



**FOURTH FIVE-YEAR REVIEW REPORT FOR
UNIVERSITY OF MINNESOTA ROSEMOUNT RESEARCH CENTER
SUPERFUND SITE
CITY OF ROSEMOUNT, DAKOTA COUNTY, MINNESOTA**

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List of Acronyms

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
CCl ₄	Carbontetrachloride
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EDD	Enforcement Decision Document
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
DNAPL	Dense Non-Aqueous Phase Liquid
FS	Feasibility Study
GAC	Granular Activated Carbon
GIS	Geographic Information System
GOW	Gopher Ordinance Works
GPS	Global Positioning System
GUE	Georges Used Electric site
GUE Deep	Area at the GUE site PCBs up to 25 ppm were placed and capped
GUE Shallow	Area at the GUE site where PCBs up to 10 ppm were spread and soil-covered
HBV	Health-Based Value (non-promulgated MDH value)
HRL	Health Risk Limit (promulgated MDH standard for private drinking water supplies)
IC	Institutional Control
ICIAP	Institutional Controls Implementation and Assurance Plan
LTS	Long-Term Stewardship
MCE	Methylene Chloride Extractable
MCL	Maximum Contaminant Level (Federal standard for public drinking water supplies)
MCLG	Maximum Contaminant Level Goal (Federally established level of a contaminant in drinking water below which there is no known or expected risk to health)
MDH	Minnesota Department of Health
MEDD	Minnesota Enforcement Decision Document
MERLA	Minnesota Environmental Response and Liability Act
Minn. R.	Minnesota Rule

MN	Minnesota
MNDOT	Minnesota Department of Transportation
MOA	Memorandum of Agreement
MPCA	Minnesota Pollution Control Agency
MW	Monitoring Well
NCP	National Contingency Plan
ng/L	Nanograms per Liter
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethylene
PE	Porter Electric and Machine Company
PLP	Permanent List of Priorities (State of Minnesota)
ppb	Parts per Billion
ppm	Parts per Million
PRP	Potentially Responsible Party
RA	Remedial Action
RAL	Recommended Allowable Limit (State of Minnesota health-based limit for private drinking water supplies, precursor to the HRL)
RAO	Remedial Action Objective
RBCA	Risk-Based Correction Action
RBSE	Risk-based Site Evaluation
RCRA	Resource Conservation and Recovery Act of 1976
RD	Remedial Design
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
SDWA	Safe Drinking Water Act
Site	University of Minnesota Rosemount Research Center Superfund Site
SLV	Soil Leaching Value (State of Minnesota)
SRV	Soil Reference Value (State of Minnesota)
SVOC	Semi-Volatile Organic Compound

TBC	To Be Considered
TCE	Trichloroethylene
TDU	Thermal Destruction Unit
TSCA	Toxic Substances Control Act
UECA	Uniform Environmental Covenants Act
UMore	University of Minnesota Outreach, Research and Education [Park]
UMRRC	University of Minnesota Rosemount Research Center
UST	U.S. Transformer
UU/UE	Unlimited Use and Unrestricted Exposure
VI	Vapor Intrusion
VOC	Volatile Organic Compound

Executive Summary

The U.S. Environmental Protection Agency (EPA) conducted this statutory five-year review of the remedy implemented at the University of Minnesota Rosemount Research Center (UMRRC) Superfund Site ("Site") in Rosemount, Minnesota. This is the fourth five-year review for the Site. Construction for the Superfund remedy at the Site was complete in 1994. The purpose of this five-year review is to determine whether the selected remedy at the Site is protective of human health and the environment.

The Site was described at the time of listing on the National Priorities List as the UMRRC property covering approximately 12 square miles and located partly in the City of Rosemount and partly in Empire Township, Minnesota. This property includes what is now known as UMore East/Gopher Ordnance Works and the Vermillion Highlands. The Site is part of EPA's agreement with the Minnesota Pollution Control Agency (MPCA) called the MPCA Enforcement Deferral Pilot Project. Under this pilot project, MPCA became the lead agency for CERCLA investigation and enforcement. During the Remedial Investigation, Site boundaries for the Minnesota Environmental Response and Liability Act (MERLA)/Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) response action were clarified to encompass specific areas of the UMRRC as described in the Record of Decision. This five-year review refers to the area addressed by the MERLA/CERCLA response action as the Site.

The Site was previously used as an agricultural research station and for a variety of industrial uses. A State-enforcement-lead Superfund cleanup was conducted on areas of the Site known as the George's Used Equipment (GUE) site, the Porter Electric and Machine Company (PE) site, the U.S. Transformer (UST) site, and the Burn Pit site. Other parts of the UMRRC property have in the past and are currently the subject of environmental and health investigations under other processes, including the Environmental Impact Statement process.

MPCA signed a Minnesota Enforcement Decision Document (MEDD) on December 4, 1986 that selected the remedial action for groundwater at the Site. MPCA signed a Record of Decision (ROD) for the Site on June 11, 1990. EPA concurred with the ROD on June 29, 1990. The ROD further documented the existing remedy for groundwater and selected a remedy for soils at the Site. The objectives of the ROD were to eliminate human health risks to contaminants in soil, to provide safe drinking water to affected residences, and to achieve Federal and State drinking water standards for chloroform in groundwater. With EPA concurrence, MPCA modified the remedy via Explanations of Significant Differences (ESDs) in August 1991 and October 1993 to make various changes to treatment and disposal methods for the soil remedy. Actions implemented under the MEDD and ROD includes:

- Operable Unit 1 (OU 1) – construction of a community rural water supply system and a groundwater pump and treat system;
- Operable Unit 2 (OU 2) – Excavation and off-site disposal of soil contaminated with metals at multiple concentrations and PCBs at concentrations greater than 25 ppm from GUE; consolidation and on-site containment of soil contaminated with metals and PCBs between 10 and 25 ppm in a containment unit designated as GUE Deep;
- Operable Unit 3 (OU 3) – Excavation and on-site thermal destruction of PCB-contaminated soil with concentrations greater than 25 ppm from multiple areas with disposal of treatment residuals and wastewater in GUE Deep; placement of a 10-inch soil cover on excavated areas with PCBs in soil at concentrations between 1 and 10 ppm;

placement of a 16-inch soil cover and fencing of GUE Deep. This OU is co-located with OU 2.

The remedy at OU 1 currently protects human health and the environment in the short-term because the community rural water supply system was implemented and groundwater does not exceed health risk levels or MCLGs for Site-related contaminants. However, in order for the remedy to be protective in the long-term, the following actions need to be taken: (1) Evaluate existing ICs for areas adjacent to the Burn Pit, which exceed levels appropriate for unrestricted use/unlimited exposure and assess whether additional ICs are needed to ensure long-term protectiveness, and (2) Document plans for further investigation prior to reuse.

The remedy for OUs 2 and 3 currently protects human health and the environment in the short-term because PCB-contaminated soil was excavated, treated on-site and disposed of on-site and off-site. However, in order for the remedy to be protective in the long-term, the following actions need to be taken: (1) Evaluate existing ICs for adjacent areas which exceed levels appropriate for unrestricted use/unlimited exposure and assess whether additional ICs are needed to ensure long-term protectiveness, (2) Conduct further soil investigation and implement appropriate cleanup for areas that exceed cleanup levels or current risk-based levels, and (3) Review available historical information and existing data for indications of PCB- or other contaminant-containing oils being used for dust control on area roadways.

The remedy for the Site currently protects human health and the environment in the short-term because groundwater meets drinking water standards for Site-related contaminants and contaminated soil was excavated, treated, and disposed of appropriately. However, in order for the remedy to be protective in the long-term, the following actions need to be taken: (1) For OUs 1, 2 and 3, evaluate existing ICs for adjacent areas which exceed levels appropriate for unrestricted use/unlimited exposure and assess whether additional ICs are needed to ensure long-term protectiveness, (2) For OU 1, document plans for further soil investigation prior to reuse, (3) For OUs 2 and 3, conduct further soil investigation and implement appropriate cleanup for areas that exceed cleanup levels or current risk-based levels, and (4) For OUs 2 and 3, review available historical information and existing data for indications of PCB- or other contaminant-containing oils being used for dust control on area roadways.

Five-Year Review Summary Form

Site name (from WasteLAN): University of Minnesota Rosemount Research Center		
EPA ID (from WasteLAN): MND980613780		
Region: 5	State: MN	City/County: Rosemount/Dakota
NPL status: <input type="checkbox"/> Final <input checked="" type="checkbox"/> Deleted <input type="checkbox"/> Other (specify)		
Remediation status (choose all that apply): <input type="checkbox"/> Under Construction <input type="checkbox"/> Operating <input checked="" type="checkbox"/> Complete		
Multiple OUs?* <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Construction completion date: 6/29/1994	
Has site been put into reuse? <input checked="" type="checkbox"/> YES (partial) <input type="checkbox"/> NO		
Lead agency: <input checked="" type="checkbox"/> EPA <input type="checkbox"/> State <input type="checkbox"/> Tribe <input type="checkbox"/> Other Federal Agency _____		
Author name: Leah Evison		
Author title: Remedial Project Manager	Author affiliation: EPA	
Review period:** 6/15/2007 to 6/15/2012		
Date(s) of site inspection: 11/7/2011 and 6/6/2012		
Type of review: <input checked="" type="checkbox"/> Post-SARA <input type="checkbox"/> Pre-SARA <input type="checkbox"/> NPL-Removal only <input type="checkbox"/> Non-NPL Remedial Action Site <input type="checkbox"/> NPL State/Tribe-lead <input type="checkbox"/> Regional Discretion		
Review number: <input type="checkbox"/> 1 (first) <input type="checkbox"/> 2 (second) <input type="checkbox"/> 3 (third) <input checked="" type="checkbox"/> Other (specify) Fourth		
Triggering action: <input type="checkbox"/> Actual RA Onsite Construction at OU #_1 <input type="checkbox"/> Actual RA Start at OU#_____ <input type="checkbox"/> Construction Completion <input checked="" type="checkbox"/> Previous Five-Year Review Report <input type="checkbox"/> Other (specify)		
Triggering action date (from WasteLAN): 6/15/2007		
Due date (five years after triggering action date): 6/15/2012		

* OU" refers to operable unit.

Five-Year Review Summary Form (continued)

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:

n/a

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 1,2,3 (site-wide)	Issue Category: Institutional Controls			
	Issue: IC review needed to ensure effective ICs are in place and long-term stewardship is conducted; need for ICs not documented in decision document			
	Recommendation: Review ICs for areas adjacent to current IC boundaries which exceed cleanup levels and/or soil screening levels for residential use and revise ICs as needed			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	PRP	MPCA	12/15/2012

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 1,2,3 (site-wide)	Issue Category: Institutional Controls			
	Issue: Need for ICs not documented in decision document			
	Recommendation: Modify decision document as appropriate			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	MPCA	EPA	6/15/2013

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 1	Issue Category: Changed Site Conditions			
	Issue: Limited soil sampling in Burn Pit area			
	Recommendation: Document plans for further investigation prior to reuse.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	PRP	MPCA	6/15/2013

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 2 & 3	Issue Category: Changed Site Conditions			
	Issue: Lead and PCB exceedances of cleanup level and uncertainty concerning dioxin/furans			
	Recommendation: Conduct further soil investigation and implement appropriate cleanup for areas that exceed cleanup levels or current risk-based levels.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	PRP	MPCA	6/15/2013

Issues and Recommendations Identified in the Five-Year Review:

OU(s): 2 & 3	Issue Category: Changed Site Conditions			
	Issue: Uncertainty concerning dust control pathway			
	Recommendation: Review available historical information and existing data for indications of PCB or other contaminant-containing oils being used for dust control on area roadways.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	PRP	MPCA	12/15/2012

Protectiveness Statement(s)

Operable Unit:

1

Protectiveness Determination:

Short-term Protective

Protectiveness Statement:

The remedy at OU 1 currently protects human health and the environment in the short-term because the community rural water supply system was implemented and groundwater does not exceed health risk levels or MCLGs for Site-related contaminants. However, in order for the remedy to be protective in the long-term, the following actions need to be taken: (1) Evaluate existing ICs for areas adjacent to the Burn Pit, which exceed levels appropriate for unrestricted use/unlimited exposure and assess whether additional ICs are needed to ensure long-term protectiveness, and (2) Document plans for further investigation prior to reuse.

Operable Units:

2 and 3

Protectiveness Determination:

Short-term Protective

Protectiveness Statement:

The remedy for OUs 2 and 3 currently protects human health and the environment in the short-term because PCB-contaminated soil was excavated, treated on-site and disposed of on-site and off-site. However, in order for the remedy to be protective in the long-term, the following actions need to be taken: (1) Evaluate existing ICs for adjacent areas which exceed levels appropriate for unrestricted use/unlimited exposure and assess whether additional ICs are needed to ensure long-term protectiveness, (2) Conduct further soil investigation and implement appropriate cleanup for areas that exceed cleanup levels or current risk-based levels, and (3) Review available historical information and existing data for indications of PCB- or other contaminant-containing oils being used for dust control on area roadways.

