probes were installed in the borings that were advanced through the waste column with measured methane concentrations between 25.7% and 64.2% (Woodward-Clyde, 1998).

3.2.7 2005 Subsurface Investigation

In 2005, a subsurface investigation was conducted by Fuller Engineering Services (FES) on behalf of the MPCA throughout the Landfill to evaluate the extent of cover soil and waste. The investigation included 74 soil borings, landfill gas monitoring, and detailed surveying to assess the topography and subsurface conditions (FES, 2005). The results of the Fuller study are the primary basis for volume calculations utilized in the Focused Feasibility Study (Barr, 2019).

3.2.8 2015 Groundwater Investigation

More recently, in 2015, the MPCA conducted groundwater investigations and Barr conducted groundwater modeling to estimate future groundwater conditions that are anticipated when the Kraemer Quarry ceases operation and discontinues dewatering pumping. MCPA installed eight monitoring wells into the waste and two monitoring wells into the bedrock. Groundwater samples were collected at these new monitoring wells. Barr used the analytical results and predictive modeling for the groundwater conditions and contaminant transport (Barr, 2015b). The findings of the modeling effort are summarized as part of the risk evaluation in [Section 8.5](#).

4.0 Waste Material Investigation

Waste material investigation activities were conducted in 2018 and 2019 to evaluate the extent and nature of waste material and to further characterize the Site geology. The results of the investigations have improved the understanding of Site risks and will inform the evaluation of potential Site remedies.

4.1 Summary of Investigation Activities

Several previous investigations, most significantly the Fuller study (FES, 2005), provided data with respect to the presence of waste material at the Landfill; however, there were data gaps related to the extent of waste, including the presence of waste along the north edge of the Landfill property and in the vicinity of the Transfer Station area. Additionally, there were limited data available regarding the extent and nature of the waste material present at the Dump. These data gaps were the focus of Phase A of the investigation, which occurred during the spring of 2018 and included:

- Thirty-five soil borings completed at the Dump
- Eight soil borings completed at the Transfer Station
- Fourteen test excavations completed at the Dump
- Nine test excavations completed at the Landfill

Following the Phase A investigation, data gaps concerning the extent of waste material to the north of the Landfill and to the south of the Dump remained. In order to address these data gaps, the following additional investigation activities were conducted as part of Phase B during the spring of 2019:

- Eight soil borings completed at the Burnsville Storage property (south of the Dump)
- Two test excavations completed at the U.S. Salt property (north of the Landfill)

4.1.1 Soil borings

Soil borings were advanced with a direct-push, tracked drill rig and soil samples were collected with a dual-tube or macro-core sampler. Continuous sampling was conducted at all soil boring locations. These samples were described in the field by a Barr geologist or environmental scientist in accordance with the Unified Soil Classification System. Samples were screened in the field for volatile organic vapors using an MPCA-provided photoionization detector (PID) fitted with a 10.6 eV lamp. Additionally, the samples were inspected by Barr for other evidence of contamination such as staining, odors, discoloration, and/or sheen and the observations were documented on the geologic log of each boring. Borings were sealed in accordance with Minnesota Department of Health rules. A soil boring matrix is provided as [Table 2](#). Boring logs are included in [Appendix A](#). There were no major deviations from the planned work. Soil borings completed at the Site are described below:

Phase A

Dump – Thirty-five soil borings were completed at the Dump. The Dump soil borings were generally spaced over an approximate 180-foot by 180-foot grid. Locations of the soil borings at the Dump are shown on [Figure 2](#).

Landfill – Eight soil borings (TS-SB-01 to TS-SB-08) were completed at the Transfer Station located in the Landfill property. The purpose of the borings at the Transfer Station was to assess the subsurface material directly under and adjacent to the operations building. For this purpose, two of the borings (TS-SB-02 and TS-SB-07) were completed within the building footprint and the remaining six borings were located surrounding the building. Locations of the soil borings at the Transfer Station are shown on [Figure 3](#).

Phase B

Dump – Eight soil borings were completed at the Burnsville Storage property located south of the Dump. The borings were generally spaced across the Burnsville Storage property for the purpose of identifying the extent of waste material south of the Dump. Two of the boring locations were placed near buildings that are used as residences, and soil-gas samples were collected for laboratory analysis from these locations. Locations of the soil borings at the Burnsville Storage property are shown on [Figure 2](#).

Soil Gas Screening

Soil gas was measured by Barr at most boring locations using a multi-gas meter capable of measuring methane, carbon dioxide, and oxygen. Upon completion of a soil boring, soil gas was screened at a depth of approximately three feet below ground surface (bgs). A tube was fitted to the multi-gas meter and lowered down the hole. The hole around the tube was then backfilled, the meter allowed to equilibrate, and the readings were logged. Recorded measurements are provided in [Table 4](#).

4.1.2 Test Excavations

Test excavations were completed at several locations at both the Dump and Landfill. The purpose of the majority of test excavations was to identify the edge of the waste boundary or to determine if waste appeared to extend beyond the property boundaries. Therefore, most of these test excavations were completed just inside the property boundary. In addition to identifying the extent of waste, the added benefit of exposing larger areas of the subsurface was to further classify the types of waste material present.

Test excavations were completed with an excavator in 1 to 2 foot lifts to depths of up to 15 feet bgs or to groundwater, whichever was encountered first. As the excavation proceeded, the operator segregated the soil and/or waste material by depth so that upon completion the leftover soil and/or waste material could be replaced back in the excavation in the order and approximate position from which it was removed. As the soil was replaced the excavator bucket was used to tamp in approximate one-foot lifts to re-compact the soil.

A test excavation matrix is provided as [Table 3](#). Excavation field logs are included in [Appendix B](#). Test excavations completed at the Site are described below:

Phase A

Dump – Fourteen test excavations were completed at the Dump. Ten of the test excavations were completed along the property boundaries and four excavations were completed in the interior of the Dump. The interior borings were completed adjacent to previously completed boring locations to better classify the waste material overserved during the soil boring investigation. Locations of the test excavations are shown on [Figure 2](#). There were no major deviations from the planned work.

Landfill – Nine test excavations (FL-TT-01 through FL-TT-08) were completed at the Landfill. Eight of the test excavations were completed along the northeast property boundary and one was completed at the southeast corner of the property. Locations of the test excavations are shown on [Figure 3](#).

Phase B

Landfill – Two test excavations (FL-TT-09 and FL-TT-10) were completed at the U.S. Salt property located north of the Landfill.

4.1.3 Sample Analysis

Selected samples collected during this RI were submitted to laboratories for analysis. The sample analytical parameter lists are provided in [Table 1](#). Laboratories were selected by the MPCA from a list of state-contract laboratories or other state agency laboratories. A summary of samples collected is provided in [Tables 2](#) and [3](#). Samples were analyzed at Pace Analytical Services, Inc. (Pace) of Minneapolis, Minnesota for all of the parameters listed, with the following exceptions:

- Groundwater analysis of volatile organic compounds (VOCs), Per- and Polyfluoroalkyl Substances (PFAS), and 1,4-dioxane was performed by Minnesota Department of Health (MDH) laboratories.
- A select group of waste sample parameters were analyzed at Minnesota Valley Testing Laboratories, Inc. (MVTL) of New Ulm, Minnesota and Beta Analytical Testing Laboratory (Beta) of Miami, Florida.
- PFAS analysis of crushed bedrock samples was performed by SGS AXYS Analytical Services Ltd. in Sidney, British Columbia.

Phase A

During the Phase A investigation, soil, waste, and groundwater samples from borings and test pits were collected for laboratory analysis by a field representative of the MPCA laboratory contractor, Pace. A detailed summary of sample collection activities is presented in Section 3.2.3 of the *Phase A Investigation Report* (Barr, 2018).

Phase B

Sample collection was conducted as part of the Phase B Waste Investigation as follows:

- Soil Gas – Soil gas samples were collected from two of the boring locations on the Burnsville Storage property. Barr and MPCA collaborated to inform the Pace representative at what intervals

samples would be collected. Pace collected the samples in accordance with the Quality Assurance Project Plan (QAPP) (Barr, 2019).

- **Waste** – Samples of waste material were also collected from the cover soil boring locations (Section 5.0) and the monitoring well borings (Section 6.0).
- **Bedrock** – Samples of bedrock were collected from the borings advanced for construction of monitoring wells MW-9D and MW-10D. These samples were crushed by the laboratory as part of sample preparation prior to analysis.

Laboratory analytical reports from the RI are included in [Appendix C](#). Upon receipt of the laboratory analytical data, Barr performed a data quality review. A summary of the data quality review is included in [Appendix D](#). The review concluded that all data met the data quality objectives of the project and are deemed acceptable for the purposes of this project, as qualified in the tables.

4.1.4 Surveying

Final locations of all soil borings and test excavations were surveyed by Barr using a hand-held global positioning system (GPS) device. Elevations were approximated based off of existing topographic information (LIDAR; [Fugro and MDNR, 2011](#)).

4.2 Summary of Subsurface Conditions

This section describes the subsurface conditions observed during the Phase A and Phase B investigations, including descriptions of the different solid media encountered and their distributions across the Site. Unconsolidated materials (including waste material, fill, and native sediments) and bedrock were described in the field by Barr. Materials were described using methods included in American Society for Testing and Materials (ASTM) D-2488, Standard Practice for Description and Identification of Soils.

A discussion of the extent and thickness of the waste material across the Dump and Landfill is included in Section 4.3.

4.2.1 Solid Media Definitions

General descriptions of the primary unconsolidated materials and bedrock encountered at the Site are provided below.

Cover Soil Fill

Fill material used as cover soil was observed at nearly all investigation locations during both phases of the investigation. Fill material generally consisted of a few inches of root zone material (topsoil with a fine sandy loam texture) underlain by sand to silty sand with varying percentages of coarse-grained sediment. Layers of finer grained sediments (clays and silts) were also observed in some locations.

Waste Material

For the purposes of this investigation, waste material was divided into two classifications: (1) municipal solid waste/construction debris (MSW/CD) and (2) ash, as described in the following paragraphs.

Municipal Solid Waste/Construction Debris – MSW/CD was encountered across most of the Site during both phases of the Investigation. Municipal solid waste consisted of paper, plastics, glass, wood, metal, and rubber and was sometimes mixed with fill material. Construction debris varied, typically including bricks, concrete, wood, shingles, pipes, and insulation. The level of decomposition varied as well, with some areas appearing relatively dry and containing readable lines of newspaper, whereas other pockets of waste material were well-degraded and had a noticeable odor of decomposition.

Ash – Ash was observed only at investigation locations at the Dump and was observed during both phases of the Investigation. Ash is generally described as gray, or black, non-plastic, silt to fine grained sand-size material and was differentiated from native sediments by strength and texture comparisons. The ash encountered at the Dump was mostly fine-grained and non-cemented, making it appear as a possible native gray silt except that it often was intermixed with waste material. The ash was generally observed either above and/or below the waste material.

Native Material Beneath Waste

Native sediments encountered during the investigation included alluvial or glacial sediment deposits. In general, native sediments were encountered below the waste material. The most commonly observed native sediment was a dark brown fibrous peat, but lean to fat clays, organic clays, silts, and sandy soils were also present in some locations.

Bedrock

The uppermost bedrock encountered during the Investigation is a sandy dolostone of the Prairie du Chien Group. The upper unit of the bedrock observed at the Site was generally described as brown, tan, and/or gray, very weak, and moderately weathered. The Prairie du Chien is heavily fractured near the surface with fracture density generally decreasing with depth. Discrete intervals with greater fracture density, vuggy porosity, and dissolution voids are present at depth and were observed during rock coring conducted in advance of installation of wells MW-9D and MW-10D ([Section 6.2](#)).

4.2.2 Freeway Dump

The summary of subsurface conditions at the Dump is primarily based on the soil borings and test excavations that were completed during Phase A of the Investigation, and the soil borings and monitoring well installations that were completed during Phase B of the Investigation. Boring logs and monitoring well logs are provided in [Appendix A](#). Test excavation logs are provided in [Appendix B](#). Subsurface conditions at the Freeway Dump generally consist of non-native fill material overlaying waste material (MSW/CD and ash), which overlay native sediments and/or bedrock. Cross section locations are displayed on [Figure 6](#), and four cross sections of the Dump are included as [Figure 6A](#), [Figure 6B](#), [Figure 6C](#), and [Figure 6D](#). Observations from both phases of the Investigation are summarized below.

Cover Soil Fill

Cover soil fill was observed at all 61 Investigation locations, at thicknesses ranging from 0.5 to 12.5 feet. Typically, the observed thickness of cover soil ranged from 2 to 5 feet. In general, the greatest cover soil

fill thicknesses were observed along the west side of the Dump, where soil borings were positioned along a landscaped Berm.

Field screening of the cover soil did not identify evidence of contamination such as staining, odors, discoloration, or sheen. PID headspace readings ranged between 0.0 and 6.9 parts per million (ppm). Field screening results are included in the boring logs.

Waste Material

Waste material encountered at the Dump consisted of a combination of MSW/CD and ash. MSW/CD thicknesses vary throughout the Dump, but generally range from 10 to 20 feet thick. The greatest thickness of MSW/CD was approximately 30 feet at boring FD-SB-A3 in the north-central portion of the Dump. The thinnest intervals of MSW/CD were identified at the westernmost borings (FD-SB-A1 through FD-SB-G1), where thicknesses averaged less than 2.5 feet.

Inferred waste extents and waste thicknesses for the Dump are presented on [Figure 4](#). A more detailed discussion of waste extent is provided in [Section 4.3](#).

Decomposition, chemical-like, and/or petroleum odors were encountered in varying degrees in the MSW/CD. Sheens were also observed, ranging from trace to heavy rainbow sheen. PID headspace readings were generally elevated (above 10 ppm) and ranged from 0.0 to 343 ppm. PID headspace readings above 100 ppm were observed at seven borings and two test excavations, all of which were generally located in the eastern portion of the Dump. Field screening results are presented in the boring logs ([Appendix A](#)).

Ash was observed both above and below the MSW/CD in the Dump ranging in thickness from 0 to 13 feet. In general, ash is more commonly observed above the MSW/CD on the east half of the property and below the MSW/CD on the west half of the property. Ash was occasionally encountered mixed with a minor amount of debris/plastic sheeting.

Field screening of the ash did not identify evidence of contamination such as staining, discoloration, odor, or sheen. PID headspace readings ranged between 0.0 and 4.5 ppm. Field screening results are presented in the boring logs ([Appendix A](#)).

Native Sediment

Native soil was observed at 31 (of 47) soil boring locations. Native soil generally consists of peat overlaying a thin layer of organic silt/fat clay. Peat was widespread throughout the main portion of the Dump but was not observed in borings completed near the southern limit and at Burnsville Storage. Peat thickness ranged from 1 to 10 feet. Generally, peat layers were observed to be between two and five feet thick. The silts and clays underlying the peat were generally no thicker than one foot. Poorly graded sand and clayey sand is present beneath the waste material only at locations in the northeast portion of the Dump.

Bedrock

Borings were generally advanced to the top of the Prairie du Chien bedrock. The depth to bedrock encountered during the investigations varied from 9.5 to 40 feet bgs. Bedrock was encountered at higher elevation (approximately 705 feet MSL) in the southern portion of the Dump, and generally slopes downward to the north edge of the property (approximately 690 feet MSL) towards the wetland.

4.2.3 Freeway Landfill

The subsurface conditions at the Landfill discussed below are based on historical investigation data as well as the recent investigations, which include test excavations, soil borings, and monitoring well installations. Boring logs and monitoring well logs are provided in [Appendix A](#). Test excavation logs are provided in [Appendix B](#). Subsurface conditions at the Landfill generally consist of non-native fill material overlaying waste material (MSW/CD), which overlay native sediments and/or bedrock. Cross section locations are displayed on [Figure 6](#), and four cross sections of the Landfill are included as [Figure 6E](#) and [Figure 6F](#).

Cover Soil Fill

Fill soil covering the waste material was encountered at all monitoring well, soil boring, and test trench locations. Fill soil ranged in thickness from approximately 0.5 feet to 25 feet, with an average thickness of approximately 10 feet. In general, fill soil was observed at greater thicknesses near the center of the Landfill, with thinner cover soil intervals around the perimeter of the Landfill. The fill soil typically included a topsoil cover overlaying brown or gray silty sand and/or sandy lean clay. These observations are consistent with those from previous investigations completed by others. Cover soil thickness contours are presented in [Figure 7](#).

Field screening in the fill material did not identify evidence of contamination such as staining, odors, discoloration, and/or sheen, with the exception of trace sheen and moderate odor being observed in borings TS-SB-02 and TS-SB-05 (Phase A, Transfer Station). PID headspace readings ranged from 0.1 to 5.4 ppm.

Waste Material

Waste material consisted of MSW/CD and observations made during the investigation were consistent with those from historical investigations. Where observed, waste material ranged in thickness from approximately 6 to 25 feet. A more detailed discussion of waste material thickness and extent is provided in [Section 4.3](#).

Light to moderate decomposition and waste odors were observed throughout the waste material at the Landfill. Sheens were also encountered, ranging from trace to heavy rainbow. PID headspace readings in the waste material varied greatly, ranging from 1.0 ppm to 203 ppm. The highest PID reading was observed in a sample from 19 feet bgs in well MW-10. Field screening results are presented in the soil boring and test excavation logs.

Native Sediment

Native sediment was observed beneath the waste material throughout the Landfill. Native sediments were observed in 46 of the 78 boring locations completed in 2005 ([FES, 2005](#)). At the remaining borings, either

waste was observed directly on top of bedrock or the borings were located outside of the footprint of the waste. Native sediment consisted of poorly graded sand, silty sand, clayey silt, and sandy lean clay.

Field screening of native sediment in soil borings completed at the Transfer Station did not identify evidence of contamination such as staining, odors, discoloration, or sheen. PID headspace readings for samples from these borings were below 1.9 ppm. At the borings completed on the north side of the property, field screening identified a moderate rainbow sheen in soil during construction of well MW-13 and a light sheen in soil during construction of well MW-12, which occurred in native sediments directly beneath waste materials. No odor or discoloration was noted in this layer and PID headspace readings were below 1.2 ppm.

Bedrock

The sandy dolostone of the Prairie du Chien Group was observed at both deep monitoring well locations (MW-9D and MW-10D). The Prairie du Chien Group was encountered between 22 and 24 feet bgs. Field screening did not identify evidence of contamination in the bedrock. The thickness of the Prairie du Chien ranges from 134 to 165 feet below the Landfill (Liesch, 1991). The bedrock surface was observed at a higher elevation (approximately 700 feet MSL) in the southern portion of the Landfill, and generally slopes downward to the north.

4.2.4 Landfill Gas Monitoring

Landfill gas monitoring was conducted with a multi-gas meter during Phase A of the investigation at the Dump and during the 2005 Fuller investigation at the Landfill. Landfill gas concentrations are presented in [Table 4](#).

Dump – Measurements indicated methane concentrations ranged from 0.0% to 36.9% across the Dump. Carbon dioxide concentrations ranged from 0.0% to 28.6% and oxygen concentrations ranged from 0.0% to 22.3%. As would be expected, the concentrations of methane and carbon dioxide generally had an inverse relationship compared with the concentration of oxygen.

Landfill – Measurements indicated methane concentrations ranged from 0.0% to 70.0% across the Landfill, with an average concentration of 36.2%. Carbon dioxide concentrations ranged from 0.0% to 42.0% and oxygen concentrations ranged from 0.0% to 20.3%.

4.3 Waste Extent

The extent of waste present at the Dump and Landfill was determined based on several methods including review of historical investigation results, review of historical aerial photography, and completion of investigation activities. The waste extent is shown on Figures 4 and 5 and the following sections describe the extent of waste and the information utilized to determine the extent at both the Dump and Landfill.

4.3.1 Freeway Dump

The extent of waste material at the Dump appears to extend beyond the property boundaries in nearly all directions. Test excavations were completed along the edges of the property during Phase A of the investigation; however, waste material and/or ash were encountered at each of these locations extending to the property line, as described in the following paragraphs.

West – Interstate 35W is located west of the Dump. Three test excavations were placed along the west edge of the property and although no MSW/CD was present, ash was observed at all three locations. The Minnesota Department of Transportation (MnDOT) conducted a Phase II investigation in 2014 (MnDOT, 2015) and a supplemental investigation in 2018 (MnDOT, 2018) along the right-of-way corridor adjacent to the property. The logs from borings placed between the Dump and the Interstate indicated the presence of a greyish silt with fine-grained sand, which is similar to the description of the ash encountered during this investigation. Additionally, historical aerial photographs from 1964 and 1967 indicate that waste disposal operations were occurring close to the edge of the highway. Although MSW/CD do not seem to extend beyond the Dump property boundary, it is assumed that ash may extend into the Interstate 35W right-of-way.

North – Along the north and east edges of the property, it was anticipated that waste material was present beyond the property boundary as the elevated ground surface of the Dump above the adjacent wetland can be observed. The elevated ground surface extends approximately 100 feet north of the property boundary and waste was observed during construction of wells MW-19-02 and MW-19-03 located above 70 feet north of the property boundary. Boring logs from three monitoring wells (MW-97-7, MW-97-8, and MW-97-9) indicate no waste present; therefore, the northern extent of the waste is assumed to be located near the toe of the slope.

East – Along the east edge of the elevated Dump surface, the slope is typically more gradual, and where it contacts the wetland is less easily identified. At one test excavation (FD-TT-06) completed along the east edge of the property near what appeared to be the bottom of the slope, waste material was observed extending below the groundwater surface. Additionally, the boring log for OFMW-1, located farther to the east, indicates ash was encountered in the boring. The extent of waste is inferred to continue along the toe of the slope to the edge of the Burnsville Storage property to the south (see below for discussion of conditions for that property).

Southeast – The Burnsville Storage property adjoins the Dump property to the south and southeast. It is assumed that the extent of waste is to the property boundary in the southeast corner of the property. Although the area to the southeast of the property corner appears disturbed in historical photos and waste material was encountered in a nearby test excavation (FD-TT-08), no waste material was observed in the five borings in this area during the Phase B waste extent investigation (see Figure 2).

South – Test excavations along the south property boundary encountered waste material. Additionally, the boring log for monitoring well MW-97-6, located just south of the property boundary indicates the presence of waste material. During the Phase B waste extent investigation, waste was observed in three

borings (FD-SB-01, FD-SB-04, and FD-SB-08) on the west side of the Burnsville Storage property. Visual evidence of this waste was mainly the presence of demolition debris or ash.

A historical dump site referred to as the “Astleford Dump” was located south of the Freeway Dump along the east side of the frontage road. The exact limits of dumping associated with the Astleford Dump are not well documented. The limits shown on Figure 12 are based on a 1986 property description diagram by the USFWS that was included in the MPCA historical files for the Dump and ground disturbance evident on historical aerial photographs. Similarly, while the exact operational dates of the Astleford Dump are unknown, based on aerial photos it appears the dump was potentially active in the 1950s and 1960s (Figure 12). Waste was observed in investigation locations south of the Site as part of the RI. Based on the location of those observations, combined with historical photograph review of the Freeway Dump operations, the delineation of the extent of waste between the two dumps is not determined.

4.3.2 Freeway Landfill

An assumed waste footprint was presented in the Investigation & Sampling Plan (MPCA, 2017) based on data from previous investigations. Along the west edge of the Landfill, the 2005 soil boring investigation (FES, 2005) delineated the extent of waste material with a line of borings (No. 1 – 8) where no waste was observed. Along the south edge of the Landfill, the extent of waste material is defined by the bottom of the slope running along the property boundary. The extent of waste is also defined by the bottom of the slope along the east edge of the Landfill. This is supported in historical aerial imagery which does not show any disturbance beyond current landfill slopes.

During the RI, test excavations were completed along the north edge of the Landfill and in the southeast corner to gain a better understanding of the extent of waste in these areas (Figure 5). In the southeast corner, waste material was observed in FL-TT-08. This excavation was located on the slope due to soft ground conditions beyond the toe of the slope. No waste material was identified in borings WT-7 or DP-8, located beyond the toe of the slope. Historical aerial photos do not show any disturbance in this corner of the Landfill, with the exception of an access road in the 1990s. It is anticipated that the waste material extends no further than the bottom of the slope, but the exact location of the extent of waste has not been determined in this area.

During Phase A of the RI, waste material was observed in test excavations completed along the northern property boundary of the Landfill. The waste included both MSW and CD, and field screening noted chemical and petroleum odors within the waste material. Two additional test excavations were completed on the U.S. Salt property north of the Landfill in 2019. Waste was observed in the eastern excavation (FL-TT-09) and was described as inert construction debris (asphalt, concrete, rebar). No waste was observed in the western excavation (FL-TT-10). The result indicate that waste extends onto the U.S. Salt property in some areas as shown on Figure 5, but it is anticipated that the waste at the this property is primarily comprised of CD mixed with fill.

At the Transfer Station, no waste material was observed at locations TS-SB-02 and TS-SB-07, which were completed inside the operations building. Waste material was observed at every other boring location surrounding the operations building that was completed during the 2018 investigation. Based on that

information, waste materials are anticipated to extend throughout the Transfer Station area, with the exception of directly under the buildings and, possibly, the weighing stations.

4.4 Summary of Analytical Results

The majority of the laboratory analysis of samples was conducted during Phase A of the RI in the spring of 2018. One sample of solid media was collected from nearly all the soil boring and test excavation locations for laboratory analysis during the Phase A investigation. This included 48 MSW/CD samples, 7 ash samples, 6 native sediment samples, and 3 cover soil fill samples.

For the purpose of providing context to the data, solid media results were compared to the MPCA's soil reference values (SRVs) and soil leaching values (SLVs). The SRVs are conservative, risk-based criteria that are dependent on land use scenarios. Concentrations from solid media samples were compared to both Recreational and Industrial SRVs. The SLVs provide a conservative estimate of the potential for contaminants detected in soil to leach to the groundwater, and it is also recognized that site specific groundwater data can be useful to further assess this potential migration pathway. For the purpose of results discussion in the subsequent sections, diesel range organics (DRO) and gasoline range organics (GRO) concentrations were compared to the criteria (100 mg/kg) included in the MPCA's *Best Management Practice for Off-Site Reuse of Unregulated Fill* (Unregulated Fill: MPCA, 2012). It is acknowledged that comparison of waste samples to these criteria is likely overly conservative; however, it is useful in developing an understanding of the overall nature and magnitude of contaminant concentrations associated with the waste material.

As discussed in Section 4.2.2 of the *Phase A Investigation Report* (Barr, 2018), previous investigations in the surrounding area have concluded that the background concentrations of arsenic, iron, manganese, and vanadium often exceed SRVs and SLVs. Therefore, the range of background concentrations will be taken into account when discussing exceedances in the following sections. A comparison of criteria to background concentrations is provided in the following table:

Parameter	Criteria (mg/kg)			Dakota County Background Range*			
	SLV	Industrial SRV	Recreational SRV	Soil (0.2 – 0.5 m)		Soil Parent Material (1 – 2 m)	
Arsenic	5.8	20	11	7	12	12	17
Iron	NA	75,000	12,000	17,000	30,000	34,000	90,000
Manganese	130	8,100	5,000	498	1,284	NA	NA
Vanadium	4	250	40	72	93	93	115

*Data range from summary maps: OFR09-02, Minnesota Soil, Till, and Ground-Water Geochemical Data. Lively, R.S.; Thorleifson, L.Harvey (Minnesota Geological Survey, 2009) <http://conservancy.umn.edu/handle/11299/117364>

Tables 5a to 5c provide a summary of exceedances of the above-referenced criteria and all data is included in Appendix E. An abbreviated summary of the analytical results from the Phase A solid media sampling is provided below. For a more detailed discussion, please refer to the *Phase A Investigation Report* (Barr, 2018).

MSW/CD – Concentrations of metals, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), PCBs, and total petroleum hydrocarbons (TPHs) that exceeded the comparison criteria listed above were detected in samples of MSW/CD throughout the Landfill and Dump.

Parameter	Samples Analyzed	Number of Phase A Sample Locations with SRV Exceedances			
		MPCA Unregulated Fill*	MPCA Tier 2 Recreational SRV	MPCA Tier 2 Industrial SRV	MPCA Screening SLV
Metals	48	-	42	13	47
VOCs	48	-	2	1	24
PCBs	48	-	20	8	35
B(a)P equivalent	48	-	15	12	19
Other SVOCs	48	-	2	2	15
DRO	48	41	-	-	-
GRO	48	8	-	-	-

*MPCA unregulated fill criteria regarding only DRO and GRO

Ash – Ash was observed only in the Dump but not in the Landfill. Concentrations of vanadium were detected above the recreational SRV at all locations and above the industrial SRV at one sample location. Concentrations of vanadium were detected above background concentrations in five of the seven samples. In five of seven samples, arsenic was detected at a concentration above the Industrial SRV (and above background concentrations). Manganese was detected at all locations at concentrations above the SLV but below or within the background range. Note that manganese was also detected in groundwater samples collected from temporary wells installed during Phase A in the vicinity of the sample locations where the SLV was exceeded. Iron was also detected at all locations at a concentration above the Recreational SRV but below or within the background range. DRO was detected at a concentration of 33.7 mg/kg in one sample. The benzo(a)pyrene (B(a)P-equivalent) concentration exceeded the Industrial SRV at one location.

Native Sediment – Six samples of native sediment were collected during Phase A for laboratory analysis – two from the Landfill and four from the Dump (Table 5c). Arsenic, iron, manganese, and vanadium were detected above SLVs or SRVs at most locations, but the concentrations were below or within their background ranges.

Boron was detected above the SLV at four locations, benzene was detected above the SLV at three locations, while Bis(2-ethylhexyl)phthalate, B(a)P-equivalent, and PCBs were each detected above their SLV in one location. Boron and benzene were also detected above drinking water and/or surface water criteria in groundwater samples collected from temporary wells installed at the Dump during Phase A. The B(a)P-equivalent concentration was also above the Recreational SRV at one location. DRO was detected at a concentration above 100 mg/kg at two locations.

The locations where parameters exceeded SLVs or SRVs and were above the background range were all located at the Dump, from native soils sitting below waste material. At the Landfill, where native sediment

samples were collected from locations outside of the waste footprint, all results were below SLVs and SRVs or were within background ranges.

4.4.1 Analytical Results – Waste to Energy

Three composite waste samples were collected during Phase B of the investigation for laboratory analysis of parameters associated with evaluating waste-to-energy potential. A composite sample from the entire waste interval was collected from each of the borings at MW-9D and MW-10D. The third sample was composited from material collected at eight of the cover soil evaluation boring locations (Table 2). The waste samples caloric value ranged from 580 to 1265 British thermal units per pound (BTUs/lb), significantly lower than typical garbage being accepted for incineration. For example, typical “fresh” garbage caloric values for MSW recently processed at the Hennepin Energy Recovery Center (HERC) range from 5,860 to 6,646 (BTU/lb) (see Barr Focused Feasibility Study).

4.4.2 Analytical Results – Crushed Bedrock

Bedrock samples were collected for laboratory analysis from wells MW-9D and MW-10D. The sample intervals were generally within 10 feet of the bedrock surface. Samples were delivered to the laboratory and crushed for the purpose of analysis.

Analytical results for the bedrock samples are shown on Table 6. The appropriate criteria to use for comparison of crushed rock sample results would be dependent on uncertain future uses and exposure scenarios. In a mining scenario, a potential exposure scenario is direct contact during crushing operations, but end uses of an aggregate product may result in other exposure scenarios. In light of those uncertainties, the results on Table 6 are compared to SRVs and SLVs for the purpose of providing context to the results. Exceedances of those criteria do not, by themselves, indicate an exposure risk issue that warrants being addressed.

The reported manganese concentration of 1,500 mg/kg at location MW-10D exceeds the SLV and is slightly higher than the upper background range value of 1,284 mg/kg. The reported concentrations of manganese from location MW-9D and vanadium at both locations exceed their SLV criteria but are within the background range. It should be noted that at locations MW-9D and MW-10D the bedrock is overlain by waste materials. For context, the concentration of manganese in groundwater samples collected from the same monitoring wells exceeded drinking water criteria, whereas vanadium did not exceed either drinking water or surface water criteria.

4.4.3 Analytical Results – Soil Gas

Two soil gas samples were collected from boring locations near occupied buildings at the Burnsville Storage property south of the Dump. The soil gas samples were submitted for laboratory analysis of VOCs. As shown on Table 7, several VOCs were detected, including benzene, ethylbenzene, perchloroethylene (PCE), and trichloroethylene (TCE). However, following MPCA guidance (MPCA, 2017), the concentrations were less than the MPCA’s 33x Residential Intrusion Screening Values (ISVs). ISVs are conservative, risk-based values for assessing the potential inhalation exposure concern related to intrusion of soil gas contaminants into occupied buildings.

Methane is a landfill gas constituent that does not have a risk-based ISV. However, it poses other risks for intrusion into buildings and the related potential for explosion in the presence of oxygen and an ignition source. Methane had been detected at high levels across much of the dump in 2018, including values of 9% to 30.8% in the four locations closest to the adjoining Burnsville Storage Property (borings FS-SB-G1 through G4, Figure 2).

Soil gas sample results from the two borings conducted in 2019 adjacent to the occupied buildings at the Burnsville Storage property (FD-SB-07 and FD-SB-08) showed non-detectable or low levels of methane. The concentration of 45.3 ppm (0.00453%) methane at FD-SB-07 is well below the lower explosive limit for methane of 5%. Based on the preliminary soil gas results at these two borings, the potential risk for landfill gas intrusion concerns at the occupied buildings at this property are relatively low, but this risk should continue to be assessed as part of future efforts.

5.0 Cover Soil Investigation

Investigation activities were completed to evaluate the substantial volume of cover soils that are present over waste at the Site. The primary objective in collecting cover soil samples was to evaluate their potential for reuse as part of a remedial action.

5.1 Summary of Investigation Activities

Cover soil investigation boring locations were selected based on previous investigation activities. The borings were completed near previous boring locations in order to (a) verify the observations from previous borings and (b) target locations with adequate thickness. The locations were chosen to be spread across both the Landfill and Dump and to represent a range of cover soil thicknesses.

5.1.1 Soil Borings

Cover soil investigation borings were advanced with a direct-push, tracked drill rig. Soil samples were collected with a dual-tube or macro-core sampler. Soil borings were advanced to, or in some cases below, the top of waste. The soil samples were described in the field by a Barr geologist or environmental scientist in accordance with the Unified Soil Classification System. The samples were inspected by Barr staff for evidence of contamination such as staining, odors, discoloration, or sheen and the observations were documented on the geologic log of each boring. Borings were sealed in accordance with Minnesota Department of Health rules. Locations of the borings are shown on [Figure 7](#) and boring logs are presented in [Appendix A](#). A summary of the cover soil borings is provided below:

Dump – Five soil borings were completed at the Dump. The borings were drilled near the locations of Phase A investigation locations FD-SB-A4, FD-SB-B1, FD-SB-C3, FD-SB-F2, FD-SB-G5 and were similarly named.

Landfill – Fourteen soil borings were completed at the Landfill. The borings were drilled near 2005 investigation ([FES, 2005](#)) locations so the approximate depth to waste was known. The borings at eight of the fourteen locations were advanced five to ten feet beyond the top of waste to facilitate collection of waste material samples (See [Section 4.1.3](#)).

5.1.2 Sample Collection

Soil samples from cover soil borings were collected and analyzed by Pace for the parameters listed in [Table 1](#). Upon receipt of the laboratory analytical data, Barr performed a data quality review. A summary of the data quality review is included in [Appendix D](#). The review concluded that all data met the data quality objectives of the project and are deemed acceptable for the purposes of this project, as qualified in the tables.

5.2 Summary of Investigation Results

The following subsections detail the results of the cover soil investigation conducted in the spring of 2019. A description of the cover soil fill material observed at the Dump and Landfill is included in [Section 4.2.1.1](#).

Soil boring details are presented in the Soil Boring Matrix (Table 2). The four cover soil samples (FD-SB-G1, TS-SB-02, TS-SB-03, TS-SB-07) collected during Phase A are also included in this discussion of results.

5.2.1 Field Screening Results

As discussed above in Sections 4.2.2 and 4.2.3, field screening of the cover soil did not identify evidence such as staining, odors, discoloration, or sheen, with the exception of trace sheen and moderate odor observed in borings TS-SB-02 and TS-SB-05 (Transfer Station). PID headspace readings for all the soil samples were below 10.0 ppm.

5.2.2 Potential Reuse Criteria

The primary purpose of the cover soil investigation was to evaluate the cover soil's potential for reuse within the proposed remedial design. The appropriate criteria for comparison with analytical results will be dependent on the design alternatives and details. For the purpose of providing context and a potential initial set of criteria for comparison, the results of the soil cover investigation were compared to the MPCA *Best Management Practices for the Off-Site Reuse of Unregulated Fill* (Unregulated Fill: MPCA, 2012) and Dakota County Ordinance 110, Solid Waste Management. These criteria, which are likely more conservative than would be required based on likely future land use scenarios (e.g., soil cover at a restricted access landfill or soil that will be covered by a future commercial redevelopment, etc.), are listed below:

- free from solid waste, debris, asbestos-containing material, visual staining, and chemical odor
- organic vapors less than 10 parts per million, as measured by a PID
- for petroleum-impacted soil, less than 100 mg/kg DRO/ GRO
- for contaminants detected in soil, less than the MPCA's SRVs and Tier 1 SLVs
 - Dakota County Ordinance 110 modifies the Lead criteria to less than 100 mg/kg

In addition to the Unregulated Fill and Dakota County criteria, analytical results are also compared to the MPCA Industrial and Recreational SRVs, which represent other conservative criteria for potential future land use scenarios.

5.2.3 Analytical Results

Soil quality results are presented with comparison to the above-described criteria in Table 8. Generally, concentrations did not exceed any of the criteria with the following exceptions:

- The arsenic concentration of 75.1 mg/kg exceeded the Residential and Industrial SRVs (11 mg/kg and 20 mg/kg, respectively) at location FD-SB-C3. Arsenic concentrations also exceeded SLV at three locations (FD-SB-G5; FL-SB-02; FL-SB-08); however, these detections were below or within their background range as discussed in Section 4.3. Arsenic was also detected at concentrations in groundwater samples collected in the vicinity of these samples; however it is important to note that the waste material underlying the cover soils may be a contributor to the arsenic detections in groundwater.

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- The BaP-equivalent concentration exceeded the SLVs in samples collected from three locations (TS-SB-03, FD-SB-C3; FL-SB-07).
 - The benzene SLV was exceeded at one location (FL-SB-13). Benzene was also detected at concentrations above drinking water criteria in locations at both the Dump and Landfill; however, it is important to note that the waste material underlying the cover soils may be a contributor to the benzene detections in groundwater.
 - DRO was detected at every location; however, DRO concentrations exceeded 100 mg/kg (the Unregulated Fill guidance concentration) at only 4 of the 23 locations (TS-SB-03, FD-SB-F2; FL-SB-03; FL-SB-13). DRO concentrations ranged from 3 to 458 mg/kg and the mean concentration was 72 mg/kg.
 - Lead was detected above 100 mg/kg at one location (TS-SB-03).

One or more potential reuse criteria were exceeded at 6 of the 23 sample locations. These sample locations were not grouped within a particular area of the Site, but, rather, appeared to be randomly distributed.

The alternatives for landfill closure under consideration include excavation, staging, and reuse of the cover soil. Given the relatively low concentrations of contaminants present in the cover soil and the expected future land uses, it is believed that, with appropriate screening during construction, the majority of the cover soil is suitable for reuse as part of the remedial alternatives under consideration for the Site.

6.0 Groundwater Investigation

Groundwater monitoring has been periodically conducted at the Site dating back to the 1970s. Over that time, the monitoring well network, sampling details, and sample parameters have evolved. The purpose of this section is to summarize the current monitoring well network (which consists of wells constructed as part of this investigation as well as those installed historically), discuss the recent investigation activities, and summarize the results of the recent investigation activities. Previous groundwater monitoring results help inform the understanding of the Site, but the results are not included in the discussion in this section.

6.1 Monitoring Well Network

The current monitoring well network consists of 40 wells (including the wells installed during the Phase B investigation). The Monitoring Well Network Matrix (Table 9) provides construction details for the well network. The monitoring well locations are shown on Figure 8. For the purpose of discussion and interpretation, the wells are organized into the following three groupings:

Perched – These wells are screened at depths where water or leachate was encountered above the regional groundwater table. The bottoms of the well screens are either on the bedrock surface or at the bottom of waste and generally low well volumes and recharge capacity have been observed during sampling events.

Water Table – These wells within the monitoring well network are screened across the regional groundwater table, with the exception of wells WT-9 and WT-10. Typically, the regional water table at the Site is in fractured Prairie du Chien bedrock and, therefore, most of the water table wells were constructed as open borehole bedrock monitoring wells (some were constructed with screen and sandpack due to hole collapse). The newly installed wells (MW-11, MW-12, and MW-13) located in the northern portion of the Landfill were constructed with a screen and sandpack as the water table is present in unconsolidated material in this area.

Jordan – There are three wells at the Landfill that are constructed as open borehole bedrock monitoring wells in the Jordan Sandstone which underlies the Prairie du Chien. The open-hole sections of these wells are in the Jordan and generally at depths of approximately 160 to 220 feet below ground surface.

Although the monitoring wells are separated into three different groups for the purpose of discussion and comparison of results, it is important to note that these are not separate aquifer units.

6.1.1 Existing Monitoring Wells

Thirty of the forty monitoring wells that comprise the network were installed prior to Phase B, as summarized below. While the following paragraphs reference wells that are no longer present, only the wells that remain at the Site are included in the total count of wells and in the well construction summary (Table 9).

Dump – Two monitoring wells were installed in 1990, of which only OFMW-1 remains. This well is screened across the regional water table in unconsolidated native material. An additional nine monitoring wells (MW-97-1 to MW-97-9) were installed by the MPCA in 1997. These wells are all Prairie du Chien water table wells. All are constructed as open borehole monitoring wells, with the exception of MW-97-8 which needed to be constructed with a 2-inch diameter screen due to borehole collapse. The nine monitoring wells were located around the perimeter of the Dump.

Landfill – From 1977 to 1983, eight regional water table monitoring wells (WT-1 through WT-8) and one Jordan Sandstone monitoring well (J-1) were installed at the Landfill. Of these wells, only wells WT-6 and J-1 remain. WT-6 was modified when the Transfer Station was built (the riser pipe was raised approximately 10 feet). Around 1986 it was observed that wells WT-7 and WT-8 (located on the southern property edge) were dry. An additional four wells (WT-9 to WT-12B) were subsequently installed in 1987 and then in 1990 four additional wells (WT-13 and WT-14, J-13 and J-14) were installed. In 1993, eight landfill gas wells were installed. One of these wells (MP-8) is located near the nested pair WT-13 and J-13. Although this well was constructed dry and for the purpose of landfill gas monitoring, it has since been observed to accumulate perched groundwater. Because the log indicates its construction is the same as a typical monitoring well would be, it is included here as part of the monitoring well network.

In 2015 the MPCA installed an additional 10 monitoring wells at the Landfill. Eight of these wells (MW-1 to MW-8) are screened in the perched groundwater/leachate, while the other two (MW-4D and MW-8D) are screened across the regional water table in the Prairie du Chien.

6.2 Summary of Investigation Activities

Previous investigations at the Landfill and Dump provided data with respect to the groundwater characterization; however, most of these investigations were conducted over twenty years ago and were somewhat limited in scope. Additional monitoring wells were installed as part of the RI to add to the monitoring well network and gain a more complete understanding of the current groundwater conditions. Recent groundwater investigation activities occurred during the spring of 2019 and included:

- Installation of four shallow monitoring wells at the Dump
- Installation of four shallow monitoring wells at the Landfill (one as a nested pair with a bedrock monitoring well)
- Installation of two bedrock monitoring wells at the Landfill
- Collection of one round of groundwater samples from the monitoring well network
- Completion of two synoptic groundwater elevation measurement events
- Collection of other physical and geophysical data, as described in Section 6.2.2 and 6.2.3

6.2.1 Monitoring Well Installation

Monitoring wells were installed using several different methods, depending on the geologic materials in which the well was to be constructed. The following paragraphs provide the well installation details for each method.

6.2.1.1 Direct-Push / Hollow Stem Auger

Soil borings were initially advanced with a direct-push, tracked drill rig. Soil samples were collected with a dual-tube or macro-core sampler to log the lithology prior to the installation of shallow monitoring wells. Soil samples were collected from continuous vertical intervals and were logged in the field by a Barr geologist or environmental scientist as described in [Section 4.1.1](#). Boring logs are provided in [Appendix A](#).

Monitoring wells were then installed via hollow-stem auger drilling and were constructed using 2-inch diameter, Schedule 40 polyvinyl chloride (PVC) well screens (No. 10 slot) and risers. Wells were constructed in accordance with Minnesota well code. Well construction details are provided in [Table 9](#). Shallow monitoring wells installed at the Site are described below:

Dump – Four monitoring wells were installed as perched wells via direct push/hollow stem auger on the north side of the Dump ([Figure 2](#)). Two of the locations are on the property owned by the Site Owner, while the other two are located on a neighboring property owned by Northern States Power Company (Xcel Energy). Because of flood conditions occurring during installation and associated higher groundwater levels, two of the wells (MW-19-03 and MW-19-04) were completed with 20-foot long well screens rather than the planned 10-foot long well screens. The 20-foot screens were installed to comply with MDH monitoring well installation requirements that do not allow for threaded riser pipe connections below the observed groundwater level.

Landfill - Three monitoring wells (MW-11 to MW-13) were installed as water table wells via hollow-stem auger on the north side of the Landfill ([Figure 3](#)).

One other shallow monitoring well (MW-9) was installed as a perched well via direct push/hollow stem auger on the south side of the Landfill as a nested pair with a bedrock monitoring well (MW-9D, discussed below). Another shallow monitoring well was planned as a nested pair with bedrock monitoring well MW-10D; however, this well was not installed because there was no evidence of perched water during the drilling of MW-10D.

6.2.1.2 Rotasonic and Diamond Core

Two soil/rock borings were advanced and monitoring wells (MW-9D and MW-10D) were installed at the Landfill. Borings were advanced using rotasonic (sonic) drilling technology to provide continuous soil samples for the planned bedrock monitoring wells. Sonic drilling uses dual line threaded drill pipe with an inner core barrel and an outer sonic drill casing. The sample is extruded from the core barrel into plastic sleeves so that it can be logged, field screened, and sampled. From ground surface to the top of competent bedrock, continuous soil core samples were collected in accordance with ASTM D-6914-04e1 *Standard Practice for Sonic Drilling for Site Characterization*.

From the top of competent bedrock to the bottom of the borehole, diamond core drilling was conducted with 2.5-inch inner diameter (HQ) core barrels. The rock cores were continuously recovered and logged for geologic classification and fracture density assessment using rock quality designation (RQD) (ASTM D6032 - 08). Core recovery and RQD were calculated as described in ASTM D6032-08. The rock type, field strength, color, texture, structure, decomposition, disintegration, fracture density, and stratigraphic

contacts were described for the core. Fractures were described noting the depth, type, apparent dip angle, aperture, healing, infilling, unevenness, and moisture. Drillers provided any observations related to rod drops, water loss, and relative coring rate to enhance the field geologist's notes as related to the potential presence of fractures. Boring logs are included as [Appendix A](#). All cores were photographed with depth and boring location identification.

MW-9D – The borehole was advanced to 31 feet bgs by rotasonic drilling with diamond core drilling from 31 to 78 feet bgs. RQD ranged from very poor to good within the diamond cored interval, though generally the RQD was fair. The casing is set to a depth of 45 feet bgs. The open borehole portion of the well extends to a depth of 83 feet bgs (the borehole was advanced by rotasonic from 78 to 83 feet bgs because it was decided to extend the depth of the well an additional 5 feet after the diamond core tooling had been removed from the hole).

MW-10D – The borehole was advanced to 31 feet bgs by rotasonic drilling with diamond core drilling from 31 to 88 feet bgs. RQD ranged from poor to excellent within the diamond cored interval, though generally the RQD was fair to good. The casing is set to a depth of 66.5 feet bgs and the open borehole extends to a depth of 88 feet bgs.

6.2.1.3 Well Development

The new monitoring wells were developed after a minimum of 24 hours following grout installation in accordance with the Minnesota Well Code. Well development was conducted by surging and over-pumping. For the bedrock monitoring wells and some of the shallow wells, the development process continued until discharge water was visibly free of sediment. Monitoring well MW-9 was observed to have very little water (less than 1 foot) and was not developed.

6.2.2 Physical Site Data Collection

The following section includes descriptions of the surveying data, groundwater level measurements, and river level measurements.

6.2.2.1 Surveying

Final locations of all soil borings, test excavations, monitoring wells, and any other important features noted during the field investigation were surveyed using a hand-held GPS device. The horizontal coordinates of each investigation location were surveyed by GPS to the nearest 1 foot, and referenced to the Universal Transverse Mercator (UTM) coordinate grid system North American Datum (NAD)-83.

Due to the complications with persistent flooded river conditions during the RI, an elevation survey has not yet been completed. The elevations of newly installed and some existing monitoring wells will be surveyed to an accuracy of 0.1 feet and will be referenced to the North American Vertical Datum (NAVD) of 1988. The elevation survey of the monitoring well network will be conducted by a licensed surveyor contracted by the MPCA.

For the purpose of this report, the ground surface elevations of well locations that have not yet been surveyed are approximated based off existing LIDAR (Light Detection and Ranging) topographic

information and the riser elevations are approximated based on LIDAR and well construction log detail. The ground surface elevation of soil boring and test excavation locations will not be surveyed but are approximated based off LIDAR.

6.2.2.2 River Level Measurements

The nearest measurement gauge on the Minnesota River is located in Savage, MN approximately 1.5 miles upstream from the northwest corner of the Landfill. River elevation data was obtained from the US Army Corps of Engineers, St. Paul Division and is presented in [Appendix G](#) along with monthly precipitation data. Precipitation data was obtained from the Minnesota State Climatology Office website.

6.2.2.3 Groundwater Level Measurements

Groundwater levels were measured in monitoring wells during the spring of 2019. A summary of groundwater level measurements is provided in [Tables 10a](#) and [10b](#). Synoptic rounds of groundwater level measurements were obtained on April 9, 2019 and June 17, 2019. The Minnesota River stage (at Savage MN, approximately 1 mile upstream) was approximately 708 feet MSL, which is between the minor flood stage (702 feet MSL) and moderate flood stage (710 feet MSL), on April 9 and, therefore, several wells were inaccessible. During the June 17 measurement event, the Minnesota River Stage at Savage, MN was approximately 699 feet MSL, which is between the action stage (697 feet MSL) and the minor flood stage. Only one well (J-1) was inaccessible (due to flooding) on June 17. Groundwater levels were also recorded by Pace when groundwater samples were collected for laboratory analysis. Groundwater levels from the synoptic measurements are presented on the groundwater contour figures ([Figures 9 to 11](#))

6.2.3 Borehole Geophysical Logging

The Minnesota Geologic Survey (MGS) conducted borehole geophysical logging in several wells at the Landfill. The logging generally consisted of video, gamma, caliper, and multi-tool (fluid resistivity, fluid temperature, spontaneous potential (SP), normal resistivity (16N and 64N), single point resistance, lateral resistivity, and specific conductance) logging. MGS performed the downhole surveys at monitoring wells WT-11B, WT-13, J-13, WT-14, and J-14 as part of their on-going regional assessment program. Barr reviewed the logs ([Appendix G](#)) to assess if discrete, hydraulically active fractures or fracture zones could be easily identified that might warrant discrete interval sampling in the open borehole wells. During Phase B, it was determined that discrete interval sampling would not be pursued; however, further analysis of the geophysical logging data will be conducted as part of the ongoing groundwater investigation.

6.2.4 Sample Collection

Groundwater samples were collected for laboratory analysis by Pace. The sample parameter lists are included in [Table 1](#). Samples were analyzed at Pace for all of the parameters listed, with the exception of a select group of groundwater sample parameters that were analyzed at MDH's laboratory. Laboratories were selected by MPCA from a list of state-contract laboratories or other state agency laboratories.

Upon receipt of the laboratory analytical data, Barr performed a data quality review. A summary of the data quality review is included in [Appendix D](#). The review concluded that all data met the data quality

objectives of the project and are deemed acceptable for the purposes of this project, as qualified in the tables.

Phase A – During Phase A of the investigation (2018) groundwater samples were collect from temporary wells in select borings and also from test excavations where groundwater was observed. Groundwater samples were collected from the borings using 1–inch diameter PVC screen and riser. New screens and risers were used at each sample location. A peristaltic pump was used to recover the sample from the temporary wells. Purging was not conducted prior to sample collection due to the limited volume and recharge observed. Samples were generally turbid due to this lack of purging. If water was encountered in a test excavation, a sample was collected using surface water sampling techniques, which generally included filling a laboratory-cleaned container by lowering it into the water that had accumulated in the excavation. The sample was then transferred into the appropriate laboratory-provided sample container.

Phase B – During Phase B (2019) of the investigation, groundwater samples were collected from the existing and newly installed monitoring wells at the Site. Due to flood conditions, sampling was not conducted at three locations (J-1, WT-9, and WT-10), and at multiple locations sampling was delayed to allow for flood waters to recede sufficiently. No sample was collected from well WT-12B because the sampling crew was unable to locate the well (the well was eventually located during the water level measuring event on June 17). Wells were sampled in accordance with procedures detailed in the QAPP.

In addition to samples collected from the monitoring wells, a groundwater sample was collected on May 29, 2019 from a seep located downgradient of the Landfill at Kraemer Quarry. A sample of the discharge water from the quarry’s pumping operations was also collected. The discharge water sample was collected from an outfall flowing into settling ponds in the northwest corner of the quarry. The sample was collected at this point because due to flooded conditions the normal effluent point for the pumping operations was not in use and sampling could not be conducted safely at the interim effluent point. Sample locations are shown on Figure 3.

6.2.5 Investigation Derived Waste

Investigation derived waste (IDW), including soil cuttings from well construction activities and purge water from well development and sampling, was containerized in 55-gallon steel drums. Solid and liquid waste streams were containerized separately. The waste was profiled as similar to the IDW disposed of during the 2015 well installation at the Landfill. Clean Harbors collected IDW generated as part of the Phase B investigation and hauled it offsite for disposal on June 24, 2019. The HQ rock cores were boxed and stored offsite.

6.3 Summary of Analytical Results

Groundwater samples were compared to drinking water and surface water criteria as there is potential risk for migration to both well receptors and surface water receptors. MPCA surface water criteria for both chronic and acute exposure were used for comparison. These criteria are dependent on the hardness of the receiving surface water body. A hardness value of 360 mg/L was estimated for the Minnesota River (MPCA, 2006). Drinking water criteria used for comparison were the EPA’s maximum contaminant levels

(MCLs) and the MDH health risk limits (HRLs). The following discussion of analytical results is separated into three groups; perched, water table, and Jordan, similar to the monitoring well network (Table 9).

During Phase A of the investigation, the analytical parameter list covered a large range and, as would be expected from groundwater in contact with waste material, concentrations of a number of parameters were above drinking water and surface water criteria. The parameter list selected for Phase B of the investigation was reduced to include only parameters that exceeded relevant criteria during Phase A. Results from Phase A of the investigation are summarized in the *Phase A Investigation Report* (Barr, 2018), and exceedances are presented in Table 11 of this report for reference. Because data collected from permanent monitoring wells is typically more reliable than data collected from temporary wells or test excavations, the majority of this section is focused on the results from Phase B of the investigation. The exceedances of drinking water and surface water criteria for groundwater samples collected from the monitoring well network are presented in Table 12. While Tables 11 and 12 only include exceedances of criteria, the complete data set is tabulated in Appendix E.

Perched Groundwater – Sample locations and monitoring wells included in the perched groundwater group include the Phase A temporary well locations at the Dump and Landfill, test excavation locations at the Dump, 2015 MPCA-installed monitoring wells (MW-1 to MW-8), former landfill gas monitoring well MP-8 at the Landfill, and the newly installed monitoring wells (MW-19-01 to MW-19-04) at the Dump.

Generally, the results for samples from perched wells installed during Phase B were similar to the results collected during Phase A. Analytical results from the perched groundwater samples collected during Phase B are summarized below:

General Parameters – Concentrations of nitrogen (ammonia, as N) were observed in 6 of 7 perched wells (MW-3 and MW-9 were not sampled for ammonia due to insufficient sample volume) at the Landfill ranging from 0.47 to 621 milligrams per liter (mg/l) and at all four perched wells at the Dump ranging from 0.4 to 20.2 mg/l, exceeding the chronic surface water standard of 0.04 mg/l. Concentrations of chloride exceeding the chronic surface water standard of 230 mg/l were not detected in wells at the Dump, but were detected in four of eight wells (MW-9 was not sampled for chloride due to insufficient sample volume) at the Landfill at concentrations ranging from 1,070 to 1,240 mg/l. Cyanide concentrations exceeded the chronic surface water standard of 5.2 µg/l at one Landfill well and two Dump wells.

Metals – More than ten metals exceeded drinking water and/or surface water criteria in the 2019 sample collected from well MW-1. At the other wells, concentrations of metals detected above criteria were widespread, but the specific metals generally varied. Boron and manganese were most commonly detected at concentrations above drinking water criteria. Cobalt concentrations were detected above surface water criteria at five wells at the Landfill but none at the Dump. Hexavalent chromium concentrations were also detected above surface water criteria at one Dump and five Landfill locations, with three locations at the Landfill also exceeding drinking water criteria. Arsenic was detected at a concentration above surface water criteria in five wells at the Landfill (also above drinking water criteria in MW-1) and one well at the Dump.

VOCs – Multiple VOC analyte concentrations above drinking water and/or surface water criteria were reported at wells MW-1 (fourteen analytes) and MW-3 (six analytes) at the Landfill. In addition, benzene concentrations above surface water and/or drinking water criteria were reported at two Dump and five other Landfill locations. A vinyl chloride (VC) concentration above both drinking water and chronic surface water criteria was reported at one well at the Dump. A TCE concentration above the HRL was reported at one location at the Dump. Naphthalene was detected at a concentration in excess of the drinking water and surface water criteria in one location at the Landfill.

1,4-dioxane - Concentrations of 1,4-dioxane were reported in 7 of 9 perched wells at the Landfill ranging from 4.2 to 220 µg/l and 3 of the 4 perched wells at the Dump ranging from 3.4 to 13 µg/l. The drinking water criteria for 1,4-dioxane is 1.0 µg/l.

PFAS- Per- and polyfluoroalkyl substances (PFAS) concentrations were reported at all perched well locations at the Dump and Landfill, with the exception of MP-8. There are no surface water criteria or MCLs for PFAS compounds. The MDH has developed HRLs and HBVs for some PFAS compounds. Compounds whose reported concentrations most often exceeded their HRL were perfluorohexane sulfonate (PFHxS), perfluorooctanesulfonate (PFOS), and perfluorooctanoic acid (PFOA). The reported concentrations of these compounds were one to two orders of magnitude higher than their HRLs.

Water Table – Sample locations and monitoring wells included in the water table group include the Phase A test excavation locations at the Landfill, newly installed bedrock wells (MW-9D and 10D), 2015 MPCA installed monitoring wells (MW-4D and MW-8D), and existing wells WT-6 to WT-14 at the Landfill, the seep sample collected from Kraemer Quarry, and the existing monitoring wells (MW-97-1 to MW-97-9; OFMW-1) at the Dump. Analytical results from the water table groundwater samples collected during Phase B are summarized below:

General Parameters – Concentrations of nitrogen (ammonia, as N) were observed in all 11 water table wells at the Landfill ranging from 0.14 to 84.9 mg/l and at 7 of 9 water table wells at the Dump ranging from 0.12 to 5.3 mg/l. The chronic surface water standard for nitrogen (ammonia, as N) is 0.04 mg/l. Concentrations of chloride exceeding the chronic surface water standard of 230 mg/l were detected in 3 of 11 wells at the Landfill ranging from 240 to 501 mg/l and at 3 of 9 wells at the Dump ranging from 272 to 291 mg/l. Cyanide concentrations exceeded the chronic surface water standard of 5.2 µg/l at two Landfill wells.

Metals –Detections of metals at concentrations in excess of surface water and/or drinking water criteria were widespread, but the specific metals varied by location. Boron and manganese were most commonly detected at concentrations above drinking water criteria. Cobalt concentrations were detected above surface water criteria at eight wells at the Landfill and five wells at the Dump. Arsenic was detected at a concentration above surface water criteria in nine wells at the Landfill (three of which were also above drinking water criteria) and three wells at the Dump.

VOCs – Vinyl chloride was detected at a concentration in excess of the MCL at well MW-8D at the Landfill. No other VOCs were detected at concentrations above drinking water or surface water criteria.

1,4-dioxane - Concentrations of 1,4-dioxane exceeding the HRL of 1.0 µg/l were reported for 8 of 11 water table wells at the Landfill ranging from 1.2 to 40 µg/l. The concentration of 1,4-dioxane reported in the seep sample was 19 µg/l. 1,4-dioxane was not reported in any of the samples from the Dump wells at a concentration that exceeds the criteria.

PFAS - PFAS compounds were reported at nearly all water table well locations at the Dump and Landfill, as well as in the seep sample, with the exception of wells MW-97-2, MW-97-3, and MW-97-4. PFOS and PFOA were the compounds most commonly reported at concentrations exceeding their HRLs. Generally, the concentrations of these compounds were one order of magnitude or less higher than their HRLs.

Jordan – There are three monitoring wells located at the Landfill that are open in the Jordan Sandstone (J-1, J-13, and J-14). Due to flood conditions, it was not possible to sample well J-1 in the spring of 2019. Analytical results from the water table groundwater samples collected during Phase B are summarized below:

General Parameters –Nitrogen (ammonia, as N) was detected in samples from wells J-13 and J-14 at concentrations in excess of the chronic surface water criteria, ranging from 0.21 to 0.30 mg/l.

Metals – No metals were detected at concentrations in excess of drinking water or surface water criteria.

VOCs – No VOCs were detected at concentrations in excess of drinking water or surface water criteria.

1,4-dioxane - 1,4-dioxane was detected in the sample from monitoring well J-14 at a concentration of 3.3 µg/l, which exceeds the HRL of 1.0 ug/l.

PFAS – No PFAS were detected at concentrations in excess of drinking water criteria.

7.0 Conceptual Site Model and Potential Pathways/Receptors

A generalized conceptual site model is presented in the following paragraphs. Because the investigations completed to date have been focused, the conceptual site model that has been developed is similarly focused. Also included in the following paragraphs is an assessment of the potential pathways and receptors associated with the presence of waste in unlined facilities.

7.1 Waste Materials and Subsurface Conditions

At both the Dump and the Landfill, a thin layer of top soil is generally present that covers non-native fill material overlying waste material, which rests on native sediments and/or bedrock. A liner below the waste is not present at either location. At the Dump, bedrock generally slopes downward to the north edge of the property towards the Minnesota River, as shown on [Figures 6A and 6D](#). At the Landfill, the bedrock elevation is generally higher in the south and slopes down to the north towards the Minnesota River, as displayed on [Figures 6E and 6F](#). Descriptions of the subsurface materials and detailed investigation observations are included in [Section 4.2](#).

At the Dump, waste appears to extend beyond the property boundaries in all directions, as detailed in [Section 4.3](#). Waste material at the Dump, which includes MSW/CD and ash, was observed to be between 10 and 30 feet thick within the Dump boundary and between 5 and 10 feet thick in locations where waste material was identified south of the perimeter of the Dump in Phase B of the Investigation ([Figure 4](#)).

At the Landfill, waste appears to be generally contained on property owned by the Site Owner, except for some waste material that extends offsite to the north adjacent to the Minnesota River. Generally, waste material encountered at the Landfill consisted of MSW/CD, with a slightly higher percentage of construction debris compared to the Dump. Waste material that extends offsite to the north appears more similar to construction debris than MSW. The thickness of waste material encountered during Phase B of this investigation ranged from 6 to 15 feet, with an average waste thickness of about 13 feet. Data from a 2005 investigation indicate that waste material was commonly observed to be between 15 and 25 feet thick in the center portion of the landfill, with a maximum thickness of 49 feet ([FES, 2005](#)). Waste material is present throughout the Transfer Station area, with the exception of directly under the buildings and, possibly, the weighing stations.

7.1.1 Direct Contact Pathway

Under current conditions, there is a limited risk of direct contact with waste. There is a vegetated soil cover present at both the Landfill and Dump that is being maintained by the Site Owner. Access is controlled at the Landfill and land use is commercial for both areas.

The Dump currently operates as a recreational facility (golf driving range). On the south end is a gravel parking lot. The majority of the land surface is vegetated by grass. Along the east, north, and west edges the vegetation includes shrubs and the south edge is wooded. Cover soil is present over the waste material. However, the investigation results indicate that the cover soil thickness is less than one foot in

some locations. A metal chain link fence runs along Interstate 35W and between the Dump and Burnsville Storage to the south. The Dump is accessible to pedestrian and vehicular traffic.

The Landfill is similarly vegetated with grasses over the majority of the land surface and the edges of the property having shrubs or wooded vegetative cover. The Landfill is no longer operational; however, the Transfer Station is operational and access roads through the Landfill are utilized as well as lay-down areas in the northern portion of the Landfill. Cover soil is present over the waste material. Investigation results indicate the soil cover thickness is two feet or greater. The Landfill is also accessible to pedestrian and vehicular traffic; however, access is controlled by fencing and gates.

There are also limited areas of waste that extend onto adjacent commercial properties as follows:

- The U.S. Salt property located north of Freeway Landfill - a gravel driving surface and support structures are present over the underlying debris, limiting direct contact risk for this commercial property.
- The wetland complex (Xcel Energy and US Fish and Wildlife) located north and east of Freeway Dump - a vegetated cover over the waste is present in these areas, reducing direct contact risks for these areas that are rarely accessed by people.
- The Burnsville Storage Company facility located south of Freeway Dump - a paved surface and slab-on-grade storage building limit direct contact concerns for this property.

7.1.2 Vapor Pathway

Decomposition of MSW creates landfill gas, including high levels of methane. Elevated methane concentrations were detected throughout all portions of the Site. The majority of the waste area is vacant land, and minimal monitoring is currently conducted. There are a few existing buildings near the waste that may pose a risk of landfill gas intrusion (all believed to be slab-on-grade construction), including:

- Freeway Transfer Station at Freeway Landfill
- Commercial building at driving range at Freeway Dump (operated seasonally)
- Storage units and two residentially-occupied spaces at the Burnsville Storage Company at south end of Freeway Dump (Soil gas samples near the occupied units did not identify soil vapor intrusion risks)

At the Dump, a limited set of soil gas samples was collected beyond the waste extent boundary on the Burnsville Storage property. These samples were collected within 20 feet of buried waste material. The methane concentration was several orders of magnitude below the lower explosive limit and the VOC concentrations did not exceed 33x ISVs. Additional sampling may be required for future buildings constructed near the waste boundaries.

7.2 Hydrogeology

The uppermost bedrock beneath the Site is dolostone of the Prairie du Chien Group. Immediately below the Prairie du Chien is the Jordan Sandstone. The Prairie du Chien and Jordan are hydraulically

interconnected and are the two most utilized and productive aquifers in the Twin Cities metropolitan area. Groundwater flow in the Prairie du Chien Group is dominated by secondary porosity features (fractures and dissolution voids). Previous investigations indicate that hydraulic conductivities range from approximately 16 feet per day (ft/d) to 1,530 ft/d within the upper Prairie du Chien (Liesch, 1991). Higher conductivity zones are expected to be representative of higher fracture density and lower conductivity zones are expected to be representative of lower fracture density. Preliminary assessment of rock coring and downhole geophysical logging results did not identify discrete fracture zones that dominate groundwater flow. Although groundwater flow at the Site is through secondary porosity features, based on available information it appears that at the scale of tens of feet or greater, the equivalent porous media approximation can be applied to the Prairie du Chien at the Site.

The Site is located in close proximity to the Minnesota River channel. Under natural conditions, groundwater in the unconsolidated material, the Prairie du Chien, and the Jordan would discharge to the Minnesota River (or into associated lakes and wetlands that discharge to the river). However, the groundwater flow patterns near the Site are currently influenced by the long-term dewatering operations at the Kraemer Quarry located approximately 1,000 feet west of the Dump and immediately south and southwest of the Landfill, which has a significant impact on current and future risks. The Site is also periodically influenced by flooding on the adjacent Minnesota River. The following sections summarize the conceptual site model and associated potential pathways and receptors for three scenarios: (1) current conditions with dewatering at Kraemer Quarry, (2) periodic flood conditions, and (3) predicted future conditions after dewatering at Kraemer Quarry ceases. Ultimately, the primary receptor for groundwater at the Site is the Minnesota River, but the pathway to the river varies for each scenario as discussed below.

7.2.1 Current Conditions

The water table in the vicinity of the Site is generally present below the unlined waste, either in unconsolidated materials above the bedrock or in the uppermost bedrock. In some areas of the Site, the waste is in contact with the bedrock and at times there is perched water within the waste. Wetlands are adjacent to the north and east sides of the Dump, which drain to Black Dog Lake and the river. The Black Dog Preserve Calcareous Fen is to the east of the Dump.

Groundwater pumping at the adjacent quarry produces a cone of depression causing the groundwater at most (if not all) of the Site to generally be captured by the quarry sump rather than river. The water collected by the Kraemer Quarry dewatering is discharged to the river at an outfall west of the Landfill (see Figure 3). The effect of the dewatering is most apparent at the Landfill where the groundwater flow direction in the water table aquifer in the Prairie du Chien under the Landfill is directly southwest toward the quarry sump with an approximate hydraulic gradient of 0.25 feet per foot (ft/ft). At the Dump, the groundwater flow may be less influenced by the quarry dewatering. The flow direction at the Dump appears to be to the northwest based on the June 2019 groundwater level measurements with an approximate hydraulic gradient of 0.01 ft/ft. However, it is anticipated that groundwater in the water table aquifer under the Dump is ultimately captured by the Kraemer Quarry pumping (i.e., it does not continue flowing toward the river).

In summary, nearly all of the groundwater at the Site is currently believed to be captured by the Kraemer Quarry pumping and discharged to the river via the quarry outfall. Additional data collection is planned to further assess the groundwater movement at the Site during various seasons and river stages.

7.2.1.1 Groundwater Pathway

Because there is no liner beneath the waste in either facility, waste is directly in contact with perched groundwater in portions of both the Dump and Landfill. Perched groundwater samples collected during the 2018 and 2019 investigations exhibited concentrations of various constituents that exceed drinking water and surface water criteria (as discussed in [Section 6.3](#)).

The newly installed wells at the Dump, which were screened in what is assumed to be perched groundwater, have been monitored only during flood conditions. Therefore, their connection to the water table is still being evaluated; however, it is assumed that there would be a downward gradient between the two based on the water levels measured to date.

At the Landfill, an apparent connection between the perched and water table wells exists, based on the analytical results for groundwater samples which indicated the presence of similar constituents, such as PFAS, metals, and 1,4-dioxane in both groups of wells at concentrations exceeding comparison criteria. At the Landfill, 1,4-dioxane was also detected above the drinking water criteria in Jordan Sandstone monitoring well J-14.

In groundwater samples collected from monitoring wells MW-9, MW-9D, and MW-10D, which are located in the southwestern portion of the Landfill and upgradient of the Kraemer Quarry, several parameters were detected in concentrations in excess of drinking water and/or surface water quality criteria. Those parameters include several metals, VOCs, 1,4-dioxane, and PFAS.

Several of those same parameters were also detected at similar concentrations in the sample collected from the seep. Fewer of the parameters, and at generally lower concentrations, were detected in the discharge sample. Based on these results, it appears that impacted groundwater from beneath the Landfill is expressed through seeps into Kraemer Quarry. It also appears that the impacted groundwater/leachate is mixed with clean groundwater that is also captured by the Quarry (i.e., groundwater that does not pass beneath or contact waste in the Dump or Landfill) thereby diluting the observed contaminants in the discharge from the quarry to the river.

The City of Burnsville utilizes a surface water feature in the southern portion of the Kraemer Quarry as a drinking water supply. The City also operates water supply wells that are open to the Jordan Sandstone and are located approximately one-third of a mile to the southeast of the Dump. Based on the current pumping rates at the quarry, and their influence on the groundwater flow direction, the current risk of contaminant migration to these receptors is low.

7.2.1.2 Surface Water Pathway

Several surface water features are present in the vicinity of, and immediately adjacent to, the Site, including the following:

- Freeway Dump is bounded to the north and east by a wetland which lies between the Dump and the Minnesota River.
- The Minnesota River is directly north of the Landfill.
- An intermittent water course that flows to the river runs along the east side of the Landfill.

There is potential risk of seepage of leachate from the Dump to the north into the wetland and from the Landfill to the north into the Minnesota River. The newly installed monitoring wells on the north side of the Landfill are defined as water table wells and show groundwater in direct contact with waste. Because the new wells were installed and sampled during a flood event (similar to the new wells at the Dump), it is too early to make conclusions about the hydrogeological conditions and connection with surface water in this area. Additional monitoring and sampling are needed to better define the groundwater to surface water pathway.

7.2.2 Periodic Flood Conditions

The periodic flooding of the Minnesota River temporarily changes the groundwater flow directions described above, especially for areas of the Site in close proximity to the river and areas inundated by the flood. The river experienced a significant flood event lasting from March through June 2019 during the Phase B groundwater investigation, which provided insights into flooded conditions.

During the flood conditions, the groundwater elevation was above the top of the bedrock and in contact with waste throughout a large portion of the landfill (see Figure 6E). Groundwater levels measured in newly installed monitoring wells MW-11, MW-12, and MW-13 were higher than the river elevation in June 2019. Based on the groundwater elevations measured relative to the river stage elevation, it appears that north of the Landfill near the river there is a groundwater divide and that some of the groundwater at the Landfill was discharging to the River as flood waters receded. The water quality in those wells exhibited concentrations of parameters such as metals, VOCs, PCBs, 1,4-dioxane, and PFAS in excess of drinking water and/or surface water quality criteria.

Additional monitoring is warranted to verify whether this observed flow pattern exists during normal (non-flooded) conditions.

7.2.3 Modeled Future Conditions

In 2015, Barr conducted groundwater model simulations to estimate future groundwater conditions near the Landfill under a future scenario when the quarry ceases operation and discontinues dewatering pumping.

The initial groundwater model (Barr, 2015a) evaluated the percent of waste in the Landfill (by area) that would come into contact with the regional water table level based on varying the surface water level in the future quarry pit lake that would form when Kraemer ceases dewatering. The future surface water elevation in the lake will be controlled by the elevation chosen for the controlled lake outlet. In those simulations, the water table rises above the bottom of the waste within the footprint of waste at the Landfill, with the predicted percentage of saturated waste dependent on the elevation of the future pit lake. At the lowest simulated pit lake stage (672.6 feet MSL) the water table rises into 9 to 12 percent of

the waste (by area). At the highest simulated pit lake stage (698.8 feet MSL) the water table rises into 75 to 85 percent of the waste (by area).

The model was then used to evaluate contaminant transport associated with contaminants leaching from waste to shallow groundwater and migrating towards both the Minnesota River and the future pit lake under future conditions (Barr, 2015b). The MPCA installed and sampled groundwater wells that were screened in the perched zone within the waste at the Landfill (MW-1 to MW-8). The analytical results from groundwater samples in contact with waste were used to define source concentrations of contaminants in groundwater used in this modeling.

Contaminants of concern evaluated in the future transport simulations included selected metals and PFOA during the average condition with the pit-lake stage at an elevation of 690 feet MSL and during a 100-year flood. The results of the model showed that, in the future scenario where dewatering is discontinued, groundwater discharging to either the pit-lake or river exceeds water quality criteria for chromium, cobalt, chloride, antimony, arsenic, cadmium, iron, lead, manganese, mercury, nickel, zinc, and PFOA. The modeling has not been updated to incorporate the most recent investigations results from Phase A and B, but as noted above, there are currently parameters in excess of surface water quality criteria in monitoring wells located adjacent to the river and at the currently downgradient wells located in the southwestern area of the landfill adjacent to the quarry.

8.0 Conclusions and Recommendations

The focused RI was completed to characterize the waste material at the Site and to evaluate potential risk related to the waste to current or likely future receptors. The focused RI was completed in support of potential future remedial design. The focused RI includes a review of Site background information and the results of the recent investigation on the Site and its surrounding properties.

Based on the existing and anticipated conditions, the MPCA has determined that additional waste management efforts are needed for the Freeway Landfill and Dump. A Focused Feasibility Study is being developed to assess a range of alternatives to address containment and/or treatment of the waste. The focused RI's purpose was primarily to inform the development of a remedial design. The following paragraphs summarize additional investigation activities that are recommended.

8.1 Waste Material Investigation

The delineation of the extent of waste material present at the Site has been refined through the recent investigation activities. Neither the Dump nor Landfill were constructed as lined facilities and the waste material directly overlays native sediments or bedrock. The waste was observed to be in direct contact with perched groundwater. Concentrations of several contaminants, notably PFAS, 1,4-dioxane, and metals were detected above drinking water or surface water criteria in perched groundwater samples.

At this time no future waste material investigation tasks are recommended.

8.2 Cover Soil Investigation

Samples were collected of the soil covering waste material to evaluate its suitability for reuse as part of the alternatives for landfill closure that are under consideration, all of which include excavation, staging, and reuse of the cover soil as part of a large-scale soil handling operation. Several contaminants were detected in cover soils; however, the majority of the soils did not exhibit contaminants at concentrations in excess of even the most conservative criteria. Given the relatively low concentrations of contaminants present in the cover soil and the expected future land uses, it is believed that, with appropriate screening during construction, the majority of cover soil is suitable for reuse as part of the remedial alternatives under consideration for the Site.

8.3 Groundwater Investigation

The evaluation of potential wider concerns for current or future groundwater conditions are beyond the scope of the focused RI, but it is recognized that improved waste containment or removal from the Site will be an important source control/removal component when wider risk pathways are evaluated and addressed. Limited groundwater investigation activities were conducted during this focused RI. The following additional tasks are recommended to complete the groundwater investigation undertaken during the focused RI:

- Survey the elevations of newly installed monitoring wells (and select existing monitoring wells to corroborate elevations)

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- Collect at least one additional round of groundwater samples from the entire monitoring well network during a non-flood river stage.
 - Conduct at least two additional synoptic rounds of groundwater level measurements from the entire monitoring well network.

Following the completion of the recommended tasks, a supplemental RI report will be prepared to further evaluate the current and future groundwater conditions at the Site. Though outside the scope of this focused RI, a more thorough remedial investigation may also be necessary in order to fully quantify the nature and extent of groundwater contamination.

8.4 Vapor Intrusion Investigation

The evaluation of potential vapor intrusion is beyond the scope of the focused RI; however, it is recommended that potential vapor intrusion exposure pathways at existing occupied buildings overlying waste be investigated. The existing buildings at the Transfer Station located in the Freeway Landfill, the commercial building at driving range at Freeway Dump, and the office building on the U.S. Salt property all overlie waste material. All of these buildings appear to be constructed as slab-on-grade and it is recommended that a sub-slab vapor investigation be conducted in accordance with MPCA guidance for vapor investigations.

9.0 References

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Tables

Table 1

LABORATORY ANALYTICAL PARAMETER LIST
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Parameter	Method	Phase A Investigation	Phase B		
			Ground water	Cover Soil	Crushed Rock
GROUNDWATER					
<i>General Parameters</i>					
Biochemical Oxygen Demand (5-day)	HACH 10360	X			
Bromate, Chlorite	EPA 300.1	X			
Chloride	EPA 300.00	X	X		
Chlorine dioxide	SM4500CIO2	X			
Cyanide, Total	SM 4500CNE	X	X		
Cyanide, Free	SM 4500C1G	X	X		
Fluoride	EPA 300.0	X			
Hardness, as CaCO ₃	SM 2340B	X	X		
Nitrogen, ammonia, as N	EPA 350.1	X	X		
Nitrogen: nitrate + nitrite, as N; nitrate, as N; nitrite, as N	EPA 353.2	X			
Nitrogen, unionized ammonia, as N	EPA 350.1 Calc	X	X		
Oil and Grease	EPA 1664A OG	X			
pH	SM 4500H+B	X			
Phosphorus, total, as P	SM 4500PE	X			
Solids, total suspended	SM 2540D	X			
Turbidity	EPA 180.1	X			
<i>Metals</i>					
Full list	EPA 200.7	X	X		
Full list	EPA 200.8	X	X		
Chromium, trivalent	calculated	X			
Chromium, hexavalent	SM3500CRB	X	X		
Mercury	EPA 245.1	X			
SVOCs	EPA 8270D	X	X		
VOCs	EPA 8260 LL/SIM	X	X		
1,4-Dioxane	EPA 8270 SIM	X	X		
DBCP & EDB	EPA 8011	X			
Acrylamide	EPA 8316	X			
Ethylene glycol, Methyl alcohol	EPA 8015 PII	X			
Formaldehyde	EPA 8315 A	X			
Trihalomethanes, total (TTHMMss)	EPA 524.2	X			
Haloacetic Acids	EPA 552.3	X			
<i>Herbicides / Pesticides</i>					
Organochlorine Pesticides	EPA 8081B	X			
Herbicides, 10 Compounds	EPA 8151 MDA List II	X	X		
Pesticides, 17 Compounds	MDA List 1 (8270 Pest)	X	X		
Diquat	EPA 549.2	X			
Aldicarb, Carbofuran	EPA 531.1	X			
Endothall	EPA 548.1	X			
PCBs	EPA 8082A	X	X		
Dioxins / Furans	EPA 1613B	X			

Table 1

LABORATORY ANALYTICAL PARAMETER LIST
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Parameter	Method	Phase A Investigation	Phase B		
			Ground water	Cover Soil	Crushed Rock
GROUNDWATER					
PFAS	MDH 555	X	X		
<i>Radiochemical</i>					
Gross Alpha, Gross Beta	EPA 900.0	X	X		
Glyphosate	EPA 547	X			
Radium 226	EPA 903.1	X			
Radium 228	EPA 904.0	X			
Radium, total	EPA 903.0	X			
SOLID MATERIAL					
<i>Metals</i>					
Full list	EPA 6010	X		X	X
Full list	EPA 6020	X		X	X
Chromium VI	EPA 7196A	X			X
Copper Cyanide Test as Total Cyanide	EPA 9012	X			
Fluoride, test as Total Fluoride	EPA 9056A	X			
Mercury	EPA 7471	X		X	
Methyl Mercury	EPA 1630	X			
Dioxins 2,3,7,8 TCDD*	EPA 8290	X			
Pesticides (DDT, DDE, DDD, etc)	EPA 8081B	X			
Herbicides	MDA List II	X			
PCBs	EPA 8082A	X			X
PAHs (standard list)	EPA 8270D SIM	X		X	
SVOCs	EPA 8270D	X			X
VOCs	EPA 8260B	X		X	X
1,4-Dioxane	EPA 8260SIM				X
GRO	WI GRO	X		X	
DRO	WI DRO	X		X	
Total Organic Carbon	EPA 9060			X	
Grain Size Distribution	ASTM D422			X	
PFAS					X
Gross Alpha and Gross Beta	EPA 9310				X
Nitrogen, ammonia	EPA 350.1				X
Cyanide, Total	EPA 9012B				X
Chloride	EPA 9056A				X

-- Analysis by MDH Laboratory

Table 2

SOIL BORING MATRIX
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Location ID	Phase A or Phase B	Sample Collected			Approximate Thickness (feet)			Depth to Top of Bedrock (feet)	Depth to Bottom	Ground Surface Elevation (feet, MSL)*	Coordinates (meters, UTM Z15N)	
		Solid Media (type)	Water	Soil Gas	Cover Soil (fill)	Waste Material (Ash/MSW/CD)	Native Soils				Easting	Northing
Dump												
FD-SB-A1	A	Ash	--	--	1	10.5	1.5	13	13	714	477228.0088	4959649.943
FD-SB-A2	A	Ash	Yes	--	4	22	N.O.	26	26	725	477280.6395	4959645.42
FD-SB-A3	A	Native	Yes	--	3.6	29.4	2	35	35	724	477345.063	4959648.941
FD-SB-A4	A	Native	Yes	--	5	21	EOB	--	38	727	477388.4567	4959649.765
FD-SB-A5	A	Waste	Yes	--	11.5	14	EOB	--	33	724	477442.5056	4959648.285
FD-SB-B1	A	Waste	--	--	6	16.5	2	24.5	24.5	725	477220.2857	4959595.631
FD-SB-B2	A	Waste	--	--	2	23	N.O.	25	25	724	477280.6487	4959597.862
FD-SB-B3	A	Waste	Yes	--	0.5	26.5	EOB	--	30	726	477337.1082	4959595.385
FD-SB-B4	A	Waste	Yes	--	2	24.3	EOB	--	35	724	477387.912	4959594.523
FD-SB-B5	A	Native	Yes	--	2	19.5	EOB	--	35	725	477435.7543	4959595.345
FD-SB-C1	A	Waste	--	--	5	12.5	2	19.5	19.5	721	477228.6978	4959542.747
FD-SB-C2	A	Waste	--	--	2.5	13.5	5	21	21	723	477282.676	4959537.967
FD-SB-C3	A	Waste	--	--	4.5	11.5	6	22	22	727	477336.7354	4959539.675
FD-SB-C4	A	Waste	--	--	1.5	23.5	--	25	25	728	477388.1041	4959545.138
FD-SB-C5	A	Waste	--	--	2.5	20	EOB	--	30	727	477441.8857	4959541.842
FD-SB-D1	A	Waste	--	--	11	12	2	25	25	726	477223.4839	4959487.867
FD-SB-D2	A	Waste	--	--	4	16.5	N.O.	20.5	20.5	724	477282.1168	4959489.374
FD-SB-D3	A	Waste	--	--	4	16	2	22	22	726	477334.0118	4959490.852
FD-SB-D4	A	Waste	Yes	--	3.5	16.5	1	21	21	727	477392.6327	4959491.983
FD-SB-D5	A	Waste	Yes	--	2	18.5	N.O.	20.5	20.5	729	477440.97	4959490.67
FD-SB-E1	A	Waste	--	--	8	14	1.5	23.5	23.5	725	477224.8548	4959442.725
FD-SB-E2	A	Ash	--	--	3	19	N.O.	22	22	726	477283.6936	4959434.995
FD-SB-E3	A	Ash	--	--	1	23	N.O.	24	24	728	477334.0974	4959432.864
FD-SB-E4	A	Waste	--	--	3	20	N.O.	23	23	728	477389.3674	4959439.703
FD-SB-E5	A	Waste	Yes	--	1.5	19.5	N.O.	21	21	728	477442.9641	4959445.53
FD-SB-F1	A	Ash	--	--	5	9.5	1	15.5	15.5	722	477229.6261	4959384.109
FD-SB-F2	A	Waste	--	--	4.5	17.5	1.5	23.5	23.5	728	477282.735	4959375.135
FD-SB-F3	A	Waste	--	--	1	20	1.5	22.5	22.5	728	477335.344	4959377.367
FD-SB-F4	A	Waste	--	--	2.5	12.5	N.O.	15	15	729	477385.9395	4959384.681
FD-SB-F5	A	Waste	--	--	1	13	N.O.	14	14	728	477440.7939	4959389.466
FD-SB-G1	A	Fill	--	--	11	8	2	21	21	726	477227.4422	4959329.617
FD-SB-G2	A	Waste	--	--	3	14	1	18	18	726	477284.823	4959314.193
FD-SB-G3	A	Waste	--	--	3	17	N.O.	20	20	730	477338.4521	4959336.563
FD-SB-G4	A	Native	--	--	1.5	14	1.5	17	17	727	477388.4639	4959302.264
FD-SB-G5	A	Waste	--	--	4	10	N.O.	14	14	729	477443.476	4959341.95
FD-SB-01	B	--	--	--	0.5	9.5	N.O.	10	10	720	477298.734	4959232.848
FD-SB-02	B	--	--	--	5	N.O.	13	18	18	721	477363.3886	4959222.999

Table 2

SOIL BORING MATRIX
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Location ID	Phase A or Phase B	Sample Collected			Approximate Thickness (feet)			Depth to Top of Bedrock (feet)	Depth to Bottom	Ground Surface Elevation (feet, MSL)*	Coordinates (meters, UTM Z15N)	
		Solid Media (type)	Water	Soil Gas	Cover Soil (fill)	Waste Material (Ash/MSW/CD)	Native Soils				Easting	Northing
Dump												
FD-SB-03	B	--	--	--	5	N.O.	5	10	10	719	477449.7056	4959225.998
FD-SB-04	B	--	--	--	5	5	N.O.	10	10	719	477232.2676	4959257.994
FD-SB-05	B	--	--	--	10.5	N.O.	N.O.	10.5	10.5	719	477508.8484	4959249.176
FD-SB-06	B	--	--	--	10	N.O.	2	12	12	719	477537.5253	4959316.851
FD-SB-07	B	--	--	Yes	8.5	N.O.	1	9.5	9.5	718	477478.1224	4959296.5
FD-SB-08	B	--	--	Yes	0.5	7.5	4.5	12.5	12.5	720	477269.8909	4959267.94
FD-SB-A4 (19)	B	Fill	--	--	3	EOB	--	--	5	727	477388.4567	4959649.765
FD-SB-B1 (19)	B	Fill	--	--	7.5	EOB	--	--	10	725	477220.2857	4959595.631
FD-SB-C3 (19)	B	Fill	--	--	4.5	EOB	--	--	10	727	477336.7354	4959539.675
FD-SB-F2 (19)	B	Fill	--	--	6	EOB	--	--	10	728	477282.735	4959375.135
FD-SB-G5 (19)	B	Fill	--	--	6	EOB	--	--	10	729	477443.476	4959341.95
Landfill												
TS-SB-01	A	Waste	--	--	2.5	14.5	6	23	23	712	476966.3097	4960152.756
TS-SB-02	A	Fill	Yes	--	25.5	N.O.	N.O.	25.5	25.5	713	477006.6878	4960110.853
TS-SB-03	A	Fill	--	--	1.5	8.5	4	14	14	707	477037.0003	4960096.446
TS-SB-04	A	Waste	--	--	7	9	N.O.	16	16	712	477010.7023	4960095.736
TS-SB-05	A	Native	Yes	--	5	6.5	12	23.5	23.5	710	477003.4062	4960183.746
TS-SB-06	A	Waste	--	--	3	9.5	5.5	18	18	709	476939.9061	4960177.95
TS-SB-07	A	Fill	Yes	--	26	N.O.	N.O.	26	26	712	476981.2764	4960146.303
TS-SB-08	A	Waste	Yes	--	3	25	N.O.	28	28	727	476934.6655	4960113.988
FL-SB-01	B	Fill	--	--	14	EOB	--	--	15	729	476490.0984	4959852.948
FL-SB-02	B	Fill	--	--	6.5	EOB	--	--	7	735	476723.9051	4959852.229
FL-SB-03	B	Fill	--	--	6.5	EOB	--	--	8	732	476932.3339	4959848.521
FL-SB-04	B	Fill	--	--	2.5	--	--	--	2.5	725	477053.5679	4959973.61
FL-SB-05	B	Fill/Waste**	--	--	6.5	EOB	--	--	15	733	476821.3797	4960093.155
FL-SB-06	B	Fill/Waste**	--	--	4.5	EOB	--	--	15	746	476953.0654	4960247.897
FL-SB-07	B	Fill/Waste**	--	--	7	EOB	--	--	15	726	476829.5298	4960340.349
FL-SB-08	B	Fill/Waste**	--	--	10	EOB	--	--	15	713	476948.4261	4960520.597
FL-SB-09	B	Fill/Waste**	--	--	17	EOB	--	--	20	735	476615.6906	4960220.658
FL-SB-10	B	Fill	--	--	25	--	--	--	25	750	476679.9978	4960100.812
FL-SB-11	B	Fill/Waste**	--	--	20	EOB	--	--	25	745	476615.7764	4959978.483
FL-SB-12	B	Fill/Waste**	--	--	10	EOB	--	--	15	731	476495.7995	4960100.822
FL-SB-13	B	Fill/Waste**	--	--	6.5	EOB	--	--	14	718	476378.648	4960224.179
FL-SB-14	B	Fill	--	--	10	--	--	--	10	730	476373.3914	4960037.175

N.O. - Not Observed

EOB - Boring ended in material

* Ground surface elevations were estimated based on LIDAR data

** Waste was composited from these locations to create one waste to energy sample WASTE-03 (see Section 4.3.1)

Table 3

TEST EXCAVATION MATRIX
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Location ID	Phase A or Phase B	Sample Collected			Approximate Thickness (feet)			Depth to Top of Bedrock (feet)	Depth to Bottom	Ground Surface Elevation* (feet, MSL)	Coordinates (meters, UTM Z15N)	
		Solid Media (type)	Water	Soil Gas	Cover Soil (fill)	Waste Material (Ash/MSW/CD)	Native Soils				Easting	Northing
Landfill												
FL-TT-01	A	Waste	--	--	2	9	EOE	--	12	711	476966.3097	4960152.756
FL-TT-02	A	Waste	Yes	--	2	EOE	--	--	10.5	709	477006.6878	4960110.853
FL-TT-02a	A	--	--	--	2	EOE	--	--	10	707	476644.2776	4960505.585
FL-TT-03	A	Waste	Yes	--	2	8	EOE	--	12	706	477037.0003	4960096.446
FL-TT-04	A	Waste	Yes	--	2	12	EOE	--	15	707	477010.7023	4960095.736
FL-TT-05	A	Waste	Yes	--	5	9.5	EOE	--	15	708	477003.4062	4960183.746
FL-TT-06	A	Native	--	--	N.O.	N.O.	EOE	--	13	699	476939.9061	4960177.95
FL-TT-07	A	Native	Yes	--	1	N.O.	EOE	--	10	695	476981.2764	4960146.303
FL-TT-08	A	Waste	Yes	--	1	6	EOE	--	8	705	476934.6655	4960113.988
FL-TT-09	B		--	--						709	476934.1114	4960652.58
FL-TT-10	B		--	--						708	476678.175	4960544.013
Dump												
FD-TT-01	A	Waste	--	--	3	EOE	--	--	12	725	477388.6068	4959670.092
FD-TT-02	A	Waste	--	--	0.5	EOE	--	--	12	722	477266.6976	4959669.704
FD-TT-03	A	Ash	--	--	2	3	EOE	--	10	712	477201.8254	4959599.414
FD-TT-04	A	--	--	--	2	8	EOE	--	12	714	477205.3006	4959476.861
FD-TT-05	A	Ash	--	--	4	5	3	12	12	716	477205.7935	4959368.201
FD-TT-06	A	Waste	Yes	--	1.5	EOE	--	--	5	709	477473.619	4959610.165
FD-TT-07	A	Waste	--	--	4	EOE	--	--	12	726	477473.6863	4959501.322
FD-TT-08	A	Waste	--	--	2	EOE	--	--	12	723	477470.5894	4959388.401
FD-TT-09	A	Waste	--	--	4	EOE	--	--	12	727	477376.4485	4959282.212
FD-TT-10	A	Waste	Yes	--	2	EOE	--	--	10.5	724	477269.377	4959278.217
FD-TT-11	A	Waste	--	--	2	EOE	--	--	12	724	477300.0688	4959562.474
FD-TT-12	A	Waste	--	--	1.5	EOE	--	--	12	725	477384.0675	4959584.992
FD-TT-13	A	Waste	--	--	1.5	EOE	--	--	12	727	477335.8057	4959426.521
FD-TT-14	A	Waste	--	--	1.5	EOE	--	--	12	728	477443.5469	4959440.224

N.O. - Not Observed

EOE - Excavation ended in material

* Ground surface elevations were estimated based on LIDAR data

Table 4

LANDFILL GAS SCREENING RESULTS
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

	DUMP																		
Location ID	FD-SB-A1	FD-SB-A2	FD-SB-A3	FD-SB-A4	FD-SB-A5	FD-SB-B1	FD-SB-B2	FD-SB-B3	FD-SB-B4	FD-SB-B5	FD-SB-C1	FD-SB-C2	FD-SB-C3	FD-SB-C4	FD-SB-C5	FD-SB-D1	FD-SB-D2	FD-SB-D3	FD-SB-D4
Date	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/20/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/21/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/21/2018	4/11/2018	3/27/2018	3/26/2018	3/22/2018
Depth (feet, BGS)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CH ₄ %	0.0	4.4	14.5	24.9	14.9	0.0	7.1	34.9	36.9	3.8	0.0	24.5	20.2	5.4	4.8	0.0	9.9	15.3	34.6
CO ₂ %	0.1	4.9	18.7	21.1	22.9	0.0	13.2	24.9	28.6	6.9	0.1	0.4	22.3	3.2	13.0	0.0	5.0	10.6	20.3
O ₂ %	20.8	7.6	0.1	0.0	0.0	21.6	1.9	0.0	0.0	15.8	21.0	19.8	0.3	16.9	5.0	21.5	10.6	7.0	4.8

	DUMP																		
Location ID	FD-SB-D5	FD-SB-E1	FD-SB-E2	FD-SB-E3	FD-SB-E4	FD-SB-E5	FD-SB-F1	FD-SB-F2	FD-SB-F3	FD-SB-F4	FD-SB-F5	FD-SB-G1	FD-SB-G2	FD-SB-G3	FD-SB-G4	FD-SB-G5	FD-SB-04	FD-SB-06	MW-19-01
Date	3/21/2018	4/11/2018	3/27/2018	3/26/2018	3/22/2018	3/21/2018	4/12/2018	3/27/2018	3/26/2018	3/21/2018	3/21/2018	4/12/2018	3/26/2018	3/26/2018	3/26/2018	3/21/2018	3/29/2019	4/1/2019	3/28/2019
Depth (feet, BGS)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3	1.5	2	1.5
CH ₄ %	24.4	0.0	32.3	23.6	18.5	19.6	0.0	34.0	34.5	28.2	10.0	0.0	9.0	30.8	21.2	18.4	1.4	0.0	0.0
CO ₂ %	16.9	0.0	15.3	13.5	17.0	18.7	0.0	13.3	19.6	17.8	6.4	0.0	10.3	23.8	18.0	13.0	3.7	1.7	0.0
O ₂ %	3.1	21.5	0.0	7.5	3.6	2.9	21.3	0.2	0.1	2.5	12.3	21.2	NM	0.0	2.5	3.4	4.9	5.2	21.3

	DUMP				LANDFILL														
Location ID	MW-19-02	MW-19-03	MW-19-04	TS-SB-01	TS-SB-02	TS-SB-03	TS-SB-05	TS-SB-06	TS-SB-07	TS-SB-08	2	3	4	5	9	10	11	13	14
Date	3/26/2019	3/26/2019	3/27/2019	4/12/2018	4/12/2018	4/12/2018	4/13/2018	4/13/2018	4/13/2018	4/13/2018	5/4/2005	5/4/2005	5/4/2005	5/11/2005	5/4/2005	5/4/2005	5/4/2005	5/5/2005	5/5/2005
Depth (feet, BGS)	1.5	1.5	1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CH ₄ %	0.0	4.2	0.2	0.0	0.3	0.0	0.0	65.6	24.6	60.9	0	10	68	14	0	64	66	62	65
CO ₂ %	0.0	14.4	0	0.0	0.8	0.0	0.0	28.3	7.1	35.9	0	3	32	4	1	37	35	42	39
O ₂ %	21.0	0	22.3	20.1	16.9	20.2	21.6	0.9	4.2	3.2	20.3	16	0	13.1	17	0	0	0	1.5

	LANDFILL																		
Location ID	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	35
Date	5/5/2005	5/3/2005	5/4/2005	5/11/2005	5/11/2005	5/11/2005	5/11/2005	5/11/2005	5/10/2005	5/3/2005	5/3/2005	5/10/2005	5/10/2005	5/11/2005	5/10/2005	5/10/2005	5/10/2005	5/10/2005	5/3/2005
Depth (feet, BGS)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CH ₄ %	66	2	16	0.1	0.1	0.1	0.1	0.1	54	9	54	0.2	55	0.1	1.7	58	39	65	0
CO ₂ %	39	3	4	0.1	0.1	0.1	0.1	0.1	31	9	27	0.1	29	0.1	1.1	26	22	35	0
O ₂ %	1.5	17	15	20	20.1	20.1	20.1	20.2	3	14	0	21	2.1	20	19.6	2.7	8.1	0	19.3

Table 4

LANDFILL GAS SCREENING RESULTS
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

LANDFILL																			
Location ID	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	54	55
Date	5/3/2005	5/10/2005	5/10/2005	5/9/2005	5/9/2005	5/9/2005	5/11/2005	4/28/2005	4/29/2005	4/29/2005	5/2/2005	5/2/2005	5/11/2005	4/27/2005	5/3/2005	5/3/2005	5/9/2005	5/9/2005	4/28/2005
Depth (feet, BGS)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CH ₄ %	5	65	0.2	0.1	66	68	37	70	67	65	66	26	59	41	9.1	42	46	66	65
CO ₂ %	9	36	0.1	0.3	34	34	25	32	33	36	32	9	32	22	8.2	23	25	33	35
O ₂ %	16	0	20.2	20.2	0	0	7.1	0	0	0	0	13	1.4	7	0	0	2	0	0

LANDFILL																			
Location ID	56	57	58	59	60B	61	62	63	64	65	66	67	68	69	74	75	76	77	78
Date	4/28/2005	4/29/2005	4/29/2005	4/27/2005	4/25/2005	4/26/2005	4/25/2005	4/25/2005	4/26/2005	4/25/2005	4/25/2005	4/26/2005	4/27/2005	4/27/2005	5/12/2005	4/27/2005	5/12/2005	5/11/2005	5/11/2005
Depth (feet, BGS)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
CH ₄ %	68	22	67	58	6.3	19.9	1	65	69	41	65	49	68	54	16	59	64	6.1	60
CO ₂ %	32	14	34	30	10	10.7	0.4	34	35	21	29	21	36	32	8	30	36	3	40
O ₂ %	0	8	0	0	8.4	12	19.2	0	0	7	0	6	0	0	14.2	2	0	16.4	0

Table 5a

Summary of Exceedances
Municipal Soil Waste / Construction Debris
Focused Remedial Investigation Report
Freeway Landfill and Dump
Burnsville, Minnesota

			LANDFILL													DUMP										
Location			FL-TT-01	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-08	TS-SB-01	TS-SB-03	TS-SB-04	TS-SB-05	TS-SB-06	TS-SB-08	FD-SB-A5	FD-SB-B1	FD-SB-B2	FD-SB-B3	FD-SB-B4	FD-SB-C1	FD-SB-C2	FD-SB-C3	FD-SB-C4			
Date			4/18/2018	4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018	4/12/2018	4/12/2018	4/13/2018	4/13/2018	4/13/2018	4/13/2018	3/20/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018	3/22/2018	4/11/2018	3/27/2018	3/23/2018	3/22/2018		
Depth			3 - 11 ft	2 - 10.5 ft	2 - 10 ft	2 - 14 ft	5 - 15 ft	1 - 7 ft	5 - 8 ft	1.5 - 3 ft	7 - 15 ft	5 - 7.5 ft	8 - 12 ft	10 - 20 ft	15 - 17 ft	11 - 13 ft	12 - 21 ft	5 - 26 ft	3 - 20 ft	5 - 8 ft	5 - 17 ft	5 - 20 ft	5 - 20 ft			
Sample Description			Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste			
Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values																					
Effective Date			06/01/2013	06/22/2009	06/22/2009																					
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>																					
Metals																										
Antimony	Lab	mg/kg	5.4	100	16	--	6.4	--	--	--	--	--	--	41.0 *	--	--	--	--	--	--	--	--	--			
Arsenic	Lab	mg/kg	5.8	20	11	--	26.8	11.9	8.9	8.1	--	--	11.4	19.0	--	14.8	16.1	12.2	6.0	15.9	7.9	6.5				
Barium	Lab	mg/kg	1700	18000	1100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Beryllium	Lab	mg/kg	2.7	230	75	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Boron	Lab	mg/kg	62	47000	8000	--	234	109 *	--	73.4	--	--	--	238 *	--	196	216	112	--	85.7	75.4	87.4				
Cadmium	Lab	mg/kg	8.8	200	35	--	--	38.6	--	--	--	--	--	--	--	--	--	--	--	--	--	46.2				
Cobalt	Lab	mg/kg	27	2600	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Copper	Lab	mg/kg	700	9000	100	--	280	448 *	102	175	--	--	--	341	--	--	--	474	--	--	119	--				
Iron	Lab	mg/kg	--	75000	12000	--	107000	166000	26700	22000	12500	--	--	27600	--	--	99500 *	--	27900	40200	32100	16800	66500	47000	42300	
Lead	Lab	mg/kg	2700	700	300	--	611	691 **	--	--	--	--	--	579	436	--	453 *	--	575	--	557	--	989			
Manganese	Lab	mg/kg	130	8100	5000	402	994	596 *	531	522	470	455	282	318	723	247	--	3260 *	238	250	141	270	264	520	951	645
Mercury	Lab	mg/kg	3.3 MC	1.5	1.2 MC	--	--	--	--	--	--	--	--	--	--	--	--	9.4	--	--	--	--	8.6			
Nickel	Lab	mg/kg	180	2500	800	--	--	--	--	--	--	--	--	--	--	--	--	1480 *	--	--	--	--	--			
Selenium	Lab	mg/kg	2.6	1300	200	--	2.8	--	--	--	--	--	--	--	--	--	3.9	5.3	3.5	--	--	--	--			
Silver	Lab	mg/kg	7.9	--	26.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Vanadium	Lab	mg/kg	4.0	250	40	24.8	44.3	40.2	38.0	30.7	34.2	19.1	18.3	19.3	19.5	13.1	--	22.6	29.8	135	239	44.6	28.8	54.5	30.5	16.5
Zinc	Lab	mg/kg	3000	75000	12000	--	--	--	--	--	--	--	--	--	3030 *	--	--	--	--	--	--	--	--			
Semivolatile Organic Compounds																										
3,4-Methylphenol (m,p cresols)	Lab	ug/kg	42 MP	59000 MP	11000 MP	--	--	--	--	--	--	--	--	--	--	--	--	1120	--	--	--	--	--			
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	29000	2100000	690000	--	--	--	--	--	--	--	--	100000	483000 *	--	--	--	--	--	--	--	--			
Butyl benzyl phthalate	Lab	ug/kg	29000	3700000	623000	--	--	4230000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Naphthalene	Lab	ug/kg	4500	28000	24000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Semivolatile Organic Compounds by Selected Ion Monitoring																										
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 I	2000 T	15000	--	--	--	--	--	2900	--	4400	1900	--	--	3900	3500	--	21000	--	--			
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 I	2000 T	15000	--	--	--	--	--	2900	--	4400	1900	--	--	4100	3500	--	21000	--	--			
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 I	2000 T	15000	--	--	--	--	--	2900	--	4400	1900	--	--	4200	3500	--	21000	--	--			
Naphthalene	Lab	ug/kg	4500	28000	24000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
Volatile Organic Compounds																										
1,1,2,2-Tetrachloroethane	Lab	ug/kg	12	--	--	--	--	--	--	--	--	138	--	--	--	--	--	--	--	--	--	--	--			
1,2,4-Trichlorobenzene	Lab	ug/kg	230	985000	290000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--			
1,2,4-Trimethylbenzene	Lab	ug/kg	2700	25000	20000	--	--	--	--	--	--	--	--	4970	--	--	--	6930	--	--	--	5820				
1,2-Dichlorobenzene	Lab	ug/kg	11000	75000	63000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
1,2-Dichloroethylene, cis	Lab	ug/kg	210	22000	19000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
1,3,5-Trimethylbenzene	Lab	ug/kg	2700	10000	8000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
1,4-Dichlorobenzene	Lab	ug/kg	170	50000	72000	--	255	175	--	443	415	--	--	512	1690	--	--	810	--	--	--	590				
Benzene	Lab	ug/kg	17	10000	14000	--	54.0	--	--	--	--	--	58.1	--	981	--	--	--	--	--	--	70.9				
Chlorobenzene	Lab	ug/kg	1200	32000	23000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
Ethyl benzene	Lab	ug/kg	1000	200000	200000	--	--	--	--	--	--	--	--	6520	--	--	--	1380	--	--	--	3310				
Naphthalene	Lab	ug/kg	4500	28000	24000	--	--	--	--	--	--	--	--	4880	7650	--	--	--	--	--	--	5570				
Tetrachloroethylene	Lab	ug/kg	42	131000	145000	--	--	178 *	--	--	--	--	--	--	741	--	--	--	--	--	--	--				
Toluene	Lab	ug/kg	2500	305000	260000	--	--	--	--	--	--	--	--	3680	--	--	--	--	--	--	--	--				
Trichloroethylene (TCE)	Lab	ug/kg	2.3	46000	82000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--				
Xylene, total	Lab	ug/kg	5400 M	130000 M	110000 M	--	--	--	--	--	--	--	--	7840	--	--	--	--	--	--	--	6550				
Polychlorinated Biphenyls																										
Polychlorinated biphenyls	Lab	ug/kg	130	8000	1400	--	4990	11300	633	1230	--	--	150	--	686	--	--	551	4220	1410	178	144	45200			
Herbicides																										
Pentachlorophenol	Lab	mg/kg	0.023	120	80	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.085			
Total Petroleum Hydrocarbons																										
Gasoline Range Organics, C6-C10	Lab	mg/kg				< 13.1	40.2	< 33.6	< 14.2	74.1	< 29.9	53.6	< 11.7	< 11.9	38.9	< 14.4	47.7	187	17.7	< 16.7	< 35.5	243	< 13.1	75.7	< 15.5	104
Total Petroleum Hydrocarbons C10-C28	Lab	mg/kg				889	2300	3370	171	395	781	1480	674	371	1150	3820	2810	4400	186	139	23.3	1570	200	413	222	1160

Table 5a

Summary of Exceedances
Municipal Soil Waste / Construction Debris
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

					DUMP																
					Location	FD-SB-C5	FD-SB-D1	FD-SB-D2	FD-SB-D3	FD-SB-D4	FD-SB-D5	FD-SB-E1	FD-SB-E4	FD-SB-E5	FD-SB-F2	FD-SB-F3	FD-SB-F4	FD-SB-F5	FD-SB-G2	FD-SB-G3	FD-SB-G5
					Date	3/21/2018	4/11/2018	3/27/2018	3/26/2018	3/22/2018	3/21/2018	4/11/2018	3/22/2018	3/21/2018	3/27/2018	3/26/2018	3/21/2018	3/26/2018	3/26/2018	3/26/2018	3/26/2018
					Depth	15 - 17.5 ft	11 - 16 ft	3 - 12 ft	4 - 16 ft	5 - 20 ft	5 - 16 ft	10 - 15 ft	3 - 21 ft	5 - 10 ft	7 - 13 ft	3 - 11 ft	5 - 10 ft	3 - 11 ft	10 - 12 ft	7 - 16 ft	5 - 14 ft
					Sample Description	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste
Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values																
Effective Date			06/01/2013	06/22/2009	06/22/2009																
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>																
Metals																					
Antimony	Lab	mg/kg	5.4	100	16	--	--	--	--	--	--	--	--	--	17.1	--	--	--	--	--	--
Arsenic	Lab	mg/kg	5.8	20	11	14.3	10.1	--	--	15.1	11.6	--	9.7	11.3	20.9	20.6	12.1	21.9	28.4	13.8	--
Barium	Lab	mg/kg	1700	18000	1100	--	--	--	--	--	--	--	1510	--	--	--	--	--	--	--	--
Beryllium	Lab	mg/kg	2.7	230	75	--	--	--	--	--	--	--	--	--	--	--	--	2.7	3.0	--	--
Boron	Lab	mg/kg	62	47000	8000	--	--	--	--	62.7	--	--	99.3	89.4	157	163	128	120	1930	163	114
Cadmium	Lab	mg/kg	8.8	200	35	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cobalt	Lab	mg/kg	27	2600	800	37.4 *	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	Lab	mg/kg	700	9000	100	228	--	--	--	--	--	--	207	--	--	--	334	--	--	--	244
Iron	Lab	mg/kg		75000	12000	15900 *	19200	--	23000	65700	17600	24800	28800	48700	37700	43500	162000	31000	39400	42300	168000
Lead	Lab	mg/kg	2700	700	300	724 *	--	--	--	--	369	--	--	1010	--	352	424	--	--	311	--
Manganese	Lab	mg/kg	130	8100	5000	249	594	277	353	532	263	360	1640	521	330	230	1060	174	188	225	804
Mercury	Lab	mg/kg	3.3 MC	1.5	1.2 MC	--	--	--	--	--	--	--	--	--	--	--	1.5	--	--	--	1.5
Nickel	Lab	mg/kg	180	2500	800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	Lab	mg/kg	2.6	1300	200	--	--	--	--	2.6	--	--	--	--	4.9	4.2	--	6.2	7.4	3.5	--
Silver	Lab	mg/kg	7.9																		
Vanadium	Lab	mg/kg	4.0	250	40	27.4	37.5	19.2	28.5	64.1	25.7	24.4	50.3	39.0	121	76.5	14.9	83.8	120	54.0	20.2
Zinc	Lab	mg/kg	3000	75000	12000	86700 *	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Semivolatile Organic Compounds																					
3,4-Methylphenol (m,p cresols)	Lab	ug/kg	42 MP	59000 MP	11000 MP	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	29000	2100000	690000	247000	--	--	40000	--	--	--	--	--	118000	--	--	--	--	--	--
Butyl benzyl phthalate	Lab	ug/kg	29000	3700000	623000	--	--	--	--	--	--	--	--	--	--	--	468000	--	--	--	--
Naphthalene	Lab	ug/kg	4500	28000	24000	--	--	--	--	--	7710	--	--	10800	--	--	--	--	--	66500	--
Semivolatile Organic Compounds by Selected Ion Monitoring																					
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 T	2000 T	2200	5500	1400	--	5600	--	--	--	20000	--	1400	3200	--	--	110000	--
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 T	2000 T	2400	5500	1400	--	6000	--	--	--	20000	--	1400	3700	--	--	110000	--
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 T	2000 T	2600	5500	1400	--	6400	--	--	--	20000	--	1400	4200	--	--	110000	--
Naphthalene	Lab	ug/kg	4500	28000	24000	--	--	--	--	8120	--	--	--	19600	--	--	--	--	--	42700	--
Volatile Organic Compounds																					
1,1,2,2-Tetrachloroethane	Lab	ug/kg	12			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	Lab	ug/kg	230	985000	290000	--	--	--	298	--	--	--	--	--	--	4380	--	470	--	--	--
1,2,4-Trimethylbenzene	Lab	ug/kg	2700	25000	20000	--	--	--	5000	5480	--	--	--	--	--	17000	--	3200	--	--	--
1,2-Dichlorobenzene	Lab	ug/kg	11000	75000	63000	--	--	--	--	--	--	--	--	--	--	79700	--	--	--	--	--
1,2-Dichloroethylene, cis	Lab	ug/kg	210	22000	19000	--	--	--	--	--	--	--	--	--	--	--	--	--	263	--	--
1,3,5-Trimethylbenzene	Lab	ug/kg	2700	10000	8000	--	--	--	--	--	--	--	--	--	--	5920	--	--	--	--	--
1,4-Dichlorobenzene	Lab	ug/kg	170	50000	72000	469	--	--	17100	262	--	--	192	433	--	32700	--	547	--	--	--
Benzene	Lab	ug/kg	17	10000	14000	--	--	--	199	--	--	--	211	--	--	142	--	--	--	--	--
Chlorobenzene	Lab	ug/kg	1200	32000	23000	--	--	--	26400	--	--	--	--	--	--	--	--	--	--	--	--
Ethyl benzene	Lab	ug/kg	1000	200000	200000	--	--	--	1210	--	--	--	--	--	--	12200	--	--	--	--	--
Naphthalene	Lab	ug/kg	4500	28000	24000	--	--	8480	--	--	--	--	--	--	--	41000	--	11200	--	--	--
Tetrachloroethylene	Lab	ug/kg	42	131000	145000	--	--	--	--	--	--	--	125	--	--	5880	--	--	363	--	--
Toluene	Lab	ug/kg	2500	305000	260000	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethylene (TCE)	Lab	ug/kg	2.3	46000	82000	--	--	--	--	--	--	--	82.5 *	--	--	--	--	--	--	--	--
Xylene, total	Lab	ug/kg	5400 M	130000 M	110000 M	--	--	--	--	14900	--	--	--	--	--	13700	--	--	--	--	--
Polychlorinated Biphenyls																					
Polychlorinated biphenyls	Lab	ug/kg	130	8000	1400	2350	--	--	2190	398	1160	231	421	17900	1740	2200	2570	8510	134	1750	15200
Herbicides																					
Pentachlorophenol	Lab	mg/kg	0.023	120	80	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Petroleum Hydrocarbons																					
Gasoline Range Organics, C6-C10	Lab	mg/kg				122	< 15.6	16.9	512	257	40.9	< 16.0	90.2	35.5	14.6	734	28.4	135	69.0	< 24.0	< 11.5
Total Petroleum Hydrocarbons C10-C28	Lab	mg/kg				4630	57.5	3710	3830	383	1730	1520	745	29.5	61.7	229	6590	4600	287	83.8	40.3

Table 5a

Summary of Exceedances
Municipal Soil Waste / Construction Debris
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

						DUMP										
			Location	FD-TT-01	FD-TT-02	FD-TT-06	FD-TT-07	FD-TT-08	FD-TT-09	FD-TT-10	FD-TT-11	FD-TT-12	FD-TT-13	FD-TT-14		
			Date	4/11/2018	4/11/2018	4/12/2018	4/12/2018	4/12/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018	4/17/2018	4/18/2018		
			Depth	10 - 12 ft	7 - 9 ft	2 - 5 ft	6 - 11 ft	5 - 12 ft	4 - 12 ft	2 - 10 ft	4 - 12 ft	3 - 12 ft	3 - 12 ft	2 - 12 ft		
			Sample Description	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste	Waste		
Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values											
Effective Date			06/01/2013	06/22/2009	06/22/2009											
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>											
Metals																
Antimony	Lab	mg/kg	5.4	100	16	--	13.3	--	--	--	--	--	--	--		
Arsenic	Lab	mg/kg	5.8	20	11	11.6	22.8	18.3	12.6	37.0	12.7	13.6	17.3	5.8		
Barium	Lab	mg/kg	1700	18000	1100	--	--	--	--	--	--	--	--	--		
Beryllium	Lab	mg/kg	2.7	230	75	--	--	--	--	--	--	2.9	--	--		
Boron	Lab	mg/kg	62	47000	8000	134	114	192	95.1	138	75.3	74.9	65.4	198		
Cadmium	Lab	mg/kg	8.8	200	35	--	--	--	13.7	--	--	--	--	--		
Cobalt	Lab	mg/kg	27	2600	800	--	--	--	--	--	--	--	--	--		
Copper	Lab	mg/kg	700	9000	100	--	166	1660	507	193	--	--	--	--		
Iron	Lab	mg/kg		75000	12000	36800	116000	31800	61000	53400	33200	22800	27800	38800		
Lead	Lab	mg/kg	2700	700	300	--	578	--	338	558	--	6520	--	--		
Manganese	Lab	mg/kg	130	8100	5000	291	868	251	447	382	328	293	238	145		
Mercury	Lab	mg/kg	3.3 MC	1.5	1.2 MC	--	--	1.7	--	--	--	--	--	--		
Nickel	Lab	mg/kg	180	2500	800	--	--	489	--	--	--	--	--	--		
Selenium	Lab	mg/kg	2.6	1300	200	2.9	--	3.7	--	4.5	--	--	5.4	--		
Silver	Lab	mg/kg	7.9													
Vanadium	Lab	mg/kg	4.0	250	40	132	44.9	69.5	41.4	96.5	42.0	63.3	49.0	81.3		
Zinc	Lab	mg/kg	3000	75000	12000	--	--	--	--	--	--	--	--	--		
Semivolatile Organic Compounds																
3,4-Methylphenol (m,p cresols)	Lab	ug/kg	42 MP	59000 MP	11000 MP	--	--	--	--	--	--	--	--	--		
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	29000	2100000	690000	--	--	--	--	--	--	--	125000	--		
Butyl benzyl phthalate	Lab	ug/kg	29000	3700000	623000	--	--	--	--	--	--	--	--	--		
Naphthalene	Lab	ug/kg	4500	28000	24000	--	--	--	--	--	--	--	--	12200		
Semivolatile Organic Compounds by Selected Ion Monitoring																
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 T	2000 T	--	--	--	1700	--	--	2200	4300	--		
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 T	2000 T	--	--	--	1700	--	--	2200	4300	--		
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 T	2000 T	--	--	--	1700	--	--	2200	4300	--		
Naphthalene	Lab	ug/kg	4500	28000	24000	--	--	--	--	--	--	--	--	14700		
Volatile Organic Compounds																
1,1,2,2-Tetrachloroethane	Lab	ug/kg	12			--	--	--	--	--	--	--	--	--		
1,2,4-Trichlorobenzene	Lab	ug/kg	230	985000	290000	--	--	--	--	--	--	--	--	--		
1,2,4-Trimethylbenzene	Lab	ug/kg	2700	25000	20000	--	--	--	--	--	--	--	--	--		
1,2-Dichlorobenzene	Lab	ug/kg	11000	75000	63000	--	--	--	--	--	--	--	--	--		
1,2-Dichloroethylene, cis	Lab	ug/kg	210	22000	19000	--	--	--	--	--	--	--	--	--		
1,3,5-Trimethylbenzene	Lab	ug/kg	2700	10000	8000	--	--	--	--	--	--	--	--	--		
1,4-Dichlorobenzene	Lab	ug/kg	170	50000	72000	--	--	--	--	--	--	--	--	194		
Benzene	Lab	ug/kg	17	10000	14000	--	--	--	818	--	37.4	--	73.8	--		
Chlorobenzene	Lab	ug/kg	1200	32000	23000	--	--	--	--	--	--	--	--	--		
Ethyl benzene	Lab	ug/kg	1000	200000	200000	--	--	--	--	--	--	--	--	--		
Naphthalene	Lab	ug/kg	4500	28000	24000	--	--	--	--	--	--	--	--	6210		
Tetrachloroethylene	Lab	ug/kg	42	131000	145000	98.0	122	--	--	--	422	--	--	--		
Toluene	Lab	ug/kg	2500	305000	260000	--	--	--	--	--	--	--	--	--		
Trichloroethylene (TCE)	Lab	ug/kg	2.3	46000	82000	--	--	--	--	--	--	--	--	--		
Xylene, total	Lab	ug/kg	5400 M	130000 M	110000 M	--	--	--	--	--	--	--	--	--		
Polychlorinated Biphenyls																
Polychlorinated biphenyls	Lab	ug/kg	130	8000	1400	864	9040	--	3780	2880	545	--	61100	759		
Herbicides																
Pentachlorophenol	Lab	mg/kg	0.023	120	80	--	--	--	--	--	--	--	--	--		
Total Petroleum Hydrocarbons																
Gasoline Range Organics, C6-C10	Lab	mg/kg				22.8	< 20.4	< 17.4	< 14.3	< 15.6	< 14.1	< 17.4	< 15.7	37.5		
Total Petroleum Hydrocarbons C10-C28	Lab	mg/kg				1420	155	119	497	825	65.0	159	485	222		

Table 5b

Summary of Exceedances
Ash
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

							DUMP						
							FD-SB-A1	FD-SB-A2	FD-SB-E2	FD-SB-E3	FD-SB-F1	FD-TT-03	FD-TT-05
Location							4/11/2018	3/27/2018	3/27/2018	3/26/2018	4/12/2018	4/11/2018	4/12/2018
Date							3 - 6 ft	10 - 20 ft	11 - 21 ft	11 - 15.5 ft	10 - 14.5 ft	2 - 5 ft	4 - 9 ft
Depth							Ash	Ash	Ash	Ash	Ash	Ash	Ash
Sample Description													
Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values	Dakota County Background Range							
Effective Date			06/01/2013	06/22/2009	06/22/2009	2009							
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>	shaded							
Metals													
Arsenic	Lab	mg/kg	5.8	<u>20</u>	<i>11</i>	7 - 17	21.7	23.3	21.1	16.9	22.5	24.9	14.8
Beryllium	Lab	mg/kg	2.7	230	75		3.1	3.1	--	2.9	3.2	3.6	--
Boron	Lab	mg/kg	62	47000	8000		265	238	439	188	802	145	106
Iron	Lab	mg/kg		75000	<i>12000</i>	17000 - 90000	<i>23000</i>	<i>35100</i>	<i>31500</i>	<i>36000</i>	<i>34200</i>	<i>35900</i>	<i>26400</i>
Manganese	Lab	mg/kg	130	8100	5000	500 - 1300	159	161	173	146	185	194	365
Selenium	Lab	mg/kg	2.6	1300	200		--	5.4	5.1	5.6	5.7	--	--
Vanadium	Lab	mg/kg	4.0	<u>250</u>	<i>40</i>	72 - 115	224	124	301	86.8	117	121	76.5
Semivolatile Organic Compounds by Selected Ion Monitoring													
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 T</u>	<i>2000 T</i>		--	17000	--	--	--	--	--
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 T</u>	<i>2000 T</i>		--	17000	--	--	--	--	--
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 T</u>	<i>2000 T</i>		--	17000	--	--	--	--	--
Herbicides													
Pentachlorophenol	Lab	mg/kg	0.023	120	80		--	0.30	--	--	--	--	--
Total Petroleum Hydrocarbons													
Gasoline Range Organics, C6-C10	Lab	mg/kg					< 15.1	< 14.0	< 14.9	< 14.2	< 14.8	< 16.9	< 15.4
Total Petroleum Hydrocarbons C10-C28	Lab	mg/kg					< 12.3	< 11.5	< 12.7	< 11.6	< 12.7	< 14.4	33.7

Table 5c

Summary of Exceedances
Native Sediment
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

							LANDFILL		DUMP			
							FL-TT-06	FL-TT-07	FD-SB-A3	FD-SB-A4	FD-SB-B5	FD-SB-G4
							Date	Date	Date	Date	Date	Date
							Depth	Depth	Depth	Depth	Depth	Depth
							Sample Description	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil
Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values	Dakota County Background Range						
Effective Date			06/01/2013	06/22/2009	06/22/2009	2009						
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>	shaded						
Metals												
Arsenic	Lab	mg/kg	5.8	20	11	7 - 17	--	6.3	--	--	9.7	--
Boron	Lab	mg/kg	62	47000	8000		--	--	524	742	296	124
Iron	Lab	mg/kg		75000	12000	17000 - 90000	--	23300	15500 *	--	13600	--
Lead	Lab	mg/kg	2700	700	300		--	--	308 *	--	--	--
Manganese	Lab	mg/kg	130	8100	5000	500 - 1300	498	999	423	310	435	834
Vanadium	Lab	mg/kg	4.0	250	40	72 - 115	30.3	29.8	15.0	7.1	19.2	12.0
Semivolatile Organic Compounds												
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	29000	2100000	690000		--	--	--	--	--	45300
Semivolatile Organic Compounds by Selected Ion Monitoring												
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 I</u>	2000 T		--	--	--	--	2100	--
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 I</u>	2000 T		--	--	--	--	2100	--
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>3000 I</u>	2000 T		--	--	--	--	2200	--
Volatile Organic Compounds												
Benzene	Lab	ug/kg	17	10000	14000		--	--	256	1370	277	--
Polychlorinated Biphenyls												
Polychlorinated biphenyls	Lab	ug/kg	130	<u>8000</u>	1400		--	--	--	--	--	1020
Total Petroleum Hydrocarbons												
Gasoline Range Organics, C6-C10	Lab	mg/kg					< 13.4	< 18.5	< 92.6	< 90.7	< 52.1	31.0
Total Petroleum Hydrocarbons C10-C28	Lab	mg/kg					< 8.3	< 14.7	< 67.6	166	71.0	409

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Sample analyzed; result does not exceed criteria for this parameter
*	Estimated value, QA/QC criteria not met.

MPCA Screening Soil Leaching Values

CR6	Value represents the criteria for Chromium, hexavalent.
M	Value represents the criteria for mixed Xylenes.
MC	Mercury as Mercuric Chloride.
MP	Value represents the criteria for p-cresol.
T	Value represents a criteria for the total carcinogenic PAHs as BaP.

MPCA Tier 2 Industrial Soil Reference Values

CR6	Value represents the criteria for Chromium, hexavalent.
M	Value represents the criteria for mixed Xylenes.
MP	Value represents the criteria for p-cresol.
T	Value represents a criteria for the total carcinogenic PAHs as BaP.

MPCA Tier 2 Recreational Soil Reference Values

CR6	Value represents the criteria for Chromium, hexavalent.
M	Value represents the criteria for mixed Xylenes.
MC	Mercury as Mercuric Chloride.
MP	Value represents the criteria for p-cresol.
T	Value represents a criteria for the total carcinogenic PAHs as BaP.

Table 6

SUMMARY OF ANALYTICAL RESULTS - CRUSHED BEDROCK
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values	Local ID	MW-10D	MW-9D
						Location	FL-MW-D2	FL-MW-E2
						Date	4/02/2019	4/02/2019
						Depth	27 - 29.5 ft	33 - 35 ft
Effective Date			06/01/2013	06/22/2009	06/22/2009			
Exceedance Key			Bold	No Exceed	No Exceed			
General Parameters								
Chloride	Lab	mg/kg					118	44.4
Cyanide	Lab	mg/kg	20	5000	60		< 0.30 h	< 0.41 h
Moisture	Lab	%					5.2	11.4
Nitrogen, ammonia, as N	Lab	mg/kg					9.9	5.12
							56.0	30.5 *
Metals								
Aluminum	Lab	mg/kg		100000	40000		1680	1340
Antimony	Lab	mg/kg	5.4	100	16		< 0.50	< 0.56
Arsenic	Lab	mg/kg	5.8	20	11		2.8	3.4
Barium	Lab	mg/kg	1700	18000	1100		12.8	8.4
Beryllium	Lab	mg/kg	2.7	230	75		< 0.20	< 0.23
Boron	Lab	mg/kg	62	47000	8000		< 10.0	< 11.3
Cadmium	Lab	mg/kg	8.8	200	35		< 0.080	0.14
Chromium	Lab	mg/kg	36 CR6	650 CR6	120 CR6		7.9	8.2
Cobalt	Lab	mg/kg	27	2600	800		3.7	2.5
Copper	Lab	mg/kg	700	9000	100		18.4	34.3
Lead	Lab	mg/kg	2700	700	300		3.0	3.1
Manganese	Lab	mg/kg	130	8100	5000		1500	998
Nickel	Lab	mg/kg	180	2500	800		10.6	10.0
Selenium	Lab	mg/kg	2.6	1300	200		< 0.50	< 0.56
Silver	Lab	mg/kg	7.9	1300	200		< 2.5	< 2.7
Thallium	Lab	mg/kg	0.89	21	3		< 0.10	0.16
Tin	Lab	mg/kg	20000	75000	12000		< 18.5	< 20.0
Uranium 238	Lab	mg/kg					0.66	0.66
Vanadium	Lab	mg/kg	4.0	250	40		16.7	17.4
Zinc	Lab	mg/kg	3000	75000	12000		13.4	14.2
Chromium, hexavalent	Lab	mg/kg	36	650	120		< 2.1	< 2.3
Semivolatile Organic Compounds								
Benz(a)anthracene	Lab	ug/kg	T	T	T		< 348 h	< 372 h
Benzo(a)pyrene	Lab	ug/kg	T	T	T		< 348 h	< 372 h
Benzo(b)fluoranthene	Lab	ug/kg	T	T	T		< 348 h	< 372 h
Benzo(k)fluoranthene	Lab	ug/kg	T	T	T		< 348 h	< 372 h
Chrysene	Lab	ug/kg	T	T	T		< 348 h	< 372 h
Dibenz(a,h)anthracene	Lab	ug/kg	T	T	T		< 348 h	< 372 h
Indeno(1,2,3-cd)pyrene	Lab	ug/kg	T	T	T		< 348 h	< 372 h
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 T	2000 T		ND a	ND a
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 T	2000 T		340 a	370 a
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	ug/kg	1400 T	3000 T	2000 T		690 a	730 a
1,2,4-Trichlorobenzene	Lab	ug/kg	230	985000	290000		< 348 h	< 372 h
1,2-Dichlorobenzene	Lab	ug/kg	11000	75000	63000		< 348 h	< 372 h
1,2-Diphenylhydrazine	Lab	ug/kg					< 348 h	< 372 h
1,3-Dichlorobenzene	Lab	ug/kg	10000	200000	32000		< 348 h	< 372 h
1,4-Dichlorobenzene	Lab	ug/kg	170	50000	72000		< 348 h	< 372 h
1-Methylnaphthalene	Lab	ug/kg					< 348 h	< 372 h
2,2'-oxybis (1-chloropropane)	Lab	ug/kg	1600				< 348 h	< 372 h
2,4,5-Trichlorophenol	Lab	ug/kg	NA	10600000	2212000		< 348 h	< 372 h
2,4,6-Trichlorophenol	Lab	ug/kg	420	1060000	705000		< 348 h	< 372 h
2,4-Dichlorophenol	Lab	ug/kg	150	230000	61000		< 348 h	< 372 h
2,4-Dimethylphenol	Lab	ug/kg	2200	1925000	530000		< 348 h	< 372 h
2,4-Dinitrophenol	Lab	ug/kg	20				< 348 h	< 372 h
2,4-Dinitrotoluene	Lab	ug/kg	13	355000	60000		< 348 h	< 372 h
2,6-Dinitrotoluene	Lab	ug/kg	13	175000	30000		< 348 h	< 372 h
2-Chloronaphthalene	Lab	ug/kg					< 348 h	< 372 h
2-Chlorophenol	Lab	ug/kg	520				< 348 h	< 372 h
2-Methyl-4,6-dinitrophenol	Lab	ug/kg					< 1790 h	< 1920 h
2-Methylnaphthalene	Lab	ug/kg		369000	120000		< 348 h	< 372 h
2-Methylphenol (o-cresol)	Lab	ug/kg	430	352000	95000		< 348 h	< 372 h
2-Nitroaniline	Lab	ug/kg					< 348 h	< 372 h
2-Nitrophenol	Lab	ug/kg					< 348 h	< 372 h
3,3'-Dichlorobenzidine	Lab	ug/kg	100	50000	30000		< 348 h	< 372 h
3,4-Methylphenol (m,p cresols)	Lab	ug/kg	42 MP	59000 MP	11000 MP		< 696 h	< 745 h
3-Nitroaniline	Lab	ug/kg					< 348 h	< 372 h
4-Bromophenyl phenyl ether	Lab	ug/kg					< 348 h	< 372 h
4-Chloro-3-methylphenol	Lab	ug/kg					< 348 h	< 372 h
4-Chloroaniline	Lab	ug/kg					< 348 h	< 372 h
4-Chlorophenyl phenyl ether	Lab	ug/kg					< 348 h	< 372 h
4-Nitroaniline	Lab	ug/kg					< 348 h	< 372 h
4-Nitrophenol	Lab	ug/kg					< 348 h	< 372 h
Acenaphthene	Lab	ug/kg	81000	5260000	1860000		< 348 h	< 372 h
Acenaphthylene	Lab	ug/kg	NA				< 348 h	< 372 h
Anthracene	Lab	ug/kg	1300000	45400000	10000000		< 348 h	< 372 h
Benzo(g,h,i)perylene	Lab	ug/kg	NA				< 348 h	< 372 h
Bis(2-chloroethoxy)methane	Lab	ug/kg					< 348 h	< 372 h
Bis(2-chloroethyl)ether	Lab	ug/kg	0.99	5000	6000		< 348 h	< 372 h
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	29000	2100000	690000		< 348 h	< 372 h
Butyl benzyl phthalate	Lab	ug/kg	29000	3700000	623000		< 348 h	< 372 h
Carbazole	Lab	ug/kg		1310000	720000		< 348 h	< 372 h
Dibenzofuran	Lab	ug/kg	NA	810000	130000		< 348 h	< 372 h
Diethyl phthalate	Lab	ug/kg	37000				< 348 h	< 372 h
Dimethyl phthalate	Lab	ug/kg	230000				< 348 h	< 372 h
Di-n-butyl phthalate	Lab	ug/kg	34000	16300000	3070000		< 348 h	< 372 h
Di-n-octyl phthalate	Lab	ug/kg	NA	3700000	630000		< 348 h	< 372 h
Fluoranthene	Lab	ug/kg	670000	6800000	1290000		< 348 h	< 372 h
Fluorene	Lab	ug/kg	110000	4120000	1200000		< 348 h	< 372 h
Hexachlorobenzene	Lab	ug/kg		9000	8000		< 348 h	< 372 h
Hexachlorobutadiene	Lab	ug/kg	37	37000	6000		< 348 h	< 372 h
Hexachloroethane	Lab	ug/kg	10				< 348 h	< 372 h
Isophorone	Lab	ug/kg	460				< 348 h	< 372 h
Naphthalene	Lab	ug/kg	4500	28000	24000		< 348 h	< 372 h

Table 6

SUMMARY OF ANALYTICAL RESULTS - CRUSHED BEDROCK
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values	Local ID	MW-10D	MW-9D
						Location	FL-MW-D2	FL-MW-E2
						Date	4/02/2019	4/02/2019
						Depth	27 - 29.5 ft	33 - 35 ft
Effective Date			06/01/2013	06/22/2009	06/22/2009			
Exceedance Key			Bold	No Exceed	No Exceed			
Nitrobenzene	Lab	ug/kg					< 348 h	< 372 h
n-Nitrosodimethylamine	Lab	ug/kg					< 348 h	< 372 h
n-Nitrosodi-n-propylamine	Lab	ug/kg		1200	1200		< 348 h	< 372 h
n-Nitrosodiphenylamine	Lab	ug/kg	7500	3720000	2585000		< 348 h	< 372 h
Pentachlorophenol	Lab	ug/kg	23	120000	80000		< 707 h	< 756 h
Phenanthrene	Lab	ug/kg	NA				< 348 h	< 372 h
Phenol	Lab	ug/kg	38000	20203000	1500000		< 348 h	< 372 h
Pyrene	Lab	ug/kg	440000	5800000	1060000		< 348 h	< 372 h
Volatile Organic Compounds								
1,1,1,2-Tetrachloroethane	Lab	ug/kg	410	51000	83000		< 55.9 h	< 59.1 h
1,1,1-Trichloroethane	Lab	ug/kg	56000	472000	280000		< 55.9 h	< 59.1 h
1,1,2,2-Tetrachloroethane	Lab	ug/kg	12	6500	4000		< 55.9 h	< 59.1 h
1,1,2-Trichloroethane	Lab	ug/kg	14	14000	24000		< 55.9 h	< 59.1 h
1,1-Dichloroethane	Lab	ug/kg	410	55000	97000		< 55.9 h	< 59.1 h
1,1-Dichloroethylene	Lab	ug/kg	1400	60000	50000		< 55.9 h	< 59.1 h
1,1-Dichloropropene	Lab	ug/kg					< 55.9 h	< 59.1 h
1,2,3-Trichlorobenzene	Lab	ug/kg					< 55.9 h	< 59.1 h
1,2,3-Trichloropropane	Lab	ug/kg	270				< 223 h	< 237 h
1,2,4-Trichlorobenzene	Lab	ug/kg	230	985000	290000		< 55.9 h	< 59.1 h
1,2,4-Trimethylbenzene	Lab	ug/kg	2700	25000	20000		< 55.9 h	< 59.1 h
1,2-Dibromo-3-chloropropane (DBCP)	Lab	ug/kg					< 559 h	< 591 h
1,2-Dibromoethane (EDB)	Lab	ug/kg	0.015	500	1000		< 55.9 h	< 59.1 h
1,2-Dichlorobenzene	Lab	ug/kg	11000	75000	63000		< 55.9 h	< 59.1 h
1,2-Dichloroethane	Lab	ug/kg	3.8	6000	10000		< 55.9 h	< 59.1 h
1,2-Dichloroethylene, cis	Lab	ug/kg	210	22000	19000		< 55.9 h	< 59.1 h
1,2-Dichloroethylene, trans	Lab	ug/kg	420	33000	28000		< 55.9 h	< 59.1 h
1,2-Dichloropropane	Lab	ug/kg	24	6000	11000		< 55.9 h	< 59.1 h
1,3,5-Trimethylbenzene	Lab	ug/kg	2700	10000	8000		< 55.9 h	< 59.1 h
1,3-Dichlorobenzene	Lab	ug/kg	10000	200000	32000		< 55.9 h	< 59.1 h
1,3-Dichloropropane	Lab	ug/kg					< 55.9 h	< 59.1 h
1,3-Dichloropropene, cis	Lab	ug/kg	11 DCP				< 55.9 h	< 59.1 h
1,3-Dichloropropene, trans	Lab	ug/kg	11 DCP				< 55.9 h	< 59.1 h
1,4-Dichlorobenzene	Lab	ug/kg	170	50000	72000		< 55.9 h	< 59.1 h
1,4-Dioxane	Lab	ug/kg	2.1	250000	250000		< 9.4 h	< 9.8 h
2,2-Dichloropropane	Lab	ug/kg					< 223 h	< 237 h
Acetone	Lab	ug/kg	8400	1000000	850000		< 1120 h	< 1180 h
Allyl chloride	Lab	ug/kg	150				< 223 h	< 237 h
Benzene	Lab	ug/kg	17	10000	14000		< 22.3 h	< 23.7 h
Bromobenzene	Lab	ug/kg					< 55.9 h	< 59.1 h
Bromochloromethane	Lab	ug/kg	280				< 55.9 h	< 59.1 h
Bromodichloromethane	Lab	ug/kg	21	17000	28000		< 55.9 h	< 59.1 h
Bromoform	Lab	ug/kg	130	650000	630000		< 223 h	< 237 h
Bromomethane	Lab	ug/kg	36	2000	2000		< 559 h	< 591 h
Butylbenzene	Lab	ug/kg	NA	92000	70000		< 55.9 h	< 59.1 h
Butylbenzene, sec	Lab	ug/kg	NA	70000	55000		< 55.9 h	< 59.1 h
Butylbenzene, tert	Lab	ug/kg	NA	90000	55000		< 55.9 h	< 59.1 h
Carbon tetrachloride	Lab	ug/kg	7.7	900	700		< 55.9 h	< 59.1 h
Chlorobenzene	Lab	ug/kg	1200	32000	23000		< 55.9 h	< 59.1 h
Chlorodibromomethane	Lab	ug/kg	34	20000	30000		< 223 h	< 237 h
Chloroethane	Lab	ug/kg	NA	3000000	2250000		< 559 h	< 591 h
Chloroform	Lab	ug/kg	110	4000	7000		< 55.9 h	< 59.1 h
Chloromethane	Lab	ug/kg	110	23000	20000		< 223 h	< 237 h
Chlorotoluene, o	Lab	ug/kg		436000	436000		< 55.9 h	< 59.1 h
Chlorotoluene, p	Lab	ug/kg					< 55.9 h	< 59.1 h
Cumene (isopropyl benzene)	Lab	ug/kg	9500	87000	74000		< 55.9 h	< 59.1 h
Cymene p- (toluene isopropyl p-)	Lab	ug/kg					< 55.9 h	< 59.1 h
Dibromomethane (methylene bromide)	Lab	ug/kg		1860000	316000		< 55.9 h	< 59.1 h
Dichlorodifluoromethane (Freon-12)	Lab	ug/kg	37000	50000	42000		< 223 h	< 237 h
Dichlorofluoromethane (Freon-21)	Lab	ug/kg	NA				< 559 h*	< 591 h*
Ethyl benzene	Lab	ug/kg	1000	200000	200000		< 55.9 h	< 59.1 h
Ethyl ether	Lab	ug/kg	510				< 223 h	< 237 h
Hexachlorobutadiene	Lab	ug/kg	37	37000	6000		< 279 h	< 296 h
Methyl ethyl ketone (2-butanone)	Lab	ug/kg	8800	19000000	5500000		< 279 h	< 296 h
Methyl isobutyl ketone (MIBK)	Lab	ug/kg	760	9000000	2500000		< 279 h	< 296 h
Methyl tertiary butyl ether (MTBE)	Lab	ug/kg	NA				< 55.9 h	< 59.1 h
Methylene chloride	Lab	ug/kg	17	158000	270000		< 223 h	< 237 h
Naphthalene	Lab	ug/kg	4500	28000	24000		< 223 h	< 237 h
Propylbenzene	Lab	ug/kg	NA	93000	70000		< 55.9 h	< 59.1 h
Styrene	Lab	ug/kg	2000	600000	500000		< 55.9 h	< 59.1 h
Tetrachloroethylene	Lab	ug/kg	42	131000	145000		< 55.9 h	< 59.1 h
Tetrahydrofuran	Lab	ug/kg	240				< 2230 h	< 2370 h
Toluene	Lab	ug/kg	2500	305000	260000		< 55.9 h	< 59.1 h
Trichloroethylene (TCE)	Lab	ug/kg	2.3	46000	82000		< 55.9 h	< 59.1 h
Trichlorofluoromethane (Freon-11)	Lab	ug/kg	35000	195000	168000		< 223 h	< 237 h
Trichlorotrifluoroethane (Freon 113)	Lab	ug/kg	17000000	5430000	5430000		< 223 h	< 237 h
Vinyl chloride	Lab	ug/kg	1.4	2200	2000		< 22.3 h	< 23.7 h
Xylene, total	Lab	ug/kg	5400 M	130000 M	110000 M		< 168 h	< 177 h

Table 6

SUMMARY OF ANALYTICAL RESULTS - CRUSHED BEDROCK
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

						Local ID	MW-10D	MW-9D
						Location	FL-MW-D2	FL-MW-E2
						Date	4/02/2019	4/02/2019
						Depth	27 - 29.5 ft	33 - 35 ft
Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values			
Effective Date			06/01/2013	06/22/2009	06/22/2009			
Exceedance Key			Bold	No Exceed	No Exceed			
Polychlorinated Biphenyls								
Aroclor 1016	Lab	ug/kg				< 34.8 h	< 37.0 h	
Aroclor 1221	Lab	ug/kg				< 34.8 h	< 37.0 h	
Aroclor 1232	Lab	ug/kg				< 34.8 h	< 37.0 h	
Aroclor 1242	Lab	ug/kg				< 34.8 h	< 37.0 h	
Aroclor 1248	Lab	ug/kg				< 34.8 h	< 37.0 h	
Aroclor 1254	Lab	ug/kg				< 34.8 h	< 37.0 h	
Aroclor 1260	Lab	ug/kg				< 34.8 h	< 37.0 h	
Aroclor 1262	Lab	ug/kg				< 34.8 h	< 37.0 h	
Aroclor 1268	Lab	ug/kg				< 34.8 h	< 37.0 h	
Polychlorinated biphenyls	Lab	ug/kg	130	8000	1400	< 34.8 h	< 37.0 h	
Radiochemical Parameters								
Gross Alpha (radiation)	Lab	pCi/g				< 13.7	< 12.1	
Gross Beta (radiation)	Lab	pCi/g				13.1 +/- 4.33	7.40 +/- 3.51	
Per- and Polyfluoroalkyl Substances								
Perfluorobutanesulfonate	Lab	ng/g				< 0.200	< 0.197	
Perfluorobutanoic acid (PFBA)	Lab	ng/g		500000	94000	< 0.100	< 0.0985	
Perfluorodecanoic acid (PFDA)	Lab	ng/g				< 0.100	< 0.0985	
Perfluorododecanoic acid (PFDoA / PFDoDA)	Lab	ng/g				< 0.100	< 0.0985	
Perfluoroheptanoic acid (PFHpA)	Lab	ng/g				< 0.100	< 0.0985	
Perfluorohexane sulfonate (PFHxS)	Lab	ng/g				< 0.200	< 0.197	
Perfluorohexanoic acid (PFHxA)	Lab	ng/g				< 0.100	< 0.0985	
Perfluorononanoic acid (PFNA)	Lab	ng/g				< 0.100	< 0.0985	
Perfluorooctanesulfonamide (PFOSA / FOSA)	Lab	ng/g				< 0.100	< 0.0985	
Perfluorooctanesulfonate (PFOS)	Lab	ng/g		14000	2600	< 0.200	< 0.197	
Perfluorooctanoic acid (PFOA)	Lab	ng/g		13000	2500	< 0.100	0.165	
Perfluoropentanoic acid (PFPeA)	Lab	ng/g				< 0.100	< 0.0985	
Perfluoroundecanoic acid (PFUnA / PFUnDA)	Lab	ng/g				< 0.100	< 0.0985	

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

*	Estimated value, QA/QC criteria not met.
a	Estimated value, calculated using some or all values that are estimates.
h	EPA recommended sample preservation, extraction or analysis holding time was exceeded.

MPCA Tier 2 Industrial Soil Reference Values

CR6	Value represents the criteria for Chromium, hexavalent.
M	Value represents the criteria for mixed Xylenes.
MP	Value represents the criteria for p-cresol.
T	Value represents a criteria for the total carcinogenic PAHs as B(a)P.

MPCA Tier 2 Recreational Soil Reference Values

CR6	Value represents the criteria for Chromium, hexavalent.
M	Value represents the criteria for mixed Xylenes.
MP	Value represents the criteria for p-cresol.
T	Value represents a criteria for the total carcinogenic PAHs as B(a)P.

Table 7

SUMMARY OF ANALYTICAL RESULTS - SOIL GAS

Focused Remedial Investigation Report
Freeway Landfill and Dump
Burnsville, Minnesota

Parameter	Units	Location		FD-SB-07	FD-SB-08
		MPCA Residential Intrusion Screening Values (ISVs) for Vapor Intrusion Risk Evaluation	MPCA Residential 33X Intrusion Screening Values (ISVs) for Vapor Intrusion Risk Evaluation	4/01/2019	4/01/2019
Effective Date		05/29/2019	05/29/2019		
Exceedance Key		Bold Shaded	No Exceed		
Volatile Organic Compounds					
1,1,1-Trichloroethane	ug/m3	5200	170000	< 2.0	< 1.9
1,1,2,2-Tetrachloroethane	ug/m3	NA	NA	< 1.3	< 1.2
1,1,2-Trichloroethane	ug/m3	0.21	7.0	< 1.0	< 0.97
1,1-Dichloroethane	ug/m3	NA	NA	< 1.5	< 1.4
1,1-Dichloroethylene	ug/m3	210	7000	< 1.5	< 1.4
1,2,4-Trichlorobenzene	ug/m3	2.1	70	< 13.8	< 13.2
1,2,4-Trimethylbenzene	ug/m3	63	2100	6.8	7.7
1,2-Dibromoethane (EDB)	ug/m3	0.017	0.57	< 1.4	< 1.4
1,2-Dichlorobenzene	ug/m3	NA	NA	< 2.2	< 2.1
1,2-Dichloroethane	ug/m3	0.39	13	< 0.75	< 0.72
1,2-Dichloroethylene, cis	ug/m3	NA	NA	< 1.5	16.1
1,2-Dichloroethylene, trans	ug/m3	NA	NA	< 1.5	< 1.4
1,2-Dichloropropane	ug/m3	2.7	90	< 1.7	< 1.6
1,2-Dichlorotetrafluoroethane (Freon 114)	ug/m3	NA	NA	15.8	77.1
1,3,5-Trimethylbenzene	ug/m3	63	2100	< 1.8	2.1
1,3-Butadiene	ug/m3	0.28	9.3	< 0.82	< 0.79
1,3-Dichlorobenzene	ug/m3	NA	NA	5.1	3.2
1,3-Dichloropropene, cis	ug/m3	2.5 (2)	83 (2)	< 1.7	< 1.6
1,3-Dichloropropene, trans	ug/m3	2.5 (2)	83 (2)	< 1.7	< 1.6
1,4-Dichlorobenzene	ug/m3	63	2100	< 5.6	< 5.4
2-Hexanone	ug/m3	31	1000	< 7.6	< 7.3
4-Ethyltoluene	ug/m3	NA	NA	< 4.6	< 4.4
Acetone	ug/m3	32000	1100000	300	159
Benzene	ug/m3	4.6	150	1.9	5.2
Benzyl chloride	ug/m3	0.21	7.0	< 4.8	< 4.6
Bromodichloromethane	ug/m3	21 (1)	700 (1)	< 2.5	< 2.4
Bromoform	ug/m3	NA	NA	< 9.6	< 9.2
Bromomethane	ug/m3	5.2	170	< 1.4	< 1.4
Carbon disulfide	ug/m3	830	28000	< 1.2	34.6
Carbon tetrachloride	ug/m3	1.7	57	< 2.3	< 2.2
Chlorobenzene	ug/m3	52	1700	< 1.7	< 1.6
Chlorodibromomethane	ug/m3	NA	NA	< 3.2	< 3.0
Chloroethane	ug/m3	4200 (1)	140000 (1)	< 0.98	< 0.94
Chloroform	ug/m3	100	3300	< 0.91	< 0.87
Chloromethane	ug/m3	94	3100	< 0.77	6.1
Cyclohexane	ug/m3	6300	210000	< 3.2	< 3.1
Dichlorodifluoromethane (Freon-12)	ug/m3	NA	NA	10.1	65.8
Ethyl acetate	ug/m3	73	2400	< 1.3	< 1.3
Ethyl alcohol	ug/m3	NA	NA	33.5	7.1
Ethyl benzene	ug/m3	4.1	140	4.4	4.4
Heptane	ug/m3	420	14000	3.5	66.3
Hexachlorobutadiene	ug/m3	NA	NA	< 9.9	< 9.5
Hexane (C6)	ug/m3	730	24000	3.4	180
Isopropyl alcohol	ug/m3	210	7000	6.7	< 4.4
Methane (CH4)	ppmv			45.3	< 36.6
Methyl ethyl ketone (2-butanone)	ug/m3	5200	170000	16.2	< 5.2
Methyl isobutyl ketone (MIBK)	ug/m3	3100	100000	< 7.6	< 7.3
Methyl tertiary butyl ether (MTBE)	ug/m3	39	1300	< 6.7	< 6.4
Methylene chloride	ug/m3	630	21000	< 6.5	< 6.2
Naphthalene	ug/m3	9.4	310	< 4.9	< 4.7
Propylene	ug/m3	3100	100000	10.9	310 e
Styrene	ug/m3	940	31000	< 1.6	< 1.5
Tetrachloroethylene	ug/m3	3.4	110	18.8	34.9
Tetrahydrofuran	ug/m3	2100	70000	< 1.1	< 1.0
Toluene	ug/m3	4200	140000	16.3	17.0
Trichloroethylene (TCE)	ug/m3	2.1 (3)	70 (3)	< 1.0	35.5
Trichlorofluoromethane (Freon-11)	ug/m3	1000 (1)	33000 (1)	11.5	< 2.0
Trichlorotrifluoroethane (Freon 113)	ug/m3	5200	170000	< 2.9	< 2.7
Vinyl acetate	ug/m3	210	7000	< 1.3	< 1.3
Vinyl chloride	ug/m3	1.7 (4)	57 (4)	< 0.48	1.2
Xylene, m & p	ug/m3	100 (5)	3300 (5)	17.5	15.7
Xylene, o	ug/m3	100 (5)	3300 (5)	6.0	5.5

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

e	Estimated value, exceeded the instrument calibration range.
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MPCA Residential 33X Intrusion Screening Values (ISVs) for Vapor Intrusion Risk Evaluation

(1)	Based on subchronic RfC.
(2)	Based on ,3-Dichloropropene cas# 542-75-6.
(3)	If a woman is pregnant or may become pregnant is present, expedited action may be needed TCE exceeds the ISVs and/or 33X ISVs (rather than EISVs/33X EISVs).
(4)	The vinyl chloride commercial/industrial ISV is not protective if children are present, see ISV Technical Support Document.
(5)	Based on total xylenes cas# 1330-20-7.
NA	No appropriate toxicity data available to support development of an ISV.

MPCA Residential Intrusion Screening Values (ISVs) for Vapor Intrusion Risk Evaluation

(5)	Based on total xylenes cas# 1330-20-7.
(1)	Based on subchronic RfC.
(2)	Based on ,3-Dichloropropene cas# 542-75-6.
(3)	If a woman is pregnant or may become pregnant is present, expedited action may be needed TCE exceeds the ISVs and/or 33X ISVs (rather than EISVs/33X EISVs).
(4)	The vinyl chloride commercial/industrial ISV is not protective if children are present, see ISV Technical Support Document.
(5)	Based on total xylenes cas# 1330-20-7.
NA	No appropriate toxicity data available to support development of an ISV.

SUMMARY OF ANALYTICAL RESULTS - COVER SOIL
Focused Remedial Investigation Report
Freeway Landfill and Dump
Burnsville, Minnesota

Table with columns for Parameter, Analysis Location, Units, MPCA Screening Soil Leaching Values, MPCA Criteria for Unregulated Fill, MPCA Tier 2 Industrial Soil Reference Values, MPCA Tier 2 Recreational Soil Reference Values, Location Date Depth, and five Landfill sampling locations (FL-SB-06, FL-SB-07, FL-SB-08, FL-SB-09, FL-SB-10).

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Not analyzed/Not detected.
NA	NA (not applicable) indicates that a fractional portion of the sample is not part of the analytical testing or field collection procedures.
*	Estimated value, QA/QC criteria not met.
a	Estimated value, calculated using some or all values that are estimates.
j	Estimated detected value. The reported value is less than the stated laboratory quantitation limit but greater than the laboratory method detection limit.

MPCA Screening Soil Leaching Values

CR6	Value represents the criteria for Chromium, hexavalent.
DCP	Value represents the criteria for 1,3-Dichloropropene.
M	Value represents the criteria for mixed Xylenes.
MC	Mercury as Mercuric Chloride.
NA	Criterion value is not available for this analyte.
T	Value represents a criteria for the total carcinogenic PAHs as B(a)P.

MPCA Criteria for Unregulated Fill

Criteria shown in this column are the minimum of the MPCA Tier 1 Residential Soil Reference Value and the MPCA Soil Leaching Value, plus the 100 mg/kg criteria for DRO and GRO. Field screening criteria are not shown.

MPCA Tier 2 Industrial Soil Reference Values

CR6	Value represents the criteria for Chromium, hexavalent.
M	Value represents the criteria for mixed Xylenes.
T	Value represents a criteria for the total carcinogenic PAHs as B(a)P.

MPCA Tier 2 Recreational Soil Reference Values

CR6	Value represents the criteria for Chromium, hexavalent.
M	Value represents the criteria for mixed Xylenes.
MC	Mercury as Mercuric Chloride.
T	Value represents a criteria for the total carcinogenic PAHs as B(a)P.

Table 9

MONITORING WELL NETWORK MATRIX
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Well Name	Unique Number	Date Installed	Unit	Total Depth (feet, bgs)	Screen or Open Borehole	Screen / Open Borehole Interval (feet, bgs)		Elevations (feet, MSL) *		Coordinates (meters, UTM Z15N)	
						Depth to Top	Depth to Bottom	Ground Surface	Top of Riser	Easting	Northing
MW-1	813761	6/4/2015	Perched	38	Screen	28	38	733.0	735.13	476723.106	4959817.822
MW-2	813762	5/28/2015	Perched	46	Screen	36	46	740.5	741.97	476580.54	4959939.57
MW-3	813763	5/27/2015	Perched	52	Screen	42	52	750.5	753.29	476689.87	4960078.91
MW-4	813764	6/4/2015	Perched	48	Screen	38	48	738.0	740.07	476822.656	4959969.66
MW-4D	813740	6/4/2015	Water Table	64	Screen	54	64	737.5	739.94	476825.11	4959969.492
MW-5	813765	6/4/2015	Perched	41	Screen	21	41	745.5	748.10	477011.92	4960008.139
MW-6	813766	6/1/2015	Perched	37	Screen	27	37	725.0	726.61	476931.665	4960343.586
MW-7	813767	6/1/2015	Perched	36	Screen	26	36	720.5	722.66	476866.966	4960416.67
MW-8	813768	5/29/2015	Perched	37	Screen	27	37	722.5	724.60	476717.616	4960398.452
MW-8D	813741	6/15/2015	Water Table	45.5	Screen	40.5	45.5	722.5	724.13	476715.487	4960398.193
MW-9	834659	5/21/2019	Perched	26	Screen	16	26	726.5	729.5	476611.2744	4959741.311
MW-9D	837777	4/4/2019	Water Table	83	Open Hole	45	83	726.5	729.5	476611.2744	4959741.311
MW-10D	837776	4/1/2019	Water Table	88	Open Hole	66.5	88	721.0	724	476391.9139	4959741.246
MW-11	834655	5/21/2019	Water Table	18	Screen	8	18	708.0	710.5	476631.1973	4960480.334
MW-12	834656	5/20/2019	Water Table	18	Screen	8	18	709.0	711.5	476782.9982	4960532.702
MW-13	834657	5/20/2019	Water Table	18	Screen	8	18	709.0	711.5	476920.5905	4960585.354
WT-6	240816	5/21/1982	Water Table	27	Screen	17	27	705.7	707.54	477090.3023	4960083.125
MP-8 **	--	9/28/1993	Perched	17	Screen	7	17	709.9	712.87		
WT-9	434012	4/29/1987	Water Table	66	Open Hole	61	66	703.1	704.14	476979.9069	4960682.233
WT-10	434010	4/28/1987	Water Table	50	Open Hole	45	50	708	707.96	476481.7578	4960444.397
WT-11B	434011	5/7/1987	Water Table	110	Open Hole	45	110	716	718.31	476448.1228	4959709.052
WT-12B	434013	5/6/1987	Water Table	94	Open Hole	49	94	712	712.25	476356.3694	4960088.115
WT-13	462523	5/21/1990	Water Table	85	Open Hole	55	85	710.3	712.16	476738.1237	4959697.259
WT-14	462522	5/25/1990	Water Table	80	Open Hole	55	80	702.3	704.02	476337.88	4959799.664
J-1	268045	10/7/1983	Jordan	220	Open Hole	194	220	697.9	700.12	477039	4959767
J-13	462520	5/21/1990	Jordan	199	Open Hole	189	199	711	712.97	476734.7724	4959697.272
J-14	462521	5/25/1990	Jordan	180	Open Hole	160	180	702	703.37	476336.9541	4959796.621

* Ground surface elevations in italics were estimated based on LIDAR data. TOR elevations in italics are from wells not surveyed and this elevation is estimated based on LIDAR elevations and well construction information. (MSL - mean sea level)

** MP-8 was not installed as a monitoring well

Table 9

MONITORING WELL NETWORK MATRIX
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Well Name	Unique Number	Date Installed	Unit	Total Depth (feet, bgs)	Screen or Open Borehole	Screen / Open Borehole Interval (feet, bgs)		Elevations (feet, MSL) *		Coordinates (meters, UTM Z15N)	
						Depth to Top	Depth to Bottom	Ground Surface	Top of Riser	Easting	Northing
OFMW-1	472759	9/18/1990	Water Table	21	Screen	11	21	<i>705</i>	<i>708</i>	477494.1855	4959585.243
MW-97-1	603281	11/10/1997	Water Table	31	Open Hole	16	31	719	721.46	477218.4561	4959349.892
MW-97-2	603282	11/10/1997	Water Table	31	Open Hole	16	31	<i>717</i>	<i>719.5</i>	477211.8912	4959463.56
MW-97-3	603283	11/17/1997	Water Table	30	Open Hole	16	30	<i>714</i>	<i>716.5</i>	477207.4566	4959576.61
MW-97-4	603287	11/18/1997	Water Table	28	Open Hole	11	28	<i>719</i>	<i>721.5</i>	477476.2928	4959371.739
MW-97-5	603288	11/18/1997	Water Table	28	Open Hole	13	30	717.8	720.88	477477.8076	4959291.3
MW-97-6	603289	11/18/1997	Water Table	29	Open Hole	16	29	<i>720</i>	<i>722.5</i>	477327.2135	4959269.036
MW-97-7	603284	11/19/1997	Water Table	18	Open Hole	8.5	18	703.9	707	477211.5752	4959695.416
MW-97-8	603285	11/18/1997	Water Table	20	Screen	15	20	<i>702</i>	<i>705</i>	477350.0159	4959726.258
MW-97-9	603286	11/18/1997	Water Table	21	Open Hole	10	20	704.9	708.11	477475.1732	4959710.232
MW-19-01	834660	3/28/2019	Perched?	17	Screen	7	17	<i>716</i>	<i>719.5</i>	477235.8417	4959662.109
MW-19-02	834662	3/26/2019	Perched?	17.5	Screen	7.5	17.5	<i>718</i>	<i>721</i>	477304.8262	4959695.369
MW-19-03	834663	3/26/2019	Perched?	34	Screen	14	34	<i>723</i>	<i>725.5</i>	477376.5751	4959697.03
MW-19-04	834661	3/27/2019	Perched?	35	Screen	15	35	<i>724</i>	<i>727</i>	477362.1911	4959643.292

* Ground surface elevations in italics were estimated based on LIDAR data. TOR elevations in italics are from wells not surveyed and this elevation is estimated based on LIDAR elevations and well construction information. (MSL - mean sea level)

Table 10a

WATER LEVEL MEASUREMENTS
Dump
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Well Name	Unique Number	Unit	Top of Riser Elevation (feet, MSL) ¹	Total Well Depth	Date Measured	Depth to Water (feet, TOR)	Groundwater Elevation (feet, MSL)	Analytical Sample Collected?	Comments
OFMW-1	472759	Water Table	708.00	23.2	4/9/2019	--	--	--	Underwater
					5/21/2019	5.19	702.81	Yes	
					6/17/2019	5.62	702.38	--	Needs new lock
MW-97-1	603281	Water Table	721.46	32.91	3/26/2019	18.74	702.72	Yes	
					4/9/2019	18.85	702.61	--	
					6/17/2019	15.14	706.32	--	
MW-97-2	603282	Water Table	719.50	32.12	4/9/2019	--	--	--	Could not open
					6/3/2019	12.3	707.20	Yes	
					6/17/2019	14.18	705.32	--	
MW-97-3	603283	Water Table	716.50	29.55	4/9/2019	12.61	703.89	--	
					5/21/2019	11.20	705.30	Yes	
					6/17/2019	14.29	702.21	--	
MW-97-4	603287	Water Table	721.50	29.53	3/26/2019	11.27	710.23	Yes	
					4/9/2019	10.81	710.69	--	
					6/17/2019	10.69	710.81	--	
MW-97-5	603288	Water Table	720.88	28.54	3/26/2019	11.38	709.50	Yes	
					4/9/2019	10.96	709.92	--	
					6/17/2019	10.46	710.42	--	
MW-97-6	603289	Water Table	722.50	30.3	3/26/2019	20.98	701.52	Yes	
					4/9/2019	19.11	703.39	--	
					6/17/2019	13.75	708.75	--	
MW-97-7	603284	Water Table	707.00	20.99	4/9/2019	--	--	--	Underwater
					5/21/2019	5.89	701.11	Yes	
					6/17/2019	7.99	699.01	--	
MW-97-8	603285	Water Table	705.00	--	4/9/2019	--	--	--	Underwater
					5/21/2019	--	--	No	Could not open
					6/17/2019	--	--	--	Needs repair
MW-97-9	603286	Water Table	708.11	23.22	4/9/2019	--	--	--	Underwater
					5/21/2019	5.94	702.17	Yes	
					6/17/2019	6.53	701.58	--	
MW-19-01	834660	Perched?	719.5	20.29	4/3/2019	11.64	707.86	Yes	
					4/9/2019	12.84	706.66	--	
					6/17/2019	14.29	705.21	--	
MW-19-02	834662	Perched?	721	38.03	4/3/2019	17.43	703.57	Yes	
					4/9/2019	13.6	707.40	--	
					6/17/2019	15.76	705.24	--	
MW-19-03	834663	Perched?	725.5	21.32	4/3/2019	14.98	710.52	Yes	
					4/9/2019	16.86	708.64	--	
					6/17/2019	19.5	706.00	--	
MW-19-04	834661	Perched?	727	35.18	4/3/2019	15.07	711.93	Yes	
					4/9/2019	18.74	708.26	--	
					6/17/2019	20.36	706.64	--	

TOR - Top of riser

MSL - Mean sea level

1 - TOR elevations in italics are from wells not surveyed and this elevation is estimated based on LIDAR elevations and well construction information.

Approximate Minnesota River Stage on April 9, 2019 = 708.3 feet MSL

Approximate Minnesota River Stage on June 17, 2019 = 699 feet MSL

Table 10b

WATER LEVEL MEASUREMENTS
Landfill
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Well Name	Unique Number	Unit	Top of Riser Elevation (feet, MSL) ¹	Total Well Depth	Date Measured	Depth to Water (feet, TOR)	Groundwater Elevation (feet, MSL)	Analytical Sample Collected?	Comments
MW-1	813761	Perched	735.13	40.03	4/1/2019	36.62	698.51	Yes	
					4/9/2019	33.95	701.18	--	
					6/17/2019	32.3	702.83	--	
MW-2	813762	Perched	741.97	47.55	4/9/2019	47.17	694.80	--	
					5/22/2019	47.21	694.76	No, dry	
					6/17/2019	47.11	694.86	--	
MW-3	813763	Perched	753.29	55.11	4/9/2019	45.09	708.20	--	
					5/22/2019	51.7	701.59	Yes	
					6/17/2019	52.18	701.11	--	
MW-4	813764	Perched	740.07	50.43	4/1/2019	46.38	693.69	Yes	
					4/9/2019	42.94	697.13	--	
					6/17/2019	45.77	694.30	--	
MW-4D	813740	Water Table	739.94	66.35	4/1/2019	55.9	684.04	Yes	
					4/9/2019	55.54	684.40	--	
					6/17/2019	52.52	687.42	--	
MW-5	813765	Perched	748.10	44.19	3/27/2019	29	719.10	Yes	
					4/9/2019	24.90	723.20	--	
					6/17/2019	25.46	722.64	--	
MW-6	813766	Perched	726.61	39.24	3/27/2019	31.45	695.16	Yes	
					4/9/2019	--	--	--	Could not open
					6/17/2019	--	--	--	Could not open
MW-7	813767	Perched	722.66	38.73	3/27/2019	29.75	692.91	Yes	
					4/9/2019	23.34	699.32	--	
					6/17/2019	24.03	698.63	--	
MW-8	813768	Perched	724.60	39.77	3/27/2019	18.41	706.19	Yes	
					4/9/2019	17.76	706.84	--	
					6/17/2019	20.4	704.20	--	
MW-8D	813741	Water Table	724.13	47.45	3/27/2019	37.43	686.70	Yes	
					4/9/2019	29.35	694.78	--	
					6/17/2019	27.13	697.00	--	
MW-9	834659	Perched	729.5	28.32	4/9/2019	--	--	--	Not yet installed
					6/3/2019	26.8	702.70	Yes	
					6/17/2019	26.28	703.22	--	
MW-9D	837777	Water Table	729.5	84.5	4/9/2019	69.97	659.53	--	
					4/10/2019	69.79	659.71	Yes	
					6/3/2019	64.93	664.57	Yes ³	
					6/17/2019	64.97	664.53	--	
MW-10D	837776	Water Table	724	66.5	4/9/2019	74.31	649.69	--	
					4/10/2019	74.19	649.81	Yes	
					6/3/2019	69.7	654.30	Yes ³	
					6/17/2019	70.31	653.69	--	
MW-11	834655	Water Table	710.5	20.3	4/9/2019	--	--	--	Not yet installed
					5/28/2019	4.03	706.47	Yes	
					6/17/2019	5.5	705.00	--	
MW-12	834656	Water Table	711.5	20.33	4/9/2019	--	--	--	Not yet installed
					5/28/2019	3.5	708.00	Yes	
					6/17/2019	7.29	704.21	--	
MW-13	834657	Water Table	711.5	20.32	4/9/2019	--	--	--	Not yet installed
					5/28/2019	4.5	707.00	Yes	
					6/17/2019	8.74	702.76	--	

Table 10b

WATER LEVEL MEASUREMENTS
Landfill
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Well Name	Unique Number	Unit	Top of Riser Elevation (feet, MSL) ¹	Total Well Depth	Date Measured	Depth to Water (feet, TOR)	Groundwater Elevation (feet, MSL)	Analytical Sample Collected?	Comments
WT-6	240816	Water Table	707.54	25.55	4/1/2019	7.9	699.64	Yes	
					4/9/2019	6.71	700.83	--	
					6/17/2019	9.48	698.06	--	
MP-8 ²	--	Perched	712.87	16.79	3/28/2019	8.93	703.94	Yes	
					4/9/2019	--	--	--	Could not open
					6/17/2019	10.3	702.57	--	
WT-9	434012	Water Table	704.14	--	4/9/2019	--	--	--	Underwater
					6/17/2019	7.82	696.32	--	Needs new lock
WT-10	434010	Water Table	707.96	--	4/9/2019	--	--	--	Underwater
					6/17/2019	14.92	693.04	--	
WT-11B	434011	Water Table	718.31	102	3/28/2019	67.35	650.96	Yes	
					4/9/2019	60.41	657.90	--	
					6/17/2019	58.95	659.36	--	
WT-12B	434013	Water Table	712.25	--	4/9/2019	--	--	--	Could not find
					6/17/2019	44.02	668.23	--	
WT-13	462523	Water Table	712.16	86.17	3/28/2019	55.52	656.64	Yes	
					4/9/2019	52.60	659.56	--	
					6/17/2019	48.89	663.27	--	
WT-14	462522	Water Table	704.02	81.73	3/29/2019	60.02	644.00	Yes	
					4/9/2019	56.65	647.37	--	
					6/17/2019	52.46	651.56	--	
J-1	268045	Jordan	700.12	--	4/9/2019	--	--	--	Underwater
					6/17/2019	--	--	--	Underwater
J-13	462520	Jordan	712.97	207	3/28/2019	42.49	670.48	Yes	
					4/9/2019	37.42	675.55	--	
					6/17/2019	45.73	667.24	--	
J-14	462521	Jordan	703.37	187	3/29/2019	39.2	664.17	Yes	
					4/9/2019	37.4	665.97	--	
					6/17/2019	42.1	661.27	--	

TOR - Top of riser

MSL - Mean sea level

1 - TOR elevations in italics are from wells not surveyed and this elevation is estimated based on LIDAR elevations and well construction information.

2 - MP-8 was not installed as a monitoring well

3 - MDH parameters were resampled

Approximate Minnesota River Stage on April 9, 2019 = 708.3 feet MSL

Approximate Minnesota River Stage on June 17, 2019 = 699 feet MSL

Table 11

SUMMARY OF EXCEEDANCES - WATER (Phase A)

Focused Remedial Investigation Report

Freeway Landfill and Dump

Burnsville, Minnesota

Parameter	Total or Dissolved	Analysis Location	Units	Location				LANDFILL								DUMP					
				Date	Sample Type	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-07	FL-TT-08		TS-SB-02	TS-SB-05	TS-SB-07	TS-SB-08	FD-SB-A2	FD-SB-A3	FD-SB-A3	FD-SB-A4	FD-SB-A5
											4/18/2018	4/19/2018									
Drinking Water Criteria	Surface Water Criteria	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012														
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade														
General Parameters																					
Chloride	NA	Lab	mg/l			230	1720	--	--	--	--	ns	ns	ns	ns	ns	820	ns	ns		
Chlorine dioxide	NA	Lab	mg/l	0.8 (11)				--	0.83 h	0.88 h	1.5 h	--	ns	ns	ns	ns	--	ns	ns		
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	<u>5.2 (5)</u>	45 (5)	<u>22.0</u>	--	--	--	<u>16.3</u>	<u>20.5</u>	ns	ns	ns	<u>41.3</u>	ns	<u>17.3</u>		
Nitrogen, ammonia, as N	NA	Lab	mg/l			<u>0.04 (3)</u>		<u>10.6</u>	<u>5.0</u>	<u>7.8</u>	<u>4.5</u>	<u>9.7</u>	<u>11.1</u>	<u>10.6</u>	ns	ns	<u>95.2</u>	ns	<u>46.9</u>		
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			<u>0.04</u>		--	--	--	--	--	--	ns	ns	ns	<u>0.18</u>	ns	ns		
pH	NA	Lab	pH units			<u>6.5 - 9.0</u>		<u>6.3 h</u>	--	--	--	--	--	ns	ns	ns	--	ns	--		
Turbidity	NA	Lab	NTU	5 (19)		<u>25</u>		620	156	246	196	152	1460 *	965 *	ns	ns	ns	260	ns	520	
pH	NA	Field	pH units			<u>6.5 - 9.0</u>		<u>5.9</u>	<u>5.6</u>	<u>5.9</u>	<u>6.3</u>	<u>6.2</u>	<u>6.0</u>	<u>6.0</u>	ns	ns	ns	--	ns	ns	
Metals																					
Aluminum	Dissolved	Lab	ug/l			<u>125</u>	2145	--	--	--	--	358	350 *	1100 *	--	3810	92800	--	ns		
Arsenic	Dissolved	Lab	ug/l	10		<u>2.0</u>	720	<u>7.3</u>	--	<u>3.7</u>	<u>3.4</u>	--	--	--	<u>3.1</u>	<u>4.4</u>	<u>71.2</u>	<u>6.6</u>	ns		
Barium	Dissolved	Lab	ug/l	2000	2000 HRL93			--	--	--	--	--	--	--	2750	2810	--	ns	--		
Beryllium	Dissolved	Lab	ug/l	4	0.08 HRL93			--	--	--	--	--	--	--	--	<u>2.8</u>	--	ns	--		
Boron	Dissolved	Lab	ug/l		500 RAA17			536	--	1090	--	1610	--	--	582	859	889	6960	ns	33000	
Cadmium	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)	<u>2.8 HD CF</u>	268 HD CF	--	--	--	--	--	--	--	--	<u>3.8</u>	--	ns	--		
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93	<u>11 CF CR6</u>	31 CF CR6	--	--	--	--	--	--	--	<u>14.0</u>	165	--	ns	--		
Cobalt	Dissolved	Lab	ug/l			<u>2.8</u>	872	<u>3.2</u>	--	<u>3.6</u>	<u>4.5</u>	--	<u>3.2</u>	<u>2.8</u>	--	<u>4.8</u>	<u>105</u>	<u>5.0</u>	ns	--	
Copper	Dissolved	Lab	ug/l	1300 TT(12)		<u>21 HD CF</u>	114 HD CF	--	--	--	--	--	--	--	--	313	--	ns	--		
Lead	Dissolved	Lab	ug/l	15 TT(12)		<u>13 HD CF</u>	661 HD CF	--	--	--	--	--	17.5 *	--	24.3	113	--	ns	--		
Manganese	Dissolved	Lab	ug/l		100 HBV18			985	1120	1030	749	902	2290	2300	722	2440	9940	226	ns	623	
Mercury	Dissolved	Lab	ug/l	2		<u>0.0069 CF</u>	4.2 CF	--	--	--	--	--	--	--	--	<u>0.35</u>	--	ns	--		
Nickel	Dissolved	Lab	ug/l		100 HRL93	<u>296 HD CF</u>	8366 HD CF	--	--	--	--	--	--	--	--	<u>215</u>	--	ns	--		
Selenium	Dissolved	Lab	ug/l	50	30 HRL93	<u>5.0</u>	40	--	--	--	--	--	--	--	--	--	--	ns	--		
Thallium	Dissolved	Lab	ug/l	2	0.6 HRL94	<u>0.28</u>	128	--	--	--	--	--	--	--	--	<u>2.9</u>	--	ns	--		
Vanadium	Dissolved	Lab	ug/l		50 HRL94			--	--	--	--	--	--	--	--	<u>205</u>	--	ns	--		
Zinc	Dissolved	Lab	ug/l		2000 HRL94	<u>309 HD CF</u>	678 HD CF	--	--	--	--	--	--	--	--	<u>492</u>	--	ns	--		
Chromium	Total	Lab	ug/l	100	100 CR HRL93	<u>11 CR6</u>	32 CR6	58.0	--	19.5	11.6	--	64.4	38.3	ns	594	713	21.6	ns		
Semivolatile Organic Compounds																					
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)			--	--	--	--	1.2	--	ns	2.2	36	11	120	ns	37	
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		3 MP HRL94			--	--	--	--	--	--	ns	232	--	--	--	ns	ns	
Bis(2-ethylhexyl)phthalate	NA	Lab	ug/l	6	7 HRL15 (1)	<u>1.9</u>	(1)	13.8	--	--	264	--	--	ns	--	--	--	ns	ns		
Volatile Organic Compounds																					
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			--	--	--	--	--	ns	--	--	--	--	--	ns	--	
1,2-Dichloroethane	NA	Lab	ug/l	5	1 HRL13 (1)	<u>3.8</u>	90100 (1)	--	--	--	--	--	ns	--	--	--	--	--	ns	--	
Acrylamide	NA	Lab	ug/l	TT(2)	0.2 HRL15 (1)			--	--	--	--	--	ns	ns	ns	ns	ns	ns	ns	ns	
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	<u>6.0</u>	8974 (1)	<u>4.5</u>	--	--	--	--	--	ns	--	--	<u>3.0</u>	--	9.8	ns	
Chlorobenzene	NA	Lab	ug/l	100	100 HRL93	<u>20</u>	846	--	--	--	--	--	ns	--	--	--	--	--	ns	--	
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	<u>68</u>	3717	--	--	--	--	--	ns	--	--	--	--	--	ns	--	
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			--	--	--	--	--	ns	--	--	--	--	--	ns	--	
Toluene	NA	Lab	ug/l	1000	200 HRL11	<u>253</u>	2703	--	--	--	--	--	ns	--	--	--	--	--	ns	--	
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	0.4 HRL15 (1)	<u>25</u>	13976	--	--	--	--	--	ns	--	--	--	--	--	ns	--	
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	<u>0.18</u>	(1)	--	--	--	--	--	ns	--	--	--	--	<u>0.68</u>	--	ns	
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			--	--	--	--	--	ns	--	--	--	--	--	ns	--	
Xylene, o	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			--	--	--	--	--	ns	--	--	--	--	--	ns	--	
Polychlorinated Biphenyls																					
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	0.04 HRL94			31.5 a	2.18 a	1.47 a	3.99 a	--	1.1	1.6	ns	ns	ns	--	ns	ns	
Radiochemical Parameters																					
Gross Alpha (radiation)	NA	Lab	pCi/l	15				--	--	--	--	--	ns	ns	ns	ns	ns	--	ns	ns	
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				--	--	--	--	--	ns	ns	ns	ns	ns	98.0 +/- 19.5	ns	ns	
Per- and Polyfluoroalkyl Substances																					
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		0.047 HBV19			--	--	--	--	--	ns	--	0.085	0.12	1.9	ns	0.15	ns	
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		0.015 HBV19			0.051	0.022 j	0.14	0.12	0.048	0.14	ns	0.042	0.30	0.50	0.33	ns	0.48	
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		0.035 HRL18 (1)			0.12	0.041	0.22	0.15	0.27	0.21	ns	0.084	0.35	0.24	1.6	ns	1.5	

Table 11

SUMMARY OF EXCEEDANCES - WATER (Phase A)

Focused Remedial Investigation Report

Freeway Landfill and Dump

Burnsville, Minnesota

								DUMP										
				Location	FD-SB-B3	FD-SB-B4	FD-SB-B4	FD-SB-B4	FD-SB-B5	FD-SB-D4	FD-SB-D5	FD-SB-D5		FD-SB-E5	FD-TT-06	FD-TT-10		
				Date	3/28/2018	3/23/2018	3/26/2018	3/29/2018	3/21/2018	3/23/2018	3/21/2018	3/29/2018		3/22/2018	4/12/2018	4/17/2018		
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N		
				Drinking Water Criteria	Surface Water Criteria													
Parameter	Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness											
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012											
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade											
General Parameters																		
Chloride	NA	Lab	mg/l			230	1720	--	ns	ns	ns	ns	ns	--	--	--		
Chlorine dioxide	NA	Lab	mg/l	0.8 (11)				--	ns	ns	ns	ns	ns	1.1 h	0.81 h	--		
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	<u>5.2 (5)</u>	45 (5)	<u>26.8</u>	ns	<u>11.0</u>	ns	<u>12.4</u>	<u>26.0</u>	<u>20.6</u>	ns	ns		
Nitrogen, ammonia, as N	NA	Lab	mg/l			<u>0.04 (3)</u>		<u>32.8 *</u>	<u>32.4</u>	ns	ns	<u>8.1</u>	<u>99.2</u>	<u>15.5</u>	ns	ns		
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			<u>0.04</u>		<u>0.052</u>	ns	ns	ns	<u>0.15</u>	ns	ns	ns	ns		
pH	NA	Lab	pH units			<u>6.5 - 9.0</u>		--	--	ns	ns	--	--	ns	ns	--		
Turbidity	NA	Lab	NTU	5 (19)		<u>25</u>		416	18400	ns	ns	200	309	302	ns	ns		
pH	NA	Field	pH units			<u>6.5 - 9.0</u>		--	ns	ns	ns	--	ns	ns	ns	ns		
Metals																		
Aluminum	Dissolved	Lab	ug/l			<u>125</u>	2145	--	--	ns	ns	--	--	ns	ns	--		
Arsenic	Dissolved	Lab	ug/l	10		<u>2.0</u>	720	--	3.5	ns	ns	--	8.1	7.8	ns	ns		
Barium	Dissolved	Lab	ug/l	2000	2000 HRL93			--	--	ns	ns	--	--	ns	ns	--		
Beryllium	Dissolved	Lab	ug/l	4	0.08 HRL93			--	--	ns	ns	--	--	ns	ns	--		
Boron	Dissolved	Lab	ug/l		500 RAA17			51900	15200	ns	ns	10700	19500	15600	ns	ns		
Cadmium	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)	<u>2.8 HD CF</u>	268 HD CF	--	--	ns	ns	--	--	ns	ns	--		
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93	<u>11 CF CR6</u>	31 CF CR6	--	--	ns	ns	--	<u>14.2</u>	ns	ns	--		
Cobalt	Dissolved	Lab	ug/l			<u>2.8</u>	872	<u>3.8</u>	--	ns	ns	--	--	ns	ns	--		
Copper	Dissolved	Lab	ug/l	1300 TT(12)		<u>21 HD CF</u>	114 HD CF	--	--	ns	ns	--	--	ns	ns	--		
Lead	Dissolved	Lab	ug/l	15 TT(12)		<u>13 HD CF</u>	661 HD CF	--	--	ns	ns	--	64.8	ns	ns	--		
Manganese	Dissolved	Lab	ug/l		100 HBV18			--	1300	ns	ns	361	351	801	ns	ns		
Mercury	Dissolved	Lab	ug/l	2		<u>0.0069 CF</u>	4.2 CF	--	--	ns	ns	--	--	ns	ns	--		
Nickel	Dissolved	Lab	ug/l		100 HRL93	<u>296 HD CF</u>	8366 HD CF	--	--	ns	ns	--	--	ns	ns	--		
Selenium	Dissolved	Lab	ug/l	50	30 HRL93	<u>5.0</u>	40	--	--	ns	ns	--	--	ns	ns	--		
Thallium	Dissolved	Lab	ug/l	2	0.6 HRL94	<u>0.28</u>	128	--	--	ns	ns	--	--	ns	ns	--		
Vanadium	Dissolved	Lab	ug/l		50 HRL94			--	--	ns	ns	--	--	ns	ns	--		
Zinc	Dissolved	Lab	ug/l		2000 HRL94	<u>309 HD CF</u>	678 HD CF	--	--	ns	ns	--	--	ns	ns	--		
Chromium	Total	Lab	ug/l	100	100 CR HRL93	<u>11 CR6</u>	32 CR6	--	<u>20.0</u>	ns	ns	ns	--	ns	ns	ns		
Semivolatile Organic Compounds																		
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)			79	87	ns	ns	10	22	11	ns	ns		
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		3 MP HRL94			--	ns	--	--	--	--	--	ns	ns		
Bis(2-ethylhexyl)phthalate	NA	Lab	ug/l	6	7 HRL15 (1)	<u>1.9</u>	(1)	--	ns	--	--	--	--	ns	ns	--		
Volatile Organic Compounds																		
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			36	--	ns	ns	--	--	--	ns	ns		
1,2-Dichloroethane	NA	Lab	ug/l	5	1 HRL13 (1)	<u>3.8</u>	90100 (1)	<u>12</u>	--	ns	ns	--	--	--	ns	ns		
Acrylamide	NA	Lab	ug/l	TT(2)	0.2 HRL15 (1)			--	ns	ns	ns	ns	ns	ns	841	--		
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	<u>6.0</u>	8974 (1)	<u>30</u>	<u>7.6</u>	ns	ns	--	<u>10</u>	--	ns	ns		
Chlorobenzene	NA	Lab	ug/l	100	100 HRL93	<u>20</u>	846	<u>20</u>	--	ns	ns	--	--	ns	ns	--		
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	<u>68</u>	3717	<u>1000</u>	--	ns	ns	--	--	ns	ns	--		
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			<u>4600</u>	--	ns	ns	--	--	ns	ns	--		
Toluene	NA	Lab	ug/l	1000	200 HRL11	<u>253</u>	2703	<u>1100</u>	--	ns	ns	--	--	ns	ns	--		
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	0.4 HRL15 (1)	<u>25</u>	13976	--	--	ns	ns	--	--	ns	ns	--		
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	<u>0.18</u>	(1)	<u>0.45</u>	--	ns	ns	--	--	ns	ns	--		
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			3300	--	ns	ns	--	--	ns	ns	--		
Xylene, o	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			870	--	ns	ns	--	--	ns	ns	--		
Polychlorinated Biphenyls																		
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	0.04 HRL94			0.31	ns	ns	ns	--	--	ns	ns	--		
Radiochemical Parameters																		
Gross Alpha (radiation)	NA	Lab	pCi/l	15				--	ns	ns	ns	ns	ns	--	--	--		
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				98.4 +/- 18.0	ns	ns	ns	ns	ns	--	57.2 +/- 10.7	--		
Per- and Polyfluoroalkyl Substances																		
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		0.047 HBV19			0.27	0.050	ns	ns	0.048	0.14	0.084	ns	ns		
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		0.015 HBV19			4.1	0.13	ns	ns	--	0.63	0.28	ns	ns		
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		0.035 HRL18 (1)			7.3	1.4	ns	ns	1.0	3.9	25	ns	ns		

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Did not exceed criteria.
ns	Not tested for analyte
N	Sample Type: Normal
FD	Sample Type: Field Duplicate
FR	Sample Type: Field Replicate
NA	NA (not applicable) indicates that a fractional portion of the sample is not part of the analytical testing or field collection procedures.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
a	Estimated value, calculated using some or all values that are estimates.
b	Potential false positive value based on blank data validation procedures. Concentrations identified as potential false positive are excluded from calculations.
h	EPA recommended sample preservation, extraction or analysis holding time was exceeded.
j	Estimated detected value. The reported value is less than the stated laboratory quantitation limit but greater than the laboratory method detection limit.

EPA Maximum Contaminant Levels

(1)	1998 Final Rule for Disinfectants and Disinfection By-products: The total for trihalomethanes (THM) is 0.08 mg/l.
(5)	The value for m-dichlorobenzene are based on data for o-dichlorobenzene.
(7)	1,2-dibromoethane.
(9)	Under review.
(14)	Based on the criteria for chromium, total.
(15)	Based on the criteria for xylenes, total.
(19)	At no time can turbidity go above 5 NTU.
TT(12)	Copper action level 1.3 mg/l; lead action level 0.015 mg/l.
(+)	This MCL is no longer an official regulatory level, but is still in use as a trigger for EPA. The actual MCL for Beta is 4 mrem/year but there is no simple conversion between a curie and a rem.

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.
(2)	Representing the criteria for cyanide, free.
CR	Value represents the criteria for Chromium, hexavalent.
DCP	Value shown is 1,3-dichloropropene in the MDH criterion, however, the laboratory reports cis and trans isomers individually.
HBV13	Health Based Value 2013.
HBV14	Health Based Value 2014.
HBV17	Health Based Value 2017.
HBV18	Health Based Value 2018.
HBV19	Health Based Value 2019.
HRL09	Health Risk Limit 2009.
HRL11	Health Risk Limit 2011.
HRL13	Health Risk Limit 2013.
HRL15	Health Risk Limit 2015.
HRL15	Health Risk Limit 2015.
HRL18	Health Risk Limit 2018.
HRL93	Health Risk Limit 1993.
HRL94	Health Risk Limit 1994.
HRLMCL	Health Risk Limit., Maximum Contaminant Level.
MP	Laboratory reports 3-methylphenol and 4-methylphenol as co-eluting compounds. The criteria in the table represents 4-methylphenol which is the more stringent criteria.
RAA09	Not Detected., Risk Assessment Advice 2009.
RAA10	Risk Assessment Advice 2010.
RAA13	Risk Assessment Advice 2013.
RAA16	Risk Assessment Advice 2016.
RAA17	Risk Assessment Advice 2008.
RAA19	Risk Assessment Advice 2019.
XYL	Value shown is for the sum of the mixed o,m and p Xylene isomers.

Data Footnotes and Qualifiers

Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness*

(3)	Value represents the criteria for Ammonia, unionized as N.
(5)	Value based on the criteria for cyanide, free.
(6)	5.0 mg/l as a daily minimum. This dissolved oxygen standard may be modified on a site-specific basis according to part 7050.0220, subpart 7, except that no site-specific standard shall be less than 5 mg/l as a daily average and 4 mg/l as a daily minimum. Compliance with this standard is required 50 percent of the days at which the flow of the receiving water is equal to the 7Q10.
(7)	5 degree F above natural in streams and 3 degrees above natural in lakes, based on monthly average of the maximum daily temperatures, except in no case shall it exceed the daily average temperature of 86 degrees F.
(8)	pH Dependent. Based on a pH value of 7.0.
CF	Conversion Factor.
CR6	Value represents the criteria for Hexavalent Chromium.
HD	Hardness Dependent.

* Estimated concentrations based on same underlying assumptions of conservative transport mechanisms and same source area. Minnesota River hardness data from MPCA, 2006. Working Draft, Surface Water Pathway Evaluation user's Guide, Appendix E.

Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness*

(1)	Subpart 7, item E applies.
(5)	Value based on the criteria for cyanide, free.
(8)	pH Dependent. Based on a pH value of 7.0.
CF	Conversion Factor.
CR6	Value represents the criteria for Hexavalent Chromium.
HD	Hardness Dependent.

* Estimated concentrations based on same underlying assumptions of conservative transport mechanisms and same source area. Minnesota River hardness data from MPCA, 2006. Working Draft, Surface Water Pathway Evaluation user's Guide, Appendix E.