Operable Unit:

Sitewide

Protectiveness Determination:

Short-term Protective

Protectiveness Statement:

The remedy for the Site currently protects human health and the environment in the short-term because groundwater meets drinking water standards for Site-related contaminants and contaminated soil was excavated, treated, and disposed of appropriately. However, in order for the remedy to be protective in the long-term, the following actions need to be taken: (1) For OUs 1, 2 and 3, evaluate existing ICs for adjacent areas which exceed levels appropriate for unrestricted use/unlimited exposure and assess whether additional ICs are needed to ensure long-term protectiveness, (2) For OU 1, document plans for further soil investigation prior to reuse, (3) For OUs 2 and 3, conduct further soil investigation and implement appropriate cleanup for areas that exceed cleanup levels or current risk-based levels, and (4) For OUs 2 and 3, review available historical information and existing data for indications of PCB- or other contaminant-containing oils being used for dust control on area roadways.

Date of last Regional review of Human Exposure Indicator (from WasteLAN): June 2012

Human Exposure Survey Status (from WasteLAN): Human Exposure Under Control

Date of last Regional review of Groundwater Migration Indicator (from WasteLAN): June 2012

Groundwater Migration Survey Status (from WasteLAN): Contaminated Groundwater Migration Under Control

Ready for Reuse Determination Status (from WasteLAN): SWRAU planned 6/30/14

I. Introduction

The purpose of this five-year review report is to determine whether the remedy at the Site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in this report. In addition, this report identifies issues found during the review and identifies recommendations to address them.

EPA must conduct five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. § 9601 et seq., and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300 et seq. Section 121(c) of CERCLA states:

If a remedial action is selected that results in any hazardous substances, pollutants, or contaminants remaining at the site, the remedial action shall be reviewed no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

The NCP at 40 C.F.R. § 300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

EPA conducted this statutory five-year review of the remedy implemented at the Site. This review was conducted from October 2011 through May 2012. This report documents the results of the five-year review.

This is the fourth five-year review for the Site. The triggering action for this statutory review is the completion date of the previous five-year review on June 15, 2007. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

In 1995, the Minnesota Pollution Control Agency (MPCA) and EPA reached an agreement about certain Minnesota sites being addressed under CERCLA called the MPCA Enforcement Deferral Pilot Project, which included the UMRRC Site. Under this pilot project, MPCA became the lead agency for CERCLA investigation and enforcement. Although at this time EPA is deferring to MPCA's authority to address the Site, EPA retains the authority to address Site contamination if new information indicates a need to do so. Additionally, EPA and MPCA may review the designation of the site to MPCA (called the "lead agency designation") at any point in the response process.

Remedial action is now complete at the Site and the Site was deleted from the National Priorities List (NPL) in 2001.

The Site consisted of three OUs as described below.

OU 1 consisted of contaminated groundwater from the Burn Pit area. The remedial action objective (RAOs) for groundwater was to prevent ingestion of groundwater contaminated with volatile organic compounds (VOCs). Remedial action at this OU included construction and operation of a groundwater pump and treatment system and construction of a community rural water supply system.

OU 2 and OU 3 involved soil at multiple areas of the Site. The RAO for soil was to eliminate human health risks through direct contact with soil and concrete contaminated with lead, copper and PCBs.

OU 2 consisted of actions conducted in 1990 to address soil contaminated by lead and copper from an area of the Site known as the George's Used Equipment (GUE) site. Remedial action at this OU included excavation and off-site disposal of approximately 4,384 tons of contaminated soil.

OU 3 consisted of actions conducted primarily in 1992 to 1995 to address PCB-contaminated soil and concrete from three industrial disposal areas known as Porter Electric and Machine Company (PE), and U.S. Transformer (UST) sites, in addition to supplemental soil from GUE. Remedial action included on-site thermal treatment of approximately 12,100 tons of contaminated soil; consolidation of treatment residuals and small amounts of additional contaminated soil onto an on-site area known as GUE Deep; off-site disposal of a small amount of additional contaminated soil; placement of a soil cover over excavated areas with low levels of PCBs remaining; and capping and fencing of GUE Deep.

II. Site Chronology

Table 1 – Chronology of Site Events

Event	Date
Discovery of problem (groundwater)	Jan. 31, 1984
Listed on State Permanent List of Priorities	October 1984
Request for Response Action issued by MPCA to University	Oct. 4, 1984
Phase I RI Report (groundwater) submitted to MPCA	March 13, 1985
Response Action Agreement under MERLA signed between MPCA and University of Minnesota	May 30, 1985
Listed on National Priorities List	June 10, 1986
Minnesota Enforcement Decision Document signed (groundwater only)	Dec. 4, 1986
Response Action Plan (RAP) for groundwater submitted	May 12, 1986
Groundwater pump and treat system constructed	1987
Remedial Investigation/Feasibility Study (soil and groundwater)	1986 – 1990
ROD signed by MPCA (soil remedy and further documenting previous groundwater remedy)	June 11, 1990
EPA concurrence with ROD	June 29, 1990
Water supply line extensions completed	1991
First remedy modification (Explanation of Significant Differences)	August 1991
Pump and treat system shut down following increase in MCL	1991
Second remedy modification (Explanation of Significant Differences)	Oct. 1, 1993
U of M conducted soil removal, operation of thermal destruction unit, on-site containment unit constructed	1990-1993

Event	Date
Construction completion date (Preliminary closeout report)	June 29, 1994
MPCA signs Final Close-out Report	June 19, 1996
First five-year review	June 6, 1997
Institutional controls put in place	1999-2000
MPCA deleted Site from PLP	September 2000
EPA deletes Site from NPL	Feb. 6, 2001
Second five-year review	June 21, 2002
Third five-year review	June 15, 2007
Institutional controls update recorded in Dakota County	April 17, 2008
Maintenance improvements made for GUE Deep containment area	2011
Additional soil and groundwater sampling at Site performed as part of UMore Park East Remedial Investigation	2011

III. Background

Physical Characteristics

The Site was described at the time of listing on the National Priorities List as the UMRRC property covering approximately 12 square miles. This property includes what is now known as UMore East/Gopher Ordnance Works and the Vermillion Highlands. During the Remedial Investigation, Site boundaries for the MERLA/CERCLA response action were clarified to encompass specific areas of the UMRRC as described in the Record of Decision.

The Site is located in the City of Rosemount, Dakota County, Minnesota, approximately 15 miles south of the St. Paul metropolitan area (Attachment 1). Approximately 22,000 people currently live in the City of Rosemount. The Site was previously used as an agricultural research station and for a variety of industrial uses. A State enforcement-lead Superfund cleanup was conducted at the Site in areas known as the George's Used Equipment (GUE) site, the Porter Electric and Machine Company (PE) site, the U.S. Transformer (UST) site, and the Burn Pit site (Attachment 2).

The topography of the Site is generally level. The Site is underlain by 75 to 150 feet of outwash sand and gravel which constitute the uppermost water-bearing unit or aquifer. The water table in the outwash aquifer is present at a depth of 50 to 70 feet below ground surface. Flow is generally to the northeast, except where it is affected locally by the presence of bedrock valleys. Groundwater discharges to the Mississippi River approximately five miles from the Site.

The sand and gravel aquifer is underlain by fractured dolomite (in some areas separated from the sand/gravel by clays). The dolomite is hydraulically connected to the underlying Jordan Sandstone, a water-bearing unit or aquifer. This unit is underlain by the St. Lawrence Formation, a dolomitic siltstone that retards water flow, that is, an aquitard. A third aquifer, the Franconia formation, underlies the St. Lawrence Formation.

Land and Resource Use

At the time of the ROD and currently, use of the Site is as a multi-use research center for the University of Minnesota. The Site is part of a larger area now known as UMore Park East, which is the subject of an area-wide land use planning process coordinated by the University of Minnesota, in cooperation with the City of Rosemount, Dakota County, and various State agencies including MPCA. Current land uses in UMore Park East include active agricultural fields, unused parcels with ruins of the Gopher Ordnance Works, and various University operations.

Groundwater is in current use on-site by several farms and businesses. The UMore Park administration building near the Site has a well that is used for sanitary purposes, but is not a potable supply due to nitrate from the surrounding agricultural areas. Approximately 50 residential and business groundwater wells are present north and east of the Site.

History of Contamination and Investigation

Wider UMRRC Property

The UMRRC property was originally developed in the early 1940s by the U.S. War Department as the Gopher Ordnance Works (GOW), a plant dedicated to the manufacturing of smokeless gunpowder and related products. The GOW operated for approximately nine months during 1945. Operation ceased due to the end of the World War II. Title to the property was transferred to the University of Minnesota in 1947 (a portion now known as UMore Park) and 1948 (a portion now known as Vermillion Highlands). Production facilities were located in the portion now known as UMore Park.

There have been a number of investigations conducted on UMore Park and Vermillion Highlands. The MPCA conducted a limited investigation of the area in 1981. The U.S. Army Corps of Engineers conducted several inspections and evaluations of the property beginning in 1985. In 2009, the U.S. Army Corps of Engineers conducted an investigation on the Vermillion Highlands area. In 2010, the University of Minnesota completed an Environmental Impact Statement process for a portion of UMore Park known as the UMore Park Sand and Gravel Mining Area, which included assessment of environmental hazards. In 2011, the University entered into a lease agreement with Dakota Aggregates LLC for sand and gravel mining at the property. In 2011, with oversight provided by the MPCA's Superfund Program, the University of Minnesota voluntarily conducted an RI for a large portion of UMore Park known as UMore Park East, which includes production areas of the former GOW. Workplans were prepared in accordance with MPCA Superfund and/or Brownfields Program guidance, were not inconsistent with EPA RI guidance, and were approved by MPCA.

The wider UMRRC property, including portions of UMore Park related to GOW production areas and Vermillion Highlands, was not part of the area subject to the MERLA/CERCLA action and therefore are not part of EPA's five-year review activities at the Site. The MPCA, the University and the U.S. Army Corps of Engineers are in discussions about the environmental conditions for these areas. All future assessments, investigations, feasibility studies and/or response actions for UMore Park East (including GOW production areas) and Vermillion Highlands will be done with MPCA Superfund and/or Brownfields Program oversight.

UMRRC MERLA/CERCLA Site

Beginning in the 1960's and continuing for a number of years, the University contracted with tenants who used some of the UMRRC property for disposal of lead, copper, and PCBs.

Disposal occurred in three areas known as the GUE site, the PE site, and the UST site. The University also disposed of chemical wastes in an area known as the Burn Pit site. Because of these activities, the University was considered a Potential Responsible Party for the Site. Soil at the GUE, PE and UST sites, and groundwater at the Burn Pit site were identified in the MEDD and ROD as the Site and are the subject of this five-year review.

The GUE site was used as an electrical equipment storage facility and a general salvage facility between 1968 and 1985. The activities conducted at GUE included reclamation of copper wire by burning off insulation, the salvage of electrical equipment, batteries, and drums; incineration of liquids including PCB-contaminated oils; and unidentified drum handling/storage and transfer activities. Most of the PCB oils were apparently disposed of in a depression area, although low-level contamination was widespread at the GUE site. Some solvents were also released at the GUE area. The contamination of soil with lead is believed to have been associated with lead acid battery and wire reclamation activities at the GUE site.

The Porter Electric and Machine Company leased property immediately south of the GUE site and operated from 1968 to 1971. The property was used for storage and reconditioning of used industrial electrical equipment. PCB-contaminated oils generated from these activities reportedly were spread on roads in the area. An area of soil contaminated by PCBs existed at the PE site.

U. S. Transformer leased property approximately 2000 feet northeast of the GUE site and operated there from 1973 to 1978. The property was used for dismantling and salvaging electrical transformers. Waste oils from these activities were reportedly washed off a concrete slab onto the soil at the UST site. An extensive area of PCB-contaminated soil existed at the UST site.

The Burn Pit site, located just north of 160th Street, mid-way between Akron and Blaine Avenues, was used by the University as a disposal area for waste chemicals. Unconfirmed reports suggest disposal of chemicals began in this area in the early 1960s. University records indicate that between 1968 and 1974, approximately 90,000 gallons of laboratory chemicals, solvents, corrosives, salts, heavy metals, organic compounds and inorganic compounds were infiltrated and/or burned in the pit. The pit was lined with lime, backfilled with sand, and capped with clay in 1980.

Initial Response

The investigation of the Site began in January 1984, when, during routine monitoring of the neighboring Pine Bend Landfill, the Minnesota Department of Public Health (MDH) detected chloroform at a concentration of 1.3 parts per billion (ppb) in a residential well up-gradient of the landfill. In July 1984, additional sampling occurred, as well as a site inspection by MPCA, County and University officials. As a result of these investigations, the MDH issued well advisories to 27 families whose wells were contaminated with chloroform above the State's health-based level, the Recommended Allowable Limit (RAL).