Table 12

SUMMARY OF EXCEEDANCES - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								LANDFILL									
								Perched									
								Location	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MP-8
								MN Unique ID#	813761	813763	813764	813765	813766	813767	813768	834659	240818
Date	4/01/2019	5/22/2019	4/01/2019	3/27/2019	3/27/2019	3/27/2019	3/27/2019	6/03/2019	3/28/2019								
Sample Type	N	N	N	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria											
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
General Parameters																	
Chloride	NA	Lab	mg/l			230	1720	1240	2440	1070	1040	--	--	--	ns	--	
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	5.2 (5)	45 (5)	--	ns	--	--	--	29.2	ns	--	--	
Cyanide, free	NA	Lab	ug/l	200	100 HRL93	5.2	45	--	ns	--	--	--	--	ns	--	--	
Nitrogen, ammonia, as N	NA	Lab	mg/l			0.04 (3)		621	ns	--	296	12.7	30.8	31.4	ns	0.47	
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			0.04		0.062	ns	--	0.51	--	--	--	ns	--	
pH	NA	Field	pH units			6.5 - 9.0		5.7	ns	--	--	6.4	6.4	6.3	ns	6.2	
Turbidity	NA	Field	NTU	5 (19)		25		440	ns	107	57.5	91.0	7.5	--	ns	7.3	
Metals																	
Aluminum	Dissolved	Lab	ug/l			125	2145	2050	--	--	--	--	--	--	ns	--	
Antimony	Dissolved	Lab	ug/l	6	6 HRL93	5.5	180	15.8	13.9	--	--	--	--	--	ns	--	
Arsenic	Dissolved	Lab	ug/l	10		2.0	720	11.4	--	3.8	5.0	9.6	3.9	--	ns	--	
Barium	Dissolved	Lab	ug/l	2000	2000 HRL93			--	--	--	--	--	--	--	ns	--	
Beryllium	Dissolved	Lab	ug/l	4	0.08 HRL93			--	--	--	--	--	--	--	ns	--	
Boron	Dissolved	Lab	ug/l		500 RAA17			14800	12800	2820	2260	1200	5040	2590	ns	--	
Cadmium	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)	2.8 HD CF	268 HD CF	5.4	--	--	--	--	--	--	ns	--	
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93	11 CF CR6	31 CF CR6	74.6	88.9	--	--	--	--	--	ns	--	
Cobalt	Dissolved	Lab	ug/l			2.8	872	347	308	42.6	11.8	4.5	--	--	ns	--	
Lead	Dissolved	Lab	ug/l	15 TT(12)		13 HD CF	661 HD CF	33.9	--	--	--	--	--	--	ns	--	
Manganese	Dissolved	Lab	ug/l		100 HBV18			35700	--	289	318	539	220	452	ns	1530	
Nickel	Dissolved	Lab	ug/l		100 HRL93	296 HD CF	8366 HD CF	1730	--	--	--	--	--	--	ns	--	
Selenium	Dissolved	Lab	ug/l	50	30 HRL93	5.0	40	--	--	--	--	--	--	--	ns	--	
Thallium	Dissolved	Lab	ug/l	2	0.6 HRL94	0.28	128	--	--	--	--	--	--	--	ns	--	
Uranium	Dissolved	Lab	ug/l	30				--	--	--	--	--	--	--	ns	--	
Zinc	Dissolved	Lab	ug/l		2000 HRL94	309 HD CF	678 HD CF	64300	--	--	--	--	--	--	ns	--	
Aluminum	Total	Lab	ug/l			125	2145	ns	ns	ns	ns	ns	ns	ns	ns	ns	
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	0.1 HRL93	0.011	0.032	0.12	0.28	--	--	--	0.023	0.022	ns	0.14	
Manganese	Total	Lab	ug/l		100 HBV18			ns	ns	ns	ns	ns	ns	ns	ns	ns	
Selenium	Total	Lab	ug/l	50	30 HRL93	5.0	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	
Thallium	Total	Lab	ug/l	2	0.6 HRL94	0.28	128	ns	ns	ns	ns	ns	ns	ns	ns	ns	
Semivolatile Organic Compounds																	
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)			ns	220	98	110	8.3	15	4.2	2.1	--	
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		3 MP HRL94			--	7670	--	--	--	--	--	ns	--	
Phenol	NA	Lab	ug/l		4000 HRL93	123	4428	--	2330	--	--	--	--	--	ns	--	

Table 12

SUMMARY OF EXCEEDANCES - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								LANDFILL									
								Perched									
								Location	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MP-8
								MN Unique ID#	813761	813763	813764	813765	813766	813767	813768	834659	240818
Date	4/01/2019	5/22/2019	4/01/2019	3/27/2019	3/27/2019	3/27/2019	3/27/2019	6/03/2019	3/28/2019								
Sample Type	N	N	N	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria											
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2012		01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
Volatile Organic Compounds																	
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			72	--	--	--	--	--	--	--	--	
1,2-Dichloroethylene, cis	NA	Lab	ug/l	70	6 HRL18 (1)			440	--	--	--	--	--	--	--	--	
1,2-Dichloropropane	NA	Lab	ug/l	5	5 HRL94			13	--	--	--	--	--	--	--	--	
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94			16	--	--	--	--	--	--	--	--	
Acetone	NA	Lab	ug/l		3000 HBV17 (1)			8600	11000	--	--	--	--	--	--	--	
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	6.0	8974 (1)	16	5.6	2.8	4.0	--	8.1	6.7	11	--	
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	68	3717	120	--	--	--	--	--	--	--	--	
Methyl ethyl ketone (2-butanone)	NA	Lab	ug/l		4000 HRL94			14000	15000	--	--	--	--	--	--	--	
Methyl isobutyl ketone (MIBK)	NA	Lab	ug/l		300 HRL94			1400	630	--	--	--	--	--	--	--	
Methylene chloride	NA	Lab	ug/l	5	5 HRLMCL	46	27749 (1)	39	--	--	--	--	--	--	--	--	
Naphthalene	NA	Lab	ug/l		70 HRL13	81	818	--	--	--	--	--	--	--	93	--	
Tetrachloroethylene	NA	Lab	ug/l	5 (9)	4 HBV14 (1)	3.8	857	100	--	--	--	--	--	--	--	--	
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			--	680	--	--	--	--	--	--	--	
Toluene	NA	Lab	ug/l	1000	200 HRL11	253	2703	610	--	--	--	--	--	--	--	--	
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	0.4 HRL15 (1)	25	13976	150	--	--	--	--	--	--	--	--	
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	0.18	(1)	32	4.0	--	--	--	--	--	--	--	
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			300	--	--	--	--	--	--	--	--	
Xylene, total	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)	166	2814	410	--	--	--	--	--	--	--	--	
Polychlorinated Biphenyls																	
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	0.04 HRL94			--	--	--	--	0.10	--	ns	--	--	
Radiochemical Parameters																	
Gross Alpha (radiation)	NA	Lab	pCi/l	15				--	ns	--	--	--	--	ns	--	--	
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				365 +/- 96.8	ns	143 +/- 27.6	238 +/- 49.6	--	--	--	ns	--	
Per- and Polyfluoroalkyl Substances																	
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l		7 HRL18 (1)			--	--	--	7.4	--	--	--	--	--	
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		0.047 HBV19			0.26	0.055	0.27 h	0.29	--	--	--	0.11	--	
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		0.015 HBV19			0.48	0.015 j	0.21 h	0.092	0.045	0.13	0.17	0.10	--	
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		0.035 HRL18 (1)			0.53	0.87	0.77 h	0.41	0.19	0.57	2.6	0.30	--	

Table 12

SUMMARY OF EXCEEDANCES - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group				LANDFILL													
				Water Table													
				Location	MW-4D	MW-8D		MW-9D	MW-9D	MW-10D	MW-10D	MW-11	MW-12	MW-13	WT-6		
				MN Unique ID#	813740	813741		837777	837777	837776	837776	834655	834656	834657	240816		
Date	4/01/2019	3/27/2019		4/10/2019	6/03/2019	4/10/2019	6/03/2019	5/28/2019	5/28/2019	5/28/2019	4/01/2019						
Sample Type	N	N	FR	N	N	N	N	N	N	N	N						
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria											
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
General Parameters																	
Chloride	NA	Lab	mg/l			230	1720	501	--	--	240 *	ns	--	ns	--	--	240
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	5.2 (5)	45 (5)	--	--	--	ns	ns	--	ns	21.0	--	21.9
Cyanide, free	NA	Lab	ug/l	200	100 HRL93	5.2	45	--	--	--	ns	ns	--	ns	--	--	--
Nitrogen, ammonia, as N	NA	Lab	mg/l			0.04 (3)		84.9	9.4	9.6	29.9	ns	11.9	ns	10.6	3.7	1.5
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			0.04		0.15	--	ns	0.091	ns	--	ns	--	--	--
pH	NA	Field	pH units			6.5 - 9.0		--	6.5	ns	--	--	--	6.4	--	6.0	--
Turbidity	NA	Field	NTU	5 (19)		25		47.3	31.8	ns	--	--	14.2	17.6	9.8	--	--
Metals																	
Aluminum	Dissolved	Lab	ug/l			125	2145	--	--	--	--	ns	--	ns	--	--	--
Antimony	Dissolved	Lab	ug/l	6	6 HRL93	5.5	180	--	--	--	--	ns	--	ns	--	--	--
Arsenic	Dissolved	Lab	ug/l	10		2.0	720	10.9	16.1	15.7	7.5	ns	4.2	ns	2.2	--	3.0
Barium	Dissolved	Lab	ug/l	2000	2000 HRL93			--	2620	2610	--	ns	--	ns	--	--	--
Beryllium	Dissolved	Lab	ug/l	4	0.08 HRL93			--	--	--	--	ns	--	ns	--	--	--
Boron	Dissolved	Lab	ug/l		500 RAA17			1220	5460	5300	1260	ns	567	ns	--	1760	--
Cadmium	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)	2.8 HD CF	268 HD CF	--	--	--	--	ns	--	ns	--	--	--
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93	11 CF CR6	31 CF CR6	--	--	--	--	ns	--	ns	--	--	--
Cobalt	Dissolved	Lab	ug/l			2.8	872	10.9	8.6	8.7	6.9	ns	38.9	ns	3.0	--	4.4
Lead	Dissolved	Lab	ug/l	15 TT(12)		13 HD CF	661 HD CF	--	--	--	--	ns	--	ns	--	--	--
Manganese	Dissolved	Lab	ug/l		100 HBV18			101	--	--	208	ns	1190	ns	1430	4020	556
Nickel	Dissolved	Lab	ug/l		100 HRL93	296 HD CF	8366 HD CF	--	--	--	--	ns	--	ns	--	--	--
Selenium	Dissolved	Lab	ug/l	50	30 HRL93	5.0	40	--	--	--	--	ns	--	ns	--	--	--
Thallium	Dissolved	Lab	ug/l	2	0.6 HRL94	0.28	128	--	0.31	0.57	--	ns	1.3	ns	--	--	--
Uranium	Dissolved	Lab	ug/l	30				--	--	--	--	ns	--	ns	--	--	--
Zinc	Dissolved	Lab	ug/l		2000 HRL94	309 HD CF	678 HD CF	--	--	--	--	ns	--	ns	--	--	--
Aluminum	Total	Lab	ug/l			125	2145	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	0.1 HRL93	0.011	0.032	--	--	0.012	--	ns	--	ns	0.025	0.025	0.016
Manganese	Total	Lab	ug/l		100 HBV18			ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Selenium	Total	Lab	ug/l	50	30 HRL93	5.0	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Thallium	Total	Lab	ug/l	2	0.6 HRL94	0.28	128	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
Semivolatile Organic Compounds																	
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)			40	26	24	ns	35	ns	27	--	--	1.2
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		3 MP HRL94			--	--	--	--	ns	--	ns	--	--	--
Phenol	NA	Lab	ug/l		4000 HRL93	123	4428	--	--	--	--	ns	--	ns	--	--	--

Table 12

SUMMARY OF EXCEEDANCES - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group				LANDFILL													
				Water Table													
				Location	MW-4D	MW-8D		MW-9D	MW-9D	MW-10D	MW-10D	MW-11	MW-12	MW-13	WT-6		
				MN Unique ID#	813740	813741		837777	837777	837776	837776	834655	834656	834657	240816		
Date	4/01/2019	3/27/2019		4/10/2019	6/03/2019	4/10/2019	6/03/2019	5/28/2019	5/28/2019	5/28/2019	4/01/2019						
Sample Type	N	N	FR	N	N	N	N	N	N	N	N						
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria											
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2012	01/24/2012	01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
Volatile Organic Compounds																	
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			--	--	--	ns	--	ns	--	--	--	--
1,2-Dichloroethylene, cis	NA	Lab	ug/l	70	6 HRL18 (1)			--	--	--	ns	--	ns	--	--	--	--
1,2-Dichloropropane	NA	Lab	ug/l	5	5 HRL94			--	--	--	ns	--	ns	--	--	--	--
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94			--	--	--	ns	--	ns	--	--	--	--
Acetone	NA	Lab	ug/l		3000 HBV17 (1)			--	--	--	ns	--	ns	--	--	--	--
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	<u>6.0</u>	8974 (1)	--	--	--	ns	--	ns	--	--	--	--
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	<u>68</u>	3717	--	--	--	ns	--	ns	--	--	--	--
Methyl ethyl ketone (2-butanone)	NA	Lab	ug/l		4000 HRL94			--	--	--	ns	--	ns	--	--	--	--
Methyl isobutyl ketone (MIBK)	NA	Lab	ug/l		300 HRL94			--	--	--	ns	--	ns	--	--	--	--
Methylene chloride	NA	Lab	ug/l	5	5 HRLMCL	46	27749 (1)	--	--	--	ns	--	ns	--	--	--	--
Naphthalene	NA	Lab	ug/l		70 HRL13	<u>81</u>	818	--	--	--	ns	--	ns	--	--	--	--
Tetrachloroethylene	NA	Lab	ug/l	5 (9)	4 HBV14 (1)	<u>3.8</u>	857	--	--	--	ns	--	ns	--	--	--	--
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			--	--	--	ns	--	ns	--	--	--	--
Toluene	NA	Lab	ug/l	1000	200 HRL11	<u>253</u>	2703	--	--	--	ns	--	ns	--	--	--	--
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	0.4 HRL15 (1)	<u>25</u>	13976	--	--	--	ns	--	ns	--	--	--	--
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	<u>0.18</u>	(1)	--	5.1	5.2	ns	--	ns	--	--	--	--
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			--	--	--	ns	--	ns	--	--	--	--
Xylene, total	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)	<u>166</u>	2814	--	--	--	ns	--	ns	--	--	--	--
Polychlorinated Biphenyls																	
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	0.04 HRL94			--	--	--	ns	--	ns	31.3	0.67	0.25	--
Radiochemical Parameters																	
Gross Alpha (radiation)	NA	Lab	pCi/l	15				16.6 +/- 6.48	20.9 +/- 6.20	20.4 +/- 6.59	--	ns	--	ns	--	--	--
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				59.6 +/- 12.1	--	--	--	ns	--	ns	--	--	--
Per- and Polyfluoroalkyl Substances																	
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l		7 HRL18 (1)			--	--	--	ns	--	ns	--	--	--	--
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		0.047 HBV19			0.087	--	--	ns	0.063	ns	--	--	--	--
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		0.015 HBV19			0.063	0.082	0.083	ns	0.13	ns	0.073	0.078	0.056	0.10
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		0.035 HRL18 (1)			0.20	0.39	0.36	ns	0.32	ns	0.58	0.14	0.10	0.052

Table 12

SUMMARY OF EXCEEDANCES - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group				LANDFILL								DUMP					
				Water Table				Jordan				Perched					
				Location	WT-11B	WT-13	WT-14	J-13	J-14		MW-19-01	MW-19-02	MW-19-03	MW-19-04			
				MN Unique ID#	434011	462523	462522	462520	462521		834660	834662	834663	834661			
Date	3/28/2019	3/28/2019	3/29/2019	3/28/2019	3/29/2019		4/03/2019	4/03/2019	4/03/2019	4/03/2019							
Sample Type	N	N	N	N	N	FR	N	N	N	N							
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria											
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
General Parameters																	
Chloride	NA	Lab	mg/l			230	1720	--	--	--	--	--	--	--	--	--	
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	<u>5.2 (5)</u>	45 (5)	--	--	--	--	--	--	<u>23.2</u>	<u>44.8</u>	--	
Cyanide, free	NA	Lab	ug/l	200	100 HRL93	<u>5.2</u>	45	--	--	--	--	ns	--	--	--	--	
Nitrogen, ammonia, as N	NA	Lab	mg/l			<u>0.04 (3)</u>		<u>7.9</u>	<u>6.3</u>	<u>0.50</u>	<u>0.21</u>	<u>0.30</u>	<u>0.29</u>	<u>0.40</u>	<u>7.2</u>	<u>18.7</u>	<u>20.2</u>
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			<u>0.04</u>		--	--	--	--	ns	--	--	--	--	
pH	NA	Field	pH units			<u>6.5 - 9.0</u>		--	--	--	--	ns	--	--	--	--	
Turbidity	NA	Field	NTU	5 (19)		<u>25</u>		10.5	5.2	--	6.0	--	ns	114	--	14	9.9
Metals																	
Aluminum	Dissolved	Lab	ug/l			<u>125</u>	2145	--	--	--	--	--	--	--	--	--	
Antimony	Dissolved	Lab	ug/l	6	<i>6 HRL93</i>	<u>5.5</u>	180	--	--	--	--	--	--	--	--	--	
Arsenic	Dissolved	Lab	ug/l	10		<u>2.0</u>	720	<u>4.7</u>	<u>4.2</u>	--	--	--	--	<u>6.3</u>	--	--	
Barium	Dissolved	Lab	ug/l	2000	<i>2000 HRL93</i>			--	--	--	--	--	--	--	--	--	
Beryllium	Dissolved	Lab	ug/l	4	<i>0.08 HRL93</i>			--	--	--	--	--	--	--	--	--	
Boron	Dissolved	Lab	ug/l		<i>500 RAA17</i>			--	<u>671</u>	--	--	--	--	<u>18700</u>	<u>20600</u>	<u>38400</u>	<u>9800</u>
Cadmium	Dissolved	Lab	ug/l	5	<i>0.5 HRL15 (1)</i>	<u>2.8 HD CF</u>	268 HD CF	--	--	--	--	--	--	--	--	--	
Chromium	Dissolved	Lab	ug/l	100	<i>100 CR HRL93</i>	<u>11 CF CR6</u>	31 CF CR6	--	--	--	--	--	--	--	--	--	
Cobalt	Dissolved	Lab	ug/l			<u>2.8</u>	872	<u>6.0</u>	<u>6.4</u>	--	--	--	--	--	--	--	
Lead	Dissolved	Lab	ug/l	15 TT(12)		<u>13 HD CF</u>	661 HD CF	--	--	--	--	--	--	--	--	--	
Manganese	Dissolved	Lab	ug/l		<i>100 HBV18</i>			<u>390</u>	<u>994</u>	--	--	--	--	<u>604</u>	<u>433</u>	<u>478</u>	<u>414</u>
Nickel	Dissolved	Lab	ug/l		<i>100 HRL93</i>	<u>296 HD CF</u>	8366 HD CF	--	--	--	--	--	--	--	--	--	
Selenium	Dissolved	Lab	ug/l	50	<i>30 HRL93</i>	<u>5.0</u>	40	--	--	--	--	--	<u>19.0</u>	<u>7.0</u>	--	--	
Thallium	Dissolved	Lab	ug/l	2	<i>0.6 HRL94</i>	<u>0.28</u>	128	--	<u>0.77</u>	--	--	--	--	--	--	--	
Uranium	Dissolved	Lab	ug/l	30				--	--	--	--	--	--	--	--	--	
Zinc	Dissolved	Lab	ug/l		<i>2000 HRL94</i>	<u>309 HD CF</u>	678 HD CF	--	--	--	--	--	--	--	--	--	
Aluminum	Total	Lab	ug/l			<u>125</u>	2145	ns	ns	ns	ns	ns	ns	ns	ns	ns	
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	<i>0.1 HRL93</i>	<u>0.011</u>	0.032	--	--	--	--	--	--	--	<u>0.012</u>	--	
Manganese	Total	Lab	ug/l		<i>100 HBV18</i>			ns	ns	ns	ns	ns	ns	ns	ns	ns	
Selenium	Total	Lab	ug/l	50	<i>30 HRL93</i>	<u>5.0</u>	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	
Thallium	Total	Lab	ug/l	2	<i>0.6 HRL94</i>	<u>0.28</u>	128	ns	ns	ns	ns	ns	ns	ns	ns	ns	
Semivolatile Organic Compounds																	
1,4-Dioxane	NA	Lab	ug/l		<i>1 HRL13 (1)</i>			<u>9.9</u>	<u>6.2</u>	<u>3.8</u>	--	<u>3.3</u>	<u>3.2</u>	--	<u>3.4</u>	<u>13</u>	<u>7.1</u>
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		<i>3 MP HRL94</i>			--	--	--	--	--	--	--	--	--	
Phenol	NA	Lab	ug/l		<i>4000 HRL93</i>	<u>123</u>	4428	--	--	--	--	--	--	--	--	--	

Table 12

SUMMARY OF EXCEEDANCES - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group				LANDFILL								DUMP				
				Water Table				Jordan				Perched				
				Location	WT-11B	WT-13	WT-14	J-13	J-14		MW-19-01	MW-19-02	MW-19-03	MW-19-04		
				MN Unique ID#	434011	462523	462522	462520	462521		834660	834662	834663	834661		
Date	3/28/2019	3/28/2019	3/29/2019	3/28/2019	3/29/2019		4/03/2019	4/03/2019	4/03/2019	4/03/2019						
Sample Type	N	N	N	N	N	FR	N	N	N	N						
				Drinking Water Criteria		Surface Water Criteria										
Parameter	Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness									
Effective Date				04/01/2012	08/05/2012		01/24/2012									
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade									
Volatile Organic Compounds																
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			--	--	--	--	--	--	--	--	--
1,2-Dichloroethylene, cis	NA	Lab	ug/l	70	6 HRL18 (1)			--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	NA	Lab	ug/l	5	5 HRL94			--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94			--	--	--	--	--	--	--	--	--
Acetone	NA	Lab	ug/l		3000 HBV17 (1)			--	--	--	--	--	--	--	--	--
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	6.0	8974 (1)	--	--	--	--	--	--	--	7.1	4.2
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	68	3717	--	--	--	--	--	--	--	--	--
Methyl ethyl ketone (2-butanone)	NA	Lab	ug/l		4000 HRL94			--	--	--	--	--	--	--	--	--
Methyl isobutyl ketone (MIBK)	NA	Lab	ug/l		300 HRL94			--	--	--	--	--	--	--	--	--
Methylene chloride	NA	Lab	ug/l	5	5 HRLMCL	46	27749 (1)	--	--	--	--	--	--	--	--	--
Naphthalene	NA	Lab	ug/l		70 HRL13	81	818	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	NA	Lab	ug/l	5 (9)	4 HBV14 (1)	3.8	857	--	--	--	--	--	--	--	--	--
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			--	--	--	--	--	--	--	--	--
Toluene	NA	Lab	ug/l	1000	200 HRL11	253	2703	--	--	--	--	--	--	--	--	--
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	0.4 HRL15 (1)	25	13976	--	--	--	--	--	--	0.47	--	--
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	0.18	(1)	--	--	--	--	--	--	--	--	0.24
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			--	--	--	--	--	--	--	--	--
Xylene, total	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)	166	2814	--	--	--	--	--	--	--	--	--
Polychlorinated Biphenyls																
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	0.04 HRL94			--	--	--	--	--	--	--	--	--
Radiochemical Parameters																
Gross Alpha (radiation)	NA	Lab	pCi/l	15				--	--	17.6 +/- 4.77	21.4 +/- 6.04	--	16.3 +/- 4.95	--	--	--
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				--	--	--	--	--	58.0 +/- 10.9	57.9 +/- 10.9	--	--
Per- and Polyfluoroalkyl Substances																
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l		7 HRL18 (1)			--	--	--	--	--	--	--	--	--
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		0.047 HBV19			--	--	--	--	0.12	0.12	0.15	0.21	
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		0.015 HBV19			0.016 j	0.038	--	--	0.28	0.12	0.43	1.6	
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		0.035 HRL18 (1)			0.083	0.11	0.068	--	0.95	0.93	13	2.1	

Table 12

SUMMARY OF EXCEEDANCES - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								DUMP										
								Water Table										
								Location	0FMW-1	MW-97-1	MW-97-2		MW-97-3	MW-97-4	MW-97-5	MW-97-6	MW-97-7	MW-97-9
								MN Unique ID#	472759	603281	603282		603283	603287	603288	603289	603284	603286
Date	5/21/2019	3/26/2019	6/03/2019		5/21/2019	3/26/2019	3/26/2019	3/26/2019	5/21/2019	5/21/2019								
Sample Type	N	N	N	FR	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria												
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness											
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012											
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade											
General Parameters																		
Chloride	NA	Lab	mg/l			230	1720	--	--	--	--	--	279	272	291	--	--	
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	5.2 (5)	45 (5)	--	--	--	--	--	--	--	--	--	--	
Cyanide, free	NA	Lab	ug/l	200	100 HRL93	5.2	45	--	--	--	--	--	23	37	--	--	--	
Nitrogen, ammonia, as N	NA	Lab	mg/l			0.04 (3)		0.18	--	0.15	0.16	0.77	0.81	0.32	5.3	--	0.12	
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			0.04		--	--	--	--	0.063	--	--	--	--	--	
pH	NA	Field	pH units			6.5 - 9.0		6.2	--	--	--	--	--	6.5	--	--	--	
Turbidity	NA	Field	NTU	5 (19)		25		9.9	54.7	25.6	ns	170	19.5	52.4	ns	7.4	11.4	
Metals																		
Aluminum	Dissolved	Lab	ug/l			125	2145	--	--	--	--	--	--	--	--	--	--	
Antimony	Dissolved	Lab	ug/l	6	6 HRL93	5.5	180	--	--	--	--	--	--	--	--	--	--	
Arsenic	Dissolved	Lab	ug/l	10		2.0	720	8.8	--	--	--	2.5	2.6	--	--	--	--	
Barium	Dissolved	Lab	ug/l	2000	2000 HRL93			--	--	--	--	--	--	--	--	--	--	
Beryllium	Dissolved	Lab	ug/l	4	0.08 HRL93			--	0.24	--	--	--	--	--	--	--	--	
Boron	Dissolved	Lab	ug/l		500 RAA17			4480	30100	32700	28900	52800	526	901	13900	10500	690	
Cadmium	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)	2.8 HD CF	268 HD CF	--	--	--	--	--	--	--	--	--	--	
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93	11 CF CR6	31 CF CR6	--	--	--	--	--	--	--	--	--	--	
Cobalt	Dissolved	Lab	ug/l			2.8	872	3.0	--	3.8	3.9	--	4.8	6.3	9.6	--	--	
Lead	Dissolved	Lab	ug/l	15 TT(12)		13 HD CF	661 HD CF	--	--	--	--	--	--	--	--	--	--	
Manganese	Dissolved	Lab	ug/l		100 HBV18			1020	--	667	672	170	1150	1490	1760	--	244	
Nickel	Dissolved	Lab	ug/l		100 HRL93	296 HD CF	8366 HD CF	--	--	--	--	--	--	--	--	--	--	
Selenium	Dissolved	Lab	ug/l	50	30 HRL93	5.0	40	--	22.9	--	--	55.0	--	--	--	15.7	--	
Thallium	Dissolved	Lab	ug/l	2	0.6 HRL94	0.28	128	--	0.42	0.76	0.74	--	0.28	1.2	4.0	--	0.48	
Uranium	Dissolved	Lab	ug/l	30				--	--	--	--	46.9	--	--	--	--	--	
Zinc	Dissolved	Lab	ug/l		2000 HRL94	309 HD CF	678 HD CF	--	--	--	--	--	--	--	--	--	--	
Aluminum	Total	Lab	ug/l			125	2145	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	0.1 HRL93	0.011	0.032	--	--	--	--	--	--	--	--	--	--	
Manganese	Total	Lab	ug/l		100 HBV18			ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	
Selenium	Total	Lab	ug/l	50	30 HRL93	5.0	40	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	
Thallium	Total	Lab	ug/l	2	0.6 HRL94	0.28	128	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	
Semivolatile Organic Compounds																		
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)			--	--	--	--	--	--	--	--	--	--	
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		3 MP HRL94			--	--	--	--	--	--	--	--	--	--	
Phenol	NA	Lab	ug/l		4000 HRL93	123	4428	--	--	--	--	--	--	--	--	--	--	

Table 12

SUMMARY OF EXCEEDANCES - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								DUMP										
								Water Table										
								Location	0FMW-1	MW-97-1	MW-97-2		MW-97-3	MW-97-4	MW-97-5	MW-97-6	MW-97-7	MW-97-9
								MN Unique ID#	472759	603281	603282		603283	603287	603288	603289	603284	603286
Date	5/21/2019	3/26/2019	6/03/2019		5/21/2019	3/26/2019	3/26/2019	3/26/2019	5/21/2019	5/21/2019								
Sample Type	N	N	N	FR	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria												
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness											
Effective Date				04/01/2012	08/05/2019													
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade											
Volatile Organic Compounds																		
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			--	--	--	--	--	--	--	--	--	--	
1,2-Dichloroethylene, cis	NA	Lab	ug/l	70	6 HRL18 (1)			--	--	--	--	--	--	--	--	--	--	
1,2-Dichloropropane	NA	Lab	ug/l	5	5 HRL94			--	--	--	--	--	--	--	--	--	--	
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94			--	--	--	--	--	--	--	--	--	--	
Acetone	NA	Lab	ug/l		3000 HBV17 (1)			--	--	--	--	--	--	--	--	--	--	
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	6.0	8974 (1)	--	--	--	--	--	--	--	--	--	--	
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	<u>68</u>	3717	--	--	--	--	--	--	--	--	--	--	
Methyl ethyl ketone (2-butanone)	NA	Lab	ug/l		4000 HRL94			--	--	--	--	--	--	--	--	--	--	
Methyl isobutyl ketone (MIBK)	NA	Lab	ug/l		300 HRL94			--	--	--	--	--	--	--	--	--	--	
Methylene chloride	NA	Lab	ug/l	5	5 HRLMCL	46	27749 (1)	--	--	--	--	--	--	--	--	--	--	
Naphthalene	NA	Lab	ug/l		70 HRL13	<u>81</u>	818	--	--	--	--	--	--	--	--	--	--	
Tetrachloroethylene	NA	Lab	ug/l	5 (9)	4 HBV14 (1)	<u>3.8</u>	857	--	--	--	--	--	--	--	--	--	--	
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			--	--	--	--	--	--	--	--	--	--	
Toluene	NA	Lab	ug/l	1000	200 HRL11	<u>253</u>	2703	--	--	--	--	--	--	--	--	--	--	
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	0.4 HRL15 (1)	<u>25</u>	13976	--	--	--	--	--	--	--	--	--	--	
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	<u>0.18</u>	(1)	--	--	--	--	--	--	--	--	--	--	
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			--	--	--	--	--	--	--	--	--	--	
Xylene, total	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)	<u>166</u>	2814	--	--	--	--	--	--	--	--	--	--	
Polychlorinated Biphenyls																		
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	0.04 HRL94			--	--	--	--	--	--	--	--	--	--	
Radiochemical Parameters																		
Gross Alpha (radiation)	NA	Lab	pCi/l	15				--	--	16.8 +/- 5.79	17.0 +/- 5.59	42.8 +/- 16.8	--	16.1 +/- 4.62	--	--	--	
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				--	--	--	--	--	--	--	--	--	--	
Per- and Polyfluoroalkyl Substances																		
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l		7 HRL18 (1)			--	--	--	--	--	--	--	--	--	--	
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		0.047 HBV19			--	--	--	--	--	--	--	--	--	--	
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		0.015 HBV19			--	0.015 j	--	--	--	0.019 j	0.20	0.037	0.037		
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		0.035 HRL18 (1)			0.11	--	--	--	--	--	1.0	0.069	0.077		

Table 12

SUMMARY OF EXCEEDANCES - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

								KRAEMER QUARRY		
Monitoring Well Group										
Location								SEEP 01		
MN Unique ID#								DISCHARGE 01		
Date								5/29/2019		
Sample Type								5/29/2019		
				Drinking Water Criteria		Surface Water Criteria		N	N	FR
Parameter	Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness			
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012			
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade			
General Parameters										
Chloride	NA	Lab	mg/l			230	1720	--	--	--
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	<u>5.2 (5)</u>	45 (5)	--	--	--
Cyanide, free	NA	Lab	ug/l	200	100 HRL93	<u>5.2</u>	45	--	--	--
Nitrogen, ammonia, as N	NA	Lab	mg/l			<u>0.04 (3)</u>		<u>6.9</u>	<u>0.23</u>	<u>0.23</u>
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			<u>0.04</u>		--	--	ns
pH	NA	Field	pH units			<u>6.5 - 9.0</u>		--	--	ns
Turbidity	NA	Field	NTU	5 (19)		<u>25</u>		ns	ns	ns
Metals										
Aluminum	Dissolved	Lab	ug/l			<u>125</u>	2145	ns	ns	ns
Antimony	Dissolved	Lab	ug/l	6	<i>6 HRL93</i>	<u>5.5</u>	180	ns	ns	ns
Arsenic	Dissolved	Lab	ug/l	10		<u>2.0</u>	720	ns	ns	ns
Barium	Dissolved	Lab	ug/l	2000	<i>2000 HRL93</i>			ns	ns	ns
Beryllium	Dissolved	Lab	ug/l	4	<i>0.08 HRL93</i>			ns	ns	ns
Boron	Dissolved	Lab	ug/l		<i>500 RAA17</i>			ns	ns	ns
Cadmium	Dissolved	Lab	ug/l	5	<i>0.5 HRL15 (1)</i>	<u>2.8 HD CF</u>	268 HD CF	ns	ns	ns
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93	<u>11 CF CR6</u>	31 CF CR6	ns	ns	ns
Cobalt	Dissolved	Lab	ug/l			<u>2.8</u>	872	ns	ns	ns
Lead	Dissolved	Lab	ug/l	15 TT(12)		<u>13 HD CF</u>	661 HD CF	ns	ns	ns
Manganese	Dissolved	Lab	ug/l		<i>100 HBV18</i>			ns	ns	ns
Nickel	Dissolved	Lab	ug/l		<i>100 HRL93</i>	<u>296 HD CF</u>	8366 HD CF	ns	ns	ns
Selenium	Dissolved	Lab	ug/l	50	<i>30 HRL93</i>	<u>5.0</u>	40	ns	ns	ns
Thallium	Dissolved	Lab	ug/l	2	<i>0.6 HRL94</i>	<u>0.28</u>	128	ns	ns	ns
Uranium	Dissolved	Lab	ug/l	30				ns	ns	ns
Zinc	Dissolved	Lab	ug/l		<i>2000 HRL94</i>	<u>309 HD CF</u>	678 HD CF	ns	ns	ns
Aluminum	Total	Lab	ug/l			<u>125</u>	2145	--	<u>317</u>	<u>320</u>
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	<i>0.1 HRL93</i>	<u>0.011</u>	0.032	--	--	--
Manganese	Total	Lab	ug/l		<i>100 HBV18</i>			744	--	--
Selenium	Total	Lab	ug/l	50	30 HRL93	<u>5.0</u>	40	--	<u>6.5</u>	<u>6.3</u>
Thallium	Total	Lab	ug/l	2	<i>0.6 HRL94</i>	<u>0.28</u>	128	<u>1.1</u>	--	--
Semivolatile Organic Compounds										
1,4-Dioxane	NA	Lab	ug/l		<i>1 HRL13 (1)</i>			19	1.5	ns
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		<i>3 MP HRL94</i>			--	--	--
Phenol	NA	Lab	ug/l		4000 HRL93	<u>123</u>	4428	--	--	--

Table 12

SUMMARY OF EXCEEDANCES - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

								KRAEMER QUARRY		
								Monitoring Well Group		
								Location		
								SEEP 01		
								DISCHARGE 01		
								MN Unique ID#		
								Date		
								5/29/2019		
								Sample Type		
								N		
								N		
								FR		
				Drinking Water Criteria		Surface Water Criteria				
Parameter	Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness			
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012			
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade			
Volatile Organic Compounds										
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			--	--	--
1,2-Dichloroethylene, cis	NA	Lab	ug/l	70	6 HRL18 (1)			--	--	--
1,2-Dichloropropane	NA	Lab	ug/l	5	5 HRL94			--	--	--
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94			--	--	--
Acetone	NA	Lab	ug/l		3000 HBV17 (1)			--	--	--
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	<u>6.0</u>	8974 (1)	--	--	--
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	<u>68</u>	3717	--	--	--
Methyl ethyl ketone (2-butanone)	NA	Lab	ug/l		4000 HRL94			--	--	--
Methyl isobutyl ketone (MIBK)	NA	Lab	ug/l		300 HRL94			--	--	--
Methylene chloride	NA	Lab	ug/l	5	5 HRLMCL	46	27749 (1)	--	--	--
Naphthalene	NA	Lab	ug/l		70 HRL13	<u>81</u>	818	--	--	--
Tetrachloroethylene	NA	Lab	ug/l	5 (9)	4 HBV14 (1)	<u>3.8</u>	857	--	--	--
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			--	--	--
Toluene	NA	Lab	ug/l	1000	200 HRL11	<u>253</u>	2703	--	--	--
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	0.4 HRL15 (1)	<u>25</u>	13976	--	--	--
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	<u>0.18</u>	(1)	--	--	--
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			--	--	--
Xylene, total	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)	<u>166</u>	2814	--	--	--
Polychlorinated Biphenyls										
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	0.04 HRL94			--	--	--
Radiochemical Parameters										
Gross Alpha (radiation)	NA	Lab	pCi/l	15				--	--	--
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				--	--	--
Per- and Polyfluoroalkyl Substances										
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l		7 HRL18 (1)			--	--	--
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		0.047 HBV19			--	--	--
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		0.015 HBV19			0.037	0.034	0.029
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		0.035 HRL18 (1)			0.25	0.066	0.059

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Did not exceed criteria.
ns	Not tested for analyte
N	Sample Type: Normal
FR	Sample Type: Field Replicate
NA	NA (not applicable) indicates that a fractional portion of the sample is not part of the analytical testing or field collection procedures.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
b	Potential false positive value based on blank data validation procedures. Concentrations identified as potential false positive are excluded from calculations.
h	EPA recommended sample preservation, extraction or analysis holding time was exceeded.
j	Estimated detected value. The reported value is less than the stated laboratory quantitation limit but greater than the laboratory method detection limit.

EPA Maximum Contaminant Levels

(1)	1998 Final Rule for Disinfectants and Disinfection By-products: The total for trihalomethanes (THM) is 0.08 mg/l.
(5)	The value for m-dichlorobenzene are based on data for o-dichlorobenzene.
(7)	1,2-dibromoethane.
(9)	Under review.
(14)	Based on the criteria for chromium, total.
(15)	Based on the criteria for xylenes, total.
(19)	At no time can turbidity go above 5 NTU.
TT(12)	Copper action level 1.3 mg/l; lead action level 0.015 mg/l.
(+)	This MCL is no longer an official regulatory level, but is still in use as a trigger for EPA. The actual MCL for Beta is 4 mrem/year but there is no simple conversion between a curie and a rem.

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.
(2)	Representing the criteria for cyanide, free.
CR	Value represents the criteria for Chromium, hexavalent.
DCP	Value shown is 1,3-dichloropropene in the MDH criterion, however, the laboratory reports cis and trans isomers individually.
HBV13	Health Based Value 2013.
HBV14	Health Based Value 2014.
HBV17	Health Based Value 2017.
HBV18	Health Based Value 2018.
HBV19	Health Based Value 2019.
HRL09	Health Risk Limit 2009.
HRL11	Health Risk Limit 2011.
HRL13	Health Risk Limit 2013.
HRL15	Health Risk Limit 2015.
HRL18	Health Risk Limit 2018.
HRL93	Health Risk Limit 1993.
HRL94	Health Risk Limit 1994.
HRLMCL	Health Risk Limit., Maximum Contaminant Level.
MP	Laboratory reports 3-methylphenol and 4-methylphenol as co-eluting compounds. The criteria in the table represents 4-methylphenol which is the more stringent criteria.
RAA09	Not Detected., Risk Assessment Advice 2009.
RAA10	Risk Assessment Advice 2010.
RAA13	Risk Assessment Advice 2013.
RAA16	Risk Assessment Advice 2016.
RAA17	Risk Assessment Advice 2008.
RAA19	Risk Assessment Advice 2019.
XYL	Value shown is for the sum of the mixed o,m and p Xylene isomers.

Data Footnotes and Qualifiers

Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness*

(3)	Value represents the criteria for Ammonia, unionized as N.
(5)	Value based on the criteria for cyanide, free.
(6)	5.0 mg/l as a daily minimum. This dissolved oxygen standard may be modified on a site-specific basis according to part 7050.0220, subpart 7, except that no site-specific standard shall be less than 5 mg/l as a daily average and 4 mg/l as a daily minimum. Compliance with this standard is required 50 percent of the days at which the flow of the receiving water is equal to the 7Q10.
(7)	5 degree F above natural in streams and 3 degrees above natural in lakes, based on monthly average of the maximum daily temperatures, except in no case shall it exceed the daily average temperature of 86 degrees F.
(8)	pH Dependent. Based on a pH value of 7.0.
CF	Conversion Factor.
CR6	Value represents the criteria for Hexavalent Chromium.
HD	Hardness Dependent.

* Estimated concentrations based on same underlying assumptions of conservative transport mechanisms and same source area. Minnesota River hardness data from MPCA, 2006. Working Draft, Surface Water Pathway Evaluation user's Guide, Appendix E.

Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness*

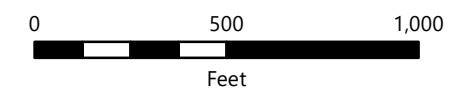
(1)	Subpart 7, item E applies.
(5)	Value based on the criteria for cyanide, free.
(8)	pH Dependent. Based on a pH value of 7.0.
CF	Conversion Factor.
CR6	Value represents the criteria for Hexavalent Chromium.
HD	Hardness Dependent.

* Estimated concentrations based on same underlying assumptions of conservative transport mechanisms and same source area. Minnesota River hardness data from MPCA, 2006. Working Draft, Surface Water Pathway Evaluation user's Guide, Appendix E.

Figures



- Project Areas
- Parcel Boundary
- County Boundary



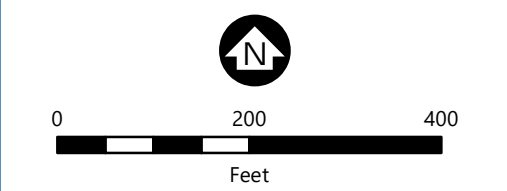
SITE OVERVIEW
 Focused Remedial
 Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

FIGURE 1





- Phase B Investigation Locations (2019)**
 - Monitoring Wells
 - Borings
- Phase A Investigation Locations (2018)**
 - Borings
 - Test Trenches
- Previous Investigation Locations**
 - Active Monitoring Well
- Other Symbols**
 - Inferred Waste Extent
 - Project Areas
 - Parcel Boundary
- Elevation Contours, Dakota County, 2011**
 - 10-Foot Contour
 - 2-Foot Contour



INVESTIGATION LOCATIONS
Freeway Dump
 Focused Remedial
 Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

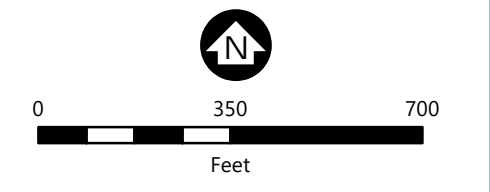
FIGURE 2



Barr Footer: ArcGIS 10.6.1, 2019-06-26 07:48 File: I:\Projects\23191372\Maps\Reports\Focused Remedial Investigation Report 2019\Figure 3 - Investigation Locations - Landfill.mxd User: RCSZ



- Phase B Investigation Locations (2019)**
- Monitoring Wells
 - Borings
 - Seep and Discharge Sample
 - Test Trenches
- Phase A Investigation Locations (2018)**
- Borings
 - Test Trenches
- Previous Investigation Locations**
- Active Monitoring Well
 - Historical Borings
- Inferred Waste Extent**
- Inferred Waste Extent
- Elevation Contours, Dakota County, 2011**
- 10-Foot Contour
- Project Areas**
- Project Areas
 - Parcel Boundary

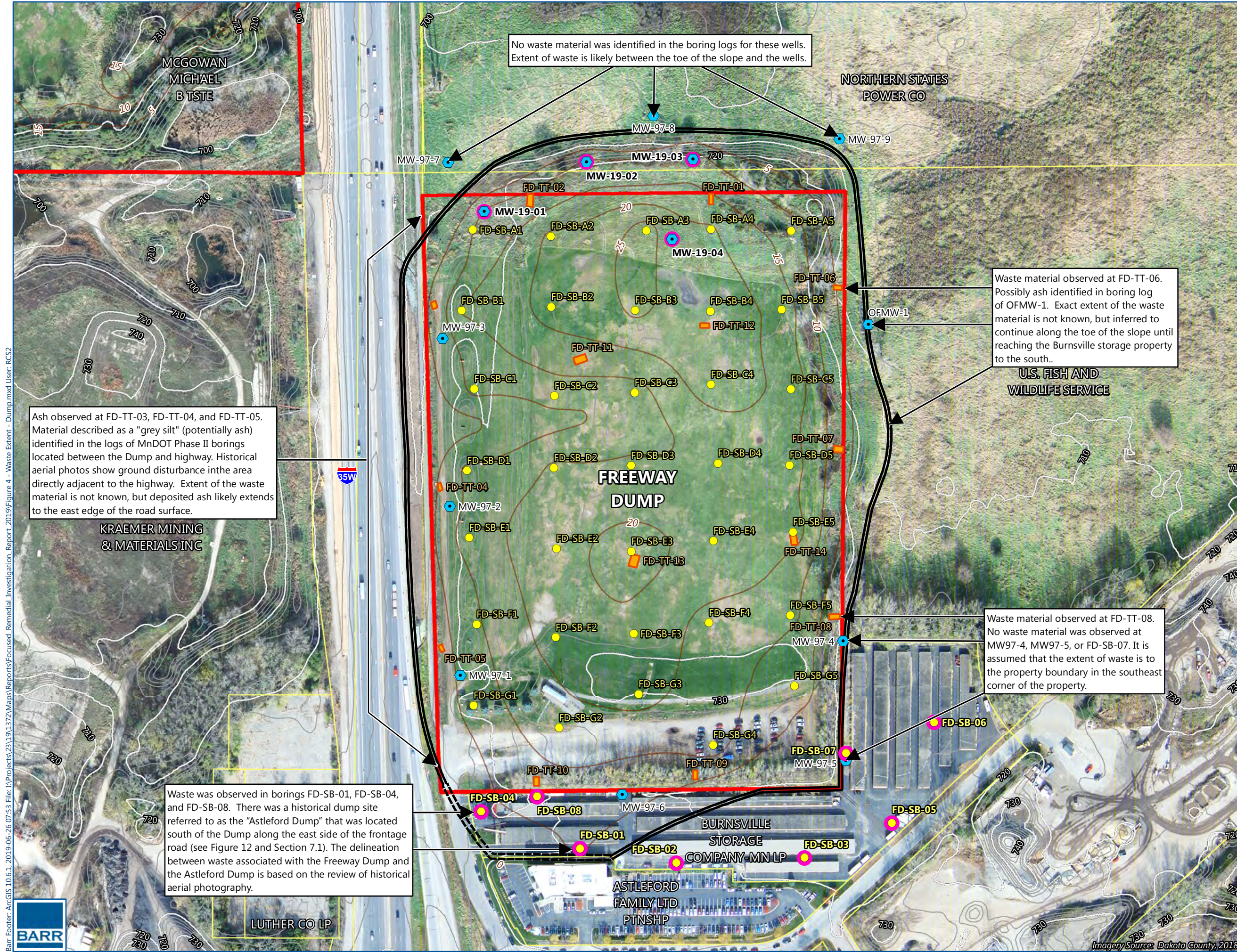


INVESTIGATION LOCATIONS
Freeway Landfill
Focused Remedial
Investigation Report
Freeway Landfill and Dump
Burnsville, Minnesota

FIGURE 3



Imagery Source: Dakota County, 2018



Phase B Investigation Locations (2019)

- Monitoring Wells
- Borings

Phase A Investigation Locations (2018)

- Borings
- Test Trenches

Previous Investigation Locations

- Active Monitoring Well

Inferred Waste Extent

Waste Thickness 5ft Contours

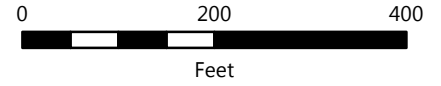
Elevation Contours, Dakota County, 2011

- 10-Foot Contour
- 2-Foot Contour

Project Areas

Parcel Boundary

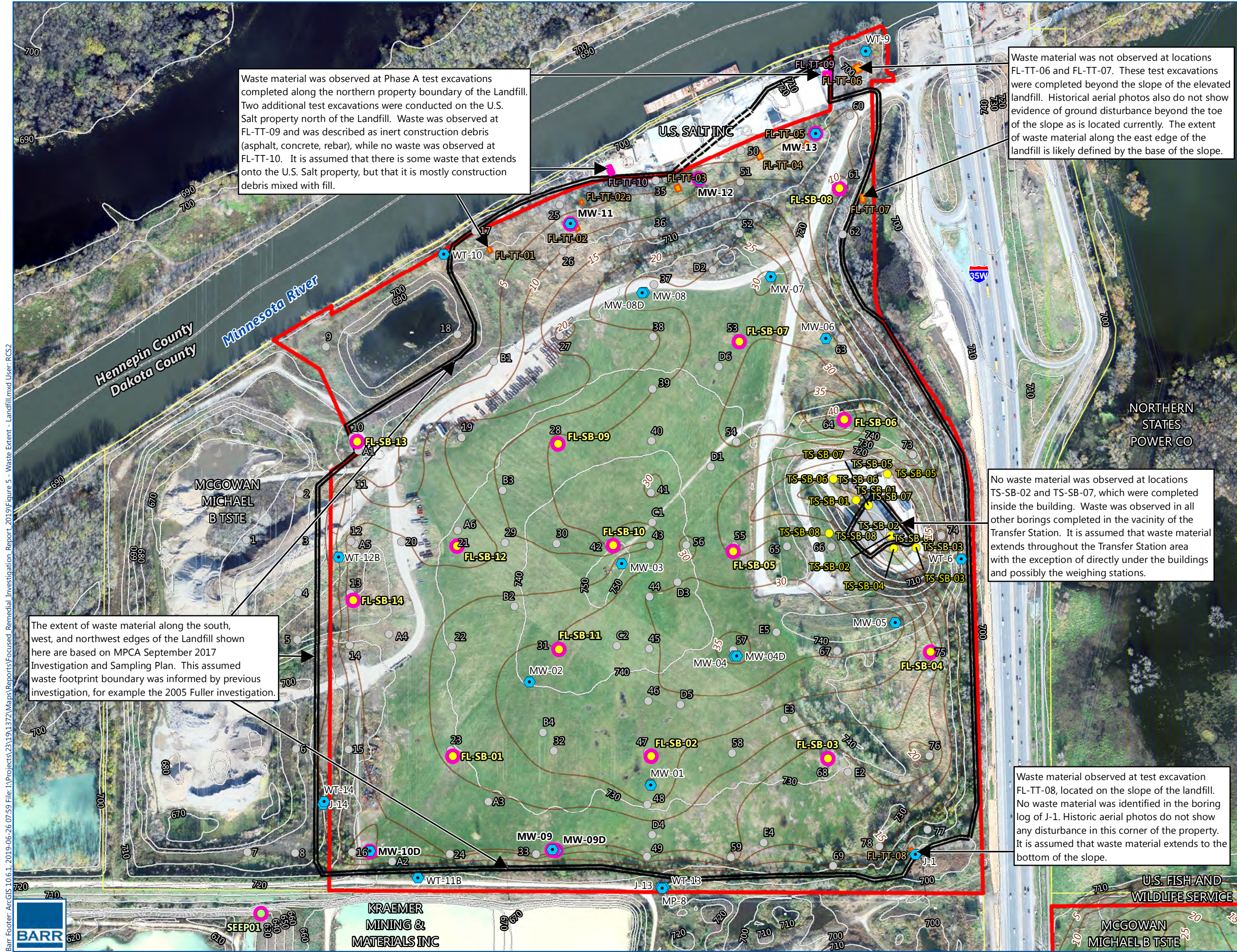
Elevation Data Source:
 Fugro Horizons, Inc. and the Minnesota Department of Natural Resources. LiDAR Elevation, Twin Cities Metro Region, Minnesota, 2011. The Minnesota Elevation Mapping Project.



WASTE EXTENT
Freeway Dump
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

FIGURE 4





Waste material was observed at Phase A test excavations completed along the northern property boundary of the Landfill. Two additional test excavations were conducted on the U.S. Salt property north of the Landfill. Waste was observed at FL-TT-09 and was described as inert construction debris (asphalt, concrete, rebar), while no waste was observed at FL-TT-10. It is assumed that there is some waste that extends onto the U.S. Salt property, but that it is mostly construction debris mixed with fill.

Waste material was not observed at locations FL-TT-06 and FL-TT-07. These test excavations were completed beyond the slope of the elevated landfill. Historical aerial photos also do not show evidence of ground disturbance beyond the toe of the slope as is located currently. The extent of waste material along the east edge of the landfill is likely defined by the base of the slope.

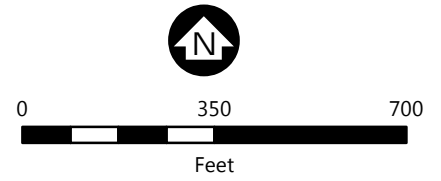
No waste material was observed at locations TS-SB-02 and TS-SB-07, which were completed inside the building. Waste was observed in all other borings completed in the vicinity of the Transfer Station. It is assumed that waste material extends throughout the Transfer Station area with the exception of directly under the buildings and possibly the weighing stations.

The extent of waste material along the south, west, and northwest edges of the Landfill shown here are based on MPCA September 2017 Investigation and Sampling Plan. This assumed waste footprint boundary was informed by previous investigation, for example the 2005 Fuller investigation.

Waste material observed at test excavation FL-TT-08, located on the slope of the landfill. No waste material was identified in the boring log of J-1. Historic aerial photos do not show any disturbance in this corner of the property. It is assumed that waste material extends to the bottom of the slope.

- Phase B Investigation Locations (2019)**
- Monitoring Wells
 - Borings
 - Seep Sample
 - Test Trenches
- Phase A Investigation Locations (2018)**
- Borings
 - Test Trenches
- Previous Investigation Locations**
- Active Monitoring Well
 - Historical Borings
- Inferred Waste Extent**
- Waste Thickness 5ft Contours
- Elevation Contours, Dakota County, 2011**
- 10-Foot Contour
- Project Areas**
- Parcel Boundary

Elevation Data Source:
 Fugro Horizons, Inc. and the Minnesota Department of Natural Resources. LiDAR Elevation, Twin Cities Metro Region, Minnesota, 2011. The Minnesota Elevation Mapping Project.

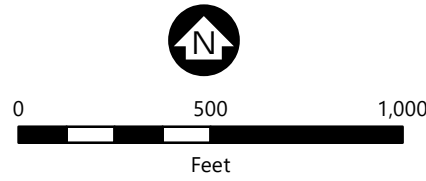


WASTE EXTENT
Freeway Landfill
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota
FIGURE 5





- Cross Section Location
- Monitoring Wells
- Borings
- Seep Sample
- Abandoned Monitoring Wells
- Historical Borings
- Test Trenches
- Inferred Waste Extent
- Project Areas



CROSS SECTION LOCATIONS
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

FIGURE 6



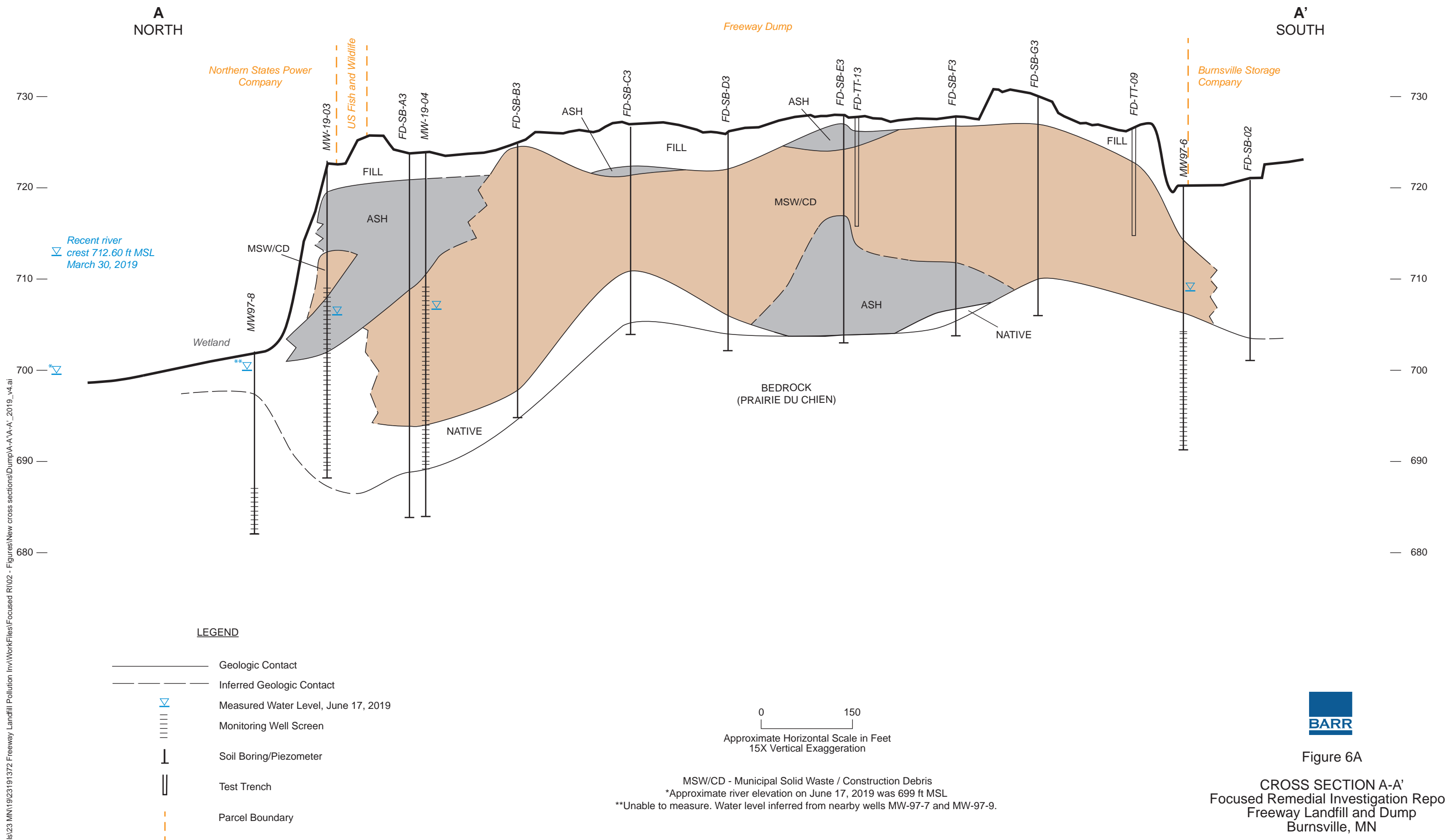
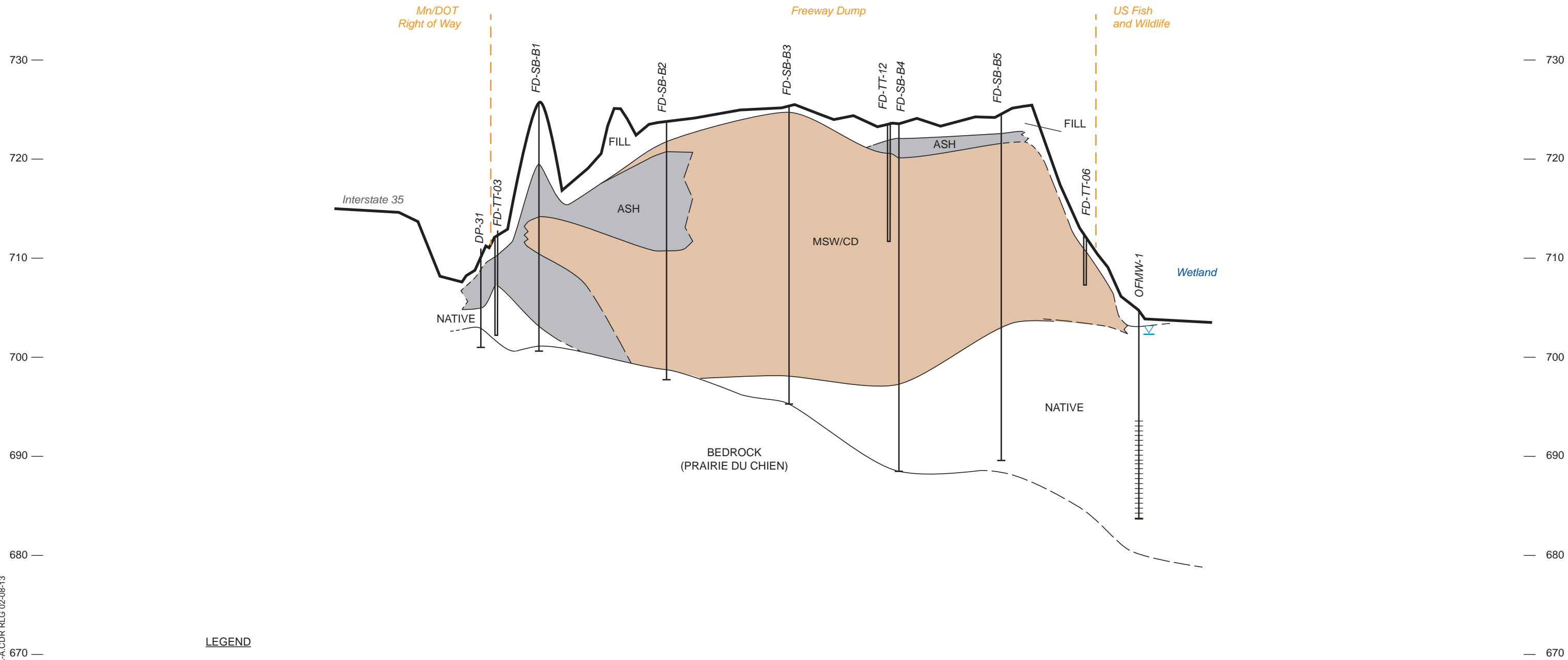


Figure 6A
CROSS SECTION A-A'
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, MN

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B
WEST

B'
EAST



LEGEND

- Geologic Contact
- - - Inferred Geologic Contact
- ∇ Measured Water Level, June 17, 2019
- ||| Monitoring Well Screen
- ┆ Soil Boring/Piezometer
- || Test Trench
- - - Parcel Boundary

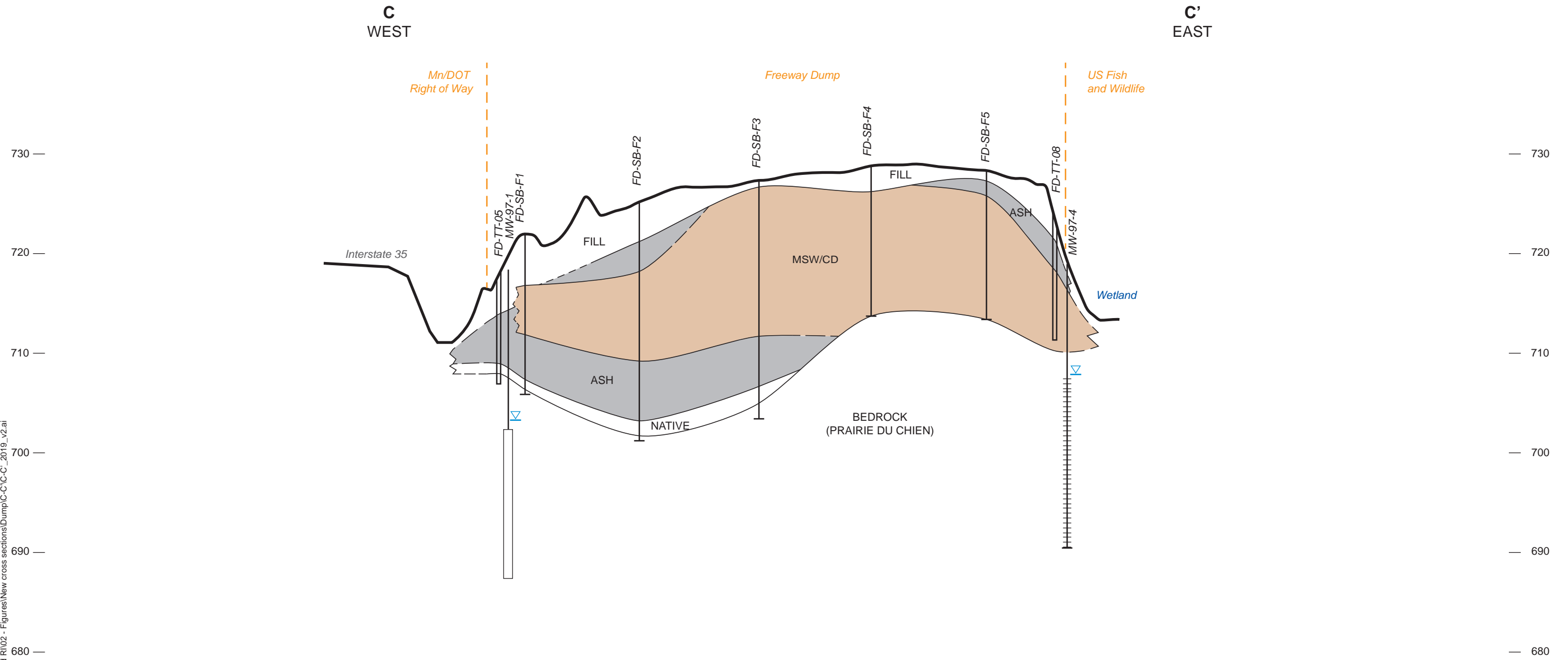
0 150
 Approximate Horizontal Scale in Feet
 15X Vertical Exaggeration

MSW/CD - Municipal Solid Waste / Construction Debris



Figure 6B
CROSS SECTION B-B'
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, MN

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LEGEND

- Geologic Contact
- - - - - Inferred Geologic Contact
- ▽ Measured Water Level, June 17, 2019
- ||||| Monitoring Well Screen
- ┆ Soil Boring/Piezometer
- ▭ Test Trench
- - - - - Parcel Boundary
- ▭ Open Borehole

0 150
 Approximate Horizontal Scale in Feet
 15X Vertical Exaggeration

MSW/CD - Municipal Solid Waste / Construction Debris

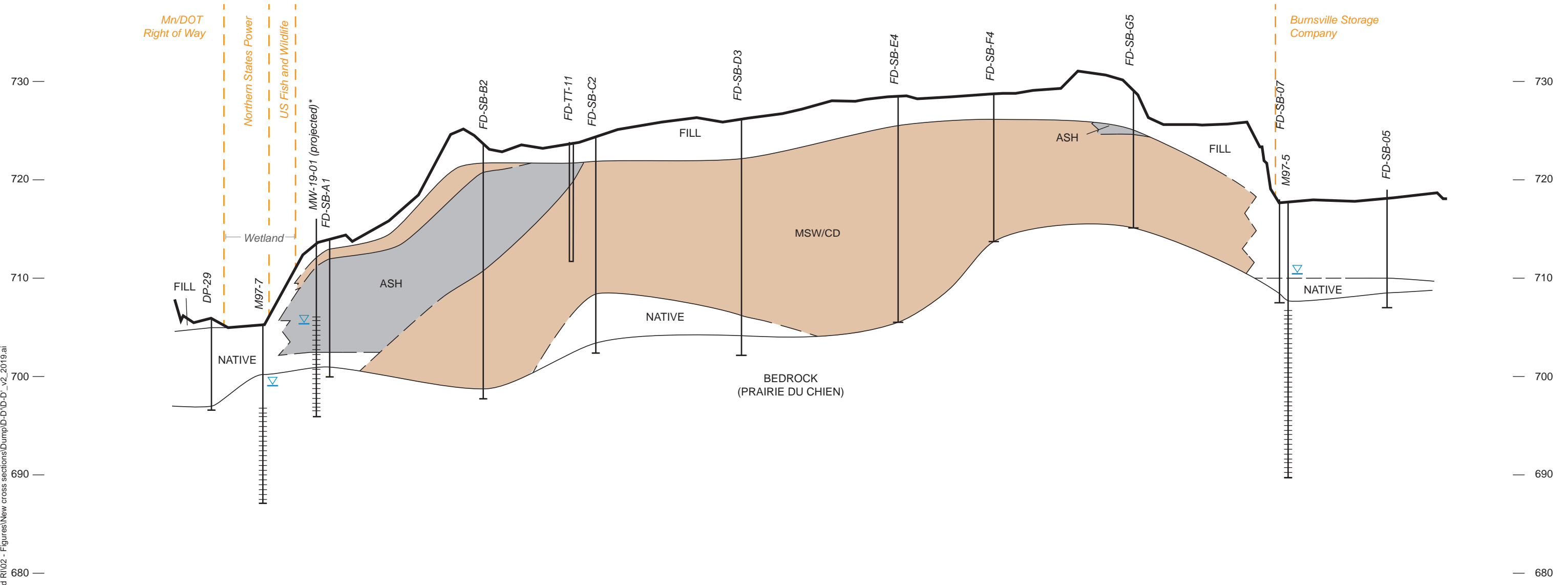


Figure 6C
 CROSS SECTION C-C'
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, MN

D
NORTHWEST

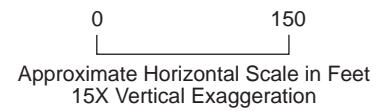
D'
SOUTHEAST

Freeway Dump



LEGEND

- Geologic Contact
- - - Inferred Geologic Contact
- ▽ Measured Water Level, June 17, 2019
- ||||| Monitoring Well Screen
- ┆ Soil Boring/Piezometer
- || Test Trench
- - - Parcel Boundary

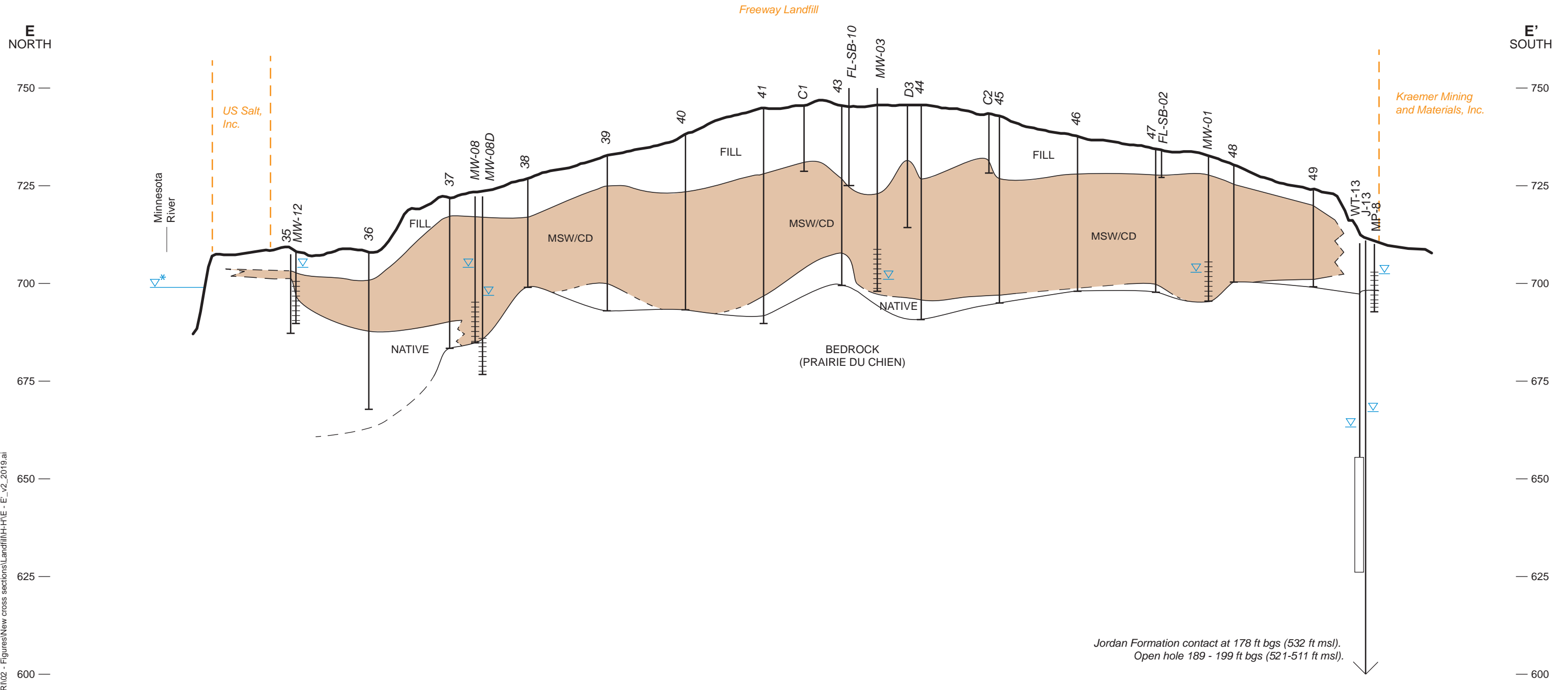


MSW/CD - Municipal Solid Waste / Construction Debris
*Boring not used to depict geologic contacts



Figure 6D
CROSS SECTION D-D'
Focused Remedial Investigation Report
Freeway Landfill and Dump
Burnsville, MN

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LEGEND

- Geologic Contact
- - - Inferred Geologic Contact
- ▽ Measured Water Level, June 17, 2019
- ||||| Monitoring Well Screen
- ┆ Soil Boring/Piezometer
- ▭ Test Trench
- - - Parcel Boundary
- ▭ Open Borehole

0 250
 Approximate Horizontal Scale in Feet
 10X Vertical Exaggeration

MSW/CD - Municipal Solid Waste / Construction Debris
 *Approximate river elevation on June 17, 2019 was 699 ft msl

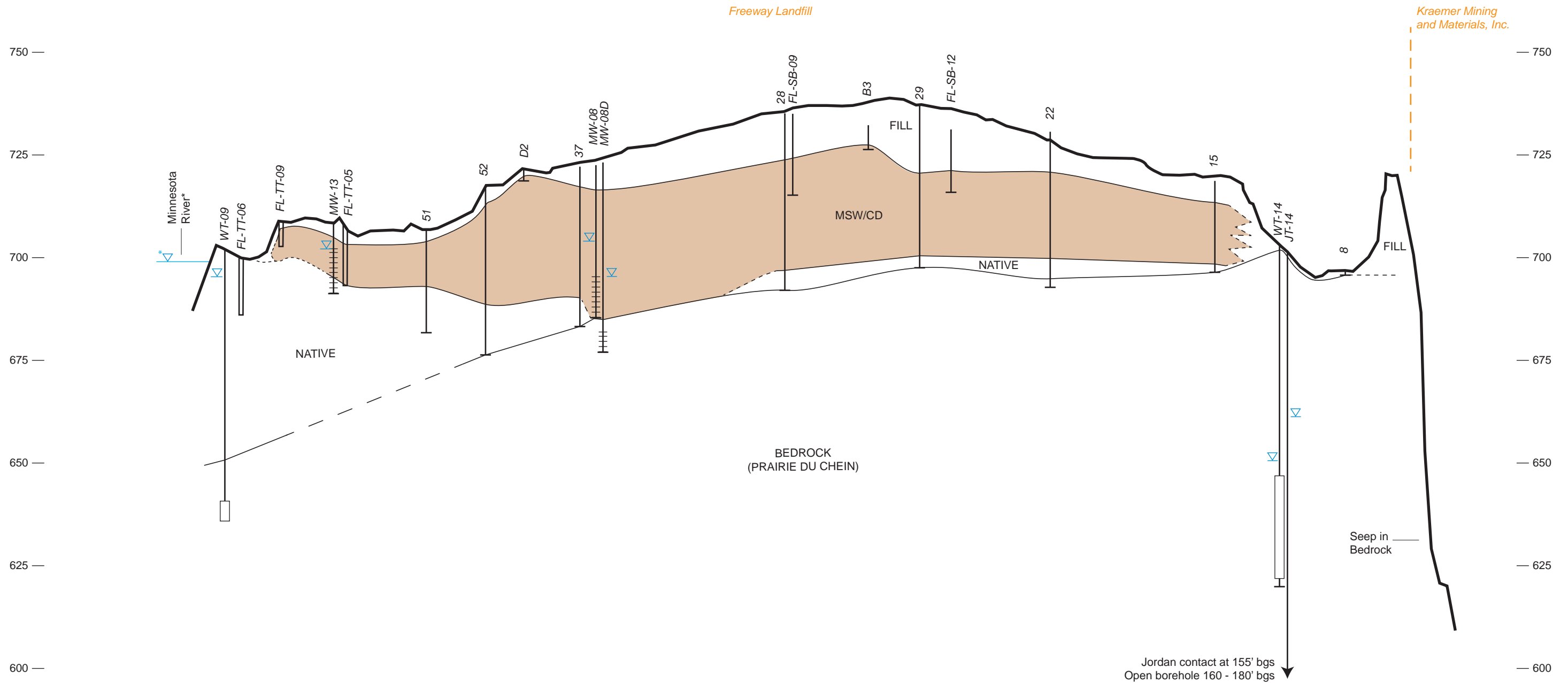


Figure 6E

GEOLOGIC CROSS SECTION E-E'
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, MN

F
NORTHEAST

F'
SOUTHWEST



LEGEND

- Geologic Contact
- - - Inferred Geologic Contact
- ▽ Measured Water Level, June 17, 2019
- ||||| Monitoring Well Screen
- ⊥ Soil Boring
- || Test Trench
- - - Parcel Boundary
- Open Borehole

0 375
 Approximate Horizontal Scale in Feet
 15X Vertical Exaggeration

MSW/CD - Municipal Solid Waste / Construction Debris
 *Approximate river elevation on June 17, 2019 was 699 ft MSL

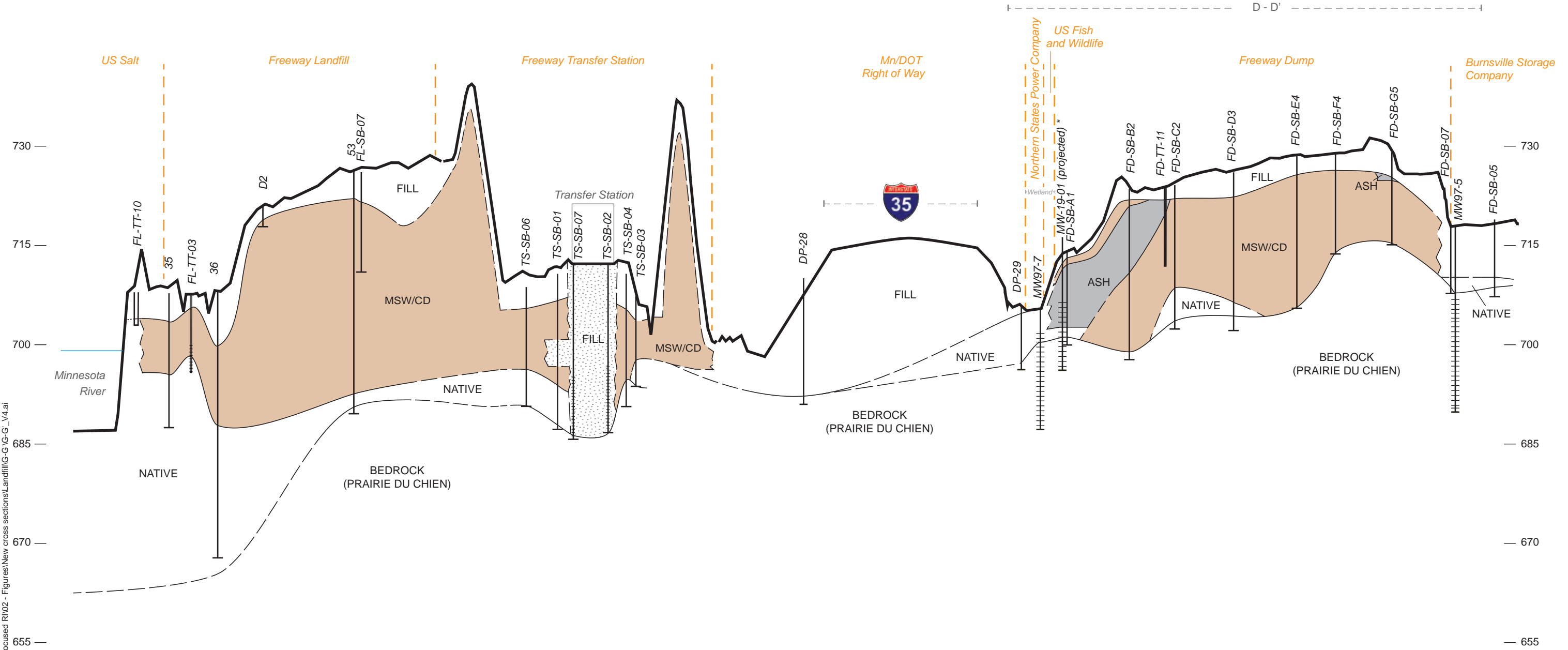


Figure 6F

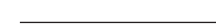





GEOLOGIC CROSS SECTION F-F'
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

G
NORTHWEST

G'
SOUTHEAST



LEGEND

-  Geologic Contact
-  Inferred Geologic Contact
-  Monitoring Well Screen
-  Soil Boring/Piezometer
-  Test Trench
-  Parcel Boundary

0 375
 Approximate Horizontal Scale in Feet
 25X Vertical Exaggeration

MSW/CD - Municipal Solid Waste / Construction Debris
 *Boring not used to depict geologic contacts



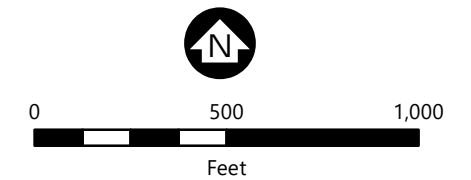
Figure 6G
 CROSS SECTION G-G'
 Freeway Dump, Landfill,
 and Transfer Station
 Site Investigation Report
 Dakota County, Minnesota



- Cover Soil Investigation Location
- Inferred Waste Extent
- Cover Soil Thickness Contours (5ft)**
- Project Areas
- Parcel Boundary
- County Boundary

* Phase A Investigation Location

** Cover soil thickness contours created using boring log data from all recent and historical investigation locations



COVER SOIL INVESTIGATION LOCATIONS
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

FIGURE 7





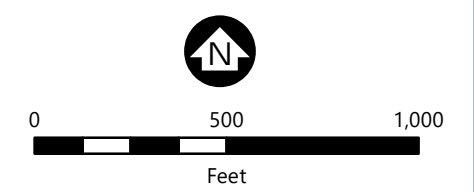
- Perched Monitoring Well
 - Water Table Monitoring Well
 - Jordan Monitoring Well
- Nested Wells**
- Perched and Water Table
 - Water Table and Jordan
 - Perched, Water Table, and Jordan
- Project Areas
 - Parcel Boundary
 - County Boundary

Well Network General Descriptions

Perched – Wells that are screened at depths where water or leachate was encountered above the groundwater table.

Water Table – Wells that are screened across the groundwater table (with the exception of WT-9 and WT-10). Typically the water table is in fractured Prairie du Chien bedrock.

Jordan – Wells that are constructed as open borehole bedrock monitoring wells in the Jordan formation which underlies the Prairie du Chien. The open-hole sections of these wells are generally at depths of approximately 160 to 220 feet below ground surface.