On October 4, 1984, the MPCA issued a Request for Response Action (RFRA) to the University. After formal negotiations, the University and the MPCA signed a Response Action Agreement (Agreement) on May 30, 1985, under MERLA for the cleanup of the Site. In June 1986, the Site was placed on EPA's National Priorities List.

The University of Minnesota's Burn Pit site was capped in 1980. At this site, volatile organic chemicals (VOCs) that were not completely burned infiltrated into the groundwater and contaminated the drinking water of some nearby Rosemount residents. In 1984, 16 residential

wells to the northeast of the Burn Pit site were found to be contaminated with chloroform. The primary contaminant of concern for OU 1 was chloroform. Other chemicals from the Burn Pit site were found in the groundwater, but were at lower levels that did not qualify as chemicals of concern.

The maximum concentration of chloroform found was 72 parts per billion (ppb). This concentration was found in a monitoring well one mile east of the Burn Pit site. The chloroform groundwater plume was found to extend approximately four miles to the east and northeast of the Burn Pit site.

In late 1985, the GUE/PE/UST soil remedial investigation (RI) became a separate investigation from the groundwater solvent contamination. The RI determined that soil and concrete on these three industrial disposal sites were contaminated by PCBs.

At the GUE site, the surface soil PCB concentrations ranged from 1.7 to 42,000 parts per million (ppm). The PCBs were generally found in the upper nine feet of soil. However, high concentrations of PCBs were also found in a natural depression to a depth of 36 feet and trace amounts of PCBs in the depression extended to a depth of 61 feet below the surface. The PCBs were identified as Aroclors 1260 and 1254. Lead concentrations in soil ranged up to 40,000 ppm and copper concentrations in soil ranged up to 310,000 ppm. These metal contaminants were generally confined to surface soil at the GUE site. Lead and copper were not found in amounts to make these contaminants of concern at the UST and PE sites.

At the PE site, the soil PCB concentrations range from 3.8 to 63,000 ppm. The PCBs were identified as Aroclors 1242, 1248, 1254, and 1260. PCBs were found to a depth of 75 feet below the surface, but generally were at concentrations less than 10 ppm below 43 feet.

At the UST site, the soil PCB concentrations were widespread but at low concentrations. The PCBs were identified as Aroclor 1260.

At the end of the RI, the University estimated that the volume of materials contaminated in excess of 1 ppm PCB and 50 ppm lead was 2,500 cubic yards of lead-contaminated soil; 160 cubic yards of PCB-contaminated concrete; and 57,000 cubic yards of PCB-contaminated soil. Lead and PCBs were not found in the groundwater under these three industrial sites. The Site contaminants of concern were identified as chloroform (OU 1), lead, copper, and PCBs (OU 2 and OU 3).

Basis for Taking Action

Soil sampling indicated that soils at the GUE, UST and PE sites were contaminated with lead, copper and PCBs at concentrations up to 63,000 ppm, 310,000 ppm and 40,000 ppm, respectively. The human health risk assessment found that there would be an unacceptable carcinogenic (cancer-causing) risk from exposure to PCBs and an unacceptable non-cancer risk from exposure to lead in the soils from ingestion and direct contact with these contaminants. An environmental risk assessment found no or very little impacts to the Mississippi River via Site-related contaminants.

Groundwater related to the Burn Pit site was found to be contaminated with chloroform at a maximum concentration of 72 parts per billion (ppb). This concentration was found in a monitoring well one mile east of the Burn Pit site. In 1984, the MDH issued well advisories to 27 families whose wells were contaminated with chloroform above the State of Minnesota's RAL. There was no MCL for chloroform. In 1984, the RAL for chloroform was 1.9 ppb, which was raised to 5 ppb, and then to 57 ppb in early 1988. Although the RAL of 57 ppb was not exceeded in the residential wells, the University agreed to take action.

IV. Remedial Actions

Remedy Selection

The Site is a State lead site and is subject to EPA and MPCA's Enforcement Deferral Agreement whereby EPA deferred enforcement to the State. In a Minnesota Enforcement Decision Document (MEDD) signed December 4, 1986, MPCA selected a remedy to address chloroform in groundwater at the Site. The remedial action objectives (RAOs) for the remedy were to protect the public against exposure to chloroform and other volatile organic compounds (VOCs) through direct contact or ingestion of groundwater. The major components of the remedy were

1) to supply new deeper individual residential water wells for affected residences; and 2) to pump out the groundwater plume near the source area and treat it using air stripping, with discharge to an infiltration pond. The MEDD stated that additional remedies for other areas of contamination still under investigation might be selected in the future.

After additional investigation and feasibility studies, MPCA signed a ROD for the Site on June 11, 1990. EPA concurred on the ROD on June 29, 1990. The ROD selected a remedy for soil and confirmed the necessity to continue operation of the pump and treatment system for groundwater selected in the MEDD. With EPA concurrence, MPCA modified the ROD twice, as documented in Explanations of Significant Differences signed in August 1991 and October 1993.

The remedy selected in the ROD is summarized below. The ROD designated PCB- and metals-contaminated soils from the GUE, PE and UST sites as the "first operable unit" and groundwater from the Burn Pit site as the "second operable unit". At the time of the ESDs, groundwater from the Burn Pit site was renamed OU 1 and the soil was subdivided into two OUs: OU 2 and OU 3. This later OU designation from the time of the ESDs is used in the summary below and throughout the remainder of this review.

OU 1

OU 1 is the Burn Pit site. At the time of the ROD, the source area had already been capped and was believed to have been adequately addressed. The RAO for OU 1 was to prevent ingestion of groundwater contaminated with VOCs. The selected remedy had the two major components listed below:

1. Continue the pump and treat system as selected in the MEDD until groundwater reaches the RAL for chloroform. The pump and treat system consisted of a pumping well down-gradient of the Burn Pit Site used to capture the contaminant plume, an air stripper, and discharge of the treated groundwater to an infiltration pond; and
2. Change the remedy component selected in the MEDD for new individual water supply wells to a rural public water supply system. The system consisted of two water supply wells completed in the Jordan Aquifer, two pump houses and distribution lines to 27 residences.

At the time of the ROD, the groundwater pump and treatment system was in place and operating and the rural water supply system was under construction.

OU 2 and OU 3

OU 2 and OU 3 are soils related to the GUE, PE, and UST sites. Soils were divided into two OUs which related to different phases of work during the remedial action, but are discussed together in this five-year review. The RAO at OU 2 and OU 3 was to eliminate human health

risks through direct contact with soil and concrete contaminated with lead, copper and PCBs. The major components of the selected remedy for OU 2 and OU 3 are summarized below. (The remedy did not refer to copper because it was co-located with lead.)

1. Excavate soil and concrete from GUE, PE, and UST contaminated with PCBs greater than 25 ppm or soil contaminated with lead greater than 1,000 ppm for treatment or off-site disposal (as specified below);
2. Dispose of soil contaminated with lead greater than 1,000 ppm at an off-site Resource Conservatory and Recovery Act (RCRA)-permitted landfill and that portion that also has PCBs greater than 49 ppm (changed during design to 50 ppm), at a RCRA/ Toxic Substance Control Act (TSCA)-permitted landfill;
3. Treat soil with greater than 25 ppm PCBs and less than 1,000 ppm lead using an on-site Thermal Desorption Unit (TDU) to remove PCBs and treat fumes with incineration;
4. Consolidate soils from GUE, PE, and UST contaminated 10 to 25 ppm PCBs into the GUE Depression (later known as GUE Deep); cover with 16 inches of clean soil, and restrict access;
5. Backfill excavated areas with clean soil, grade and establish vegetation; and
6. Review, within three years of the ROD, of mandatory cleanup levels and other remedial action alternatives not previously reviewed, for lead and PCBs in soil.

As described in the ROD, this remedy met the TSCA Spill Policy requirements for a restricted access area.

The cleanup levels established in the ROD are summarized below:

Table 2 – Cleanup Levels Summary Table

Medium	Contaminant	Cleanup Level
Groundwater	Chloroform	57 ppb
Soil	Lead	1000 ppm
Soil	PCBs	10 ppm

The MPCA first modified the ROD in an Explanation of Significant Differences (ESD) issued in August 1991. The changes approved in the ESD were:

1. The ESD allowed the use of either on-site incineration (incineration of soil, not just fumes) or the previously-selected alternative of on-site thermal desorption and fume incineration (the University subsequently used the on-site incineration option);
2. The ESD required that access be restricted at the areas of the three disposal sites (GUE, PE and UST) with PCB levels of between 10 and 25 ppm PCBs rather than consolidating soils from all three sites at the GUE site; and
3. The ESD required a review of the effectiveness of the remedial action three years after completion of the remedy rather than three years after the approval of the remedial action clean-up plan.

MPCA issued a second ESD on October 1, 1993, with EPA's concurrence. The changes approved in the ESD were:

1. The ESD allowed the consolidation of soil contaminated with between 10 and 25 ppm PCBs in George's Used Equipment (GUE) site in an area known as GUE Deep as originally described in the ROD, resulting in unrestricted use of GUE, PE, and UST with the exception of the GUE Deep. (Due to changes in health-based limits, these areas are not currently appropriate for unrestricted use and institutional controls are in place.)
2. The ESD required that all remaining soil contaminated with 1 to 10 ppm PCBs (known as GUE Shallow) be covered with 10 inches of clean fill in order to comply with the TSCA PCB Spill Policy and to provide safe unrestricted access to these areas.

Additional technical requirements for the Remedial Action were identified during Remedial Design. MPCA issued an "Authorization to Install and Operate a Thermal Destruction Unit (TDU), University of Minnesota Rosemount Research Station," (Authorization to Burn) on December 27, 1991. MPCA modified the Authorization to Burn on February 3, 1992, and August 17, 1992. These modifications reduced the scope of the Authorization to Burn based on additional information received from the University. MPCA permitted the TDU to operate under a TSCA permit. The TSCA permit required that the TDU leave no more than 2 ppm PCBs in the ash from the incineration process. MPCA identified requirements for wastewater generated from the TDU in a memorandum dated December 10, 1992. The wastewater was required to contain less than 15 ppb lead; 0.5 ppm PCBs; 250 ppm chlorides; and no detectable dioxins or furans at a detection limit of 1.0 nanograms/gram/congener.

Remedy Implementation

Remedy implementation is summarized by OU, below:

OU 1

In 1987, in response to the MEDD, the University constructed a groundwater pump and treatment system with packed tower aeration and discharge of the treated groundwater to an infiltration pond. The groundwater remedy selected in the MEDD had also required installation of new individual residential wells drilled into the Franconia Aquifer. Residents subsequently rejected the individual wells in the Franconia Aquifer because of potential problems with iron bacteria and these wells were not constructed.

In 1988, based on new toxicological information, the State of Minnesota health-based guideline for chloroform was raised from 1.9 ppb to 57 ppb. Since the concentration of chloroform in all residential wells was below 57 ppb, the drinking water well advisories issued by the Minnesota Department of Health (MDH) to the Rosemount residents became unnecessary. However, the University decided to proceed anyway with its plan to provide the residents with an alternate, long-term water remedy - a community rural water supply. The water supply system consisted of two wells drilled in the Jordan Sandstone Formation and distribution lines to the 27 residences whose wells had drinking water well advisories previously issued by MDH. The construction of the water supply began in 1989, and was completed in 1991. The Site ROD memorialized the selection of the final OU 1 remedy to be the existing ground-water pump and treatment system, combined with the community rural water supply then under construction.

By 1991, the groundwater met all drinking water criteria, including chloroform, in part due to the increase in the RAL for chloroform from 5 to 57 ppb. With approval of MPCA, the pump and treatment system was shut down on October 30, 1991. MPCA required continued groundwater monitoring of the Site.

OU 2

During July and August 1990, the University excavated and disposed of soil contaminated with lead and copper from the GUE site. The soil contaminated with lead and copper which contained less than 50 ppm PCBs was disposed of at the Adams Center Landfill in Ft. Wayne, Indiana, a RCRA-permitted landfill. Soil contaminated with lead and copper which contained greater than 50 ppm PCBs was disposed of at the Chemical Waste Management, Inc., Landfill in Emelle, Alabama, a TSCA/RCRA-permitted landfill. Approximately 4,384 tons of soil were removed and placed in these landfills.

OU 3

Implementation of the OU3 RA began in the summer of 1992 with the excavation of contaminated soil from multiple areas of the Site. The University's contractor's work proceeded rapidly: (1) assembly of the mobile TDU began in December 1992; (2) burning of clean soil was initiated in February 1993; (3) incineration of contaminated soil started in March 1993; and (4) the contractor completed the incineration in July 1993.

A total of approximately 7,000 cubic yards of soil were excavated, and 12,100 tons of soil were thermally treated. Large pieces of contaminated concrete were also excavated, but, due to low levels of contamination, these pieces were consolidated at the GUE Deep rather than incinerated because of likely damage to the rotating kiln. GUE Deep is the name given to the pit where the ash and soil contaminated between 10 and 25ppm PCBs were placed at the GUE site.