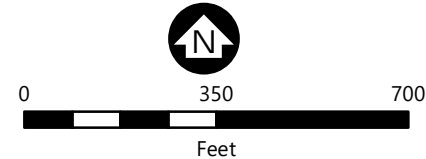
MONITORING WELL NETWORK
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

FIGURE 8





- Perched Monitoring Well
- Water Table Monitoring Well
- Jordan Well
- Perched and Water Table Nest
- Water Table and Jordan Nest
- Perched, Water Table, and Jordan
- Groundwater Elevation Contour*
Contour Interval = 5 ft (MSL)
- Estimated Flow Direction
- Project Areas
- Parcel Boundary
- Contours, Dakota County, 2011**
- 10-Foot Contour
- * Groundwater Elevation from Water Table Monitoring Wells
- NM - Not Measured

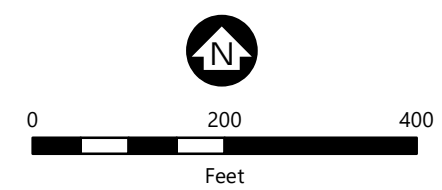


**REGIONAL WATER TABLE
GROUNDWATER ELEVATIONS
CONTOURS - April 9, 2019**
Freeway Landfill
Focused Remedial
Investigation Report
Freeway Landfill and Dump
Burnsville, Minnesota

FIGURE 9



- Perched Monitoring Well
- Water Table Monitoring Well
- Groundwater Elevation Contour*
Contour Interval = 1 ft (MSL)
Dashed where Inferred
- Estimated Flow Direction
- Project Areas
- Parcel Boundary
- Contours, Dakota County, 2011**
- 10-Foot Contour
- 2-Foot Contour
- * Groundwater Elevation from Water Table Monitoring Wells
- NM - Not Measured



REGIONAL WATER TABLE GROUNDWATER ELEVATION CONTOURS - June 17, 2019
Freeway Dump
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

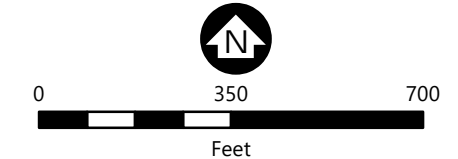
FIGURE 10



Barr Footer: ArcGIS 10.6.1, 2019-06-27 13:47 File: I:\Projects\23\191372\Maps\Reports\Focused Remedial Investigation_Report_2019\Figure 11 - Groundwater Contours - Landfill - June 17, 2019.mxd User: RC32



- Perched Monitoring Well
- Water Table Monitoring Well
- Jordan Well
- Perched and Water Table Nest
- Water Table and Jordan Nest
- Perched, Water Table, and Jordan Nest
- Groundwater Elevation Contour*
Contour Interval = 5 ft (MSL)
- Estimated Flow Direction
- Project Areas
- Parcel Boundary
- Contours, Dakota County, 2011**
- 10-Foot Contour
- * Groundwater Elevation from Water Table Monitoring Wells (except WT-9 and WT-10)
- NM - Not Measured



**REGIONAL WATER TABLE
GROUNDWATER ELEVATION
CONTOURS - June 17, 2019**
Freeway Landfill
Focused Remedial
Investigation Report
Freeway Landfill and Dump
Burnsville, Minnesota

FIGURE 11

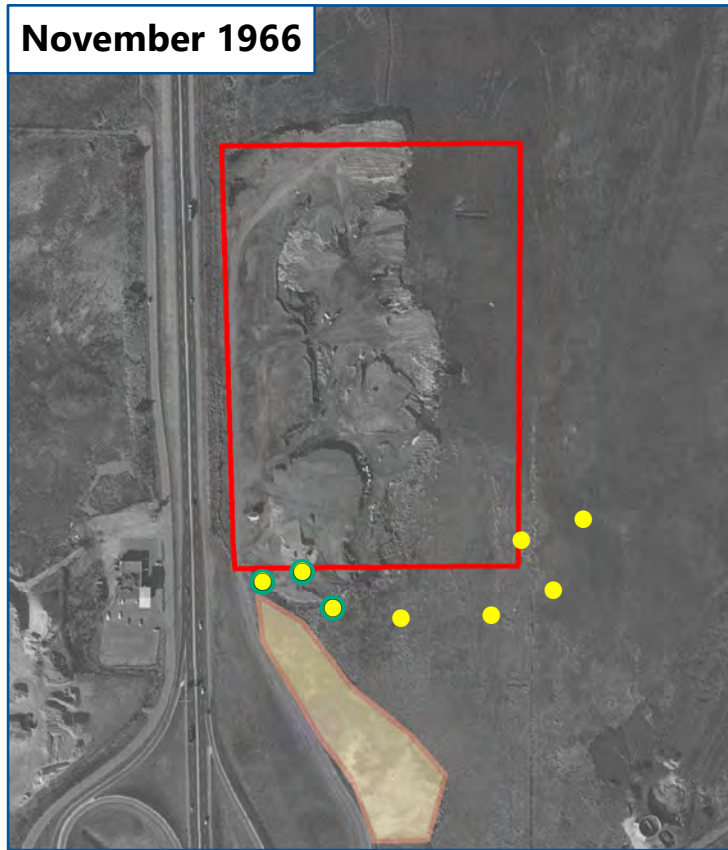


MCGOWAN
MICHAEL B TSTE
Imagery Source: Dakota County, 2018

October 1964



November 1966



December 1969



1991



- Waste Extent Boring Location
- Waste Observed
- Approximate Location of Astleford Dump
- Project Areas



0 300 600
Feet

HISTORIC AERIAL PHOTOGRAPHS
ASTLEFORD DUMP
Focused Remedial Investigation Report
Freeway Landfill and Dump
Burnsville, Minnesota

FIGURE 12

Appendices

Appendix A-1

Waste Investigation Boring Logs



Barr Engineering Company
 4300 MarketPointe Drive Suite 200
 Minneapolis, MN 55435
 Telephone: 952-832-2600

LOG OF GEOPROBE FD-SB-01

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:477298.734m, E:4959232.848m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 720 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 13.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					ASPHALT: black.	
0 - 5		1	PID:0.0 D/O/S:None/ None/ None	GW SP-SM	GRAVEL BASE (GW): Class 5 gravel; light yellowish brown. POORLY GRADED SAND WITH SILT (SP-SM): fine to medium grained; brownish gray; very dense; trace slag material; [FILL].	
5 - 10		2	PID:0.0 D/O/S:None/ None/ Trace	WM	WASTE MATERIAL (WM): silty matrix with glass, plastic, wood, and slag; dark brown/black; wet; trace mono-sheen.	
10 - 13		3	PID:0.0 D/O/S:None/ None/ None		9.5' - 10': trace roots, disturbed topsoil. PRAIRIE DU CHIEN (OPC). Bedrock; very weak; blue-greenish gray; highly weathered.	
13.0					End of geoprobe 13.0 feet	

M:\GINT\FREWAY LANDFILL_23191372.GPJ_BARR\LIBRARY.GLB_BARR\LOG ENVIRO LOG_BARR TEMPLATE.GDT

Date Boring Started: 3/28/19
 Date Boring Completed: 3/28/19
 Logged By: AKS3/EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Background PID: 0.0 ppm
 Obstruction encountered at 6' at original location. Moved 1' off and resumed logging from 5' at new location.
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level
 PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF GEOPROBE FD-SB-02

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:477363.3886m, E:4959222.999m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 721 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 20.0 ft

M:\GINT\FREWAY LANDFILL_23191372.GPJ_BARR\LIBRARY.GLB_ENVIRO LOG_BARR TEMPLATE.GDT

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S O S C	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						ASPHALT: black.	
1		1	PID:0.0 D/O/S:None/ None/ None			SILTY SAND (SM); very fine to fine grained; dark gray; moist; very dense; trace slag; with little gravel [FILL].	
5			PID:0.2 D/O/S:None/ None/ None				
2		2	PID:0.0 D/O/S:None/ None/ None			From 5':; fine to medium grained; dark yellowish brown; moist; loose. 6.5': 2" diameter gravel clast.	
10			PID:0.0 D/O/S:None/ None/ None	SM			
3		3	PID:0.0 D/O/S:None/ None/ None			From 13': color change to grayish brown, trace medium gravel. 13': 2" diameter gravel clast.	
15							
4		4	PID:0.0 D/O/S:None/ None/ None			PRAIRIE DU CHIEN (OPC). Bedrock; very weak; olive yellow; moderately weathered.	
20						End of geoprobe 20.0 feet	
25							
30							

Date Boring Started: 3/28/19
 Date Boring Completed: 3/28/19
 Logged By: AKS3/EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Background PID: 0.0 ppm
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF GEOPROBE FD-SB-03

SHEET 1 OF 1

Project: Freeway Dump and Landfill Surface Elevation: 719 ft MSL*
 Project No.: 23191372 Drilling Method: Geoprobe
 Location: Burnsville, MN Sampling Method: Dual-Tube
 Coordinates: UTM 15 N:477449.7056m, E:4959225.998m Completion Depth: 10.7 ft
 Datum: NAD 83; UTM Zone 15

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					ASPHALT: black.	
0 - 1		1	PID:0.0 D/O/S:None/ None/ None	GW	GRAVEL BASE (GW): Class 5 gravel; light yellowish brown. SILTY SAND (SM): fine to coarse grained; dark gray; moist; dense; [FILL].	
1 - 5		2	PID:0.0 D/O/S:None/ None/ None	SM	From 5': yellowish brown; trace gravel.	
5 - 10		3	PID:0.0 D/O/S:None/ None/ None	CL	SANDY LEAN CLAY (CL): green/gray; moist; trace gravel; sand is very fine to coarse grained.	
10 - 10.7			D/O/S:None/ None/ None		PRAIRIE DU CHIEN (OPC). Bedrock; very weak; white/tan; moderately weathered. End of geoprobe 10.7 feet	

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Date Boring Started: 3/28/19
 Date Boring Completed: 3/28/19
 Logged By: AKS3/EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 Background PID: 0.0 ppm
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level
 PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF GEOPROBE FD-SB-04

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:477232.2676m, E:4959257.994m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 719 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 11.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					ASPHALT: black.	
0 - 4		1	PID:0.0 D/O/S:None/ None/ None	GW SM	GRAVEL BASE (GW): Class 5 gravel; light yellowish brown. SILTY SAND (SM): fine to coarse grained; gray; moist; dense; [FILL].	
4 - 10		2	PID:0.1 D/O/S:None/ None/ None	WM	From 4': brown. WASTE MATERIAL WITH ASH (WM): moist; wood waste mixed with gray ash.	
10 - 11.0		3	D/O/S:None/ None/ None		PRAIRIE DU CHIEN (OPC). Bedrock; very weak; white/tan; moderately weathered.	
11.0					End of geoprobe 11.0 feet	

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Date Boring Started: 3/29/19
 Date Boring Completed: 3/29/19
 Logged By: AKS3
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF GEOPROBE FD-SB-05

SHEET 1 OF 1

Project: Freeway Dump and Landfill Surface Elevation: 719 ft MSL*
 Project No.: 23191372 Drilling Method: Geoprobe
 Location: Burnsville, MN Sampling Method: Dual-Tube
 Coordinates: UTM 15 N:477508.8484m, E:4959249.176m Completion Depth: 12.0 ft
 Datum: NAD 83; UTM Zone 15

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						ASPHALT: black.	
1		1	PID:0.6 D/O/S:None/ None/ None			SILTY SAND (SM): fine to coarse grained; dark brown to brown, some gray; moist; with pebbles. [FILL].	
5		2	PID:0.5 D/O/S:None/ None/ None	SM			
10		3	D/O/S:None/ None/ None	CL		SANDY LEAN CLAY (CL): gray; moist; medium plasticity; sand is very fine to fine grained. [NATIVE].	
						PRAIRIE DU CHIEN (OPC). Bedrock; very weak; white/tan; moderately weathered.	
						End of geoprobe 12.0 feet	

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Date Boring Started: 4/1/19
 Date Boring Completed: 4/1/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Background PID: 0.2 ppm
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF GEOPROBE FD-SB-06

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:477537.5253m, E:4959316.851m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 719 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 13.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0				GW	ASPHALT: black. GRAVEL BASE (GW): Class 5 gravel; light yellowish brown. SILTY SAND (SM): fine to coarse grained; brown; moist; w/ gravel; [FILL].	
1		1	PID:0.5 D/O/S:None/ None/ None			
5				SM	From 5': fine to medium grained, more fines, no gravel.	
2		2	PID:0.7 D/O/S:None/ None/ None			
10				OL	ORGANIC SILT (OL): peat, silty organic; black; moist; [NATIVE].	
		3	PID:0.7 D/O/S:None/ None/ None	CL	LEAN CLAY (CL): dark gray; moist; medium plasticity; sand is very fine to fine grained w/ gravel [NATIVE].	
					PRAIRIE DU CHIEN (OPC). Bedrock; very weak; white, tan, green; moderately weathered.	
					End of geoprobe 13.0 feet	

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Date Boring Started: 4/1/19
 Date Boring Completed: 4/1/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 Background PID: 0.2 ppm
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF GEOPROBE FD-SB-07

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:477478.1224m, E:4959296.5m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 718 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 10.5 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						ASPHALT: black.	
1		1	PID:0.4 D/O/S:None/ None/ None		GW	GRAVEL BASE (GW): Class 5 gravel; light yellowish brown.	
5		2	PID:0.5 D/O/S:None/ None/ None		SM	SILTY SAND (SM): fine to coarse grained; brown; moist; trace pebbles; [FILL].	
10		3	D/O/S:None/ None/ None		OL	ORGANIC SILT (OL): peat, silty organic; black; moist; [NATIVE].	
						PRAIRIE DU CHIEN (OPC). Bedrock; very weak; tan; moderately weathered.	
						End of geoprobe 10.5 feet	

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Date Boring Started: 4/1/19
 Date Boring Completed: 4/1/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Background PID: 0.2 ppm
 Pace collected soil gas sample at this location
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF GEOPROBE FD-SB-08

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:477269.8909m, E:4959267.94m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 720 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 14.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0				GW	ASPHALT: black. GRAVEL BASE (GW): Class 5 gravel; light yellowish brown. ASH (ASH): very fine to coarse grained; gray; moist; dense; trace slag; [FILL].	
1		1	PID:0.4 D/O/S:None/ None/ None			
5		2	PID:0.5 D/O/S:None/ None/ None	ASH	From 8': fine to coarse grained; brown.	
10		3	PID:0.6 D/O/S:None/ None/ None	CL	SANDY LEAN CLAY (CL): medium plastic; sand is very fine to coarse grained; black/green; moist; [NATIVE].	
					PRAIRIE DU CHIEN (OPC). Bedrock; very weak; brown, tan, green, and gray; moderately weathered.	
15					End of geoprobe 14.0 feet	
20						
25						
30						

Date Boring Started: 4/1/19
 Date Boring Completed: 4/1/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Background PID: 0.2 ppm
 Pace collected soil gas sample at this location
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF Geoprobe FD-SB-A1

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959649.943m, E:477228.009m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 714.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 14.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0		1	D/O/S:No/ None/ None PID:0.3 D/O/S:No/ None/ None D/O/S:No/ None/ None		SM WM	(SM): SILTY SAND with GRAVEL; fine to coarse grained; brown; moist; homogeneous; fill. (WM): WASTE MATERIAL; gray; moist; with plastic, wood, glass, mixed with silty/ash matrix; [FILL]. (ASH): ASH; gray; moist to wet; with very fine grained sand, soft, homogeneous, nonplastic.	710
5		2	PID:0.3 D/O/S:No/ None/ None D/O/S:No/ None/ None		ASH	At 7.5': wet.	705
10		3	PID:0.3 D/O/S:No/ Organic/ None D/O/S:No/ None/ None D/O/S:No/ None/ None		PT CH	(PT): PEAT; dark brown; moist; spongy, fibrous, organic odor; [NATIVE]. (CH): FAT CLAY; very dark gray; moist; high plasticity, soft; [NATIVE].	700
15						BEDROCK. End of geoprobe 14.0 feet	
20							
25							
30							
35							
40							

M:\GINT\FREWAY LANDFILL_23191372.GPJ_BARR\LIBRARY.GLB_ENVIRO LOG_BARR TEMPLATE.GDT

Date Boring Started: 4/11/18
 Date Boring Completed: 4/11/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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 Minneapolis, MN 55435
 Telephone: 952-832-2600

LOG OF Geoprobe FD-SB-A2

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959645.42m, E:477280.64m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 27.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0		1	PID:0.7 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; medium grained; brown; moist; homogeneous, stiff; 10% gravel, 70% sand, 20% fines, [FILL].	720
5		2	PID:6.0 D/O/S:No/ Light/ None	ASH WM	 	(ASH): ASH; gray; moist; homogeneous, soft, nonplastic; mixed with waste material. (WM): WASTE MATERIAL; with wood, shingles; light odor.	715
10		3	PID:0.9 D/O/S:Trace/ None/ None			(ASH): ASH; gray; moist to wet; homogeneous, soft, with sand and trace black discoloration.	710
15		4		ASH		From 15' - 20': No recovery.	705
20		5	D/O/S:Trace/ Trace/ None			From 20' - 26': wet, dark gray to black.	700
25		6	D/O/S:Black/ None/ None				
						BEDROCK.	
						End of geoprobe 27.0 feet	

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Date Boring Started: 3/27/18
 Date Boring Completed: 3/27/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF Geoprobe FD-SB-A3

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959648.941m, E:477345.063m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 40.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCSU	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0		1	PID:0.4 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; fine to coarse grained; dark brown; moist.	
5		2	PID:1.2 D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; moist; nonplastic, firm. From 5' - 8.5': soft to firm.	720
10		3	PID:3.2 D/O/S:No/ None/ None	ASH		From 10': wood debris observed.	715
15		4	PID:3.0 D/O/S:No/ Strong/ Slight	WM		(WM): WASTE MATERIAL; wet; with wood, fabric, ash; strong odor and light sheen; [FILL]. From 20' - 25': No recovery.	710
20		5		WM			705
25		6	PID:7.9 D/O/S:No/ Strong/ Slight	WM		From 25': wood and plastic; strong odor and light sheen.	700
30		7	PID:1.5 D/O/S:No/ Strong/ Medium	PT		(PT): PEAT; very dark brown; wet; very soft, fibrous, mixed with trace waste material; strong odor and sheen; [NATIVE]. From 33': no waste material.	695
35		8	PID:1.1			BEDROCK; tan; pulverized bedrock, with trace wood and plastic. Limestone clast in shoe.	690
40						End of geoprobe 40.0 feet	685

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Date Boring Started: 3/23/18
 Date Boring Completed: 3/23/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-A4

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959649.765m, E:477388.457m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 38.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 5		1	PID:0.5 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; dark brown; moist; homogeneous, loose; 10% gravel, 70% sand, 20% fines, [FILL].	725
5 - 10		2	PID:2.1 D/O/S:No/ None/ None	WM		(WM): WASTE MATERIAL; gray; moist; with brick, wood, glass, mixed with ash and clay.	720
10 - 15		3	PID:170.4 D/O/S:No/ Moderate/ None			From 10': with wood and plastic; moderate odor.	715
15 - 20		4				From 15' - 20': No recovery.	710
20 - 25		5	PID:8.1 D/O/S:No/ Light/ Trace	PT		From 20': with wood and plastic, wet, loose/soupy; light odor and light rainbow sheen.	705
25 - 30		6	PID:71.9 D/O/S:No/ Moderate/ None			From 25': with wood, rubber, plastic; moderate odor.	700
30 - 35		7	PID:11.3 D/O/S:No/ Light/ None	CH		(PT): PEAT; dark yellowish brown; moist; fibrous; light organic odor; [NATIVE].	695
35 - 40		8	PID:3.0			From 30': soft, with few shells.	690
			PID:1.8 D/O/S:No/ None/ None			(ML): SILT; tan; moist; nonplastic, soft; [NATIVE]. (CH): FAT CLAY; gray; moist; stiff, high plasticity; [NATIVE].	
						End of geoprobe 38.0 feet	

Date Boring Started: 3/22/18
 Date Boring Completed: 3/22/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-A5

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959648.285m, E:477442.506m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 33.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
1		1	PID:0.4 D/O/S:No/ None/ None	SM		(SM): SILTY SAND; [FILL].	720
5			PID:0.8 D/O/S:No/ None/ None			Frozen to 2.5' bgs.	
2		2	PID:4.9 D/O/S:No/ Moderate/ None	CL		From 5.4' - 6': mixed with paper, wood, plaster; moderate chemical/burnt odor.	715
10			PID:1.1 D/O/S:No/ None/ None			From 10': wet.	
3		3	PID:24.5 D/O/S:No/ None/ None			(WM): WASTE MATERIAL; moist.	710
15			PID:26.7 D/O/S:No/ Slight/ None			From 15': with canvas, glass, wood, plaster, plastic; slight organic/burnt odor.	
4		4	PID:2.5 D/O/S:No/ Slight/ None	WM		From 20': wet, with black fine-grained material, plastic, wood, chalk; slight chemical odor.	705
20			PID:3.0 D/O/S:No/ Slight/ None				
5		5	PID:0.4 D/O/S:No/ None/ None			(PT): PEAT; very dark brown; moist; fibrous; [NATIVE].	700
25			PID:0.4 D/O/S:No/ None/ None				
6		6	PID:0.4 D/O/S:No/ None/ None	PT		From 30': more clay, less fibrous, with some shells.	695
30			PID:0.5 D/O/S:No/ None/ None				
7		7	PID:0.5 D/O/S:No/ None/ None				
35						End of geoprobe 33.0 feet	

Date Boring Started: 3/20/18
 Date Boring Completed: 3/20/18
 Logged By: ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-B1

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959595.631m, E:477220.286m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 25.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S U S S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
1		1	PID:0.3 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; brown; moist; homogeneous, firm, with fine to coarse gravel; 5% gravel, 70% sand, 25% fines, [FILL].	720
5		2	PID:0.3 D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; moist; alternating with layers of brown silty sand and waste material (brick and concrete). From 10': with more waste material (wood and brick).	715
10		3	PID:9.0 D/O/S:No/ Moderate/ None	WM		(WM): WASTE MATERIAL; black; moist; with wood, plastic, concrete; moderate odor.	710
15		4	PID:0.3 D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; wet; soft, nonplastic, homogeneous.	705
20		5	D/O/S:No/ None/ None	PT		(PT): PEAT; dark brown; fibrous, spongy; organic odor; [NATIVE].	700
25				CH		(CH): FAT CLAY; dark gray; high plasticity; [NATIVE].	
						BEDROCK; Prairie du Chien. End of geoprobe 25.0 feet	

Date Boring Started: 4/11/18
 Date Boring Completed: 4/11/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-B2

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959597.862m, E:477280.649m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 26.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0			D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	
1		1	PID:1.0 D/O/S:No/ Trace/ None	WM		(WM): WASTE MATERIAL; with plastic, wood; trace odor.	
5		2	D/O/S:Trace/ None/ None PID:0.3 D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; with trace wood debris. From 8': wet.	720
15		4	PID:3.7 D/O/S:No/ None/ None PID:1.1 D/O/S:No/ Light/ None	WM		(WM): WASTE MATERIAL; with wood, bricks, plastic; light odor.	710
25						BEDROCK.	705
26.0						End of geoprobe 26.0 feet	700

Date Boring Started: 3/27/18
 Date Boring Completed: 3/27/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-B3

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959595.385m, E:477337.108m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 725.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 30.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; Topsoil; [FILL]. (WM): WASTE MATERIAL; with brick, concrete, wood.	725
1		1	PID:5.5 D/O/S:No/ None/ None			From 0.5' - 5': mixed with silty sand.	
5		2				From 5' - 10': No recovery.	720
10		3	PID:5.5 D/O/S:No/ Strong/ None			From 10': with ash, wood, plastic; strong treated wood odor.	715
15		4	PID:20.5 D/O/S:No/ Moderate/ None	WM		From 15': with wood, green plastic; moderate odor.	710
20		5				From 20' - 25': No recovery.	705
25		6	PID:150.6 D/O/S:No/ Strong/ None			From 25': soupy ash matrix, with some plastic.	700
30			D/O/S:No/ None/ None	PT		(PT): PEAT; dark brown; moist; fibrous, spongy, soft; organic odor; [NATIVE].	695
30						End of geoprobe 30.0 feet	695

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Date Boring Started: 3/23/18
 Date Boring Completed: 3/23/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-B4

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959594.523m, E:477387.912m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 35.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0				SM		(SM): SILTY SAND with GRAVEL; fine to coarse grained; brown; moist; homogeneous; [FILL].	
1		1	PID:0.8 D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; moist; homogeneous, nonplastic, with some fine grained sand.	
5		2	D/O/S:No/ Strong/ None PID:222.8 D/O/S:No/ Strong/ None	WM		(WM): WASTE MATERIAL; dark gray; moist; sandy matrix, with wood and plastic. From 5': with treated wood; strong odor.	720
10		3	PID:175.6 D/O/S:No/ Strong/ None	WM		From 10': with treated wood and plastic; strong odor.	715
15		4	PID:122.9 D/O/S:No/ Strong/ None	WM		From 15': black silty sandy matrix, with treated wood and concrete.	710
20		5	PID:9.5 D/O/S:No/ Moderate/ None	WM		From 20': wet, with wood and shingles; moderate odor.	705
25		6	PID:15.1 D/O/S:No/ Moderate/ Moderate	WM		From 25': black granular matrix, with wood and glass; moderate odor and sheen.	700
30		7	PID:6.6 D/O/S:No/ Organic/ None	PT		(PT): PEAT; dark brown; moist; fibrous, firm; [NATIVE].	695
35				ML		(ML): SILT; dark grey to tan; wet; possibly pulverized limestone, very soft, homogeneous; sulfur/wetland odor; [NATIVE].	690
35.0						End of geoprobe 35.0 feet	

Date Boring Started: 3/22/18
 Date Boring Completed: 3/22/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-B5

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959595.345m, E:477435.754m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 725.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 35.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							725
0 - 1		1	PID:1.6 D/O/S:No/ None/ None PID:2.1 D/O/S:No/ None/ None	SM		(SM): SILTY SAND; fine to medium grained; moist; [FILL].	
1 - 5				ASH		(ASH): ASH; gray; moist; stiff.	
5 - 10		2	PID:11.1 D/O/S:No/ None/ None	WM		(WM): WASTE MATERIAL; moist; with wood debris. From 5': with paper.	720
10 - 15		3	PID:26.3 D/O/S:No/ None/ None	WM		From 10': black fine grained matrix, with wood, glass, plastic. At 12': refusal, offset ~10' south.	715
15 - 20		4	PID:30.9 D/O/S:Black/ Slight/ Moderate	WM		From 15': black fine grained matrix, with wood, plastic, granular blue/gray material (slight odor and moderate sheen).	710
20 - 25		5	PID:16.0 D/O/S:No/ None/ None	PT		(PT): PEAT; dark brown; moist; fibrous; [NATIVE]. From 20': wet, black fine grained matrix, with wood.	705
25 - 30		6	PID:1.2 D/O/S:No/ None/ None	PT		(PT): PEAT; dark brown; moist; fibrous; [NATIVE]. From 27': black, less fibrous, more clay.	700
30 - 32			PID:0.2 D/O/S:No/ None/ None	CL		(CL): SANDY LEAN CLAY; gray; moist; with fine grained sand, small to large round to subrounded gravel, increasing silt with depth; 25% gravel, 25% sand, 50% fines, [NATIVE].	695
32 - 34		7	PID:0.3 D/O/S:No/ None/ None	SC-SM		(SC-SM): CLAYEY SAND with SILT; fine to coarse grained; gray; wet; 5% gravel, 80% sand, 15% fines, [NATIVE]. From 32' - 33': more coarse grained sand.	
34 - 35			PID:0.5 D/O/S:No/ None/ None	SC-SM		From 34' - 35': more silt.	
35						End of geoprobe 35.0 feet	690

Date Boring Started: 3/20/18
 Date Boring Completed: 3/20/18
 Logged By: ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-C1

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959542.747m, E:477228.698m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 720.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 20.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0		1	PID:3.4 D/O/S:No/ None/ None	SM	(SM): SILTY SAND with GRAVEL; fine to coarse grained; brown; moist; firm; 5% gravel, 70% sand, 25% fines, [FILL].	720
5		2	PID:2.9 D/O/S:No/ Trace/ None D/O/S:No/ None/ None	WM	(WM): WASTE MATERIAL; moist; with paper, brick, wood, plastic.	715
10		3	PID:1.7 D/O/S:No/ None/ None D/O/S:No/ None/ None	ASH	(ASH): ASH; gray; moist; soft, nonplastic. From 10': wet.	710 705
15		4	PID:0.9 D/O/S:No/ Organic/ None D/O/S:No/ None/ None D/O/S:No/ None/ None	PT CH	(PT): PEAT; moist; organic odor; [NATIVE]. (CH): FAT CLAY; moist; [NATIVE]. BEDROCK; moist.	700
20					End of geoprobe 20.0 feet	

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Date Boring Started: 4/11/18
 Date Boring Completed: 4/11/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-C2

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959537.967m, E:477282.676m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 22.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	
1		1	PID:21.7 D/O/S:No/ None/ None			(WM): WASTE MATERIAL; moist; with greenish gray clay, wood, brick, plastic.	720
5		2	PID:23.8 D/O/S:No/ None/ None			From 5': with cement and wood.	
10		3	PID:33.0 D/O/S:No/ Moderate/ Trace			From 10': No recovery (offset), with wood, brick, plastic; moderate odor and trace sheen.	715
15		4	PID:8.0			From 15': with plastic and wood; moderate odor.	710
20		5				(PT): PEAT; dark brown; moist; fibrous, spongy; [NATIVE].	705
						BEDROCK.	
						End of geoprobe 22.0 feet	

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Date Boring Started: 3/27/18
 Date Boring Completed: 3/27/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF Geoprobe FD-SB-C3

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959539.675m, E:477336.735m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 22.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0		1	PID:0.4 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; fine to coarse grained; brown; moist; 10% gravel, 70% sand, 20% fines, [FILL].	725
5		2	PID:11.0 D/O/S:No/ Moderate/ Trace	ASH		(ASH): ASH; gray; moist; soft, massive, nonplastic.	720
10		3	PID:21.0 D/O/S:No/ Moderate/ None	WM		(WM): WASTE MATERIAL; with treated wood and brick; moderate odor and trace sheen. From 10': with brick, wood, concrete.	715
15		4	PID:14.6 D/O/S:No/ Moderate/ None	ML		(ML): SILT; tan; moist; dense, spongy, nonplastic, with organic material; [NATIVE].	710
20		5	PID:3.5 D/O/S:No/ None/ None	PT		(PT): PEAT; dark brown; moist; fibrous, spongy, soft to firm; organic odor; [NATIVE].	705
22.0						BEDROCK. End of geoprobe 22.0 feet	

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Date Boring Started: 3/22/18
 Date Boring Completed: 3/22/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-C4

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959545.138m, E:477388.104m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 26.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCSU	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
1		1	PID:1.0 D/O/S:No/ None/ None	SM	(SM): SILTY SAND with GRAVEL; medium to coarse grained; brown; moist; homogeneous; 10% gravel, 70% sand, 20% fines, [FILL].	725	
2		2	PID:1.0 D/O/S:No/ Light/ None PID:23.7 D/O/S:No/ Moderate/ Trace	ASH	(ASH): ASH; gray; moist; homogeneous, firm, nonplastic.		
5				WM	(WM): Waste Material; moist; black silty sandy matrix, with wood; light odor. From 5': with treated wood and metal; moderate odor and trace sheen.	720	
10		3	PID:84.9 D/O/S:No/ Strong/ Trace		From 10': with wood, paper, concrete, metal, fabric; light to strong odor and trace sheen.	715	
15		4	PID:60.4 D/O/S:No/ Moderate/ None		From 15': with treated wood; moderate odor.	710	
20		5	PID:72.1 D/O/S:No/ Light/ None		From 20': light gray sandy matrix, with concrete and wood; light odor.	705	
25		6	PID:2.1		BEDROCK; gray; weathered Prairie du Chien, positive HCl reaction.	700	
26.0					End of geoprobe 26.0 feet		

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Date Boring Started: 3/22/18
 Date Boring Completed: 3/22/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-C5

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959541.842m, E:477441.886m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 727.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 30.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0		1	PID:0.4 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	725
0			PID:0.4 D/O/S:No/ None/ None	ASH		(ASH): ASH; dark gray; moist; stiff.	
5		2	PID:18.3 D/O/S:No/ None/ None	WM		(WM): WASTE MATERIAL; moist. From 5': with wood, plastic, paper, fabric.	720
10		3	PID:16.0 D/O/S:No/ Slight/ Trace			From 10': with wood, plastic, rubber; slight odor and light/trace sheen.	715
15		4	PID:15.4 D/O/S:No/ Moderate/ Heavy			From 15': with wood, plastic, brick, concrete rubber; moderate odor and heavy sheen.	710
20		5	PID:5.0 D/O/S:No/ None/ None			From 20': black fine grained matrix, with wood and blue powder.	705
25		6	PID:1.1 D/O/S:No/ Organic/ None			SP	
30						End of geoprobe 30.0 feet	

Date Boring Started: 3/20/18
 Date Boring Completed: 3/21/18
 Logged By: ARP2/ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-D1

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959487.867m, E:477223.484m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 25.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 3		1	PID:0.3 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; fine to coarse grained; dark brown; moist; 5% gravel, 70% sand, 25% fines, [FILL]. From 3': no gravel, yellowish brown.	720
3 - 6		2	PID:1.4 D/O/S:No/ None/ None	SP		(SP): POORLY GRADED SAND; medium grained; yellowish brown; moist; homogeneous, some iron oxidation from 6.5'-7' bgs; 0% gravel, 95% sand, 5% fines, [FILL].	715
6 - 10		3	D/O/S:No/ None/ None PID:3.9 D/O/S:No/ Trace/ None	CL		(CL): SANDY LEAN CLAY; olive green/gray; moist; stiff, low plasticity, with fine to medium grained sand and trace fine gravel; 0% gravel, 30% sand, 70% fines, [FILL].	
10 - 15				WM		(WM): WASTE MATERIAL; moist; black silty matrix, with wood, concrete; trace odor.	710
15 - 20		4	PID:6.9 D/O/S:No/ Light/ None D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; wet; soft, nonplastic.	705
20 - 24		5	PID:0.3 D/O/S:No/ None/ None	PT		(PT): PEAT; organic odor; [NATIVE].	700
24 - 25			PID:0.3 D/O/S:No/ Organic/ None	CH		(CH): FAT CLAY; [NATIVE].	
25						BEDROCK. End of geoprobe 25.0 feet	

Date Boring Started: 4/11/18
 Date Boring Completed: 4/11/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-D2

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959489.374m, E:477282.117m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 23.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; medium to coarse grained; brown; moist; homogeneous; [FILL].	
1		1	D/O/S: No/ None/ None PID: 8.1 D/O/S: No/ Light/ None	SM			720
5		2	PID: 26.1 D/O/S: No/ Strong/ None			(WM): WASTE MATERIAL; moist; with wood and plastic; light odor. From 5': sandy silty matrix, with wood, brick, plastic; strong odor.	
10		3	PID: 26.3 D/O/S: No/ Strong/ None	WM		From 10': with wood and fabric; strong odor.	715
15		4				From 15' - 20': No recovery.	710
20		5	PID: 0.7 D/O/S: No/ None/ None			BEDROCK.	705
23.0						End of geoprobe 23.0 feet	

Date Boring Started: 3/27/18
 Date Boring Completed: 3/27/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-D3

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959490.852m, E:477334.012m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 24.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0		1	D/O/S: No/ None/ None PID: 8.8 D/O/S: No/ Moderate/ None	SM		(SM): SILTY SAND with GRAVEL; brown; moist; homogeneous; 10% gravel, 70% sand, 20% fines, [FILL].	725
5		2	D/O/S: No/ Moderate/ None PID: 36.0 D/O/S: No/ Moderate/ None			WASTE MATERIAL; black; moist; with wood and fabric; moderate odor. From 10': shingles with wood.	720
10		3	D/O/S: No/ Moderate/ None PID: 15.9 D/O/S: No/ Moderate/ Trace			From 15': with wood and metal; moderate odor and trace sheen.	715
15		4					710
20		5	D/O/S: No/ None/ None PID: 0.9 D/O/S: No/ None/ None	PT CH	 	(PT): PEAT; dark brown; moist; fibrous, spongy; [NATIVE]. (CH): FAT CLAY; dark gray; moist; soft, high plasticity, massive; [NATIVE].	705
						BEDROCK.	
25						End of geoprobe 24.0 feet	
30							
35							
40							

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Date Boring Started: 3/26/18
 Date Boring Completed: 3/26/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-D4

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959491.983m, E:477392.633m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 727.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 22.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 5		1	D/O/S: No/ None/ None PID: 20.6 D/O/S: No/ Light/ None	SM		(SM): SILTY SAND with GRAVEL; medium to coarse grained; dark brown; moist; homogeneous; [FILL].	725
5 - 10		2	PID: 142.0 D/O/S: No/ Moderate/ Trace	WM		(WM): WASTE MATERIAL; moist; with wood; light odor. From 5': with wood, plastic, rubber; moderate odor and trace sheen.	720
10 - 15		3	PID: 29.2 D/O/S: No/ Moderate/ Trace			From 10': silty matrix, with wood and glass; moderate odor and trace sheen.	715
15 - 20		4	PID: 14.0 D/O/S: No/ Moderate/ None			From 15': silty matrix, with wood and semi-cohesive white granular material; moderate odor.	710
20 - 22		5	PID: 19.5 D/O/S: No/ None/ None	PT		(PT): PEAT; dark brown; moist; fibrous; [NATIVE].	705
22.0						BEDROCK; limestone.	
22.0						End of geoprobe 22.0 feet	

Date Boring Started: 3/22/18
 Date Boring Completed: 3/22/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-D5

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959490.67m, E:477440.97m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 728.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 23.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S O S U	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	
1		1	D/O/S:No/ None/ None PID:1.3 D/O/S:No/ None/ None		SM		
2		2	D/O/S:No/ Light/ None PID:67.1 D/O/S:No/ Strong/ None		ASH	(ASH): ASH; gray; moist; firm, massive, nonplastic. (WM): WASTE MATERIAL; dark gray fine grained matrix, with plastic; light odor. From 5': wet, black matrix, with wood, plastic; moderate to strong odor.	725
3		3			WM	From 10' - 15': No recovery (wood chunk jammed in liner).	720
4		4	PID:102.5 D/O/S:No/ Light/ None			From 15': with wood, plastic; light odor.	715
5		5	D/O/S:No/ Light/ None D/O/S:No/ None/ None			From 20': with metal, wood; light odor. BEDROCK; tan; moist; Prairie du Chien, friable, sandy.	710
23.0						End of geoprobe 23.0 feet	705

Date Boring Started: 3/21/18
 Date Boring Completed: 3/21/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-E1

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959442.725m, E:477224.855m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 25.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; fine to medium grained; dark brown; moist; [FILL].	
1		1	PID:0.9 D/O/S:No/ None/ None	SM			
5				CL/ML		(CL/ML): LEAN CLAY with SILT; gray; moist; soft, low plasticity, mixed with trace glass and ash.	720
5		2	PID:1.8 D/O/S:No/ None/ None	SM		(SM): SILTY SAND; brown; moist; with few coarse sand and trace clay.	
10		3	PID:7.6 D/O/S:No/ Light/ None D/O/S:No/ Moderate/ None	WM		(WM): WASTE MATERIAL; moist; gray silty sandy matrix, with concrete and brick. From 10': same; light odor. From 12': silty matrix, with wood, paper, plastic, glass; moderate odor.	715 710
15		4	PID:4.6 D/O/S:No/ Light/ None D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; wet; soft, nonplastic.	705
25		5		PT		(PT): PEAT; moist; fibrous; organic odor; [NATIVE].	
				CH		(CH): FAT CLAY; moist; [NATIVE].	700
						BEDROCK.	
						End of geoprobe 25.0 feet	

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Date Boring Started: 4/11/18
 Date Boring Completed: 4/11/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF Geoprobe FD-SB-E2

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959434.995m, E:477283.694m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 725.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 22.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	725
1		1	D/O/S:No/ None/ None PID:10.5 D/O/S:No/ Moderate/ None	SM			
5		2	PID:16.1 D/O/S:No/ Moderate/ None	WM		(WM): WASTE MATERIAL; dark gray; moist; with wood, plastic; moderate treated wood odor. From 5': sandy matrix, with wood; moderate odor.	720
10		3	PID:36.6 D/O/S:Yes/ Moderate/ None D/O/S:Black/ None/ None	ASH		From 10': with wood and plywood; moderate treated wood odor. (ASH): ASH; dark gray; moist to wet; soft, massive; black discoloration.	715
15		4		ASH		From 15' - 20': No recovery.	710
20		5	PID:6.6 D/O/S:No/ None/ None			From 20': wet.	705
22						At 22': Bedrock.	
22.0						End of geoprobe 22.0 feet	

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Date Boring Started: 3/27/18
 Date Boring Completed: 3/27/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-E3

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959432.864m, E:477334.097m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 727.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 25.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 1		1	PID:0.4 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; brown; moist; homogeneous; [FILL].	725
1 - 5			D/O/S:No/ Light/ None	ASH		(ASH): ASH; gray; moist; homogeneous, stiff, nonplastic.	
5 - 10		2	PID:8.6 D/O/S:No/ Moderate/ None	WM		(WM): WASTE MATERIAL; with glass and wood. From 5': with wood and fibrous material; moderate odor.	720
10 - 15						[offset, no recovery from 10'].	
15 - 20		3	PID:3.4 D/O/S:No/ Trace/ None	ASH		(ASH): ASH; gray; moist to wet; soft to stiff, homogeneous, with trace wood; trace odor.	715
20 - 25		4	PID:1.9 D/O/S:No/ None/ None	ASH		From 15': no wood, no odor. From 18.5': wet.	710
25 - 25.0		5	D/O/S:No/ None/ None			BEDROCK; limestone.	705
25.0						End of geoprobe 25.0 feet	

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Date Boring Started: 3/26/18
 Date Boring Completed: 3/26/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-E4

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959439.703m, E:477389.367m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 728.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 23.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 1		1	D/O/S:No/ None/ None PID:4.5 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; brown; moist; with organic material; [FILL].	725
1 - 5			PID:4.9 D/O/S:No/ Light/ None	ASH		(ASH): ASH; moist; with sand and waste material (plastic).	
5 - 10		2	PID:14.5 D/O/S:No/ None/ None	WM		(WM): WASTE MATERIAL; moist; with wood, concrete, rock.	720
10 - 15		3	PID:20.6 D/O/S:No/ Moderate/ None			From 15': with wood; moderate treated wood odor.	715
15 - 20		4	PID:4.5 D/O/S:No/ None/ None			From 20': with wood.	710
20 - 23.0		5				End of geoprobe 23.0 feet	705

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Date Boring Started: 3/22/18
 Date Boring Completed: 3/22/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF Geoprobe FD-SB-E5

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959445.53m, E:477442.964m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 727.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 23.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0		1	D/O/S:No/ None/ None PID:34.5 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; dark gray; moist; firm, massive; [FILL].	725
0			D/O/S:No/ None/ None PID:342.8 D/O/S:No/ Strong/ None	ASH		(ASH): ASH; gray; moist; stiff, massive, nonplastic.	
5		2				(WM): WASTE MATERIAL; gray; moist; with wood, bricks, plastic. From 5': with wood, fabric, shingles; strong solvent/petroleum odor.	720
10		3		WM		From 10' - 15': No recovery.	715
15		4	D/O/S:No/ Moderate/ None			From 15': with wood and fibrous material.	710
20		5	PID:35.5 D/O/S:No/ None/ None			From 20': with plastic and wood. BEDROCK; light yellowish brown; Prairie du Chien limestone.	705
23.0						End of geoprobe 23.0 feet	

Date Boring Started: 3/21/18
 Date Boring Completed: 3/21/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-F1

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959384.109m, E:477229.626m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 722.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 16.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						
1		1	D/O/S:No/ None/ None PID:1.5 D/O/S:No/ None/ None	SP	(SP): POORLY GRADED SAND with SILT; medium grained; brown; moist; homogeneous, with trace fine gravel; trace% gravel, 90% sand, 10% fines, [FILL].	720
5				SM	(SM): SILTY SAND; fine to coarse grained; olive gray; moist; homogeneous; 0% gravel, 75% sand, 25% fines, [FILL].	
2		2	D/O/S:No/ Trace/ None PID:3.5	WM	(WM): WASTE MATERIAL; sandy matrix, with wood, plastic; trace odor.	715
10				ASH	(ASH): ASH; gray; wet; soft, homogeneous, with few wood debris.	710
15		4	D/O/S:No/ Organic/ None PID:0.6 PID:0.3 D/O/S:No/ None/ None	PT CL	(PT): PEAT; dark brown; moist; fibrous, spongy; organic odor; [NATIVE]. (CL): LEAN CLAY; dark gray; moist; [NATIVE].	
					BEDROCK. End of geoprobe 16.0 feet	

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Date Boring Started: 4/12/18
 Date Boring Completed: 4/12/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-F2

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959375.135m, E:477282.735m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 24.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						725
1		1	PID:6.5 D/O/S:No/ None/ None	SM	(SM): SILTY SAND with GRAVEL; brown; moist; compact, massive; 10% gravel, 70% sand, 20% fines, [FILL].	725
5			D/O/S:No/ None/ None D/O/S:No/ None/ None	ASH	(ASH): ASH; dark gray; moist; nonplastic, stiff, more clay at 6' bgs.	720
10		2	PID:13.2 D/O/S:No/ Moderate/ None	WM	(WM): WASTE MATERIAL; moist; dark gray sandy matrix, with wood, glass, plastic; moderate treated wood odor.	715
15		3	PID:16.2 D/O/S:No/ Moderate/ None	WM		715
15		4	PID:8.8 D/O/S:Black/ Moderate/ None D/O/S:No/ None/ None	ASH	From 15': wet, silty matrix, with green plastic and wood; black discoloration. (ASH): ASH; gray; wet; soft, sandy, massive.	710
20			D/O/S:No/ None/ None	ASH		705
25		5		PT	(PT): PEAT; dark brown; moist; fibrous, spongy; organic odor; [NATIVE].	
25					BEDROCK.	
25					End of geoprobe 24.0 feet	

Date Boring Started: 3/27/18
 Date Boring Completed: 3/27/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-F3

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959377.367m, E:477335.344m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 727.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 24.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0			D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; moist; [FILL].	
1		1	PID:4.2 D/O/S:No/ Light/ None			WASTE MATERIAL; black sandy matrix, with paper, wood, plastic; light odor.	725
5		2	PID:17.0 D/O/S:No/ Moderate/ None			From 5': silty matrix.	720
10		3	PID:26.5 D/O/S:No/ Moderate/ None				715
15		4	D/O/S:No/ Moderate/ None PID:3.5 D/O/S:No/ None/ None	ASH		(ASH): ASH; dark gray; wet; homogeneous, soft, nonplastic.	710
20		5	D/O/S:No/ None/ None PID:0.9 D/O/S:No/ Organic/ None D/O/S:No/ None/ None	PT CH		(PT): PEAT; moist; strong organic odor; [NATIVE]. (CH): FAT CLAY; moist; strong organic odor; [NATIVE].	705
24						BEDROCK; limestone.	
24.0						End of geoprobe 24.0 feet	

Date Boring Started: 3/26/18
 Date Boring Completed: 3/26/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-F4

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959384.681m, E:477385.94m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 728.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 15.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	
1		1	PID:6.9 D/O/S:No/ None/ None	SM		(WM): WASTE MATERIAL; dark brown sandy matrix, with plastic and wood.	725
5		2	PID:56.9 D/O/S:No/ Moderate/ Slight	WM		From 5': brown sandy matrix, with wood, plastic, glass; moderate odor and light sheen.	720
10		3	PID:7.3 D/O/S:No/ Moderate/ None	WM		From 10': gray silty matrix, with wood; treated wood odor.	715
15						[offset due to refusal at 14', second refusal at 15'] End of geoprobe 15.0 feet	

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Date Boring Started: 3/21/18
 Date Boring Completed: 3/21/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-F5

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959389.466m, E:477440.794m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 728.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 15.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S U C S U	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0		1	D/O/S: No/ None/ None PID: 9.0 D/O/S: No/ Moderate/ None	SM		(SM): SILTY SAND with GRAVEL; moist; compact; [FILL].	
0				ASH		(ASH): ASH; gray; moist; homogeneous, stiff, nonplastic.	
5		2	PID: 119.8 D/O/S: No/ Moderate/ None	WM		(WM): WASTE MATERIAL; with plastic and wood; moderate odor.	725
5						From 5': black/dark gray matrix, with plastic and wood; moderate odor.	
10		3	PID: 99.5 D/O/S: No/ Light/ None			From 10': black matrix, with wood and plastic; light odor.	720
15						Bedrock in shoe, refusal.	715
15						End of geoprobe 15.0 feet	

Date Boring Started: 3/21/18
 Date Boring Completed: 3/21/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-G1

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959329.617m, E:477227.442m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 724.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 23.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
1		1	PID:0.6 D/O/S:No/ None/ None	SP-SM		(SP-SM): POORLY GRADED SAND with SILT; fine to coarse grained; brown; moist; homogeneous, with trace fine gravel; trace% gravel, 90% sand, 10% fines, [FILL].	720
5		2	PID:0.9 D/O/S:No/ None/ None	SM		(SM): SILTY SAND; very dark brown; moist; with fine gravel; 5% gravel, 75% sand, 20% fines, [FILL].	715
10		3	PID:0.9 D/O/S:No/ None/ None	SM			
15		4	PID:0.6 D/O/S:No/ None/ None	ASH		(ASH): ASH; gray; wet; soft, homogeneous, with few white very fine grained flecks.	710
20		5	PID:0.2 D/O/S:No/ None/ None	PT		(PT): PEAT; very dark brown; moist; fibrous, organic odor; [NATIVE].	705
23.0			PID:0.0 D/O/S:No/ Organic/ None			BEDROCK.	
25						End of geoprobe 23.0 feet	

Date Boring Started: 4/12/18
 Date Boring Completed: 4/12/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-G2

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959314.193m, E:477284.823m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 725.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 19.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S O S U	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; compact, massive; [FILL].	725
1		1	PID:0.2 D/O/S:No/ None/ None		SM		
5		2	PID:0.2 D/O/S:No/ None/ None		ASH	(ASH): ASH; gray; moist; homogeneous, soft, nonplastic, with very little waste mixed.	720
10		3	PID:3.6 D/O/S:No/ Moderate/ None		WM	(WM): WASTE MATERIAL; moist to wet; black matrix, with plastic, paper, wood; moderate odor.	715
15		4	PID:0.1 D/O/S:No/ None/ None		ASH	(ASH): ASH; gray; wet; homogeneous, soft, nonplastic, increasingly granular.	710
			PID:0.1 D/O/S:No/ None/ None		PT	(PT): PEAT; moist; [NATIVE].	
			PID:0.1 D/O/S:No/ None/ None			BEDROCK; moist.	
20						End of geoprobe 19.0 feet	

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Date Boring Started: 3/26/18
 Date Boring Completed: 3/26/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-G3

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959336.563m, E:477338.452m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 730.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 24.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S O S C	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	730
1		1	PID:0.2 D/O/S:No/ None/ None	SM			
5		2	D/O/S:No/ None/ None D/O/S:No/ None/ None PID:1.2 D/O/S:No/ Moderate/ Trace D/O/S:No/ None/ None			(WM): WASTE MATERIAL; moist; silty matrix, with brick, wood, light debris. From 5': silty matrix, with wood, paper, plastic.	725
10		3	PID:22.7 D/O/S:No/ Strong/ None	WM		[refusal at 9' bgs, offset]. From 10': with concrete and treated wood; strong odor.	720
15		4	PID:29.7 D/O/S:No/ Moderate/ Trace			From 15': with treated wood; strong odor and trace sheen.	715
20		5				BEDROCK.	710
25						End of geoprobe 24.0 feet	

Date Boring Started: 3/26/18
 Date Boring Completed: 3/26/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe FD-SB-G4

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959302.264m, E:477388.464m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 727.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 21.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0				SM	(SM): SILTY SAND with GRAVEL; brown; moist; compact, homogeneous; 10% gravel, 70% sand, 20% fines, [FILL].	
1		1	PID:0.4 D/O/S:No/ None/ None		(ASH): ASH; dark gray; moist to wet; compact, stiff, nonplastic.	725
5			D/O/S:No/ None/ None	ASH		
2		2	PID:51.0 D/O/S:No/ Strong/ None		(WM): WASTE MATERIAL; moist; black sandy matrix, with paper, plastic, wood; strong treated wood odor.	720
10			PID:38.6 D/O/S:No/ Strong/ None	WM	From 10': with concrete, glass, plastic, wood; strong odor.	715
15		3	D/O/S:No/ Strong/ None	PT	(PT): PEAT; [NATIVE].	
4		4	PID:1.1 D/O/S:No/ None/ None	CH	(CH): FAT CLAY; [NATIVE].	710
20		5			BEDROCK; crushed/weathered.	
21.0					End of geoprobe 21.0 feet	

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Date Boring Started: 3/26/18
 Date Boring Completed: 3/26/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF Geoprobe FD-SB-G5

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959341.95m, E:477443.476m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 730.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 14.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	730
1		1	PID:2.5 D/O/S:No/ None/ None	SM			
5				ASH		(ASH): ASH; gray; moist.	
5		2	PID:16.0 D/O/S:No/ Light/ None			(WM): WASTE MATERIAL; black sandy matrix, with brick, slag, wood, plastic; light odor.	725
10				WM		From 10': black silty matrix, with wood and plastic; light odor.	720
10		3	PID:12.1 D/O/S:No/ Light/ None				
14						[Refusal at 14' bgs, metal on bedrock]. End of geoprobe 14.0 feet	

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Date Boring Started: 3/21/18
 Date Boring Completed: 3/21/18
 Logged By: ABW
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF Geoprobe TS-SB-01

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960152.756m, E:476966.31m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 711.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 23.5 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 1		1	PID:1 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; medium grained; dark grayish brown; moist; 5% gravel, 80% sand, 15% fines, [FILL].	710
1 - 5		2	D/O/S:No/ Slight/ None PID:7.7 D/O/S:No/ Slight/ Trace			WASTE MATERIAL; moist; black silty matrix, with plastic, wood; slight odor.	
5 - 10		2	PID:23.6 D/O/S:No/ Strong/ Moderate			From 6.5': asphalt debris; strong petroleum odor and moderate sheen.	705
10 - 15		3	PID:6.9 D/O/S:No/ None/ None	SP		(SP): POORLY GRADED SAND; medium grained; dark gray; moist; homogeneous, little fine gravel; [FILL].	700
15 - 16.5			PID:16.5 D/O/S:No/ None/ None			(WM): WASTE MATERIAL; moist; silty matrix, with wood, concrete, brick.	
16.5 - 20		4	PID:1.4 D/O/S:No/ None/ None	WM			695
20 - 21			PID:1.4 D/O/S:No/ None/ None	PT		(PT): PEAT; very dark brown; moist; fibrous, spongy; [NATIVE].	
21 - 23.5		5	PID:0.8 D/O/S:No/ None/ None	OH		(OH): ORGANIC CLAY; very dark gray; moist; homogeneous, soft, medium to high plasticity, with shells; [NATIVE].	690
23.5						BEDROCK.	
						End of geoprobe 23.5 feet	

Date Boring Started: 4/12/18
 Date Boring Completed: 4/12/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF Geoprobe TS-SB-02

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960110.853m, E:477006.688m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 712.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 25.5 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
1		1	PID:0.7 D/O/S:No/ None/ None	SP		(SP): POORLY GRADED SAND; fine to medium grained; light to dark brown; moist; homogeneous, little fine gravel, [fill]; 5% gravel, 90% sand, 5% fines, [FILL].	710
5		2	PID:0.6 D/O/S:No/ None/ None PID:0.6 D/O/S:Black/ None/ None PID:0.6 D/O/S:Black/ None/ Trace			(SM): SILTY SAND with GRAVEL; grayish brown; moist; 10% gravel, 70% sand, 20% fines, [FILL]. From 7.5' - 8': few black discolorations, wood, trace sheen.	705
10		3	PID:6 D/O/S:No/ None/ None				700
15		4	PID:0.6 D/O/S:No/ None/ None	SM		From 16': moist to wet.	695
20		5	PID:0.3 D/O/S:No/ None/ None			From 20': gray.	690
25		6	PID:0.5 D/O/S:No/ None/ None				
25.5			D/O/S:No/ None/ None			End of geoprobe 25.5 feet	

Date Boring Started: 4/12/18
 Date Boring Completed: 4/12/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF Geoprobe TS-SB-03

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960096.446m, E:477037m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 708.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 14.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 1		1	PID:0.2 D/O/S:No/ None/ None	SP-SM		(SP-SM): POORLY GRADED SAND with SILT; light brown; moist; [FILL].	705
1 - 5			PID:0.5 D/O/S:No/ Light/ Slight			(WM): WASTE MATERIAL; moist; black silty sandy matrix; light organic odor andn light sheen.	
5 - 10		2		WM		From 5' - 10': No recovery.	700
10 - 14		3	PID:0.3 D/O/S:No/ None/ None	OH		(OH): ORGANIC CLAY; dark gray; moist; high plasticity, with trace shells; [NATIVE].	695
14 - 15						End of geoprobe 14.0 feet	
15 - 30							

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Date Boring Started: 4/12/18
 Date Boring Completed: 4/12/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF Geoprobe TS-SB-04

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960095.736m, E:477010.702m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 711.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 20.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCSU	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 1		1	PID:0 D/O/S:No/ None/ None	SM		(SM): SILTY SAND; fine grained; brown to gray; moist; [FILL].	710
1 - 5			PID:0.9 D/O/S:No/ None/ None	SP-SM		(SP-SM): POORLY GRADED SAND with SILT; medium to coarse grained; black; moist; with some asphalt-like material; [FILL].	
5						At 5.5': large brick/concrete clast.	
5 - 10		2	PID:0.2 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; fine to coarse grained; gray; moist; [FILL].	705
10 - 15		3	PID:0.6 D/O/S:No/ None/ None	WM		(WM): WASTE MATERIAL; silty sand fill intermixed with waste material.	700
15 - 20		4	PID:3.5 D/O/S:No/ None/ None			BEDROCK; weathered.	695
20						End of geoprobe 20.0 feet	

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Date Boring Started: 4/13/18
 Date Boring Completed: 4/13/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF Geoprobe TS-SB-05

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960183.746m, E:477003.406m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 712.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 24.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						
0 - 1		1	PID:0.9 D/O/S:No/ None/ None D/O/S:No/ None/ None	SM	(SM): SILTY SAND with GRAVEL; dark brown; moist; 10% gravel, 70% sand, 20% fines, [FILL].	710
1 - 1.5					At 1.5': crushed concrete.	
1.5 - 5			PID:2.1 D/O/S:No/ None/ None D/O/S:Trace/ Trace/ None	ML	(ML): SILT; dark gray; moist; with fine grained sand, homogeneous, nonplastic.	
5 - 6					(SP): POORLY GRADED SAND; fine grained; gray; moist; homogeneous, few fine gravel; trace dark discoloration and odor at bottom of sample; [FILL].	
6 - 10		2	PID:36.7 D/O/S:No/ Moderate/ Trace	WM	(WM): WASTE MATERIAL; moist; with wood, glass, plastic; moderate odor and trace sheen.	705
10 - 16.5		3	PID:9.8 D/O/S:No/ Moderate/ Slight D/O/S:No/ None/ None	OH	(OH): ORGANIC CLAY; dark gray; moist; few fine grained sand and silt, few shells, medium plasticity; [NATIVE].	700
16.5 - 20		4	PID:1.7 D/O/S:No/ None/ None PID:1.1 D/O/S:No/ None/ None	OH	At 16.5 possible waste material observed, below 16.5' clay is black with increasing plasticity and shells.	695
20 - 21					At 20.5': few fine gravel.	
21 - 24		5	PID:0.7 D/O/S:No/ None/ None PID:0.4 D/O/S:No/ None/ None	SM	(SM): SILTY SAND; very fine to fine grained; gray; moist to wet; homogeneous, nonplastic fines; 0% gravel, 70% sand, 30% fines.	690
24 - 25					BEDROCK.	
25 - 24.0					End of geoprobe 24.0 feet	

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Date Boring Started: 4/13/18
 Date Boring Completed: 4/13/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe TS-SB-06

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960177.95m, E:476939.906m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 708.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 18.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(OL/OH): TOPSOIL; black; moist; silty/organic; [FILL].	
		1	PID:0.5 D/O/S:No/ None/ None		OL/OH		
					SP	(SP): POORLY GRADED SAND; fine to medium grained; light brown; moist; 5% gravel, 90% sand, 5% fines, [FILL].	
			PID:0.6 D/O/S:No/ None/ None		SM	(SM): SILTY SAND with GRAVEL; gray; moist; 10% gravel, 60% sand, 30% fines, [FILL].	705
5			PID:2.6 D/O/S:No/ Light/ None			(WM): WASTE MATERIAL; moist; black sandy matrix, with wood; light odor.	
		2			WM	From 5': black sandy matrix, with wood, concrete, styrofoam, shingles, plastic; light odor and light 'film' (no sheen).	700
10			PID:15.2 D/O/S:No/ Light/ None				
		3					
			PID:1.4 D/O/S:No/ None/ None			(OH): ORGANIC CLAY; black; moist; with shells and few very fine sand, soft to firm, medium to high plasticity, less sand with depth; 0% gravel, 10% sand, 90% fines, [NATIVE].	695
15					OH		
		4	PID:0.6 D/O/S:No/ None/ None				
20						End of geoprobe 18.0 feet	690

Date Boring Started: 4/13/18
 Date Boring Completed: 4/13/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF Geoprobe TS-SB-07

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960146.303m, E:476981.276m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 712.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 26.5 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S O S C	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						(SM); SILTY SAND with GRAVEL; gray; moist; homogenous, dense; 5% gravel, 70% sand, 25% fines, [FILL].	712.0
1		1	PID:0.5 D/O/S:No/ None/ None				
5		2	PID:0.6 D/O/S:No/ None/ None				705
10		3	PID:0.4 D/O/S:No/ None/ None				700
15		4	PID:1 D/O/S:No/ None/ None	SM			695
20		5	PID:0.8 D/O/S:No/ None/ None			At 20': wet.	690
25		6	PID:1.3 D/O/S:No/ None/ None				
26.5			PID:0.5 D/O/S:No/ None/ None				
			PID:0.4 D/O/S:No/ None/ None				
			PID:0.2 D/O/S:No/ None/ None				
			PID:0.1 D/O/S:No/ None/ None				
						BEDROCK.	
						End of geoprobe 26.5 feet	

Date Boring Started: 4/13/18
 Date Boring Completed: 4/13/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF Geoprobe TS-SB-08

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4960113.988m, E:476934.666m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726.0 ft
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 28.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							725
1		1	PID:0.1 D/O/S:No/ None/ None	SM		(SM): SILTY SAND with GRAVEL; gray; moist; homogenous, dense, with trace clay and fine gravel; 10% gravel, 50% sand, 40% fines, [FILL].	
5		2	PID:2.6 D/O/S:No/ Light/ None			(WM): WASTE MATERIAL; black matrix, with wood, plastic; light odor.	
10		3	PID:7.6 D/O/S:No/ Strong/ Trace			From 5': with wood, brick, plastic; at 6.8' soft, gooey, white substance with strong odor observed.	720
15		4	PID:24.8 D/O/S:No/ Strong/ Moderate			From 10': with wood, paper, plastic, insulating material; strong odor.	715
20		5	PID:27.9 D/O/S:No/ Moderate/ Moderate	WM		From 15': with abundant paper.	710
25		6	PID:5.1 D/O/S:No/ Moderate/ None			From 20': sandy matrix, with wood and fabric.	705
28						From 25' - 28': No recovery.	700
28						End of geoprobe 28.0 feet	

Date Boring Started: 4/13/18
 Date Boring Completed: 4/13/18
 Logged By: ABW/ARP2
 Drilling Contractor: Range Environmental Drilling
 Drill Rig: Geoprobe

Remarks:

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Appendix A-2

Cover Soil Investigation Boring Logs



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LOG OF GEOPROBE FD-SB-A4 (19)

SHEET 1 OF 1

Project: Freeway Dump and Landfill Surface Elevation: 726 ft MSL*
 Project No.: 23191372 Drilling Method: Geoprobe
 Location: Burnsville, MN Sampling Method: Dual-Tube
 Coordinates: UTM 15 N:4959649.765m, E:477388.457m Completion Depth: 5.0 ft
 Datum: NAD 83; UTM Zone 15

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					(SM): SILTY SAND with GRAVEL; dark brown; moist; homogeneous, loose; 10% gravel, 70% sand, 20% fines, [FILL].	
1		1	SM			
5			ASH		(ASH): ASH; gray; moist; massive.	
5.0					End of geoprobe 5.0 feet	
10						
15						
20						
25						
30						

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Date Boring Started: 3/29/19
 Date Boring Completed: 3/29/19
 Logged By: AKS3/EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

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



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LOG OF GEOPROBE FD-SB-B1 (19)

SHEET 1 OF 1

Project: Freeway Dump and Landfill Surface Elevation: 724 ft MSL*
 Project No.: 23191372 Drilling Method: Geoprobe
 Location: Burnsville, MN Sampling Method: Dual-Tube
 Coordinates: UTM 15 N:4959595.631m, E:477220.286m Completion Depth: 10.0 ft
 Datum: NAD 83; UTM Zone 15

Depth, feet	Sample Type & Recovery	Sample No.	U C S	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					(SM): SILTY SAND with GRAVEL; brown; moist; homogeneous, firm, with fine to coarse gravel; 5% gravel, 70% sand, 25% fines, [FILL].	
1		1		SM		
5						
2		2		ASH	(ASH): ASH; gray; moist; layer of brown silty sand below ash.	
10					End of geoprobe 10.0 feet	
15						
20						
25						
30						

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Date Boring Started: 3/29/19
 Date Boring Completed: 3/29/19
 Logged By: AKS3/EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

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



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LOG OF GEOPROBE FD-SB-C3 (19)

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:4959539.675m, E:477336.735m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						
1		1	SM		(SM): SILTY SAND with GRAVEL; fine to coarse grained; brown; moist; 10% gravel, 70% sand, 20% fines, [FILL].	
5			ASH		(ASH): ASH; gray; moist; soft, massive, nonplastic.	
5			WM		(WM): WASTE MATERIAL; with treated wood and brick.	
10		2	WM			
10					End of geoprobe 10.0 feet	
15						
20						
25						
30						

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Date Boring Started: 3/29/19
 Date Boring Completed: 3/29/19
 Logged By: AKS3/EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

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



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LOG OF GEOPROBE FD-SB-F2 (19)

SHEET 1 OF 1

Project: Freeway Dump and Landfill Surface Elevation: 726 ft MSL*
 Project No.: 23191372 Drilling Method: Geoprobe
 Location: Burnsville, MN Sampling Method: Dual-Tube
 Coordinates: UTM 15 N:4959375.135m, E:477282.735m
 Datum: NAD 83; UTM Zone 15 Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	SSU	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					(SM): SILTY SAND with GRAVEL; brown; moist; compact, massive; 10% gravel, 70% sand, 20% fines, [FILL].	
1		1	SM			
5					(ASH): ASH; dark gray; moist; nonplastic, stiff, more clay at 6' bgs.	
6		2	ASH			
7					(WM): WASTE MATERIAL; moist; dark gray sandy matrix, with wood, glass, plastic; moderate treated wood odor.	
8			WM			
10					End of geoprobe 10.0 feet	
15						
20						
25						
30						

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Date Boring Started: 3/29/19
 Date Boring Completed: 3/29/19
 Logged By: AKS3/EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

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



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LOG OF GEOPROBE FD-SB-G5 (19)

SHEET 1 OF 1

Project: Freeway Dump and Landfill Surface Elevation: 730 ft MSL*
 Project No.: 23191372 Drilling Method: Geoprobe
 Location: Burnsville, MN Sampling Method: Dual-Tube
 Coordinates: UTM 15 N:4959341.95m, E:477443.476m
 Datum: NAD 83; UTM Zone 15 Completion Depth: 10.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0					(SM): SILTY SAND with GRAVEL; brown; moist; [FILL].	
1		1	SM			
5					(ASH): ASH; gray; moist.	
2		2	ASH			
10			WM		(WM): WASTE MATERIAL; black sandy matrix, with brick, slag, wood, plastic; light odor.	
					End of geoprobe 10.0 feet	
15						
20						
25						
30						

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Date Boring Started: 3/29/19
 Date Boring Completed: 3/29/19
 Logged By: AKS3/EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

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



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LOG OF GEOPROBE FL-SB-01

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476490.098m, E:4959852.948m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 729 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 15.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	U S C S	ENVIRONMENTAL DATA	LITHOLOGIC DESCRIPTION	Elevation, feet
0						
0 - 1		1	SM		TOPSOIL (SM): moist. SILTY SAND (SM): fine to coarse grained; brown to dark gray; moist; trace fine gravel; [FILL].	
1 - 5				D/O/S: None/ None/ None		
5 - 10		2	SM			
10 - 15				D/O/S: None/ None/ None	From 10': silty matrix; mixed with silty ash; black to dark gray.	
15		3	WM		WASTE MATERIAL WITH ASH (WM): moist; metal; paper; glass; gray ash mixed in with waste material.	
15					End of geoprobe 15.0 feet	

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Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Pace sampled soil 0-10'
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF GEOPROBE FL-SB-02

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476723.905m, E:4959852.229m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 735 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 7.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						TOPSOIL (SM): moist.	
0 - 5		1	D/O/S:None/ None/ None		CL	SANDY LEAN CLAY (CL): medium plasticity; dark gray; moist; trace fine gravel; sand is very fine to medium grained; [FILL].	
5 - 7.0		2	D/O/S:None/ None/ None		SM WM	SILTY SAND (SM): fine to coarse grained; dark gray; moist; [FILL]. WASTE MATERIAL WITH ASH (WM): moist; brick; cardboard; dark gray ash mixed in with waste material.	
						End of geoprobe 7.0 feet	

Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Pace sampled soil 0-6'
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF GEOPROBE FL-SB-03

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476932.334m, E:4959848.521m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 732 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 8.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						TOPSOIL (SM): moist.	
1		1	D/O/S:None/ None/ None		SM	SILTY SAND (SM): very fine to coarse grained; gray; moist; dense; trace fine gravel and clay; [FILL].	
5		2	D/O/S:None/ None/ None		CL	LEAN CLAY (CL): medium plasticity; gray; moist; stiff; [FILL].	
					WM	WASTE MATERIAL (WM): waste material; layers of clay fill mixed with waste; moist; wood; paper; plastic.	
8.0						End of geoprobe 8.0 feet	

Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Pace sampled soil 0-6.5'
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF GEOPROBE FL-SB-04

SHEET 1 OF 1

Project: Freeway Dump and Landfill Surface Elevation: 725 ft MSL*
 Project No.: 23191372 Drilling Method: Geoprobe
 Location: Burnsville, MN Sampling Method: Dual-Tube
 Coordinates: UTM 15 N:477053.568m, E:4959973.610m Completion Depth: 2.5 ft
 Datum: NAD 83; UTM Zone 15

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0		1	D/O/S:None/ None/ None	SM		TOPSOIL (SM): moist.	
				SM		1.5': Large white gravel clast. SILTY SAND (SM): very fine to medium grained; gray; moist; [FILL]. End of geoprobe 2.5 feet	
5							
10							
15							
20							
25							
30							

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Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Pace sampled soil 0-2.5'
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

 PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF GEOPROBE FL-SB-05

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476821.380m, E:4960093.155m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 733 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 15.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0				SM		TOPSOIL (SM): moist.	
		1	D/O/S:None/ None/ None	CL		SANDY LEAN CLAY (CL): medium plasticity; brown; moist; sand is very fine to fine grained; [FILL].	
5				SM		SILTY SAND (SM): fine to coarse grained; gray and brown; moist; trace fine gravel; [FILL].	
		2	D/O/S:None/ None/ None			WASTE MATERIAL (WM): plastic; brick; carpet; wood; paper.	
10				WM			
		3	D/O/S:None/ None/ None				
15						End of geoprobe 15.0 feet	

Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Pace sampled soil 0-6.5'
 Pace sampled waste material 6.5-15'
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF GEOPROBE FL-SB-06

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476953.065m, E:4960247.897m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 746 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 15.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
1		1	D/O/S:None/ None/ None	SM		SILTY SAND (SM): silty sand transitioning to silt/clay with sand at 1-1.5'; brown to gray; moist; [FILL].	
5		2	D/O/S:None/ Light/ None	WM		WASTE MATERIAL (WM): waste material mixed with soil; dark brown to black; moist; with wood; paper; plastic; light decomposition odor.	
10		3	D/O/S:None/ Strong/ None			12 - 14': black clay lense. 14 - 15': strong decomposition odor.	
15						End of geoprobe 15.0 feet	
20							
25							
30							

Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF GEOPROBE FL-SB-07

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476829.530m, E:4960340.349m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 726 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 15.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0				SM		TOPSOIL (SM): moist.	
1		1	D/O/S:None/ None/ None	SM		SILTY SAND WITH GRAVEL (SM): dark brown; moist; [FILL]. From 3.5': very fine to fine; brown/dark gray.	
5		2	D/O/S:None/ Light/ None	WM		WASTE MATERIAL (WM): moist; with wood; paper; plastic; fabric; brick; concrete; chalk; light decomposition odor. From 5 -7': layer of silty sand fill.	
10		3	D/O/S:None/ Light/ None	WM			
15						End of geoprobe 15.0 feet	

Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Pace sampled soil 0-4.5'
 Pace sampled waste material 4.5-15' (portions without fill)
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF GEOPROBE FL-SB-08

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476948.426m, E:4960520.597m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 713 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 15.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0				SM		TOPSOIL (SM): moist.	
0-5		1	D/O/S:None/ None/ None	SM		SILTY SAND (SM): layers of firm, medium plasticity lean clay; fine to coarse grained; gray/dark gray to brown; moist; trace fine gravel; [FILL].	
5-10		2	D/O/S:None/ None/ None			WASTE MATERIAL (WM): wood waste mixed with dark gray silty sand fill; wet.	
10-15		3	D/O/S:None/ Light/ None	WM			
15						End of geoprobe 15.0 feet	

Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 Pace sampled soil 0-5'
 Pace sampled waste material 6-15' (portions without fill)
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level
 PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF GEOPROBE FL-SB-09

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476615.691m, E:4960220.658m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 735 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 20.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						TOPSOIL (SM): moist.	
0-3		1	D/O/S:None/ None/ None			SILTY SAND (SM): fine to coarse grained; brown; moist; w/ gravel; [FILL]. From 3': dense; gray; trace fine gravel.	
3-5							
5-8.5		2	D/O/S:None/ None/ None			From 5': very fine to fine grained, dark brown to gray.	
8.5-10						8.5': 6" layer of concrete debris.	
10-17		3				WASTE MATERIAL (WM): moist; with wood, concrete; light waste odor; sample stuck in sampling tube; attempted to sample with macro core; appeared to be wood waste material.	
17-20						From 10 - 15': no recovery.	
20		4	D/O/S:None/ Light/ None			End of geoprobe 20.0 feet	

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Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 Pace sampled soil 0-8'; Pace sampled waste material 17-20'
 Sample 3 from 10-15' stuck in sampling tube
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level
 PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF GEOPROBE FL-SB-10

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476679.998m, E:4960100.812m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 750 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 25.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0				SM		TOPSOIL (SM): moist.	
1		1	D/O/S:None/ None/ None			SILTY SAND (SM): fine to coarse grained; brown to black; moist; [FILL].	
5		2	D/O/S:None/ None/ None	SM		From 5': gray; layers of white sandy fill with coarse gravel; trace wood debris.	
10		3	D/O/S:None/ None/ None	CL		SANDY LEAN CLAY (CL): medium plasticity; gray; moist; sand is very fine to medium grained; trace wood debris; [FILL].	
15		4	D/O/S:None/ None/ None			SILTY SAND (SM): very fine to medium grained; gray; moist; trace fine gravel; [FILL].	
20		5	D/O/S:None/ None/ None	SM			
25						End of geoprobe 25.0 feet	

Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Pace sampled soil 0-25'
 No waste material encountered
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF GEOPROBE FL-SB-11

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476615.776m, E:4959978.483m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 745 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 25.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0				SM	TOPSOIL (SM): moist.	
1		1	D/O/S:None/ None/ None		SILTY SAND (SM): very fine to medium grained; brown, black, gray; moist; trace fine gravel; [FILL].	
5		2	D/O/S:None/ None/ None	SM	From 5': gray.	
10		3	D/O/S:None/ None/ None	OL	ORGANIC SILT (OL): organics; black; soft; moist; [FILL].	
15		4	D/O/S:None/ None/ None	CL	LEAN CLAY (CL): medium plasticity; gray; stiff to soft; moist; [FILL].	
20		5	D/O/S:Yes/ Light/ None	WM	WASTE MATERIAL (WM): mixed layers of gray silty sand/lean clay with waste material; moist; wood; organics; plastic; brick; brown sludge; light waste odor.	
25					End of geoprobe 25.0 feet	
30						

Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 Pace sampled soil 0-20'
 Pace sampled waste material 20-25' (portions without fill)
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level
 PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF GEOPROBE FL-SB-12

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476495.800m, E:4960100.822m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 731 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 15.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0						TOPSOIL (SM): moist.	
0 - 5		1	D/O/S:None/ None/ None			SANDY LEAN CLAY (CL): gray; moist; soft; medium plasticity; sand is very fine grained to fine grained; mixed with layers of fine to coarse grained silty sand with trace gravel; [FILL].	
5 - 10		2	D/O/S:None/ None/ None				
10 - 15		3	D/O/S:None/ Light/ None			WASTE MATERIAL (WM): moist; with brick, wood, coal tar; light petroleum odor.	
15						End of geoprobe 15.0 feet	

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Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 Pace sampled soil 0-10'
 Pace sampled waste material 10-15'
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level
 PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF GEOPROBE FL-SB-13

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476378.648m, E:4960224.179m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 718 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 14.0 ft

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Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0							
0 - 2.5		1	D/O/S:None/ None/ None	SM		SILTY SAND (SM): fine to coarse grained; gray; moist; [FILL]. From 2.5': dense, very fine to fine grained.	
2.5 - 6		2	D/O/S:None/ Light/ Slight	WM		WASTE MATERIAL (WM): mixed layers of silty sand fill with waste; moist. 4.5 - 6': potentially CCR impacted fill; light undefined odor; cloudy filmy sheen. 6': large white gravel clast.	
6 - 10		3	D/O/S:None/ None/ None				
10 - 14.0						End of geoprobe 14.0 feet	

Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Pace sampled soil 0-6'
 Pace sampled waste material 6.5-14' (portions without fill)
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF GEOPROBE FL-SB-14

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:476373.391m, E:4960037.175m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 730 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Dual-Tube
 Completion Depth: 13.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation, feet
0				SM		TOPSOIL (SM): moist.	
0-5		1	D/O/S:None/ None/ None	SM		SILTY SAND (SM): very fine to medium grained; dark brown to gray; moist; trace gravel; [FILL].	
5-10		2	D/O/S:None/ None/ None	CL		LEAN CLAY (CL): very fine to fine grained; gray; moist; soft; medium plasticity; sand is very fine to fine grained; [FILL].	
10-13		3		SM		SILTY SAND (SM): very fine to medium grained; gray; moist; trace gravel; [FILL].	
13.0				WM		WASTE MATERIAL (WM): sample stuck in sampling tube; attempted to sample with macro core; appeared to be asphalt.	
13.0						End of geoprobe 13.0 feet	

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Date Boring Started: 4/2/19
 Date Boring Completed: 4/2/19
 Logged By: EMC
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 Pace sampled soil 0-10'
 No waste sampled, waste sample stuck in tube
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level
 PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Appendix A-3

Monitoring Well Boring Logs



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 Telephone: 952-832-2600

LOG OF BORING MW-09

SHEET 1 OF 1

Project:	Freeway Dump and Landfill	Surface Elevation:	727 ft MSL*
Project No.:	23191372	Drilling Method:	Geoprobe
Location:	Burnsville, MN	Unique Well No.:	834659
Coordinates:	UTM 15 N:476607.023m, E:4959741.980m	Sampling Method:	Dual-Tube
Datum:	NAD 83; UTM Zone 15	Completion Depth:	26.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0							
0 - 1		1	PID:4 D/O/S:None/ None/ Slight	SM	SILTY SAND (SM): fine to medium grained; brown; moist to wet; subangular; few gravel; few roots and organics.	-0 - 2': Quick Set Cement Grout	
1 - 5				CL	SANDY LEAN CLAY (CL): dark gray; firm; medium grained sand, few subangular gravel, trace asphalt; slight monochrome sheen.		
5 - 10		2	PID:47.1 D/O/S:None/ Moderate/ None		WASTE MATERIAL (WM): moderate waste odor. 5.5 - 15': wood, concrete, plastic, decomposition odor; moist.		
10 - 15			D/O/S:None/ None/ None			-2 - 15': Bentonite Chip Grout	
15 - 20		3		WM	15 - 20': paper, wood, metal, glass, plastic; wet.		
20 - 25		4	PID:53.1 D/O/S:None/ Moderate/ None		20 - 25': wood, paper, ash.		
25 - 26		5	PID:74.6 D/O/S:None/ Moderate/ None			-15 - 26': Red Flint Sand Pack, No. 20	
26 - 27		6	PID:28.2 D/O/S:None/ None/ None	SP	POORLY GRADED SAND (SP): fine to medium grained; brown to black.	-16 - 26': 0.010 Slot PVC Screen	
27 - 26.0					PRAIRIE DU CHIEN (OPC). DOLOMITE LIMESTONE; white to gray; moderately weathered. End of boring 26.0 feet		

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Date Boring Started: 5/21/19
 Date Boring Completed: 5/21/19
 Logged By: EMC
 Drilling Contractor: Midwestern
 Drill Rig: Geoprobe

Remarks: Background PID: 0.2 ppm
 LandGEM 2000: 66.8% CH4, 32.2% CO2, 0.3% O2, 0.7% Balance
 Refusal at 26'
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level
 PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF BORING MW-09D

SHEET 1 OF 3

Project: Freeway Dump and Landfill Project No.: 23191372 Location: Burnsville, MN Coordinates: UTM 15 N:476611.274m, E:4959741.311m Datum: NAD 83; UTM Zone 15	Surface Elevation: 726 ft MSL* Drilling Method: Sonic/Rock Coring Unique Well No.: 837777 Sampling Method: Sonic/HQ Core Completion Depth: 83.0 ft
--	---

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0			PID:0.3 D/O/S:None/ Light/ None	SC-CL		CLAYEY SAND TO SANDY LEAN CLAY (SC-CL): very dark gray(10 YR 3/1); firm; cohesive; trace gravel, approximately 50% sand, and 50% fines.	-0 - 45': Portland Cement Grout	
1				CL		SANDY LEAN CLAY (CL): fine to coarse grained; mottled very dark and olive gray (10 YR 3/1 and 5 Y 4/2); firm; medium plasticity; medium toughness; approximately 5% gravel and 30% sand.		
5			PID:2 D/O/S:Black/ Light/ None			WASTE MATERIAL (WM): newspaper, glass, wood, wire, plastic bags, and plastic in black clayey matrix, light waste odor and black discoloration throughout.		
10		2	PID:4.1 D/O/S:Black/ Light/ None			11': red paint/grease, moderate odor, 28.1 ppm PID reading. 13': tire.		
15			PID:25.3 D/O/S:Black/ Light/ None			WM		
20			PID:49.3 D/O/S:Black/ Light/ Trace			16 - 20': trace biogenic sheen, 49.3 ppm PID reading.		
25		3	PID:26			21': 26 ppm PID reading. 22': concrete.		
30			PID:11 D/O/S:Black/ Light/ Trace					
		4	PID:1.6			PRAIRIE DU CHEIN (OPC): Dolomitic limestone, hard, white/gray to light brown, fine to medium grained, medium bedding, moderately to intensely fractured, fractures are primarily horizontal with secondary mineralization/infilling, frequent vuggy zones, occasional dolomite recrystallization in vugs.		
						OPC		

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Date Boring Started: 4/2/19
 Date Boring Completed: 4/4/19
 Logged By: KAM/AKS3
 Drilling Contractor: Cascade Drilling LP
 Drill Rig: Full Size Track Mounted Rotasonic

Remarks: Sonic drilled to 31' bgs then switched to HQ core barrel. Driller reported loss of water return at 65' and 70'. Returned at 67'. *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF BORING MW-09D

SHEET 2 OF 3

Project:	Freeway Dump and Landfill	Surface Elevation:	726 ft MSL*
Project No.:	23191372	Drilling Method:	Sonic/Rock Coring Unique Well No.: 837777
Location:	Burnsville, MN	Sampling Method:	Sonic/HQ Core
Coordinates:	UTM 15 N:476611.274m, E:4959741.311m	Completion Depth:	83.0 ft
Datum:	NAD 83; UTM Zone 15		

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
30		5				PRAIRIE DU CHEIN (OPC): Dolomitic limestone, hard, white/gray to light brown, fine to medium grained, medium bedding, moderately to intensely fractured, fractures are primarily horizontal with secondary mineralization/infilling, frequent vuggy zones, occasional dolomite recrystallization in vugs. <i>(continued)</i>		
33.4						33.4': thin bedding, moderately fractured.		
34.4 - 34.8		6				34.4 - 34.8': rubble zone, light gray, angular dolomite fragments.		
34.8 - 43'						34.8 - 43': transition to unfractured/slightly fractured vuggy dolomite, light brown.		
43		7						
43 - 44'						43 - 44': increase in fracture density (slight to moderate), iron and manganese coating on fracture planes.		
44 - 49'						44 - 49': return to competent/relatively unfractured rock.		
44'		8		OPC		44': loss of water circulation during drilling.		
46'						46': highly vuggy zone.		
49 - 50.7'		9				49 - 50.7': highly vugged zone with moderate to intense fractured. Secondary dolomite mineralization in vugs and infilling fractures.		
50.7 - 53'						50.7 - 53': decrease to moderate fracture intensity. Persistent large vugs with dolomite recrystallization.		
55		10						
45 - 83'							-45 - 83': Open to Bedrock	

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Date Boring Started: 4/2/19
 Date Boring Completed: 4/4/19
 Logged By: KAM/AKS3
 Drilling Contractor: Cascade Drilling LP
 Drill Rig: Full Size Track Mounted Rotasonic

Remarks: Sonic drilled to 31' bgs then switched to HQ core barrel. Driller reported loss of water return at 65' and 70'. Returned at 67'. *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
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LOG OF BORING MW-09D

SHEET 3 OF 3

Project:	Freeway Dump and Landfill	Surface Elevation:	726 ft MSL*
Project No.:	23191372	Drilling Method:	Sonic/Rock Coring Unique Well No.: 837777
Location:	Burnsville, MN	Sampling Method:	Sonic/HQ Core
Coordinates:	UTM 15 N:476611.274m, E:4959741.311m	Completion Depth:	83.0 ft
Datum:	NAD 83; UTM Zone 15		

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SSCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
60		11				PRAIRIE DU CHEIN (OPC): Dolomitic limestone, hard, white/gray to light brown, fine to medium grained, medium bedding, moderately to intensely fractured, fractures are primarily horizontal with secondary mineralization/infilling, frequent vuggy zones, occasional dolomite recrystallization in vugs. <i>(continued)</i>		
65		12						
70		13		OPC		70 - 72': driller reported 1' void and soft drilling. 71 - 72': Sandy dolomite, pitted and vuggy. 73 - 75.3': thinly bedded sandy zone.		
75		14				76.4 - 76.6': broken, pitted and vugs throughout. Manganese and iron staining on fracture faces. From 77.3': sandy dolomite.		
80		15				78 - 83': sampled with 4" sonic core barrel to deepen open hole. No RQD completed.		
85						End of boring 83.0 feet		
90								

Date Boring Started: 4/2/19
 Date Boring Completed: 4/4/19
 Logged By: KAM/AKS3
 Drilling Contractor: Cascade Drilling LP
 Drill Rig: Full Size Track Mounted Rotasonic

Remarks: Sonic drilled to 31' bgs then switched to HQ core barrel. Driller reported loss of water return at 65' and 70'. Returned at 67'. *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

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LOG OF BORING MW-10D

SHEET 1 OF 3

Project:	Freeway Dump and Landfill	Surface Elevation:	721 ft MSL*
Project No.:	23191372	Drilling Method:	Sonic/Rock Coring Unique Well No.: 837776
Location:	Burnsville, MN	Sampling Method:	Sonic/HQ Core
Coordinates:	UTM 15 N:476391.914m, E:4959741.246m	Completion Depth:	88.0 ft
Datum:	NAD 83; UTM Zone 15		

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	SCUC	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0								
0 - 66.5		1	PID:4.9 D/O/S:Black/ Light/ None	CL		SANDY LEAN CLAY (CL): brown (10 YR 4/3) to very dark gray (10 YR 3/1); medium plasticity; medium toughness; trace to 5% gravel, 30% fine to coarse grained sand; black discoloration.		
66.5 - 160		2	PID:5.6 D/O/S:Black/ Light/ None PID:62.5 D/O/S:Black/ Light/ None	WM		WASTE MATERIAL (WM): plywood, wood, plastic, paper, metal, wire, burlap, tubing, plastic bags and containers, newspaper, glass, light to moderate waste odors and black discoloration throughout. 2 - 2.4': pulverized concrete. 6': 62.5 ppm PID detection. 16': 1971 newspaper, 57.9 ppm PID detection.		
160 - 240		3	PID:203 D/O/S:Black/ Moderate/ Rainbow PID:57.9 D/O/S:Black/ Light/ None PID:5.9 D/O/S:Black/ Light/ None	OPC		PRAIRIE DU CHIEN (OPC): Prairie du Chien limestone, hard to very hard, gray to light orangeish brown, fine grained, medium to thickly bedded, slightly decomposed, moderately disintegrated, moderately fractured, near horizontal bedding plane joints, pin holes and vugs are partially healed with dolomite/calcite. 22 - 24': pulverized highly weathered limestone, light to pale brown.		
240 - 30		4					-0 - 66.5': Portland Cement Grout	

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Date Boring Started: 3/27/19
 Date Boring Completed: 4/1/19
 Logged By: KAM
 Drilling Contractor: Cascade Drilling LP
 Drill Rig: Full Size Track Mounted Rotasonic

Remarks: Sonic drilled to 31' bgs then switched to HQ core barrel. Driller reported core barrel drop in the last 4" of the 43 - 48' core interval, and loss of water return at 55' and 78'. *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF BORING MW-10D

SHEET 2 OF 3

Project:	Freeway Dump and Landfill	Surface Elevation:	721 ft MSL*
Project No.:	23191372	Drilling Method:	Sonic/Rock Coring Unique Well No.: 837776
Location:	Burnsville, MN	Sampling Method:	Sonic/HQ Core
Coordinates:	UTM 15 N:476391.914m, E:4959741.246m	Completion Depth:	88.0 ft
Datum:	NAD 83; UTM Zone 15		

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
30		5			PRAIRIE DU CHIEN (OPC): Prairie du Chien limestone, hard to very hard, gray to light orangeish brown, fine grained, medium to thickly bedded, slightly decomposed, moderately disintegrated, moderately fractured, near horizontal bedding plane joints, pin holes and vugs are partially healed with dolomite/calcite. <i>(continued)</i>		
					From 33': thin to thick bedding.		
35		6			35.5 - 36.5: thin shale lenses and laminations present.		
					36.5 - 37.8: oolitic dolomite.		
					From 37.8': manganese in dendritic pattern on fracture faces.		
40		7			39': some manganese infilling of fractures.		
					42.4': thin shale laminations (~2-5 mm) dipping approximately 10% from horizontal. Pitted and small vugs with calcite infilling.		
					42.7': sandstone lamination.		
45		8		OPC	45.5': large vug.		
					46': soft shale bed, gray.		
					46.8': soft shale bed, gray.		
50		9			50.3 - 51.3': broken and vuggy with manganese staining, steep 80 degree fracture on edge of core.		
					55': broken and vuggy.		
55		10			56.5': fractured with calcite crystals also found in vugs and pinholes.		
					57.5 - 58.3': thinly bedded.		
					59.2 - 60.6': very broken/vuggy weak rock with manganese staining prevalent.		
60							

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Date Boring Started: 3/27/19
 Date Boring Completed: 4/1/19
 Logged By: KAM
 Drilling Contractor: Cascade Drilling LP
 Drill Rig: Full Size Track Mounted Rotasonic

Remarks: Sonic drilled to 31' bgs then switched to HQ core barrel. Driller reported core barrel drop in the last 4" of the 43 - 48' core interval, and loss of water return at 55' and 78'. *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF BORING MW-10D

SHEET 3 OF 3

Project:	Freeway Dump and Landfill	Surface Elevation:	721 ft MSL*
Project No.:	23191372	Drilling Method:	Sonic/Rock Coring Unique Well No.: 837776
Location:	Burnsville, MN	Sampling Method:	Sonic/HQ Core
Coordinates:	UTM 15 N:476391.914m, E:4959741.246m	Completion Depth:	88.0 ft
Datum:	NAD 83; UTM Zone 15		

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
60		11			PRAIRIE DU CHIEN (OPC): Prairie du Chien limestone, hard to very hard, gray to light orangeish brown, fine grained, medium to thickly bedded, slightly decomposed, moderately disintegrated, moderately fractured, near horizontal bedding plane joints, pin holes and vugs are partially healed with dolomite/calcite. <i>(continued)</i> 60': driller reported soft drilling. 60.8': steep 80 degree fracture on edge of core (possibly mechanical).		
65		12			63.7': some green mineral infilling of pinholes - soft shale/mud, manganese along near horizontal fractures. 65.5': core broken, vuggy and pitted. 65.6': calcite healed vugs.		
70		13			68 - 69.5': thinly bedded. 70.5': large vugs/fractures recrystallized dolomite and calcite crystals. 71.5': water level during drilling.		
75		14		OPC	74 - 76.3': abundant vugs and pinholes, large vug at 74'. Water level at 74' after drilling.		
80		15			78.5 - 79': large vugs and pinholes. 79.5': 45 degree fracture, smaller pinholes below. 80.7': fracture on bedding plane. 81': large vug. 81.8 - 82.5': large vugs, core broken in pieces, green (possibly chlorite) mineralization along bedding plane fracture at 81.8'. 83': top 3" broken.		
85		16			Broken from: 83.9 - 84', 85 - 85.5', 85.9 - 87.3'. Iron and manganese staining present in all broken zones.		
90					End of boring 88.0 feet		

Date Boring Started: 3/27/19
 Date Boring Completed: 4/1/19
 Logged By: KAM
 Drilling Contractor: Cascade Drilling LP
 Drill Rig: Full Size Track Mounted Rotasonic

Remarks: Sonic drilled to 31' bgs then switched to HQ core barrel. Driller reported core barrel drop in the last 4" of the 43 - 48' core interval, and loss of water return at 55' and 78'. *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

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LOG OF BORING MW-11

SHEET 1 OF 1

Project:	Freeway Dump and Landfill	Surface Elevation:	708 ft MSL*
Project No.:	23191372	Drilling Method:	Geoprobe
Location:	Burnsville, MN	Unique Well No.:	834665
Coordinates:	UTM 15 N:476631.197m, E:4960480.334m	Sampling Method:	Dual-Tube
Datum:	NAD 83; UTM Zone 15	Completion Depth:	18.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0			PID:1.4 D/O/S:None/ Slight/ Rainbow	OL	ORGANIC SILT (OL): organics, roots; brown and black; moist; slight natural organic odor, light rainbow sheen; [FILL].	-0 - 1': Quick Set Cement Grout	
1 - 5		1	PID:9.9 D/O/S:None/ None/ None PID:20.4 D/O/S:None/ None/ None	WM	WASTE MATERIAL (WM): wood, plastic.	-1 - 7': Bentonite Chip Grout	
5 - 10		2					
10 - 15		3	PID:1.4 D/O/S:None/ None/ None				
15 - 18.0		4	PID:0.9 D/O/S:None/ None/ None	SM	SILTY SAND (SM): very fine to fine grained. 13 - 14.5': interbedded with some lenses of soft clayey silt, cohesive, non plastic. 14.5 - 18': interbedded with some lenses of poorly graded sand.	-8 - 18': Red Flint Sand Pack, No. 20 -7 - 18': 0.010 Slot PVC Screen	
18.0					End of boring 18.0 feet		

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Date Boring Started: 5/21/19
 Date Boring Completed: 5/21/19
 Logged By: EMC
 Drilling Contractor: Midwestern
 Drill Rig: Geoprobe

Remarks: Background PID: 0.2 ppm
 Refusal at 6', moved locations several times
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF BORING MW-12

SHEET 1 OF 1

Project: Freeway Dump and Landfill	Surface Elevation: 709 ft MSL*	Unique Well No.: 834656
Project No.: 23191372	Drilling Method: Geoprobe	
Location: Burnsville, MN	Sampling Method: Dual-Tube	
Coordinates: UTM 15 N:476782.998m, E:4960532.702m	Completion Depth: 18.0 ft	
Datum: NAD 83; UTM Zone 15		

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S C S U	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0								
0 - 1		1	PID:0.6 D/O/S:None/ None/ None		OL	ORGANIC SILT (OL): dark gray; medium stiff; 0% gravel, 10% sand, 90% fines. 0.6': 2" brown medium grained sand lens. From 0.8': very soft, wet.	-0 - 1': Quick Set Cement Grout	
1 - 5		2	PID:1 D/O/S:None/ None/ None		WM	WASTE MATERIAL (WM): wood and plastic debris; wet.	-1 - 7': Bentonite Chip Grout	
5 - 11.5		3	PID:1.3 D/O/S:None/ None/ Medium		SM	SILTY SAND (SM): interbedded with some poorly graded sand. From 11.5 - 15': medium sheen, possibly rainbow.	-8 - 18': Red Flint Sand Pack, No. 20	
11.5 - 15		4	PID:0.7 D/O/S:None/ None/ Slight		SM	From 15 - 18': light monochrome sheen.	-7 - 18': 0.010 Slot PVC Screen	
15 - 18					ML	CLAYEY SILT (ML): soft; cohesive; non-plastic.		
18 - 18.0						End of boring 18.0 feet		

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Date Boring Started: 5/20/19
 Date Boring Completed: 5/20/19
 Logged By: ARP2/EMC
 Drilling Contractor: Midwestern
 Drill Rig: Geoprobe

Remarks: Background PID: 0.2 ppm
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.



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LOG OF BORING MW-13

SHEET 1 OF 1

Project: Freeway Dump and Landfill	Surface Elevation: 709 ft MSL*	
Project No.: 23191372	Drilling Method: Geoprobe	Unique Well No.: 834657
Location: Burnsville, MN	Sampling Method: Dual-Tube	
Coordinates: UTM 15 N:476920.591m, E:4960585.354m	Completion Depth: 18.0 ft	
Datum: NAD 83; UTM Zone 15		

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S O C S U	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0			PID:2.8 D/O/S:None/ None/ None			SILTY SAND (SM): with organic fines; fine to medium grained; brown and black; moist; with little fine to coarse gravel (subangular to subrounded); 20% gravel, 60% sand, 20% fines.	-0 - 1': Quick Set Cement Grout	
1		1			SM			
5			PID:10.1 D/O/S:None/ None/ None			WASTE MATERIAL (WM): wood, plastic, concrete (low recovery); brown and black; wet.	-1 - 7': Bentonite Chip Grout	
2		2			WM			
10			PID:2.1 D/O/S:None/ None/ Rainbow			SILTY SAND (SM): very fine to fine grained; gray; interbedded with stiff sandy silt; 0% gravel, 50% sand, 50% fines, medium rainbow sheen, no odors other than natural organic.	-8 - 18': Red Flint Sand Pack, No. 20	
3		3			SM			
15			PID:1.2 D/O/S:None/ None/ Rainbow				-7 - 18': 0.010 Slot PVC Screen	
4		4			SM			
18.0						End of boring 18.0 feet		

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Date Boring Started: 5/20/19
 Date Boring Completed: 5/20/19
 Logged By: ARP2/EMC
 Drilling Contractor: Midwestern
 Drill Rig: Geoprobe

Remarks: *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

LOG OF BORING MW-19-01



Barr Engineering Company
 4300 MarketPointe Drive Suite 200
 Minneapolis, MN 55435
 Telephone: 952-832-2600

SHEET 1 OF 1

Project: Freeway Dump and Landfill	Surface Elevation: 716 ft MSL*
Project No.: 23191372	Drilling Method: Geoprobe
Location: Burnsville, MN	Unique Well No.: 834660
Coordinates: UTM 15 N:477235.842m, E:4959662.109m	Sampling Method: Dual-Tube
Datum: NAD 83; UTM Zone 15	Completion Depth: 18.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0								
1		1	PID:0.0 D/O/S:None/ None/ None	SM		SILTY SAND (SM): fine to medium grained; very dark gray; moist; trace small gravel [FILL]. Few organics and roots 0 - 1'; trace glass and slag 1 - 1.4'. ASH (ASH): dark gray; moist; soft to stiff; massive.	-0 - 5': Bentonite Grout	
5		2	PID:0.0 D/O/S:None/ Slight/ None	ASH		5 - 6': pulverized concrete, woodchips, and asphalt, woodchips have slight treated odor.	-5 - 6': Bentonite Chip Seal	
10		3	PID:0.1 D/O/S:None/ None/ None	ASH			-6 - 17': Red Flint Sand Pack, No. 15	
15		4	PID:0.0 D/O/S:None/ None/ None	PT CL-CH		PEAT (PT): black/dark brown; fibrous; [NATIVE]. LEAN CLAY (CL-CH): very dark gray; soft; medium to high plasticity; medium toughness; [NATIVE]. PRAIRIE DU CHIEN (OPC). Bedrock; weak; light brownish gray; highly weathered.	-7 - 17': 0.010 Slot PVC Screen	
18.0						End of boring 18.0 feet		

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Date Boring Started: 3/28/19
 Date Boring Completed: 3/28/19
 Logged By: AKS3
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 Background PID: 0.0 - 0.3
 Refusal at 18', with poor recovery from 15 - 18'. Offset and resampled 15 - 18' with macro-core.
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level
 PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

LOG OF BORING MW-19-02



Barr Engineering Company
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 Minneapolis, MN 55435
 Telephone: 952-832-2600

SHEET 1 OF 1

Project: Freeway Dump and Landfill
 Project No.: 23191372
 Location: Burnsville, MN
 Coordinates: UTM 15 N:477304.826m, E:4959695.369m
 Datum: NAD 83; UTM Zone 15

Surface Elevation: 718 ft MSL*
 Drilling Method: Geoprobe
 Sampling Method: Macro Core
 Completion Depth: 21.0 ft
 Unique Well No.: 834662

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0			PID:1.1 D/O/S:None/None/None	CL		LEAN CLAY (CL): very dark gray-brown; frozen; medium plasticity; medium toughness; abundant roots at surface, piece of white glass at 1'; [FILL]. ASH (ASH): dark gray; moist to wet; soft; massive.	-0 - 3.5': Bentonite Grout	
1		1	PID:0.2					
5			PID:0.2 D/O/S:None/None/None			4.5': slag and roots.	-3.5 - 5.5': Bentonite Chip Seal	
10		2	PID:0.0	ASH		7': wooden obstruction.		
15			PID:0.0 D/O/S:None/None/None				-5.5 - 17.5': Red Flint Sand Pack, No. 15	
20		3	PID:0.1 PID:0.2				-7.5 - 17.5': 0.010 Slot PVC Screen	
25			PID:0.7 D/O/S:None/None/None	PT		PEAT (PT): black/dark brown; moist; fibric to hemic; [NATIVE].		
28		4	PID:0.1	CL-CH		GRAVELLY CLAY (CL-CH): greenish gray to olive gray; soft; high plasticity; high toughness; ~30% small sub-rounded gravel; [NATIVE]. DOLOMITE LIMESTONE; Prairie du Chien; light gray to yellow-brown; moderately weathered.		
30		5	PID:0.3 D/O/S:None/None/None			End of boring 21.0 feet		

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Date Boring Started: 3/26/19
 Date Boring Completed: 3/26/19
 Logged By: KAM
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 Encountered obstruction at 7' at first location, moved 2' east.
 Background PID: 0.3
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level
 PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

LOG OF BORING MW-19-03



Barr Engineering Company
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Minneapolis, MN 55435
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SHEET 1 OF 1

Project:	Freeway Dump and Landfill	Surface Elevation:	723 ft MSL*
Project No.:	23191372	Drilling Method:	Geoprobe
Location:	Burnsville, MN	Unique Well No.:	834663
Coordinates:	UTM 15 N:477376.575m, E:4959697.030m	Sampling Method:	Macro Core
Datum:	NAD 83; UTM Zone 15	Completion Depth:	35.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0								
1		1	PID:0.8 D/O/S:None/ None/ None	SM		SILTY SAND (SM): fine to medium with trace coarse grained; very dark gray; few small roots decrease with depth; [FILL].		
3.5			PID:0.1			3.5': few clay lenses.		
5		2	PID:0.6 D/O/S:None/ None/ None PID:1.4	ASH		ASH (ASH): dark gray; moist; soft; massive.	-0 - 12': Bentonite Grout	
10		3	PID:3.8 D/O/S:None/ Slight/ None	WM		WASTE MATERIAL (WM): paper, concrete, wood, plastic, and glass; wood has creosote odor.	-12 - 13': Bentonite Chip Seal	
15		4	PID:0.6 D/O/S:None/ None/ None PID:0.5	ASH		ASH (ASH): dark gray; moist; soft; massive; wood at bottom of core.		
20						20 - 22': No recovery, see remarks below.	-13 - 34': Red Flint Sand Pack, No. 15	
25		7	PID:0.6 PID:0.2 D/O/S:None/ None/ None	PT		PEAT (PT): black; wet; very soft.		
28.5						28': Peat/soil mix with some plastic and snail shells. Grades to dark gray at 28.5'.		
30		8	PID:0.7 D/O/S:None/ None/ None PID:0.2	CH		FAT CLAY (CH): with shells; dark gray; moist; firm; high plasticity; high toughness; lacustrine deposit.	-14 - 34': 0.010 Slot PVC Screen	
32						POORLY GRADED SAND WITH SILT (SP-SM): fine to coarse grained; dark gray; saturated; subangular to subrounded; 30% gravel, 60% sand, 10% fines, fine gravel.		
34						POORLY GRADED GRAVEL WITH SAND (GP): fine gravel with fine grained to coarse grained sand; dark gray; 60% gravel, 35% sand, 5% fines.		
35						End of boring 35.0 feet		

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Date Boring Started: 3/26/19
Date Boring Completed: 3/26/19
Logged By: KAM
Drilling Contractor: Midwestern Drilling
Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
Refusal at 27', with no recovery from 20 - 27'. Offset 2' west, refusal at 17'. Offset 2' east, closed piston macro sampler used, starting at 22'.
*Surface elevation interpreted from LIDAR, MSL = feet above mean sea level
PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
Additional data may have been collected in the field which is not included on this log.

LOG OF BORING MW-19-04



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 4300 MarketPointe Drive Suite 200
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SHEET 1 OF 1

Project: Freeway Dump and Landfill	Surface Elevation: 724 ft MSL*
Project No.: 23191372	Drilling Method: Geoprobe
Location: Burnsville, MN	Unique Well No.: 834661
Coordinates: UTM 15 N:477362.191m, E:4959643.292m	Sampling Method: Dual-Tube
Datum: NAD 83; UTM Zone 15	Completion Depth: 40.0 ft

Depth, feet	Sample Type & Recovery	Sample No.	ENVIRONMENTAL DATA	S U C S	Graphic Log	LITHOLOGIC DESCRIPTION	WELL OR PIEZOMETER CONSTRUCTION DETAIL	Elevation, feet
0		1	PID:0.5 D/O/S:None/ None/ None	SM		SILTY SAND WITH GRAVEL (SM): medium grained; dark brown; dry to moist; trace concrete and slag; small gravel [FILL].	<p>-0 - 13': Bentonite Grout</p> <p>-13 - 14': Bentonite Chip Seal</p> <p>-14 - 35': Red Flint Sand Pack, No. 15</p> <p>-15 - 35': 0.010 Slot PVC Screen</p>	
5		2	PID:1.0 D/O/S:None/ None/ None	ASH		ASH (ASH): gray; moist; soft; massive. 5 - 9': few slag, glass, and wood debris.		
10		3	PID:0.9 D/O/S:None/ None/ None	ASH				
15		4	PID:0.3 D/O/S:None/ Slight/ None	WM		WASTE MATERIAL (WM): ash with wood, plastic, paper, glass; gray; wet; waste odor.		
20		5	PID:0.6 D/O/S:None/ Slight/ None	WM				
25		6	PID:0.6 D/O/S:None/ Slight/ None	WM				
30		7	PID:0.5 D/O/S:None/ Slight/ None	PT		PEAT (PT): black/dark brown and red; wet; fibrous; swampy organic odor; [NATIVE].		
35		8	PID:0.3 D/O/S:None/ None/ None	OPC		PRAIRIE DU CHIEN (OPC). Bedrock; very weak; white/tan; highly weathered; possible lime sludge.		
40						End of boring 40.0 feet		

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Date Boring Started: 3/27/19
 Date Boring Completed: 3/27/19
 Logged By: AKS3
 Drilling Contractor: Midwestern Drilling
 Drill Rig: Geoprobe

Remarks: Dashed line indicates an inferred contact depth
 *Surface elevation interpreted from LIDAR, MSL = feet above mean sea level

PID = Headspace; D/O/S = Discoloration/Odor/Sheen; FID/MC = FID/Methane Corrected; G/S/F = Gravel/Sand/Fines
 Additional data may have been collected in the field which is not included on this log.

Appendix B

Test Excavation Field Logs

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

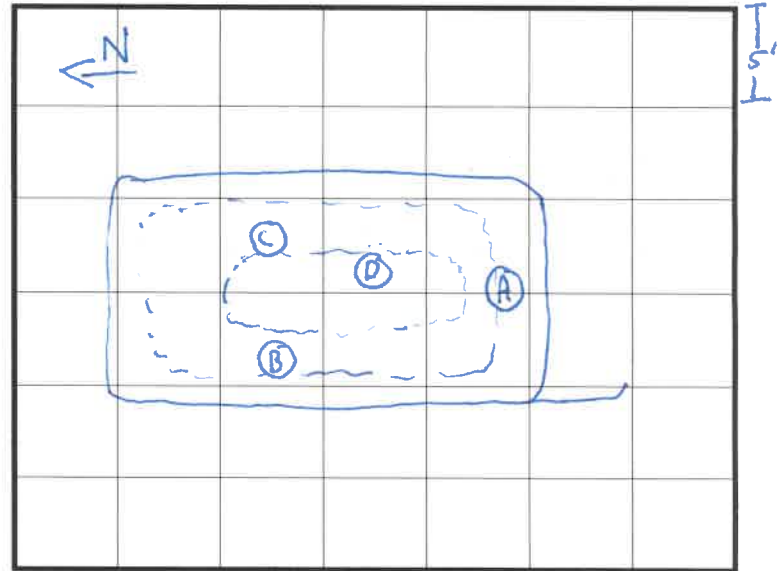
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TF-01

Date: 04/11/18
 Time Started: 9:20
 Time Ended: 11:00

Sampler: ARP2 / Pucc
 Calibration Time: 8:50
 Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-3	N/N	0.2	Sandy silty clay
B	3-5	N/N	1.8	Silt/Ash w/ debris + sand
C	5-8	N/N	0.8	Ash w/ little debris
D	8-12	mild chem trace	97.6	Waste material

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..