In 1993 and 1994, after demobilization of the TDU, an additional 350 cubic yards of soil and concrete between 10 and 25 ppm PCBs were consolidated at the GUE Deep pursuant to the second Explanation of Significant Differences. Also consolidated in the GUE Deep were approximately 65 cubic yards of soil scrapings removed from operational areas that were contaminated with greater than 1 ppm (and less than 25 ppm) PCBs. Another 36 cubic yards of PCB-contaminated soil in excess of 25 ppm PCBs discovered during pre-remedial sampling was sent to the U.S. Pollution Control Inc., Grassy Mountain Facility in Clive, Utah.

By the summer of 1994, excavated areas were backfilled, compacted, and graded. A 16-inch cover of material of less than 2 ppm PCBs was placed over the GUE Deep. The top six inches of this cover was topsoil with less than 1 ppm PCBs. The cover was vegetated and a fence designed to restrict access to the GUE Deep was placed around its perimeter.

A 10-inch cover of less than 1 ppm PCBs was placed over all areas left with between 1 and 10 ppm PCBs. The top six inches of this cover was clean topsoil of less than 1 ppm PCBs, which was also vegetated. At the conclusion of the TDU soil incineration, 25,000 gallons of TDU wastewater remained for on-site disposal. The wastewater met the disposal criteria of 15 ppb lead; 0.5 ppm PCBs; and no detectable dioxins or furans at a detection of 1.0 nanograms/gram/congener. The MPCA staff granted a waiver to its disposal criterion of 250 ppm chlorides for the slightly elevated levels of 229 to 472 ppm chlorides. This water was disposed of on-site at the GUE.

In 1993, during the implementation of the remedy for OU 3, the University identified and transported an additional 100 cubic yards of soil contaminated with lead in excess of 1,000 ppm (but less than 50 ppm PCBs) to the Adams Center Landfill and placed other lead-contaminated soil in GUE Deep.

Post-remedial sampling indicated that the highest lead concentration found outside of GUE Deep was 669 ppm lead, with most samples indicating less than 100 ppm lead.

On September 24, 1993, the MPCA and EPA conducted a preliminary site close-out report inspection. At this time, the only remaining work at the Site involved installing a fence at the GUE site and spreading topsoil, mulching and seeding the Site areas that were excavated and restored. A final close-out report inspection was conducted on September 30, 1994, and all construction activities were found to be completed.

Review of Mandatory Cleanup Levels and Other Remedial Alternatives for Soil

In response to the ROD requirement to review mandatory cleanup levels and other remedial action alternatives for lead and PCBs in soil, the University conducted studies and submitted several reports. In November 1996, the University submitted three reports regarding lead clean-up technology carried out at the Coleraine Minerals Research Laboratory. In February 1997, the University submitted a feasibility study report evaluating both lead and PCB remedies.

The feasibility study report evaluated three new technologies that could possibly remediate approximately 750 cubic yards of residual PCB- and lead-contaminated soil that remained in the restricted area of the Site. The technologies included a biological process for treating PCBs, a dechlorination/detoxification treatment for PCBs and a particle separation process for lead-impacted soil. The recommendations from the feasibility report were that all of the methods evaluated were less cost-effective than the on-site incineration or off-site disposal alternatives that were previously implemented at the Site. In addition, treatability studies would be required to determine the actual effectiveness of the soil remedies. The high cost associated with additional treatability studies and the remedies themselves lead to the recommendation that these alternatives not be pursued. MPCA concurred with the recommendation.

Site Deletion

On June 19, 1996, MPCA signed a Final Closeout Report for the Site, documenting that all MERCLA/CERCLA response actions were complete. Following confirmatory groundwater monitoring, EPA deleted the Site from the National Priorities List on February 6, 2001. Since contaminants remain at the Site above levels that allow unlimited use and unrestricted exposure, EPA conducts five-year reviews to ensure that the Site remedy remains protective of human health and the environment.

Institutional Controls

ICs are non-engineered instruments, such as administrative and legal controls, that help to minimize the potential for exposure to contamination and that protect the integrity of the remedy. Compliance with ICs is required to assure the long-term protectiveness for any areas which do not allow for unlimited use or unrestricted exposure (UU/UE).

The 1990 ROD did not include institutional controls as part of the remedy. However, the ROD did include fencing, which is an access control, to limit access to the GUE Deep area, where soils containing 10 to 25 ppm PCBs were consolidated and capped.

The Table below summarizes the ICs which are currently in place for the Site. Copies of the ICs are found in Attachment 3. The Site map shows the location of parcels (Attachment 2).

Table 3 – Institutional Controls Summary Table

Media, Engineered Controls, & Areas that Do Not Support UU/UE* Based on Current Conditions.	IC Objective	Title of Institutional Control Instrument Implemented (note if planned)
Soil – Parcel A (GUE Deep)	<p>1) Prohibits disturbance or alteration of any nature on, above or beneath Parcel A without approval of MPCA.</p> <p>Requires that a 10 inch soil cap be maintained. Requires, at minimum, a six foot chain link fence to restrict access to authorized personnel.</p> <hr/> <p>2) Discloses that property is contaminated with hazardous wastes. Provides identity, location quantity, etc. of hazardous substances.</p>	<p>Declaration of Restrictions and Covenants dated 1/3/00 and recorded in Dakota County 5/11/00.</p> <p>First Amendment to Declaration of Restrictions and Covenants dated 12/26/07 and recorded in Dakota County 4/17/08.</p> <hr/> <p>Affidavit Concerning Real Property Contaminated With Hazardous Substances dated 11/5/99 and recorded in Dakota County 5/11/00.</p>
Soil – Parcel B (GUE Shallow) and Parcel C (UST site)	<p>1) Limits land use to commercial /industrial. Prohibits use for day care center, any type of educational facilities, churches, social centers, hospitals, elder care facilities, nursing homes, recreational, and single or multiple family dwellings.</p> <p>Requires that a 10 inch soil cap be maintained.</p> <p>Prohibits soils excavated from Parcels B and C from being used as clean fill off-site. Any removal of soils for other purposes must be approved by MPCA.</p> <hr/> <p>2) Discloses that property is contaminated with hazardous wastes. Provides identity, location quantity, etc. of hazardous substances.</p>	<p>Declaration of Restrictions and Covenants dated 1/3/00 and recorded in Dakota County 5/11/00.</p> <p>First Amendment to Declaration of Restrictions and Covenants dated 12/26/07 and recorded in Dakota County 4/17/08.</p> <hr/> <p>Affidavit Concerning Real Property Contaminated With Hazardous Substances dated 11/5/99 and recorded in Dakota County 5/11/00.</p>
Soil – Parcel D (Burn Pit)	<p>1) Prohibits disturbance or alteration of any nature on, above or beneath Parcel D without approval of MPCA.</p> <p>Requires that a soil cap be maintained in all outdoor exposure areas to minimize direct contact and infiltration.</p> <hr/>	<p>Declaration of Restrictions and Covenants dated 1/3/00 and recorded in Dakota County 5/11/00.</p> <p>First Amendment to Declaration of Restrictions and Covenants dated 12/26/07 and recorded in Dakota County 4/17/08.</p> <hr/>

	2) Discloses that property is contaminated with hazardous wastes. Provides identity, location quantity, etc. of hazardous substances.	Affidavit Concerning Real Property Contaminated With Hazardous Substances dated 11/5/99 and recorded in Dakota County 5/11/00.
Soil -- Parcel E (PE site)	<p>1) Limits land use to commercial /industrial.</p> <p>Prohibits use for day care center, any type of educational facilities, churches, social centers, hospitals, elder care facilities, nursing homes, recreational, and single or multiple family dwellings.</p> <p>Prohibits soils excavated from Parcel E from being used as clean fill off-site. Any removal of soils for other purposes must be approved by MPCA.</p> <p>2) Discloses that property is contaminated with hazardous wastes. Provides identity, location quantity etc. of hazardous substances.</p>	<p>Declaration of Restrictions and Covenants dated 1/3/00 and recorded in Dakota County 5/11/00.</p> <p>First Amendment to Declaration of Restrictions and Covenants dated 12/26/07 and recorded in Dakota County 4/17/08.</p> <p>Affidavit Concerning Real Property Contaminated With Hazardous Substances dated 11/5/99 and recorded in Dakota County 5/11/00.</p>

* unlimited use/unrestricted exposure

Analysis of Existing ICs:

On May 11, 2000, the University recorded the following documents with the Office of the County Recorder, Dakota County, Minnesota: “Declaration of Restrictions and Covenants” and “Affidavit Concerning Real Property Contaminated With Hazardous Substances.” These documents were signed by the Interim Treasurer for the University and the Commissioner for the MPCA. Both the Declaration and the Affidavit contain as exhibits “Sketch[es] of Description” prepared by a Registered Land Surveyor that map out the metes and bounds of the areas with use restrictions, including the PE, UST, GUE and Burn Pit sites.

The Declarations contain the following restrictions for areas with soil contamination up to 10 ppm PCBs: maintenance of a 10 inch soil cap in outdoor exposure areas, limitation to commercial and industrial use, and prohibition of the following uses: day care centers, any form of primary or secondary educational facility, churches, social centers, hospitals, elder care facilities, nursing homes, recreational, and single or multiple family dwellings.

The original Declaration for Parcel E, also known as the PE site, indicated that PCBs remain in the soil at a concentration of 3.5 ppm. Upon further investigation, MPCA concluded that the Release Sampling Exhibits M and N from the Affidavit support the 1ppm PCB cleanup level for the PE site and thus, the 3.5ppm PCB concentration stated in the Declaration is in error. Therefore, the University amended the Declaration to say that 1 ppm PCBs are remaining at Parcel E. This amendment was recorded in Dakota County on April 17, 2008.

On December 31, 2007, the University completed an IC evaluation, as requested in the 2007 five-year review. The University evaluated the title for prior-in-time encumbrances; the University’s Director of Real Estate certified that there were none. The University amended the Declaration of Restrictions and Covenants for the PE site, as noted above. The University prepared an IC Inspection Checklist, which is to be completed annually and certified annually to

EPA that all ICs are in place and functioning as intended. The University surveyed the boundaries of GUE Shallow, GUE Deep, PE, UST, and the Burn Pit containment area and obtained GPS coordinates identifying their boundaries. The University completed a well survey of sealed and unsealed wells and set forth recommendations for abandonment and maintenance. The University repaired the GUE Deep fence.

IC evaluation activities reveal that the remedy currently is functioning as intended with regard to the ICs and effective procedures are in-place for long-term stewardship at the Site.

Current Site Conditions:

Neither MPCA nor EPA is aware of any current Site uses that interfere with the remedy.

IC Follow-up Actions Needed:

Long-term protectiveness requires compliance with effective ICs. Hence, effective ICs must be implemented, monitored, maintained and enforced, along with maintaining site remedy components so that the remedy will function as intended. Long-term protectiveness should be ensured by implementing effective ICs and through long-term stewardship of ICs. To that end, the University should continue to evaluate and certify to EPA as to the effectiveness of ICs on an annual basis. The University should evaluate whether all abandonment and/or maintenance of wells was completed. The University should also complete their installation of new signs for GUE Deep.

As part of the Data Review conducted for this five-year review, EPA determined that additional IC actions in the Burn Pit (OU 1), UST and GUE (OUs 2 and 3) may be necessary. These actions are discussed further in Sections VI and VII of this five-year review.

Long Term Stewardship:

To ensure long-term protectiveness at the Site, effective ICs must be implemented, monitored, maintained and enforced to ensure that the remedy continues to function as intended. Long-term protectiveness at the Site requires compliance with remedy and use restrictions to assure the remedy continues to function as intended. Long-term stewardship (LTS) involves assuring effective procedures are in place to properly maintain, monitor and to enforce the ICs, along with site O&M. As mentioned above, the University should continue its annual inspection and certification to EPA that ICs are in place and effective.

System Operation/Operation and Maintenance

The public water supply system is owned and operated by Empire Township. The system was not reviewed for this five-year review because groundwater is no longer contaminated due to Site-related activities.

The GUE Deep containment area fence is inspected monthly and corrections are made when needed. Although not part of the MERLA/CERCLA action, the Burn Pit cap is also inspected monthly for any cap erosion or growth of woody vegetation and corrections are made when needed.

Costs

Costs for monitoring and maintenance of OU 1, 2, and 3 are paid by the University and are not available at the time of this review.

V. Progress since the Last Five-Year Review

Previous Five-Year Review Recommendations and Progress Toward Implementation

The 2007 five-year review concluded that the remedies at OU 1, OU 2 and OU 3 were functioning as intended and were protective of human health and the environment in the short term. For OU 1, the review recommended that in order for the remedy to be protective in the long-term, protectiveness should be reevaluated when EPA completed its national reassessment of risk from trichloroethylene (TCE). This was recommended because at that time TCE was detected in groundwater at low levels (below the MCL). The MCL has not changed since that time. For OU 2 and OU 3, the review recommended that in order for the remedies to be protective in the long term, an institutional control evaluation should be conducted, and needed corrective measures for institutional controls should be implemented.