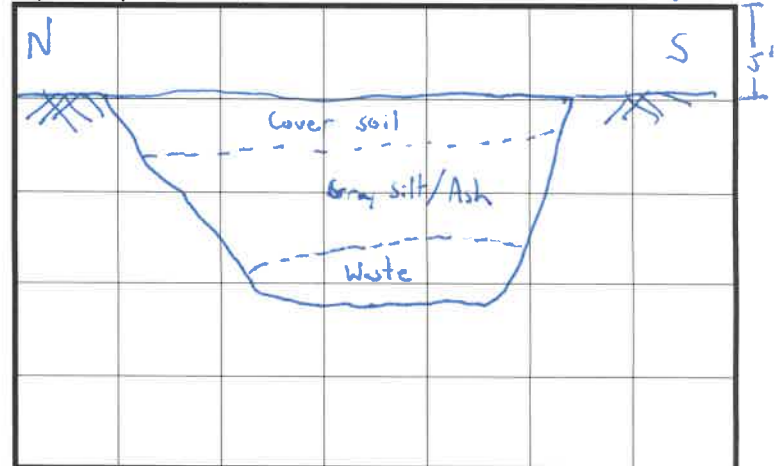


General stratigraphy description / General notes

0-3: Cover soil - Sandy silty clay (10/46/50) w/ gravel, brown
 3-8: Silt/Ash - Gray, little debris throughout, w/fg sand from 3-5, ~~with~~ denser / darker color from 6-8.
 8-12: Waste Material - decomp. wood, metal wiring, plastic conduit, rubber tire, motor oil containers (empty, 1qt)

Sample collected: FD-TF-01 (W, 10-12)

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

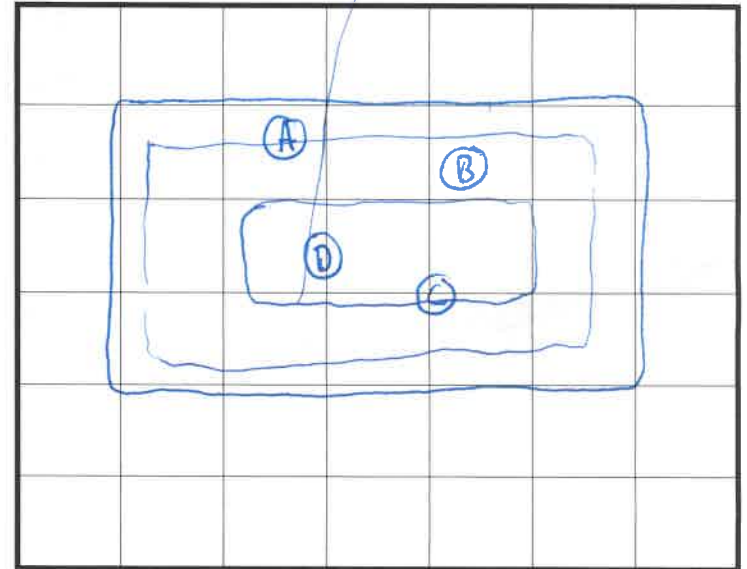
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-02

Date: 04/11/18
 Time Started: 11:30
 Time Ended: _____

Sampler: ARP2 / Pace
 Calibration Time: 8:50
 Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-3	N/N	1.0	Topsoil / Waste mat.
B	3-6	N/N	0.3	Waste Mat. * collected from
C	6-9	N/N	0.8	Waste Mat / Silt/Ash
D	9-12	N/N	0.7	Silt/Ash

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..

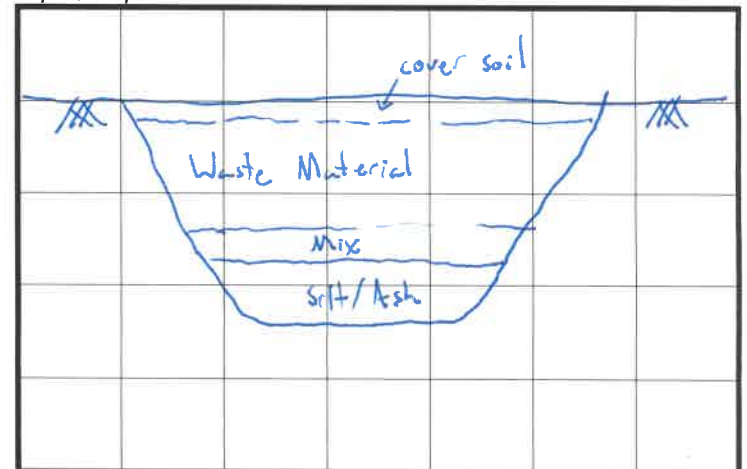


General stratigraphy description / General notes

0-1: Cover soil - sandy silty clay w/ gravel, brown
 1-7: Waste mat - MSW, tree trunks, building materials
 7-9: Waste mat mixed w/ silt/ash
 9-12: Gray silt/ash w/ some fly sand

Sample collected: FD-TT-02 (W, 7-9)

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

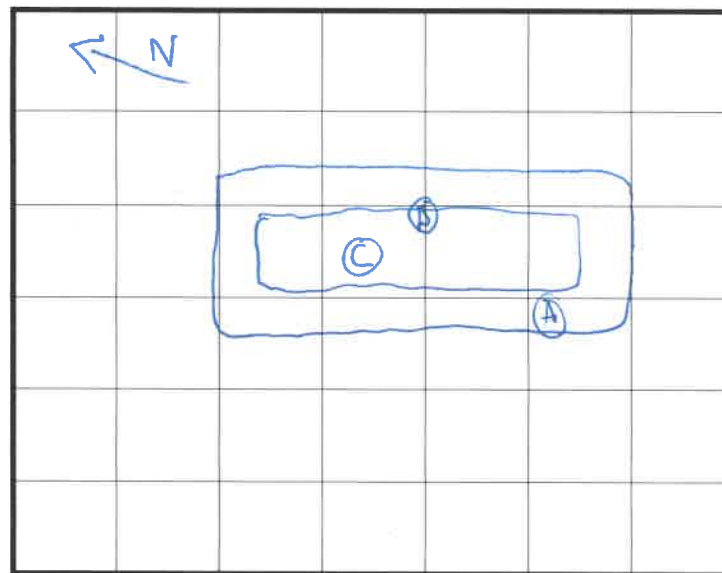
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TF-03

Date: 04/11/14
 Time Stated: 14:05
 Time Ended: 15:10

Sampler: ARR2 / Pace
 Calibration Time: 8:50
 Background Headspace: 0.2 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-2	N/N	0.4	Clayey Sand * collected from stockpile
B	2-5	N/N	0.4	Gray Silt
C	5-10	N/N	0.4	Peat

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..

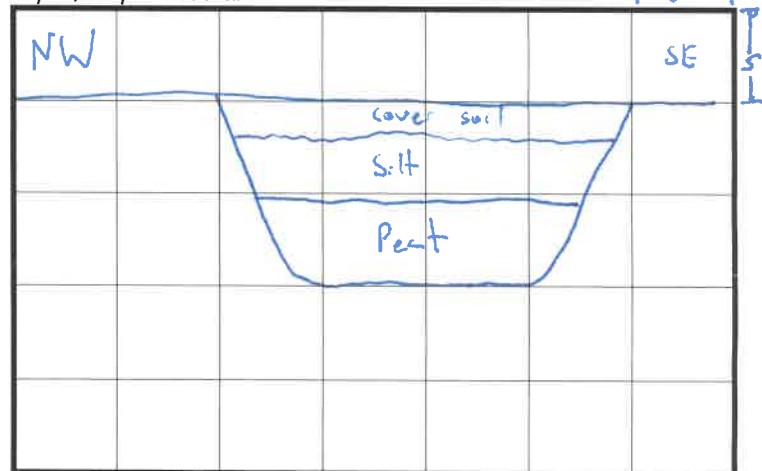


General stratigraphy description / General notes

0-2: Cover soil - Clayey sand w/ silt + gravel
 2-5: Silt, gray w/ some vfg sand
 5-10: Peat, very fibrous, black/brown

Sample collected FD-TF-03 (s, 2-5)

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

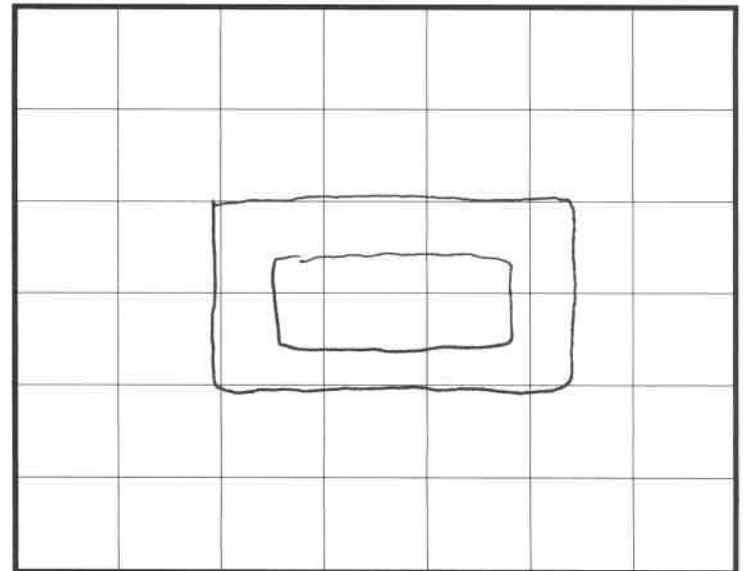
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-04

Date: 04/11/18
 Time Started: 15:25
 Time Ended: 16:05

Sampler: ARP2
 Calibration Time: 8:56
 Background Headspace: 0.2 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-2	N/N	0.4	Cover soil
B	2-5	N/N	0.3	Silt/Ash
C	6-10	N/N	0.2	Silt/Ash
D	10-12	N/N	0.3	Peat

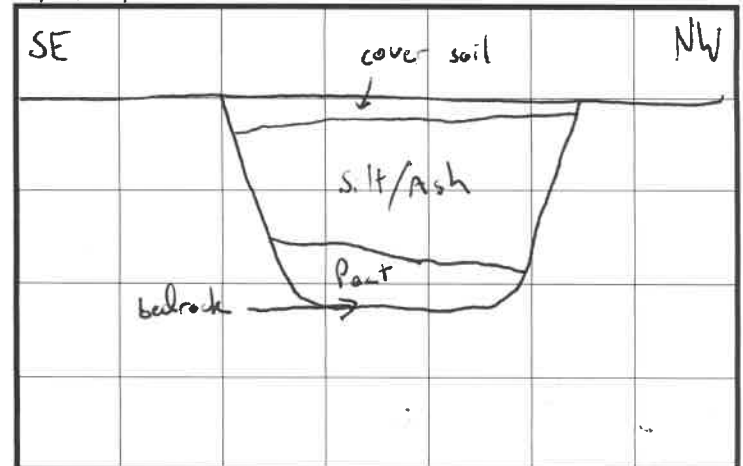
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0-1.5: Cover soil, clayey sand w/ silt + gravel, brown
 1.5-10: Silt/Ash, gray, random plastic sheeting observed from 6-10, harder, partially solidified, very small white flecks observed ~~from~~ ^{during} sheen test
 10-12: Peat, very fibrous, black/brown
 Bedrock encountered @ ~12' logs
 No sample collected

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-05
 West face

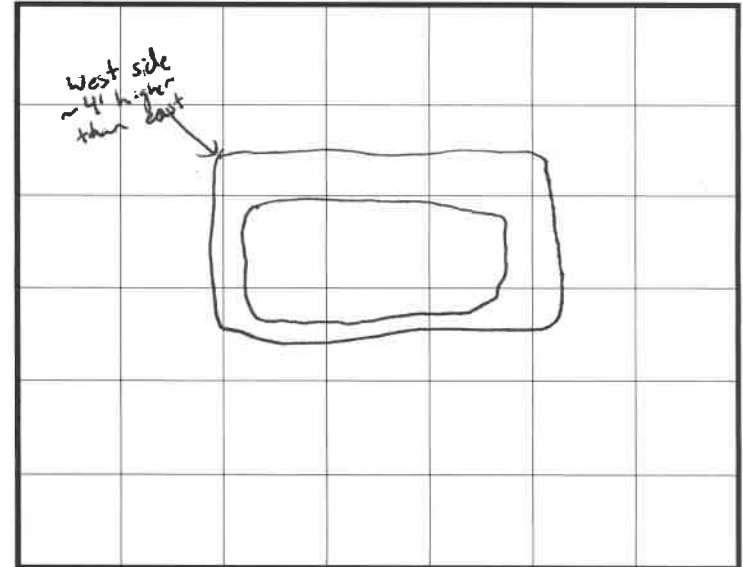
Date: 4/12/18
 Time Started: 8:50
 Time Ended: 9:45

Sampler: ARP2/Pace
 Calibration Time: 8:50
 Background Headspace: 0.1 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-4	N/N	0.2	Cover soil
B	4-9	N/N	0.2	Silt/Ash
C	9-12	N/N	0.2	Peat / Weather BR

} Collected from stockpiles

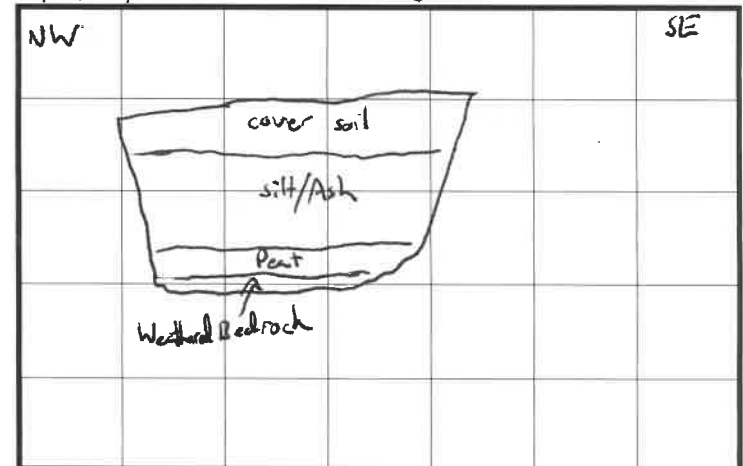
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0-4: Cover soil - Clayey sand w/ silt + gravel, brown, shunks of asphalt observed (12"-18")
 4-9: Silt/Ash - Gray, some rfy sand, white flecks observed from sheen test
 9-10: Peat/organic clay, black, w/ some sand
 10-11: Weathered bedrock

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.. West face



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

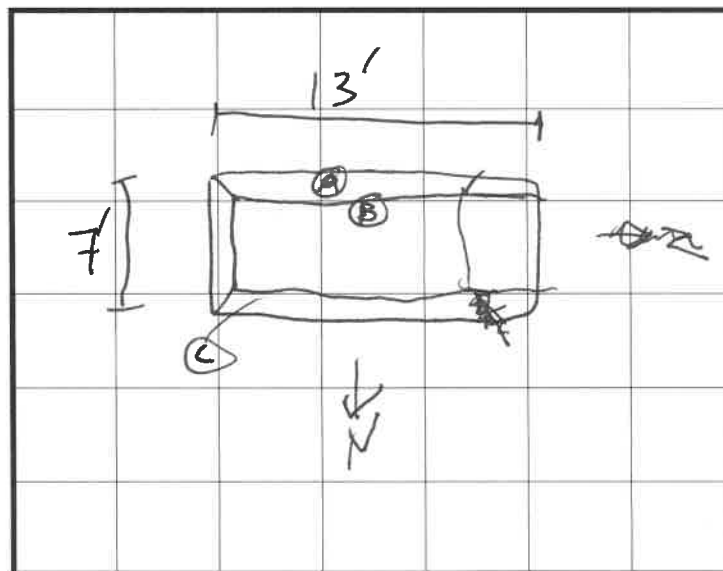
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-06

Date: 4-12-18
 Time Started: 10:45
 Time Ended: 13:30 - backfilled

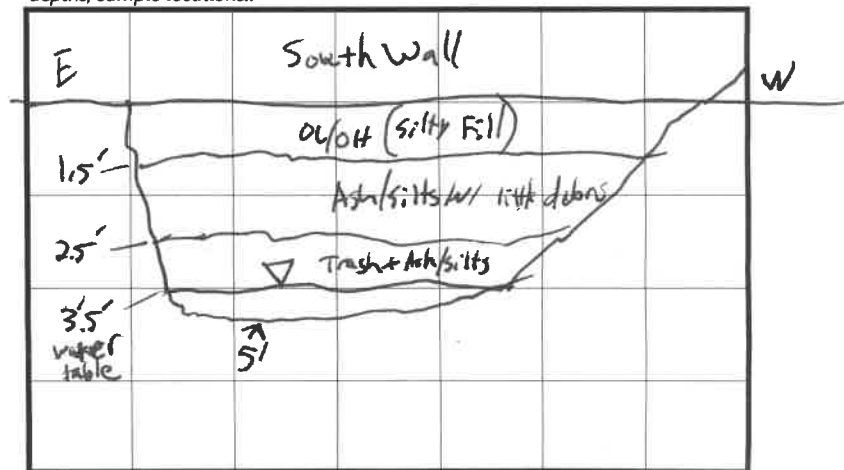
Sampler: JWJ/Pace
 Calibration Time: 8:50
 Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0- ^{1.5} _{1.5}	org/N	0.4	Black silty fill w/ roots and some wood debris. (OL/OH)
B	1.5- ^{3.5} _{3.5}	ash/silt/N	1.0	Ash/silt w/ debris + sand (Trash 2.5-3.5')
C	@3'	None/N	0.5	Green colored soils in ^{silty} Ashy layer

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities.



CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.



General stratigraphy description / General notes

0'-1.5' = Black silty fill w/ some woody debris (45/15/180)
 1.5'-3.5' = ^{5' SW} Gray, little debris to 1.5'-2.5'. Trash from 2.5'-3.5' ^{glass bottles/ metal wood plastics}
 5' rusty coloration. grabbed green colored soils @ 3' ^{from NE corner} (C) on plan view
 water @ 3.5' light sheen noticed

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FD-JT-07

Date: 4/12/18

Time Started: 11:30

Time Ended: 12:50

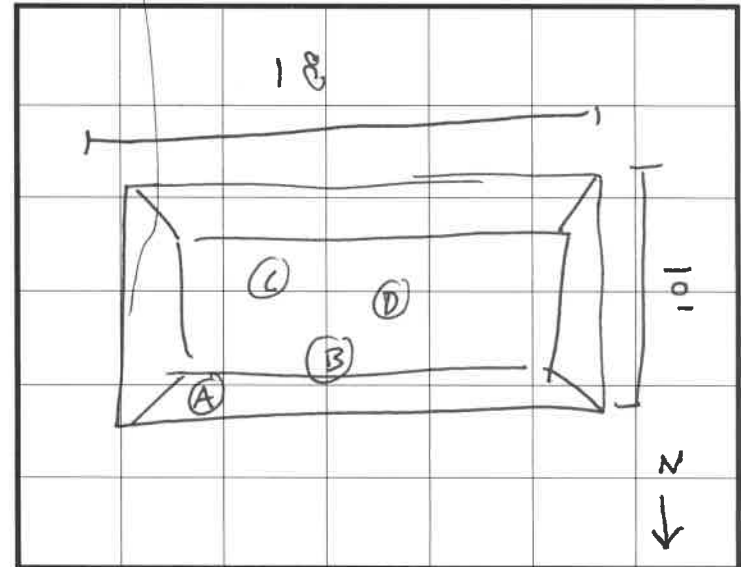
Sampler: ABW / Pace

Calibration Time: 8:58

Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-4	N/N	0.4	upper fill, ^{sample} grabbed from stockpile
B	4-6	N/N	0.5	silt/ash sample grabbed from #0
C	6-11	H / Trace	6.0	from stockpile,
D	11-12	N/N	0.8	bucket taken from base of exc.

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0-4 - V. Dr. brn silt/ash ^{sand} fill, few med-co gravel, (5/60/35) [cover]

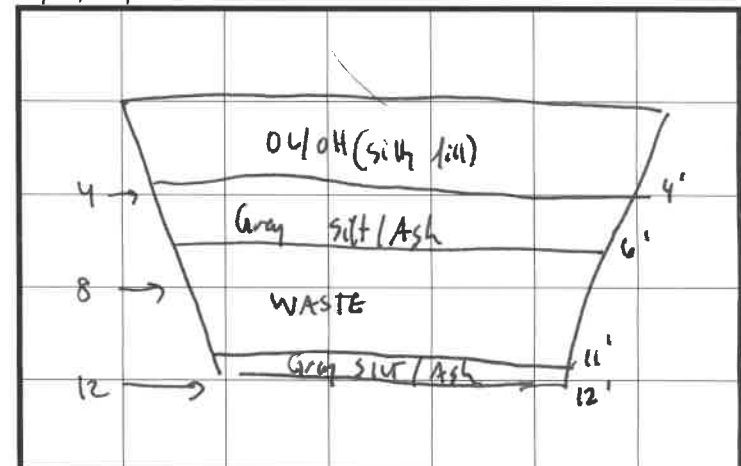
4-6 - Gray silt/ash, trace debris throughout

6-11 - WASTE MATERIAL - mixed - no defined layers [pipe (metal) plastic, wood (abundant wood), tires, brick, ash, silt fence, bottles] ^H odor

11-12 - Gray silt/ash, no debris noticed

Sample collected - FD-JT-07 (WM, 6-11)

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FD-TT-08

From E edge

Date: 4/12/18

Time Started: 13:45

Time Ended: 15:00

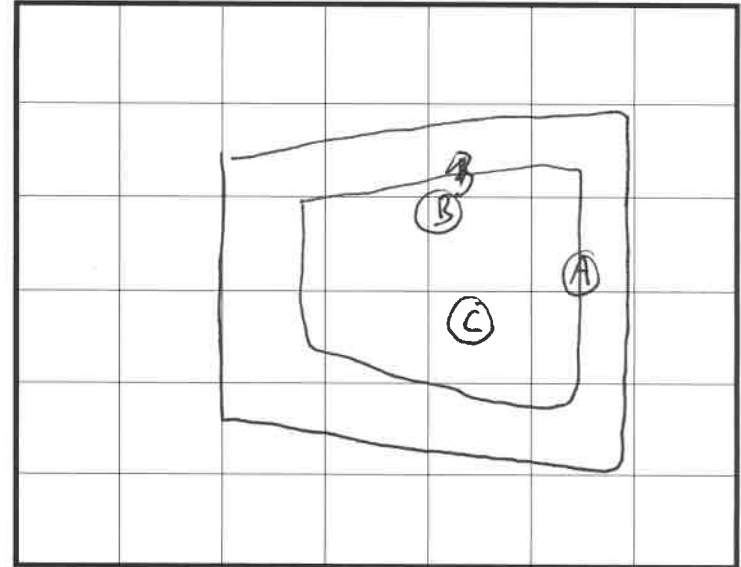
Sampler: ARP2 / Pucc

Calibration Time: 8:50

Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-2	N/N	0.6	Cover
B	2-5	N/N	0.5	Silt/Ash
C	5-12	N mild decomp.	2.3	Waste

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



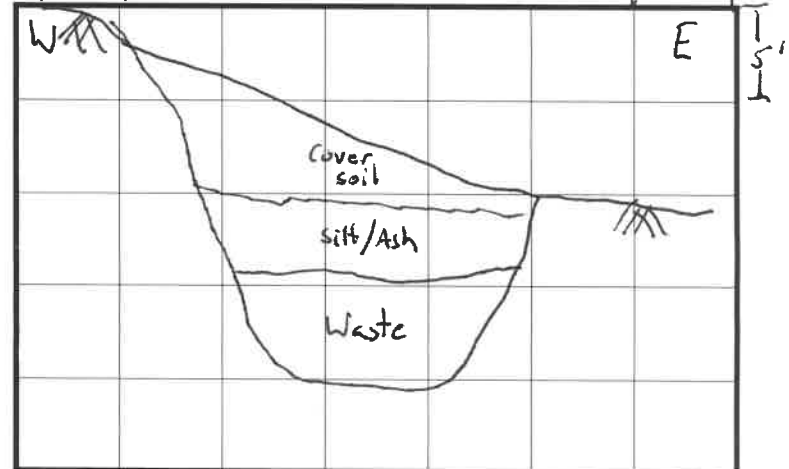
From E edge

General stratigraphy description / General notes

0-2: cover soil - silty sand w/ gravel, mg-cg, brown
 2-5 = silt/ash - Gray, w/ tiny white flecks
 5-12: Waste material - MSW, steel container, tires, paper, plastic, metal wire

Sample collected: FD-TT-08 (W, 5-12)

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

* Soil Sample collected 4-12' bgs
(Waste Material)

* "Point" ggs location collected - could not walk
ground trench due to trees/slope
Sampler: ASW/PCC

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FD-11-09

Date: 4/17/18

Time Started: 840

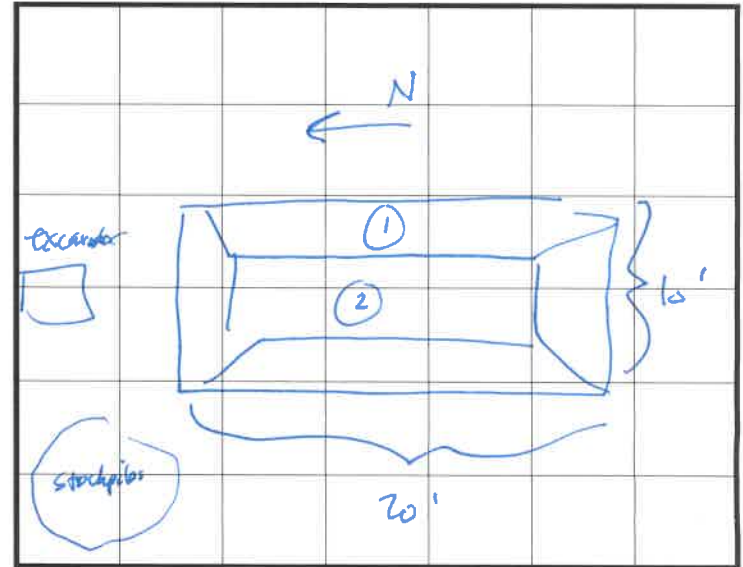
Time Ended: _____

Calibration Time: 815

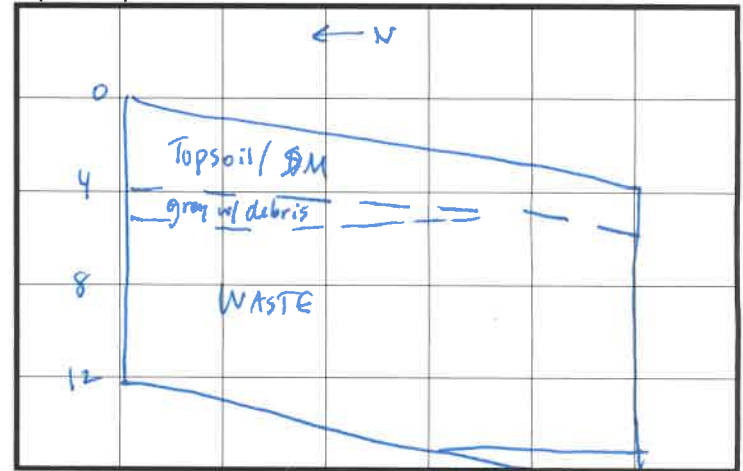
Background Headspace: 0.1 - 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	4	None	0.5	Silty Sand topsoil/Fill, brown, from stockpile
4	12	NONE	2.2	Debris/Waste Material (from stockpile)

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



General stratigraphy description / General notes

0-3' : Dk brown topsoil/SM [b/70/50] loose, homogenous, organics/roots, M-W

3-4 : dk gray SM (S.A.A) w/ few construction debris (concrete), same as above, less wet w/ debris, thinner to south of excavation, (lumped in w/ 0-3 for screening)

4-12: WASTE Material : Moist, dk gray to black. Tires, plastic, wood, metal, rubber hose, few large concrete pieces

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

* Water Sampled ABC List

* WASTE Sampled 2.5-10'

* "Point" gps collected due to slope/stability

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FD-TT-10

Date: 4/17/18

Time Started: 1015

Time Ended: _____

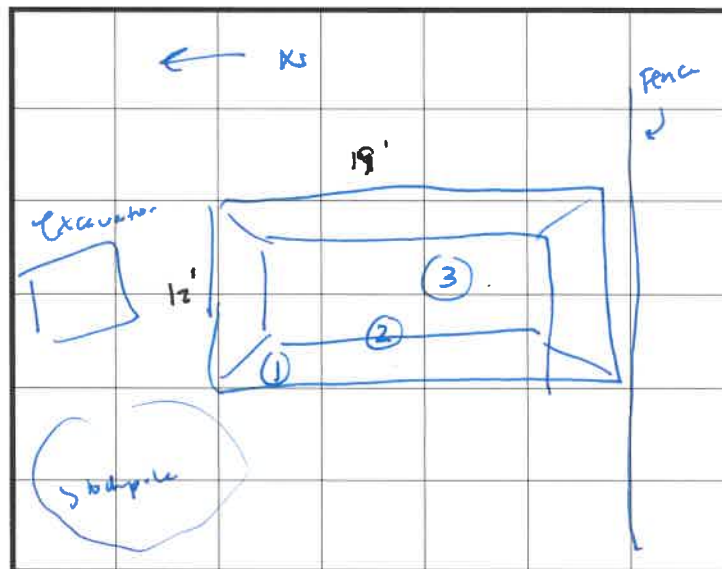
Sampler: ABW/Paw

Calibration Time: 815

Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
1 0	2	NONE	3.0	SM Cover/FILL
2 2	2.5	NONE	0.4	ASH/ML -gray
3 2.5	10.5	Light/None	3.3	WASTE MATERIAL

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



General stratigraphy description / General notes

0-2: Dk brown SM fill/cover soil [*/70/30] organics, roots, M-W, Partially frozen

2-2.5: very thin ML/Ash layer, soft, homogeneous, loose, ^{few} VF sands

2.5-10.5 WASTE MATERIAL: wood, bricks, bottles, rubber hose: tires, Cinder blocks: construction material, wet @ 10' bgs

* accessed on foot

* Sample collected 4-12' bgs

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Landfill gas: CH₄ | CO₂ | O₂ | Bal | LEL

CH ₄	CO ₂	O ₂	Bal	LEL

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: ~~FD-11-U~~ FD-11-U

Date: 4/17/18

Time Started: 1245

Time Ended:

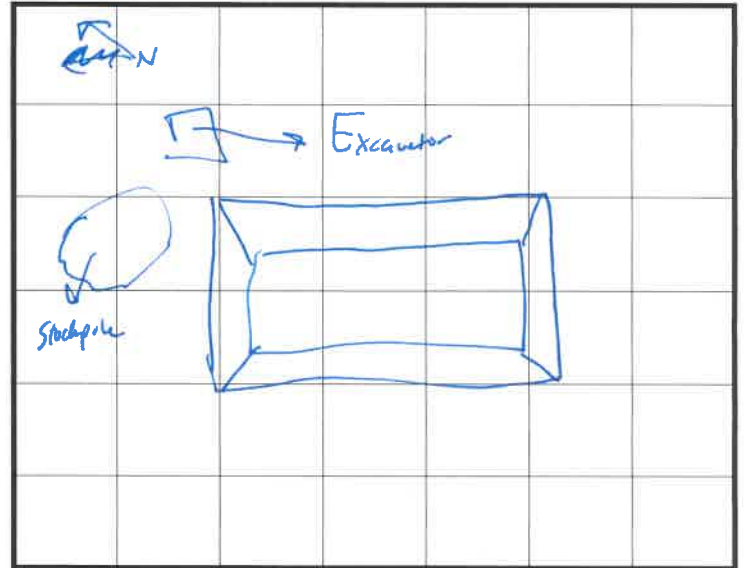
Sampler: AB w/ Pinner

Calibration Time: 815

Background Headspace: 0.1 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	2	None	0.2	Topsoil
2	4	None	0.18	Mixed Brown SM w/ McAsh : construction debris
4	12	Treated wood/light	21.9	WASTE MATERIAL

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



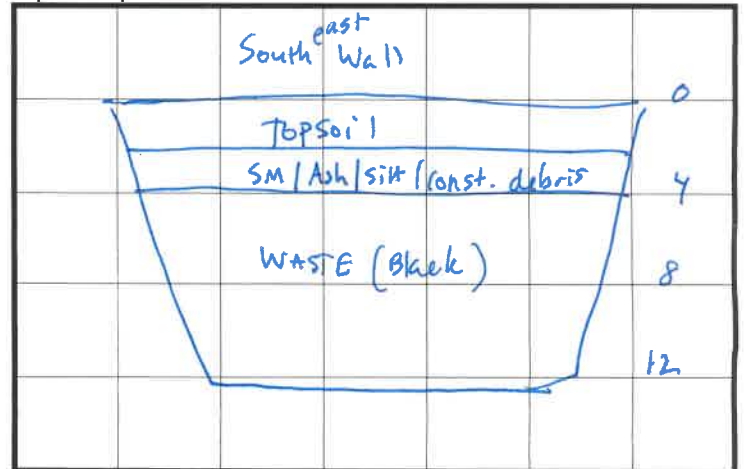
General stratigraphy description / General notes

0-2 : Dk gray topsoil : 0/20/30 SM, Organics, grass, lower soil, moist

2-4 : Mixed light brown SM w/ gray ash/silt : construction debris → wood, Bricks, concrete, moist

4-12 : WASTE material, moist, black silty sand matrix, heavy debris [wood, plastic, bottles, wire, rubber, newspapers, metal, Ash]

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



* Waste sample collected 3-12' br

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Landfill	CH ₄	CO ₂	O ₂	B ₂	LEL
	0	0	19.9	20.1	0%

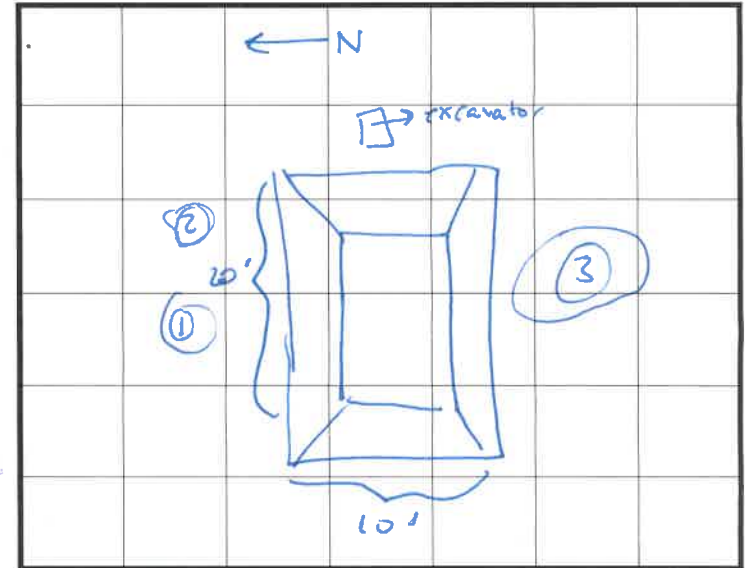
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-12

Date: 4/17/18
 Time Stated: 1410
 Time Ended: _____

Sampler: ABW
 Calibration Time: 815
 Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	1.5	NONE	1.0	Topsoil
1.5	3	NONE	0.5	hardened / solidified Ash/ML → difficult to break thru w/ excavator
3	12	Strong / Lt.	129.4	WASTE MATERIAL

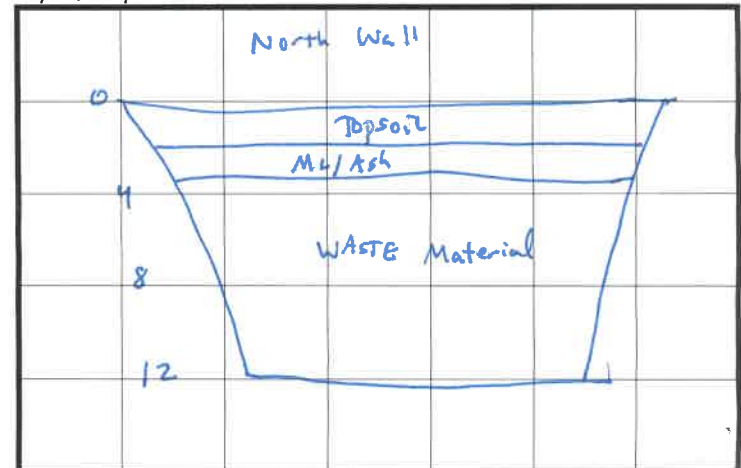
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0-1.5: Topsoil, dk grey/brown, silt w/ organics (OL)
 1.5-3: gray Ash/silt → solidified/hard → very difficult to dig thru, fg siltor ash, 10% 1/4" gray, few conc. etc pieces mixed in
 3-12: WASTE MATERIAL: Very strong decomp. odor, light sheen, Assorted debris w/ black silty sand [bottles, wood, cardboard, paper, chard, tape, shingles, etc]

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



* WASTE SAMPLE collected 3-12'

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Landfill:

CH ₄	CO ₂	O ₂	Bul	LEL
0	0	21.3	18.7	0

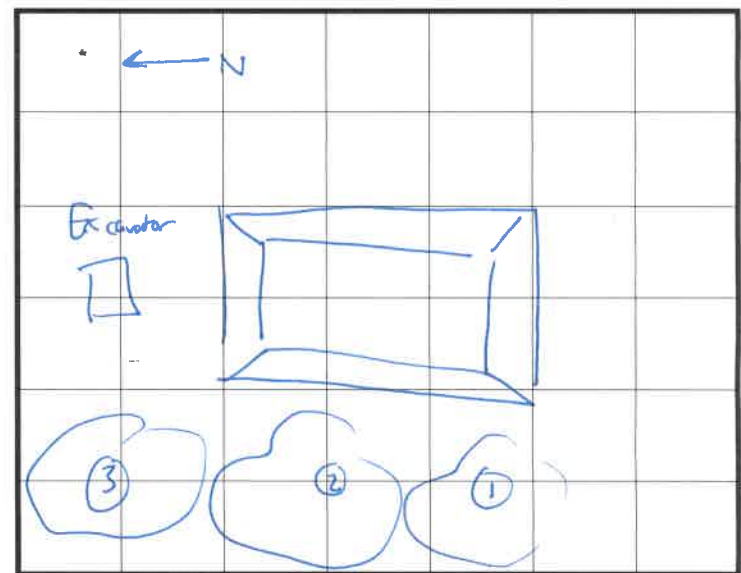
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-11-13

Date: 4/17/18
 Time Stated: 1515
 Time Ended: _____

Sampler: ABW
 Calibration Time: 815
 Background Headspace: 0-0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
① 0	1.5	NONE	4.5	Topsoil
② 1.5	3.0	NONE	0.9	Gray Solidified silt/Ash
③ 3.0	12	strong decomp. Lt	11.9	WASTE MATERIAL

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



General stratigraphy description / General notes

0-1.5 → Topsoil, dk brown OL w/ silty material
 1.5-3.0 → Ash/ML → hard, difficult to dig thru, compact, gray, very fine material 10% 2 1/4 gray
 3.0 → 12 → WASTE MATERIAL: Assorted waste → paper, wood, metal, insulation, dishwasher, metal, fencing, plastic, glass, etc

* waste sample collected 2'-12'

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

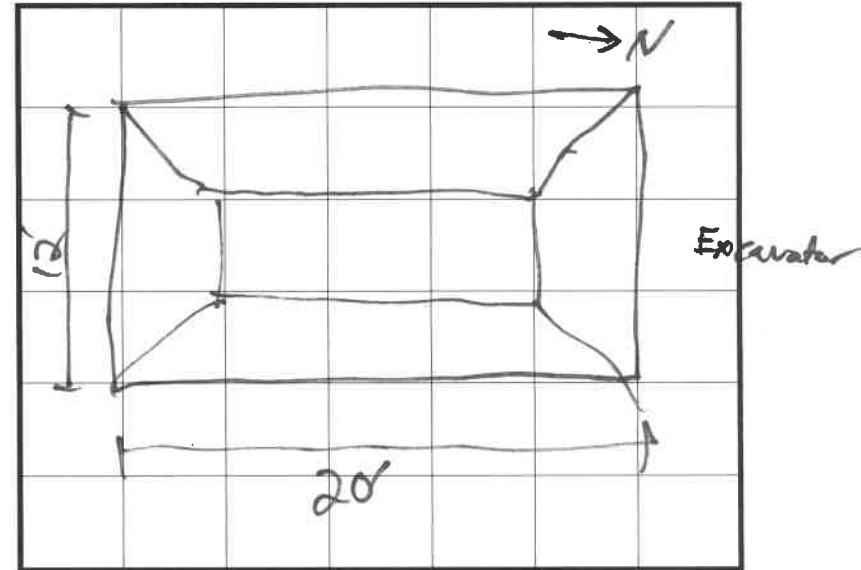
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FD-TT-14

Date: 4-18-18
 Time Started: 08:45
 Time Ended: 09:50

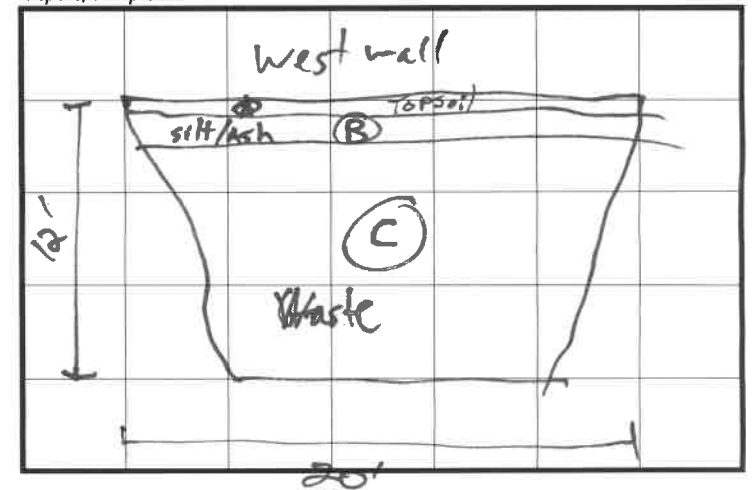
Sampler: JWT
 Calibration Time: 08:20
 Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0'-0.5'	N/	1.5	Topsoil
B	0.5'-2'	N/	2.1	Gray solidified silt/Ash
C	2'-12'	strong chemical	28.5	Waste material

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



General stratigraphy description / General notes

0'-0.5' = Topsoil, Dk brown OL/OM w/ silty material
 0.5'-2' = Ash/MC(silty) compact gray very fine material
 10YR 4/1 gray
 2'-12' = Waste material: Assorted waste; paper, shingles
 insulation, wood, metal, plastic sheeting, concrete chunks, glass
 strong chemical odor

Waste Sample collected @ 3'-11"

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

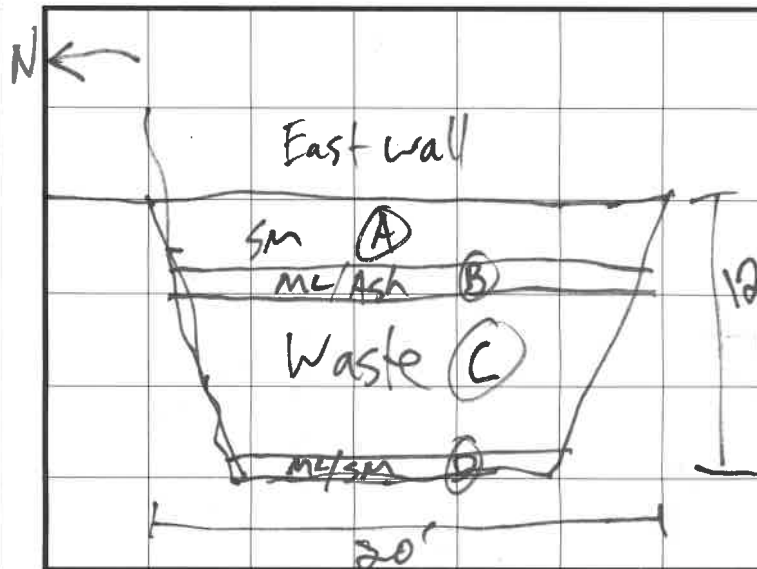
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FL-TT-01

Date: 4-18-18
 Time Started: 12:30
 Time Ended: _____

Sampler: JWS
 Calibration Time: 08:20
 Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-2	N/N	0.4	Brown silty sands
B	2-3	N/M	0.7	Gray silt/Ash
C	3-11	N/N	1.6	Waste
D	11-12	N/N	1.1	Gray silts/sands ^{and silty}

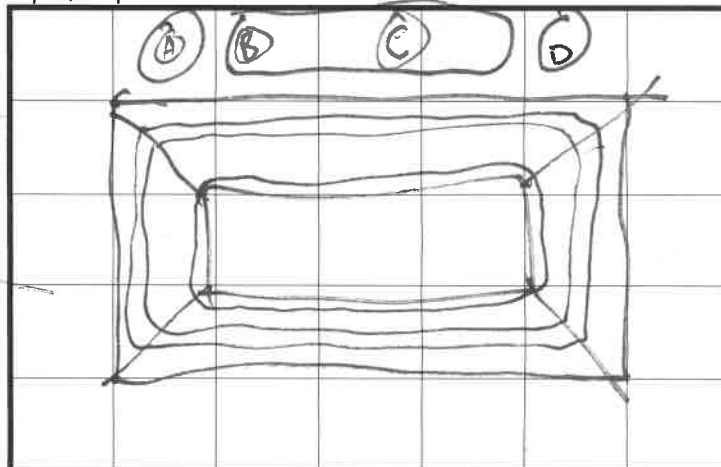
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

A 0'-2' = Brown silty sand + topsoil cover (SM)
 B 2'-3' = Gray silts/Ash (ML)
 C 3'-11' = Waste, glass, plastics, wood, bricks some concrete
 D 11'-12' = layers of gray silty sands (fg-mg) over Gray silts w/ some clay.

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



Face sampled water @ ~10' bgs TEST TRENCH FIELD SAMPLING AND SCREENING LOG

waste sample collected 2'-10.5'

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FL-TT-02

Date: 4-18-18

Time Started: 13:30

Time Ended: 16:00

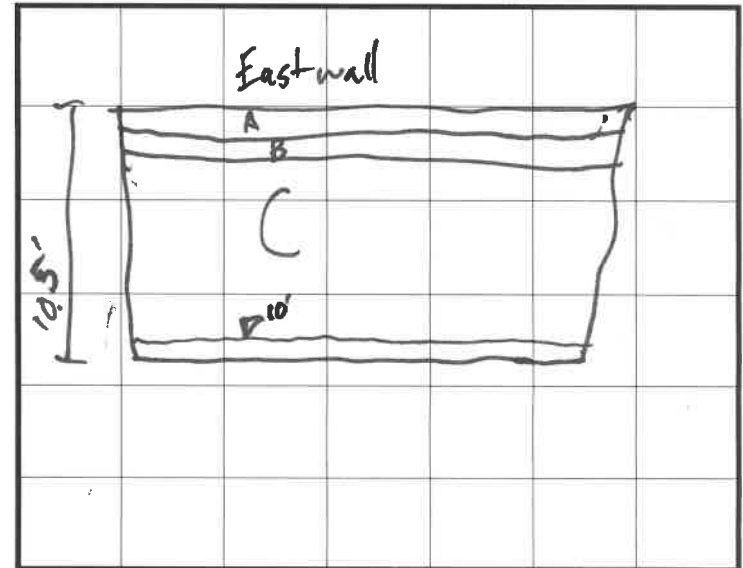
Sampler: JWS

Calibration Time: 08:20

Background Headspace: 0.3 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-1	N N	0.4	Dark Brown topsoil fill
B	1-2	N N	5.4	Gray silts/ash silty sand (sm) JWS
C	2-10.5	Lt. Lt.	20.5	Waste

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities.



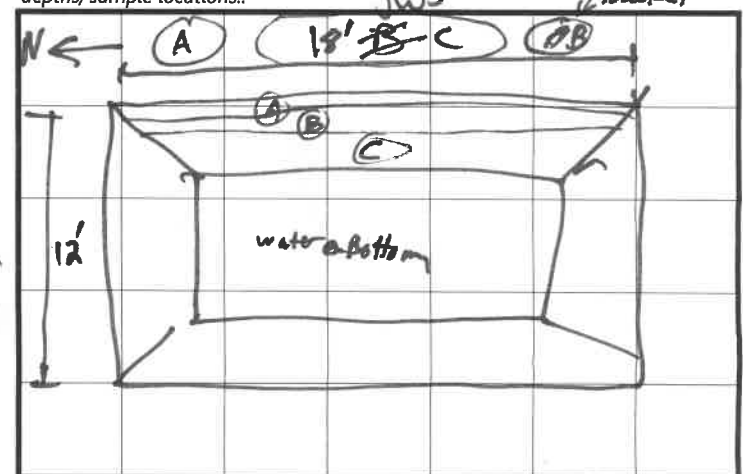
General stratigraphy description / General notes

A = Dark Brown topsoil fill 02/04

B = Gray silts/ash silty sand (sm) fill ~15% silts (Frozen)
JWS

C = Waste fill, wood, bricks, plastic, paper, glass, scrap metal
wet @ ~10' bgs Lt chemical odor, Lt. sheen
Face sampled water @ 10'

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FL-TT-02a

Date: 4-20-18

Time Started: 08:45

Time Ended: 09:45

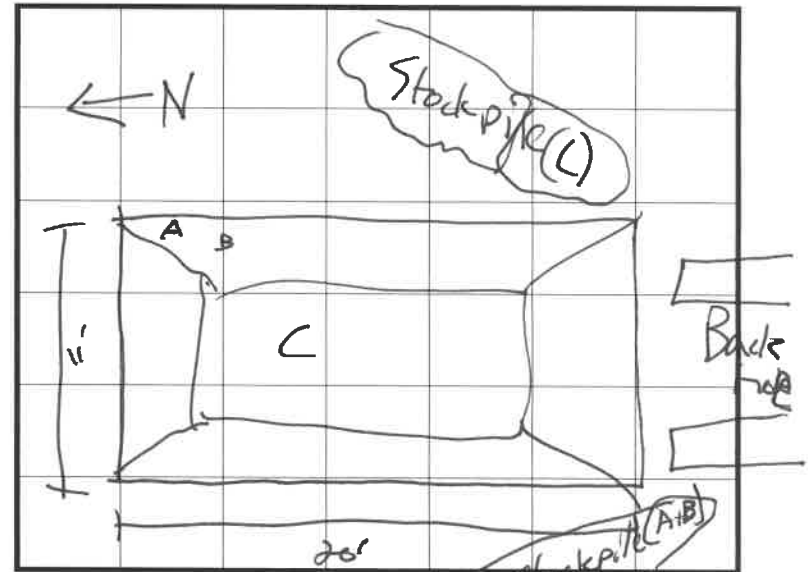
Sampler: JWJ

Calibration Time: 0740

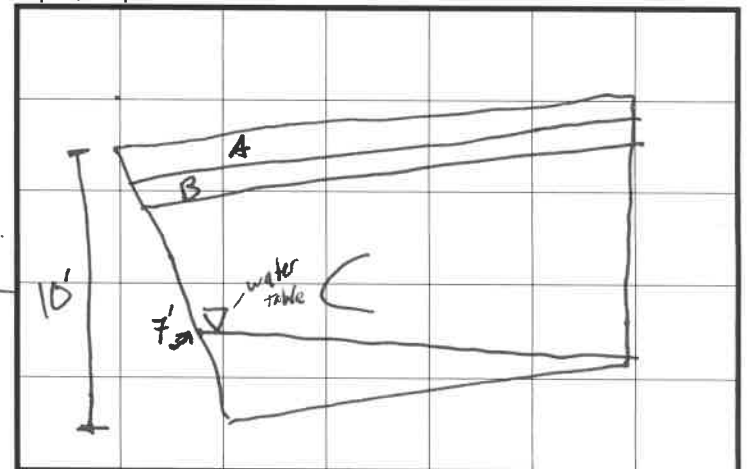
Background Headspace: 0.4 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-1	N/N	2.7	Dark brown topsoil + silty sand (SM)
B	1-2	N/N	0.5	Gray silty sand w some debris
C	2-10	4 / Rainbow	4.8	Waste

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



General stratigraphy description / General notes

A = Dark brown organic topsoil w/ silty sand (SM) tree roots present

B = Gray silty sand cover w/ some concrete blocks

C = Waste fill including wood, plastics, glass, paper, wiring, 1# chemical
 Odor, Rainbow sheen in darker colored soils
 water @ 7'

Soil Sample Collected [2-10]

* ABC WATER Sample

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Landfill =

CH ₄	CO ₂	O ₂	Bal	LEL ₂
6.0	0.0	21.4 20.0	0.6	0.7

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: PL-11-03

Date: 4/19/18

Time Started: 7:30

Time Ended: _____

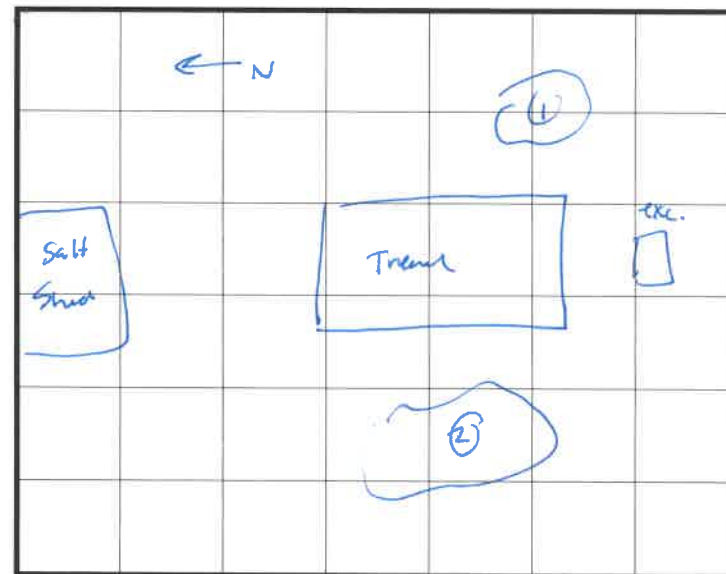
Sampler: ABW

Calibration Time: 7:30

Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	2	None	0.5	Topsoil → org OL
2	10	lt. wood, None	4.0	WASTE MATERIAL
10	12	None	0.2	Gray silt

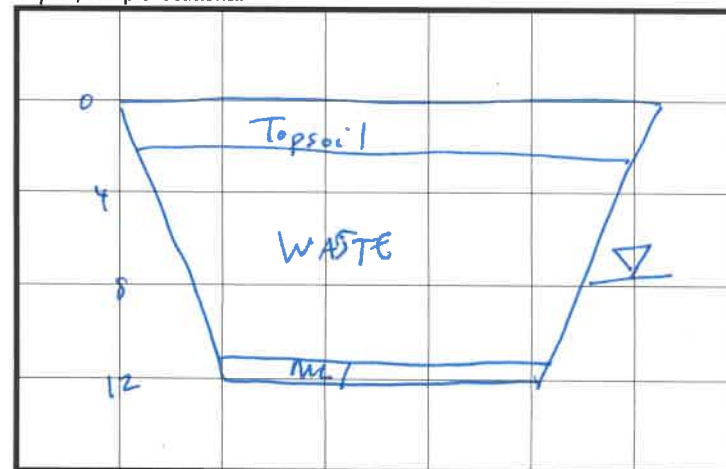
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities.



General stratigraphy description / General notes

0-2 : Dk brown OL (topsoil), abundant roots, silty, low line gravel
 2-10: Waste Material = wood, plastic, rubber, w/ silty sand, brown, moist to 5' bgs, wet below, [Industrial Waste]
 10-12 : gray silt w/ sand, no plastic, fine sand, gray (107R4/1) wet, homogeneous, loose, [0/30/70]

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.



* ABC water

* Waste 2-14

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FL-TT-04

Date: 4/19/18

Time Started: 820

Time Ended:

Sampler: ABW

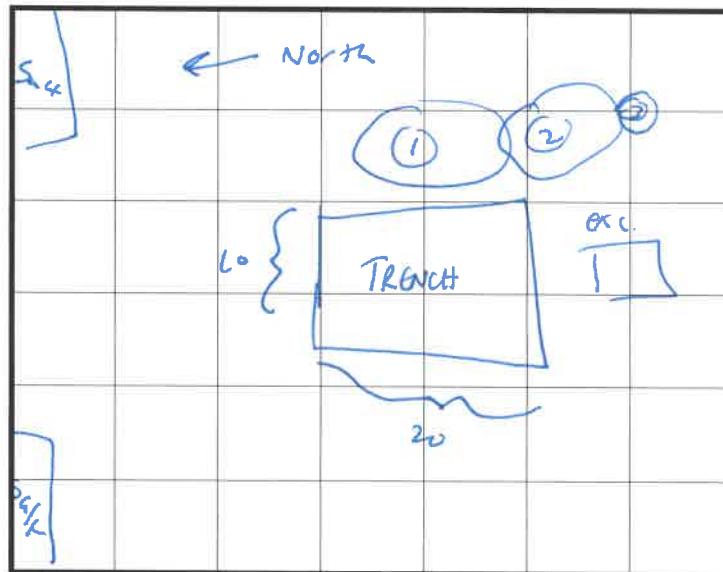
Calibration Time: 730

Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	2	NONE	0.1	Topsoil (Brown)
2	14	Trace/ NONE	0.2	WASTE MATERIAL
14	15	NONE	0.1	Gray silt w/ sand

7'bes
N

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



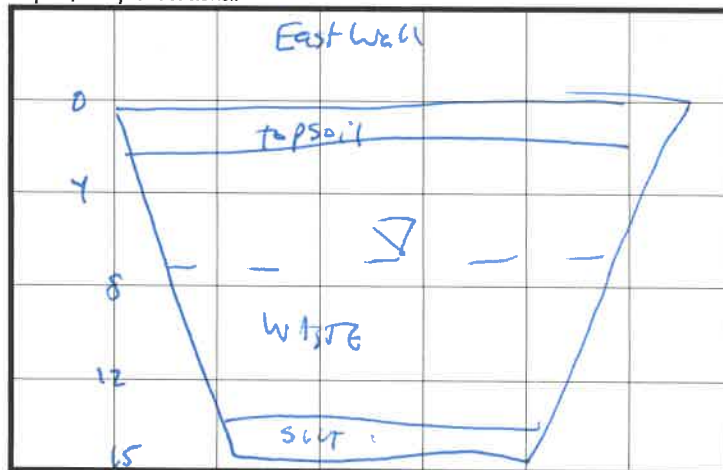
General stratigraphy description / General notes

0-2 Topsoil (OL) Brown-Dk brown, silty sand w/ organics

2-14: WASTE MATERIAL: Black silty sand, wood, plastic, Rubber, bricks, concrete, veto 7, see trace sheen, Lt. woody odor, insulation, glass (construction debris)

14-15: Sandy silt, gray (w/ r y₁₁), loose, homogenous f. vfy sand [Native]

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



Electrical

* Sample Waste S-15

* ABC list Waters

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

LF	Uth	CO ₂	O ₂	Bd	LEL2
0.0	0.0	20.0	80.0	0%	

Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FT-TT-05

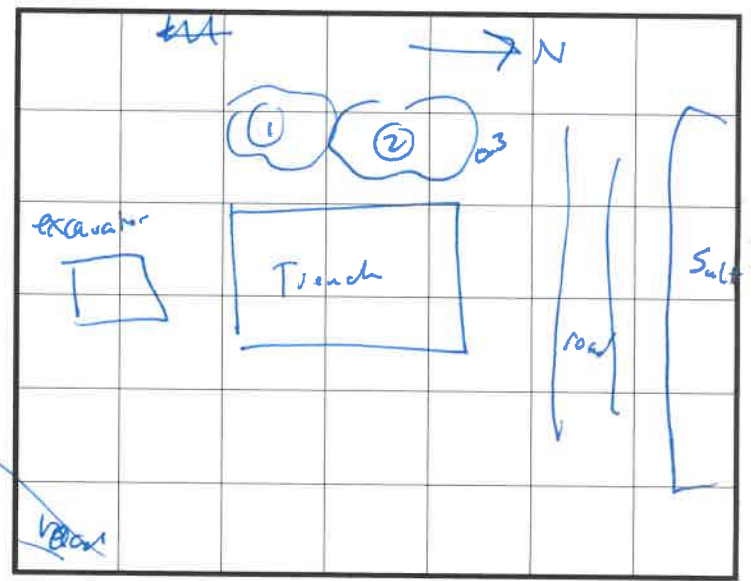
Date: 4/19/15
 Time Started: 9:30
 Time Ended: 10:15

Sampler: ABU/Pace
 Calibration Time: 730
 Background Headspace: 0.0 ppm

1
 1" bas
 2
 3

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	5	N/A/N	0.6	Topsoil → Black, organics
5	15	strong decomp. trace	29.2	WASTE MATERIAL
15	-			@ 15 → Gray silty sandy silt

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



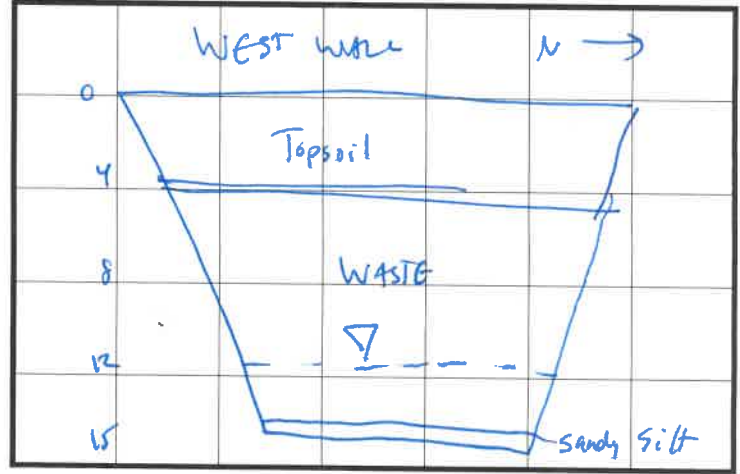
General stratigraphy description / General notes

0-5: Topsoil, Black, organic, silty silt (OL)(@ 50/50)

Waste 5-15: WASTE Material, Tires, metal, wood, plastic, glass, automotive
 ? construction debris, strong decomposition odor, trace sheen, Black
 silty sand throughout

@ 15: last Bucket contained Sandy silt, gray, VF fgsad, homogeneous,
 loose, wet, (0/40/60) [Native]

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.



Soil Sample 0-10' bgs

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

* No water Sample → ~~not seen~~ Only trickle of water entering trench

Client: Minnesota Pollution Control Agency

Project Name: Freeway Landfill & Dump Investigation

Number: 23 / 19 - 1372

Location ID: FL-11-06

Date: 4/15/18

Time Started: 1045

Time Ended: _____

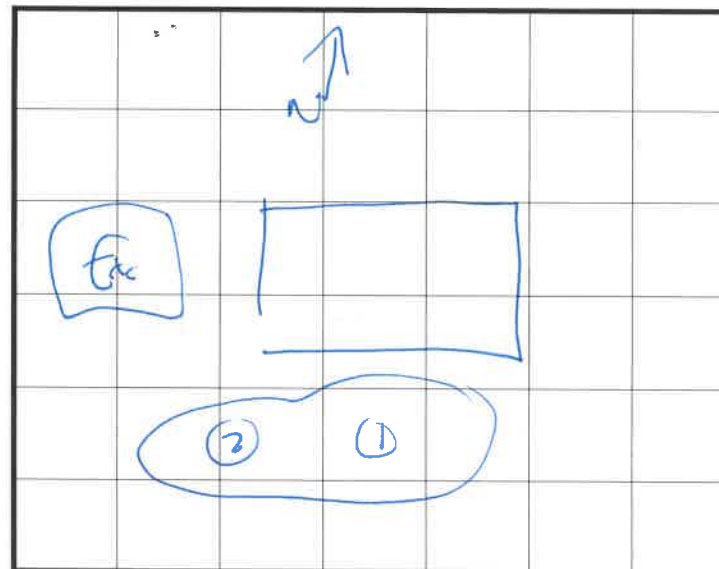
Sampler: ABW

Calibration Time: 750

Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	10	None	0.4	Brown sandy silt Silty sand
10	13	None	0.4	gray sandy silt, few clay

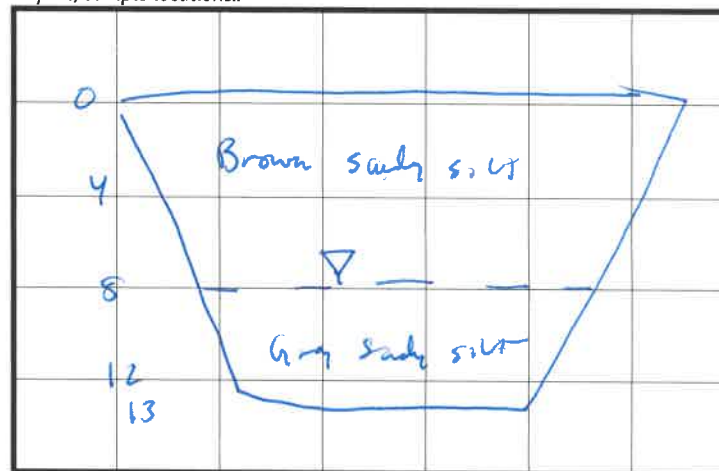
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0-10: ^{Silty sand} Brown ~~sandy silt~~, 10% ^[0/00/40] $\frac{1}{3}$ Brown, organics 0-4' bgs
 f-mg sand (mostly fs), soft, loose, homogeneous, few clay,
 Soil forms "clumps"
 [x water entering trench @ 8' bgs
 (trickle, ~~not~~ no standing water)]
 10-13: Gray sandy silt w/ clay, soft low plast, (few clay), dense,
 homogeneous, few thin laminations, iron ox. throughout, 10% $\frac{1}{1}$
 [0/30/70]

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



* Soil Sample from 1-5'
 A Water Add list

TEST TRENCH FIELD SAMPLING AND SCREENING LOG

Another small pothole (~6") dug just NW on toe of slope → contained water

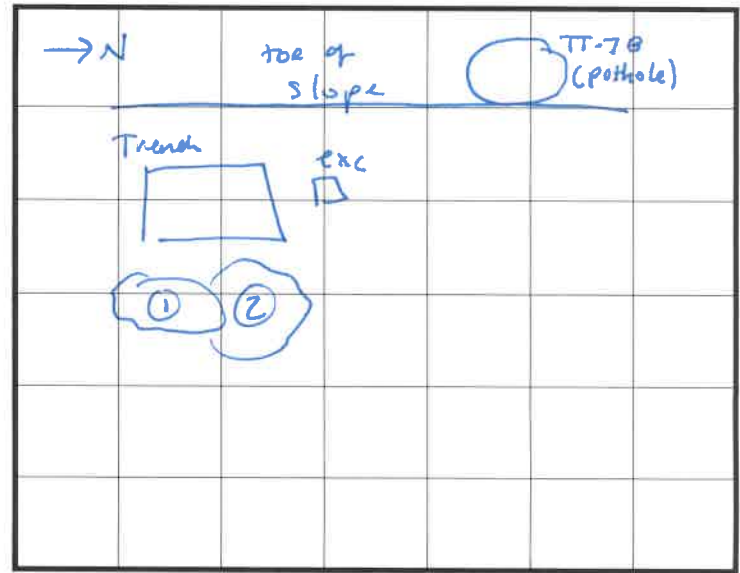
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FL-TT-07

Date: 4/19/18
 Time Started: 1245
 Time Ended: _____

Sampler: ABW/Pace
 Calibration Time: 730
 Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
0	5	NONE	0.3	Clayey sand (Dk grayish Brown)
5	10	NONE	0.3	Fat clay (Dk gray)

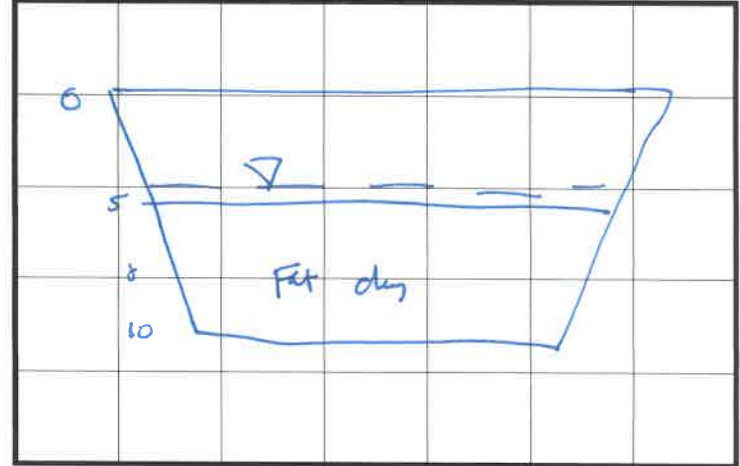
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

0-1 Topsoil: org. 0.4
 1-5: Clayey sand [0/70/30] Dk grayish Brown, fig sand, w/ gray and plast clay, forms small clumps ~1", iron oxidation 1.5-2' bgs, water entry trench @ 4' bgs
 5-10: Dk gray Fat clay, high plast [0/10/90] Thin bedding, shells, org odor, wet to moist

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



TEST TRENCH FIELD SAMPLING AND SCREENING LOG

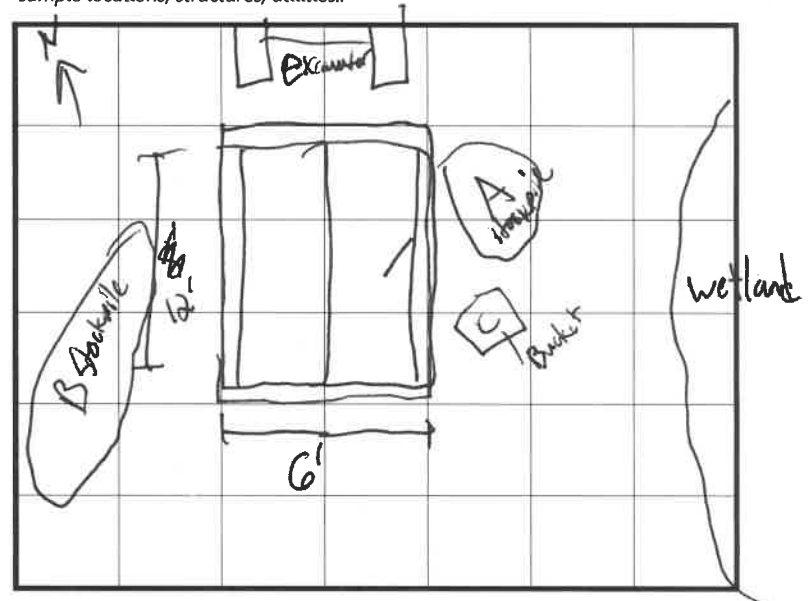
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill & Dump Investigation
 Number: 23 / 19 - 1372
 Location ID: FL-TT-08

Date: 4-20-18
 Time Started: 13:55
 Time Ended: _____

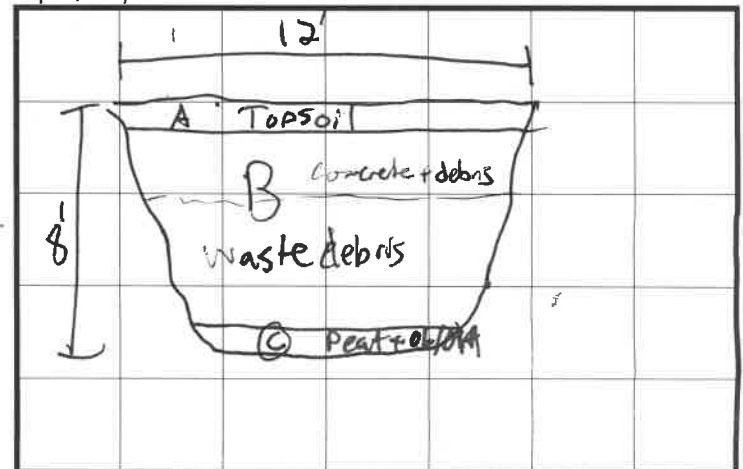
Sampler: JWS
 Calibration Time: 07:40
 Background Headspace: 0.2 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-1'	N N	2.8	Black topsoil + roots
B	1-7'	N org plastic	3.5	Black soils + WASTE
C	7-7.8'	Lt charcoal N	4.3	Black + Dk-brown Peat + OL/OH ^{Native}

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities.



CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.



General stratigraphy description / General notes

A - Black topsoil + roots

B - Black organic soils + WASTE ^{plastic} 1-3' = concrete rubble + debris
 - plastics, rope, paper, fabric, wood, metal, metal piping

C - Black and dark brown peat +/- organic soils (OL/OH)
 Native

Field Form 3
TEST EXCAVATION FIELD LOG

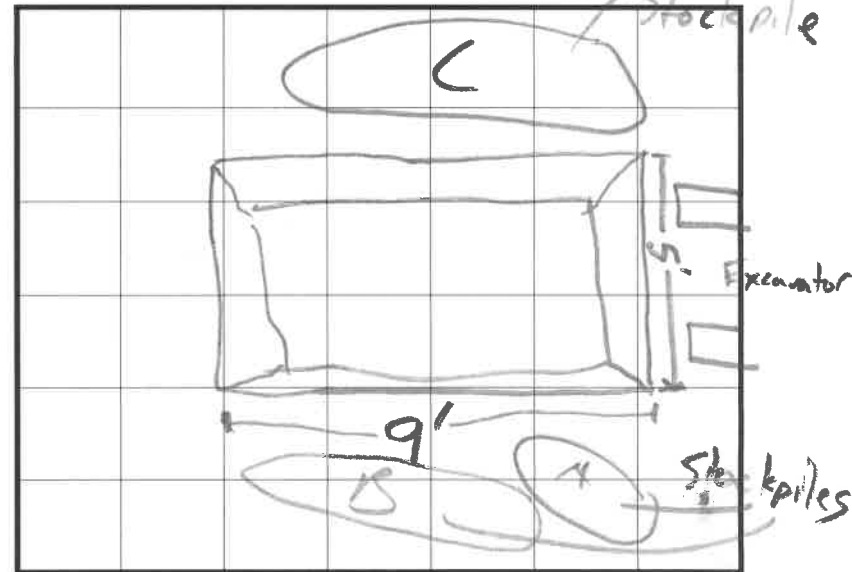
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill - Phase B
 Number: 23 / 19 - 1372
 Location ID: FL-TT-09

Date: 5/30/19
 Time Started: 09:20
 Time Ended: 09:40

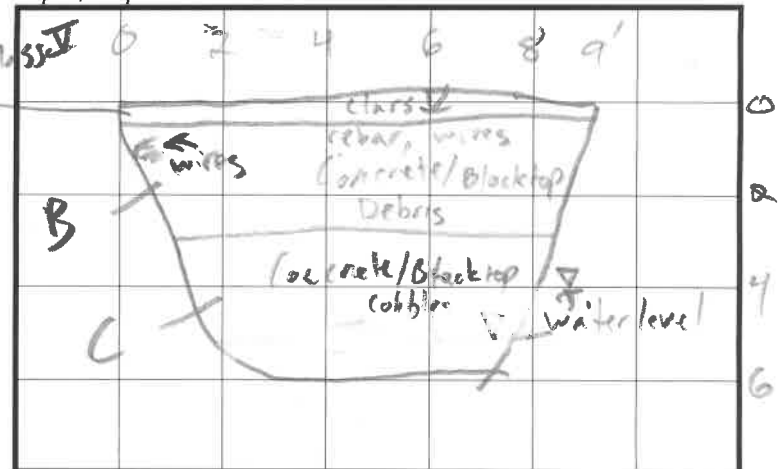
Sampler: JWJ
 Calibration Time: 9:15
 Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-0.5	N	1.1	light brown/tan class V gravel
B	0.5-3	N	1.4	Med brown silty sand w/ concrete, blacktop, wiring, rebar
C	3'-6'	N lt. sheen	1.8	Dark gray brown silty sand w/ concrete, blacktop, cobbles

PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities.



CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations.



General stratigraphy description / General notes

A: Tan/Brown class V gravel
Trace debris at surface

B = SM: Fill med brown silty sand w/ debris (concrete, blacktop, wiring, rebar, cobbles)

C = SM: Fill Dark gray brown silty sands w/ debris (concrete, blacktop, cobbles) net @ ~4' lt. sheen (silty)

Field Form 3
TEST EXCAVATION FIELD LOG

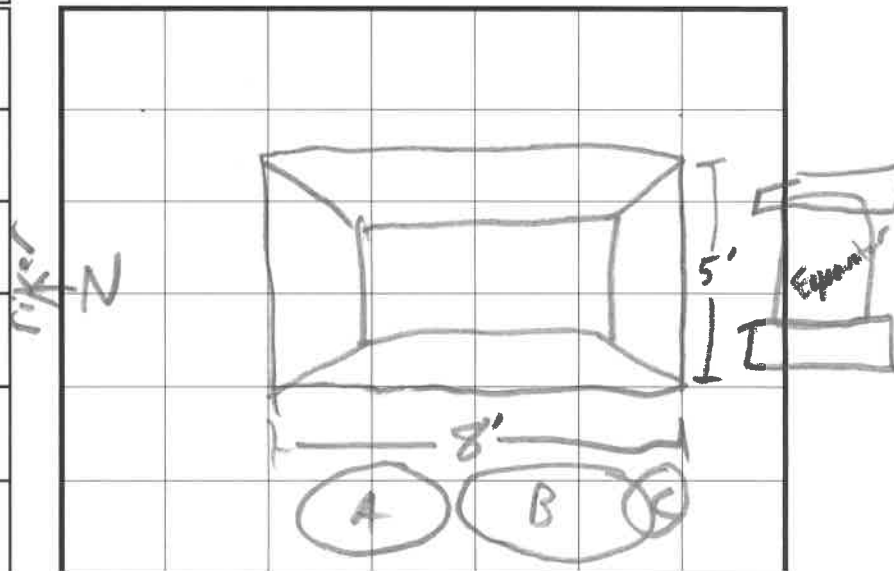
Client: Minnesota Pollution Control Agency
 Project Name: Freeway Landfill - Phase B
 Number: 23 / 19 - 1372
 Location ID: FL-TT-10

Date: 5/30/19
 Time Stated: 10:00
 Time Ended: 10:08

Sampler: JWJ
 Calibration Time: 09:15
 Background Headspace: 0.0 ppm

Sample ID	Depth (ft)	Odor/Sheen	Headspace Reading (ppm)	Description
A	0-1'	N / N	1.0	Class II gravel
B	1-4'	N / N	1.1	Class II gravel (mostly mg-cg sand)
C	4-5'	N / N	1.1	SC clayey sand w/silt

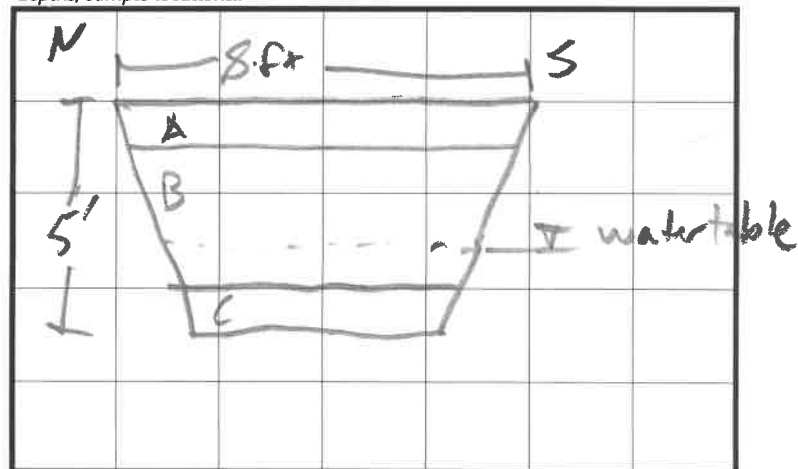
PLAN VIEW SKETCH: identify scale and direction, excavation extents and depths, sample locations, structures, utilities..



General stratigraphy description / General notes

A	Class II gravel tan/light brown 5m	No debris	Fill
B	Class II gravel tan/light brown 5m mostly fg-cg sand	wet @ 3' No Debris	Fill
C	Dark brown SC clayey sand, w/silt	No Debris	

CROSS SECTION SKETCH: identify scale and direction, excavation extents and depths, sample locations..



Appendix C-1

Included in Separate File

Laboratory Analytical Reports

Solid Media – Phase A (2018)

Appendix C-2

Included in Separate File

Laboratory Analytical Reports

Water – Phase A (2018)

Appendix C-3

Included in Separate File

Laboratory Analytical Reports

Solid Media – Phase B (2019)

Appendix C-4

Included in Separate File

Laboratory Analytical Reports

Water – Phase B (2019)

Appendix C-5

Included in Separate File

Laboratory Analytical Report

Soil Gas – Phase B (2019)

Appendix D

Data Quality Review

Data Quality Review

The quality assurance data from the 2019 sampling event were evaluated to determine the integrity of the sampling procedures and the validity of the analytical results. Review procedures were performed in accordance with Barr standard operating procedures (SOPs) and/or method QC requirements where no SOP was available.

Both laboratory and field sampling procedures were examined in the review of the sampling events. Field sampling procedures were examined utilizing field blank and field duplicate analysis; additionally, laboratory procedures were evaluated by examining technical holding times, precision and accuracy data, laboratory method blank analysis, duplicate analysis, and data package completeness.

1.1 Field Procedures

Four field duplicates were collected with this sampling event. Duplicate relative percent differences (RPDs) were calculated for all otherwise unqualified results greater than five times the reporting limit (RL). RPD values close to the reporting limit are not always good measures of precision, and were therefore not necessarily evaluated as part of the review. All duplicate results greater than five times the reporting limit exhibited acceptable RPDs.

One field blank had detectable concentrations of methylene chloride and perfluoropentanoic acid (PFPeA). All methylene chloride concentrations were non-detect for the associated samples and no qualification was required. A number of samples reported concentrations of PFPeA between the reporting limit and five times that of the detected concentration in the field blank and the associated results were qualified as potential false positives. In a separate field blank, methylene chloride was also had reported detectable concentrations. All associated methylene chloride concentrations in project samples were non-detect or greater than five times the detected values in the blank, and no qualification was required. In a third field blank, trace detections of methylene chloride, chloroform and 1,4-dioxane were observed. With the exception of 1,4-dioxane, the samples were non-detect for the detected samples or reported at concentrations well over five times that in the field blank and no qualification was needed. 1,4-dioxane was detected in one sample and the masked duplicate associated with the sample during the same event at concentrations below the threshold of five times that of the field blank and the reported values were qualified accordingly as potential blank contamination. All remaining target parameters were non-detect in the field blanks.

1.2 Laboratory Procedures

1.2.1 Technical Holding Times

Technical holding times were evaluated for each sample and target compound based on the Environmental Protection Agency (EPA) recommendations listed in 40 CFR SW846 "Test Methods for Evaluating Hazardous Waste" or method recommendations. The pH was measured using field instruments at the time of sampling at each monitoring location, and field results are reported in the tables. The pH was also analyzed in the laboratory for confirmatory purposes and was generally analyzed several days later. The EPA-recommended hold time for pH analysis is immediately after sample collection; as it is not feasible to meet this holding time with laboratory analysis, the field-measured pH appropriately taken at the time of sample collection is reported in the tables.

PFAS analysis of sample 813764 was conducted outside recommended hold times and the associated results are qualified accordingly.

Bedrock core samples reported with Pace work order 10471713 were submitted to the laboratory past hold for a number of parameters and with elevated temperatures (20.7°C). All organic parameters were qualified as past hold, as well as a number of short-hold general parameters – these results may be potentially biased low, some of them significantly so.

Several other samples coolers were received by the laboratories at elevated temperatures. However, this always occurred within typical allowed cool-down periods after sample collection and no qualifiers were applied as a result.

The remaining technical holding times were within recommendations for all of the samples.

1.2.2 Precision and Accuracy Data

The accuracy and precision of the analytical process were reviewed by comparing sample surrogate recoveries, matrix spike (MS) and matrix spike duplicate (MSD), laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) percent recoveries for spiked target compounds. Accuracy was evaluated by comparing the percent recoveries of the target compounds to laboratory acceptance criteria. Precision was evaluated using the percent recoveries of the laboratory duplicate samples, LCS/LCSD and MS/MSD data and calculating duplicate relative percent differences (RPDs).

In general, surrogate recoveries on samples were acceptable when the results came from undiluted analyses. No action was taken for those surrogate results outside laboratory acceptance criteria if the sample was analyzed at dilution or if only one surrogate was outside control on a given sample.

Laboratory duplicate samples displayed acceptable RPDs for all results greater than five times the RL, except where noted in the tables. In general LCS/LCSD displayed acceptable percent recoveries and all RPDs met laboratory acceptance criteria; however, there were a few instances where this was not the case (largely individual VOC, SVOC or pesticide analyses) and samples associated with the affected batches were qualified as estimated values where appropriate.

It is noted that MS/MSD sample results reported by the laboratory included project and non-project specific samples. Where MS/MSD recoveries and/or associated RPDs failed acceptance criteria and where the native sample was associated with another laboratory client, acceptance of the sample results were based on the acceptable LCS/LCSD data which generally indicated in-control analytical systems during this project with the exception of the aforementioned issues with various organics analyses. Results of MS/MSD samples not specific to this project are not discussed herein.

The MS/MSD recoveries for the several analytes were occasionally outside acceptance criteria. Where the parent sample concentrations were greater than four times the spike added, no qualification was required. In other cases where MS/MSD results were outside laboratory control limits, but were less than 5% outside control limits, no qualification was added. In other cases where MS/MSD results were outside of control limits and the sample was associated with this project, qualifiers were applied accordingly to indicate that the sample results reported reflect estimated values. In one instance, hexavalent chromium MS/MSD results recoveries were reported as having no recovery of the spiked amount and the associated reported result was qualified as a rejected value.

1.2.3 Laboratory Method Blank Results

In several series of VOC samples analyzed, the continuing calibration verification and/or LCS/LCSD recoveries were low for hexachlorocyclopentadiene, hexachloroethane, bromomethane, bentazon, and/or dichlorodifluoromethane. Affected results were qualified as estimated values. A few samples were impacted by recoveries and RPDs outside laboratory acceptance criteria for ethalfluralin, fonofos, propachlor, and triallate. Because both the recovery and RPD were outside of control, the affected samples were qualified as estimated values.

No other target compounds were detected in the laboratory method blanks.

1.2.4 Accreditations

With respect to all solid samples, there were a few parameters reported that Pace lacked accreditation in. Where the lab was not accredited for a target parameter, but accreditation was available, results were qualified as estimated values.

1.2.3 Completeness

Data completeness was evaluated by comparing the analysis requested with the data package as received. The data package received from the laboratory is complete.

1.2.3 Conclusion

All data met the data quality objectives of the project and are deemed acceptable for the purposes of this project, as qualified in the accompanying tables.

Appendix E

Laboratory Analytical Data Tables

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

				Monitoring Well Group				LANDFILL									
								Perched									
								Location	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MP-8
								MN Unique ID#	813761	813763	813764	813765	813766	813767	813768	834659	240818
								Date	4/01/2019	5/22/2019	4/01/2019	3/27/2019	3/27/2019	3/27/2019	6/03/2019	3/28/2019	
								Sample Type	N	N	N	N	N	N	N	N	
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria											
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2012	01/24/2012	01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
General Parameters																	
Chloride	NA	Lab	mg/l			230	1720	1240	2440	1070	1040	74.8 *	112	26.9	--	12.7	
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	5.2 (5)	45 (5)	< 20.0	--	< 20.0	< 20.0	< 20.0	< 20.0	29.2	--	< 20.0	
Cyanide, free	NA	Lab	ug/l	200	100 HRL93	5.2	45	< 20	--	< 20	< 20	< 20	< 20	< 20	--	< 20	
Hardness, as CaCO3	NA	Lab	ug/l					6930000	277000	1470000	1190000	782000	816000	794000	--	790000	
Nitrogen, ammonia, as N	NA	Lab	mg/l			0.04 (3)		621	--	< 0.11	296	12.7	30.8	31.4	--	0.47	
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			0.04		0.062	--	< 0.010	0.51	< 0.010	0.017	0.013	--	< 0.010	
Dissolved oxygen	NA	Field	mg/l			(6)		0.9	--	0.8	0.8	1.4	1.0	1.2	--	0.7	
pH	NA	Field	pH units			6.5 - 9.0		5.7	--	6.9	6.9	6.4	6.4	6.3	--	6.2	
Redox (oxidation potential)	NA	Field	mV					-28	--	-118	-137	-54	-61	-82	--	-6	
Specific conductance @ 25 °C	NA	Field	umhos/cm					18100	--	7290	6960	1950	2270	1920	--	1570	
Temperature	NA	Field	deg C			(7)		11.0	--	12.5	12.0	11.5	12.0	11.5	--	6.0	
Turbidity	NA	Field	NTU	5 (19)		25		440	--	107	57.5	91.0	7.5	3.5	--	7.3	
Metals																	
Aluminum	Dissolved	Lab	ug/l			125	2145	2050	< 200	< 200	< 200	< 200	< 200	< 200	--	< 200	
Antimony	Dissolved	Lab	ug/l	6	6 HRL93	5.5	180	15.8	13.9	0.59	< 2.5	< 0.50	< 0.50	< 0.50	--	0.50	
Arsenic	Dissolved	Lab	ug/l	10		2.0	720	11.4	< 10.0	3.8	5.0	9.6	3.9	0.73	--	0.82	
Barium	Dissolved	Lab	ug/l	2000	2000 HRL93			87.8	19.0	587	713	662	694	993	--	204	
Beryllium	Dissolved	Lab	ug/l	4	0.08 HRL93			< 1.0	< 4.0	< 1.0	< 1.0	< 0.20	< 0.20	< 0.20	--	< 0.20	
Boron	Dissolved	Lab	ug/l		500 RAA17			14800	12800	2820	2260	1200	5040	2590	--	42.0	
Cadmium	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)	2.8 HD CF	268 HD CF	5.4	< 1.6	< 0.080	< 0.40	< 0.080	< 0.080	< 0.080	--	< 0.080	
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93	11 CF CR6	31 CF CR6	74.6	88.9	8.8	7.9	0.61	1.3	3.5	--	< 0.50	
Cobalt	Dissolved	Lab	ug/l			2.8	872	347	308	42.6	11.8	4.5	0.86	0.86	--	1.6	
Copper	Dissolved	Lab	ug/l	1300 TT(12)		21 HD CF	114 HD CF	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	--	< 10.0	
Lead	Dissolved	Lab	ug/l	15 TT(12)		13 HD CF	661 HD CF	33.9	< 2.0	0.15	< 0.50	0.15	< 0.10	< 0.10	--	< 0.10	
Manganese	Dissolved	Lab	ug/l		100 HBV18			35700	< 5.0	289	318	539	220	452	--	1530	
Nickel	Dissolved	Lab	ug/l		100 HRL93	296 HD CF	8366 HD CF	1730	< 20.0	38.1	< 20.0	< 20.0	< 20.0	< 20.0	--	< 20.0	
Selenium	Dissolved	Lab	ug/l	50	30 HRL93	5.0	40	< 2.5	< 10.0	< 0.50	< 2.5	< 0.50	< 0.50	< 0.50	--	< 0.50	
Silver	Dissolved	Lab	ug/l		30 HRL93	0.85 CF	31 HD CF	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	--	< 10.0	
Thallium	Dissolved	Lab	ug/l	2	0.6 HRL94	0.28	128	< 0.50	< 2.0	< 0.10	< 0.50	< 0.10	< 0.10	< 0.10	--	< 0.10	
Tin	Dissolved	Lab	ug/l		4000 HRL94			78.5	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	--	< 75.0	
Uranium	Dissolved	Lab	ug/l	30				< 2.5	< 10.0	< 0.50	< 2.5	1.2	< 0.50	< 0.50	--	4.4	
Vanadium	Dissolved	Lab	ug/l		50 HRL94			6.0	20.1	< 5.0	5.6	2.1	1.3	1.3	--	< 1.0	
Zinc	Dissolved	Lab	ug/l		2000 HRL94	309 HD CF	678 HD CF	64300	59.2	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	--	< 20.0	
Aluminum	Total	Lab	ug/l			125	2145	--	--	--	--	--	--	--	--	--	
Antimony	Total	Lab	ug/l	6	6 HRL93	5.5	180	--	--	--	--	--	--	--	--	--	
Arsenic	Total	Lab	ug/l	10		2.0	720	--	--	--	--	--	--	--	--	--	
Barium	Total	Lab	ug/l	2000	2000 HRL93			--	--	--	--	--	--	--	--	--	
Beryllium	Total	Lab	ug/l	4	0.08 HRL93			--	--	--	--	--	--	--	--	--	
Boron	Total	Lab	ug/l		500 RAA17			--	--	--	--	--	--	--	--	--	
Cadmium	Total	Lab	ug/l	5	0.5 HRL15 (1)	3.1 HD	284 HD	--	--	--	--	--	--	--	--	--	
Chromium	Total	Lab	ug/l	100	100 CR HRL93	11 CR6	32 CR6	--	--	--	--	--	--	--	--	--	
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	0.1 HRL93	0.011	0.032	0.12	0.28	< 0.010	< 0.010	< 0.010 *	0.023	0.022	--	0.14	
Cobalt	Total	Lab	ug/l			2.8	872	--	--	--	--	--	--	--	--	--	
Copper	Total	Lab	ug/l	1300 TT(12)		22 HD	119 HD	--	--	--	--	--	--	--	--	--	
Lead	Total	Lab	ug/l	15 TT(12)		16 HD	836 HD	--	--	--	--	--	--	--	--	--	
Manganese	Total	Lab	ug/l		100 HBV18			--	--	--	--	--	--	--	--	--	
Nickel	Total	Lab	ug/l		100 HRL93	297 HD	8383 HD	--	--	--	--	--	--	--	--	--	
Selenium	Total	Lab	ug/l	50	30 HRL93	5.0	40	--	--	--	--	--	--	--	--	--	
Silver	Total	Lab	ug/l		30 HRL93	1.0	37 HD	--	--	--	--	--	--	--	--	--	
Thallium	Total	Lab	ug/l	2	0.6 HRL94	0.28	128	--	--	--	--	--	--	--	--	--	
Tin	Total	Lab	ug/l		4000 HRL94			--	--	--	--	--	--	--	--	--	

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								LANDFILL									
								Perched									
								Location	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MP-8
								MN Unique ID#	813761	813763	813764	813765	813766	813767	813768	834659	240818
Date	4/01/2019	5/22/2019	4/01/2019	3/27/2019	3/27/2019	3/27/2019	3/27/2019	6/03/2019	3/28/2019								
Sample Type	N	N	N	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria											
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
Uranium	Total	Lab	ug/l	30				--	--	--	--	--	--	--	--	--	
Vanadium	Total	Lab	ug/l		50 HRL94			--	--	--	--	--	--	--	--	--	
Zinc	Total	Lab	ug/l		2000 HRL94	314 HD	693 HD	--	--	--	--	--	--	--	--	--	
Semivolatile Organic Compounds																	
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)			--	220	98	110	8.3	15	4.2	2.1	< 0.049	
2,4,6-Trichlorophenol	NA	Lab	ug/l		30 HRL93	2.0	203	< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
2,4-Dichlorophenol	NA	Lab	ug/l		20 HRL93			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
2,4-Dimethylphenol	NA	Lab	ug/l		100 HRL93			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
2,4-Dinitrophenol	NA	Lab	ug/l		10 HRL94			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
2-Chlorophenol	NA	Lab	ug/l		30 HRL93			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
2-Methylnaphthalene	NA	Lab	ug/l		8 RAA13			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
2-Methylphenol (o-cresol)	NA	Lab	ug/l		30 HRL93			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
3,3'-Dichlorobenzidine	NA	Lab	ug/l		0.8 HRL93			< 2500	< 10000	< 105	< 245	< 49.3	< 49.0	< 49.0	--	< 49.0	
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		3 MP HRL94			< 1000	7670	< 42.1	< 98.0	< 19.7	< 19.6	< 19.6	--	< 19.6	
4-Bromophenyl phenyl ether	NA	Lab	ug/l					< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Acenaphthene	NA	Lab	ug/l		100 HRL18 (1)	20	112	< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Anthracene	NA	Lab	ug/l		600 RAA19 (1)	0.035	0.63	< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Benzo(a)pyrene	NA	Lab	ug/l	0.2	0.1 HBV18 (1)			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Benzoic acid	NA	Lab	ug/l		30000 HRL93			< 2500	10400	< 105	< 245	< 49.3	< 49.0	< 49.0	--	< 49.0	
Bis(2-chloroethyl)ether	NA	Lab	ug/l		0.3 HRL93			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Bis(2-ethylhexyl)phthalate	NA	Lab	ug/l	6	7 HRL15 (1)	1.9	(1)	< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Butyl benzyl phthalate	NA	Lab	ug/l		100 HRL15			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Diethyl phthalate	NA	Lab	ug/l		6000 HRL93			1300	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Dimethyl phthalate	NA	Lab	ug/l		70000 HRL94			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Di-n-butyl phthalate	NA	Lab	ug/l		20 HRL15			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Di-n-octyl phthalate	NA	Lab	ug/l			30	1650	< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Fluoranthene	NA	Lab	ug/l		70 HRL18 (1)	1.9	6.9	< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Fluorene	NA	Lab	ug/l		80 HBV19 (1)			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Hexachlorobenzene	NA	Lab	ug/l	1	0.2 HRL93	0.00024		< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Hexachlorocyclopentadiene	NA	Lab	ug/l	50				< 2500	< 10000	< 105	< 245	< 49.3	< 49.0	< 49.0	--	< 49.0	
Hexachloroethane	NA	Lab	ug/l					< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Isophorone	NA	Lab	ug/l		100 HRL93			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
n-Nitrosodimethylamine	NA	Lab	ug/l		0.005 HBV17 (1)			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Pentachlorophenol	NA	Lab	ug/l	1	0.3 HRL15 (1)	1.9 (8)	18 (8)	< 1000	< 4000	< 42.1	< 98.0	< 19.7	< 19.6	< 19.6	--	< 19.6	
Phenanthrene	NA	Lab	ug/l			3.6	64	< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Phenol	NA	Lab	ug/l		4000 HRL93	<u>123</u>	4428	< 500	<u>2330</u>	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	
Pyrene	NA	Lab	ug/l		50 HRL18 (1)			< 500	< 2000	< 21.1	< 49.0	< 9.9	< 9.8	< 9.8	--	< 9.8	

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								LANDFILL								
								Perched								
								MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MP-8
								MN Unique ID#	813761	813763	813764	813765	813766	813767	813768	834659
Date	4/01/2019	5/22/2019	4/01/2019	3/27/2019	3/27/2019	3/27/2019	3/27/2019	6/03/2019	3/28/2019							
Sample Type	N	N	N	N	N	N	N	N	N							
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria		MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MP-8
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness									
Effective Date				04/01/2012	08/05/2012	01/24/2012	01/24/2012									
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade									
Volatile Organic Compounds																
1,1,1,2-Tetrachloroethane	NA	Lab	ug/l		70 HRL93			< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	NA	Lab	ug/l	200	5000 HRL18 (1)	329	5913	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	NA	Lab	ug/l		2 HRL94	1.5	2253 (1)	< 5.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1,2-Trichloroethane	NA	Lab	ug/l	5	3 HRL93			< 5.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,1-Dichloroethane	NA	Lab	ug/l		80 RAA16 (1)			< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethylene	NA	Lab	ug/l	7	200 HRL11			< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	NA	Lab	ug/l		0.003 HRL13 (1)			< 2.0	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
1,2,4-Trichlorobenzene	NA	Lab	ug/l	70	4 HRL13 (1)			< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			72	21	< 1.0	6.2	< 1.0	< 1.0	< 1.0	14	< 1.0
1,2-Dibromo-3-chloropropane (DBCP)	NA	Lab	ug/l	0.2				< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromoethane (EDB)	NA	Lab	ug/l	0.05 (7)	0.004 HRL93			< 5.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	NA	Lab	ug/l	600	600 HRL93			< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	NA	Lab	ug/l	5	1 HRL13 (1)	3.8	90100 (1)	< 2.0	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
1,2-Dichloroethylene, cis	NA	Lab	ug/l	70	6 HRL18 (1)			440	1.6	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloroethylene, trans	NA	Lab	ug/l	100	40 HRL13 (1)			12	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	NA	Lab	ug/l	5	5 HRL94			13	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			22	4.7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.1	< 1.0
1,3-Dichlorobenzene	NA	Lab	ug/l	600 (5)				< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropene, cis	NA	Lab	ug/l		2 DCP HRL94			< 5.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,3-Dichloropropene, trans	NA	Lab	ug/l		2 DCP HRL94			< 5.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94			16	< 1.0	2.8	8.6	< 1.0	< 1.0	1.6	2.4	< 1.0
2,2-Dichloropropane	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acetone	NA	Lab	ug/l		3000 HBV17 (1)			8600	11000	< 20	< 20	< 20	< 20	< 20	150	72
Allyl chloride	NA	Lab	ug/l		30 HRL94			< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	<u>6.0</u>	8974 (1)	16	5.6	2.8	4.0	0.81	8.1	6.7	11	< 0.50
Bromobenzene	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromochloromethane	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	NA	Lab	ug/l	80 (1)	3 HBV18 (1)			< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromoform	NA	Lab	ug/l	80 (1)	40 HRL93	41	5800	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	NA	Lab	ug/l		10 HRL93			< 20 *	< 2.0	< 2.0 *	< 2.0 *	< 2.0 *	< 2.0 *	< 2.0 *	< 2.0 *	< 2.0 *
Butylbenzene	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.2	< 1.0	< 1.0
Butylbenzene, sec	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.2	< 1.0	< 1.0
Butylbenzene, tert	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Carbon tetrachloride	NA	Lab	ug/l	5	1 HRL13 (1)	1.9	3500 (1)	< 2.0	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Chlorobenzene	NA	Lab	ug/l	100	100 HRL93	20	846	< 10	1.7	5.6	3.0	< 1.0	4.9	4.7	5.4	< 1.0
Chlorodibromomethane	NA	Lab	ug/l	80 (1)	10 HRL93			< 5.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chloroethane	NA	Lab	ug/l		ND RAA09			< 10	2.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.1	< 1.0
Chloroform	NA	Lab	ug/l	80 (1)	20 HRL18 (1)	53	2784	< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloromethane	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorotoluene, o	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorotoluene, p	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cumene (isopropyl benzene)	NA	Lab	ug/l		300 HRL93			< 10	2.6	1.4	2.3	< 1.0	3.0	5.1	2.9	< 1.0
Cymene p- (toluene isopropyl p-)	NA	Lab	ug/l					27	15	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.7	< 1.0
Dibromomethane (methylene bromide)	NA	Lab	ug/l					< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon-12)	NA	Lab	ug/l		700 HRL11			< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichlorofluoromethane (Freon-21)	NA	Lab	ug/l		20 RAA17			< 10	4.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.7	< 1.0
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	<u>68</u>	3717	<u>120</u>	19	< 1.0	1.9	< 1.0	< 1.0	< 1.0	2.4	< 1.0
Ethyl ether	NA	Lab	ug/l		200 RAA10 (1)			50	56	19	3.6	13	13	7.8	21	< 1.0
Hexachlorobutadiene	NA	Lab	ug/l		1 HRL93			< 5.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

ANALYTICAL DATA SUMMARY - WATER (Phase B)
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 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								LANDFILL									
								Perched									
								Location	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MP-8
								MN Unique ID#	813761	813763	813764	813765	813766	813767	813768	834659	240818
Date	4/01/2019	5/22/2019	4/01/2019	3/27/2019	3/27/2019	3/27/2019	3/27/2019	6/03/2019	3/28/2019								
Sample Type	N	N	N	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria											
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2012	01/24/2012	01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
Methyl ethyl ketone (2-butanone)	NA	Lab	ug/l		4000 HRL94			14000	15000	< 10	< 10	< 10	< 10	< 10	49	< 10	
Methyl isobutyl ketone (MIBK)	NA	Lab	ug/l		300 HRL94			1400	630	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
Methyl tertiary butyl ether (MTBE)	NA	Lab	ug/l		60 RAA13 (1)			< 20	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	
Methylene chloride	NA	Lab	ug/l	5	5 HRLMCL	46	27749 (1)	39	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Naphthalene	NA	Lab	ug/l		70 HRL13	81	818	18	28	2.0	62	< 1.0	< 1.0	12	93	< 1.0	
Propylbenzene	NA	Lab	ug/l					13	2.7	1.3	1.8	< 1.0	1.9	3.0	2.6	< 1.0	
Styrene	NA	Lab	ug/l	100				30	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrachloroethylene	NA	Lab	ug/l	5 (9)	4 HBV14 (1)	3.8	857	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			420	680	110	220	< 10	11	< 10	17	< 10	
Toluene	NA	Lab	ug/l	1000	200 HRL11	253	2703	610	18	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.2	< 1.0	
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	0.4 HRL15 (1)	25	13976	150	0.25	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Trichlorofluoromethane (Freon-11)	NA	Lab	ug/l		2000 HRL93			< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Trichlorotrifluoroethane (Freon 113)	NA	Lab	ug/l		200000 HRL93			< 10	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	0.18	(1)	32	4.0	< 0.050	0.13	< 0.050	< 0.050	0.070	< 0.050	< 0.050	
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			300	41	< 1.0	12	< 1.0	< 1.0	1.2	16	< 1.0	
Xylene, o	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			110	16	1.4	2.2	< 1.0	< 1.0	< 1.0	3.4	< 1.0	
Xylene, total	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)	166	2814	410	57	1.4	14.2	0	0	1.2	19.4	ND	
Pesticides																	
Acetochlor	NA	Lab	ug/l		20 HRL18 (1)	3.6	173	< 2.5	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Alachlor	NA	Lab	ug/l	2	9 HRL18 (1)	4.2	1600 (1)	< 5.0	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Atrazine	NA	Lab	ug/l	3	3 HRLMCL	3.4	645	< 2.5	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Chlorpyrifos	NA	Lab	ug/l		0.6 HBV13 (1)	0.041	0.17	< 3.8	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Cyanazine (bladex)	NA	Lab	ug/l		1 HRL18 (1)			< 6.0	--	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	--	< 0.20	
Deisopropyl atrazine	NA	Lab	ug/l					< 3.9	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Desethylatrazine	NA	Lab	ug/l					< 2.2	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Dimethenamid	NA	Lab	ug/l		300 HRL15 (1)			< 2.5	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
EPTC	NA	Lab	ug/l		40 HRL18 (1)			< 2.3	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Ethalfuralin	NA	Lab	ug/l					< 9.6 *	--	< 0.50 *	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50 *	
Fonofos (dyphonate)	NA	Lab	ug/l					< 4.6	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Metolachlor	NA	Lab	ug/l		300 HBV18 (1)	23	543	< 3.0	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Metribuzin	NA	Lab	ug/l		10 HRL13 (1)			< 1.9	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Pendimethalin	NA	Lab	ug/l					< 2.8	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Phorate	NA	Lab	ug/l					< 5.5	--	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	--	< 0.30	
Prometon	NA	Lab	ug/l		100 HRL93			< 3.3	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Propachlor	NA	Lab	ug/l		90 HRL93			< 4.6	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Propazine	NA	Lab	ug/l					< 4.3	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Simazine	NA	Lab	ug/l	4	4 HRLMCL			< 2.3	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Terbufos	NA	Lab	ug/l					< 4.0 *	--	< 0.20 *	< 0.20	< 0.20	< 0.20	< 0.20	--	< 0.20 *	
Triallate	NA	Lab	ug/l					< 6.5	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Trifluralin	NA	Lab	ug/l					< 2.8	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	

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								Location	MW-1	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MP-8
								MN Unique ID#	813761	813763	813764	813765	813766	813767	813768	834659	240818
Date	4/01/2019	5/22/2019	4/01/2019	3/27/2019	3/27/2019	3/27/2019	3/27/2019	6/03/2019	3/28/2019								
Sample Type	N	N	N	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria											
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
Polychlorinated Biphenyls																	
Aroclor 1016	NA	Lab	ug/l					< 1.0	< 1.0	< 0.11	< 1.0	< 0.098	< 0.097	< 0.098	--	< 0.095	
Aroclor 1221	NA	Lab	ug/l					< 1.0	< 1.0	< 0.11	< 1.0	< 0.098	0.10	< 0.098	--	< 0.095	
Aroclor 1232	NA	Lab	ug/l					< 1.0	< 1.0	< 0.11	< 1.0	< 0.098	< 0.097	< 0.098	--	< 0.095	
Aroclor 1242	NA	Lab	ug/l					< 1.0	< 1.0	< 0.11	< 1.0	< 0.098	< 0.097	< 0.098	--	< 0.095	
Aroclor 1248	NA	Lab	ug/l					< 1.0	< 1.0	< 0.11	< 1.0	< 0.098	< 0.097	< 0.098	--	< 0.095	
Aroclor 1254	NA	Lab	ug/l					< 1.0	< 1.0	< 0.11	< 1.0	< 0.098	< 0.097	< 0.098	--	< 0.095	
Aroclor 1260	NA	Lab	ug/l					< 1.0	< 1.0	< 0.11	< 1.0	< 0.098	< 0.097	< 0.098	--	< 0.095	
Aroclor 1262	NA	Lab	ug/l					< 1.0	< 1.0	< 0.11	< 1.0	< 0.098	< 0.097	< 0.098	--	< 0.095	
Aroclor 1268	NA	Lab	ug/l					< 1.0	< 1.0	< 0.11	< 1.0	< 0.098	< 0.097	< 0.098	--	< 0.095	
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	<i>0.04 HRL94</i>			ND	ND	ND	ND	ND	0.10	< 0.098	--	ND	
Herbicides																	
2,4,5-TP (Silvex)	NA	Lab	ug/l	50	50 HRLMCL			< 5.1	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
2,4,5-Trichlorophenoxyacetic acid	NA	Lab	ug/l		70 HRL93			< 6.5	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
2,4-D	NA	Lab	ug/l	70	30 HRL18 (1)			< 14	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
2,4-DB	NA	Lab	ug/l					< 10	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Bentazone	NA	Lab	ug/l		30 HRL15 (1)			< 13	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Dicamba	NA	Lab	ug/l		200 HRL93			< 3.8	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
MCPA	NA	Lab	ug/l		3 HRL93			< 7.3	--	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	--	< 0.30	
Picloram	NA	Lab	ug/l	500	500 HRL93			< 4.4	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Triclopyr	NA	Lab	ug/l					< 8.5	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	
Radiochemical Parameters																	
Gross Alpha (radiation)	NA	Lab	pCi/l	15				< 107	--	< 12.5	< 23.8	7.46 +/- 3.33	5.83 +/- 3.81	8.97 +/- 4.34	--	4.17 +/- 2.01	
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				365 +/- 96.8	--	143 +/- 27.6	238 +/- 49.6	34.9 +/- 7.68	32.6 +/- 7.93	31.0 +/- 7.52	--	7.64 +/- 2.46	
Per- and Polyfluoroalkyl Substances																	
Perfluorobutanesulfonate	NA	Lab	ug/l					0.067 j	0.14 j	0.17 jh	0.027 j	< 0.050	0.011 j	< 0.050	0.010 j	< 0.050	
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l		<i>7 HRL18 (1)</i>			4.0	2.9	1.9 h	7.4	0.049 j	0.067	0.040 j	0.063 j	0.030 j	
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		<i>0.047 HBV19</i>			0.26	<i>0.055</i>	<i>0.27 h</i>	0.29	0.012 j	0.030	0.031	<i>0.11</i>	< 0.025	
Perfluorohexanoic acid (PFHxA)	NA	Lab	ug/l					0.80	0.57	0.84 h	0.89	0.023 j	0.048 j	0.057	0.043 j	< 0.050	
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		<i>0.015 HBV19</i>			<i>0.48</i>	<i>0.015 j</i>	<i>0.21 h</i>	<i>0.092</i>	<i>0.045</i>	<i>0.13</i>	<i>0.17</i>	<i>0.10</i>	< 0.025	
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		<i>0.035 HRL18 (1)</i>			0.53	0.87	0.77 h	0.41	0.19	0.57	2.6	0.30	0.0090 j	
Perfluoropentanoic acid (PFPeA)	NA	Lab	ug/l					0.59	0.13 j	0.73 h	1.0	0.017 jb	0.018 j	0.012 j	< 0.25	< 0.050	

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group				LANDFILL																	
				Water Table																	
				Location	MW-4D	MW-8D		MW-9D	MW-9D	MW-10D	MW-10D	MW-11	MW-12	MW-13	WT-6						
				MN Unique ID#	813740	813741		837777	837777	837776	837776	834655	834656	834657	240816						
Date	4/01/2019	3/27/2019		4/10/2019	6/03/2019	4/10/2019	6/03/2019	5/28/2019	5/28/2019	5/28/2019	4/01/2019										
Sample Type	N	N	FR	N	N	N	N	N	N	N	N										
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria															
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness														
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012														
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade														
General Parameters																					
Chloride	NA	Lab	mg/l			230	1720	501	134	134	<u>240</u> *	--	139	--	19.9	75.6*	57.2	240			
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	<u>5.2</u> (5)	45 (5)	< 20.0	< 20.0	< 20.0	--	--	--	< 20.0	<u>21.0</u>	< 20.0	< 20.0	<u>21.9</u>			
Cyanide, free	NA	Lab	ug/l	200	100 HRL93	<u>5.2</u>	45	< 20	< 20	< 20	< 20.0*	--	< 20.0	--	< 20	< 20	< 20	< 20			
Hardness, as CaCO3	NA	Lab	ug/l					683000	726000	732000	445000	--	447000	--	550000	833000	310000	602000			
Nitrogen, ammonia, as N	NA	Lab	mg/l			<u>0.04</u> (3)		<u>84.9</u>	<u>9.4</u>	<u>9.6</u>	<u>29.9</u>	--	<u>11.9</u>	--	<u>10.6</u>	<u>3.7</u>	<u>1.5</u>	<u>0.14</u>			
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			<u>0.04</u>		<u>0.15</u>	< 0.010	--	<u>0.091</u>	--	<u>0.031</u>	--	< 0.010	< 0.010	< 0.010	< 0.010			
Dissolved oxygen	NA	Field	mg/l			(6)		0.9	0.5	--	0.5	0.8	0.3	0.9	2.3	0.4	1.1	0.3			
pH	NA	Field	pH units			<u>6.5 - 9.0</u>		6.9	<u>6.5</u>	--	7.2	7.1	7.1	7.2	<u>6.4</u>	6.6	<u>6.0</u>	6.9			
Redox (oxidation potential)	NA	Field	mV					-91	-43	--	-138	-139	-97	-85	-65	-100	-69	-50			
Specific conductance @ 25 °C	NA	Field	umhos/cm					4440	1950	--	1930	2100	1340	1740	1230	1870	790	1730			
Temperature	NA	Field	deg C			(7)		12.5	11.5	--	10.5	13.0	11.5	14.5	10.5	9.0	9.5	8.5			
Turbidity	NA	Field	NTU	5 (19)		<u>25</u>		47.3	31.8	--	3.1	4.3	14.2	17.6	9.8	4.6	4.8	3.6			
Metals																					
Aluminum	Dissolved	Lab	ug/l			125	2145	< 200	< 200	< 200	< 200	--	< 200	--	< 200	< 200	< 200	< 200			
Antimony	Dissolved	Lab	ug/l	6	6 HRL93	<u>5.5</u>	180	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50			
Arsenic	Dissolved	Lab	ug/l	10		<u>2.0</u>	720	10.9	16.1	15.7	<u>7.5</u>	--	<u>4.2</u>	--	<u>2.2</u>	1.6	1.3	<u>3.0</u>			
Barium	Dissolved	Lab	ug/l	2000	2000 HRL93			703	2620	2610	1250	--	1090	--	369	185	205	146			
Beryllium	Dissolved	Lab	ug/l	4	0.08 HRL93			< 0.20	< 0.20	< 0.20	< 0.20	--	< 0.20	--	< 0.20	< 0.20	< 0.20	< 0.20			
Boron	Dissolved	Lab	ug/l		500 RAA17			1220	<u>5460</u>	<u>5300</u>	<u>1260</u>	--	<u>567</u>	--	<u>345</u>	<u>1760</u>	<u>224</u>	<u>377</u>			
Cadmium	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)	<u>2.8</u> HD CF	268 HD CF	< 0.080	< 0.080	< 0.080	< 0.080	--	< 0.080	--	< 0.080	< 0.080	0.26	< 0.080			
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93	<u>11</u> CF CR6	<u>31</u> CF CR6	4.2	0.54	< 0.50	0.66	--	0.59	--	1.5	0.58	< 0.50	< 0.50			
Cobalt	Dissolved	Lab	ug/l			<u>2.8</u>	872	<u>10.9</u>	<u>8.6</u>	<u>8.7</u>	<u>6.9</u>	--	<u>38.9</u>	--	<u>3.0</u>	0.83	< 0.50	<u>4.4</u>			
Copper	Dissolved	Lab	ug/l	1300 TT(12)		21 HD CF	114 HD CF	< 10.0	< 10.0	< 10.0	< 10.0	--	< 10.0	--	< 10.0	< 10.0	< 10.0	< 10.0			
Lead	Dissolved	Lab	ug/l	15 TT(12)		<u>13</u> HD CF	661 HD CF	< 0.10	< 0.10	< 0.10	< 0.10	--	< 0.10	--	0.21	0.29	2.3	0.11			
Manganese	Dissolved	Lab	ug/l		100 HBV18			101	91.3	89.9	208	--	1190	--	1430	4020	556	1240			
Nickel	Dissolved	Lab	ug/l		100 HRL93	<u>296</u> HD CF	8366 HD CF	34.3	26.6	27.1	35.7	--	42.0	--	< 20.0	< 20.0	< 20.0	< 20.0			
Selenium	Dissolved	Lab	ug/l	50	30 HRL93	<u>5.0</u>	40	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50			
Silver	Dissolved	Lab	ug/l		30 HRL93	0.85 CF	31 HD CF	< 10.0	< 10.0	< 10.0	< 10.0	--	< 10.0	--	< 10.0	< 10.0	< 10.0	< 10.0			
Thallium	Dissolved	Lab	ug/l	2	0.6 HRL94	<u>0.28</u>	128	< 0.10	<u>0.31</u>	<u>0.57</u>	0.18	--	<u>1.3</u>	--	< 0.10	< 0.10	< 0.10	0.18			
Tin	Dissolved	Lab	ug/l		4000 HRL94			< 75.0	< 75.0	< 75.0	< 75.0	--	< 75.0	--	< 75.0	< 75.0	< 75.0	< 75.0			
Uranium	Dissolved	Lab	ug/l	30				0.90	< 0.50	< 0.50	< 0.50	--	0.78	--	0.58	1.2	0.67	3.3			
Vanadium	Dissolved	Lab	ug/l		50 HRL94			1.6	< 1.0	< 1.0	< 1.0	--	< 1.0	--	1.6	1.8	< 1.0	< 1.0			
Zinc	Dissolved	Lab	ug/l		2000 HRL94	<u>309</u> HD CF	<u>678</u> HD CF	< 20.0	< 20.0	< 20.0	< 20.0	--	< 20.0	--	< 20.0	< 20.0	< 20.0	< 20.0			
Aluminum	Total	Lab	ug/l			125	2145	--	--	--	--	--	--	--	--	--	--	--			
Antimony	Total	Lab	ug/l	6	6 HRL93	5.5	180	--	--	--	--	--	--	--	--	--	--	--			
Arsenic	Total	Lab	ug/l	10		2.0	720	--	--	--	--	--	--	--	--	--	--	--			
Barium	Total	Lab	ug/l	2000	2000 HRL93			--	--	--	--	--	--	--	--	--	--	--			
Beryllium	Total	Lab	ug/l	4	0.08 HRL93			--	--	--	--	--	--	--	--	--	--	--			
Boron	Total	Lab	ug/l		500 RAA17			--	--	--	--	--	--	--	--	--	--	--			
Cadmium	Total	Lab	ug/l	5	0.5 HRL15 (1)	3.1 HD	284 HD	--	--	--	--	--	--	--	--	--	--	--			
Chromium	Total	Lab	ug/l	100	100 CR HRL93	11 CR6	32 CR6	--	--	--	--	--	--	--	--	--	--	--			
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	0.1 HRL93	<u>0.011</u>	<u>0.032</u>	< 0.010	< 0.010	<u>0.012</u>	< 0.010	--	< 0.010	--	<u>0.025</u>	<u>0.025</u>	<u>0.016</u>	**			
Cobalt	Total	Lab	ug/l			2.8	872	--	--	--	--	--	--	--	--	--	--	--			
Copper	Total	Lab	ug/l	1300 TT(12)		22 HD	119 HD	--	--	--	--	--	--	--	--	--	--	--			
Lead	Total	Lab	ug/l	15 TT(12)		16 HD	836 HD	--	--	--	--	--	--	--	--	--	--	--			
Manganese	Total	Lab	ug/l		100 HBV18			--	--	--	--	--	--	--	--	--	--	--			
Nickel	Total	Lab	ug/l		100 HRL93	297 HD	8383 HD	--	--	--	--	--	--	--	--	--	--	--			
Selenium	Total	Lab	ug/l	50	30 HRL93	5.0	40	--	--	--	--	--	--	--	--	--	--	--			
Silver	Total	Lab	ug/l		30 HRL93	1.0	37 HD	--	--	--	--	--	--	--	--	--	--	--			
Thallium	Total	Lab	ug/l	2	0.6 HRL94	<u>0.28</u>	128	--	--	--	--	--	--	--	--	--	--	--			
Tin	Total	Lab	ug/l		4000 HRL94			--	--	--	--	--	--	--	--	--	--	--			

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								LANDFILL											
								Water Table											
								Location	MW-4D	MW-8D		MW-9D	MW-9D	MW-10D	MW-10D	MW-11	MW-12	MW-13	WT-6
								MN Unique ID#	813740	813741		837777	837777	837776	837776	834655	834656	834657	240816
Date	4/01/2019	3/27/2019		4/10/2019	6/03/2019	4/10/2019	6/03/2019	5/28/2019	5/28/2019	5/28/2019	4/01/2019								
Sample Type	N	N	FR	N	N	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria													
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness												
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012												
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade												
Uranium	Total	Lab	ug/l	30				--	--	--	--	--	--	--	--	--	--	--	
Vanadium	Total	Lab	ug/l		50 HRL94			--	--	--	--	--	--	--	--	--	--	--	
Zinc	Total	Lab	ug/l		2000 HRL94	314 HD	693 HD	--	--	--	--	--	--	--	--	--	--	--	
Semivolatile Organic Compounds																			
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)			40	26	24	--	35	--	27	0.80	< 0.053	< 0.051	1.2	
2,4,6-Trichlorophenol	NA	Lab	ug/l		30 HRL93	2.0	203	< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
2,4-Dichlorophenol	NA	Lab	ug/l		20 HRL93			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
2,4-Dimethylphenol	NA	Lab	ug/l		100 HRL93			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
2,4-Dinitrophenol	NA	Lab	ug/l		10 HRL94			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
2-Chlorophenol	NA	Lab	ug/l		30 HRL93			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
2-Methylnaphthalene	NA	Lab	ug/l		8 RAA13			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
2-Methylphenol (o-cresol)	NA	Lab	ug/l		30 HRL93			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
3,3'-Dichlorobenzidine	NA	Lab	ug/l		0.8 HRL93			< 49.5	< 50.0	< 49.0	< 48.5	--	< 48.3	--	< 48.1	< 49.3	< 49.0	< 47.4	
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		3 MP HRL94			< 19.8	< 20.0	< 19.6	< 19.4	--	< 19.3	--	< 9.6	< 9.9	< 9.8	< 19.0	
4-Bromophenyl phenyl ether	NA	Lab	ug/l					< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Acenaphthene	NA	Lab	ug/l		100 HRL18 (1)	20	112	< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Anthracene	NA	Lab	ug/l		600 RAA19 (1)	0.035	0.63	< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Benzo(a)pyrene	NA	Lab	ug/l	0.2	0.1 HBV18 (1)			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Benzoic acid	NA	Lab	ug/l		30000 HRL93			< 49.5	< 50.0	< 49.0	< 48.5	--	< 48.3	--	< 48.1	< 49.3	< 49.0	< 47.4	
Bis(2-chloroethyl)ether	NA	Lab	ug/l		0.3 HRL93			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Bis(2-ethylhexyl)phthalate	NA	Lab	ug/l	6	7 HRL15 (1)	1.9	(1)	< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Butyl benzyl phthalate	NA	Lab	ug/l		100 HRL15			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Diethyl phthalate	NA	Lab	ug/l		6000 HRL93			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Dimethyl phthalate	NA	Lab	ug/l		70000 HRL94			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Di-n-butyl phthalate	NA	Lab	ug/l		20 HRL15			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Di-n-octyl phthalate	NA	Lab	ug/l			30	1650	< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Fluoranthene	NA	Lab	ug/l		70 HRL18 (1)	1.9	6.9	< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Fluorene	NA	Lab	ug/l		80 HBV19 (1)			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Hexachlorobenzene	NA	Lab	ug/l	1	0.2 HRL93	0.00024		< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Hexachlorocyclopentadiene	NA	Lab	ug/l	50				< 49.5	< 50.0	< 49.0	< 48.5 *	--	< 48.3 *	--	< 48.1 *	< 49.3 *	< 49.0 *	< 47.4	
Hexachloroethane	NA	Lab	ug/l					< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Isophorone	NA	Lab	ug/l		100 HRL93			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
n-Nitrosodimethylamine	NA	Lab	ug/l		0.005 HBV17 (1)			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Pentachlorophenol	NA	Lab	ug/l	1	0.3 HRL15 (1)	1.9 (8)	18 (8)	< 19.8	< 20.0	< 19.6	< 19.4	--	< 19.3	--	< 19.2	< 19.7	< 19.6	< 19.0	
Phenanthrene	NA	Lab	ug/l			3.6	64	< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Phenol	NA	Lab	ug/l		4000 HRL93	123	4428	< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	
Pyrene	NA	Lab	ug/l		50 HRL18 (1)			< 9.9	< 10.0	< 9.8	< 9.7	--	< 9.7	--	< 9.6	< 9.9	< 9.8	< 9.5	

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								LANDFILL											
								Water Table											
								Location	MW-4D	MW-8D		MW-9D	MW-9D	MW-10D	MW-10D	MW-11	MW-12	MW-13	WT-6
								MN Unique ID#	813740	813741		837777	837777	837776	837776	834655	834656	834657	240816
Date	4/01/2019	3/27/2019		4/10/2019	6/03/2019	4/10/2019	6/03/2019	5/28/2019	5/28/2019	5/28/2019	4/01/2019								
Sample Type	N	N	FR	N	N	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria													
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness												
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012												
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade												
Volatile Organic Compounds																			
1,1,1,2-Tetrachloroethane	NA	Lab	ug/l		70 HRL93			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,1-Trichloroethane	NA	Lab	ug/l	200	5000 HRL18 (1)	329	5913	< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2,2-Tetrachloroethane	NA	Lab	ug/l		2 HRL94	1.5	2253 (1)	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
1,1,2-Trichloroethane	NA	Lab	ug/l	5	3 HRL93			< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
1,1-Dichloroethane	NA	Lab	ug/l		80 RAA16 (1)			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethylene	NA	Lab	ug/l	7	200 HRL11			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloropropene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,3-Trichlorobenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,3-Trichloropropane	NA	Lab	ug/l		0.003 HRL13 (1)			< 0.20	< 0.20	< 0.20	--	< 0.20	--	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	
1,2,4-Trichlorobenzene	NA	Lab	ug/l	70	4 HRL13 (1)			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromo-3-chloropropane (DBCP)	NA	Lab	ug/l	0.2				< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromoethane (EDB)	NA	Lab	ug/l	0.05 (7)	0.004 HRL93			< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
1,2-Dichlorobenzene	NA	Lab	ug/l	600	600 HRL93			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloroethane	NA	Lab	ug/l	5	1 HRL13 (1)	3.8	90100 (1)	< 0.20	< 0.20	< 0.20	--	< 0.20	--	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	
1,2-Dichloroethylene, cis	NA	Lab	ug/l	70	6 HRL18 (1)			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloroethylene, trans	NA	Lab	ug/l	100	40 HRL13 (1)			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloropropane	NA	Lab	ug/l	5	5 HRL94			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,3,5-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichlorobenzene	NA	Lab	ug/l	600 (5)				< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichloropropane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichloropropene, cis	NA	Lab	ug/l		2 DCP HRL94			< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
1,3-Dichloropropene, trans	NA	Lab	ug/l		2 DCP HRL94			< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94			1.6	< 1.0	< 1.0	--	< 1.0	--	< 1.0	1.0	< 1.0	< 1.0	< 1.0	
2,2-Dichloropropane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Acetone	NA	Lab	ug/l		3000 HBV17 (1)			< 20	< 20	< 20	--	< 20	--	< 20	< 20	< 20	< 20	< 20	
Allyl chloride	NA	Lab	ug/l		30 HRL94			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	6.0	8974 (1)	0.72	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Bromobenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromochloromethane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromodichloromethane	NA	Lab	ug/l	80 (1)	3 HBV18 (1)			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromoform	NA	Lab	ug/l	80 (1)	40 HRL93	41	5800	< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromomethane	NA	Lab	ug/l		10 HRL93			< 2.0 *	< 2.0 *	< 2.0 *	--	< 2.0	--	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0 *	
Butylbenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Butylbenzene, sec	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Butylbenzene, tert	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Carbon tetrachloride	NA	Lab	ug/l	5	1 HRL13 (1)	1.9	3500 (1)	< 0.20	< 0.20	< 0.20	--	< 0.20	--	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	
Chlorobenzene	NA	Lab	ug/l	100	100 HRL93	20	846	5.6	< 1.0	< 1.0	--	1.3	--	< 1.0	1.5	< 1.0	< 1.0	< 1.0	
Chlorodibromomethane	NA	Lab	ug/l	80 (1)	10 HRL93			< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Chloroethane	NA	Lab	ug/l		ND RAA09			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chloroform	NA	Lab	ug/l	80 (1)	20 HRL18 (1)	53	2784	< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chloromethane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chlorotoluene, o	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chlorotoluene, p	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Cumene (isopropyl benzene)	NA	Lab	ug/l		300 HRL93			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Cymene p- (toluene isopropyl p-)	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Dibromomethane (methylene bromide)	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Dichlorodifluoromethane (Freon-12)	NA	Lab	ug/l		700 HRL11			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Dichlorofluoromethane (Freon-21)	NA	Lab	ug/l		20 RAA17			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	68	3717	< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Ethyl ether	NA	Lab	ug/l		200 RAA10 (1)			12	7.3	7.4	--	16	--	10	2.9	< 1.0	< 1.0	< 1.0	
Hexachlorobutadiene	NA	Lab	ug/l		1 HRL93			< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								LANDFILL											
								Water Table											
								Location	MW-4D	MW-8D		MW-9D	MW-9D	MW-10D	MW-10D	MW-11	MW-12	MW-13	WT-6
								MN Unique ID#	813740	813741		837777	837777	837776	837776	834655	834656	834657	240816
Date	4/01/2019	3/27/2019		4/10/2019	6/03/2019	4/10/2019	6/03/2019	5/28/2019	5/28/2019	5/28/2019	4/01/2019								
Sample Type	N	N	FR	N	N	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria													
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness												
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012												
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade												
Methyl ethyl ketone (2-butanone)	NA	Lab	ug/l		4000 HRL94			< 10	< 10	< 10	--	< 10	--	< 10	< 10	< 10	< 10	< 10	
Methyl isobutyl ketone (MIBK)	NA	Lab	ug/l		300 HRL94			< 5.0	< 5.0	< 5.0	--	< 5.0	--	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	
Methyl tertiary butyl ether (MTBE)	NA	Lab	ug/l		60 RAA13 (1)			< 2.0	< 2.0	< 2.0	--	< 2.0	--	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	
Methylene chloride	NA	Lab	ug/l	5	5 HRLMCL	46	27749 (1)	< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Naphthalene	NA	Lab	ug/l		70 HRL13	81	818	< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Propylbenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Styrene	NA	Lab	ug/l	100				< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrachloroethylene	NA	Lab	ug/l	5 (9)	4 HBV14 (1)	3.8	857	< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			39	13	14	--	18	--	13	< 10	< 10	< 10	< 10	
Toluene	NA	Lab	ug/l	1000	200 HRL11	253	2703	< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	0.4 HRL15 (1)	25	13976	< 0.10	< 0.10	< 0.10	--	< 0.10	--	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Trichlorofluoromethane (Freon-11)	NA	Lab	ug/l		2000 HRL93			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Trichlorotrifluoroethane (Freon 113)	NA	Lab	ug/l		200000 HRL93			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	0.18	(1)	< 0.050	5.1	5.2	--	< 0.050	--	< 0.050	0.050	< 0.050	< 0.050	< 0.050	
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Xylene, o	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			< 1.0	< 1.0	< 1.0	--	< 1.0	--	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Xylene, total	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)	166	2814	ND	ND	ND	--	ND	--	ND	ND	ND	ND	ND	
Pesticides																			
Acetochlor	NA	Lab	ug/l		20 HRL18 (1)	3.6	173	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Alachlor	NA	Lab	ug/l	2	9 HRL18 (1)	4.2	1600 (1)	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Atrazine	NA	Lab	ug/l	3	3 HRLMCL	3.4	645	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Chlorpyrifos	NA	Lab	ug/l		0.6 HBV13 (1)	0.041	0.17	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Cyanazine (bladex)	NA	Lab	ug/l		1 HRL18 (1)			< 0.20	< 0.20	< 0.20	< 0.20	--	< 0.20	--	< 0.20	< 0.20	< 0.20	< 0.20	
Deisopropyl atrazine	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Desethylatrazine	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Dimethenamid	NA	Lab	ug/l		300 HRL15 (1)			< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
EPTC	NA	Lab	ug/l		40 HRL18 (1)			< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Ethalfuralin	NA	Lab	ug/l					< 0.50 *	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50 *	
Fonofos (dyphonate)	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Metolachlor	NA	Lab	ug/l		300 HBV18 (1)	23	543	< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Metribuzin	NA	Lab	ug/l		10 HRL13 (1)			< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Pendimethalin	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Phorate	NA	Lab	ug/l					< 0.30	< 0.30	< 0.30	< 0.30	--	< 0.30	--	< 0.30	< 0.30	< 0.30	< 0.30	
Prometon	NA	Lab	ug/l		100 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Propachlor	NA	Lab	ug/l		90 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Propazine	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Simazine	NA	Lab	ug/l	4	4 HRLMCL			< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Terbufos	NA	Lab	ug/l					< 0.20 *	< 0.20	< 0.20	< 0.20	--	< 0.20	--	< 0.20	< 0.20	< 0.20	< 0.20 *	
Triallate	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Trifluralin	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								LANDFILL											
								Water Table											
								Location	MW-4D	MW-8D		MW-9D	MW-9D	MW-10D	MW-10D	MW-11	MW-12	MW-13	WT-6
								MN Unique ID#	813740	813741		837777	837777	837776	837776	834655	834656	834657	240816
Date	4/01/2019	3/27/2019		4/10/2019	6/03/2019	4/10/2019	6/03/2019	5/28/2019	5/28/2019	5/28/2019	4/01/2019								
Sample Type	N	N	FR	N	N	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria													
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness												
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012												
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade												
Polychlorinated Biphenyls																			
Aroclor 1016	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.097	--	< 0.10	--	< 0.097	< 0.098	< 0.098	< 0.098	
Aroclor 1221	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.097	--	< 0.10	--	< 0.097	< 0.098	< 0.098	< 0.098	
Aroclor 1232	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.097	--	< 0.10	--	31.3	0.67	0.25	< 0.098	
Aroclor 1242	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.097	--	< 0.10	--	< 0.097	< 0.098	< 0.098	< 0.098	
Aroclor 1248	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.097	--	< 0.10	--	< 0.097	< 0.098	< 0.098	< 0.098	
Aroclor 1254	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.097	--	< 0.10	--	< 0.097	< 0.098	< 0.098	< 0.098	
Aroclor 1260	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.097	--	< 0.10	--	< 0.097	< 0.098	< 0.098	< 0.098	
Aroclor 1262	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.097	--	< 0.10	--	< 0.097	< 0.098	< 0.098	< 0.098	
Aroclor 1268	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.097	--	< 0.10	--	< 0.097	< 0.098	< 0.098	< 0.098	
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	<i>0.04 HRL94</i>			ND	ND	ND	ND	--	ND	--	31.3	0.67	0.25	ND	
Herbicides																			
2,4,5-TP (Silvex)	NA	Lab	ug/l	50	50 HRLMCL			< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
2,4,5-Trichlorophenoxyacetic acid	NA	Lab	ug/l		70 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	4.0 *	< 0.50	
2,4-D	NA	Lab	ug/l	70	30 HRL18 (1)			< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
2,4-DB	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Bentazone	NA	Lab	ug/l		30 HRL15 (1)			< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50 *	< 0.50 *	< 0.50 *	< 0.50	
Dicamba	NA	Lab	ug/l		200 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
MCPA	NA	Lab	ug/l		3 HRL93			< 0.30	< 0.30	< 0.30	< 0.30	--	< 0.30	--	< 0.30	< 0.30	< 0.30	< 0.30	
Picloram	NA	Lab	ug/l	500	500 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Triclopyr	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	--	< 0.50	--	< 0.50	< 0.50	< 0.50	< 0.50	
Radiochemical Parameters																			
Gross Alpha (radiation)	NA	Lab	pCi/l	15				16.6 +/- 6.48	20.9 +/- 6.20	20.4 +/- 6.59	5.24 +/- 3.14	--	6.89 +/- 2.49	--	5.88 +/- 3.72	8.00 +/- 4.98	< 2.73	< 5.13	
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				59.6 +/- 12.1	24.8 +/- 5.91	36.6 +/- 8.36	18.7 +/- 4.24	--	8.25 +/- 2.10	--	10.3 +/- 3.47	10.5 +/- 3.94	3.13 +/- 1.25	7.12 +/- 3.36	
Per- and Polyfluoroalkyl Substances																			
Perfluorobutanesulfonate	NA	Lab	ug/l					0.066	< 0.050	0.008 j	--	0.020 j	--	0.010 j	< 0.050	< 0.050	< 0.050	0.011 j	
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l		<i>7 HRL18 (1)</i>			0.78	0.10	0.11	--	0.60	--	0.51	0.017 j	0.023 j	0.011 j	0.088	
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		<i>0.047 HBV19</i>			<i>0.087</i>	0.015 j	0.014 j	--	<i>0.063</i>	--	0.033	0.015 j	0.010 j	0.0050 j	0.029	
Perfluorohexanoic acid (PFHxA)	NA	Lab	ug/l					0.30	0.084	0.061	--	0.11	--	0.084	0.015 j	< 0.050	< 0.050	0.051	
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		<i>0.015 HBV19</i>			<i>0.063</i>	<i>0.082</i>	<i>0.083</i>	--	<i>0.13</i>	--	<i>0.073</i>	<i>0.078</i>	<i>0.056</i>	<i>0.10</i>	<i>0.046</i>	
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		<i>0.035 HRL18 (1)</i>			<i>0.20</i>	<i>0.39</i>	<i>0.36</i>	--	<i>0.32</i>	--	<i>0.58</i>	<i>0.14</i>	<i>0.10</i>	<i>0.052</i>	<i>0.061</i>	
Perfluoropentanoic acid (PFPeA)	NA	Lab	ug/l					0.24	0.025 jb	0.025 jb	--	0.081	--	0.072	0.0060 j	< 0.050	< 0.050	0.049 j	

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group				LANDFILL									DUMP				
				Water Table			Jordan			Perched							
				Location	WT-11B	WT-13	WT-14	J-13	J-14		MW-19-01	MW-19-02	MW-19-03	MW-19-04			
				MN Unique ID#	434011	462523	462522	462520	462521		834660	834662	834663	834661			
Date	3/28/2019	3/28/2019	3/29/2019	3/29/2019	3/29/2019		4/03/2019	4/03/2019	4/03/2019	4/03/2019							
Sample Type	N	N	N	N	N	FR	N	N	N	N							
				Drinking Water Criteria		Surface Water Criteria											
Parameter	Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
General Parameters																	
Chloride	NA	Lab	mg/l			230	1720	132	137	30.2	< 1.2	55.3	54.1	25.0	38.9	74.4	44.6
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	<u>5.2 (5)</u>	45 (5)	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	<u>23.2</u>	<u>44.8</u>	< 20.0
Cyanide, free	NA	Lab	ug/l	200	100 HRL93	<u>5.2</u>	45	< 20	< 20	< 20	< 20	< 20	< 20	--	< 20	< 20	< 20
Hardness, as CaCO3	NA	Lab	ug/l					524000	518000	321000	258000	315000	318000	506000	883000	925000	560000
Nitrogen, ammonia, as N	NA	Lab	mg/l			<u>0.04 (3)</u>		7.9	6.3	<u>0.50</u>	<u>0.21</u>	<u>0.30</u>	<u>0.29</u>	<u>0.40</u>	<u>7.2</u>	<u>18.7</u>	<u>20.2</u>
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			<u>0.04</u>		0.018	0.013	< 0.010	< 0.010	< 0.010	--	< 0.010	< 0.010	0.015	0.019
Dissolved oxygen	NA	Field	mg/l			(6)		0.2	0.2	1.2	0.5	0.1	--	3.7	0.7	0.5	1.0
pH	NA	Field	pH units			<u>6.5 - 9.0</u>		7.0	7.0	6.9	7.5	7.5	--	7.4	6.6	6.6	6.7
Redox (oxidation potential)	NA	Field	mV					-94	-82	54	-94	-177	--	-30	5	-88	-93
Specific conductance @ 25 °C	NA	Field	umhos/cm					1370	1370	730	230	680	--	1140	1850	2180	1450
Temperature	NA	Field	deg C			(7)		12.5	11.5	13.0	10.5	12.0	--	9.5	10.0	11.0	10.0
Turbidity	NA	Field	NTU	5 (19)		<u>25</u>		10.5	5.2	3.4	6.0	4.5	--	114	4.5	14	9.9
Metals																	
Aluminum	Dissolved	Lab	ug/l			125	2145	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200
Antimony	Dissolved	Lab	ug/l	6	6 HRL93	<u>5.5</u>	180	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	3.6	< 0.50	< 0.50	< 0.50
Arsenic	Dissolved	Lab	ug/l	10		<u>2.0</u>	720	4.7	4.2	< 0.50	< 0.50	< 0.50	< 0.50	6.3	0.84	0.79	1.2
Barium	Dissolved	Lab	ug/l	2000	2000 HRL93			559	278	255	206	302	305	54.4	354	545	440
Beryllium	Dissolved	Lab	ug/l	4	0.08 HRL93			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Boron	Dissolved	Lab	ug/l		500 RAA17			386	671	145	35.4	47.2	50.1	18700	20600	38400	9800
Cadmium	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)	<u>2.8 HD CF</u>	268 HD CF	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93	<u>11 CF CR6</u>	31 CF CR6	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.65	2.3	4.2
Cobalt	Dissolved	Lab	ug/l			<u>2.8</u>	872	<u>6.0</u>	<u>6.4</u>	0.63	< 0.50	< 0.50	< 0.50	1.2	1.0	0.87	0.67
Copper	Dissolved	Lab	ug/l	1300 TT(12)		21 HD CF	114 HD CF	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Lead	Dissolved	Lab	ug/l	15 TT(12)		<u>13 HD CF</u>	661 HD CF	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.76	0.25
Manganese	Dissolved	Lab	ug/l		100 HBV18			390	994	8.2	51.8	60.0	61.5	604	433	478	414
Nickel	Dissolved	Lab	ug/l		100 HRL93	<u>296 HD CF</u>	8366 HD CF	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0
Selenium	Dissolved	Lab	ug/l	50	30 HRL93	<u>5.0</u>	40	< 0.50	< 0.50	1.4	< 0.50	< 0.50	< 0.50	19.0	7.0	0.94	< 0.50
Silver	Dissolved	Lab	ug/l		30 HRL93	0.85 CF	31 HD CF	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Thallium	Dissolved	Lab	ug/l	2	0.6 HRL94	<u>0.28</u>	128	0.20	<u>0.77</u>	0.20	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Tin	Dissolved	Lab	ug/l		4000 HRL94			< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0
Uranium	Dissolved	Lab	ug/l	30				0.99	0.52	1.4	< 0.50	< 0.50	< 0.50	10.4	10.6	0.85	0.90
Vanadium	Dissolved	Lab	ug/l		50 HRL94			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	8.1	1.7	2.8	2.0
Zinc	Dissolved	Lab	ug/l		2000 HRL94	<u>309 HD CF</u>	678 HD CF	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0
Aluminum	Total	Lab	ug/l			125	2145	--	--	--	--	--	--	--	--	--	--
Antimony	Total	Lab	ug/l	6	6 HRL93	5.5	180	--	--	--	--	--	--	--	--	--	--
Arsenic	Total	Lab	ug/l	10		2.0	720	--	--	--	--	--	--	--	--	--	--
Barium	Total	Lab	ug/l	2000	2000 HRL93			--	--	--	--	--	--	--	--	--	--
Beryllium	Total	Lab	ug/l	4	0.08 HRL93			--	--	--	--	--	--	--	--	--	--
Boron	Total	Lab	ug/l		500 RAA17			--	--	--	--	--	--	--	--	--	--
Cadmium	Total	Lab	ug/l	5	0.5 HRL15 (1)	3.1 HD	284 HD	--	--	--	--	--	--	--	--	--	--
Chromium	Total	Lab	ug/l	100	100 CR HRL93	11 CR6	32 CR6	--	--	--	--	--	--	--	--	--	--
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	0.1 HRL93	<u>0.011</u>	0.032	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010 *	< 0.010	<u>0.012</u>	< 0.010
Cobalt	Total	Lab	ug/l			2.8	872	--	--	--	--	--	--	--	--	--	--
Copper	Total	Lab	ug/l	1300 TT(12)		22 HD	119 HD	--	--	--	--	--	--	--	--	--	--
Lead	Total	Lab	ug/l	15 TT(12)		16 HD	836 HD	--	--	--	--	--	--	--	--	--	--
Manganese	Total	Lab	ug/l		100 HBV18			--	--	--	--	--	--	--	--	--	--
Nickel	Total	Lab	ug/l		100 HRL93	297 HD	8383 HD	--	--	--	--	--	--	--	--	--	--
Selenium	Total	Lab	ug/l	50	30 HRL93	5.0	40	--	--	--	--	--	--	--	--	--	--
Silver	Total	Lab	ug/l		30 HRL93	1.0	37 HD	--	--	--	--	--	--	--	--	--	--
Thallium	Total	Lab	ug/l	2	0.6 HRL94	0.28	128	--	--	--	--	--	--	--	--	--	--
Tin	Total	Lab	ug/l		4000 HRL94			--	--	--	--	--	--	--	--	--	--

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group				LANDFILL								DUMP					
				Location MN Unique ID# Date Sample Type				Water Table			Jordan		Perched				
								WT-11B	WT-13	WT-14	J-13	J-14	MW-19-01	MW-19-02	MW-19-03	MW-19-04	
				434011	462523	462522	462520	462521	834660	834662	834663	834661					
Drinking Water Criteria				Surface Water Criteria													
Parameter	Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness	WT-11B	WT-13	WT-14	J-13	J-14	MW-19-01	MW-19-02	MW-19-03	MW-19-04	
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
Uranium	Total	Lab	ug/l	30				--	--	--	--	--	--	--	--	--	
Vanadium	Total	Lab	ug/l		50 HRL94			--	--	--	--	--	--	--	--	--	
Zinc	Total	Lab	ug/l		2000 HRL94	314 HD	693 HD	--	--	--	--	--	--	--	--	--	
Semivolatile Organic Compounds																	
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)			9.9	6.2	3.8	< 0.050	3.3	3.2	< 0.051	3.4	13	7.1
2,4,6-Trichlorophenol	NA	Lab	ug/l		30 HRL93	2.0	203	< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
2,4-Dichlorophenol	NA	Lab	ug/l		20 HRL93			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
2,4-Dimethylphenol	NA	Lab	ug/l		100 HRL93			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
2,4-Dinitrophenol	NA	Lab	ug/l		10 HRL94			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
2-Chlorophenol	NA	Lab	ug/l		30 HRL93			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
2-Methylnaphthalene	NA	Lab	ug/l		8 RAA13			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
2-Methylphenol (o-cresol)	NA	Lab	ug/l		30 HRL93			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
3,3'-Dichlorobenzidine	NA	Lab	ug/l		0.8 HRL93			< 50.5	< 49.3	< 48.5	< 47.4	< 48.8	< 47.4	< 49.3	< 48.8	< 48.8	< 49.0
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		3 MP HRL94			< 20.2	< 19.7	< 19.4	< 19.0	< 19.5	< 19.0	< 19.7	< 19.5	< 19.5	< 19.6
4-Bromophenyl phenyl ether	NA	Lab	ug/l					< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Acenaphthene	NA	Lab	ug/l		100 HRL18 (1)	20	112	< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Anthracene	NA	Lab	ug/l		600 RAA19 (1)	0.035	0.63	< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Benzo(a)pyrene	NA	Lab	ug/l	0.2	0.1 HBV18 (1)			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Benzoic acid	NA	Lab	ug/l		30000 HRL93			< 50.5	< 49.3	< 48.5	< 47.4	< 48.8	< 47.4	< 49.3	< 48.8	< 48.8	< 49.0
Bis(2-chloroethyl)ether	NA	Lab	ug/l		0.3 HRL93			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Bis(2-ethylhexyl)phthalate	NA	Lab	ug/l	6	7 HRL15 (1)	1.9	(1)	< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Butyl benzyl phthalate	NA	Lab	ug/l		100 HRL15			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Diethyl phthalate	NA	Lab	ug/l		6000 HRL93			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Dimethyl phthalate	NA	Lab	ug/l		70000 HRL94			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Di-n-butyl phthalate	NA	Lab	ug/l		20 HRL15			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Di-n-octyl phthalate	NA	Lab	ug/l			30	1650	< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Fluoranthene	NA	Lab	ug/l		70 HRL18 (1)	1.9	6.9	< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Fluorene	NA	Lab	ug/l		80 HBV19 (1)			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Hexachlorobenzene	NA	Lab	ug/l	1	0.2 HRL93	0.00024		< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Hexachlorocyclopentadiene	NA	Lab	ug/l	50				< 50.5	< 49.3	< 48.5 *	< 47.4	< 48.8 *	< 47.4 *	< 49.3	< 48.8	< 48.8	< 49.0
Hexachloroethane	NA	Lab	ug/l					< 10.1	< 9.9	< 9.7 *	< 9.5	< 9.8 *	< 9.5 *	< 9.9	< 9.8	< 9.8	< 9.8
Isophorone	NA	Lab	ug/l		100 HRL93			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
n-Nitrosodimethylamine	NA	Lab	ug/l		0.005 HBV17 (1)			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Pentachlorophenol	NA	Lab	ug/l	1	0.3 HRL15 (1)	1.9 (8)	18 (8)	< 20.2	< 19.7	< 19.4	< 19.0	< 19.5	< 19.0	< 19.7	< 19.5	< 19.5	< 19.6
Phenanthrene	NA	Lab	ug/l			3.6	64	< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Phenol	NA	Lab	ug/l		4000 HRL93	<u>123</u>	4428	< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8
Pyrene	NA	Lab	ug/l		50 HRL18 (1)			< 10.1	< 9.9	< 9.7	< 9.5	< 9.8	< 9.5	< 9.9	< 9.8	< 9.8	< 9.8

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group				LANDFILL										DUMP			
				Water Table					Jordan					Perched			
				Location	WT-11B	WT-13	WT-14	J-13	J-14		MW-19-01	MW-19-02	MW-19-03	MW-19-04			
				MN Unique ID#	434011	462523	462522	462520	462521		834660	834662	834663	834661			
Date	3/28/2019	3/28/2019	3/29/2019	3/28/2019	3/29/2019		4/03/2019	4/03/2019	4/03/2019	4/03/2019							
Sample Type	N	N	N	N	N	FR	N	N	N	N							
				Drinking Water Criteria		Surface Water Criteria											
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
				04/01/2012	08/05/2019	01/24/2012	01/24/2012										
				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
Parameter	Total or Dissolved	Analysis Location	Units														
Effective Date																	
Exceedance Key																	
Volatile Organic Compounds																	
1,1,1,2-Tetrachloroethane	NA	Lab	ug/l		70 HRL93			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,1-Trichloroethane	NA	Lab	ug/l	200	5000 HRL18 (1)	329	5913	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1,2,2-Tetrachloroethane	NA	Lab	ug/l		2 HRL94	1.5	2253 (1)	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
1,1,2-Trichloroethane	NA	Lab	ug/l	5	3 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	1.5	< 0.50	
1,1-Dichloroethane	NA	Lab	ug/l		80 RAA16 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloroethylene	NA	Lab	ug/l	7	200 HRL11			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,1-Dichloropropene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,3-Trichlorobenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,3-Trichloropropane	NA	Lab	ug/l		0.003 HRL13 (1)			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	
1,2,4-Trichlorobenzene	NA	Lab	ug/l	70	4 HRL13 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromo-3-chloropropane (DBCP)	NA	Lab	ug/l	0.2				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dibromoethane (EDB)	NA	Lab	ug/l	0.05 (7)	0.004 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
1,2-Dichlorobenzene	NA	Lab	ug/l	600	600 HRL93			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloroethane	NA	Lab	ug/l	5	1 HRL13 (1)	3.8	90100 (1)	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	
1,2-Dichloroethylene, cis	NA	Lab	ug/l	70	6 HRL18 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloroethylene, trans	NA	Lab	ug/l	100	40 HRL13 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,2-Dichloropropane	NA	Lab	ug/l	5	5 HRL94			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,3,5-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichlorobenzene	NA	Lab	ug/l	600 (5)				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichloropropane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
1,3-Dichloropropene, cis	NA	Lab	ug/l		2 DCP HRL94			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
1,3-Dichloropropene, trans	NA	Lab	ug/l		2 DCP HRL94			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.3	< 1.0	
2,2-Dichloropropane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Acetone	NA	Lab	ug/l		3000 HBV17 (1)			< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	
Allyl chloride	NA	Lab	ug/l		30 HRL94			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	6.0	8974 (1)	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	7.1	
Bromobenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromochloromethane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromodichloromethane	NA	Lab	ug/l	80 (1)	3 HBV18 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromoform	NA	Lab	ug/l	80 (1)	40 HRL93	41	5800	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Bromomethane	NA	Lab	ug/l		10 HRL93			< 2.0 *	< 2.0 *	< 2.0 *	< 2.0 *	< 2.0 *	< 2.0 *	< 2.0 *	< 2.0 *	< 2.0 *	
Butylbenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Butylbenzene, sec	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Butylbenzene, tert	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Carbon tetrachloride	NA	Lab	ug/l	5	1 HRL13 (1)	1.9	3500 (1)	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	
Chlorobenzene	NA	Lab	ug/l	100	100 HRL93	20	846	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	3.5	
Chlorodibromomethane	NA	Lab	ug/l	80 (1)	10 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Chloroethane	NA	Lab	ug/l		ND RAA09			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chloroform	NA	Lab	ug/l	80 (1)	20 HRL18 (1)	53	2784	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chloromethane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chlorotoluene, o	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Chlorotoluene, p	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Cumene (isopropyl benzene)	NA	Lab	ug/l		300 HRL93			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.8	< 1.0	
Cymene p- (toluene isopropyl p-)	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Dibromomethane (methylene bromide)	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Dichlorodifluoromethane (Freon-12)	NA	Lab	ug/l		700 HRL11			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Dichlorofluoromethane (Freon-21)	NA	Lab	ug/l		20 RAA17			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	68	3717	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Ethyl ether	NA	Lab	ug/l		200 RAA10 (1)			3.1	3.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	2.6	1.6	
Hexachlorobutadiene	NA	Lab	ug/l		1 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group				LANDFILL								DUMP					
				Water Table				Jordan				Perched					
				Location	WT-11B	WT-13	WT-14	J-13	J-14		MW-19-01	MW-19-02	MW-19-03	MW-19-04			
				MN Unique ID#	434011	462523	462522	462520	462521		834660	834662	834663	834661			
Date	3/28/2019	3/28/2019	3/29/2019	3/28/2019	3/29/2019		4/03/2019	4/03/2019	4/03/2019	4/03/2019							
Sample Type	N	N	N	N	N	FR	N	N	N	N							
Drinking Water Criteria		Surface Water Criteria		Drinking Water Criteria		Surface Water Criteria		Drinking Water Criteria		Surface Water Criteria							
Parameter	Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
Methyl ethyl ketone (2-butanone)	NA	Lab	ug/l		4000 HRL94			< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Methyl isobutyl ketone (MIBK)	NA	Lab	ug/l		300 HRL94			< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl tertiary butyl ether (MTBE)	NA	Lab	ug/l		60 RAA13 (1)			< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methylene chloride	NA	Lab	ug/l	5	5 HRLMCL	46	27749 (1)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	NA	Lab	ug/l		70 HRL13	81	818	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Propylbenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.3	< 1.0	< 1.0
Styrene	NA	Lab	ug/l	100				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethylene	NA	Lab	ug/l	5 (9)	4 HBV14 (1)	3.8	857	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene	NA	Lab	ug/l	1000	200 HRL11	253	2703	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	0.4 HRL15 (1)	25	13976	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.47	< 0.10	< 0.10	< 0.10
Trichlorofluoromethane (Freon-11)	NA	Lab	ug/l		2000 HRL93			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorotrifluoroethane (Freon 113)	NA	Lab	ug/l		200000 HRL93			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	0.18	(1)	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.24
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene, o	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene, total	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)	166	2814	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides																	
Acetochlor	NA	Lab	ug/l		20 HRL18 (1)	3.6	173	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Alachlor	NA	Lab	ug/l	2	9 HRL18 (1)	4.2	1600 (1)	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Atrazine	NA	Lab	ug/l	3	3 HRLMCL	3.4	645	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chlorpyrifos	NA	Lab	ug/l		0.6 HBV13 (1)	0.041	0.17	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanazine (bladex)	NA	Lab	ug/l		1 HRL18 (1)			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Deisopropyl atrazine	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Desethylatrazine	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethenamid	NA	Lab	ug/l		300 HRL15 (1)			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
EPTC	NA	Lab	ug/l		40 HRL18 (1)			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ethalfuralin	NA	Lab	ug/l					< 0.50 *	< 0.50 *	< 0.50 *	< 0.50 *	< 0.50 *	< 0.50 *	< 0.50 *	< 0.50 *	< 0.50 *	< 0.50 *
Fonofos (dyphonate)	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Metolachlor	NA	Lab	ug/l		300 HBV18 (1)	23	543	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Metribuzin	NA	Lab	ug/l		10 HRL13 (1)			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pendimethalin	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phorate	NA	Lab	ug/l					< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Prometon	NA	Lab	ug/l		100 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Propachlor	NA	Lab	ug/l		90 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Propazine	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Simazine	NA	Lab	ug/l	4	4 HRLMCL			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Terbufos	NA	Lab	ug/l					< 0.20 *	< 0.20 *	< 0.20 *	< 0.20 *	< 0.20 *	< 0.20 *	< 0.20 *	< 0.20 *	< 0.20 *	< 0.20 *
Triallate	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trifluralin	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group				LANDFILL						DUMP							
				Water Table			Jordan			Perched							
				Location	WT-11B	WT-13	WT-14	J-13	J-14		MW-19-01	MW-19-02	MW-19-03	MW-19-04			
				MN Unique ID#	434011	462523	462522	462520	462521		834660	834662	834663	834661			
Date	3/28/2019	3/28/2019	3/29/2019	3/28/2019	3/29/2019		4/03/2019	4/03/2019	4/03/2019	4/03/2019							
Sample Type	N	N	N	N	N	FR	N	N	N	N							
				Drinking Water Criteria		Surface Water Criteria											
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
				04/01/2012	08/05/2019	01/24/2012	01/24/2012										
				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
Polychlorinated Biphenyls																	
Aroclor 1016	NA	Lab	ug/l					< 0.098	< 0.096	< 0.098	< 0.10	< 0.095	< 0.098	< 0.098	< 0.098	< 0.097	< 0.097
Aroclor 1221	NA	Lab	ug/l					< 0.098	< 0.096	< 0.098	< 0.10	< 0.095	< 0.098	< 0.098	< 0.098	< 0.097	< 0.097
Aroclor 1232	NA	Lab	ug/l					< 0.098	< 0.096	< 0.098	< 0.10	< 0.095	< 0.098	< 0.098	< 0.098	< 0.097	< 0.097
Aroclor 1242	NA	Lab	ug/l					< 0.098	< 0.096	< 0.098	< 0.10	< 0.095	< 0.098	< 0.098	< 0.098	< 0.097	< 0.097
Aroclor 1248	NA	Lab	ug/l					< 0.098	< 0.096	< 0.098	< 0.10	< 0.095	< 0.098	< 0.098	< 0.098	< 0.097	< 0.097
Aroclor 1254	NA	Lab	ug/l					< 0.098	< 0.096	< 0.098	< 0.10	< 0.095	< 0.098	< 0.098	< 0.098	< 0.097	< 0.097
Aroclor 1260	NA	Lab	ug/l					< 0.098	< 0.096	< 0.098	< 0.10	< 0.095	< 0.098	< 0.098	< 0.098	< 0.097	< 0.097
Aroclor 1262	NA	Lab	ug/l					< 0.098	< 0.096	< 0.098	< 0.10	< 0.095	< 0.098	< 0.098	< 0.098	< 0.097	< 0.097
Aroclor 1268	NA	Lab	ug/l					< 0.098	< 0.096	< 0.098	< 0.10	< 0.095	< 0.098	< 0.098	< 0.098	< 0.097	< 0.097
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	<i>0.04 HRL94</i>			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Herbicides																	
2,4,5-TP (Silvex)	NA	Lab	ug/l	50	50 HRLMCL			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4,5-Trichlorophenoxyacetic acid	NA	Lab	ug/l		70 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-D	NA	Lab	ug/l	70	30 HRL18 (1)			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
2,4-DB	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Bentazone	NA	Lab	ug/l		30 HRL15 (1)			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dicamba	NA	Lab	ug/l		200 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
MCPA	NA	Lab	ug/l		3 HRL93			< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Picloram	NA	Lab	ug/l	500	500 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Triclopyr	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Radiochemical Parameters																	
Gross Alpha (radiation)	NA	Lab	pCi/l	15				5.65 +/- 2.09	5.89 +/- 2.11	3.40 +/- 2.24	7.14 +/- 2.92	17.6 +/- 4.77	21.4 +/- 6.04	10.6 +/- 3.61	16.3 +/- 4.95	7.74 +/- 3.32	4.18 +/- 1.95
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				6.80 +/- 2.20	8.82 +/- 2.45	6.62 +/- 2.32	< 2.76	6.16 +/- 2.22	6.04 +/- 2.37	23.7 +/- 4.85	58.0 +/- 10.9	57.9 +/- 10.9	33.3 +/- 6.24
Per- and Polyfluoroalkyl Substances																	
Perfluorobutanesulfonate	NA	Lab	ug/l					< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.065	0.031 j	0.060	0.022 j
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l		<i>7 HRL18 (1)</i>			0.16	0.10	0.056	< 0.050	0.024 j	0.044 j	0.056	0.078	0.92	0.10
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		<i>0.047 HBV19</i>			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.12	0.12	0.15	0.21
Perfluorohexanoic acid (PFHxA)	NA	Lab	ug/l					0.024 j	< 0.050	0.024 j	< 0.050	< 0.050	< 0.050	0.21	0.085	1.2	0.15
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		<i>0.015 HBV19</i>			<i>0.016 j</i>	<i>0.038</i>	< 0.025	< 0.025	< 0.025	< 0.025	0.28	0.12	0.43	1.6
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		<i>0.035 HRL18 (1)</i>			0.083	0.11	0.068	< 0.035	< 0.035	< 0.035	0.95	0.93	13	2.1
Perfluoropentanoic acid (PFPeA)	NA	Lab	ug/l					0.021 j	0.014 j	0.010 j	< 0.050	< 0.050	< 0.050	0.076	0.043 j	0.62	0.070

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								DUMP													
								Water Table													
								Location	0FMW-1	MW-97-1	MW-97-2		MW-97-3	MW-97-4	MW-97-5	MW-97-6	MW-97-7	MW-97-9			
								MN Unique ID#	472759	603281	603282		603283	603287	603288	603289	603284	603286			
Date	5/21/2019	3/26/2019	6/03/2019		5/21/2019	3/26/2019	3/26/2019	3/26/2019	3/26/2019	5/21/2019	5/21/2019										
Sample Type	N	N	N	FR	N	N	N	N	N	N											
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria															
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness														
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012														
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade														
General Parameters																					
Chloride	NA	Lab	mg/l			230	1720	49.5	81.6	98.1	96.0	66.5	279	272	291	72.7	34.2				
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	5.2 (5)	45 (5)	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	
Cyanide, free	NA	Lab	ug/l	200	100 HRL93	5.2	45	< 20	< 20	< 20	< 20	< 20	< 20	23	37	< 20	< 20	< 20	< 20	< 20	
Hardness, as CaCO3	NA	Lab	ug/l					983000	801000	992000	984000	1060000	679000	772000	958000	616000	811000				
Nitrogen, ammonia, as N	NA	Lab	mg/l			0.04 (3)		0.18	< 0.11	0.15	0.16	0.77	0.81	0.32	5.3	< 0.11	0.12				
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			0.04		< 0.010	< 0.010	< 0.010	< 0.010	0.063	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	
Dissolved oxygen	NA	Field	mg/l			(6)		0.8	1.1	0.5	--	2.7	1.5	1.0	0.9	4.7	0.1				
pH	NA	Field	pH units			6.5 - 9.0		6.2	6.8	7.0	7.0	8.7	6.7	6.5	6.9	6.9	6.9				
Redox (oxidation potential)	NA	Field	mV					-35	80	-8	--	-90	-29	52	3	106	-17				
Specific conductance @ 25 °C	NA	Field	umhos/cm					1850	1810	1870	--	2110	1850	2030	2700	1240	1400				
Temperature	NA	Field	deg C			(7)		9.0	10.0	10.0	10.0	9.5	11.5	10.5	13.0	8.0	7.5				
Turbidity	NA	Field	NTU	5 (19)		25		9.9	54.7	25.6	--	170	19.5	52.4	--	7.4	11.4				
Metals																					
Aluminum	Dissolved	Lab	ug/l			125	2145	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	
Antimony	Dissolved	Lab	ug/l	6	6 HRL93	5.5	180	< 0.50	< 0.50	< 0.50	< 0.50	2.8	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Arsenic	Dissolved	Lab	ug/l	10		2.0	720	8.8	< 0.50	0.90	0.91	2.5	2.6	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Barium	Dissolved	Lab	ug/l	2000	2000 HRL93			25.9	28.6	76.6	76.5	25.0	266	122	130	36.6	25.9				
Beryllium	Dissolved	Lab	ug/l	4	0.08 HRL93			< 0.20	0.24	< 50.0	< 50.0	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	
Boron	Dissolved	Lab	ug/l		500 RAA17			4480	30100	32700	28900	52800	526	901	13900	10500	690				
Cadmium	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)	2.8 HD CF	268 HD CF	0.16	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	< 0.080	
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93	11 CF CR6	31 CF CR6	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	0.60	< 0.50	< 0.50	< 0.50	< 0.50	
Cobalt	Dissolved	Lab	ug/l			2.8	872	3.0	< 0.50	3.8	3.9	< 0.50	4.8	6.3	9.6	< 0.50	0.66				
Copper	Dissolved	Lab	ug/l	1300 TT(12)		21 HD CF	114 HD CF	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	
Lead	Dissolved	Lab	ug/l	15 TT(12)		13 HD CF	661 HD CF	0.18	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	
Manganese	Dissolved	Lab	ug/l		100 HBV18			1020	75.2	667	672	170	1150	1490	1760	< 5.0	244				
Nickel	Dissolved	Lab	ug/l		100 HRL93	296 HD CF	8366 HD CF	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	
Selenium	Dissolved	Lab	ug/l	50	30 HRL93	5.0	40	0.97	22.9	3.5	3.3	55.0	< 0.50	< 0.50	< 0.50	15.7	< 0.50	< 0.50	< 0.50	< 0.50	
Silver	Dissolved	Lab	ug/l		30 HRL93	0.85 CF	31 HD CF	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	
Thallium	Dissolved	Lab	ug/l	2	0.6 HRL94	0.28	128	0.13	0.42	0.76	0.74	< 0.10	0.28	1.2	4.0	0.11	0.48				
Tin	Dissolved	Lab	ug/l		4000 HRL94			< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	< 75.0	
Uranium	Dissolved	Lab	ug/l	30				4.7	12.7	15.9	16.2	46.9	2.4	6.9	5.0	6.9	6.7				
Vanadium	Dissolved	Lab	ug/l		50 HRL94			< 1.0	< 1.0	< 1.0	< 1.0	14.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	
Zinc	Dissolved	Lab	ug/l		2000 HRL94	309 HD CF	678 HD CF	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	
Aluminum	Total	Lab	ug/l			125	2145	--	--	--	--	--	--	--	--	--	--	--	--	--	
Antimony	Total	Lab	ug/l	6	6 HRL93	5.5	180	--	--	--	--	--	--	--	--	--	--	--	--	--	
Arsenic	Total	Lab	ug/l	10		2.0	720	--	--	--	--	--	--	--	--	--	--	--	--	--	
Barium	Total	Lab	ug/l	2000	2000 HRL93			--	--	--	--	--	--	--	--	--	--	--	--	--	
Beryllium	Total	Lab	ug/l	4	0.08 HRL93			--	--	--	--	--	--	--	--	--	--	--	--	--	
Boron	Total	Lab	ug/l		500 RAA17			--	--	--	--	--	--	--	--	--	--	--	--	--	
Cadmium	Total	Lab	ug/l	5	0.5 HRL15 (1)	3.1 HD	284 HD	--	--	--	--	--	--	--	--	--	--	--	--	--	
Chromium	Total	Lab	ug/l	100	100 CR HRL93	11 CR6	32 CR6	--	--	--	--	--	--	--	--	--	--	--	--	--	
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	0.1 HRL93	0.011	0.032	< 0.010 *	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010 *	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	
Cobalt	Total	Lab	ug/l			2.8	872	--	--	--	--	--	--	--	--	--	--	--	--	--	
Copper	Total	Lab	ug/l	1300 TT(12)		22 HD	119 HD	--	--	--	--	--	--	--	--	--	--	--	--	--	
Lead	Total	Lab	ug/l	15 TT(12)		16 HD	836 HD	--	--	--	--	--	--	--	--	--	--	--	--	--	
Manganese	Total	Lab	ug/l		100 HBV18			--	--	--	--	--	--	--	--	--	--	--	--	--	
Nickel	Total	Lab	ug/l		100 HRL93	297 HD	8383 HD	--	--	--	--	--	--	--	--	--	--	--	--	--	
Selenium	Total	Lab	ug/l	50	30 HRL93	5.0	40	--	--	--	--	--	--	--	--	--	--	--	--	--	
Silver	Total	Lab	ug/l		30 HRL93	1.0	37 HD	--	--	--	--	--	--	--	--	--	--	--	--	--	
Thallium	Total	Lab	ug/l	2	0.6 HRL94	0.28	128	--	--	--	--	--	--	--	--	--	--	--	--	--	
Tin	Total	Lab	ug/l		4000 HRL94			--	--	--	--	--	--	--	--	--	--	--	--	--	

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								DUMP										
								Water Table										
								Location	0FMW-1	MW-97-1	MW-97-2		MW-97-3	MW-97-4	MW-97-5	MW-97-6	MW-97-7	MW-97-9
								MN Unique ID#	472759	603281	603282		603283	603287	603288	603289	603284	603286
Date	5/21/2019	3/26/2019	6/03/2019		5/21/2019	3/26/2019	3/26/2019	3/26/2019	5/21/2019	5/21/2019								
Sample Type	N	N	N	FR	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria												
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness											
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012											
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade											
Uranium	Total	Lab	ug/l	30				--	--	--	--	--	--	--	--	--	--	
Vanadium	Total	Lab	ug/l		50 HRL94			--	--	--	--	--	--	--	--	--	--	
Zinc	Total	Lab	ug/l		2000 HRL94	314 HD	693 HD	--	--	--	--	--	--	--	--	--	--	
Semivolatile Organic Compounds																		
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)			0.70	< 0.051	0.12 b	0.15 b	0.11	< 0.050	< 0.051	0.83	< 0.051	0.36	
2,4,6-Trichlorophenol	NA	Lab	ug/l		30 HRL93	2.0	203	< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
2,4-Dichlorophenol	NA	Lab	ug/l		20 HRL93			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
2,4-Dimethylphenol	NA	Lab	ug/l		100 HRL93			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
2,4-Dinitrophenol	NA	Lab	ug/l		10 HRL94			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
2-Chlorophenol	NA	Lab	ug/l		30 HRL93			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
2-Methylnaphthalene	NA	Lab	ug/l		8 RAA13			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
2-Methylphenol (o-cresol)	NA	Lab	ug/l		30 HRL93			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
3,3'-Dichlorobenzidine	NA	Lab	ug/l		0.8 HRL93			< 50.8	< 52.6	< 49.0	< 49.5	< 51.5	< 50.0	< 48.5	< 49.0	< 51.5	< 51.0	
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		3 MP HRL94			< 10.2	< 21.1	< 9.8	< 9.9	< 10.3	< 20.0	< 19.4	< 19.6	< 10.3	< 10.2	
4-Bromophenyl phenyl ether	NA	Lab	ug/l					< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Acenaphthene	NA	Lab	ug/l		100 HRL18 (1)	20	112	< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Anthracene	NA	Lab	ug/l		600 RAA19 (1)	0.035	0.63	< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Benzo(a)pyrene	NA	Lab	ug/l	0.2	0.1 HBV18 (1)			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Benzoic acid	NA	Lab	ug/l		30000 HRL93			< 50.8	< 52.6	< 49.0	< 49.5	< 51.5	< 50.0	< 48.5	< 49.0	< 51.5	< 51.0	
Bis(2-chloroethyl)ether	NA	Lab	ug/l		0.3 HRL93			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Bis(2-ethylhexyl)phthalate	NA	Lab	ug/l	6	7 HRL15 (1)	1.9	(1)	< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Butyl benzyl phthalate	NA	Lab	ug/l		100 HRL15			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Diethyl phthalate	NA	Lab	ug/l		6000 HRL93			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Dimethyl phthalate	NA	Lab	ug/l		70000 HRL94			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Di-n-butyl phthalate	NA	Lab	ug/l		20 HRL15			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Di-n-octyl phthalate	NA	Lab	ug/l			30	1650	< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Fluoranthene	NA	Lab	ug/l		70 HRL18 (1)	1.9	6.9	< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Fluorene	NA	Lab	ug/l		80 HBV19 (1)			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Hexachlorobenzene	NA	Lab	ug/l	1	0.2 HRL93	0.00024		< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Hexachlorocyclopentadiene	NA	Lab	ug/l	50				< 50.8	< 52.6	< 49.0 *	< 49.5 *	< 51.5	< 50.0	< 48.5	< 49.0	< 51.5	< 51.0	
Hexachloroethane	NA	Lab	ug/l					< 10.2	< 10.5	< 9.8 *	< 9.9 *	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Isophorone	NA	Lab	ug/l		100 HRL93			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
n-Nitrosodimethylamine	NA	Lab	ug/l		0.005 HBV17 (1)			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Pentachlorophenol	NA	Lab	ug/l	1	0.3 HRL15 (1)	1.9 (8)	18 (8)	< 20.3	< 21.1	< 19.6	< 19.8	< 20.6	< 20.0	< 19.4	< 19.6	< 20.6	< 20.4	
Phenanthrene	NA	Lab	ug/l			3.6	64	< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Phenol	NA	Lab	ug/l		4000 HRL93	<u>123</u>	4428	< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	
Pyrene	NA	Lab	ug/l		50 HRL18 (1)			< 10.2	< 10.5	< 9.8	< 9.9	< 10.3	< 10.0	< 9.7	< 9.8	< 10.3	< 10.2	

ANALYTICAL DATA SUMMARY - WATER (Phase B)

Focused Remedial Investigation Report

Freeway Landfill and Dump

Burnsville, Minnesota

Monitoring Well Group								DUMP												
								Water Table												
								Location		0FMW-1	MW-97-1	MW-97-2		MW-97-3	MW-97-4	MW-97-5	MW-97-6	MW-97-7	MW-97-9	
								MN Unique ID#		472759	603281	603282		603283	603287	603288	603289	603284	603286	
Sample Type								Date		6/03/2019		5/21/2019	3/26/2019	3/26/2019	3/26/2019	5/21/2019	5/21/2019			
								N		N		N	FR	N	N	N	N	N	N	
				Drinking Water Criteria		Surface Water Criteria														
Parameter				Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012													
Exceedance Key				Bold	Italic	Underline	Shade													
Volatile Organic Compounds																				
1,1,1,2-Tetrachloroethane	NA	Lab	ug/l		70 HRL93			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,1,1-Trichloroethane	NA	Lab	ug/l	200	5000 HRL18 (1)	329	5913	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,1,2,2-Tetrachloroethane	NA	Lab	ug/l		2 HRL94	1.5	2253 (1)	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
1,1,2-Trichloroethane	NA	Lab	ug/l	5	3 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
1,1-Dichloroethane	NA	Lab	ug/l		80 RAA16 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,1-Dichloroethylene	NA	Lab	ug/l	7	200 HRL11			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,1-Dichloropropene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,2,3-Trichlorobenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,2,3-Trichloropropane	NA	Lab	ug/l		0.003 HRL13 (1)			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20			
1,2,4-Trichlorobenzene	NA	Lab	ug/l	70	4 HRL13 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,2-Dibromo-3-chloropropane (DBCP)	NA	Lab	ug/l	0.2				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,2-Dibromoethane (EDB)	NA	Lab	ug/l	0.05 (7)	0.004 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
1,2-Dichlorobenzene	NA	Lab	ug/l	600	600 HRL93			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,2-Dichloroethane	NA	Lab	ug/l	5	1 HRL13 (1)	3.8	90100 (1)	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20			
1,2-Dichloroethylene, cis	NA	Lab	ug/l	70	6 HRL18 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,2-Dichloroethylene, trans	NA	Lab	ug/l	100	40 HRL13 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,2-Dichloropropane	NA	Lab	ug/l	5	5 HRL94			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,3,5-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,3-Dichlorobenzene	NA	Lab	ug/l	600 (5)				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,3-Dichloropropane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
1,3-Dichloropropene, cis	NA	Lab	ug/l		2 DCP HRL94			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
1,3-Dichloropropene, trans	NA	Lab	ug/l		2 DCP HRL94			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
2,2-Dichloropropane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Acetone	NA	Lab	ug/l		3000 HBV17 (1)			< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20			
Allyl chloride	NA	Lab	ug/l		30 HRL94			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	6.0	8974 (1)	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
Bromobenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Bromochloromethane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Bromodichloromethane	NA	Lab	ug/l	80 (1)	3 HBV18 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Bromoform	NA	Lab	ug/l	80 (1)	40 HRL93	41	5800	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Bromomethane	NA	Lab	ug/l		10 HRL93			< 2.0	< 2.0 *	< 2.0	< 2.0	< 2.0	< 2.0 *	< 2.0 *	< 2.0 *	< 2.0	< 2.0			
Butylbenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Butylbenzene, sec	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Butylbenzene, tert	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Carbon tetrachloride	NA	Lab	ug/l	5	1 HRL13 (1)	1.9	3500 (1)	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20			
Chlorobenzene	NA	Lab	ug/l	100	100 HRL93	20	846	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Chlorodibromomethane	NA	Lab	ug/l	80 (1)	10 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
Chloroethane	NA	Lab	ug/l		ND RAA09			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Chloroform	NA	Lab	ug/l	80 (1)	20 HRL18 (1)	53	2784	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Chloromethane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Chlorotoluene, o	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Chlorotoluene, p	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Cumene (isopropyl benzene)	NA	Lab	ug/l		300 HRL93			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Cymene p- (toluene isopropyl p-)	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Dibromomethane (methylene bromide)	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Dichlorodifluoromethane (Freon-12)	NA	Lab	ug/l		700 HRL11			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Dichlorofluoromethane (Freon-21)	NA	Lab	ug/l		20 RAA17			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	68	3717	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Ethyl ether	NA	Lab	ug/l		200 RAA10 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0			
Hexachlorobutadiene	NA	Lab	ug/l		1 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								DUMP									
								Water Table									
								Location	MW-97-1	MW-97-2		MW-97-3	MW-97-4	MW-97-5	MW-97-6	MW-97-7	MW-97-9
								MN Unique ID#	603281	603282		603283	603287	603288	603289	603284	603286
Date	3/26/2019	6/03/2019		5/21/2019	3/26/2019	3/26/2019	3/26/2019	5/21/2019	5/21/2019								
Sample Type	N	N	N	FR	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria											
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness										
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012										
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade										
Methyl ethyl ketone (2-butanone)	NA	Lab	ug/l		4000 HRL94			< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Methyl isobutyl ketone (MIBK)	NA	Lab	ug/l		300 HRL94			< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Methyl tertiary butyl ether (MTBE)	NA	Lab	ug/l		60 RAA13 (1)			< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Methylene chloride	NA	Lab	ug/l	5	5 HRLMCL	46	27749 (1)	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Naphthalene	NA	Lab	ug/l		70 HRL13	81	818	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Propylbenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	NA	Lab	ug/l	100				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethylene	NA	Lab	ug/l	5 (9)	4 HBV14 (1)	3.8	857	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Toluene	NA	Lab	ug/l	1000	200 HRL11	253	2703	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	0.4 HRL15 (1)	25	13976	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Trichlorofluoromethane (Freon-11)	NA	Lab	ug/l		2000 HRL93			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorotrifluoroethane (Freon 113)	NA	Lab	ug/l		200000 HRL93			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	0.18	(1)	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.090	< 0.050	< 0.050
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene, o	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylene, total	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)	166	2814	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pesticides																	
Acetochlor	NA	Lab	ug/l		20 HRL18 (1)	3.6	173	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Alachlor	NA	Lab	ug/l	2	9 HRL18 (1)	4.2	1600 (1)	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Atrazine	NA	Lab	ug/l	3	3 HRLMCL	3.4	645	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Chlorpyrifos	NA	Lab	ug/l		0.6 HBV13 (1)	0.041	0.17	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Cyanazine (bladex)	NA	Lab	ug/l		1 HRL18 (1)			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Deisopropyl atrazine	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Desethylatrazine	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dimethenamid	NA	Lab	ug/l		300 HRL15 (1)			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
EPTC	NA	Lab	ug/l		40 HRL18 (1)			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ethalfuralin	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50 *	< 0.50 *	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Fonofos (dyphonate)	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50 *	< 0.50 *	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Metolachlor	NA	Lab	ug/l		300 HBV18 (1)	23	543	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Metribuzin	NA	Lab	ug/l		10 HRL13 (1)			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Pendimethalin	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Phorate	NA	Lab	ug/l					< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30
Prometon	NA	Lab	ug/l		100 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Propachlor	NA	Lab	ug/l		90 HRL93			< 0.50	< 0.50	< 0.50 *	< 0.50 *	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Propazine	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Simazine	NA	Lab	ug/l	4	4 HRLMCL			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Terbufos	NA	Lab	ug/l					< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20
Triallate	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50 *	< 0.50 *	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Trifluralin	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Monitoring Well Group								DUMP										
								Water Table										
								Location	0FMW-1	MW-97-1	MW-97-2		MW-97-3	MW-97-4	MW-97-5	MW-97-6	MW-97-7	MW-97-9
								MN Unique ID#	472759	603281	603282		603283	603287	603288	603289	603284	603286
Date	5/21/2019	3/26/2019	6/03/2019		5/21/2019	3/26/2019	3/26/2019	3/26/2019	5/21/2019	5/21/2019								
Sample Type	N	N	N	FR	N	N	N	N	N	N								
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria												
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness											
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012											
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade											
Polychlorinated Biphenyls																		
Aroclor 1016	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.098	< 0.10	< 0.10	< 0.098	< 0.10	< 0.096	< 0.098	
Aroclor 1221	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.098	< 0.10	< 0.10	< 0.098	< 0.10	< 0.096	< 0.098	
Aroclor 1232	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.098	< 0.10	< 0.10	< 0.098	< 0.10	< 0.096	< 0.098	
Aroclor 1242	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.098	< 0.10	< 0.10	< 0.098	< 0.10	< 0.096	< 0.098	
Aroclor 1248	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.098	< 0.10	< 0.10	< 0.098	< 0.10	< 0.096	< 0.098	
Aroclor 1254	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.098	< 0.10	< 0.10	< 0.098	< 0.10	< 0.096	< 0.098	
Aroclor 1260	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.098	< 0.10	< 0.10	< 0.098	< 0.10	< 0.096	< 0.098	
Aroclor 1262	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.098	< 0.10	< 0.10	< 0.098	< 0.10	< 0.096	< 0.098	
Aroclor 1268	NA	Lab	ug/l					< 0.095	< 0.098	< 0.097	< 0.098	< 0.10	< 0.10	< 0.098	< 0.10	< 0.096	< 0.098	
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	<i>0.04 HRL94</i>			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Herbicides																		
2,4,5-TP (Silvex)	NA	Lab	ug/l	50	50 HRLMCL			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2,4,5-Trichlorophenoxyacetic acid	NA	Lab	ug/l		70 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2,4-D	NA	Lab	ug/l	70	30 HRL18 (1)			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
2,4-DB	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Bentazone	NA	Lab	ug/l		30 HRL15 (1)			< 0.50	< 0.50	< 0.50 *	< 0.50 *	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Dicamba	NA	Lab	ug/l		200 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
MCPA	NA	Lab	ug/l		3 HRL93			< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	
Picloram	NA	Lab	ug/l	500	500 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Triclopyr	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Radiochemical Parameters																		
Gross Alpha (radiation)	NA	Lab	pCi/l	15				< 7.23	13.2 +/- 4.16	16.8 +/- 5.79	17.0 +/- 5.59	42.8 +/- 16.8	8.95 +/- 2.91	16.1 +/- 4.62	13.6 +/- 4.68	< 11.2	< 6.92	
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				9.08 +/- 2.92	26.1 +/- 5.63	10.8 +/- 3.79	5.43 +/- 2.76	32.6 +/- 12.4	5.25 +/- 2.12	6.42 +/- 2.73	28.8 +/- 6.21	< 9.43	< 6.07	
Per- and Polyfluoroalkyl Substances																		
Perfluorobutanesulfonate	NA	Lab	ug/l					0.0070 j	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	0.0080 j	< 0.050	
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l		7 HRL18 (1)			0.041 j	0.017 j	< 0.25	0.032 j	0.043 j	0.021 j	0.014 j	0.035 j	0.022 j	0.022 j	
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		0.047 HBV19			< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	< 0.025	0.019 j	0.0060 j	< 0.025	
Perfluorohexanoic acid (PFHxA)	NA	Lab	ug/l					0.034 j	< 0.050	0.0080 j	0.0090 j	< 0.050	< 0.050	< 0.050	0.11	0.029 j	< 0.050	
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		0.015 HBV19			< 0.015	0.015 j	< 0.015	< 0.015	< 0.015	0.013 j	0.019 j	0.20	0.037	0.037	
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		0.035 HRL18 (1)			0.11	0.026 j	0.0090 j	< 0.035	0.025 j	0.021 j	< 0.035	1.0	0.069	0.077	
Perfluoropentanoic acid (PFPeA)	NA	Lab	ug/l					0.023 j	0.008 j	0.0060 j	0.0060 j	0.0060 j	< 0.050	0.010 j	0.062	0.015 j	0.0060 j	

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

								KRAEMER QUARRY		
								Monitoring Well Group		
								Location		
								MN Unique ID#		
								Date		
								Sample Type		
				Drinking Water Criteria		Surface Water Criteria		SEEP 01	DISCHARGE 01	
				EPA Maximum Contaminant Levels		Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness		5/29/2019	5/29/2019	
				MDH Human Health-Based Water Guidance Table		Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness		N	N	FR
				04/01/2012		01/24/2012		N	N	FR
				08/05/2019		01/24/2012		N	N	FR
				Bold		<u>Underline</u>		N	N	FR
				<i>Italic</i>		Shade		N	N	FR
Effective Date										
Exceedance Key										
General Parameters										
Parameter	Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness	SEEP 01	DISCHARGE 01	DISCHARGE 01
Chloride	NA	Lab	mg/l			230	1720	124	57.9	58.2
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	5.2 (5)	45 (5)	< 20.0	< 20.0	< 20.0
Cyanide, free	NA	Lab	ug/l	200	100 HRL93	5.2	45	< 20 *	< 20	< 20
Hardness, as CaCO3	NA	Lab	ug/l					370000	337000	339000
Nitrogen, ammonia, as N	NA	Lab	mg/l			0.04 (3)		6.9	0.23	0.23
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			0.04		< 0.010	< 0.010	--
Dissolved oxygen	NA	Field	mg/l			(6)		--	--	--
pH	NA	Field	pH units			6.5 - 9.0		6.6	7.5	--
Redox (oxidation potential)	NA	Field	mV					--	--	--
Specific conductance @ 25 °C	NA	Field	umhos/cm					--	--	--
Temperature	NA	Field	deg C			(7)		12.5	15.0	--
Turbidity	NA	Field	NTU	5 (19)		25		--	--	--
Metals										
Aluminum	Dissolved	Lab	ug/l	6	6 HRL93	125	2145	--	--	--
Antimony	Dissolved	Lab	ug/l	10	30 HRL93	5.5	180	--	--	--
Arsenic	Dissolved	Lab	ug/l	2000	2000 HRL93	2.0	720	--	--	--
Barium	Dissolved	Lab	ug/l	4	0.08 HRL93			--	--	--
Beryllium	Dissolved	Lab	ug/l		500 RAA17			--	--	--
Boron	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)	2.8 HD CF	268 HD CF	--	--	--
Cadmium	Dissolved	Lab	ug/l	100	100 CR HRL93	11 CF CR6	31 CF CR6	--	--	--
Chromium	Dissolved	Lab	ug/l			2.8	872	--	--	--
Cobalt	Dissolved	Lab	ug/l	1300 TT(12)		21 HD CF	114 HD CF	--	--	--
Copper	Dissolved	Lab	ug/l	15 TT(12)		13 HD CF	661 HD CF	--	--	--
Lead	Dissolved	Lab	ug/l		100 HBV18			--	--	--
Manganese	Dissolved	Lab	ug/l		100 HRL93	296 HD CF	8366 HD CF	--	--	--
Nickel	Dissolved	Lab	ug/l	50	30 HRL93	5.0	40	--	--	--
Selenium	Dissolved	Lab	ug/l	2	0.6 HRL94	0.85 CF	31 HD CF	--	--	--
Silver	Dissolved	Lab	ug/l		4000 HRL94	0.28	128	--	--	--
Thallium	Dissolved	Lab	ug/l					--	--	--
Tin	Dissolved	Lab	ug/l	30				--	--	--
Uranium	Dissolved	Lab	ug/l		50 HRL94			--	--	--
Vanadium	Dissolved	Lab	ug/l		2000 HRL94	309 HD CF	678 HD CF	--	--	--
Zinc	Dissolved	Lab	ug/l					--	--	--
Aluminum	Total	Lab	ug/l	6	6 HRL93	125	2145	< 200	317	320
Antimony	Total	Lab	ug/l	10	30 HRL93	5.5	180	< 0.50	< 0.50	< 0.50
Arsenic	Total	Lab	ug/l	2000	2000 HRL93	2.0	720	< 0.50	0.58	0.58
Barium	Total	Lab	ug/l	4	0.08 HRL93			522	174	174
Beryllium	Total	Lab	ug/l		500 RAA17			< 0.20	< 0.20	< 0.20
Boron	Total	Lab	ug/l	5	0.5 HRL15 (1)	3.1 HD	284 HD	291	220	218
Cadmium	Total	Lab	ug/l	100	100 CR HRL93	11 CR6	32 CR6	< 0.080	< 0.080	< 0.080
Chromium	Total	Lab	ug/l					0.51	< 0.50	< 0.50
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	0.1 HRL93	0.011	0.032	< 0.010	< 0.010	< 0.010
Cobalt	Total	Lab	ug/l			2.8	872	1.6	< 0.50	< 0.50
Copper	Total	Lab	ug/l	1300 TT(12)		22 HD	119 HD	< 10.0	< 10.0	< 10.0
Lead	Total	Lab	ug/l	15 TT(12)		16 HD	836 HD	< 0.10	0.51	0.55
Manganese	Total	Lab	ug/l		100 HBV18			744	66.7	67.2
Nickel	Total	Lab	ug/l		100 HRL93	297 HD	8383 HD	< 20.0	< 20.0	< 20.0
Selenium	Total	Lab	ug/l	50	30 HRL93	5.0	40	0.70	6.5	6.3
Silver	Total	Lab	ug/l		4000 HRL94	1.0	37 HD	< 10.0	< 10.0	< 10.0
Thallium	Total	Lab	ug/l	2	0.6 HRL94	0.28	128	1.1	0.20	0.20
Tin	Total	Lab	ug/l					< 75.0	< 75.0	< 75.0