Five recommendations for follow-up actions were listed in the 2007 five-year review. The recommendations and subsequent follow-up actions are summarized in Table 4 and the discussion below.

Table 4: Actions Taken Since the Last Five-Year Review

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Assess adequacy of institutional controls	An Institutional Control Evaluation will be conducted. * See Below	UM	Dec 2007	All items completed.	Dec 2007
Ensure adequacy of ICs and plan for long-term stewardship of the Site	An Institutional Control Plan will be developed. The Plan will incorporate the results of the evaluation activities and plan for additional IC activities as needed including planning for long-term stewardship.	EPA	June 2008	IC evaluation and long-term stewardship plan completed.	Dec 2007
Protectiveness of current groundwater cleanup goals for TCE	Reevaluate protectiveness after EPA Headquarters completes risk assessment for TCE.	MPCA/EPA	June 2008	Most recently, reevaluated protectiveness as part of current five-year review and found Site continues to be protective in short term.	May 2012

Issues from Previous Review	Recommendations/ Follow-up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Clarification of extent of contamination in the vicinity of the Burn Pit subsite	A file search should be performed of the multiple locations where the University may have burned or disposed of chemicals. This review should evaluate the sampling performed and determine whether any follow-up actions may be required.	UM	Dec 2007	File search conducted; additional sampling conducted during UMore East RI (see details in text).	Dec 2007
Site Inspection Issues	** See below.	UM	Dec 2007	Most items completed (see details in text).	Dec 2007

* The Institutional Control Evaluation will include: 1) An evaluation of the title for prior in-time encumbrances, 2) Correction of the Declaration of Restrictions and Covenants for the PE site to state 1 ppm PCBs have been left in place rather than 3.5 ppm PCB concentration remaining, and 3) An evaluation to determine whether procedures are in place to ensure long-term stewardship such as regular site inspection of ICs at the site and annual certification to EPA that ICs are in place and any other necessary measures.

** 1) The boundaries of the GUE Shallow, PE and UST sites should be marked. 2) All abandoned monitoring wells should be evaluated to assure the wells were abandoned in accordance with the Minnesota Department of Health well code. 3) The damaged areas of the GUE Deep fence need to be repaired. 4) New signs with hazardous waste warning language should be placed on the GUE Deep fence.

The recommendations regarding ICs are discussed in the IC and Data Review sections of this five-year review.

Regarding the recommendation concerning the protectiveness of current groundwater cleanup goals for TCE, EPA has reviewed the groundwater monitoring data and found that TCE is present in two monitoring wells at the Site at a maximum concentration of 0.92 ppb, which is below the MCL of 5 ppb. TCE also did not exceed the MCL at the time of the ROD and no cleanup level was established for TCE in the ROD. Groundwater continues to meet current MCLs for all Site-related contaminants.

Regarding the recommendation to clarify the extent of contamination in the vicinity of the Burn Pit, in December 2007, the University completed a file search of both its files and files maintained by MPCA, and reported its finding that the information relied upon in the ROD accurately reflects historical information regarding locations where the University may have burned or disposed of chemicals in the Burn Pit vicinity. During a remedial investigation conducted on the wider UMore East area in 2011, the University conducted an electromagnetic survey and a follow-up ground penetrating radar survey at suspected disposal areas in the vicinity of the Burn Pit. A small number of soil samples were also collected at this time. Several sampling results exceeded the State of Minnesota soil screening values for residential use (Tier 1 soil reference values (SRVs) for arsenic and benzo(a)pyrene equivalents, but did not exceed the soil screening level for industrial use (Tier 2 SRVs). The ROD does not establish cleanup levels for these contaminants. Due to the small number of soil samples in this area,

there is remaining uncertainty concerning soil contamination in the Burn Pit area and additional follow-up sampling should be conducted prior to reuse.

Regarding recommendations to address site inspection issues, the University took the following actions in December 2007:

- Surveyed the boundaries of the GUE Shallow, GUE Deep, PE, UST, and former Burn Pit sites, obtained global positioning system (GPS) coordinates, and placed fence posts to demarcate the surveyed corners of the each of the sites;
- Completed a well survey of the Site, identified the locations of all sealed and unsealed wells and documented certain abandonment and maintenance procedures;
- Repaired GUE Deep fence and placed signs.

Other Actions Since Last Five-Year Review

Since the last five-year review, other parts of the UMRRC property in the vicinity of the Site have been the subject of environmental and health investigations outside of the Superfund program, as indicated in section III of this five-year review. Results of these investigations which pertain to the Site are discussed in the Data Review section of this five-year review.

In addition, the UMRRC property as a whole is currently the subject of a health assessment being conducted by the Minnesota Department of Health under a grant from the Agency for Toxic Substances and Disease Registry. Results have not yet been released.

VI. Five-Year Review Process

Administrative Components

Representatives of the following groups were notified of the five-year review for the Site:

- Minnesota Pollution Control Agency
- Minnesota Department of Health
- Dakota County
- City of Rosemount
- University of Minnesota

Community Involvement

EPA and MPCA met with representatives of Dakota County and the City of Rosemount early in the five-year review process. The University of Minnesota maintains a public website with extensive information concerning the UMRRC, including Site-related documents: <http://www.umorepark.umn.edu/>. EPA issued a legal notice in the Rosemount Town Pages and the Farmington Independent on May 10, 2012 that announced the five-year review and solicited comments from the public (Attachment 4). Several comments were received by phone and email.

Several comments related to contamination remaining in areas of the wider UMRRC property and concern for the safety of future residents if areas are developed for residential use. With the exception of the areas subject to the MERCLA/CERCLA action, these areas are not the subject of this five-year review. However, EPA and MPCA share this concern and these areas are among those which are the subject of current discussions between MPCA, the University of Minnesota and the U.S. Army Corps of Engineers.

Several comments concerned the possibility that oil from GUE operations which contained PCBs may have been spread on area roads for dust control in the past. Recent sampling data may provide information which is useful to address this concern and it has been identified as an issue for follow-up in this five-year review.

Several comments concerned the possibility that dioxin/furans may be a concern in remaining Site-related soils. They noted that very limited analysis for these contaminants was conducted during the previous investigation and cleanup. They also noted that it is unclear whether areas where dioxins were detected were excavated during the cleanup, especially in an area just west of the GUE concrete slab. This concern has been identified as an issue for follow-up in this five-year review.

One comment concerned the fact that soil contamination related to the Burn Pit area has not been completely characterized. EPA and MPCA agree that additional characterization is needed before any future use and this has been identified as an issue for follow-up in this five-year review.

Document Review

This five-year review consisted of a review of relevant documents, as listed in Attachment 5.

Data Review

OU 1

The ROD established a groundwater cleanup level for chloroform of 57 ppb.

Groundwater was most recently sampled in July 2011. Results are shown in Attachment 6. With the exception of nitrate+nitrite, which is not Site-related, the groundwater is below federal MCLs and State drinking water standards.

The recent sampling indicates that chloroform is currently present in groundwater at levels up to 7.9 ppb. This level is below the cleanup level. It is also below the current State of Minnesota Health Risk Limit (HRL) of 30 ppb and below the current Maximum Contaminant Level Goal (MCLG) of 70 ppb. HRLs are promulgated MDH standards for private drinking water supplies. MCLGs are Federal levels of contaminants in drinking water below which there is no known or expected risk to health. These levels are discussed further under Question B of this five-year review.

The recent sampling also indicates that several other contaminants, including TCE, carbon tetrachloride (CCl₄) and tetrachloroethylene (PCE), are detected sporadically in groundwater at low levels which are below current MCLs. For example, TCE is detected at levels up to 0.92 ppb. The level currently detected in groundwater is below the current MCL of 5 ppb and also below the current HRL of 5 ppb. The ROD did not establish a cleanup level for TCE because it was below the MCL.

OU 2 and 3

The ROD established soil cleanup levels of 1000 ppm for lead and 10 ppm for PCBs.

Sampling conducted at OUs 2 and 3 soon after the remediation indicated that the highest concentration of lead remaining in soil outside of the GUE Deep containment area was 669 ppm lead, with most results below 100 ppm lead. Soil at OU 2 and 3 was most recently sampled in 2011 as part of a Remedial Investigation conducted on the UMore East section of the UMRRC property. Results for areas related to the Site are shown in Attachment 7.

During 2011, soil was sampled at one location within the GUE site and analyzed for a variety of contaminants, including the Site-related contaminants of concern, lead and PCBs. Results indicated no contaminants present above cleanup levels or above State of Minnesota soil screening values for residential use (Tier 1 SRVs). However, sampling in the area nearby the GUE site indicated lead and PCBs at one location present above the cleanup levels in the ROD. At this location, lead was present at levels of up to 2470 ppm at the surface and PCBs were present at levels of up to 270 ppm at the surface. The sampling also indicated one other location where lead exceeded the current State of Minnesota soil screening levels for residential and industrial use (Tier 1 and Tier 2 SRVs, respectively). There appears to be some uncertainty about whether these samples were from soil next to the remaining concrete slab or from floor drain sediment in an existing building.

During 2011, soil at the PE site was sampled at one location and analyzed for a variety of contaminants, including Site-related contaminants of concern. No contaminants were present above cleanup levels or above current State of Minnesota soil screening levels for residential use (Tier 1 SRVs).

During 2011, soil at the UST site was analyzed for a variety of contaminants, including the Site-related contaminant of concern, PCBs. Nine samples were taken. With the exception of one sample, results were non-detect for PCBs. One sample indicated PCBs present at 2.3 ppm at a depth of 6 inches. This is below the cleanup level of 10 ppm, but above the current State of Minnesota soil screening level for residential use (Tier 1 SRV) of 1.2 ppm. This level is below the State of Minnesota soil screening level for industrial or recreational use (Tier 2 SRV) of 8 ppm.

Site Inspection

Site inspections were conducted on November 7, 2011 and June 6, 2012, by representatives of EPA, MPCA, MDH and the University. The purpose of the inspections was to assess the protectiveness of the remedy.

Interviews

Interviews were not conducted as part of this five-year review because the Site is deleted from the NPL and no significant changes have occurred in the area subject to the Superfund remedy since the last five-year review, other than maintenance and IC improvements.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision documents?

The review of documents, ARARs, risk assumptions, and the results of the site inspections indicate that the implemented remedies in OUs 1, 2 and 3 currently are functioning as intended for the areas identified as the Site in the ROD. Recent sampling indicates that nearly all areas of the Site meet cleanup levels; however, there is one location of soil nearby and likely related to the GUE site that exceeds cleanup levels for lead and PCBs.

OU 1

For OU 1, the pump and treatment system that was constructed in 1987 was shut down on October 30, 1991. The system was implemented in order to improve the performance of the Site

remedy. With the exception of nitrate+nitrite, which is not Site-related, the groundwater is below federal MCLs and State standards. The rural water supply system continues to be operated by Empire Township and draws water from a deeper aquifer. Operation of this system was not reviewed as part of this five-year review. The remedial action objective to minimize the migration of contaminants to groundwater and surface water has been achieved.

OU 2 and 3

The disposal of lead- and PCB-contaminated soil in appropriate landfills, the incineration of highly concentrated PCB soils, along with the capping and consolidation of lesser PCB-contaminated soils in a fenced area, has achieved the remedial action objectives of preventing direct contact with, or ingestion of, contaminants in soil for OUs 2 and 3. The implementation of ICs through the Declaration of Restrictions and Covenants and the Affidavit Concerning Real Property Contaminated with Hazardous Substances, prevents exposure to, or ingestion of, contaminated soil. However, in order for the remedy to be protective in the long-term, cleanup is needed for an area of soil in the vicinity of, and likely related to, the GUE site, where a recent soil sample exceeds cleanup levels.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?

Changes in Standards and "To Be Considered"

Groundwater

At the time of the ROD, the only contaminant which exceeded health-based levels was chloroform, although several other contaminants were present at low levels. The ROD established a groundwater cleanup level of 57 ppb for chloroform based on a State of Minnesota RAL. At the time of the ROD, there was no Federal MCL for chloroform. Both State and Federal groundwater standards have changed since the ROD. Currently, there is still no MCL for chloroform, but there is a MCLG of 70 ppb. Chloroform is also included in a standard for a group of chemicals called Trihalomethanes, which are disinfection byproducts. The current MCL for Total Trihalomethanes is 80 ppb. The State of Minnesota has replaced RALs with a new standard called Health Risk Limits (HRLs). The current HRL for chloroform is 30 ppb.

Currently, chloroform is detected in 7 of 15 monitoring wells, at concentrations from 0.24 ppb to 7.9 ppb. All results are below the current HRL for chloroform, below the current MCL for the Trihalomethanes group, and below the current MCLG for chloroform.