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

								KRAEMER QUARRY					
								Monitoring Well Group			SEEP 01	DISCHARGE 01	
								Location			5/29/2019	5/29/2019	
								MN Unique ID#				N	N
Date			N	5/29/2019									
Sample Type				N	N	FR							
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria							
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness						
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012						
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade						
Uranium	Total	Lab	ug/l	30				1.8	2.7	2.7			
Vanadium	Total	Lab	ug/l		50 HRL94			< 1.0	< 1.0	< 1.0			
Zinc	Total	Lab	ug/l		2000 HRL94	314 HD	693 HD	< 20.0	< 20.0	< 20.0			
Semivolatile Organic Compounds													
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)			19	1.5	--			
2,4,6-Trichlorophenol	NA	Lab	ug/l		30 HRL93	2.0	203	< 10.1	< 9.9	< 9.9			
2,4-Dichlorophenol	NA	Lab	ug/l		20 HRL93			< 10.1	< 9.9	< 9.9			
2,4-Dimethylphenol	NA	Lab	ug/l		100 HRL93			< 10.1	< 9.9	< 9.9			
2,4-Dinitrophenol	NA	Lab	ug/l		10 HRL94			< 10.1	< 9.9	< 9.9			
2-Chlorophenol	NA	Lab	ug/l		30 HRL93			< 10.1	< 9.9	< 9.9			
2-Methylnaphthalene	NA	Lab	ug/l		8 RAA13			< 10.1	< 9.9	< 9.9			
2-Methylphenol (o-cresol)	NA	Lab	ug/l		30 HRL93			< 10.1	< 9.9	< 9.9			
3,3'-Dichlorobenzidine	NA	Lab	ug/l		0.8 HRL93			< 50.5	< 49.5	< 49.5			
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		3 MP HRL94			< 10.1	< 9.9	< 9.9			
4-Bromophenyl phenyl ether	NA	Lab	ug/l					< 10.1	< 9.9	< 9.9			
Acenaphthene	NA	Lab	ug/l		100 HRL18 (1)	20	112	< 10.1	< 9.9	< 9.9			
Anthracene	NA	Lab	ug/l		600 RAA19 (1)	0.035	0.63	< 10.1	< 9.9	< 9.9			
Benzo(a)pyrene	NA	Lab	ug/l	0.2	0.1 HBV18 (1)			< 10.1	< 9.9	< 9.9			
Benzoic acid	NA	Lab	ug/l		30000 HRL93			< 50.5	< 49.5	< 49.5			
Bis(2-chloroethyl)ether	NA	Lab	ug/l		0.3 HRL93			< 10.1	< 9.9	< 9.9			
Bis(2-ethylhexyl)phthalate	NA	Lab	ug/l	6	7 HRL15 (1)	1.9	(1)	< 10.1	< 9.9	< 9.9			
Butyl benzyl phthalate	NA	Lab	ug/l		100 HRL15			< 10.1	< 9.9	< 9.9			
Diethyl phthalate	NA	Lab	ug/l		6000 HRL93			< 10.1	< 9.9	< 9.9			
Dimethyl phthalate	NA	Lab	ug/l		70000 HRL94			< 10.1	< 9.9	< 9.9			
Di-n-butyl phthalate	NA	Lab	ug/l		20 HRL15			< 10.1	< 9.9	< 9.9			
Di-n-octyl phthalate	NA	Lab	ug/l			30	1650	< 10.1	< 9.9	< 9.9			
Fluoranthene	NA	Lab	ug/l		70 HRL18 (1)	1.9	6.9	< 10.1	< 9.9	< 9.9			
Fluorene	NA	Lab	ug/l		80 HBV19 (1)			< 10.1	< 9.9	< 9.9			
Hexachlorobenzene	NA	Lab	ug/l	1	0.2 HRL93	0.00024		< 10.1	< 9.9	< 9.9			
Hexachlorocyclopentadiene	NA	Lab	ug/l	50				< 50.5 *	< 49.5 *	< 49.5 *			
Hexachloroethane	NA	Lab	ug/l					< 10.1	< 9.9	< 9.9			
Isophorone	NA	Lab	ug/l		100 HRL93			< 10.1	< 9.9	< 9.9			
n-Nitrosodimethylamine	NA	Lab	ug/l		0.005 HBV17 (1)			< 10.1	< 9.9	< 9.9			
Pentachlorophenol	NA	Lab	ug/l	1	0.3 HRL15 (1)	1.9 (8)	18 (8)	< 20.2	< 19.8	< 19.8			
Phenanthrene	NA	Lab	ug/l			3.6	64	< 10.1	< 9.9	< 9.9			
Phenol	NA	Lab	ug/l		4000 HRL93	<u>123</u>	4428	< 10.1	< 9.9	< 9.9			
Pyrene	NA	Lab	ug/l		50 HRL18 (1)			< 10.1	< 9.9	< 9.9			

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

								KRAEMER QUARRY		
								Monitoring Well Group		
								Location		
								MN Unique ID#		
								Date		
								Sample Type		
				Drinking Water Criteria		Surface Water Criteria		SEEP 01	DISCHARGE 01	
				EPA Maximum Contaminant Levels		MDH Human Health-Based Water Guidance Table		5/29/2019	5/29/2019	
				04/01/2012		08/05/2019		N	N	FR
				Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness		Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness				
Parameter	Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness			
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012			
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade			
Volatile Organic Compounds										
1,1,1,2-Tetrachloroethane	NA	Lab	ug/l		70 HRL93			< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	NA	Lab	ug/l	200	5000 HRL18 (1)	329	5913	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	NA	Lab	ug/l		2 HRL94	1.5	2253 (1)	< 0.50	< 0.50	< 0.50
1,1,2-Trichloroethane	NA	Lab	ug/l	5	3 HRL93			< 0.50	< 0.50	< 0.50
1,1-Dichloroethane	NA	Lab	ug/l		80 RAA16 (1)			< 1.0	< 1.0	< 1.0
1,1-Dichloroethylene	NA	Lab	ug/l	7	200 HRL11			< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	NA	Lab	ug/l		0.003 HRL13 (1)			< 0.20	< 0.20	< 0.20
1,2,4-Trichlorobenzene	NA	Lab	ug/l	70	4 HRL13 (1)			< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane (DBCP)	NA	Lab	ug/l	0.2				< 1.0	< 1.0	< 1.0
1,2-Dibromoethane (EDB)	NA	Lab	ug/l	0.05 (7)	0.004 HRL93			< 0.50	< 0.50	< 0.50
1,2-Dichlorobenzene	NA	Lab	ug/l	600	600 HRL93			< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	NA	Lab	ug/l	5	1 HRL13 (1)	3.8	90100 (1)	< 0.20	< 0.20	< 0.20
1,2-Dichloroethylene, cis	NA	Lab	ug/l	70	<i>6 HRL18 (1)</i>			< 1.0	< 1.0	< 1.0
1,2-Dichloroethylene, trans	NA	Lab	ug/l	100	40 HRL13 (1)			< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	NA	Lab	ug/l	5	<i>5 HRL94</i>			< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	NA	Lab	ug/l	600 (5)				< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
1,3-Dichloropropene, cis	NA	Lab	ug/l		2 DCP HRL94			< 0.50	< 0.50	< 0.50
1,3-Dichloropropene, trans	NA	Lab	ug/l		2 DCP HRL94			< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94			< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
Acetone	NA	Lab	ug/l		3000 HBV17 (1)			< 20	< 20	< 20
Allyl chloride	NA	Lab	ug/l		30 HRL94			< 1.0	< 1.0	< 1.0
Benzene	NA	Lab	ug/l	5	<i>2 HRL09 (1)</i>	<u>6.0</u>	8974 (1)	< 0.50	< 0.50	< 0.50
Bromobenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
Bromochloromethane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
Bromodichloromethane	NA	Lab	ug/l	80 (1)	3 HBV18 (1)			< 1.0	< 1.0	< 1.0
Bromoform	NA	Lab	ug/l	80 (1)	40 HRL93	41	5800	< 1.0	< 1.0	< 1.0
Bromomethane	NA	Lab	ug/l		10 HRL93			< 2.0	< 2.0	< 2.0
Butylbenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
Butylbenzene, sec	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
Butylbenzene, tert	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
Carbon tetrachloride	NA	Lab	ug/l	5	1 HRL13 (1)	1.9	3500 (1)	< 0.20	< 0.20	< 0.20
Chlorobenzene	NA	Lab	ug/l	100	100 HRL93	20	846	< 1.0	< 1.0	< 1.0
Chlorodibromomethane	NA	Lab	ug/l	80 (1)	10 HRL93			< 0.50	< 0.50	< 0.50
Chloroethane	NA	Lab	ug/l		ND RAA09			< 1.0	< 1.0	< 1.0
Chloroform	NA	Lab	ug/l	80 (1)	20 HRL18 (1)	53	2784	< 1.0	< 1.0	< 1.0
Chloromethane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
Chlorotoluene, o	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
Chlorotoluene, p	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
Cumene (isopropyl benzene)	NA	Lab	ug/l		300 HRL93			< 1.0	< 1.0	< 1.0
Cymene p- (toluene isopropyl p-)	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
Dibromomethane (methylene bromide)	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon-12)	NA	Lab	ug/l		700 HRL11			< 1.0	< 1.0	< 1.0
Dichlorofluoromethane (Freon-21)	NA	Lab	ug/l		20 RAA17			< 1.0	< 1.0	< 1.0
Ethyl benzene	NA	Lab	ug/l	700	<i>40 HBV19 (1)</i>	<u>68</u>	3717	< 1.0	< 1.0	< 1.0
Ethyl ether	NA	Lab	ug/l		200 RAA10 (1)			3.8	< 1.0	< 1.0
Hexachlorobutadiene	NA	Lab	ug/l		1 HRL93			< 0.50	< 0.50	< 0.50

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

								KRAEMER QUARRY					
								Monitoring Well Group			SEEP 01	DISCHARGE 01	
								Location			5/29/2019	5/29/2019	
								MN Unique ID#				N	N
Date			N	5/29/2019									
Sample Type				N	N	FR							
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria							
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness						
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012						
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade						
Methyl ethyl ketone (2-butanone)	NA	Lab	ug/l		4000 HRL94			< 10	< 10	< 10			
Methyl isobutyl ketone (MIBK)	NA	Lab	ug/l		300 HRL94			< 5.0	< 5.0	< 5.0			
Methyl tertiary butyl ether (MTBE)	NA	Lab	ug/l		60 RAA13 (1)			< 2.0	< 2.0	< 2.0			
Methylene chloride	NA	Lab	ug/l	5	5 HRLMCL	46	27749 (1)	< 1.0	< 1.0	< 1.0			
Naphthalene	NA	Lab	ug/l		70 HRL13	81	818	< 1.0	< 1.0	< 1.0			
Propylbenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0			
Styrene	NA	Lab	ug/l	100				< 1.0	< 1.0	< 1.0			
Tetrachloroethylene	NA	Lab	ug/l	5 (9)	4 HBV14 (1)	3.8	857	< 1.0	< 1.0	< 1.0			
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			< 10	< 10	< 10			
Toluene	NA	Lab	ug/l	1000	200 HRL11	253	2703	< 1.0	< 1.0	< 1.0			
Trichloroethylene (TCE)	NA	Lab	ug/l	5 (9)	0.4 HRL15 (1)	25	13976	< 0.10	< 0.10	< 0.10			
Trichlorofluoromethane (Freon-11)	NA	Lab	ug/l		2000 HRL93			< 1.0	< 1.0	< 1.0			
Trichlorotrifluoroethane (Freon 113)	NA	Lab	ug/l		200000 HRL93			< 1.0	< 1.0	< 1.0			
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	0.18	(1)	< 0.050	< 0.050	< 0.050			
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			< 1.0	< 1.0	< 1.0			
Xylene, o	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			< 1.0	< 1.0	< 1.0			
Xylene, total	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)	166	2814	ND	ND	ND			
Pesticides													
Acetochlor	NA	Lab	ug/l		20 HRL18 (1)	3.6	173	< 0.50	< 0.50	< 0.50			
Alachlor	NA	Lab	ug/l	2	9 HRL18 (1)	4.2	1600 (1)	< 0.50	< 0.50	< 0.50			
Atrazine	NA	Lab	ug/l	3	3 HRLMCL	3.4	645	< 0.50	< 0.50	< 0.50			
Chlorpyrifos	NA	Lab	ug/l		0.6 HBV13 (1)	0.041	0.17	< 0.50	< 0.50	< 0.50			
Cyanazine (bladex)	NA	Lab	ug/l		1 HRL18 (1)			< 0.20	< 0.20	< 0.20			
Deisopropyl atrazine	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50			
Desethylatrazine	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50			
Dimethenamid	NA	Lab	ug/l		300 HRL15 (1)			< 0.50	< 0.50	< 0.50			
EPTC	NA	Lab	ug/l		40 HRL18 (1)			< 0.50	< 0.50	< 0.50			
Ethalfuralin	NA	Lab	ug/l					< 0.50 *	< 0.50 *	< 0.50 *			
Fonofos (dyphonate)	NA	Lab	ug/l					< 0.50 *	< 0.50 *	< 0.50 *			
Metolachlor	NA	Lab	ug/l		300 HBV18 (1)	23	543	< 0.50	< 0.50	< 0.50			
Metribuzin	NA	Lab	ug/l		10 HRL13 (1)			< 0.50	< 0.50	< 0.50			
Pendimethalin	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50			
Phorate	NA	Lab	ug/l					< 0.30	< 0.30	< 0.30			
Prometon	NA	Lab	ug/l		100 HRL93			< 0.50	< 0.50	< 0.50			
Propachlor	NA	Lab	ug/l		90 HRL93			< 0.50 *	< 0.50 *	< 0.50 *			
Propazine	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50			
Simazine	NA	Lab	ug/l	4	4 HRLMCL			< 0.50	< 0.50	< 0.50			
Terbufos	NA	Lab	ug/l					< 0.20	< 0.20	< 0.20			
Triallate	NA	Lab	ug/l					< 0.50 *	< 0.50 *	< 0.50 *			
Trifluralin	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50			

ANALYTICAL DATA SUMMARY - WATER (Phase B)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

								KRAEMER QUARRY					
								Monitoring Well Group			SEEP 01	DISCHARGE 01	
								Location			5/29/2019	5/29/2019	
								MN Unique ID#			N	N	FR
								Date					
								Sample Type					
				Drinking Water Criteria		Surface Water Criteria							
Parameter	Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness						
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012						
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade						
Polychlorinated Biphenyls													
Aroclor 1016	NA	Lab	ug/l					< 0.098	< 0.098	< 0.098			
Aroclor 1221	NA	Lab	ug/l					< 0.098	< 0.098	< 0.098			
Aroclor 1232	NA	Lab	ug/l					< 0.098	< 0.098	< 0.098			
Aroclor 1242	NA	Lab	ug/l					< 0.098	< 0.098	< 0.098			
Aroclor 1248	NA	Lab	ug/l					< 0.098	< 0.098	< 0.098			
Aroclor 1254	NA	Lab	ug/l					< 0.098	< 0.098	< 0.098			
Aroclor 1260	NA	Lab	ug/l					< 0.098	< 0.098	< 0.098			
Aroclor 1262	NA	Lab	ug/l					< 0.098	< 0.098	< 0.098			
Aroclor 1268	NA	Lab	ug/l					< 0.098	< 0.098	< 0.098			
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	<i>0.04 HRL94</i>			ND	ND	ND			
Herbicides													
2,4,5-TP (Silvex)	NA	Lab	ug/l	50	50 HRLMCL			< 0.50	< 0.50	< 0.50			
2,4,5-Trichlorophenoxyacetic acid	NA	Lab	ug/l		70 HRL93			< 0.50	< 0.50	< 0.50			
2,4-D	NA	Lab	ug/l	70	30 HRL18 (1)			< 0.50	< 0.50	< 0.50			
2,4-DB	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50			
Bentazone	NA	Lab	ug/l		30 HRL15 (1)			< 0.50 *	< 0.50 *	< 0.50 *			
Dicamba	NA	Lab	ug/l		200 HRL93			< 0.50	< 0.50	< 0.50			
MCPA	NA	Lab	ug/l		3 HRL93			< 0.30	< 0.30	< 0.30			
Picloram	NA	Lab	ug/l	500	500 HRL93			< 0.50	< 0.50	< 0.50			
Triclopyr	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50			
Radiochemical Parameters													
Gross Alpha (radiation)	NA	Lab	pCi/l	15				< 2.06	4.98 +/- 1.75	< 7.98			
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				10.4 +/- 2.56	4.08 +/- 1.78	< 8.83			
Per- and Polyfluoroalkyl Substances													
Perfluorobutanesulfonate	NA	Lab	ug/l					0.0060 j	0.0060 j	< 0.050			
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l		<i>7 HRL18 (1)</i>			0.25	0.080	0.079			
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		<i>0.047 HBV19</i>			0.022 j	0.0040 j	< 0.025			
Perfluorohexanoic acid (PFHxA)	NA	Lab	ug/l					0.051	0.018 j	0.019 j			
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		<i>0.015 HBV19</i>			<i>0.037</i>	<i>0.034</i>	<i>0.029</i>			
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		<i>0.035 HRL18 (1)</i>			0.25	0.066	0.059			
Perfluoropentanoic acid (PFPeA)	NA	Lab	ug/l					0.035 j	0.013 j	0.012 j			

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Not analyzed or did not exceed criteria.
N	Sample Type: Normal
FR	Sample Type: Field Replicate
NA	NA (not applicable) indicates that a fractional portion of the sample is not part of the analytical testing or field collection procedures.
ND	Not detected.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
b	Potential false positive value based on blank data validation procedures. Concentrations identified as potential false positive are excluded from calculations.
h	EPA recommended sample preservation, extraction or analysis holding time was exceeded.
j	Estimated detected value. The reported value is less than the stated laboratory quantitation limit but greater than the laboratory method detection limit.

EPA Maximum Contaminant Levels

(1)	1998 Final Rule for Disinfectants and Disinfection By-products: The total for trihalomethanes (THM) is 0.08 mg/l.
(5)	The value for m-dichlorobenzene are based on data for o-dichlorobenzene.
(7)	1,2-dibromoethane.
(9)	Under review.
(14)	Based on the criteria for chromium, total.
(15)	Based on the criteria for xylenes, total.
(19)	At no time can turbidity go above 5 NTU.
TT(12)	Copper action level 1.3 mg/l; lead action level 0.015 mg/l.
(+)	This MCL is no longer an official regulatory level, but is still in use as a trigger for EPA. The actual MCL for Beta is 4 mrem/year but there is no simple conversion between a curie and a rem.

MDH Human Health-Based Water Guidance Table

CR	Value represents the criteria for Chromium, hexavalent.
DCP	Value shown is 1,3-dichloropropene in the MDH criterion, however, the laboratory reports cis and trans isomers individually.
(1)	Value is representative of the lowest exposure duration published in the Minnesota Department of Health Human Health Advisory Table.
(2)	Representing the criteria for cyanide, free.
HBV13	Health Based Value 2013.
HBV14	Health Based Value 2014.
HBV17	Health Based Value 2017.
HBV18	Health Based Value 2018.
HBV19	Health Based Value 2019.
HRL09	Health Risk Limit 2009.
HRL11	Health Risk Limit 2011.
HRL13	Health Risk Limit 2013.
HRL15	Health Risk Limit 2015.
HRL15	Health Risk Limit 2015.
HRL18	Health Risk Limit 2018.
HRL93	Health Risk Limit 1993.
HRL94	Health Risk Limit 1994.
HRLMCL	Health Risk Limit., Maximum Contaminant Level.
MP	Laboratory reports 3-methylphenol and 4-methylphenol as co-eluting compounds. The criteria in the table represents 4-methylphenol which is the more stringent criteria.
RAA09	Not Detected., Risk Assessment Advice 2009.
RAA10	Risk Assessment Advice 2010.
RAA13	Risk Assessment Advice 2013.
RAA16	Risk Assessment Advice 2016.
RAA17	Risk Assessment Advice 2008.
RAA19	Risk Assessment Advice 2019.
XYL	Value shown is for the sum of the mixed o,m and p Xylene isomers.

Data Footnotes and Qualifiers

Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness*

(3)	Value represents the criteria for Ammonia, unionized as N.
(5)	Value based on the criteria for cyanide, free.
(6)	5.0 mg/l as a daily minimum. This dissolved oxygen standard may be modified on a site-specific basis according to part 7050.0220, subpart 7, except that no site-specific standard shall be less than 5 mg/l as a daily average and 4 mg/l as a daily minimum. Compliance with this standard is required 50 percent of the days at which the flow of the receiving water is equal to the 7Q10.
(7)	5 degree F above natural in streams and 3 degrees above natural in lakes, based on monthly average of the maximum daily temperatures, except in no case shall it exceed the daily average temperature of 86 degrees F.
(8)	pH Dependent. Based on a pH value of 7.0.
CF	Conversion Factor.
CR6	Value represents the criteria for Hexavalent Chromium.
HD	Hardness Dependent.

* Estimated concentrations based on same underlying assumptions of conservative transport mechanisms and same source area. Minnesota River hardness data from MPCA, 2006. Working Draft, Surface Water Pathway Evaluation user's Guide, Appendix E.

Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness*

(1)	Subpart 7, item E applies.
(5)	Value based on the criteria for cyanide, free.
(8)	pH Dependent. Based on a pH value of 7.0.
CF	Conversion Factor.
CR6	Value represents the criteria for Hexavalent Chromium.
HD	Hardness Dependent.

* Estimated concentrations based on same underlying assumptions of conservative transport mechanisms and same source area. Minnesota River hardness data from MPCA, 2006. Working Draft, Surface Water Pathway Evaluation user's Guide, Appendix E.

ANALYTICAL DATA SUMMARY - WATER (Phase A)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Parameter	Total or Dissolved	Analysis Location	Units	Location Date	Sample Type	LANDFILL										DUMP					
						FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-07	FL-TT-08		TS-SB-02	TS-SB-05	TS-SB-07	TS-SB-08	FD-SB-A2	FD-SB-A3	FD-SB-A3	FD-SB-A4	FD-SB-A5
						4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018		4/12/2018	4/13/2018	4/13/2018	4/13/2018	3/28/2018	3/26/2018	3/29/2018	3/26/2018	3/21/2018
						N	N	N	N	N	N	FD	N	N	N	N	N				
						Drinking Water Criteria			Surface Water Criteria												
						EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness												
Effective Date						04/01/2012	08/05/2019	01/24/2012	01/24/2012												
Exceedance Key						Bold	<i>Italic</i>	<u>Underline</u>	Shade												
General Parameters																					
Biochemical Oxygen Demand (5-day)	NA	Lab	mg/l																		
Bromate	NA	Lab	ug/l	10																	
Chloride	NA	Lab	mg/l					<u>230</u>	1720												
Chlorine dioxide	NA	Lab	mg/l	0.8 (11)																	
Chlorite	NA	Lab	ug/l	1000																	
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	<u>5.2 (5)</u>		<u>45 (5)</u>													
Cyanide, free	NA	Lab	ug/l	200	100 HRL93	5.2		45													
Fluoride	NA	Lab	mg/l	4																	
Hardness, as CaCO3	NA	Lab	ug/l																		
Nitrogen, ammonia, as N	NA	Lab	mg/l					<u>0.04 (3)</u>													
Nitrogen, nitrate + nitrite, as N	NA	Lab	mg/l	10																	
Nitrogen, nitrate, as N	NA	Lab	mg/l	10	10 HRLMCL																
Nitrogen, nitrite, as N	NA	Lab	mg/l	1																	
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l			<u>0.04</u>															
Oil and Grease	NA	Lab	mg/l			<u>0.5</u>		10													
pH	NA	Lab	pH units			<u>6.5 - 9.0</u>															
Phosphorus, total, as P	NA	Lab	mg/l			<u>(4)</u>		<u>(4)</u>													
Solids, total suspended	NA	Lab	mg/l			<u>(4)</u>		<u>(4)</u>													
Turbidity	NA	Lab	NTU	5 (19)		<u>25</u>															
pH	NA	Field	pH units			<u>6.5 - 9.0</u>															
Temperature	NA	Field	deg C			<u>(7)</u>															
Metals																					
Aluminum	Dissolved	Lab	ug/l			<u>125</u>		<u>2145</u>													
Antimony	Dissolved	Lab	ug/l	6	6 HRL93	5.5		180													
Arsenic	Dissolved	Lab	ug/l	10		<u>2.0</u>		<u>720</u>													
Barium	Dissolved	Lab	ug/l	2000	2000 HRL93																
Beryllium	Dissolved	Lab	ug/l	4	0.08 HRL93																
Boron	Dissolved	Lab	ug/l		500 RAA17																
Cadmium	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)	<u>2.8 HD CF</u>		<u>268 HD CF</u>													
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93	<u>11 CF CR6</u>		<u>31 CF CR6</u>													
Cobalt	Dissolved	Lab	ug/l			<u>2.8</u>		<u>872</u>													
Copper	Dissolved	Lab	ug/l	1300 TT(12)		<u>21 HD CF</u>		<u>114 HD CF</u>													
Lead	Dissolved	Lab	ug/l	15 TT(12)		<u>13 HD CF</u>		<u>661 HD CF</u>													
Manganese	Dissolved	Lab	ug/l		100 HBV18																
Mercury	Dissolved	Lab	ug/l	2		<u>0.0069 CF</u>		<u>4.2 CF</u>													
Nickel	Dissolved	Lab	ug/l		100 HRL93	<u>296 HD CF</u>		<u>8366 HD CF</u>													
Selenium	Dissolved	Lab	ug/l	50	30 HRL93	<u>5.0</u>		<u>40</u>													
Silver	Dissolved	Lab	ug/l		30 HRL93	<u>0.85 CF</u>		<u>31 HD CF</u>													
Thallium	Dissolved	Lab	ug/l	2	0.6 HRL94	<u>0.28</u>		<u>128</u>													
Tin	Dissolved	Lab	ug/l		4000 HRL94																
Uranium	Dissolved	Lab	ug/l	30																	
Vanadium	Dissolved	Lab	ug/l		50 HRL94																
Zinc	Dissolved	Lab	ug/l		2000 HRL94	<u>309 HD CF</u>		<u>678 HD CF</u>													
Chromium	Total	Lab	ug/l	100	100 CR HRL93	<u>11 CR6</u>		<u>32 CR6</u>													
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	0.1 HRL93	0.011		0.032													
Chromium, trivalent	Total	Lab	mg/l	0.1 (14)	20 HRL94	0.508 HD		3.130 HD													
Semivolatile Organic Compounds																					
1,2,4-Trichlorobenzene	NA	Lab	ug/l	70	4 HRL13 (1)																
1,2-Dichlorobenzene	NA	Lab	ug/l	600	600 HRL93																
1,2-Diphenylhydrazine	NA	Lab	ug/l																		
1,3-Dichlorobenzene	NA	Lab	ug/l	600 (5)																	
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94																
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)																
1-Methylnaphthalene	NA	Lab	ug/l																		
2,2'-oxybis (1-chloropropane)	NA	Lab	ug/l																		
2,4,5-Trichlorophenol	NA	Lab	ug/l																		
2,4,6-Trichlorophenol	NA	Lab	ug/l		30 HRL93	<u>2.0</u>		<u>203</u>													
2,4-Dichlorophenol	NA	Lab	ug/l		20 HRL93																
2,4-Dimethylphenol	NA	Lab	ug/l		100 HRL93																
2,4-Dinitrophenol	NA	Lab	ug/l		10 HRL94																
2,4-Dinitrotoluene	NA	Lab	ug/l																		
2,6-Dinitrotoluene	NA	Lab	ug/l																		

ANALYTICAL DATA SUMMARY - WATER (Phase A)

Focused Remedial Investigation Report
Freeway Landfill and Dump
Burnsville, Minnesota

				LANDFILL													DUMP									
				Location	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-07	FL-TT-08		TS-SB-02	TS-SB-05	TS-SB-07	TS-SB-08	FD-SB-A2	FD-SB-A3	FD-SB-A3	FD-SB-A4	FD-SB-A5						
				Date	4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018		4/12/2018	4/13/2018	4/13/2018	4/13/2018	3/28/2018	3/26/2018	3/29/2018	3/26/2018	3/21/2018						
				Sample Type	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N						
		Drinking Water Criteria			Surface Water Criteria																					
		EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness																					
Parameter	Total or Dissolved	Analysis Location	Units	04/01/2012	08/05/2019	01/24/2012	01/24/2012																			
Effective Date				Bold	<i>Italic</i>	<u>Underline</u>	Shade																			
Exceedance Key																										
2-Chloronaphthalene	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Chlorophenol	NA	Lab	ug/l		30 HRL93			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
2-Methyl-4,6-dinitrophenol	NA	Lab	ug/l					< 10.3	< 11.4 *	< 10.2 *	< 10.3 *	< 10.3 *	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Methylnaphthalene	NA	Lab	ug/l		8 RAA13			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
2-Methylphenol (o-cresol)	NA	Lab	ug/l		30 HRL93			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
2-Nitroaniline	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Nitrophenol	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
3,3'-Dichlorobenzidine	NA	Lab	ug/l		0.8 HRL93			< 51.5	< 56.8	< 50.8	< 51.5	< 51.3	< 256	< 51.0	--	< 52.1	< 52.6	< 52.1	--	--	< 58.1	--	--	< 52.1	--	
3,4-Methylphenol (m.p cresols)	NA	Lab	ug/l		3 MP HRL94			< 20.6	< 22.7	< 20.3	< 20.6	< 20.5	< 103	< 20.4	--	232	< 21.1	< 20.8	--	--	< 23.3	--	--	< 20.8	--	
3-Nitroaniline	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Bromophenyl phenyl ether	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
4-Chloro-3-methylphenol	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chloroaniline	NA	Lab	ug/l					< 51.5	< 56.8	< 50.8	< 51.5	< 51.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Chlorophenyl phenyl ether	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Nitroaniline	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
4-Nitrophenol	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Acenaphthene	NA	Lab	ug/l		100 HRL18 (1)	20	112	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Acenaphthylene	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aldicarb	NA	Lab	ug/l	3 (3)	1 HRL93			< 2.0	< 2.0	--	< 2.0	--	--	--	--	--	< 2.0	--	--	--	--	--	--	--	--	--
Anthracene	NA	Lab	ug/l		600 RAA19 (1)	0.035	0.63	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Benz(a)anthracene	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	NA	Lab	ug/l	0.2	0.1 HBV18 (1)			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Benzo(b)fluoranthene	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzoic acid	NA	Lab	ug/l		30000 HRL93			--	--	--	--	--	< 256	< 51.0	--	< 521	< 52.6	< 52.1	--	--	< 58.1	--	--	< 52.1	--	
Bis(2-chloroethoxy)methane	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bis(2-chloroethyl)ether	NA	Lab	ug/l		0.3 HRL93			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Bis(2-ethylhexyl)phthalate	NA	Lab	ug/l	6	7 HRL15 (1)	1.9	(1)	13.8	< 11.4	< 10.2	264	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Butyl benzyl phthalate	NA	Lab	ug/l		100 HRL15			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Carbazole	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Carbofuran	NA	Lab	ug/l	40				< 2.0	< 2.0	--	< 2.0	--	--	--	--	--	< 2.0	--	--	--	--	--	--	--	--	--
Chrysene	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzofuran	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Diethyl phthalate	NA	Lab	ug/l		6000 HRL93			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Dimethyl phthalate	NA	Lab	ug/l		70000 HRL94			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Di-n-butyl phthalate	NA	Lab	ug/l		20 HRL15			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Di-n-octyl phthalate	NA	Lab	ug/l			30	1650	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Ethylene glycol	NA	Lab	mg/l		2 HRL11 (1)			< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	--	--	--	--	< 5.0	--	--	--	--	--	--	< 5.0	--	
Fluoranthene	NA	Lab	ug/l		70 HRL18 (1)	1.9	6.9	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Fluorene	NA	Lab	ug/l		80 HBV19 (1)			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Glyphosate	NA	Lab	ug/l	700	500 HBV17 (1)			< 6.0	< 6.0	**	< 6.0	< 6.0	--	--	--	--	< 6.0	--	--	--	--	--	--	< 6.0	--	
Hexachlorobenzene	NA	Lab	ug/l	1	0.2 HRL93	0.00024		< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Hexachlorobutadiene	NA	Lab	ug/l		1 HRL93			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hexachlorocyclopentadiene	NA	Lab	ug/l	50				--	--	--	--	--	**	**	--	< 52.1	< 52.6	< 52.1	--	--	< 58.1	--	--	< 52.1	--	
Hexachloroethane	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Indeno(1,2,3-cd)pyrene	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Isophorone	NA	Lab	ug/l		100 HRL93			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	< 51.3	< 10.2	--	< 10.4	< 10.5	< 10.4	--	--	< 11.6	--	--	< 10.4	--	
Methyl alcohol	NA	Lab	mg/l		3 HRL94			< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	--	--	--	--	--	--	--	--	--	--	--	< 5.0	--	
Methyl alcohol	NA	Lab	ug/l		3000 HRL94			--	--	--	--	--	--	--	--	--	< 5000	--	--	--	--	--	--	--	--	--
Naphthalene	NA	Lab	ug/l		70 HRL13	81	818	< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrobenzene	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Nitrosodimethylamine	NA	Lab	ug/l		0.005 HBV17 (1)			< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Nitrosodi-n-propylamine	NA	Lab	ug/l					< 10.3	< 11.4	< 10.2	< 10.3	< 10.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--
n-Nitrosodiphenylamine	NA	Lab	ug/l																							

ANALYTICAL DATA SUMMARY - WATER (Phase A)

Focused Remedial Investigation Report

Freeway Landfill and Dump

Burnsville, Minnesota

Parameter	Total or Dissolved	Analysis Location	Units	Location				LANDFILL								DUMP								
				Drinking Water Criteria	Surface Water Criteria			FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-07	FL-TT-08		TS-SB-02	TS-SB-05	TS-SB-07	TS-SB-08	FD-SB-A2	FD-SB-A3	FD-SB-A3	FD-SB-A4	FD-SB-A5	
					EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness	Date	Date	Date	Date	Date	Date		Date	Date	Date	Date	Date	Date	Date	Date	Date
									4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018		4/12/2018	4/13/2018	4/13/2018	4/13/2018	3/28/2018	3/26/2018	3/29/2018	3/26/2018	3/21/2018
Sample Type	N	N	N	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N					
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012																	
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade																	
1,1-Dichloroethane	NA	Lab	ug/l		80 RAA16 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
1,1-Dichloroethylene	NA	Lab	ug/l	7	200 HRL11			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
1,1-Dichloropropene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
1,2,3-Trichlorobenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
1,2,3-Trichloropropane	NA	Lab	ug/l		0.003 HRL13 (1)			< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	--	< 1.0	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20				
1,2,4-Trichlorobenzene	NA	Lab	ug/l	70	4 HRL13 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	5.7	< 1.0	1.7	< 1.0	< 1.0				
1,2-Dibromo-3-chloropropane (DBCP)	NA	Lab	ug/l	0.2				< 0.010	< 0.0098	< 0.0098	< 0.010	< 0.010	< 1.0	--	< 5.0	< 1.0	< 1.0	< 0.0099	< 1.0	< 1.0				
1,2-Dibromoethane (EDB)	NA	Lab	ug/l	0.05 (7)	0.004 HRL93			< 0.010	< 0.0098	< 0.0098	< 0.010	< 0.010	< 0.50	--	< 2.5	< 0.50	< 0.50	< 0.0099	< 0.50	< 0.50				
1,2-Dichlorobenzene	NA	Lab	ug/l	600	600 HRL93			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
1,2-Dichloroethane	NA	Lab	ug/l	5	1 HRL13 (1)	3.8	90100 (1)	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	--	< 1.0	< 0.20	< 0.20	< 0.20	< 0.20	< 0.43				
1,2-Dichloroethylene, cis	NA	Lab	ug/l	70	6 HRL18 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	1.6	< 1.0	< 1.0	< 1.0	< 1.0				
1,2-Dichloroethylene, trans	NA	Lab	ug/l	100	40 HRL13 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
1,2-Dichloropropane	NA	Lab	ug/l	5	5 HRL94			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
1,3,5-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	1.6	< 1.0	< 1.0	< 1.0	< 1.0				
1,3-Dichlorobenzene	NA	Lab	ug/l	600 (5)				< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
1,3-Dichloropropane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
1,3-Dichloropropene, cis	NA	Lab	ug/l		2 DCP HRL94			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50				
1,3-Dichloropropene, trans	NA	Lab	ug/l		2 DCP HRL94			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50				
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94			1.4	1.6	< 1.0	1.9	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.2				
2,2-Dichloropropane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Acetone	NA	Lab	ug/l		3000 HBV17 (1)			< 20	< 20	< 20	< 20	< 20	26	--	< 100	< 20	< 20	< 20	77	25				
Acrylamide	NA	Lab	ug/l	TT(2)	0.2 HRL15 (1)			< 20.0	< 20.0	< 20.0	< 20.0	< 20.0	--	--	--	--	--	< 20.0	--	--				
Allyl chloride	NA	Lab	ug/l		30 HRL94			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	6.0	8974 (1)	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 2.5	1.4	< 0.50	3.0	1.9	9.8				
Bromobenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Bromochloromethane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Bromodichloromethane	NA	Lab	ug/l	80 (1)	3 HBV18 (1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Bromoform	NA	Lab	ug/l	80 (1)	40 HRL93	41	5800	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Bromomethane	NA	Lab	ug/l		10 HRL93			< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	--	< 10	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0				
Butylbenzene	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Butylbenzene, sec	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	1.2	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.2				
Butylbenzene, tert	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Carbon tetrachloride	NA	Lab	ug/l	5	1 HRL13 (1)	1.9	3500 (1)	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	--	< 1.0	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20				
Chlorobenzene	NA	Lab	ug/l	100	100 HRL93	20	846	1.6	< 1.0	1.5	1.8	3.5	< 1.0	--	< 5.0	< 1.0	< 1.0	1.3	< 1.0	1.7				
Chlorodibromomethane	NA	Lab	ug/l	80 (1)	10 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 2.5	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50				
Chloroethane	NA	Lab	ug/l		ND RAA09			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Chloroform	NA	Lab	ug/l	80 (1)	20 HRL18 (1)	53	2784	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Chloromethane	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Chlorotoluene, o	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Chlorotoluene, p	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Cumene (isopropyl benzene)	NA	Lab	ug/l		300 HRL93			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	4.5				
Cymene p- (toluene isopropyl p-)	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	2.2	< 1.0	8.0	< 1.0	1.2				
Dibromomethane (methylene bromide)	NA	Lab	ug/l					< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0				
Dichlorodifluoromethane (Freon-12)	NA	Lab	ug/l		700 HRL11			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	< 1.0	6.6				
Dichlorofluoromethane (Freon-21)	NA	Lab	ug/l		20 RAA17			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	< 1.0	< 1.0	< 1.0	2.1	< 1.0				
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	68	3717	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	2.2	< 1.0	3.2	< 1.0	< 1.0				
Ethyl ether	NA	Lab	ug/l		200 RAA10 (1)			5.1	< 1.0	< 1.0	< 1.0	2.1	< 1.0	--	< 5.0	8.6	8.0	10	53	4.4				
Formaldehyde	NA	Lab	ug/l		1000 HRL94			< 100	< 100 h	< 100 h	< 100 h	< 100 h	--	--	--	--	--	< 100 h	--	< 100 h				
Hexachlorobutadiene	NA	Lab	ug/l		1 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	< 2.5	< 0.50	< 0.50	< 0.50						

ANALYTICAL DATA SUMMARY - WATER (Phase A)

Focused Remedial Investigation Report
Freeway Landfill and Dump
Burnsville, Minnesota

Parameter	Total or Dissolved	Analysis Location	Units	Location Date				LANDFILL								DUMP							
				Sample Type		Sample Type		FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-07	FL-TT-08		TS-SB-02	TS-SB-05	TS-SB-07	TS-SB-08	FD-SB-A2	FD-SB-A3	FD-SB-A3	FD-SB-A4	FD-SB-A5
				Drinking Water Criteria		Surface Water Criteria		4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018		4/12/2018	4/13/2018	4/13/2018	4/13/2018	3/28/2018	3/26/2018	3/29/2018	3/26/2018	3/21/2018
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness	N	N	N	N	N	N	FD	N	N	N	N	N	N	N	N	N
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012																
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade																
Vinyl chloride	NA	Lab	ug/l	2	0.2 HRL18 (1)	0.18	(1)	0.10	0.080	< 0.050	< 0.050	< 0.050	< 0.050	--	< 0.25	< 0.050	< 0.050	< 0.050	0.68	< 0.050	--	< 0.050	0.37
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	5.0	< 1.0	2.1	< 1.0	1.2	--	< 1.0	5.0
Xylene, o	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	--	< 5.0	1.7	< 1.0	1.6	< 1.0	< 1.0	--	< 1.0	< 1.0
Haloacetic Acids																							
Dibromoacetic acid	NA	Lab	ug/l					< 1.0	< 1.0	--	< 1.0	--	--	--	--	--	--	< 1.0	--	--	--	--	< 1.0
Dichloroacetic acid	NA	Lab	ug/l	60 (4)				< 1.0	< 1.0	--	< 1.0	--	--	--	--	--	--	< 1.0	--	--	--	--	< 1.0
Haloacetic acids, total (HAA5)	NA	Lab	ug/l	60 (4)				5.0	< 1.0	--	< 1.0	--	--	--	--	--	--	< 1.0	--	--	--	--	< 1.0
Monobromoacetic acid	NA	Lab	ug/l					< 1.0	< 1.0	--	< 1.0	--	--	--	--	--	--	< 1.0	--	--	--	--	< 1.0
Monochloroacetic acid	NA	Lab	ug/l	60 (4)				5.0 *	< 1.0	--	< 1.0	--	--	--	--	--	--	< 1.0	--	--	--	--	< 1.0
Trichloroacetic acid	NA	Lab	ug/l	60 (4)				< 1.0	< 1.0	--	< 1.0	--	--	--	--	--	--	< 1.0	--	--	--	--	< 1.0
Pesticides																							
4,4'-DDD	NA	Lab	ug/l		1 HRL93			< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1	--	--	< 0.12	--	< 2.2
4,4'-DDE	NA	Lab	ug/l		1 HRL93			< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1	--	--	< 0.12	--	< 2.2
4,4'-DDT	NA	Lab	ug/l		1 HRL93	0.0017	1.1 (1)	< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1	--	--	< 0.12	--	< 2.2
a-BHC	NA	Lab	ug/l					< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53	--	--	< 0.058	--	< 1.1
Acetochlor	NA	Lab	ug/l		20 HRL18 (1)	3.6	173	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.47
Alachlor	NA	Lab	ug/l	2	9 HRL18 (1)	4.2	1600 (1)	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.48
Aldrin	NA	Lab	ug/l					< 0.51 *	< 0.29 *	< 0.26 *	< 0.26 *	< 0.053 *	< 0.26	< 0.26	--	--	--	< 0.53	--	--	< 0.058	--	< 1.1
Atrazine	NA	Lab	ug/l	3	3 HRLMCL	3.4	645	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.41
b-BHC	NA	Lab	ug/l					< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53	--	--	< 0.058	--	< 1.1
Chlordane, alpha & gamma	NA	Lab	ug/l	2		0.00029	2.4 (1)	< 5.1	< 2.9	< 2.6	< 2.6	< 0.53	< 2.6	< 2.6	--	--	--	< 5.3	--	--	< 0.58	--	< 10.8
Chlordane, cis (alpha)	NA	Lab	ug/l	2 (16)				< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53	--	--	< 0.058	--	< 1.1
Chlordane, trans (gamma)	NA	Lab	ug/l	2 (16)				< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53	--	--	< 0.058	--	< 1.1
Chlorpyrifos	NA	Lab	ug/l		0.6 HBV13 (1)	0.041	0.17	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.54
Cyanazine (bladex)	NA	Lab	ug/l		1 HRL18 (1)			< 0.40	< 0.20	< 0.20	< 0.20	< 0.20	--	--	--	--	--	< 0.20	--	--	--	--	< 0.91
d-BHC	NA	Lab	ug/l					< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53	--	--	< 0.058	--	< 1.1
Deisopropyl atrazine	NA	Lab	ug/l					< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.52
Desethylatrazine	NA	Lab	ug/l					< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.18
Dieldrin	NA	Lab	ug/l		0.006 HRL18 (1)	0.000026	2.5 (1)	< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1	--	--	< 0.12	--	< 2.2
Dimethenamid	NA	Lab	ug/l		300 HRL15 (1)			< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.23
Endosulfan I	NA	Lab	ug/l					< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53	--	--	< 0.058	--	< 1.1
Endosulfan II	NA	Lab	ug/l					< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1	--	--	< 0.12	--	< 2.2
Endosulfan sulfate	NA	Lab	ug/l					< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1	--	--	< 0.12	--	< 2.2
Endrin	NA	Lab	ug/l	2		0.016	0.18	< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1	--	--	< 0.12	--	< 2.2
Endrin aldehyde	NA	Lab	ug/l					< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1	--	--	< 0.12	--	< 2.2
Endrin ketone	NA	Lab	ug/l					< 1.0	< 0.57	< 0.51	< 0.52	< 0.11	< 0.52	< 0.52	--	--	--	< 1.1	--	--	< 0.12	--	< 2.2
EPTC	NA	Lab	ug/l		40 HRL18 (1)			< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.61
Ethalfuralin	NA	Lab	ug/l					< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 1.3
Fonofos (dyphonate)	NA	Lab	ug/l					< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.32
g-BHC (Lindane)	NA	Lab	ug/l	0.2 (8)		0.032	8.8 (1)	< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53	--	--	< 0.058	--	< 1.1
Heptachlor	NA	Lab	ug/l	0.4	0.08 HRL93	0.00039	0.52 (1)	< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53	--	--	< 0.058	--	< 1.1
Heptachlor epoxide	NA	Lab	ug/l	0.2	0.04 HRL93	0.00048	0.53 (1)	< 0.51	< 0.29	< 0.26	< 0.26	< 0.053	< 0.26	< 0.26	--	--	--	< 0.53	--	--	< 0.058	--	< 1.1
Methoxychlor	NA	Lab	ug/l	40				< 5.1	< 2.9	< 2.6	< 2.6	< 0.53	< 2.6	< 2.6	--	--	--	< 5.3	--	--	< 0.58	--	< 10.8
Metolachlor	NA	Lab	ug/l		300 HBV18 (1)	23	543	< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.28
Metribuzin	NA	Lab	ug/l		10 HRL13 (1)			< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.33
Pendimethalin	NA	Lab	ug/l					< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.38
Phorate	NA	Lab	ug/l					< 0.60	< 0.30	< 0.30	< 0.30	< 0.30	--	--	--	--	--	< 0.30	--	--	--	--	< 0.58
Prometon	NA	Lab	ug/l		100 HRL93			< 1.0 *	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.78
Propachlor	NA	Lab	ug/l		90 HRL93			< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.22
Propazine	NA	Lab	ug/l					< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.65
Simazine	NA	Lab	ug/l	4	4 HRLMCL			< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.47
Terbufos	NA	Lab	ug/l					< 0.40	< 0.20	< 0.20	< 0.20	< 0.20	--	--	--	--	--	< 0.20	--	--	--	--	< 0.32
Toxaphene	NA	Lab	ug/l	3	0.3 HRL93	0.0013	1.5	< 15.4	< 8.6	< 7.7	< 7.7	< 1.6	< 7.7	< 7.8	--	--	--	< 15.8	--	--	< 1.7	--	< 32.3
Triallate	NA	Lab	ug/l					< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.59
Trifluralin	NA	Lab	ug/l					< 1.0	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	< 0.50	--	--	--	--	< 0.16
Polychlorinated Biphenyls																							
Aroclor 1016	NA	Lab	ug/l					< 0.10 *	< 0.11 *	< 0.10 *	< 0.10 *	< 0.10 *	< 0.10	< 0.10	--	--	--	< 0.11	--	--	< 0.12	--	< 0.11
Aroclor 1221	NA	Lab	ug/l					< 0.10 *	< 0.11 *	< 0.10 *	< 0.10 *	< 0.10 *	< 0.10	< 0.10	--	--	--	< 0.11	--	--	< 0.12	--	< 0.11
Aroclor 1232	NA	Lab	ug/l					< 0.10 *	< 0.11 *	< 0.10 *	< 0.10 *	< 0.10 *	< 0.10	< 0.10	--	--	--	&					

ANALYTICAL DATA SUMMARY - WATER (Phase A)

Focused Remedial Investigation Report

Freeway Landfill and Dump

Burnsville, Minnesota

				LANDFILL												DUMP						
				Location Date	FL-TT-02	FL-TT-03	FL-TT-04	FL-TT-05	FL-TT-07	FL-TT-08		TS-SB-02	TS-SB-05	TS-SB-07	TS-SB-08	FD-SB-A2	FD-SB-A3	FD-SB-A3	FD-SB-A4	FD-SB-A5		
				Sample Type	4/18/2018	4/19/2018	4/19/2018	4/19/2018	4/19/2018	4/20/2018		4/12/2018	4/13/2018	4/13/2018	4/13/2018	3/28/2018	3/26/2018	3/29/2018	3/26/2018	3/21/2018		
					N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N		
				Drinking Water Criteria	Surface Water Criteria		Surface Water Criteria		Surface Water Criteria		Surface Water Criteria		Surface Water Criteria		Surface Water Criteria		Surface Water Criteria		Surface Water Criteria			
Parameter	Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness															
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012															
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade															
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	<i>0.04 HRL94</i>			31.5 a	2.18 a	1.47 a	3.99 a	ND a	1.1	1.6	--	--	--	--	ND	--	ND	
Herbicides																						
2,4,5-TP (Silvex)	NA	Lab	ug/l	50	50 HRLMCL			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	--	< 0.50	
2,4,5-Trichlorophenoxyacetic acid	NA	Lab	ug/l		70 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	--	< 0.50	
2,4-D	NA	Lab	ug/l	70	30 HRL18 (1)			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	--	< 0.50	
2,4-DB	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	--	< 0.50	
Bentazone	NA	Lab	ug/l		30 HRL15 (1)			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	--	< 0.50	
Dicamba	NA	Lab	ug/l		200 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	--	< 0.50	
Diquat	NA	Lab	ug/l	20				< 0.40	< 0.40	--	< 0.40	--	--	--	--	--	--	--	< 0.40	--	< 0.40 h	
Endothall	NA	Lab	ug/l	100				< 9.0	< 9.0 *	--	< 9.0 *	--	--	--	--	--	--	--	< 9.0	--	--	
MCPA	NA	Lab	ug/l		3 HRL93			< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	--	--	--	--	--	--	< 0.30	--	< 0.30	
Paraquat	NA	Lab	ug/l					< 0.40	< 0.40	--	< 0.40	--	--	--	--	--	--	--	< 0.40	--	--	
Picloram	NA	Lab	ug/l	500	500 HRL93			< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	--	< 0.50	
Triclopyr	NA	Lab	ug/l					< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	--	--	--	--	--	--	< 0.50	--	< 0.50	
Chlorinated Dioxins / Furans																						
2,3,7,8-Dioxin, tetra (TCDD)	NA	Lab	pg/l	30				< 10	< 10	< 10	< 10	< 10	< 10	< 10	--	--	--	--	< 10	--	< 10	
Radiochemical Parameters																						
Gross Alpha (radiation)	NA	Lab	pCi/l	15				7.56 +/- 2.61	5.81 +/- 3.02	4.78 +/- 2.20	9.07 +/- 2.50	< 2.63	--	--	--	--	--	--	< 15.4	--	< 14.7	
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				9.79 +/- 3.19	9.38 +/- 3.53	7.32 +/- 1.94	8.72 +/- 1.93	7.15 +/- 2.03	--	--	--	--	--	--	98.0 +/- 19.5	--	142 +/- 26.9	
Radium 226	NA	Lab	pCi/l	5 (13)				< 0.531	< 0.950	< 0.753	< 0.826	< 0.743	--	--	--	--	--	--	< 0.779	--	--	
Radium 228	NA	Lab	pCi/l	5 (13)				< 1.64	< 1.11	< 1.08	< 0.789	< 0.706	--	--	--	--	--	--	0.991 +/- 0.456	--	--	
Radium, total	NA	Lab	pCi/l	5 (13)				< 2.17	< 2.06	< 1.83	< 1.62	< 1.45	--	--	--	--	--	--	< 1.54	--	--	
Per- and Polyfluoroalkyl Substances																						
Perfluorobutanesulfonate	NA	Lab	ug/l					< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	--	0.0090 j	0.011 j	0.020 j	0.039 j	--	0.053	0.033 j	0.023 j
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l		7 HRL18 (1)			0.021 j	0.018 j	0.025 j	0.018 j	0.031 j	0.070	--	0.14	0.38	0.27	1.6	--	0.36	1.4	0.50
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		0.047 HBV19			0.017 j	< 0.025	< 0.025	< 0.025	< 0.025	0.019 j	--	0.032	0.085	0.12	1.9	--	0.15	0.063	0.064
Perfluorohexanoic acid (PFHxA)	NA	Lab	ug/l					0.013 j	< 0.050	0.013 j	< 0.050	0.018 j	0.080	--	0.054	0.12	0.12	0.66	--	0.31	0.31	0.24
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		0.015 HBV19			0.051	0.022 j	0.14	0.12	0.048	0.14	--	0.042	0.30	0.50	0.33	--	0.48	0.19	0.17
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		0.035 HRL18 (1)			0.12	0.041	0.22	0.15	0.27	0.21	--	0.084	0.35	0.24	1.6	--	1.5	0.53	2.1
Perfluoropentanoic acid (PFPeA)	NA	Lab	ug/l					< 0.050	< 0.050	0.0090 j	< 0.050	0.011 j	0.070	--	0.058	0.12	0.076	0.24	--	0.17	0.25	0.096

ANALYTICAL DATA SUMMARY - WATER (Phase A)

Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Parameter	Total or Dissolved	Analysis Location	Units	Sample Type	DUMP															
					Drinking Water Criteria		Surface Water Criteria		FD-SB-B3	FD-SB-B4	FD-SB-B4	FD-SB-B4	FD-SB-B5	FD-SB-D4	FD-SB-D5	FD-SB-D5		FD-SB-E5	FD-TT-06	FD-TT-10
					EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness	3/28/2018	3/23/2018	3/26/2018	3/29/2018	3/21/2018	3/23/2018	3/21/2018	3/29/2018		3/22/2018	4/12/2018	4/17/2018
					NA	NA	NA	NA	N	N	N	N	N	N	N	N	N	N	N	N
Effective Date					04/01/2012	08/05/2019	01/24/2012	01/24/2012												
Exceedance Key					Bold	<i>Italic</i>	<u>Underline</u>	Shade												
General Parameters																				
Biochemical Oxygen Demand (5-day)	NA	Lab	mg/l						12.1 *	79.3	--	--	6.8 *	24.0	< 20.0 *	--	--	2.3	27.7	3.8 *
Bromate	NA	Lab	ug/l	10					--	--	--	--	--	--	< 10.0	< 10.0	< 5.0	< 10.0	< 10.0	< 10.0
Chloride	NA	Lab	mg/l												80.1	82.8	176	56.5 *	199	56.5 *
Chlorine dioxide	NA	Lab	mg/l	0.8 (11)					< 0.10 h	--	--	--	--	--	1.1 h	0.81 h	0.25 h	1.6 h	--	--
Chlorite	NA	Lab	ug/l	1000					< 500	--	--	--	--	--	< 50.0	< 50.0	< 25.0	< 50.0	< 50.0	< 50.0
Cyanide	NA	Lab	ug/l	200	100 HRL93 (2)	5.2 (5)	45 (5)		26.8	--	11.0		12.4	26.0	20.6	--	--	13.2	< 10.0	13.4
Cyanide, free	NA	Lab	ug/l	200	100 HRL93	5.2	45		< 5.0	--	< 5.0		--	< 5.0	--	--	--	< 5.0	< 5.0	< 5.0
Fluoride	NA	Lab	mg/l	4					< 0.050	< 0.050	--	--	0.12	0.14	0.18	--	--	0.16	0.14 *	0.17
Hardness, as CaCO3	NA	Lab	ug/l						1280000	1100000	--	--	1010000	1030000	1060000	--	--	717000	477000	1450000
Nitrogen, ammonia, as N	NA	Lab	mg/l						32.8 *	32.4	--	--	8.1	99.2	15.5	--	--	2.0 *	5.4	0.11
Nitrogen, nitrate + nitrite, as N	NA	Lab	mg/l	10					0.021	0.032	--	--	< 0.020	< 0.020	< 0.020	--	--	< 0.020	0.58	0.034
Nitrogen, nitrate, as N	NA	Lab	mg/l	10	10 HRLMCL				0.021	< 0.020	--	--	< 0.020	< 0.020	< 0.020	--	--	< 0.020	0.55	0.025
Nitrogen, nitrite, as N	NA	Lab	mg/l	1					< 0.020	0.027	--	--	< 0.020	< 0.020	< 0.020	--	--	< 0.020	0.032	< 0.020
Nitrogen, unionized ammonia, as N	NA	Lab	mg/l						0.052	--	--	--	--	0.15	--	--	--	--	< 0.010	< 0.010
Oil and Grease	NA	Lab	mg/l						< 5.4	--	--	--	< 5.4	< 5.7	< 5.4	--	--	< 5.6	< 4.8	< 4.9
pH	NA	Lab	pH units						6.9	6.7 h	--	--	6.7 h	6.6 h	6.8 h	--	--	7.0 h	6.8 h	7.1 h
Phosphorus, total, as P	NA	Lab	mg/l			(4)	(4)		0.53	6.1	--	--	0.11	0.29	0.40	6.1	--	< 0.050	0.19	0.24
Solids, total suspended	NA	Lab	mg/l			(4)	(4)		113	22200	--	--	111	220	60.0	--	--	10.0	230	397
Turbidity	NA	Lab	NTU	5 (19)			25		416	18400	--	--	200	309	302	--	--	5.0	315	388
pH	NA	Field	pH units				6.5 - 9.0		6.9	--	--	--	--	6.9	--	--	--	--	6.7	5.9
Temperature	NA	Field	deg C				(7)		11.0	--	--	--	--	10.0	--	--	--	--	6.5	3.6
Metals																				
Aluminum	Dissolved	Lab	ug/l				125	2145	< 200	< 200	--	--	< 200	< 200	< 200	--	--	< 200	1610	< 200
Antimony	Dissolved	Lab	ug/l	6	6 HRL93		5.5	180	< 0.50	1.7	--	--	< 0.50	< 0.50	1.7	--	--	< 0.50	1.3	2.1
Arsenic	Dissolved	Lab	ug/l	10			2.0	720	1.2	3.5	--	--	1.3	8.1	7.8	--	--	0.66	2.4	1.7
Barium	Dissolved	Lab	ug/l	2000	2000 HRL93				< 10.0	490	--	--	253	694	910	--	--	170	407	132
Beryllium	Dissolved	Lab	ug/l	4	0.08 HRL93				< 0.20	< 0.20	--	--	< 0.20	< 0.20	< 0.20	--	--	< 0.20	0.21	< 0.20
Boron	Dissolved	Lab	ug/l		500 RAA17				51900	15200	--	--	10700	19500	15600	--	--	1690 *	6600	7030
Cadmium	Dissolved	Lab	ug/l	5	0.5 HRL15 (1)		2.8 HD CF	268 HD CF	< 0.080	< 0.080	--	--	< 0.080	< 0.080	< 0.080	--	--	< 0.080	0.65	0.93
Chromium	Dissolved	Lab	ug/l	100	100 CR HRL93		11 CF CR6	31 CF CR6	3.2	3.2	--	--	2.5	4.7	14.2	--	--	0.56	3.9	< 0.50
Cobalt	Dissolved	Lab	ug/l				2.8	872	0.96	0.96	--	--	0.71	2.3	1.5	--	--	< 0.50	4.6	4.1
Copper	Dissolved	Lab	ug/l	1300 TT(12)			21 HD CF	114 HD CF	< 10.0	< 10.0	--	--	< 10.0	< 10.0	< 10.0	--	--	< 10.0	54.1	26.6
Lead	Dissolved	Lab	ug/l	15 TT(12)			13 HD CF	661 HD CF	1.6	0.42	--	--	< 0.10	< 0.10	64.8	--	--	< 0.10	21.5	0.67
Manganese	Dissolved	Lab	ug/l		100 HBV18				< 5.0	1300	--	--	361	351	801	--	--	719	738	496
Mercury	Dissolved	Lab	ug/l	2			0.0069 CF	4.2 CF	< 0.20	< 0.20	--	--	< 0.20	< 0.20	< 0.20	--	--	< 0.20	0.26	< 0.20
Nickel	Dissolved	Lab	ug/l		100 HRL93		296 HD CF	8366 HD CF	< 20.0	< 20.0	--	--	< 20.0	< 20.0	< 20.0	--	--	< 20.0	27.4	159
Selenium	Dissolved	Lab	ug/l	50	30 HRL93		5.0	40	0.79	< 0.50	--	--	< 0.50	0.81	< 0.50	--	--	< 0.50	2.6	44.0
Silver	Dissolved	Lab	ug/l		30 HRL93		0.85 CF	31 HD CF	< 10.0	< 10.0	--	--	< 10.0	< 10.0	< 10.0	--	--	< 10.0	< 10.0	< 10.0
Thallium	Dissolved	Lab	ug/l	2	0.6 HRL94		0.28	128	< 0.10	< 0.10	--	--	< 0.10	< 0.10	< 0.10	--	--	< 0.10	0.61	0.57
Tin	Dissolved	Lab	ug/l		4000 HRL94				< 75.0	< 75.0	--	--	< 75.0	< 75.0	< 75.0	--	--	< 75.0	< 75.0	< 75.0
Uranium	Dissolved	Lab	ug/l	30					< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	3.3	2.0	16.5
Vanadium	Dissolved	Lab	ug/l		50 HRL94				1.3	< 1.0	--	--	< 1.0	1.7	< 1.0	--	--	1.7	4.4	3.7
Zinc	Dissolved	Lab	ug/l		2000 HRL94		309 HD CF	678 HD CF	< 20.0	< 20.0	--	--	< 20.0	< 20.0	53.6	--	--	< 20.0	212	509
Chromium	Total	Lab	ug/l	100	100 CR HRL93		11 CR6	32 CR6	10.4	20.0	--	--	6.0	--	--	--	--	--	14.6	22.7
Chromium, hexavalent	Total	Lab	mg/l	0.1 (14)	0.1 HRL93		0.011	0.032	**	**	--	--	< 0.010	< 0.010	**	--	--	**	**	< 0.010 *
Chromium, trivalent	Total	Lab	mg/l	0.1 (14)	20 HRL94		0.508 HD	3.130 HD	< 0.010	< 0.010	--	--	--	< 0.010	--	--	--	--	< 0.010	0.023
Semivolatile Organic Compounds																				
1,2,4-Trichlorobenzene	NA	Lab	ug/l	70	4 HRL13 (1)				--	--	--	--	--	--	--	--	--	--	--	< 10.2
1,2-Dichlorobenzene	NA	Lab	ug/l	600	600 HRL93				--	--	--	--	--	--	--	--	--	--	--	< 10.2
1,2-Diphenylhydrazine	NA	Lab	ug/l						--	--	--	--	--	--	--	--	--	--	--	< 10.2
1,3-Dichlorobenzene	NA	Lab	ug/l	600 (5)					--	--	--	--	--	--	--	--	--	--	--	< 10.2
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94				--	--	--	--	--	--	--	--	--	--	--	< 10.2
1,4-Dioxane	NA	Lab	ug/l		1 HRL13 (1)				79	87	--	--	10	22	11	--	--	8.0	8.4	< 0.049
1-Methylnaphthalene	NA	Lab	ug/l						--	--	--	--	--	--	--	--	--	--	--	< 10.2
2,2'-oxybis (1-chloropropane)	NA	Lab	ug/l						--	--	--	--	--	--	--	--	--	--	--	< 10.2
2,4,5-Trichlorophenol	NA	Lab	ug/l						--	--	--	--	--	--	--	--	--	--	--	< 10.2
2,4,6-Trichlorophenol	NA	Lab	ug/l		30 HRL93		2.0	203	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
2,4-Dichlorophenol	NA	Lab	ug/l		20 HRL93				< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
2,4-Dimethylphenol	NA	Lab	ug/l		100 HRL93				< 256	--	< 529	< 53.8	< 53.2	< 53.8	< 51.5	--	--	< 56.2	< 51.8	< 51.0
2,4-Dinitrophenol	NA	Lab	ug/l		10 HRL94				< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
2,4-Dinitrotoluene	NA	Lab	ug/l						--	--	--	--	--	--	--	--	--	--	--	< 10.2
2,6-Dinitrotoluene	NA	Lab	ug/l						--	--	--	--	--	--	--	--	--	--	--	< 10.2

ANALYTICAL DATA SUMMARY - WATER (Phase A)

Focused Remedial Investigation Report
Freeway Landfill and Dump
Burnsville, Minnesota

				DUMP															
				Location		FD-SB-B3	FD-SB-B4	FD-SB-B4	FD-SB-B4	FD-SB-B5	FD-SB-D4	FD-SB-D5	FD-SB-D5		FD-SB-E5	FD-TT-06	FD-TT-10		
				Date		3/28/2018	3/23/2018	3/26/2018	3/29/2018	3/21/2018	3/23/2018	3/21/2018	3/29/2018		3/22/2018	4/12/2018	4/17/2018		
				Sample Type		N	N	N	N	N	N	N	N	FR	N	N	N		
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria													
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness												
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012												
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade												
2-Chloronaphthalene	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
2-Chlorophenol	NA	Lab	ug/l		30 HRL93			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
2-Methyl-4,6-dinitrophenol	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
2-Methylnaphthalene	NA	Lab	ug/l		8 RAA13			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
2-Methylphenol (o-cresol)	NA	Lab	ug/l		30 HRL93			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
2-Nitroaniline	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
2-Nitrophenol	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
3,3'-Dichlorobenzidine	NA	Lab	ug/l		0.8 HRL93			< 256	--	< 529	< 53.8	< 53.2	< 53.8	< 51.5	--	--	< 56.2	< 51.8	< 51.0
3,4-Methylphenol (m,p cresols)	NA	Lab	ug/l		<i>3 MP HRL94</i>			< 103	--	< 212	< 21.5	< 21.3	< 21.5	< 20.6	--	--	< 22.5	< 20.7	< 20.4
3-Nitroaniline	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
4-Bromophenyl phenyl ether	NA	Lab	ug/l					< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
4-Chloro-3-methylphenol	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
4-Chloroaniline	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 51.0		
4-Chlorophenyl phenyl ether	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
4-Nitroaniline	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
4-Nitrophenol	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
Acenaphthene	NA	Lab	ug/l		100 HRL18 (1)	20	112	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Acenaphthylene	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
Aldicarb	NA	Lab	ug/l	3 (3)	1 HRL93			< 2.0	--	--	--	--	--	< 2.0	< 2.0	--	< 2.0	< 2.0	
Anthracene	NA	Lab	ug/l		600 RAA19 (1)	0.035	0.63	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Benz(a)anthracene	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
Benzo(a)pyrene	NA	Lab	ug/l	0.2	0.1 HBV18 (1)			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Benzo(b)fluoranthene	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
Benzo(g,h,i)perylene	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
Benzo(k)fluoranthene	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
Benzoic acid	NA	Lab	ug/l		30000 HRL93			< 256	--	< 529	< 53.8	< 53.2	< 53.8 *	< 51.5	--	--	< 56.2	< 51.8	--
Bis(2-chloroethoxy)methane	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
Bis(2-chloroethyl)ether	NA	Lab	ug/l		0.3 HRL93			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Bis(2-ethylhexyl)phthalate	NA	Lab	ug/l	6	7 HRL 15 (1)	1.9	(1)	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Butyl benzyl phthalate	NA	Lab	ug/l		100 HRL15			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Carbazole	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
Carbofuran	NA	Lab	ug/l	40				< 2.0	--	--	--	--	--	< 2.0	< 2.0	--	< 2.0	< 2.0	
Chrysene	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
Dibenz(a,h)anthracene	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
Dibenzofuran	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
Diethyl phthalate	NA	Lab	ug/l		6000 HRL93			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Dimethyl phthalate	NA	Lab	ug/l		70000 HRL94			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Di-n-butyl phthalate	NA	Lab	ug/l		20 HRL15			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Di-n-octyl phthalate	NA	Lab	ug/l			30	1650	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Ethylene glycol	NA	Lab	mg/l		2 HRL11 (1)			< 5.0	--	--	--	--	--	< 5.0	< 5.0	--	< 5.0	< 5.0	
Fluoranthene	NA	Lab	ug/l		70 HRL18 (1)	1.9	6.9	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Fluorene	NA	Lab	ug/l		80 HBV19 (1)			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Glyphosate	NA	Lab	ug/l	700	500 HBV17 (1)			< 6.0	--	--	--	--	--	< 6.0	< 6.0	--	< 6.0 *	< 6.0	< 6.0
Hexachlorobenzene	NA	Lab	ug/l	1	0.2 HRL93	0.00024		< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Hexachlorobutadiene	NA	Lab	ug/l		1 HRL93			--	--	--	--	--	--	--	--	--	< 10.2		
Hexachlorocyclopentadiene	NA	Lab	ug/l	50				< 256	--	< 529	< 53.8	< 53.2	< 53.8	< 51.5	--	--	< 56.2	< 51.8	--
Hexachloroethane	NA	Lab	ug/l					< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Indeno(1,2,3-cd)pyrene	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
Isophorone	NA	Lab	ug/l		100 HRL93			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Methyl alcohol	NA	Lab	mg/l		3 HRL94			< 5.0	--	--	--	--	--	< 5.0	< 5.0	--	< 5.0	--	
Methyl alcohol	NA	Lab	ug/l		3000 HRL94			--	--	--	--	--	--	--	--	--	< 5000	< 5000	
Naphthalene	NA	Lab	ug/l		70 HRL13	81	818	--	--	--	--	--	--	--	--	--	< 10.2		
Nitrobenzene	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
n-Nitrosodimethylamine	NA	Lab	ug/l		0.005 HBV17 (1)			--	--	--	--	--	--	--	--	--	< 10.2		
n-Nitrosodi-n-propylamine	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	< 10.2		
n-Nitrosodiphenylamine	NA	Lab	ug/l		70 HRL93			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Oxamyl (vydate)	NA	Lab	ug/l	200				--	--	--	--	--	--	--	--	--	< 2.0	--	
Pentachlorophenol	NA	Lab	ug/l	1	0.3 HRL15 (1)	1.9 (8)	18 (8)	< 103	--	< 212	< 21.5	< 21.3	< 21.5	< 20.6	--	--	< 22.5	< 20.7	< 20.4
Phenanthrene	NA	Lab	ug/l			3.6	64	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Phenol	NA	Lab	ug/l		4000 HRL93	123	4428	< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Pyrene	NA	Lab	ug/l		50 HRL18 (1)			< 51.3	--	< 106	< 10.8	< 10.6	< 10.8	< 10.3	--	--	< 11.2	< 10.4	< 10.2
Volatile Organic Compounds																			
1,1,1,2-Tetrachloroethane	NA	Lab	ug/l		70 HRL93			< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	NA	Lab	ug/l	200	5000 HRL18 (1)	329	5913	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	NA	Lab	ug/l		2 HRL94	1.5	2253 (1)	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50
1,1,2-Trichloroethane	NA	Lab	ug/l	5	3 HRL93			< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50

ANALYTICAL DATA SUMMARY - WATER (Phase A)

Focused Remedial Investigation Report
Freeway Landfill and Dump
Burnsville, Minnesota

Parameter	Total or Dissolved	Analysis Location	Units	Location Date	Sample Type	DUMP													
						FD-SB-B3	FD-SB-B4	FD-SB-B4	FD-SB-B4	FD-SB-B5	FD-SB-D4	FD-SB-D5	FD-SB-D5		FD-SB-E5	FD-TT-06	FD-TT-10		
						3/28/2018	3/23/2018	3/26/2018	3/29/2018	3/21/2018	3/23/2018	3/21/2018	3/29/2018		3/22/2018	4/12/2018	4/17/2018		
				Drinking Water Criteria				Surface Water Criteria				N	N	N	N	N	N	N	
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness												
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012												
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade												
1,1-Dichloroethane	NA	Lab	ug/l		80 RAA16 (1)			< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,1-Dichloroethylene	NA	Lab	ug/l	7	200 HRL11			< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	NA	Lab	ug/l					< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,2,3-Trichlorobenzene	NA	Lab	ug/l					< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,2,3-Trichloropropane	NA	Lab	ug/l		0.003 HRL13 (1)			< 0.20	< 0.20	--	--	< 0.20	< 0.20	< 0.20	--	--	< 0.20	< 0.20	< 0.20
1,2,4-Trichlorobenzene	NA	Lab	ug/l	70	4 HRL13 (1)			< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			36	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane (DBCP)	NA	Lab	ug/l	0.2				< 0.010	< 1.0	--	--	< 1.0	< 1.0	< 1.0	< 0.0098	< 0.0098	< 1.0	< 0.010	< 0.0098
1,2-Dibromoethane (EDB)	NA	Lab	ug/l	0.05 (7)	0.004 HRL93			< 0.010	< 0.50	--	--	< 0.50	< 0.50	< 0.50	< 0.0098	< 0.0098	< 0.50	< 0.010	< 0.0098
1,2-Dichlorobenzene	NA	Lab	ug/l	600	600 HRL93			< 1.0	< 1.0	--	--	< 1.0	1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	NA	Lab	ug/l	5	1 HRL13 (1)	3.8	90100 (1)	12	< 0.20	--	--	< 0.20	< 0.20	< 0.20	--	--	< 0.20	< 0.20	< 0.20
1,2-Dichloroethylene, cis	NA	Lab	ug/l	70	6 HRL18 (1)			3.2	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,2-Dichloroethylene, trans	NA	Lab	ug/l	100	40 HRL13 (1)			< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,2-Dichloropropane	NA	Lab	ug/l	5	5 HRL94			< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	NA	Lab	ug/l		30 HBV19			11	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,3-Dichlorobenzene	NA	Lab	ug/l	600 (5)				< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	NA	Lab	ug/l					< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
1,3-Dichloropropene, cis	NA	Lab	ug/l		2 DCP HRL94			< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50
1,3-Dichloropropene, trans	NA	Lab	ug/l		2 DCP HRL94			< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50
1,4-Dichlorobenzene	NA	Lab	ug/l	75	10 HRL94			3.6	< 1.0	--	--	< 1.0	2.6	< 1.0	--	--	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	NA	Lab	ug/l					< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Acetone	NA	Lab	ug/l		3000 HBV17 (1)			49	< 20	--	--	< 20	< 20	< 20	--	--	< 20	< 20	< 20
Acrylamide	NA	Lab	ug/l	TT(2)	0.2 HRL15 (1)			< 20.0	--	--	--	--	--	841	< 20.0	--	< 20.0	< 20.0	< 20.0
Allyl chloride	NA	Lab	ug/l		30 HRL94			< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Benzene	NA	Lab	ug/l	5	2 HRL09 (1)	6.0	8974 (1)	30	7.6	--	--	1.6	10	< 0.50	--	--	0.53	2.7	< 0.50
Bromobenzene	NA	Lab	ug/l					< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Bromochloromethane	NA	Lab	ug/l					< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Bromodichloromethane	NA	Lab	ug/l	80 (1)	3 HBV18 (1)			< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Bromoform	NA	Lab	ug/l	80 (1)	40 HRL93	41	5800	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Bromomethane	NA	Lab	ug/l		10 HRL93			< 2.0	< 2.0	--	--	< 2.0	< 2.0	< 2.0	--	--	< 2.0	< 2.0	< 2.0
Butylbenzene	NA	Lab	ug/l					< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Butylbenzene, sec	NA	Lab	ug/l					1.7	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Butylbenzene, tert	NA	Lab	ug/l					< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Carbon tetrachloride	NA	Lab	ug/l	5	1 HRL13 (1)	1.9	3500 (1)	< 0.20	< 0.20	--	--	< 0.20	< 0.20	< 0.20	--	--	< 0.20	< 0.20	< 0.20
Chlorobenzene	NA	Lab	ug/l	100	100 HRL93	20	846	20	6.5	--	--	2.2	8.2	< 1.0	--	--	< 1.0	2.1	< 1.0
Chlorodibromomethane	NA	Lab	ug/l	80 (1)	10 HRL93			< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50
Chloroethane	NA	Lab	ug/l		ND RAA09			1.2	46	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	1.1	< 1.0
Chloroform	NA	Lab	ug/l	80 (1)	20 HRL18 (1)	53	2784	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Chloromethane	NA	Lab	ug/l					< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Chlorotoluene, o	NA	Lab	ug/l					< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Chlorotoluene, p	NA	Lab	ug/l					< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Cumene (isopropyl benzene)	NA	Lab	ug/l		300 HRL93			27	< 1.0	--	--	< 1.0	1.9	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Cymene p- (toluene isopropyl p-)	NA	Lab	ug/l					3.9	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Dibromomethane (methylene bromide)	NA	Lab	ug/l					< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Dichlorodifluoromethane (Freon-12)	NA	Lab	ug/l		700 HRL11			< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Dichlorofluoromethane (Freon-21)	NA	Lab	ug/l		20 RAA17			< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Ethyl benzene	NA	Lab	ug/l	700	40 HBV19 (1)	68	3717	1000	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Ethyl ether	NA	Lab	ug/l		200 RAA10 (1)			5.1	8.6	--	--	1.6	6.2	< 1.0	--	--	1.8	1.1	< 1.0
Formaldehyde	NA	Lab	ug/l		1000 HRL94			< 100	--	--	--	--	--	< 100 h	< 100 h	--	< 100 h	< 100 h*	< 100
Hexachlorobutadiene	NA	Lab	ug/l		1 HRL93			< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50	--	--	< 0.50	< 0.50	< 0.50
Methyl ethyl ketone (2-butanone)	NA	Lab	ug/l		4000 HRL94			42	< 10	--	--	< 10	< 10	< 10	--	--	< 10	< 10	< 10
Methyl isobutyl ketone (MIBK)	NA	Lab	ug/l		300 HRL94			140	< 5.0	--	--	< 5.0	< 5.0	< 5.0	--	--	< 5.0	< 5.0	< 5.0
Methyl tertiary butyl ether (MTBE)	NA	Lab	ug/l		60 RAA13 (1)			< 2.0	< 2.0	--	--	< 2.0	< 2.0	< 2.0	--	--	< 2.0	< 2.0	< 2.0
Methylene chloride	NA	Lab	ug/l	5	5 HRLMCL	46	27749 (1)	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Naphthalene	NA	Lab	ug/l		70 HRL13	81	818	5.5	< 1.0	--	--	< 1.0	< 1.0	6.4	--	--	2.1	< 1.0	< 1.0
Propylbenzene	NA	Lab	ug/l					13	< 1.0	--	--	< 1.0	1.1	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Styrene	NA	Lab	ug/l	100				< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0
Tetrachloroethylene	NA	Lab	ug/l	5 (9)	4 HBV14 (1)	3.8	857	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	1.2
Tetrahydrofuran	NA	Lab	ug/l		600 HRL18 (1)			4600	10	--	--	< 10	170	< 10	--	--	< 10	< 10	< 10
Toluene	NA	Lab	ug/l	1000	200 HRL11	253	2703	1100											

ANALYTICAL DATA SUMMARY - WATER (Phase A)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

								DUMP												
								FD-SB-B3	FD-SB-B4	FD-SB-B4	FD-SB-B4	FD-SB-B5	FD-SB-D4	FD-SB-D5	FD-SB-D5		FD-SB-E5	FD-TT-06	FD-TT-10	
								3/28/2018	3/23/2018	3/26/2018	3/29/2018	3/21/2018	3/23/2018	3/21/2018	3/29/2018		3/22/2018	4/12/2018	4/17/2018	
								N	N	N	N	N	N	N	N	N	FR	N	N	N
Parameter	Total or Dissolved	Analysis Location	Units	Drinking Water Criteria		Surface Water Criteria														
				EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness													
				Effective Date	Effective Date	Effective Date	Effective Date													
Exceedance Key				04/01/2012	08/05/2019	01/24/2012	01/24/2012													
				2	<i>0.2 HRL18 (1)</i>	<u>0.18</u>	(1)	0.45	< 0.050	--	--	0.090	0.050	< 0.050	--	--	< 0.050	0.10	< 0.050	
Vinyl chloride	NA	Lab	ug/l																	
Xylene, m & p	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			3300	< 1.0	--	--	< 1.0	1.4	< 1.0	--	--	< 1.0	< 1.0	< 1.0	
Xylene, o	NA	Lab	ug/l	10000 (15)	300 XYL HBV19(1)			870	< 1.0	--	--	< 1.0	< 1.0	< 1.0	--	--	< 1.0	< 1.0	< 1.0	
Haloacetic Acids																				
Dibromoacetic acid	NA	Lab	ug/l					< 1.0	--	--	--	--	--	--	--	--	< 1.0	< 1.0	< 1.0	
Dichloroacetic acid	NA	Lab	ug/l	60 (4)				< 1.0	--	--	--	--	--	--	--	--	< 1.0	< 1.0	< 1.0	
Haloacetic acids, total (HAA5)	NA	Lab	ug/l	60 (4)				< 1.0	--	--	--	--	--	--	--	--	< 1.0	< 1.0	< 1.0	
Monobromoacetic acid	NA	Lab	ug/l					< 1.0	--	--	--	--	--	--	--	--	< 1.0	< 1.0	< 1.0	
Monochloroacetic acid	NA	Lab	ug/l	60 (4)				< 1.0	--	--	--	--	--	--	--	--	< 1.0	< 1.0	< 1.0	
Trichloroacetic acid	NA	Lab	ug/l	60 (4)				< 1.0	--	--	--	--	--	--	--	--	< 1.0	< 1.0	< 1.0	
Pesticides																				
4,4'-DDD	NA	Lab	ug/l		1 HRL93			< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	< 0.11	< 0.21	< 2.1	
4,4'-DDE	NA	Lab	ug/l		1 HRL93			< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	< 0.11	< 0.21	< 2.1	
4,4'-DDT	NA	Lab	ug/l		1 HRL93	0.0017	1.1 (1)	< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	< 0.11	< 0.21	< 2.1	
a-BHC	NA	Lab	ug/l					< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	< 0.055	< 0.10	< 1.1	
Acetochlor	NA	Lab	ug/l		20 HRL18 (1)	3.6	173	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Alachlor	NA	Lab	ug/l	2	9 HRL18 (1)	4.2	1600 (1)	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Aldrin	NA	Lab	ug/l					< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	< 0.055	< 0.10	< 1.1 *	
Atrazine	NA	Lab	ug/l	3	3 HRLMCL	3.4	645	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
b-BHC	NA	Lab	ug/l					< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	< 0.055	< 0.10	< 1.1	
Chlordane, alpha & gamma	NA	Lab	ug/l	2		0.00029	2.4 (1)	< 0.53	--	--	--	< 5.6	< 5.4	< 0.53	--	--	< 0.55	< 1.0	< 10.6	
Chlordane, cis (alpha)	NA	Lab	ug/l	2 (16)				< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	< 0.055	< 0.10	< 1.1	
Chlordane, trans (gamma)	NA	Lab	ug/l	2 (16)				< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	< 0.055	< 0.10	< 1.1	
Chlorpyrifos	NA	Lab	ug/l		0.6 HBV13 (1)	0.041	0.17	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Cyanazine (bladex)	NA	Lab	ug/l		1 HRL18 (1)			< 0.20	--	--	--	--	--	--	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	
d-BHC	NA	Lab	ug/l					< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	< 0.055	< 0.10	< 1.1	
Deisopropyl atrazine	NA	Lab	ug/l					< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Desethylatrazine	NA	Lab	ug/l					< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Dieldrin	NA	Lab	ug/l		0.006 HRL18 (1)	0.000026	2.5 (1)	< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	< 0.11	< 0.21	< 2.1	
Dimethenamid	NA	Lab	ug/l		300 HRL15 (1)			< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Endosulfan I	NA	Lab	ug/l					< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	< 0.055	< 0.10	< 1.1	
Endosulfan II	NA	Lab	ug/l					< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	< 0.11	< 0.21	< 2.1	
Endosulfan sulfate	NA	Lab	ug/l					< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	< 0.11	< 0.21	< 2.1	
Endrin	NA	Lab	ug/l	2		0.016	0.18	< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	< 0.11	< 0.21	< 2.1	
Endrin aldehyde	NA	Lab	ug/l					< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	< 0.11	< 0.21	< 2.1	
Endrin ketone	NA	Lab	ug/l					< 0.11	--	--	--	< 1.1	< 1.1	< 0.11	--	--	< 0.11	< 0.21	< 2.1	
EPTC	NA	Lab	ug/l		40 HRL18 (1)			< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Ethalfuralin	NA	Lab	ug/l					< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Fonofos (dyphonate)	NA	Lab	ug/l					< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
g-BHC (Lindane)	NA	Lab	ug/l	0.2 (8)		0.032	8.8 (1)	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	< 0.055	< 0.10	< 1.1	
Heptachlor	NA	Lab	ug/l	0.4	0.08 HRL93	0.00039	0.52 (1)	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	< 0.055	< 0.10	< 1.1	
Heptachlor epoxide	NA	Lab	ug/l	0.2	0.04 HRL93	0.00048	0.53 (1)	< 0.053	--	--	--	< 0.56	< 0.54	< 0.053	--	--	< 0.055	< 0.10	< 1.1	
Methoxychlor	NA	Lab	ug/l	40				< 0.53	--	--	--	< 5.6	< 5.4	< 0.53	--	--	< 0.55	< 1.0	< 10.6	
Metolachlor	NA	Lab	ug/l		300 HBV18 (1)	23	543	< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Metribuzin	NA	Lab	ug/l		10 HRL13 (1)			< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Pendimethalin	NA	Lab	ug/l					< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Phorate	NA	Lab	ug/l					< 0.30	--	--	--	--	--	--	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30	
Prometon	NA	Lab	ug/l		100 HRL93			< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50 *	< 0.50	
Propachlor	NA	Lab	ug/l		90 HRL93			< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Propazine	NA	Lab	ug/l					< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Simazine	NA	Lab	ug/l	4	4 HRLMCL			< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Terbufos	NA	Lab	ug/l					< 0.20	--	--	--	--	--	--	< 0.20	< 0.20	< 0.20	< 0.20	< 0.20	
Toxaphene	NA	Lab	ug/l	3	0.3 HRL93	0.0013	1.5	< 1.6	--	--	--	< 16.9	< 16.1	< 1.6	--	--	< 1.6	< 3.1	< 31.9	
Triallate	NA	Lab	ug/l					< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Trifluralin	NA	Lab	ug/l					< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	
Polychlorinated Biphenyls																				
Aroclor 1016	NA	Lab	ug/l					< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	< 0.10	< 0.10	
Aroclor 1221	NA	Lab	ug/l					< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	< 0.10	< 0.10	
Aroclor 1232	NA	Lab	ug/l					< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	< 0.10	< 0.10	
Aroclor 1242	NA	Lab	ug/l					< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	< 0.10	< 0.10	
Aroclor 1248	NA	Lab	ug/l					< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	< 0.10	< 0.10	
Aroclor 1254	NA	Lab	ug/l					0.31	--	--	--	< 0.11	< 0.11	< 0.11	--	--	< 0.11	< 0.10	< 0.10	
Aroclor 1260	NA	Lab	ug/l					< 0.11	--	--	--	< 0.11	< 0.11	< 0.11	--	--	&			

ANALYTICAL DATA SUMMARY - WATER (Phase A)

Focused Remedial Investigation Report

Freeway Landfill and Dump

Burnsville, Minnesota

								DUMP														
								FD-SB-B3	FD-SB-B4	FD-SB-B4	FD-SB-B4	FD-SB-B5	FD-SB-D4	FD-SB-D5	FD-SB-D5		FD-SB-E5	FD-TT-06	FD-TT-10			
								3/28/2018	3/23/2018	3/26/2018	3/29/2018	3/21/2018	3/23/2018	3/21/2018	3/29/2018		3/22/2018	4/12/2018	4/17/2018			
								N	N	N	N	N	N	N	N	N	N	N	N			
								Drinking Water Criteria		Surface Water Criteria												
Parameter	Total or Dissolved	Analysis Location	Units	EPA Maximum Contaminant Levels	MDH Human Health-Based Water Guidance Table	Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness	Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness															
Effective Date				04/01/2012	08/05/2019	01/24/2012	01/24/2012															
Exceedance Key				Bold	<i>Italic</i>	<u>Underline</u>	Shade															
Polychlorinated biphenyls	NA	Barr Calc	ug/l	0.5	<i>0.04 HRL94</i>			0.31	--	--	--	ND	ND	ND	--	--	ND	ND	ND			
Herbicides																						
2,4,5-TP (Silvex)	NA	Lab	ug/l	50	50 HRLMCL			< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
2,4,5-Trichlorophenoxyacetic acid	NA	Lab	ug/l		70 HRL93			< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
2,4-D	NA	Lab	ug/l	70	30 HRL18 (1)			< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
2,4-DB	NA	Lab	ug/l					< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
Bentazone	NA	Lab	ug/l		30 HRL15 (1)			< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
Dicamba	NA	Lab	ug/l		200 HRL93			< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
Diquat	NA	Lab	ug/l	20				< 0.40	--	--	--	--	--	--	< 0.40	< 0.40	< 0.40	< 0.40	< 0.40			
Endothall	NA	Lab	ug/l	100				**	--	--	--	--	--	--	**	**	< 9.0 *	< 9.0 *	< 9.0			
MCPA	NA	Lab	ug/l		3 HRL93			< 0.30	--	--	--	--	--	--	< 0.30	< 0.30	< 0.30	< 0.30	< 0.30			
Paraquat	NA	Lab	ug/l					--	--	--	--	--	--	--	--	--	--	< 0.40	< 0.40			
Picloram	NA	Lab	ug/l	500	500 HRL93			< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
Triclopyr	NA	Lab	ug/l					< 0.50	--	--	--	--	--	--	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50			
Chlorinated Dioxins / Furans																						
2,3,7,8-Dioxin, tetra (TCDD)	NA	Lab	pg/l	30				< 10	--	< 10	< 10	< 10	< 10	< 10	--	--	< 10	17 j	< 10			
Radiochemical Parameters																						
Gross Alpha (radiation)	NA	Lab	pCi/l	15				5.96 +/- 2.57	--	--	--	--	--	--	< 4.42	< 2.72	3.06 +/- 1.90	< 18.6	29.2 +/- 8.77			
Gross Beta (radiation)	NA	Lab	pCi/l	50 (+)				98.4 +/- 18.0	--	--	--	--	--	--	48.2 +/- 9.69	57.2 +/- 10.7	5.90 +/- 2.23	< 30.2	< 8.16			
Radium 226	NA	Lab	pCi/l	5 (13)				< 0.581	--	--	--	--	--	--	0.703 +/- 0.520	1.25 +/- 0.785	< 0.815	0.821 +/- 0.548	1.54 +/- 0.735			
Radium 228	NA	Lab	pCi/l	5 (13)				< 0.667	--	--	--	--	--	--	< 0.804	< 0.810	0.937 +/- 0.493	< 0.976	< 1.04			
Radium, total	NA	Lab	pCi/l	5 (13)				< 1.25	--	--	--	--	--	--	< 1.51	< 1.85	< 1.72	< 1.66	2.40 +/- 1.28			
Per- and Polyfluoroalkyl Substances																						
Perfluorobutanesulfonate	NA	Lab	ug/l					0.15	0.027 j	--	--	0.024 j	0.065	0.060	--	--	< 0.050	0.015 j	0.038 j			
Perfluorobutanoic acid (PFBA)	NA	Lab	ug/l		7 HRL18 (1)			0.36	0.18	--	--	0.11	0.24	0.27	--	--	0.052	0.080	0.020 j			
Perfluorohexane sulfonate (PFHxS)	NA	Lab	ug/l		0.047 HBV19			0.27	0.050	--	--	0.048	0.14	0.084	--	--	< 0.025	0.057	< 0.025			
Perfluorohexanoic acid (PFHxA)	NA	Lab	ug/l					1.5	0.59	--	--	0.18	0.40	0.25	--	--	0.022 j	0.17	< 0.050			
Perfluorooctanesulfonate (PFOS)	NA	Lab	ug/l		0.015 HBV19			4.1	0.13	--	--	< 0.025	0.63	0.28	--	--	< 0.025	0.23	0.041			
Perfluorooctanoic acid (PFOA)	NA	Lab	ug/l		0.035 HRL18 (1)			7.3	1.4	--	--	1.0	3.9	25	--	--	0.19	0.79	0.033 j			
Perfluoropentanoic acid (PFPeA)	NA	Lab	ug/l					0.43	0.47	--	--	0.12	0.13	0.11	--	--	< 0.050	0.13	< 0.050			

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Not analyzed or did not exceed criteria.
N	Sample Type: Normal
FD	Sample Type: Field Duplicate
FR	Sample Type: Field Replicate
NA	NA (not applicable) indicates that a fractional portion of the sample is not part of the analytical testing or field collection procedures.
ND	Not detected.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
a	Estimated value, calculated using some or all values that are estimates.
b	Potential false positive value based on blank data validation procedures. Concentrations identified as potential false positive are excluded from calculations.
h	EPA recommended sample preservation, extraction or analysis holding time was exceeded.
j	Estimated detected value. The reported value is less than the stated laboratory quantitation limit but greater than the laboratory method detection limit.

EPA Maximum Contaminant Levels

(1)	1998 Final Rule for Disinfectants and Disinfection By-products: The total for trihalomethanes (THM) is 0.08 mg/l.
(5)	The value for m-dichlorobenzene are based on data for o-dichlorobenzene.
(7)	1,2-dibromoethane.
(9)	Under review.
(14)	Based on the criteria for chromium, total.
(15)	Based on the criteria for xylenes, total.
(19)	At no time can turbidity go above 5 NTU.
TT(12)	Copper action level 1.3 mg/l; lead action level 0.015 mg/l.
(+)	This MCL is no longer an official regulatory level, but is still in use as a trigger for EPA. The actual MCL for Beta is 4 mrem/year but there is no simple conversion between a curie and a rem.

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.
(2)	Representing the criteria for cyanide, free.
CR	Value represents the criteria for Chromium, hexavalent.
DCP	Value shown is 1,3-dichloropropene in the MDH criterion, however, the laboratory reports cis and trans isomers individually.
HBV13	Health Based Value 2013.
HBV14	Health Based Value 2014.
HBV17	Health Based Value 2017.
HBV18	Health Based Value 2018.
HBV19	Health Based Value 2019.
HRL09	Health Risk Limit 2009.
HRL11	Health Risk Limit 2011.
HRL13	Health Risk Limit 2013.
HRL15	Health Risk Limit 2015.
HRL15	Health Risk Limit 2015.
HRL18	Health Risk Limit 2018.
HRL93	Health Risk Limit 1993.
HRL94	Health Risk Limit 1994.
HRLMCL	Health Risk Limit., Maximum Contaminant Level.
MP	Laboratory reports 3-methylphenol and 4-methylphenol as co-eluting compounds. The criteria in the table represents 4-methylphenol which is the more stringent criteria.
RAA09	Not Detected., Risk Assessment Advice 2009.
RAA10	Risk Assessment Advice 2010.
RAA13	Risk Assessment Advice 2013.
RAA16	Risk Assessment Advice 2016.
RAA17	Risk Assessment Advice 2008.
RAA19	Risk Assessment Advice 2019.
XYL	Value shown is for the sum of the mixed o,m and p Xylene isomers.

Data Footnotes and Qualifiers

Minnesota Surface Water 2Bd Chronic 7050 - 360 Hardness*

(3)	Value represents the criteria for Ammonia, unionized as N.
(5)	Value based on the criteria for cyanide, free.
(6)	5.0 mg/l as a daily minimum. This dissolved oxygen standard may be modified on a site-specific basis according to part 7050.0220, subpart 7, except that no site-specific standard shall be less than 5 mg/l as a daily average and 4 mg/l as a daily minimum. Compliance with this standard is required 50 percent of the days at which the flow of the receiving water is equal to the 7Q10.
(7)	5 degree F above natural in streams and 3 degrees above natural in lakes, based on monthly average of the maximum daily temperatures, except in no case shall it exceed the daily average temperature of 86 degrees F.
(8)	pH Dependent. Based on a pH value of 7.0.
CF	Conversion Factor.
CR6	Value represents the criteria for Hexavalent Chromium.
HD	Hardness Dependent.

* Estimated concentrations based on same underlying assumptions of conservative transport mechanisms and same source area. Minnesota River hardness data from MPCA, 2006. Working Draft, Surface Water Pathway Evaluation user's Guide, Appendix E.

Minnesota Surface Water 2Bd Final Acute Value 7050 - 360 Hardness*

(1)	Subpart 7, item E applies.
(5)	Value based on the criteria for cyanide, free.
(8)	pH Dependent. Based on a pH value of 7.0.
CF	Conversion Factor.
CR6	Value represents the criteria for Hexavalent Chromium.
HD	Hardness Dependent.

* Estimated concentrations based on same underlying assumptions of conservative transport mechanisms and same source area. Minnesota River hardness data from MPCA, 2006. Working Draft, Surface Water Pathway Evaluation user's Guide, Appendix E.