Lead in Soil

The ROD established a cleanup level for lead of 1,000 ppm based on RCRA definitions of hazardous waste using an extraction procedure that measures the contaminant's ability to leach into and contaminate groundwater. Currently, EPA uses a soil screening level of 800 ppm for lead at commercial/industrial properties and 400 ppm lead at residential properties. This screening level is not a cleanup level, but rather is a conservative level used to determine if the contaminant may present an unacceptable risk. Currently, the State of Minnesota screens soil for residential use using a Tier 1 SRV of 300 ppm, for recreational use SRV also of 300 ppm and for industrial use with a Tier 2 SRV of 700 ppm.

PCBs in Soil

The ROD established a cleanup level for PCBs of 10 ppm with a soil cover of 10 inches, based on 40 CFR Part 761, Polychlorinated Biphenyls Spill Cleanup Policy; Final Rule, dated April 2,

1987. Since that time, EPA has issued updated regulations and guidance on PCB remediation, including the following:

- 1990 – EPA issued *Guidance on Remedial Actions for Superfund Sites with PCB Contamination*, EPA/540/G-90/007, OSWER Directive 9355.4-01.
- 1998 – EPA established 40 CFR Parts 750 and 761, *Disposal of Polychlorinated Biphenyls (PCBs); Final Rule*.
- 2005 -- EPA issued *Polychlorinated Biphenyl (PCB) Site Revitalization Guidance* under the Toxic Substances Control Act (TSCA), OPPT-2004-0123.
- 2009 -- EPA TSCA program issued revised *PCB Question & Answer Manual*.

EPA's current Superfund guidance on PCB remediation (cited above) establishes a preliminary remediation goal (PRG) of 1 ppm PCB for residential use areas and 10 to 25 ppm PCBs for industrial use areas. If contamination is present above these levels, unrestricted exposure may result in risks exceeding protective levels. Cleanup levels may differ from these levels based on a site-specific risk assessment.

EPA's current TSCA guidance on PCB site revitalization also establishes cleanup levels for PCB remediation waste, including in-situ soils, under the "self-implementing option." Although not directly applicable to a Superfund cleanup, this guidance offers information which may be useful in assessing a cleanup. For "high occupancy areas," TSCA establishes a cleanup level of 1 ppm or 10 ppm, if the 10 ppm soil is covered with an appropriate cap. An appropriate cap may include, for example, six inches of concrete or asphalt or 10 inches of soil. Examples of "high occupancy areas" would be residences, schools, a day care center or a single or multiple occupancy 40 hour per week work station. For "low occupancy areas," TSCA establishes a cleanup level of 25 ppm; or 50 ppm, provided that the site is secured by a fence, marked with a sign and an institutional control is implemented. Examples of "low occupancy areas" would be industrial facilities where workers spend small amounts of time per week, such as unoccupied areas outside a building. The cleanup level could also be 100 ppm, provided the site is covered by an appropriate cap and an IC is implemented.

Currently, the State of Minnesota has established a Tier 1 (residential use) SRV of 1.2 ppm PCB, a recreational use SRV of 1.4 ppm PCB and a Tier 2 (industrial use) SRV of 8 ppm PCBs.

The cleanup levels in the ROD meet the PRGs recommended by EPA's current Superfund PCB guidance for industrial use and also meet the cleanup levels required by TSCA under the self-implementing option, for both low and high occupancy areas, assuming the 10 inch soil cap remains intact. The cleanup levels in the ROD are slightly higher than the current State SRVs. The remedy included a 10 inch soil cap on these areas; however, the State of Minnesota considers the top four feet to be accessible soil. At the Site, ICs are in place to protect this area.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

No new exposure pathways have been discovered at the Site.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

Public comments have introduced a concern about whether oil which contained PCBs from GUE operations may have been spread on area roads for dust control in the past. This risk pathway was not identified as an issue in the RI; however, this concern has been identified as an issue for follow-up in this five-year review.

Public comments have raised the question of whether dioxin/furans are present in remaining Site-related soils at unsafe levels. The original RI noted that PCB oil was alleged to have fueled an incinerator at the GUE site, but only limited dioxin sampling was done during the investigation and remediation of the Site. At the time of the ROD, the dioxin/furans that were detected were below soil screening levels and not considered to be a risk. It is unclear whether these locations are in areas which were excavated during the remedial action and whether other Site-related soils which remain could present a risk. This has been added as an issue for follow-up to this five-year review.

Technical Assessment Summary

According to the data reviewed and the site inspection, the remedies at the Site currently are functioning as intended by the ROD. However, in order to ensure long-term protection, several potential issues should be evaluated, including small areas of Site-related contaminated soil which remain above cleanup levels and should be addressed.

VIII. Issues

Table 5 – Issues

Issue	Currently Affects Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
OUs 1, 2, & 3 - IC review needed to ensure effective ICs are in place and long-term stewardship is conducted	N	Y
OUs 1, 2, & 3 - Need for ICs not documented in a decision document	N	Y
OU 1 – Limited soil sampling in Burn Pit area	N	Y
OUs 2 & 3 - Lead and PCB exceedances of cleanup level and uncertainty concerning dioxin/furans	N	Y
OUs 2 & 3 – Uncertainty concerning dust control pathway	N	Y

IX. Recommendations and Follow-Up Actions

Table 6 – Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
OUs 1, 2 & 3 - IC review needed to ensure effective ICs are in place and long-term stewardship is conducted;	Review ICs for areas adjacent to current IC boundaries which exceed cleanup levels and/or soil screening levels for residential use and revise ICs as needed.	PRP	MPCA	12/15/2012	N	Y
OUs 1, 2, & 3 - Need for ICs not documented in a decision document	Modify decision document as appropriate.	MPCA	EPA	6/15/2013	N	Y
OU 1 – Limited soil sampling in Burn Pit area	Document plans for further investigation prior to reuse.	PRP	MPCA	12/15/2012	N	Y
OUs 2 & 3 - Lead and PCB exceedances of cleanup level and uncertainty concerning dioxin/furans	Conduct further soil investigation and implement appropriate cleanup for areas that exceed cleanup levels or current risk-based levels.	PRP	MPCA	06/15/2013	N	Y
OUs 2 & 3 – Uncertainty concerning dust control pathway	Review available historical information and existing data for indications of PCB or other contaminant- containing oils being used for dust control on area roadways.	PRP	MPCA	12/15/2012	N	Y

X. Protectiveness Statements

OU 1

The remedy at OU 1 currently protects human health and the environment in the short-term because the community rural water supply system was implemented and groundwater does not exceed health risk levels or MCLGs for Site-related contaminants. However, in order for the remedy to be protective in the long-term, the following actions need to be taken: (1) Evaluate existing ICs for areas adjacent to the Burn Pit, which exceed levels appropriate for unrestricted use/unlimited exposure and assess whether additional ICs are needed to ensure long-term protectiveness, and (2) Document plans for further investigation prior to reuse.

OUs 2 & 3

The remedy for OUs 2 and 3 currently protects human health and the environment in the short-term because PCB-contaminated soil was excavated, treated on-site and disposed of on-site and off-site. However, in order for the remedy to be protective in the long-term, the following actions need to be taken: (1) Evaluate existing ICs for adjacent areas which exceed levels appropriate for unrestricted use/unlimited exposure and assess whether additional ICs are needed to ensure long-term protectiveness, (2) Conduct further soil investigation and implement appropriate cleanup for areas that exceed cleanup levels or current risk-based levels, and (3) Review available historical information and existing data for indications of PCB- or other contaminant-containing oils being used for dust control on area roadways.

Sitewide

The remedy for the Site currently protects human health and the environment in the short-term because groundwater meets drinking water standards for Site-related contaminants and contaminated soil was excavated, treated, and disposed of appropriately. However, in order for the remedy to be protective in the long-term, the following actions need to be taken: (1) For OUs 1, 2 and 3, evaluate existing ICs for adjacent areas which exceed levels appropriate for unrestricted use/unlimited exposure and assess whether additional ICs are needed to ensure long-term protectiveness, (2) For OU 1, document plans for further soil investigation prior to reuse, (3) For OUs 2 and 3, conduct further soil investigation and implement appropriate cleanup for areas that exceed cleanup levels or current risk-based levels, and (4) For OUs 2 and 3, review available historical information and existing data for indications of PCB- or other contaminant-containing oils being used for dust control on area roadways.

XI. Next Review

The next Five-Year Review report for the Site is required five years from the completion date of this review.

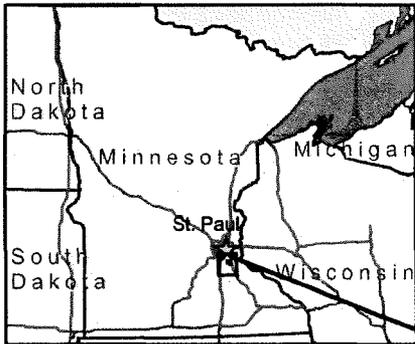
Site Location

Superfund
U.S. Environmental Protection Agency

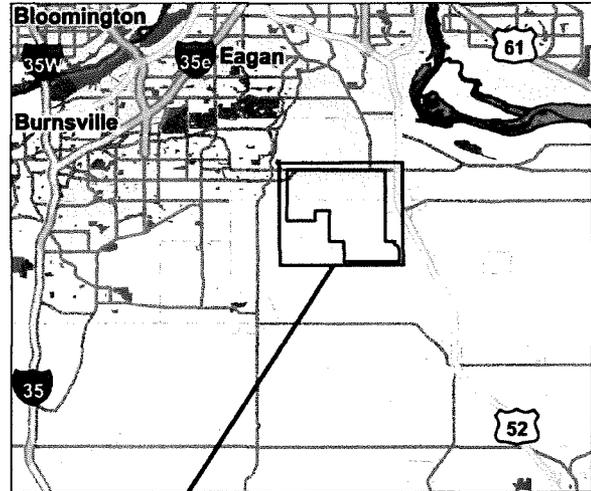


University of Minnesota (Rosemount Research Center)
Dakota County, MN

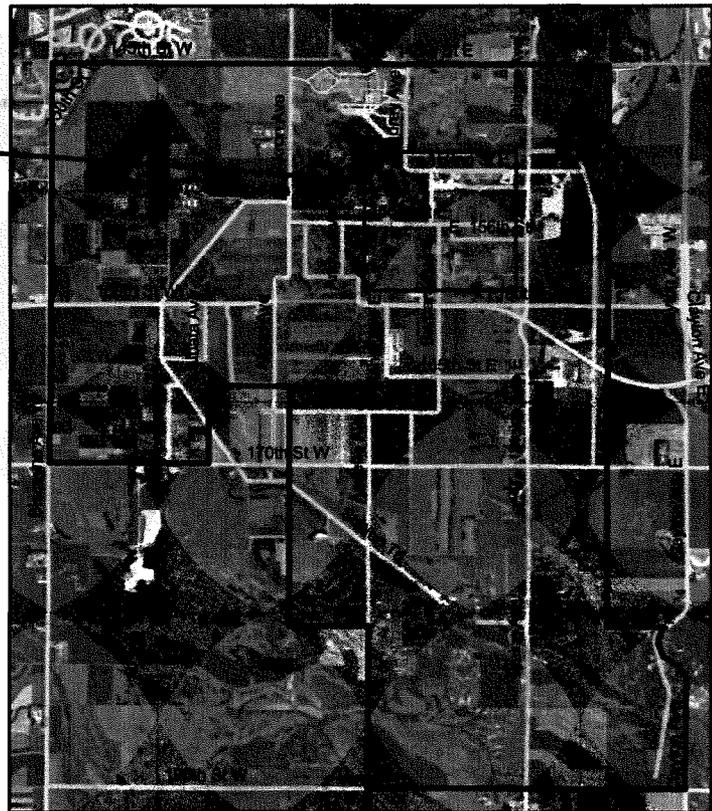
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State



County



Site

Legend

- Rosemount Research Center
- GUE Deep Site
- GUE Shallow Site
- US Transformer Site
- Burn Pit Site
- Porter Electric and Machine Site

Produced by Sarah Backhouse
U.S. EPA Region 5 on 4/19/07
Image Date: 2003



Institutional Control (IC) Review

Areas Depicting Implemented Institutional Controls

Superfund
U.S. Environmental Protection Agency



**University of Minnesota (Rosemount Research Center)
Dakota County, MN**

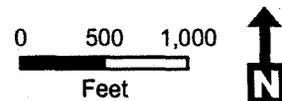
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Legend

Implemented Institutional Controls:

- Restricted Access Parcel A* - GUE Deep Site
- Restricted Parcel B* - GUE Shallow Site
- Restricted Parcel C* - US Transformer Site
- Restricted Parcel D* - Burn Pit Site
- Restricted Parcel E* - Porter Electric and Machine Site



* See the University of Minnesota Declaration of Restrictions and Covenants (2000) for restriction details

EPA Disclaimer: Please be advised that areas depicted in the map have been estimated. The map does not create any rights enforceable by any party. EPA may refine or change this data and map at any time.

Created by Sarah Backhouse
U.S. EPA Region 5 on 3/15/2006
Image Date: 2003



DECLARATION OF RESTRICTIONS AND COVENANTS

THIS DECLARATION is made this ²⁰⁰⁰ ~~1999~~ ^{3rd} day of ~~January~~ ^{January}, 1999, by the Regents of the University of Minnesota (hereinafter "University of Minnesota" or "University"). 

WITNESSETH:

WHEREAS, University of Minnesota is the fee owner of certain real property located in Section 35, Township 115N, Range 19W, Dakota County, Minnesota, as described herein (the "Property"); and

WHEREAS, a portion of the Property was the site of release(s) of certain hazardous substances as defined by Minnesota Statutes Section 115B.02 and was listed on the State Permanent List of Priorities pursuant to Minnesota Statutes Section 115B.17, Subd. 13 and Minnesota Rules 7044.0450; and

WHEREAS, response actions have been taken at the Property pursuant to a Response Action Agreement dated May 30, 1985 between the Minnesota Pollution Control Agency ("MPCA") and the University of Minnesota; and

WHEREAS, the MPCA and University of Minnesota desire to de-list the Property from the State Permanent List of Priorities; and

WHEREAS, to assure the continued effectiveness of response actions and as a condition to de-listing the Property, the MPCA has requested that University of Minnesota place

certain restrictions on the use of portions of the Property; and

WHEREAS, University of Minnesota is willing to place such restrictions on said portions of the property;

NOW, THEREFORE, the University of Minnesota makes the following declarations as to limitations, restrictions and uses to which the Property may be put, and specifies that such declarations shall constitute covenants to run with the Property as provided by law and shall be binding on all parties who now or hereafter have or hold any right, title or interest in or to the property and all persons claiming under them:

1. Property.

As used herein, "Property" shall be the real property owned by University of Minnesota located in Section 35, Township 115N, Range 19W, Dakota County, Minnesota, shown on Exhibit A, B, C, D, and E hereto and legally described as follows: (hereinafter "Parcels A, B, C, D, and E" or "the Parcels")

a) Restricted Access Area (Parcel A)

That part of the Southeast Quarter of the Northwest Quarter of Section 35, Township 115, Range 19, Dakota County, Minnesota, described as follows:

Commencing at the Southeast corner of said Southeast Quarter of Northwest Quarter; thence North 00 degrees 23 minutes 47 seconds East, assumed bearing along the east line of said Southeast Quarter of the Northwest Quarter, a distance of 567.51 feet; thence South 88 degrees 56 minutes 43 seconds West a distance of 52.00 feet to the actual point of beginning of the land to be described; thence continue South 88 degrees 56 minutes 43 seconds West a distance of 136.00 feet; thence North 04 degrees 17 minutes 43 seconds West a distance of 157.00 feet; thence South 89 degrees 49 minutes 58 seconds East a distance of 141.00 feet; thence South 02 degrees 30 minutes 39 seconds East a distance of 153.79 feet to the point of beginning, consisting of 0.4922 acres (hereinafter "Parcel A").

b) Nonrestricted Access Area (Parcel B)

That part of the Southeast Quarter of the Northwest Quarter and the Southwest Quarter of the Northeast Quarter, Section 35, Township 115, Range 19, Dakota County, Minnesota, described as follows:

Commencing at the Southeast corner of said Southeast Quarter of the Northwest Quarter; thence North 00 degrees 23 minutes 47 seconds East, assumed bearing along the east line of said Southeast Quarter of the Northwest Quarter, a distance of 554.55 feet to the actual point of beginning of the land to be described; thence South 89 degrees 36 minutes 13 seconds East a distance of 9.58 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 7.50 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 205.00 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 325.00 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 8.68 feet; thence North 63 degrees 49 minutes 53 second East a distance of 32.22 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 35.59 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 25.00 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 60.00 feet; thence North 89 degrees 36 minutes 13 seconds West a distance of 100.00 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 50.00 feet; thence North 89 degrees 36 minutes 13 seconds West a distance of 210.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 36.50 feet; thence North 89 degrees 36 minutes 13 seconds West a distance of 150.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 166.80 feet; thence South 16 degrees 20 minutes 30 seconds West a distance of 91.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 193.20 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 132.50 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 35.00 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 40.00 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 35.00 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 20.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 7.50 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 15.42 feet to the point of beginning. Excluding the restricted access area in a) above. Consisting of 4.0582 acres (hereinafter "Parcel B"). (Parcels A and B total 4.5504 acres.)

c) Nonrestricted Access Area (Parcel C)

That part of the Northeast Quarter of the Northeast Quarter of Section 35, Township 115, Range 19, Dakota County, Minnesota, described as follows:

Commencing at the Southeast corner of said Northeast Quarter of the Northeast Quarter; thence South 89 degrees 56 minutes 07 seconds West, assumed bearing along the south line of said Northeast Quarter of the Northeast Quarter, a distance of 568.55 feet; thence North 00 degrees 03 minutes 53 seconds West a distance of 45.00 feet to the actual point of beginning of the land to be described; thence continue North 00 degrees 03 minutes 53 seconds West a distance of 226.30 feet; thence North 18 degrees 31 minutes 08 seconds East a distance of 82.94 feet; thence North 00 degrees 03 minutes 53 seconds West a distance of 18.42 feet; thence North 89 degrees 56 minutes 07 seconds East a distance of 100.000 feet; thence North 00 degrees 03 minutes 53 seconds West a distance of 50.00 feet; thence South 89 degrees 56 minutes 07 seconds West a distance of 220.00 feet; thence South 00 degrees 03 minutes 53 seconds East a distance of 70.85 feet; thence South 89 degrees 59 minutes 05 seconds East a distance of 42.64 feet; thence South 00 degrees 02 minutes 46 seconds West a distance of 120.25 feet; thence North 89 degrees 59 minutes 05 seconds West a distance of 128.84 feet; thence South 00 degrees 03 minutes 53 seconds East a distance of 32.36 feet; thence South 89 degrees 56 minutes 07 seconds West a distance of 110.00 feet; thence South 00 degrees 03 minutes 53 seconds East a distance of 60.00 feet; thence South 89 degrees 56 minutes 07 seconds West a distance of 60.00 feet; thence South 00 degrees 03 minutes 53 seconds East a distance of 70.00 feet; thence North 89 degrees 56 minutes 07 seconds East a distance of 170.00 feet; thence South 00 degrees 03 minutes 53 seconds East a distance of 20.00 feet; thence North 89 degrees 56 minutes 07 seconds East a distance of 180.00 feet to the point of beginning, consisting of 1.6511 acres (hereinafter "Parcel C").

d) Nonrestricted Access Area (Parcel D)

That part of the Southwest Quarter of Section 35, Township 115, Range 19, Dakota County, Minnesota, described as follows:

Commencing at the Southwest corner of said Southwest Quarter of the Southwest Quarter; thence North 00 degrees 19 minutes 47 seconds East, assumed bearing along the west line of said Southwest Quarter of the Southwest Quarter a distance of 632.00 feet to the actual point of beginning of the land to be described; thence South 89 degrees 40 minutes 13 seconds East a distance of 126.50 feet; thence North 00 degrees 19 minutes 47 seconds East a distance of 72.00 feet; thence North 89 degrees 40 minutes 13 seconds West a distance of 126.50 feet to the west line of said Southwest Quarter to the Southwest Quarter; thence South 00 degrees 19 minutes 47 seconds West along said west line a distance of 72.00 feet to the point of beginning, consisting of 0.2091 acres (hereinafter "Parcel D").

e) Nonrestricted Access Area (Parcel E)

That part of the Southeast Quarter of the Northwest Quarter and the Southwest Quarter of the Northeast Quarter, Section 35, Township 115, Range 19, Dakota County, Minnesota, described as follows:

Commencing at the Southeast corner of said Southeast Quarter of the Northwest Quarter: thence North 00 degrees 23 minutes 47 seconds East, assumed bearing along the east line of said Southeast Quarter of the Northwest Quarter, a distance of 210.00 feet to the actual point of beginning of the land described; thence South 89 degrees 36 minutes 13 seconds East a distance of 40.00 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 260.00 feet; thence North 69 degrees 36 minutes 13 seconds West a distance of 40.00 feet to the east line of said South east Quarter of the Northwest Quarter; thence continuing North 89 degrees 36 minutes 13 seconds West a distance of 428.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 40.00 feet; thence North 89 degrees 36 minutes 13 seconds West a distance of 32.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 220.00 feet; thence South 00 degrees 23 minutes 13 seconds East a distance of 460.00 feet to the point of beginning, consisting of 2.96 acres.

2. Use Restrictions

Subject to the terms and conditions of this Declaration and the reservation and covenants contained herein, the University of Minnesota hereby declares and imposes the following restrictions ("Restrictions") on the Parcels depicted and identified on the General Site

Plans attached hereto as Exhibits A, B, C, D, and E and made a part of by reference, as follows:

a) Nonrestricted Access Areas: Parcels B and C

Parcels B and C, where cleaned soils contain up to 10 ppm polychlorinated biphenyls (PCB's) by weight have the following use restrictions:

(i) A soil cap of a minimum of 10 inches shall be maintained in all outdoor exposure areas with soil containing less than 1 ppm PCB's.

(ii) Use of Parcels B and C shall be limited to commercial and industrial use. The following uses of Parcels B and C are not allowed: day care centers; any form of primary or secondary educational facility; churches; social centers; hospitals; elder care facilities; nursing homes; recreational; and single family or multiple family dwellings.

(iii) Soil testing in area of Parcels B and C indicates that soils meet the MPCA soil cleanup standards for the commercial and industrial uses allowed under this Declaration. However, this soil is not acceptable as clean fill off-site. Therefore, soil excavated from Parcels B and C shall not be removed from Parcels B and C unless such removal is in accordance with a Contingency Plan to be approved by the MPCA Commissioner at the same time such removal and disposal is proposed.

b) Nonrestricted Access Area: Parcel D

Parcel D, where a waste disposal/burn pit for disposal and burning of liquid laboratory wastes resulted in infiltration of volatile organic compounds (VOCs) into groundwater, was remediated and contains landfilled waste. Parcel D shall have the following use restriction:

i) A soil cap shall be maintained in all outdoor exposure areas to minimize direct contact and reduce infiltration.

c) Nonrestricted Access Area: Parcel E

Parcel E, where soil and concrete contain up to 3.5 ppm PCB's by weight has the following use restrictions:

i) Use of Parcel E shall be limited to commercial and industrial use. The following uses of Parcel E are not allowed: day care centers; any form of primary or secondary educational facility; churches; social centers; hospitals; elder care facilities; nursing homes; recreational; and single family or multiple family dwellings.

ii) Soil testing in the area of Parcel E indicates that soils meet the MPCA soil cleanup standards for the commercial and industrial uses allowed under this Declaration. However, this soil is not acceptable as clean fill off-site. Therefore, soil excavated from Parcel E shall not be removed from Parcel E unless such removal is in accordance with a Contingency Plan to be approved by the MPCA Commissioner at the same time such removal and disposal is proposed.

d) Restricted Access Area: Parcel A

Parcel A, where soils, concrete, and debris contain up to 25 ppm PCB's by weight, have the following use restrictions:

i) Restricted access is required for Parcel A, by using at a minimum a six foot chain link fence, which is the method existing on the date of execution of this Declaration. Other methods of restriction may be used provided that such methods allow only authorized personnel to gain access.

ii) A 10 inch soil cap shall be maintained to prevent wind and water erosion from the site. The cap also may be replaced with some other form of impervious cap (such as an asphalt cap) so as to provide erosion protection.

e) Disturbance or alteration of any nature shall not occur on, above, or beneath Parcels A and D without the prior written approval of the Commissioner of the MPCA or his/her successor (the "Commissioner"). The Commissioner's approval may include conditions which the Commissioner deems reasonable and necessary to protect public health or the environment, and shall not be unreasonably withheld. Any disturbances or alteration of Parcels B, C, or E shall be consistent with commercial or industrial uses to which those parcels are restricted. If any disturbances or alterations of parcels B, C, or E results in discovery of any contamination that exceeds 10 ppm PCBs, the owner shall immediately notify the Commissioner and shall follow the procedures set forth in section 7(d) of this Declaration.

Within 60 days after receipt of a written request for approval to engage in any activities subject to the Use Restrictions, the Commissioner shall respond, in writing, by approving such request, disapproving such request, or requiring that additional information be provided. A lack of response by the Commissioner shall not be considered as approval by default or as conveying ability to proceed with the proposed activity. The Commissioner shall not unreasonably withhold approval of the written request.

3. Covenants

The Restrictions set forth in Section 2 and the covenants herein shall run with the land and be binding upon the University and its successors and assigns and on all parties who now and hereafter have or hold any right, title of interest in or to the Property. The University of Minnesota hereby covenants that the Property shall not be held, occupied, altered or used in violation of the Restrictions set forth in Section 2 of this Declaration.

4. Reservations

Nothing contained in this Declaration shall in any way prohibit, restrict, or limit the University of Minnesota, its successors or assigns, from fully conveying, transferring, occupying or using the Property for purposes consistent with the Restrictions.