ANALYTICAL DATA SUMMARY - SOIL (Phase A)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Parameter	Analysis Location	Units	Location						FD-SB-A1	FD-SB-A2	FD-SB-E2	FD-SB-E3	FD-SB-F1	FD-TT-03	FD-TT-05	FD-SB-G1	TS-SB-02	TS-SB-03	TS-SB-07	FD-SB-A3	FD-SB-A4	FD-SB-B5	FD-SB-G4	FL-TT-06	FL-TT-07	TS-SB-05
			Date	4/11/2018	3/27/2018	3/27/2018	3/26/2018	4/12/2018	4/11/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/13/2018	3/23/2018	3/22/2018	3/20/2018	3/26/2018	4/19/2018	4/19/2018	4/13/2018
			Depth	3 - 6 ft	10 - 20 ft	11 - 21 ft	11 - 15.5 ft	10 - 14.5 ft	2 - 5 ft	4 - 9 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	15 - 18.5 ft	30 - 35 ft	26 - 32.5 ft	11.5 - 23 ft	15.5 - 17.5 ft	0 - 10 ft	1 - 5 ft	5 - 7.5 ft
Sample Description	Ash	Ash	Ash	Ash	Ash	Ash	Ash	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil		
			MPCA Screening Soil Leaching Values	MPCA Criteria for Unregulated Fill	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values																				
Effective Date			06/01/2013	06/22/2009	06/22/2009	06/22/2009																				
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>	Shade																				
General Parameters																										
Cyanide	Lab	mg/kg	20	20	5000	60	< 0.49	< 0.41	< 0.60	< 0.59	< 0.57	< 0.53	< 0.47	< 0.39	< 0.37	< 0.42	< 0.32	< 1.7	< 1.1	< 0.96	0.90	< 0.51	0.78	< 0.38		
Fluoride	Lab	mg/kg					4.6	2.3 *	1.9	3.5 *	4.1	5.1	4.3	1.8	< 0.99 *	6.1	0.99	< 0.99	< 0.98	< 0.98	< 0.98	< 0.98	3.0	< 0.99	4.1	
Moisture	Lab	%					31.3	27.3	27.4	31.9	32.6	33.8	28.0	10.6	7.6	12.1	7.2	79.9	67.6	71.5	26.9	25.3	48.2	31.9		
Solids, percent	Lab	%					71.6	--	--	--	67.4	67.5	75.5	89.4	92.8	90.3	92.7	--	--	--	--	74.6	51.1	74.5		
Metals																										
Aluminum	Lab	mg/kg		30000	100000	40000	8780	11500	9940	12900	10700	13000	7800	4200	2940	3290	2680	5600 *	2190	3030	4370 *	5520	8590	4730		
Antimony	Lab	mg/kg	5.4	5.4	100	16	1.1	2.0 *	2.0	1.1	2.1	1.7	1.0	< 0.53	< 0.54	< 0.55	< 0.53	< 2.3	< 1.5	< 1.7	< 0.68	< 0.66	< 0.90	0.78		
Arsenic	Lab	mg/kg	5.8	<u>5.8</u>	20	11	21.7	23.3	21.1	16.9	22.5	24.9	14.8	13.3	2.9	2.3	2.1	3.8	< 1.5	9.7	1.4	3.4	6.3	11.4		
Barium	Lab	mg/kg	1700	1100	18000	1100	100	130	144	104	134	171	129	60.3	49.5	47.1	40.0	252	140	174	104	78.6	240	174		
Beryllium	Lab	mg/kg	2.7	<u>2.7</u>	230	75	3.1	3.1	2.6	2.9	3.2	3.6	1.8	0.30	< 0.21	0.28	< 0.21	< 0.94	< 0.60	< 0.67	< 0.27	0.61	0.67	0.31		
Boron	Lab	mg/kg	62	<u>62</u>	47000	8000	265	238	439	188	802	145	106	11.6	< 8.0	< 7.9	< 7.6	524	742	296	124	9.3	27.0	18.4		
Cadmium	Lab	mg/kg	8.8	8.8	200	35	1.9	2.3	1.8	2.4	2.2	1.4	0.18	0.10	0.12	0.72	0.37	0.37	0.37	0.37	0.14	0.34	0.47	3.4		
Chromium	Lab	mg/kg	36 CR6	<u>36 CR6</u>	650 CR6	120 CR6	43.5 *	49.9 *	47.5 *	45.1 *	53.4 *	44.0	42.6	11.4 *	8.8 *	9.4 *	8.3	29.3 *	< 2.8 *	6.4 *	19.0 *	3.3 *	7.5 *	38.2 *		
Chromium, hexavalent	Lab	mg/kg	36	36	650	120	< 14.4	< 13.5	< 13.6	< 14.7	< 14.5	< 14.6	< 14.0	< 44.9	< 10.6	< 11.3	< 2.1	--	< 305	< 139	< 273 **	< 13.4	< 190	< 57.1		
Chromium, trivalent	Lab	mg/kg	1000000000	44000	100000	60000	43.5	49.9	47.5	45.1	53.4	44.0	42.6	11.4	8.8	9.4	8.3	--	< 1.0	6.4	19.0	3.3	7.5	38.2		
Cobalt	Lab	mg/kg	27	27	2600	800	6.9	8.3	6.7	7.9	6.9	8.2	5.2	3.3	3.7	3.4	3.4	1.9	7.9	3.2	7.1	8.3	5.2			
Copper	Lab	mg/kg	700	100	9000	100	18.0	26.1	20.1	25.2	20.2	25.1	16.9	8.0	6.5	9.1	6.3	24.2	4.3	11.4	38.1	8.9	17.5	18.2		
Iron	Lab	mg/kg		<u>9000</u>	75000	12000	23000	35100	31500	36000	34200	35900	26400	8290	7500	7440	7710	15500 *	3870	13600	10600	10000	23300	27600		
Lead	Lab	mg/kg	2700	<u>300</u>	700	300	31.3	37.7	29.0	20.5	30.4	30.9	18.2	19.2	4.5	199	4.8	308 *	4.2	4.9	5.7 *	8.9	16.2	579		
Lithium	Lab	mg/kg		700	5900	950	10.2	14.9	10.7	10.4	10.2	12.0	8.6	3.6	4.4	5.0	4.5	4.6	3.9	2.5	1.9	10.2	9.8	5.6		
Manganese	Lab	mg/kg	130	<u>130</u>	8100	5000	159	161	173	146	185	194	365	323	258	282	300	423	310	435	834	498	999	723		
Mercury	Lab	mg/kg	3.3 MC	0.5	1.5	1.2 MC	< 0.028	0.070	0.033	0.075	0.075	0.060	0.057	0.042	< 0.021	0.034	< 0.020	0.12	< 0.058	< 0.066	< 0.023	0.026	0.065	0.14		
Methyl mercury	Lab	ng/g		3000	20000	4000	< 13.6	< 11.0	< 10.2	< 10.4	< 13.7	< 14.4	< 12.2	< 11.0	< 8.81	< 9.41	< 9.58	< 43.9	< 26.3	< 39.4	< 12.2	< 7.33	< 12.3	< 13.8		
Nickel	Lab	mg/kg	180	180	2500	800	41.6	26.9	62.7	26.8	22.5	25.5	18.4	10.2	8.7	9.0	7.6	11.3	3.6	13.3	9.6	11.7	16.4	11.3		
Selenium	Lab	mg/kg	2.6	<u>2.6</u>	1300	200	2.2	5.4	5.1	5.6	5.7	1.6	2.0	< 0.53	< 0.54	< 0.55	< 0.53	< 2.3	< 1.5	1.8	< 0.68	0.69	2.2	< 0.73		
Silver	Lab	mg/kg	7.9	7.9	1300	200	< 0.72	< 0.66	< 0.64	< 0.71	< 0.73	< 0.76	< 0.67	< 0.54	< 0.54	< 0.53	< 0.50	< 2.4	< 1.5	< 1.7	< 0.65	< 0.62	< 0.96	< 0.73		
Strontium	Lab	mg/kg	2800	2800	100000	24000	57.0	77.3	60.9	69.7	71.4	66.7	49.0	15.7	25.0	22.7	27.3	47.6	65.9	47.7	36.9	52.8	102	72.7		
Tin	Lab	mg/kg	20000	9000	75000	12000	< 5.4	< 5.0	< 4.8	< 5.3	< 5.5 *	< 5.7	< 5.1	< 4.0	< 4.0	< 3.9	< 3.8	44.1	< 11.5	< 12.5	< 4.9	< 4.6	< 7.2	10.5		
Titanium	Lab	mg/kg		100000	100000	100000	472	568	558	589	653	432	147	204	148	182	158	62.0	87.3	206	155	170	172			
Vanadium	Lab	mg/kg	4.0	<u>4.0</u>	250	40	224	124	301	86.8	117	121	76.5	17.6	16.3	18.3	19.7	15.0	7.1	19.2	12.0	30.3	29.8	19.5		
Zinc	Lab	mg/kg	3000	3000	75000	12000	127	173	154	149	180	171	117	33.1	26.9	38.6	16.1	232 *	12.7	38.0	35.7	31.2	62.5	999		
Semivolatile Organic Compounds																										
Benz(a)anthracene	Lab	ug/kg	T	T	T	T	< 14.5	14400	< 13.8	< 14.7	< 14.8	< 15.1	< 13.8	84.8	37.9	2360	< 10.8	< 49.7	< 30.8	261	197	< 13.4	< 19.3	373		
Benzo(a)pyrene	Lab	ug/kg	T	T	T	T	< 14.5	11700	< 13.8	< 14.7	< 14.8	< 15.1	< 13.8	107	36.5	2040	< 10.8	< 49.7	< 30.8	1850	283	< 13.4	< 19.3	307		
Benzo(b)fluoranthene	Lab	ug/kg	T	T	T	T	< 15.9	13300	< 13.8	< 14.7	< 14.8	< 15.1	16.7	147	46.4	2540	< 10.8	< 49.7	< 30.8	495	335	< 13.4	< 19.3	398		
Benzo(k)fluoranthene	Lab	ug/kg	T	T	T	T	< 14.5	6960	< 13.8	< 14.7	< 14.8	< 15.1	< 13.8	58.5	20.5	950	< 10.8	< 49.7	< 30.8	< 175	124	< 13.4	< 19.3	112		
Chrysene	Lab	ug/kg	T	T	T	T	< 14.5	13900	< 13.8	< 14.7	< 14.8	< 15.1	< 13.8	131	40.1	2040	< 10.8	< 49.7	< 30.8	239	241	< 13.4	< 19.3	356		
Dibenz(a,h)anthracene	Lab	ug/kg	T	T	T	T	< 14.5	1700	< 13.8	< 14.7	< 14.8	< 15.1	< 13.8	29.8	< 10.8	357	< 10.8	< 49.7	< 30.8	< 175	41.3	< 13.4	< 19.3	< 73.2		
Indeno(1,2,3-cd)pyrene	Lab	ug/kg	T	T	T	T	< 14.5	4480	< 13.8	< 14.7	< 14.8	< 15.1	< 13.8	66.7	14.7	1020	< 10.8	< 49.7	< 30.8	1450	150	< 13.4	< 19.3	153		
B(a)P Equivalent, non-detects at 0, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>1400 T</u>	3000 T	2000 T	1.6	17000	ND	ND	ND	ND	1.7	--	49	2900	ND	ND	ND	2100	390	ND	ND	410		
B(a)P Equivalent, non-detects at 1/2, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>1400 T</u>	3000 T	2000 T	15	17000	14	14	15	15	15	--	52	2900	11	49	30	2100	390	13	19	430		
B(a)P Equivalent, non-detects at 1x, 2002 PEFs	Barr Calculation	ug/kg	1400 T	<u>1400 T</u>	3000 T	2000 T	29																			

ANALYTICAL DATA SUMMARY - SOIL (Phase A)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Criteria for Unregulated Fill	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values	Location	FD-SB-A1	FD-SB-A2	FD-SB-E2	FD-SB-E3	FD-SB-F1	FD-TT-03	FD-TT-05	FD-SB-G1	TS-SB-02	TS-SB-03	TS-SB-07	FD-SB-A3	FD-SB-A4	FD-SB-B5	FD-SB-G4	FL-TT-06	FL-TT-07	TS-SB-05
							Date	4/11/2018	3/27/2018	3/27/2018	3/26/2018	4/12/2018	4/11/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/13/2018	3/23/2018	3/22/2018	3/20/2018
Sample Description	Depth						Ash	Ash	Ash	Ash	Ash	Ash	Ash	Ash	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil
							3 - 6 ft	10 - 20 ft	11 - 21 ft	11 - 15.5 ft	10 - 14.5 ft	2 - 5 ft	4 - 9 ft	5 - 10 ft	5 - 10 ft	1.5 - 3 ft	15 - 18.5 ft	30 - 35 ft	26 - 32.5 ft	11.5 - 23 ft	15.5 - 17.5 ft	0 - 10 ft	1 - 5 ft	5 - 7.5 ft	
Effective Date			06/01/2013	06/22/2009	06/22/2009	06/22/2009																			
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>	Shade																			
2,4-Dinitrotoluene	Lab	ug/kg	13	13	355000	60000	< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
2,6-Dinitrotoluene	Lab	ug/kg	13	13	175000	30000	< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
2-Chloronaphthalene	Lab	ug/kg					< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
2-Chlorophenol	Lab	ug/kg	520	520			< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
2-Methyl-4,6-dinitrophenol	Lab	ug/kg					< 2470	< 2330 *	< 2340 *	< 2490	< 4660	< 2560	< 2350	< 1900	< 1840	< 1930	< 1830	< 8430	< 15400	< 5950	< 2320	< 2270	< 3280	< 2490	
2-Methylnaphthalene	Lab	ug/kg		100000	369000	120000	< 480	523	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	427	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
2-Methylphenol (o-cresol)	Lab	ug/kg	430	430	352000	95000	< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
2-Nitroaniline	Lab	ug/kg					< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
2-Nitrophenol	Lab	ug/kg					< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
3,3'-Dichlorobenzidine	Lab	ug/kg	100	100	50000	30000	< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
3,4-Methylphenol (m,p cresols)	Lab	ug/kg	42 MP	42 MP	59000 MP	11000 MP	< 959	< 904	< 908	< 968	< 1810	< 1810	< 993	< 914	< 737	< 714	< 749	< 710	< 3270	< 5960	< 2310	< 901	< 881	< 1270	< 966
3-Nitroaniline	Lab	ug/kg					< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
4-Bromophenyl phenyl ether	Lab	ug/kg					< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
4-Chloro-3-methylphenol	Lab	ug/kg					< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
4-Chloroaniline	Lab	ug/kg					< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
4-Chlorophenyl phenyl ether	Lab	ug/kg					< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
4-Nitroaniline	Lab	ug/kg					< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
4-Nitrophenol	Lab	ug/kg					< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
Acenaphthene	Lab	ug/kg	81000	81000	5260000	1860000	< 14.5	3930	< 13.8	< 14.7	< 14.8	< 14.8	< 15.1	< 13.8	< 22.3	11.9	1030	< 10.8	< 49.7	< 30.8	2330	18.9	< 13.4	< 19.3	167
							< 480	2320	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	1010	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
Acenaphthylene	Lab	ug/kg	NA				< 14.5	204	< 13.8	< 14.7	< 14.8	< 14.8	< 15.1	< 13.8	< 22.3	< 10.8	< 283	< 10.8	< 49.7	< 30.8	305	< 13.7	< 13.4	< 19.3	< 73.2
							< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
Anthracene	Lab	ug/kg	1300000	1300000	45400000	10000000	< 14.5	11300	< 13.8	< 14.7	< 14.8	< 14.8	< 15.1	< 13.8	< 22.3	17.8	2200	< 10.8	< 49.7	< 30.8	< 175	19.4	< 13.4	< 19.3	217
							< 480	8100	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	2220	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
Benzo(g,h,i)perylene	Lab	ug/kg	NA				< 14.5	5310	< 13.8	< 14.7	< 14.8	< 14.8	< 15.1	< 13.8	79.7	19.0	963	< 10.8	< 49.7	< 30.8	7000	197	< 13.4	< 19.3	190
							< 480	3930	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	1160	< 355	< 1640	< 2980	< 1150	2190	< 441	< 636	< 483
Bis(2-chloroethoxy)methane	Lab	ug/kg					< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
Bis(2-chloroethyl)ether	Lab	ug/kg	0.99	0.99	5000	6000	< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
Bis(2-ethylhexyl)phthalate	Lab	ug/kg	29000	<u>29000</u>	2100000	690000	< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	45300	< 441	< 636	6560
Butyl benzyl phthalate	Lab	ug/kg	29000	29000	3700000	623000	< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
Carbazole	Lab	ug/kg		700000	1310000	720000	< 480	2950	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	550	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
Dibenzofuran	Lab	ug/kg	NA	104000	810000	130000	< 480	1590	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	1300	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
Diethyl phthalate	Lab	ug/kg	37000	37000			< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
Dimethyl phthalate	Lab	ug/kg	230000	230000			< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
Di-n-butyl phthalate	Lab	ug/kg	34000	34000	16300000	3070000	< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	< 451	< 441	< 636	< 483
Di-n-octyl phthalate	Lab	ug/kg	NA	520000	3700000	630000	< 480	< 452	< 454	< 484	< 904	< 904	< 497	< 457	< 369	< 357	< 374	< 355	< 1640	< 2980	< 1150	576	< 441	< 636	< 483
Fluoranthene	Lab	ug/kg	670000	670000	6800000	1290000	39.4	40																	

ANALYTICAL DATA SUMMARY - SOIL (Phase A)

Focused Remedial Investigation Report

Freeway Landfill and Dump

Burnsville, Minnesota

Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Criteria for Unregulated Fill	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values	Location	FD-SB-A1	FD-SB-A2	FD-SB-E2	FD-SB-E3	FD-SB-F1	FD-TT-03	FD-TT-05	FD-SB-G1	TS-SB-02	TS-SB-03	TS-SB-07	FD-SB-A3	FD-SB-A4	FD-SB-B5	FD-SB-G4	FL-TT-06	FL-TT-07	TS-SB-05
							Date	4/11/2018	3/27/2018	3/27/2018	3/26/2018	4/12/2018	4/11/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/13/2018	3/23/2018	3/22/2018	3/20/2018	3/26/2018	4/19/2018
Sample Description	Depth	3 - 6 ft	10 - 20 ft	11 - 21 ft	11 - 15.5 ft	10 - 14.5 ft	2 - 5 ft	4 - 9 ft	5 - 10 ft	5 - 10 ft	1.5 - 3 ft	15 - 18.5 ft	30 - 35 ft	26 - 32.5 ft	11.5 - 23 ft	15.5 - 17.5 ft	0 - 10 ft	1 - 5 ft	5 - 7.5 ft						
		Ash	Ash	Ash	Ash	Ash	Ash	Ash	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil		
Effective Date			06/01/2013	06/22/2009	06/22/2009	06/22/2009																			
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>	Shade																			
1,2,3-Trichloropropane	Lab	ug/kg	270	270	270	270	< 290	< 271	< 293	< 316	< 304	< 315	< 287	< 216	< 225	< 234	< 208	< 1650	< 1480	< 1240	< 479	< 271	< 404	< 392	
1,2,4-Trichlorobenzene	Lab	ug/kg	230	230	985000	290000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
1,2,4-Trimethylbenzene	Lab	ug/kg	2700	2700	25000	20000	< 72.5	< 67.7	120	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	302	< 67.7	< 101	386	
1,2-Dibromo-3-chloropropane (DBCP)	Lab	ug/kg					< 725	< 677	< 731	< 790	< 761	< 787	< 718	< 540	< 563	< 584	< 521	< 4120	< 3700	< 3100	< 1200	< 677	< 1010	< 980	
1,2-Dibromoethane (EDB)	Lab	ug/kg	0.015	0.015	500	1000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
1,2-Dichlorobenzene	Lab	ug/kg	11000	11000	75000	63000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
1,2-Dichloroethane	Lab	ug/kg	3.8	3.8	6000	10000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
1,2-Dichloroethylene, cis	Lab	ug/kg	210	210	22000	19000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
1,2-Dichloroethylene, trans	Lab	ug/kg	420	420	33000	28000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
1,2-Dichloropropane	Lab	ug/kg	24	24	6000	11000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
1,3,5-Trimethylbenzene	Lab	ug/kg	2700	2700	10000	8000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
1,3-Dichlorobenzene	Lab	ug/kg	10000	10000	200000	32000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
1,3-Dichloropropane	Lab	ug/kg					< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
1,3-Dichloropropene, cis	Lab	ug/kg	11 DCP	11			< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
1,3-Dichloropropene, trans	Lab	ug/kg	11 DCP	11			< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
1,4-Dichlorobenzene	Lab	ug/kg	170	170	50000	72000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
2,2-Dichloropropane	Lab	ug/kg					< 290	< 271	< 293	< 316	< 304	< 315	< 287	< 216	< 225	< 234	< 208	< 1650	< 1480	< 1240	< 479	< 271	< 404	< 392	
Acetone	Lab	ug/kg	8400	8400	1000000	850000	< 1450	< 1350	< 1460	< 1580	< 1520	< 1570	< 1440	< 1080	< 1130	< 1170	< 1040	< 8250	< 7400	< 6200	< 2400	< 1350	< 2020	< 1960	
Allyl chloride	Lab	ug/kg	150	150			< 290	< 271	< 293	< 316	< 304	< 315	< 287	< 216	< 225	< 234	< 208	< 1650	< 1480	< 1240	< 479	< 271	< 404	< 392	
Benzene	Lab	ug/kg	17	17	10000	14000	< 29.0	< 27.1	< 29.3	< 31.6	< 30.4	< 31.5	< 28.7	< 21.6	< 22.5	< 23.4	< 20.8	256	1370	277	< 47.9	< 27.1	< 40.4	58.1	
Bromobenzene	Lab	ug/kg					< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
Bromochloromethane	Lab	ug/kg	280	280			< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
Bromodichloromethane	Lab	ug/kg	21	21	17000	28000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
Bromoform	Lab	ug/kg	130	130	650000	630000	< 290	< 271	< 293	< 316	< 761	< 315	< 718	< 540	< 563	< 584	< 521	< 4120	< 3700	< 3100	< 1200	< 677	< 1010	< 980	
Bromomethane	Lab	ug/kg	36	36	2000	2000	< 725	< 677	< 731	< 790	< 761	< 787	< 718	< 540	< 563	< 584	< 521	< 4120	< 3700	< 3100	< 1200	< 677	< 1010	< 980	
Butylbenzene	Lab	ug/kg	NA	30000	92000	70000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	137	< 67.7	< 101	< 98.0	
Butylbenzene, sec	Lab	ug/kg	NA	25000	70000	55000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
Butylbenzene, tert	Lab	ug/kg	NA	30000	90000	55000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
Carbon tetrachloride	Lab	ug/kg	7.7	7.7	900	700	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
Chlorobenzene	Lab	ug/kg	1200	1200	32000	23000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
Chlorodibromomethane	Lab	ug/kg	34	34	20000	30000	< 290	< 271	< 293	< 316	< 304	< 315	< 287	< 216	< 225	< 234	< 208	< 1650	< 1480	< 1240	< 479	< 271	< 404	< 392	
Chloroethane	Lab	ug/kg	NA	1000000	3000000	2250000	< 725	< 677	< 731	< 790	< 761	< 787	< 718	< 540	< 563	< 584	< 521	< 4120	< 3700	< 3100	< 1200	< 677	< 1010	< 980	
Chloroform	Lab	ug/kg	110	110	4000	7000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
Chloromethane	Lab	ug/kg	110	110	23000	20000	< 290	< 271	< 293	< 316	< 304	< 315	< 287	< 216	< 225	< 234	< 208	< 1650	< 1480	< 1240	< 479	< 271	< 404	< 392	
Chlorotoluene, o	Lab	ug/kg		436000	436000	436000	< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.7	< 101	< 98.0	
Chlorotoluene, p	Lab	ug/kg					< 72.5	< 67.7	< 73.1	< 79.0	< 76.1	< 78.7	< 71.8	< 54.0	< 56.3	< 58.4	< 52.1	< 412	< 370	< 310	< 120	< 67.			

ANALYTICAL DATA SUMMARY - SOIL (Phase A)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Parameter	Analysis Location	Units	Location						FD-SB-A1	FD-SB-A2	FD-SB-E2	FD-SB-E3	FD-SB-F1	FD-TT-03	FD-TT-05	FD-SB-G1	TS-SB-02	TS-SB-03	TS-SB-07	FD-SB-A3	FD-SB-A4	FD-SB-B5	FD-SB-G4	FL-TT-06	FL-TT-07	TS-SB-05	
			Date	4/11/2018	3/27/2018	3/27/2018	3/26/2018	4/12/2018	4/11/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/12/2018	4/13/2018	3/23/2018	3/22/2018	3/20/2018	3/26/2018	4/19/2018	4/19/2018	4/13/2018
			Depth	3 - 6 ft	10 - 20 ft	11 - 21 ft	11 - 15.5 ft	10 - 14.5 ft	2 - 5 ft	4 - 9 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	5 - 10 ft	30 - 35 ft	26 - 32.5 ft	11.5 - 23 ft	15.5 - 17.5 ft	0 - 10 ft	1 - 5 ft
Sample Description	Ash	Ash	Ash	Ash	Ash	Ash	Ash	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil		
MPCA Screening Soil Leaching Values	MPCA Criteria for Unregulated Fill	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values																								
Effective Date			06/01/2013	06/22/2009	06/22/2009	06/22/2009																					
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>	Shade																					
b-BHC	Lab	ug/kg		7000	15000	11000	< 2.4	< 230	< 4.6	< 2.4	< 2.5	< 2.5	< 11.6	< 37.2	< 3.6	< 19.0	< 3.6	< 3.6	64.3 *	< 5.1	< 29.2	< 4.6 *	< 2.2	< 6.4	< 49.0		
Chlordane, alpha & gamma	Lab	ug/kg		13000	74000 (1)	16000 (1)	< 24.2	< 2300	< 45.9	< 24.4	< 24.7	< 25.2	< 116	< 372	< 36.0	< 190	< 35.9	< 166	< 51.4	< 292	< 45.7	< 22.3	< 64.4	< 490			
Chlordane, cis (alpha)	Lab	ug/kg		13000	74000 (1)	16000 (1)	< 2.4	< 230	< 4.6	< 2.4	< 2.5	< 2.5	< 11.6	< 37.2	< 3.6	< 19.0	< 3.6	< 3.6	147 *	< 5.1	< 29.2	< 4.6 *	< 2.2	< 6.4	< 49.0		
Chlordane, trans (gamma)	Lab	ug/kg		13000	74000 (1)	16000 (1)	< 2.4	< 230	< 4.6	< 2.4	< 2.5	< 2.5	< 11.6	< 37.2	< 3.6	< 19.0	< 3.6	< 3.6	129 *	< 5.1	< 29.2	< 4.6	< 2.2	< 6.4	< 49.0		
d-BHC	Lab	ug/kg					< 2.4	< 230	< 4.6	< 2.4	< 2.5	< 2.5	< 11.6	< 37.2	< 3.6	< 19.0	< 3.6	< 3.6	< 16.6	< 5.1	< 29.2	< 4.6	< 2.2	< 6.4	< 49.0		
Dieldrin	Lab	ug/kg		800	2000	1200	< 4.8	< 458	< 9.1	< 4.9	< 4.9	< 4.9	< 5.0	< 23.1	< 74.2	< 7.2	< 37.8	< 7.2	< 33.1	< 10.2	< 58.1	< 9.1	< 4.5	< 12.8	< 97.7		
Endosulfan I	Lab	ug/kg					< 2.4	< 230	< 4.6	< 2.4	< 2.5	< 2.5	< 11.6	< 37.2	< 3.6	< 19.0	< 3.6	< 3.6	< 16.6	< 5.1	< 29.2	< 4.6	< 2.2	< 6.4	< 49.0		
Endosulfan II	Lab	ug/kg					< 4.8	< 458	< 9.1	< 4.9	< 4.9	< 4.9	< 5.0	< 23.1	< 74.2	< 7.2	< 37.8	< 7.2	< 33.1	< 10.2	< 58.1	< 9.1	< 4.5	< 12.8	< 97.7		
Endosulfan sulfate	Lab	ug/kg					< 4.8	< 458	< 9.1	< 4.9	< 4.9	< 4.9	< 5.0	< 23.1	< 74.2	< 7.2	< 37.8	< 7.2	< 33.1	< 10.2	< 58.1	< 9.1	< 4.5	< 12.8	< 97.7		
Endrin	Lab	ug/kg		8000	56000	10000	< 4.8	< 458	< 9.1	< 4.9	< 4.9	< 4.9	< 5.0	< 23.1	< 74.2	< 7.2	< 37.8	< 7.2	< 33.1	< 10.2	< 58.1	< 9.1	< 4.5	< 12.8	< 97.7		
Endrin aldehyde	Lab	ug/kg					< 4.8	< 458	< 9.1	< 4.9	< 4.9	< 4.9	< 5.0	< 23.1	< 74.2	< 7.2	< 37.8	< 7.2	< 33.1	< 10.2	< 58.1	< 9.1	< 4.5	< 12.8	< 97.7		
Endrin ketone	Lab	ug/kg					< 4.8	< 458	< 9.1	< 4.9	< 4.9	< 4.9	< 5.0	< 23.1	< 74.2	< 7.2	< 37.8	< 7.2	< 33.1	< 10.2	< 58.1	< 9.1	< 4.5	< 12.8	< 97.7		
g-BHC (Lindane)	Lab	ug/kg		9000	15000	12000	< 2.4	< 230	< 4.6	< 2.4	< 2.5	< 2.5	< 11.6	< 37.2	< 3.6	< 19.0	< 3.6	< 3.6	< 16.6	< 5.1	< 29.2	< 4.6 *	< 2.2	< 6.4	< 49.0		
Heptachlor	Lab	ug/kg		2000	3500	3000	< 2.4	< 230	< 4.6	< 2.4	< 2.5	< 2.5	< 11.6	< 37.2	< 3.6	< 19.0	< 3.6	< 3.6	< 16.6	< 5.1	< 29.2	< 4.6	< 2.2	< 6.4	< 49.0		
Heptachlor epoxide	Lab	ug/kg		400	3000	500	< 2.4	< 230	< 4.6	< 2.4	< 2.5	< 2.5	< 11.6	< 37.2	< 3.6	< 19.0	< 3.6	< 3.6	< 16.6	< 5.1	< 29.2	< 4.6	< 2.2	< 6.4	< 49.0		
Methoxychlor	Lab	ug/kg		11000	50000	13000	< 24.2	< 2300	< 45.9	< 24.4	< 24.7	< 25.2	< 116	< 372	< 36.0	< 190	< 35.9	< 166	< 51.4	< 292	< 45.7	< 22.3	< 64.4	< 490			
Toxaphene	Lab	ug/kg		13000	28000	17000	< 72.6	< 6870	< 137	< 72.9	< 74.0	< 75.4	< 347	< 1110	< 108	< 568	< 108	< 497	< 154	< 873	< 137	< 66.9	< 193	< 1470			

ANALYTICAL DATA SUMMARY - SOIL (Phase A)
 Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota

Parameter	Analysis Location	Units	MPCA Screening Soil Leaching Values	MPCA Criteria for Unregulated Fill	MPCA Tier 2 Industrial Soil Reference Values	MPCA Tier 2 Recreational Soil Reference Values	Location	FD-SB-A1	FD-SB-A2	FD-SB-E2	FD-SB-E3	FD-SB-F1	FD-TT-03	FD-TT-05	FD-SB-G1	TS-SB-02	TS-SB-03	TS-SB-07	FD-SB-A3	FD-SB-A4	FD-SB-B5	FD-SB-G4	FL-TT-06	FL-TT-07	TS-SB-05	
							Date	3 - 6 ft	10 - 20 ft	11 - 21 ft	11 - 15.5 ft	10 - 14.5 ft	2 - 5 ft	4 - 9 ft	5 - 10 ft	5 - 10 ft	1.5 - 3 ft	15 - 18.5 ft	30 - 35 ft	26 - 32.5 ft	11.5 - 23 ft	15.5 - 17.5 ft	0 - 10 ft	1 - 5 ft	5 - 7.5 ft	
Sample Description	Depth	Sample Description	Sample Description	Sample Description	Sample Description	Sample Description	Ash	Ash	Ash	Ash	Ash	Ash	Ash	Ash	Fill Soil	Fill Soil	Fill Soil	Fill Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	Native Soil	
Effective Date			06/01/2013	06/22/2009	06/22/2009	06/22/2009																				
Exceedance Key			Bold	<u>Underline</u>	<i>Italic</i>	Shade																				
Polychlorinated Biphenyls																										
Aroclor 1016	Lab	ug/kg					< 47.9	< 44.9	< 45.4	< 48.3	< 48.9	< 49.8	< 45.8	< 36.7	< 35.7	< 37.5	< 35.5	< 164	< 105	< 116	< 44.9	< 44.1	< 63.6	< 48.4		
Aroclor 1221	Lab	ug/kg					< 47.9	< 44.9	< 45.4	< 48.3	< 48.9	< 49.8	< 45.8	< 36.7	< 35.7	< 37.5	< 35.5	< 164	< 105	< 116	< 44.9	< 44.1	< 63.6	< 48.4		
Aroclor 1232	Lab	ug/kg					< 47.9	< 44.9	< 45.4	< 48.3	< 48.9	< 49.8	< 45.8	< 36.7	< 35.7	< 37.5	< 35.5	< 164	< 105	< 116	< 44.9	< 44.1	< 63.6	< 48.4		
Aroclor 1242	Lab	ug/kg					< 47.9	122	< 45.4	< 48.3	< 48.9	< 49.8	< 45.8	< 36.7	< 35.7	< 37.5	< 35.5	< 164	< 105	< 116	124	< 44.1	< 63.6	< 48.4		
Aroclor 1248	Lab	ug/kg					< 47.9	< 44.9	< 45.4	< 48.3	< 48.9	< 49.8	< 45.8	< 36.7	< 35.7	56.3	< 35.5	< 164	< 105	< 116	< 44.9	< 44.1	< 63.6	< 48.4		
Aroclor 1254	Lab	ug/kg					< 47.9	< 44.9	< 45.4	< 48.3	< 48.9	< 49.8	< 45.8	< 36.7	< 35.7	< 37.5	< 35.5	< 164	< 105	< 116	< 44.9	< 44.1	< 63.6	< 48.4		
Aroclor 1260	Lab	ug/kg					< 47.9	< 44.9	< 45.4	< 48.3	< 48.9	< 49.8	< 45.8	< 36.7	< 35.7	< 37.5	< 35.5	< 164	< 105	< 116	558	< 44.1	< 63.6	< 48.4		
Aroclor 1262	Lab	ug/kg					< 47.9	< 44.9	< 45.4	< 48.3	< 48.9	< 49.8	< 45.8	< 36.7	< 35.7	< 37.5	< 35.5	< 164	< 105	< 116	< 44.9	< 44.1	< 63.6	< 48.4		
Aroclor 1268	Lab	ug/kg					< 47.9	< 44.9	< 45.4	< 48.3	< 48.9	< 49.8	< 45.8	< 36.7	< 35.7	< 37.5	< 35.5	< 164	< 105	< 116	< 44.9	< 44.1	< 63.6	< 48.4		
Polychlorinated biphenyls	Lab	ug/kg	130	<u>130</u>	8000	1400	< 47.9	122	< 45.4	< 48.3	< 48.9	< 49.8	< 45.8	< 36.7	< 35.7	56.3	< 35.5	< 164	< 105	< 116	1020	< 44.1	< 63.6	< 48.4		
Herbicides																										
2,4,5-TP (Silvex)	Lab	mg/kg					< 0.10	< 0.23	< 0.045	< 0.048	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.15	< 0.10	< 0.33	< 0.20	< 1.2	< 0.045	< 0.10	< 0.10	0.13 *		
2,4,5-Trichlorophenoxyacetic acid	Lab	mg/kg		290	2150	360	< 0.10	< 0.23	< 0.045	< 0.048	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.33	< 0.20	< 1.2	< 0.045	< 0.10	< 0.10	< 0.10		
2,4-D	Lab	mg/kg		285	2200	360	< 0.10	< 0.23	< 0.045	< 0.048	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.33	< 0.20	< 1.2	< 0.045	< 0.10	< 0.10	0.30 *		
2,4-DB	Lab	mg/kg		226	1750	286	< 0.10	< 0.23	< 0.045	< 0.048	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.33	< 0.20	< 1.2	< 0.045	< 0.10	< 0.10	0.45 *		
Bentazone	Lab	mg/kg					< 0.10	< 0.23	< 0.045	< 0.048	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.33	< 0.20	< 1.2	< 0.045	< 0.10	< 0.10	< 0.10		
Dicamba	Lab	mg/kg					< 0.10	< 0.23	< 0.045	< 0.048	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.33	< 0.20	< 1.2	< 0.045	< 0.10	< 0.10	< 0.10		
Dinoseb (DNBP)	Lab	mg/kg					--	< 0.23	< 0.045	< 0.048	--	--	--	--	--	--	--	< 0.33	< 0.20	< 1.2	< 0.045	--	--	--		
MCPA	Lab	mg/kg		16	110	18	< 0.10	< 0.23	< 0.045	< 0.048	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.33	< 0.20	< 1.2	< 0.045	< 0.10	< 0.10	< 0.10		
Pentachlorophenol	Lab	mg/kg	0.023	<u>0.023</u>	120	80	--	0.30	< 0.045	< 0.048	--	--	--	--	--	--	--	< 0.33	< 0.20	< 1.2	< 0.045	--	--	--		
Picloram	Lab	mg/kg		2000	15000	2500	< 0.10	< 0.23	< 0.045	< 0.048	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.33	< 0.20	< 1.2	< 0.045	< 0.10	< 0.10	< 0.10		
Triclopyr	Lab	mg/kg					< 0.10	< 0.23	< 0.045	< 0.048	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.11	< 0.10	< 0.33	< 0.20	< 1.2	< 0.045	< 0.10	< 0.10	< 0.10		
Total Petroleum Hydrocarbons																										
Diesel Range Organics, C10-C28	Lab	mg/kg					< 12.3	< 11.5	< 12.7	< 11.6	< 12.7	< 14.4	33.7	68.1	12.4	674	< 7.2	< 67.6	166	71.0	409	< 8.3	< 14.7	1150		
Gasoline Range Organics, C6-C10	Lab	mg/kg					< 15.1	< 14.0	< 14.9	< 14.2	< 14.8	< 16.9	< 15.4	< 11.5	< 11.9	< 11.7	< 11.2	< 92.6	< 90.7	< 52.1	31.0	< 13.4	< 18.5	38.9		
Chlorinated Dioxins / Furans																										
2,3,7,8-Dioxin, tetra (TCDD)	Lab	ng/kg	DI	20 DI	35 DI	25 DI	< 1.0	< 1.0 *	< 1.0 *	--	< 1.0	--	< 1.0	--	--	< 1.0	< 1.0	--	< 1.0	--	--	< 1.0	4.3	< 1.0 *		

Data Footnotes and Qualifiers

Barr Standard Footnotes and Qualifiers

--	Not analyzed/Not available.
ND	Not detected.
*	Estimated value, QA/QC criteria not met.
**	Unusable value, QA/QC criteria not met.
I	Indeterminate value based on failure of blind duplicate data to meet quality assurance criteria

MPCA Screening Soil Leaching Values

CR6	Value represents the criteria for Chromium, hexavalent.
DCP	Value represents the criteria for 1,3-Dichloropropene.
DI	Value represents a criteria for 2,3,7,8-TCDD or 2,3,7,8-TCDD equivalents.
M	Value represents the criteria for mixed Xylenes.
MC	Mercury as Mercuric Chloride.
MP	Value represents the criteria for p-cresol.
NA	Criterion value is not available for this analyte.
T	Value represents a criteria for the total carcinogenic PAHs as B(a)P.

MPCA Criteria for Unregulated Fill

Criteria shown in this column are the minimum of the MPCA Tier 1 Residential Soil Reference Value and the MPCA Soil Leaching Value, plus the 100 mg/kg criteria for DRO and GRO. Field screening criteria are not shown.

MPCA Tier 2 Industrial Soil Reference Values

(1)	MPCA guidance is not specific for this compound, therefore the criteria are replicated for each isomer.
CR6	Value represents the criteria for Chromium, hexavalent.
DI	Value represents a criteria for 2,3,7,8-TCDD or 2,3,7,8-TCDD equivalents.
M	Value represents the criteria for mixed Xylenes.
MP	Value represents the criteria for p-cresol.
T	Value represents a criteria for the total carcinogenic PAHs as B(a)P.

MPCA Tier 2 Recreational Soil Reference Values

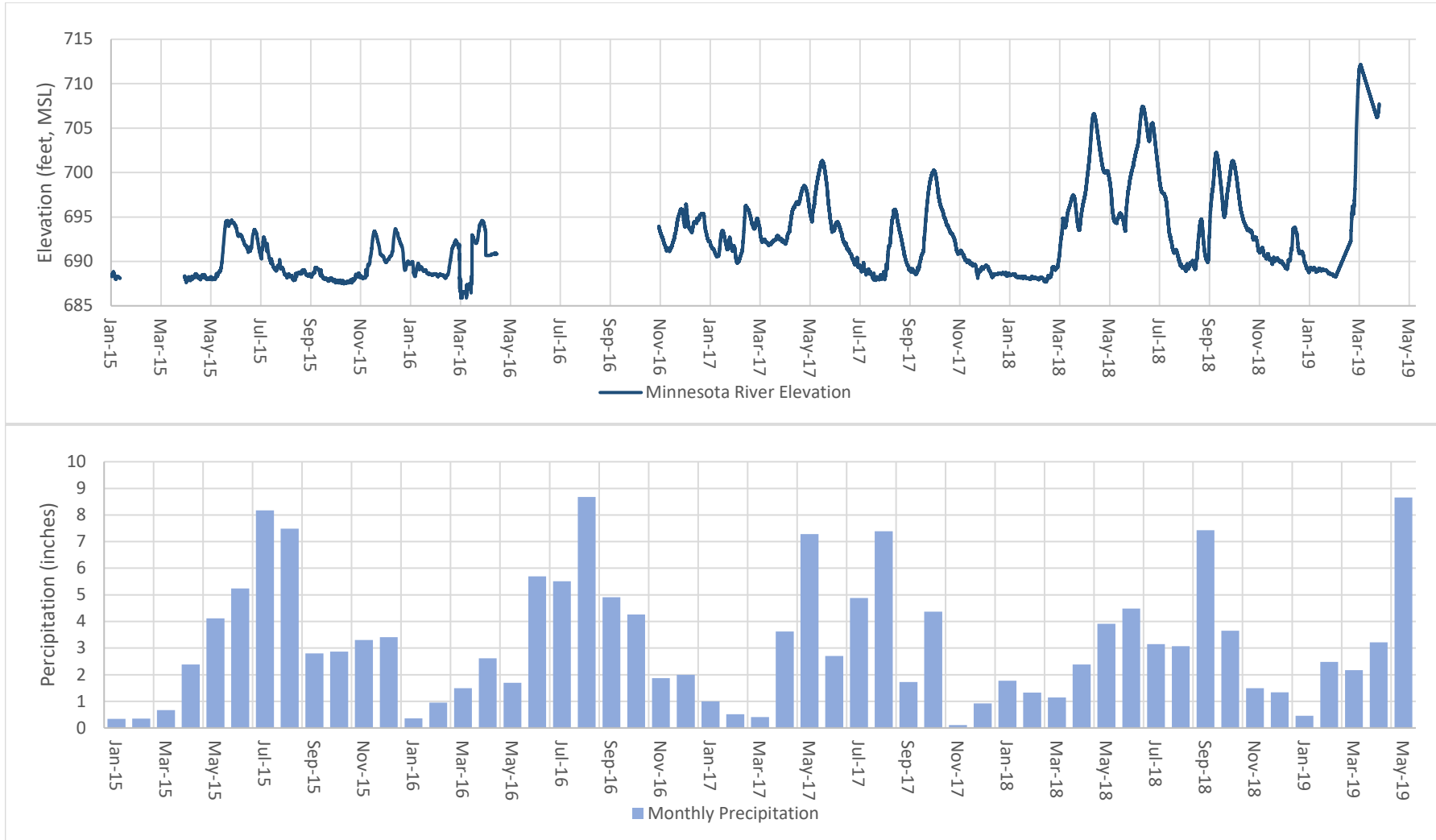
(1)	MPCA guidance is not specific for this compound, therefore the criteria are replicated for each isomer.
CR6	Value represents the criteria for Chromium, hexavalent.
DI	Value represents a criteria for 2,3,7,8-TCDD or 2,3,7,8-TCDD equivalents.
M	Value represents the criteria for mixed Xylenes.
MC	Mercury as Mercuric Chloride.
MP	Value represents the criteria for p-cresol.
T	Value represents a criteria for the total carcinogenic PAHs as B(a)P.

Appendix F

Minnesota River Elevations and Monthly Precipitation

MINNESOTA RIVER ELEVATION and MONTHLY PRECIPITATION

Focused Remedial Investigation Report
 Freeway Landfill and Dump
 Burnsville, Minnesota



Precipitation data from Minnesota State Climatology Office website http://climateapps.dnr.state.mn.us/HIDradius/radius_new.asp

Minnesota River Elevation at gauge in Savage, MN. Data received from US Army Corps of Engineers, St Paul District

Appendix G

Downhole Geophysical Survey Field Logs



462520-CALIPER

NAME : J-13
 UNIQUE NUMBER : 462520-CALIPER
 QUADRANGLE : 104-D BLOOMINGTON
 COUNTY : DAKOTA
 LOCATION/SUBSECT: ABAAAA
 SECTION : 33

OTHER SERVICES:
 [Empty box]

TOWNSHIP : 27 RANGE : 24

DATE : 03/27/19
 CASING BOTTOM : 185
 LOG BOTTOM : 199.18
 LOG TOP : 0.04

MGS CUTTINGS # :
 LOG MEASURED FROM: KB :
 DRL MEASURED FROM: DF :
 GL : 711 L1

CASING DIAMETER : 4
 CASING TYPE :
 CASING THICKNESS : 0

LOGGING UNIT :
 FIELD OFFICE : TRUCK
 RECORDED BY : STEENBERG

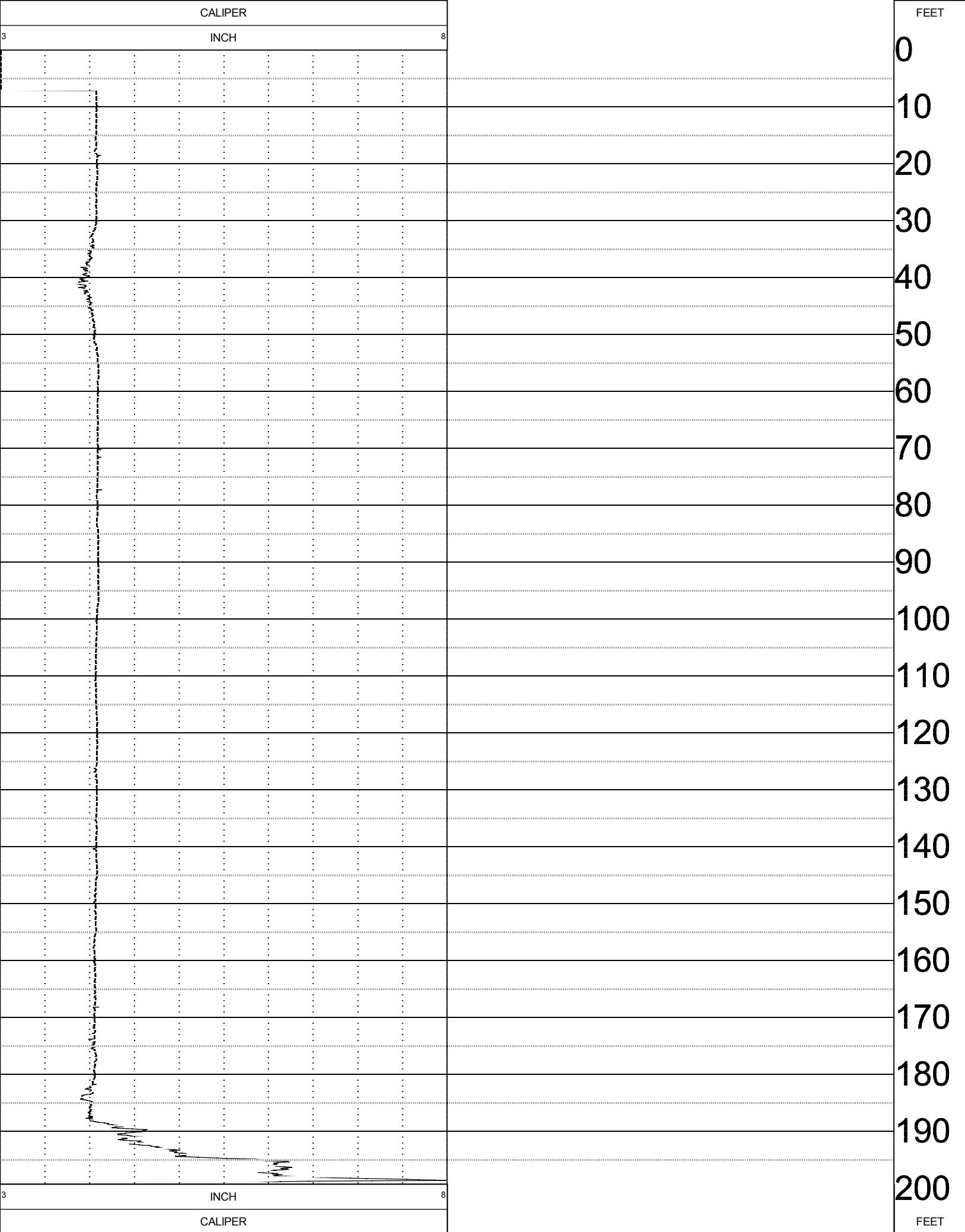
BIT SIZE : 4
 MAGNETIC DECL. : 0
 MATRIX DENSITY : 2.84
 NEUTRON MATRIX : DOLOMITE

BOREHOLE FLUID : 0
 RM : 0
 RM TEMPERATURE : 0
 MATRIX DELTA T : 44

FILE : PROCESSED
 TYPE : 8074A
 LGDATE: 03/27/19
 LGTIME : 14:49:
 THRESH: 2500

SWL : 55
 REMARKS :

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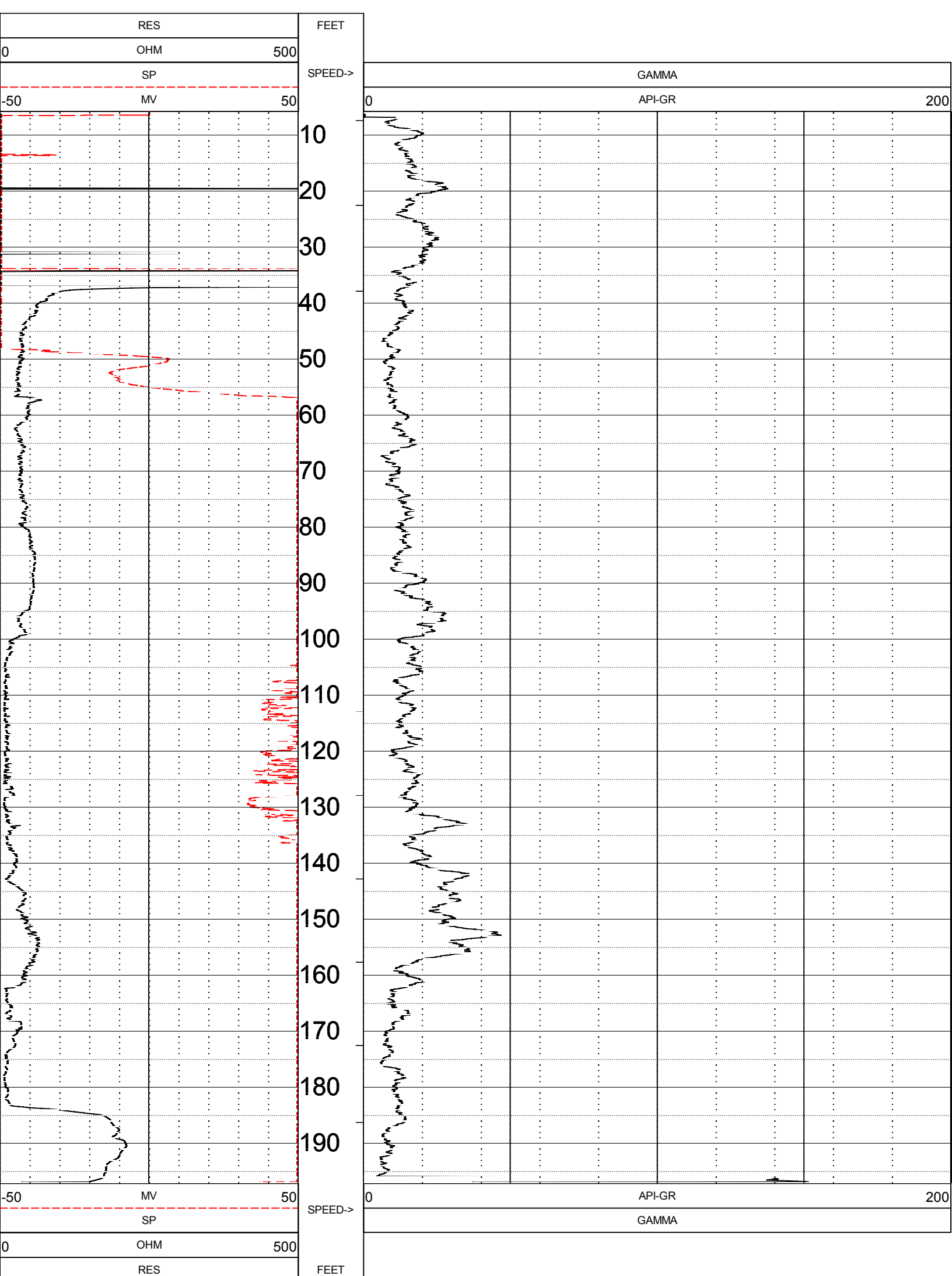


462520

NAME : J-13	OTHER SERVICES:	
UNIQUE NUMBER : 462520		
QUADRANGLE : 104-D BLOOMINGTON		
COUNTY : DAKOTA		
LOCATION/SUBSECT: ABAAAA		
SECTION : 33	TOWNSHIP : 27	RANGE : 24
DATE : 03/27/19	MGS CUTTINGS # :	
CASING BOTTOM : 185		KB :
LOG BOTTOM : 197.05	LOG MEASURED FROM:	DF :
LOG TOP : 5.77	DRL MEASURED FROM:	GL : 711 L1
CASING DIAMETER : 4	LOGGING UNIT :	
CASING TYPE :	FIELD OFFICE : TRUCK	
CASING THICKNESS : 0	RECORDED BY : STEENBERG	
BIT SIZE : 4	BOREHOLE FLUID : 0	FILE : PROCESSED
MAGNETIC DECL. : 0	RM : 0	TYPE : 9060A
MATRIX DENSITY : 2.84	RM TEMPERATURE : 0	LGDATE: 03/27/19
NEUTRON MATRIX : DOLOMITE	MATRIX DELTA T : 44	LGTIME : 13:32:
		THRESH: 2500

SWL : 55
 REMARKS :

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462521

NAME : J-14
 UNIQUE NUMBER : 462521
 QUADRANGLE : 104-D BLOOMINGTON
 COUNTY : DAKOTA
 LOCATION/SUBSECT: CDDADD
 SECTION : 33

OTHER SERVICES:
 [Empty box]

TOWNSHIP : 27 RANGE : 24

DATE : 04/03/19
 CASING BOTTOM : 162
 LOG BOTTOM : 179.90
 LOG TOP : 5.94
 CASING DIAMETER : 4
 CASING TYPE :
 CASING THICKNESS : 0

MGS CUTTINGS # :
 LOG MEASURED FROM:
 DRL MEASURED FROM:
 LOGGING UNIT :
 FIELD OFFICE : TRUCK
 RECORDED BY : STEENBERG

KB :
 DF :
 GL : 699 L1

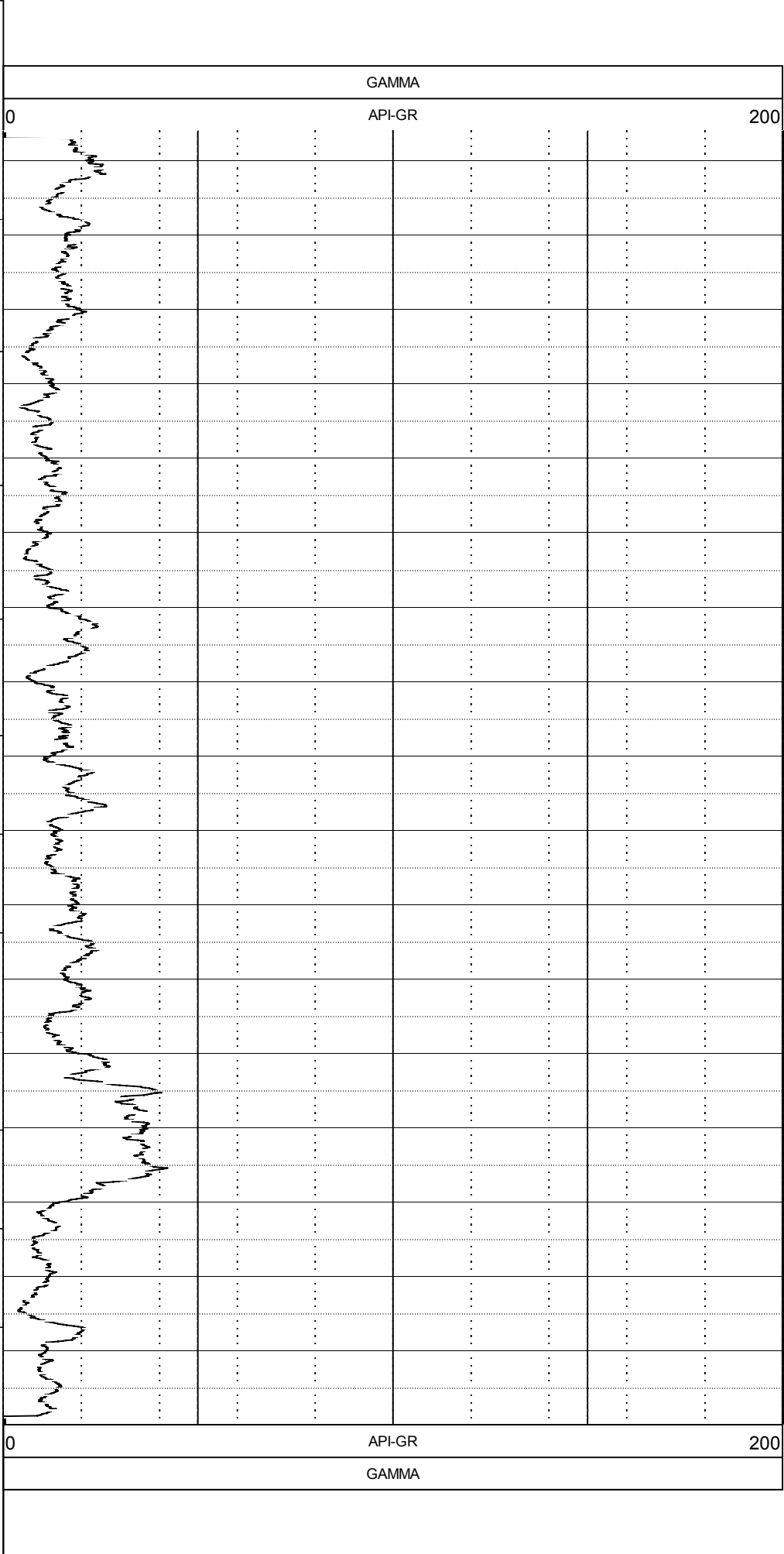
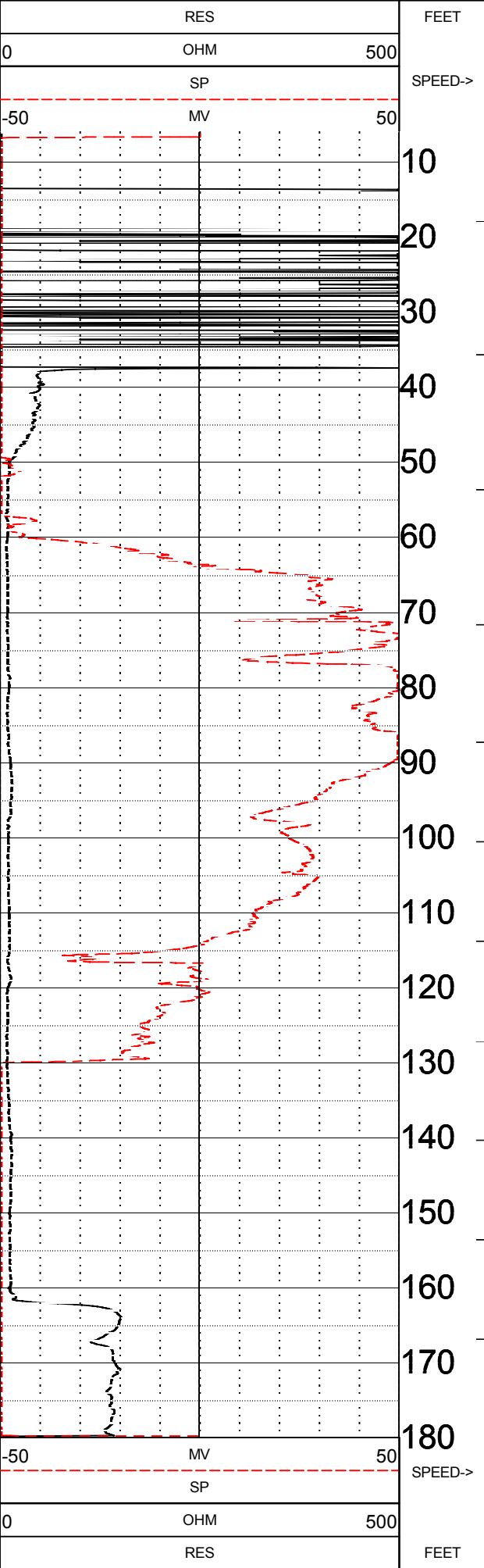
BIT SIZE : 4
 MAGNETIC DECL. : 0
 MATRIX DENSITY : 2.84
 NEUTRON MATRIX : DOLOMITE

BOREHOLE FLUID : 0
 RM : 0
 RM TEMPERATURE : 0
 MATRIX DELTA T : 44

FILE : PROCESSED
 TYPE : 9060A
 LGDATE: 04/03/19
 LGTIME : 10:53:
 THRESH: 2500

SWL : 38
 REMARKS :

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434011-CALIPER

NAME : 11-B
 UNIQUE NUMBER : 434011-CALIPER
 QUADRANGLE : 104-D BLOOMINGTON
 COUNTY : DAKOTA
 LOCATION/SUBSECT: DCCCDD
 SECTION : 28

OTHER SERVICES:

TOWNSHIP : 27 RANGE : 24

DATE : 03/27/19
 CASING BOTTOM : 46.5
 LOG BOTTOM : 98.82
 LOG TOP : 0.51
 CASING DIAMETER : 5
 CASING TYPE :
 CASING THICKNESS : 0

MGS CUTTINGS # :
 LOG MEASURED FROM:
 DRL MEASURED FROM:
 LOGGING UNIT :
 FIELD OFFICE : TRUCK
 RECORDED BY : STEENBERG

KB :
 DF :
 GL : 715 L1

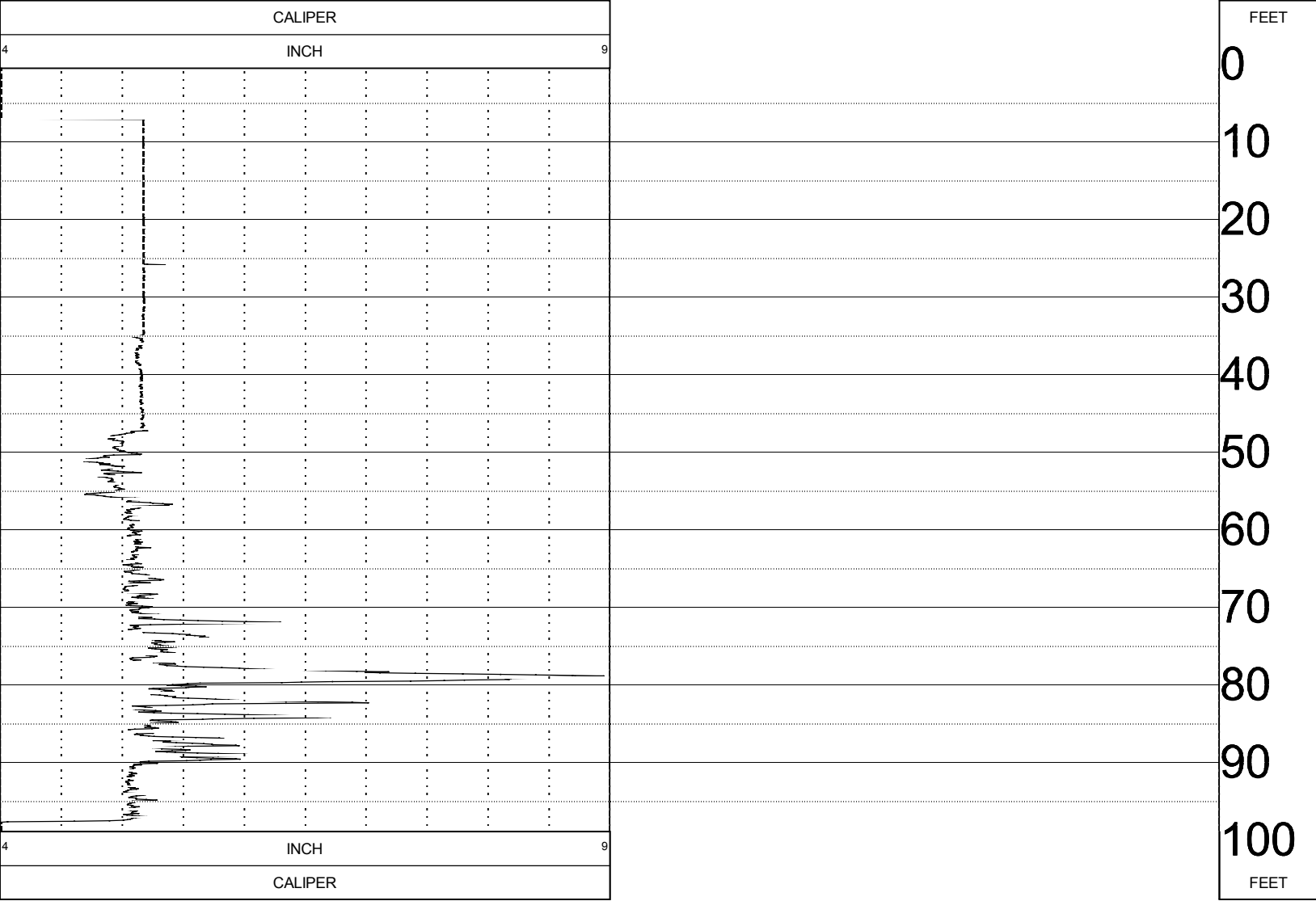
BIT SIZE : 4
 MAGNETIC DECL. : 0
 MATRIX DENSITY : 2.84
 NEUTRON MATRIX : DOLOMITE

BOREHOLE FLUID : 0
 RM : 0
 RM TEMPERATURE : 0
 MATRIX DELTA T : 44

FILE : PROCESSED
 TYPE : 8074A
 LGDATE: 03/27/19
 LGTIME : 11:00:
 THRESH: 2500

SWL : 66
 REMARKS :

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434011

NAME : 11-B
 UNIQUE NUMBER : 434011
 QUADRANGLE : 104-D BLOOMINGTON
 COUNTY : DAKOTA
 LOCATION/SUBSECT: DCCCDD
 SECTION : 28

OTHER SERVICES:

TOWNSHIP : 27 RANGE : 24

DATE : 03/27/19
 CASING BOTTOM : 46.5
 LOG BOTTOM : 98.90
 LOG TOP : 5.77
 CASING DIAMETER : 5
 CASING TYPE :
 CASING THICKNESS : 0

MGS CUTTINGS # :
 LOG MEASURED FROM:
 DRL MEASURED FROM:
 LOGGING UNIT :
 FIELD OFFICE : TRUCK
 RECORDED BY : STEENBERG
 KB :
 DF :
 GL : 715 L1

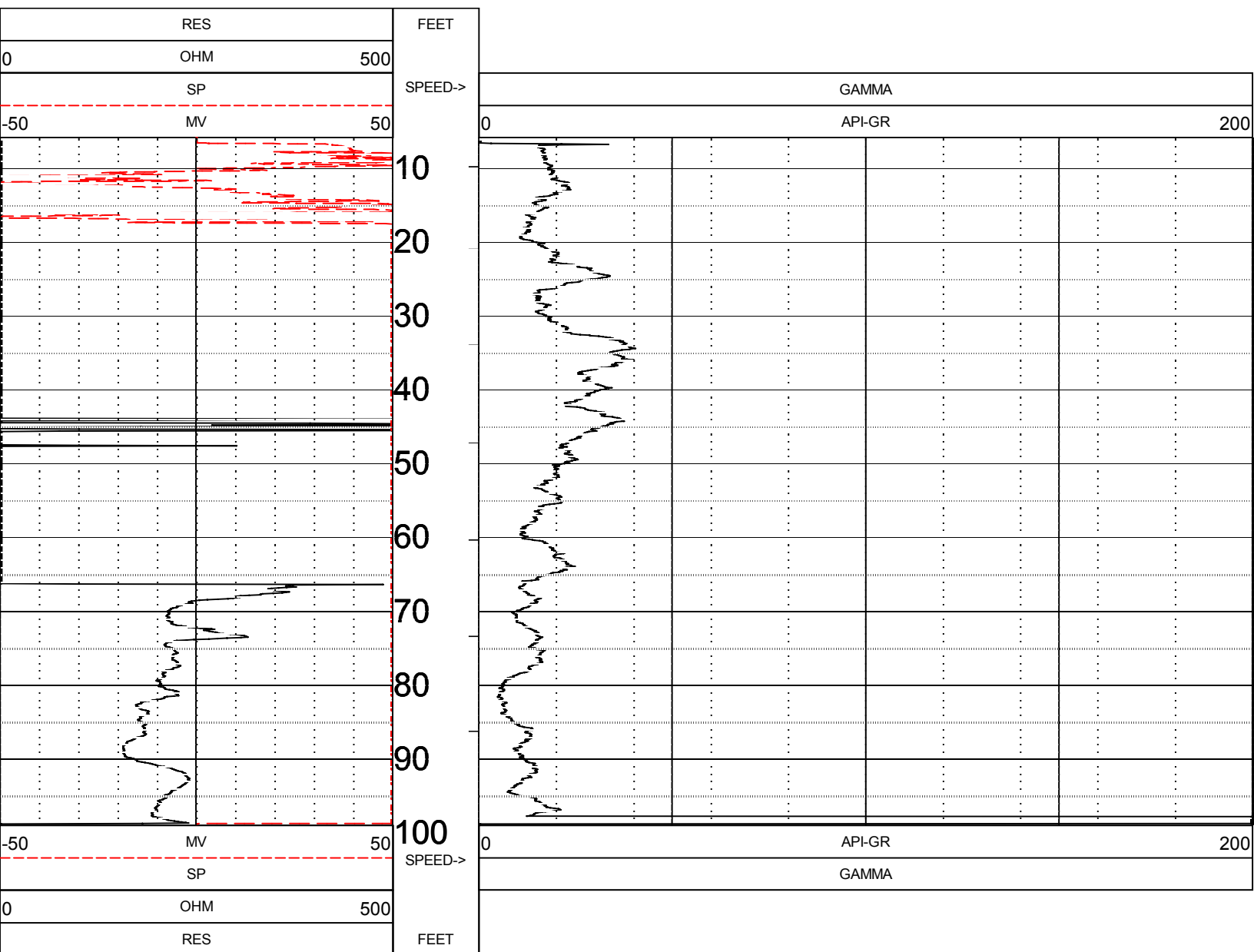
BIT SIZE : 4
 MAGNETIC DECL. : 0
 MATRIX DENSITY : 2.84
 NEUTRON MATRIX : DOLOMITE

BOREHOLE FLUID : 0
 RM : 0
 RM TEMPERATURE : 0
 MATRIX DELTA T : 44

FILE : PROCESSED
 TYPE : 9060A
 LGDATE: 03/27/19
 LGTIME : 10:20:
 THRESH: 2500

SWL : 66
 REMARKS :

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434011 - MULTI TOOL

NAME : 11-B
 UNIQUE NUMBER : 434011 - MULTI TOOL
 QUADRANGLE : 104-D BLOOMINGTON
 COUNTY : DAKOTA
 LOCATION/SUBSECT: DCCCDD
 SECTION : 28

OTHER SERVICES:

TOWNSHIP : 27 RANGE : 24

DATE : 03/27/19
 CASING BOTTOM : 46.5
 LOG BOTTOM : 96.95
 LOG TOP : 0.86
 CASING DIAMETER : 5
 CASING TYPE :
 CASING THICKNESS : 0

MGS CUTTINGS # :
 LOG MEASURED FROM:
 DRL MEASURED FROM:
 LOGGING UNIT :
 FIELD OFFICE : TRUCK
 RECORDED BY : STEENBERG

KB :
 DF :
 GL : 715 L

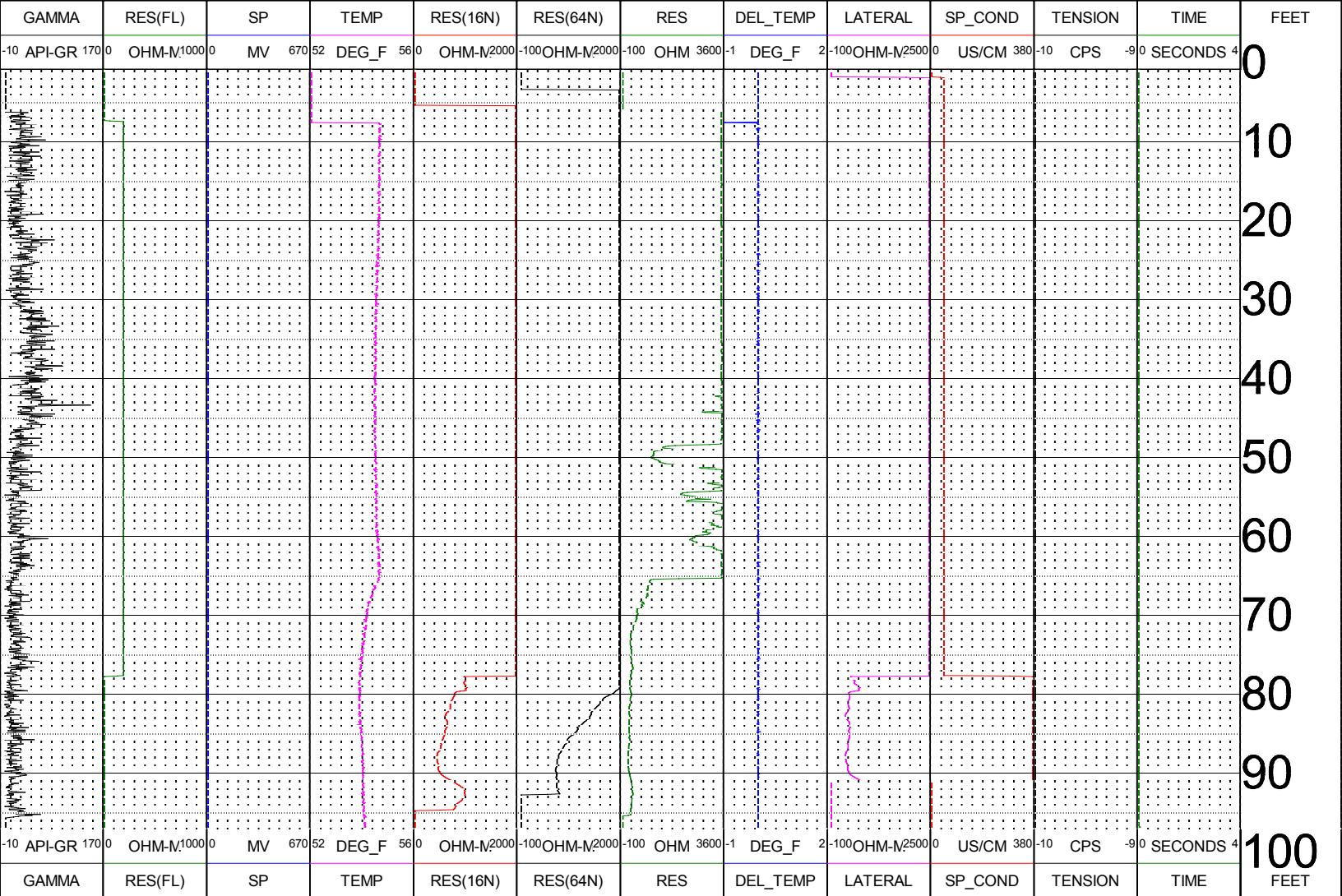
BIT SIZE : 4
 MAGNETIC DECL. : 0
 MATRIX DENSITY : 2.84
 NEUTRON MATRIX : DOLOMITE

BOREHOLE FLUID : 0
 RM : 0
 RM TEMPERATURE : 0
 MATRIX DELTA T : 44

FILE : PROCESSED
 TYPE : 8144A
 LGDATE: 03/27/19
 LGTIME : 10:44:
 THRESH: 2500

SWL : 66
 REMARKS :

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 Dept. Phone: (612)626-2969



462523

NAME : WT-13
 UNIQUE NUMBER : 462523
 QUADRANGLE : 104-D BLOOMINGTON
 COUNTY : DAKOTA
 LOCATION/SUBSECT: ABAAAA
 SECTION : 33

OTHER SERVICES:
 [Empty box]

TOWNSHIP : 27 RANGE : 24

DATE : 03/27/19
 CASING BOTTOM : 56
 LOG BOTTOM : 84.63
 LOG TOP : 5.67
 CASING DIAMETER : 4
 CASING TYPE :
 CASING THICKNESS : 0

MGS CUTTINGS # :
 LOG MEASURED FROM:
 DRL MEASURED FROM:
 LOGGING UNIT :
 FIELD OFFICE : TRUCK
 RECORDED BY : STEENBERG

KB :
 DF :
 GL : 710 L1

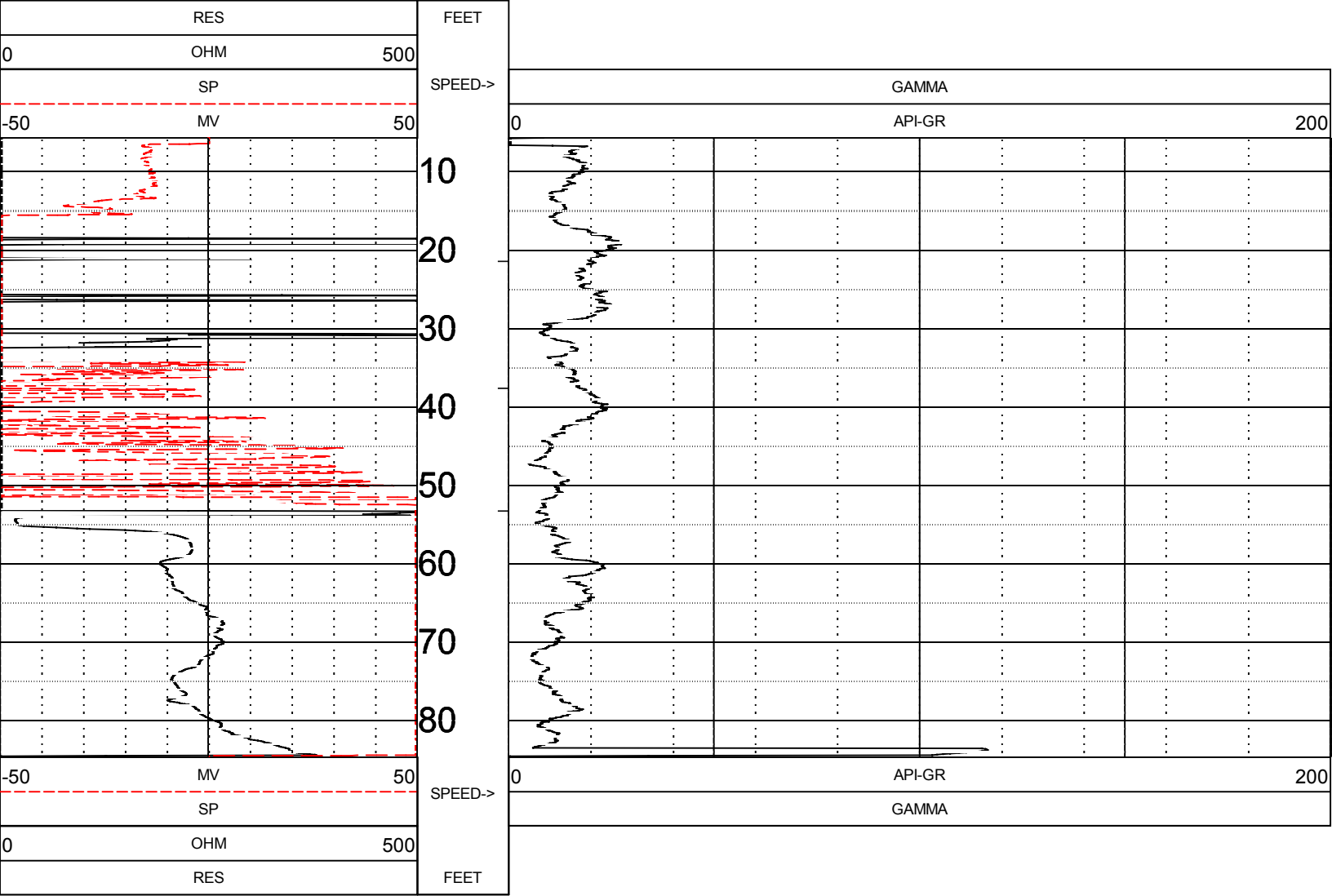
BIT SIZE : 4
 MAGNETIC DECL. : 0
 MATRIX DENSITY : 2.84
 NEUTRON MATRIX : DOLOMITE

BOREHOLE FLUID : 0
 RM : 0
 RM TEMPERATURE : 0
 MATRIX DELTA T : 44

FILE : PROCESSED
 TYPE : 9060A
 LGDATE: 03/27/19
 LGTIME : 13:54:
 THRESH: 2500

SWL : 53
 REMARKS :

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462523-CALIPER

NAME : WT-13
 UNIQUE NUMBER : 462523-CALIPER
 QUADRANGLE : 104-D BLOOMINGTON
 COUNTY : DAKOTA
 LOCATION/SUBSECT: ABAAAA
 SECTION : 33

OTHER SERVICES:

TOWNSHIP : 27 RANGE : 24

DATE : 03/27/19
 CASING BOTTOM : 56
 LOG BOTTOM : 84.97
 LOG TOP : 0.02
 CASING DIAMETER : 4
 CASING TYPE :
 CASING THICKNESS : 0

MGS CUTTINGS # :
 LOG MEASURED FROM:
 DRL MEASURED FROM:
 LOGGING UNIT :
 FIELD OFFICE : TRUCK
 RECORDED BY : STEENBERG

KB :
 DF :
 GL : 710 L1

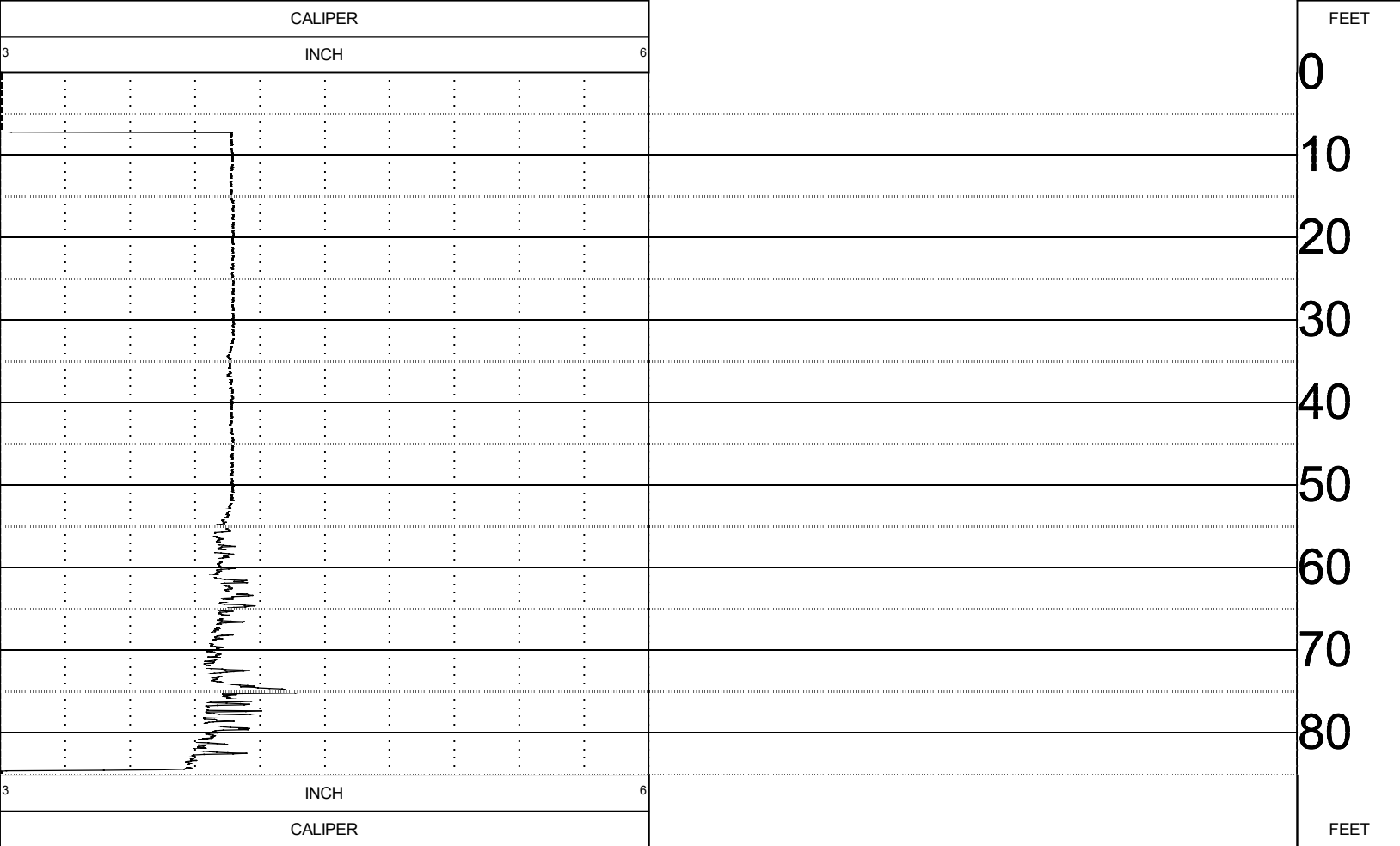
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 MAGNETIC DECL. : 0
 MATRIX DENSITY : 2.84
 NEUTRON MATRIX : DOLOMITE

BOREHOLE FLUID : 0
 RM : 0
 RM TEMPERATURE : 0
 MATRIX DELTA T : 44

FILE : PROCESSED
 TYPE : 8074A
 LGDATE: 03/27/19
 LGTIME : 15:05:
 THRESH: 2500

SWL : 53
 REMARKS :

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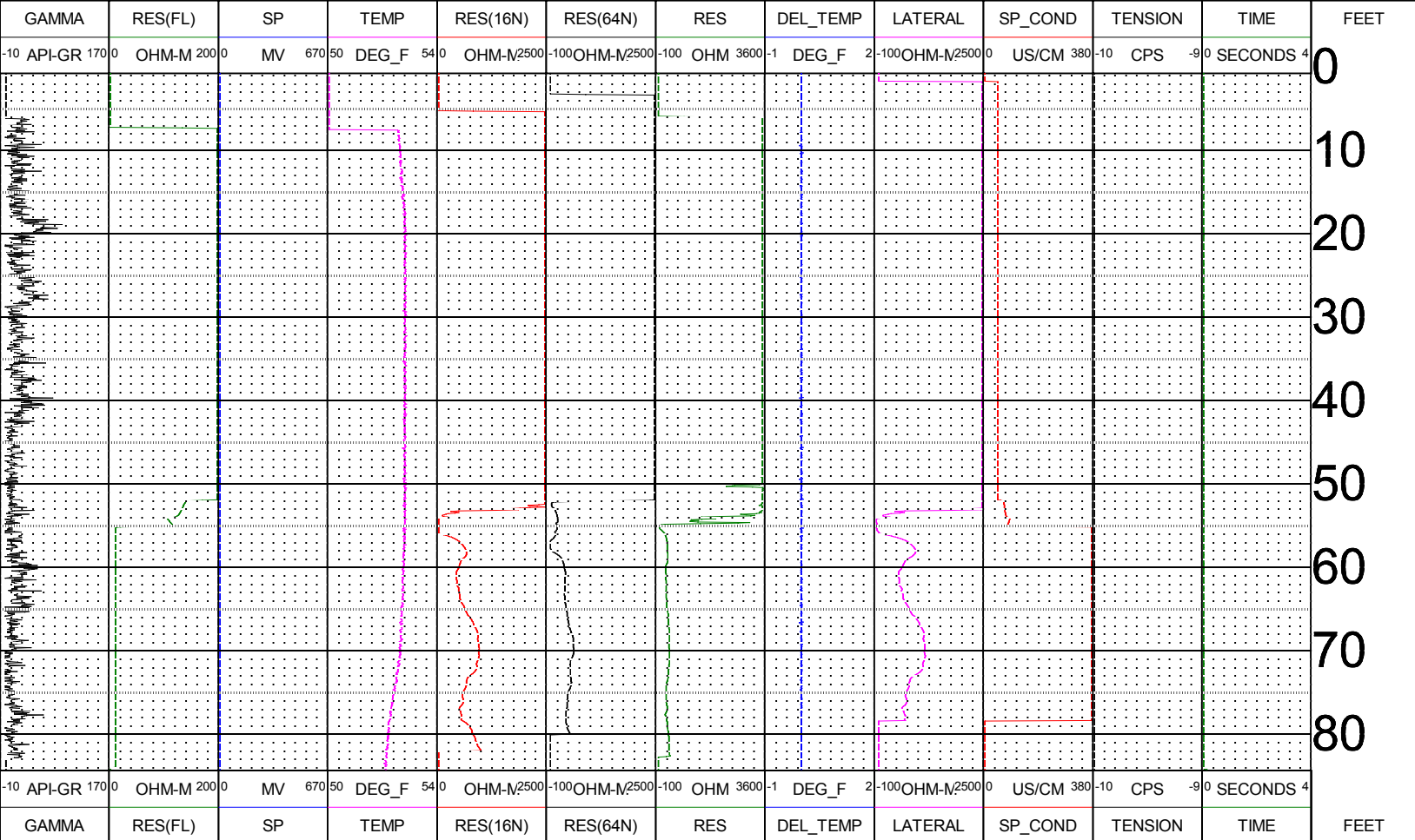




462523-MULTI

NAME	: WT-13	OTHER SERVICES:			
UNIQUE NUMBER	: 462523-MULTI				
QUADRANGLE	: 104-D BLOOMINGTON				
COUNTY	: DAKOTA				
LOCATION/SUBSECT:	ABAAAA				
SECTION	: 33		TOWNSHIP : 27	RANGE : 24	
DATE	: 03/27/19	MGS CUTTINGS #	:		
CASING BOTTOM	: 56		KB :		
LOG BOTTOM	: 84.28	LOG MEASURED FROM:	DF :		
LOG TOP	: 0.78	DRL MEASURED FROM:	GL : 710 L1		
CASING DIAMETER	: 4	LOGGING UNIT	:		
CASING TYPE	:	FIELD OFFICE	: TRUCK		
CASING THICKNESS	: 0	RECORDED BY	: STEENBERG		
BIT SIZE	: 4	BOREHOLE FLUID	: 0	FILE	: PROCESSED
MAGNETIC DECL.	: 0	RM	: 0	TYPE	: 8144A
MATRIX DENSITY	: 2.84	RM TEMPERATURE	: 0	LGDATE:	03/27/19
NEUTRON MATRIX	: DOLOMITE	MATRIX DELTA T	: 44	LGTIME:	14:09:
				THRESH:	2500
SWL	: 53				
REMARKS	:				

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462522

NAME : WJ-14
 UNIQUE NUMBER : 462522
 QUADRANGLE : 104-D BLOOMINGTON
 COUNTY : DAKOTA
 LOCATION/SUBSECT: CDDADD
 SECTION : 33

OTHER SERVICES:
 [Empty box]

TOWNSHIP : 27 RANGE : 24

DATE : 04/03/19
 CASING BOTTOM : 56
 LOG BOTTOM : 79.94
 LOG TOP : 5.80
 CASING DIAMETER : 4
 CASING TYPE :
 CASING THICKNESS : 0

MGS CUTTINGS # :
 LOG MEASURED FROM:
 DRL MEASURED FROM:
 LOGGING UNIT :
 FIELD OFFICE : TRUCK
 RECORDED BY : STEENBERG

KB :
 DF :
 GL : 699 L1

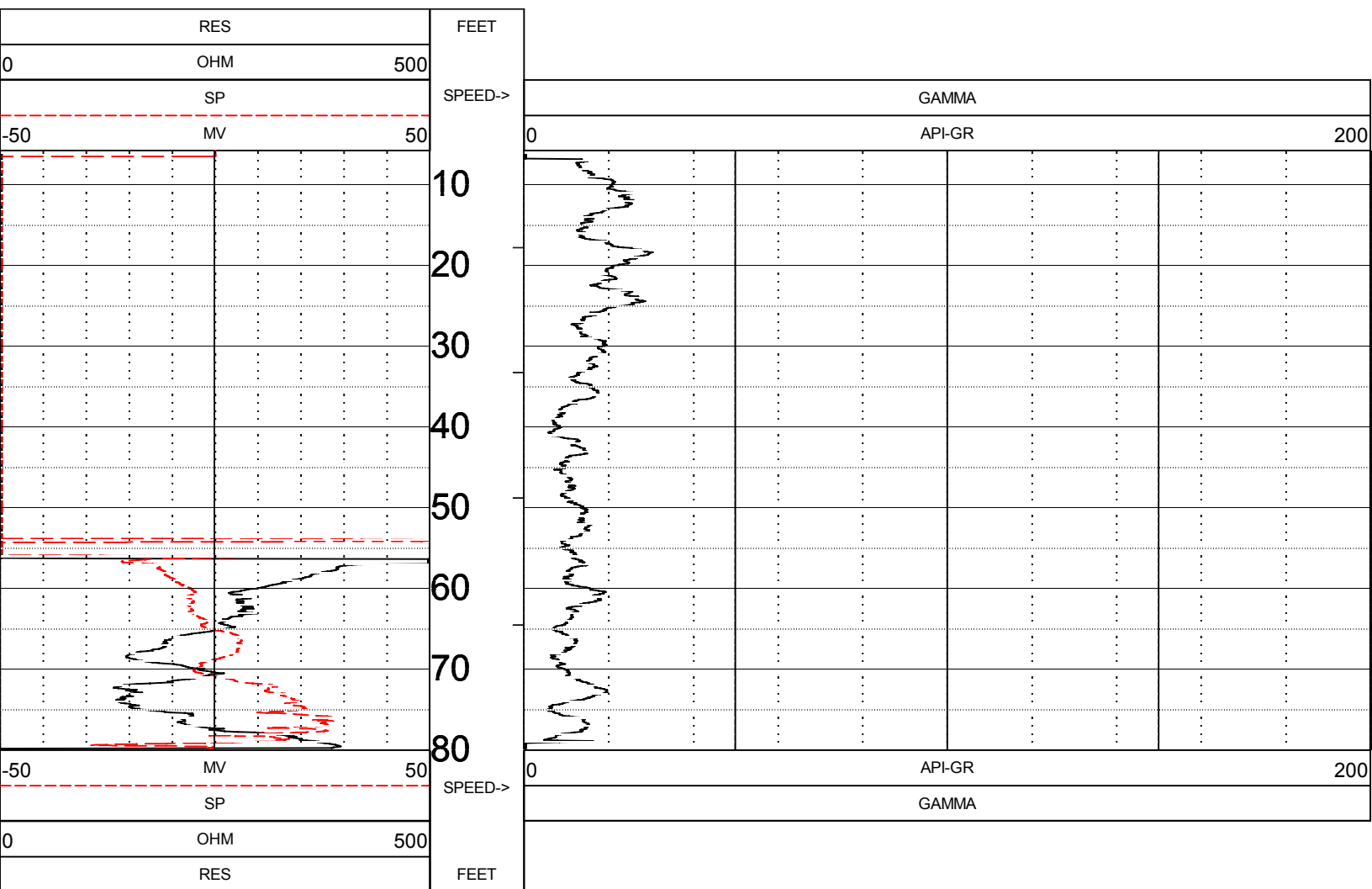
BIT SIZE : 4
 MAGNETIC DECL. : 0
 MATRIX DENSITY : 2.84
 NEUTRON MATRIX : DOLOMITE

BOREHOLE FLUID : 0
 RM : 0
 RM TEMPERATURE : 0
 MATRIX DELTA T : 44

FILE : PROCESSED
 TYPE : 9060A
 LGDATE: 04/03/19
 LGTIME : 10:37:
 THRESH: 2500

SWL : 57.2
 REMARKS :

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462522-MULTI

NAME : WJ-14		OTHER SERVICES:
UNIQUE NUMBER : 462522-MULTI		
QUADRANGLE : 104-D BLOOMINGTON		
COUNTY : DAKOTA		
LOCATION/SUBSECT: CDDADD		
SECTION : 33	TOWNSHIP : 27	RANGE : 24
DATE : 04/03/19	MGS CUTTINGS # :	
CASING BOTTOM : 56		KB :
LOG BOTTOM : 79.88	LOG MEASURED FROM:	DF :
LOG TOP : 0.92	DRL MEASURED FROM:	GL : 699 L1
CASING DIAMETER : 4	LOGGING UNIT :	
CASING TYPE :	FIELD OFFICE : TRUCK	
CASING THICKNESS : 0	RECORDED BY : STEENBERG	
BIT SIZE : 4	BOREHOLE FLUID : 0	FILE : PROCESSED
MAGNETIC DECL. : 0	RM : 0	TYPE : 8144A
MATRIX DENSITY : 2.84	RM TEMPERATURE : 0	LGDATE: 04/03/19
NEUTRON MATRIX : DOLOMITE	MATRIX DELTA T : 44	LGTIME : 11:32:
		THRESH: 2500
SWL : 57.2		
REMARKS :		

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