5. Duration Amendment

This Declaration and the covenants, grants, and Restrictions herein shall continue until terminated, modified, released and/or amended with the written consent of the Commissioner or his/her successors, such consent not to be unreasonably withheld. Notwithstanding the foregoing, this Declaration and the covenants, grants, and Restrictions set forth herein may be terminated by the Commissioner, modified, released and/or amended upon the occurrence and satisfaction of the following conditions:

a) Soil, ground water and surface water sampling is conducted on Parcels A, B, C, D and/or E with prior written notice to and in accordance with a plan approved by the MPCA, such approval not to be unreasonably withheld; and

b) Based on such samples the Commissioner determines that the soil, ground water and surface water located within Parcels A, B, C, D and/or E no longer pose an unacceptable risk to public health and the environment that disturbance of such soil and/or groundwater and/or surface waters will not hinder the biodegradation of any remaining contamination; or

c) If the Commissioner finds that the conditions set forth in Section 2 of this Declaration are inadequate to achieve or maintain an acceptable risk as set forth in the Record of Decision, June 11, 1990, Explanation of Significant Difference, August 1991, and second Explanation of Significant Difference, October 1, 1993.

In the event of a termination, modification, release and/or amendment of this Declaration, the Commissioner, within 60 days after receipt of written request from the then-current owner of Parcels A, B, C, D and/or E, shall execute an instrument in recordable form, terminating, releasing, modifying and/or amending this Declaration.

6. Grant and Covenants to Commissioner: Right of Entry

Subject to the terms and conditions of this Declaration, the University of Minnesota grants and conveys to the MPCA, its agents, contractors and subcontractors and its successors such rights and interest in the Property necessary and convenient to enforce the Restrictions set forth in section 2 of this Declaration, including the right, upon reasonable advance notice to the then-current owner and at reasonable times and upon displaying proper credentials to enter from time to time upon the Property to verify compliance with the Restrictions. The MPCA will be liable for injury or loss of property or personal injury or death caused by an act of omission of any employee of the MPCA in the performance of such inspection activities under circumstances where the MPCA, if a private person, would be liable to the claimant, in accordance with and subject to the limitations provided in the State Tort Claims Act, Minnesota Statutes Section 3.736.

7. Emergency Procedures

The University of Minnesota covenants that the procedures set forth shall be followed when an emergency requires immediate excavation of contaminated soil on Parcels A and D to repair utility lines or other infrastructure, or to respond to other types of emergencies (e.g., fires, floods) that may result in an unacceptable risk of harm from exposure:

(a) notify the Commissioner within 24 hours of obtaining knowledge of such emergency conditions by contacting the State Duty Officer.

(b) limit disturbance of contaminated media to the minimum reasonably necessary to adequately respond to the emergency;

(c) undertake precautions to minimize exposure to workers and neighbors of the site to contaminated media (e.g., provide appropriate types of protective clothing for workers conducting the excavation, and establish procedures for minimizing the liberation of contaminated dust); and

(d) prepare and implement a plan to restore the site to a level of acceptable risk. Submit to the Commissioner a copy of such a plan for review and approval prior to implementation of a plan. Submit a follow-up report after the plan is implemented so that the Commissioner can determine whether a level of acceptable risk has been restored.

8. Disclosures

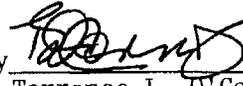
The restrictions set forth in Section 2 of this Declaration shall be incorporated in full or by reference into all instruments conveying an interest in and/or a right to use or occupy the property (e.g., easements, mortgages, leases).

9. Reporting

Any changes in address of the parties shall be promptly conveyed to the other party. If the Property is transferred, sold or conveyed to another person, the University shall inform the MPCA in writing of the name and address of the new owner.

In Witness Whereof, this instrument has been executed on the day and year first above written.

Regents of the University of Minnesota

By 
Terrence L. O'Connor

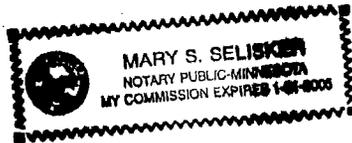
Its Interim Treasurer

State of Minnesota)

)SS.

County of Hennepin)

The foregoing instrument was acknowledged before me this 5th day of November 1999, by Terrence L., the Interim of the Regents of the University of Minnesota. O'Connor Treasurer



Mary S. Selisker
Notary Public

Accepted on behalf of

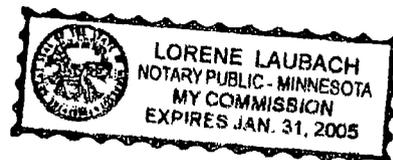
Minnesota Pollution Control Agency
Pursuant to Minn. Stat. § 115B.17,
Subd. 15

By *Karen A. Studders*
Karen A. Studders
Commissioner

State of Minnesota)
)SS.
County of Ramsey)

ff The foregoing instrument was acknowledged before me this 3rd day of January,
2000
1999, by Karen A. Studders, the Commissioner of Minnesota Pollution Control Agency, a
Minnesota body politic, on behalf of the State of Minnesota.

Lorene Laubach
Notary Public

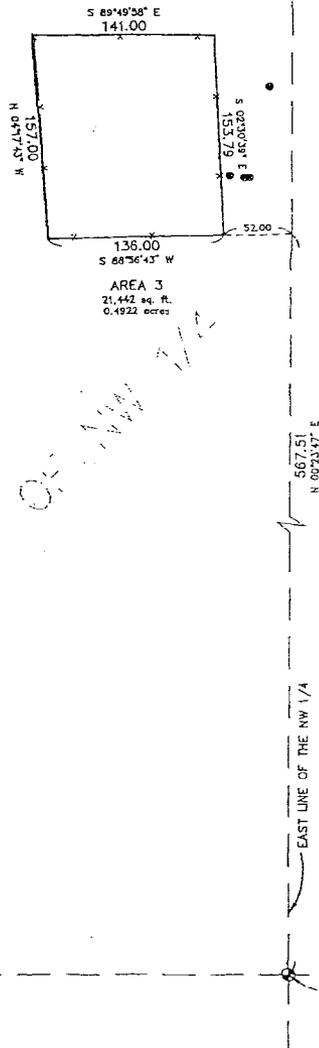


Sketch of Description

Exhibit A - Parcel A: GUE Deep Site (Restricted Access)

for

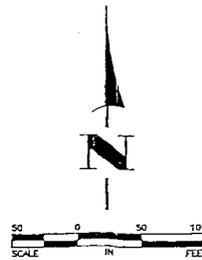
UNIVERSITY OF MINNESOTA ROSEMOUNT EXPERIMENTAL STATION



PROPOSED PROPERTY DESCRIPTION - AREA 3

The part of the Southeast Quarter of the Northwest Quarter of Section 35, Township 115, Range 19, Dakota County, Minnesota, described as follows:

Commencing at the Southwest corner of said Southeast Quarter of Northwest Quarter; thence North 00 degrees 23 minutes 47 seconds East, assumed bearing along the west line of said Southeast Quarter of the Northwest Quarter, a distance of 567.51 feet; thence South 88 degrees 56 minutes 43 seconds West a distance of 52.00 feet to the actual point of beginning of the land to be described; thence continue South 88 degrees 56 minutes 43 seconds West a distance of 136.00 feet; thence North 04 degrees 17 minutes 43 seconds West a distance of 157.00 feet; thence South 89 degrees 49 minutes 58 seconds East a distance of 141.00 feet; thence South 02 degrees 30 minutes 39 seconds East a distance of 153.79 feet to the point of beginning.



I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly Registered Land Surveyor under the laws of the State of Minnesota.

Charles R. Christopherson 18420 8/19/95
Charles R. Christopherson Reg. No. Date

REVISED 8/27/98 - ADDED AREA 3
REVISED 10/29/98 - REMOVE AREA 1,2

**Hakanson
Anderson
Assoc., Inc.**

Engineers, Surveyors & Landscapers and Architects
3602 Thurston Ave., Ancker, Minnesota 55303
612-487-2866 FAX 612-487-1080
182 Park St. N., Monticello, Minnesota 55362
612-291-3888 FAX 612-293-4488

BOOK 318 PAGE 88-79
JOB No. 2200.05
22000554.DWG

Exhibit E - Parcel E: Porter Electric and Machine Site (Nonrestricted Access)

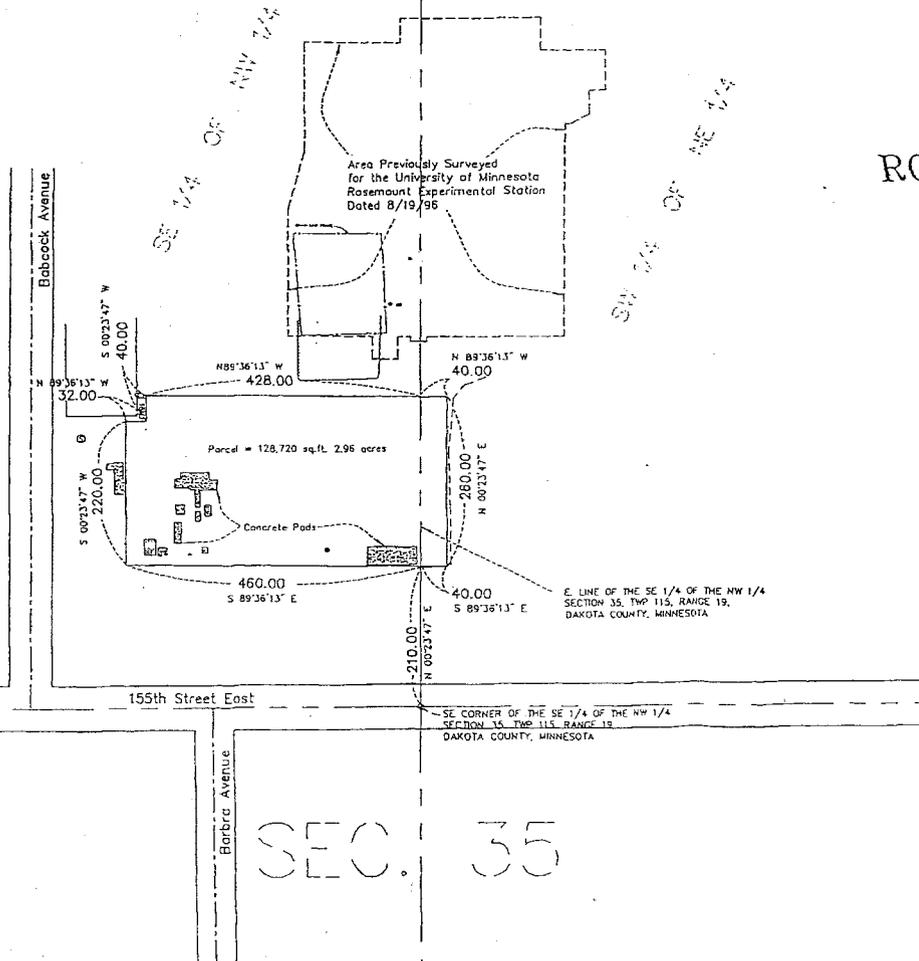
SKETCH OF DESCRIPTION

~ FOR ~

UNIVERSITY OF MINNESOTA
REAL ESTATE OFFICE

~ OF ~

ROSEMOUNT EXPERIMENTAL STATION

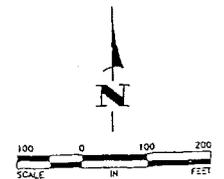


Proposed Property Description

That part of the Southeast Quarter of the Northwest Quarter and the Southwest Quarter of the Northeast Quarter, Section 35, Township 115, Range 19, Dakota County, Minnesota, described as follows:

Commencing at the Southeast corner of said Southeast Quarter of the Northwest Quarter; thence North 00 degrees 23 minutes 47 seconds East, assumed bearing along the east line of said Southeast Quarter of the Northwest Quarter, a distance of 210.00 feet to the actual point of beginning of the land to be described; thence South 89 degrees 36 minutes 13 seconds East a distance of 40.00 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 280.00 feet; thence North 89 degrees 36 minutes 13 seconds West a distance of 40.00 feet to the east line of said Southeast Quarter of the Northwest Quarter; thence continuing North 89 degrees 36 minutes 13 seconds West a distance of 428.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 40.00 feet; thence North 89 degrees 36 minutes 13 seconds West a distance of 32.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 220.00 feet; thence South 00 degrees 23 minutes 47 seconds East a distance of 480.00 feet to the point of beginning.

NOTE:
AREA = 128,720 sq. ft. 2.96 acres



I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly Registered Land Surveyor under the laws of the State of Minnesota.
10/21/98

DATE	REVISION	BY	CHK	SCALE
		CRC		1" = 100
		SLD		
		BOG		

Hakanson Anderson Assoc. Inc.
Engineers, Surveyors & Landscape Architects
3601 Purdee Avenue, Appleton, Minnesota 55003
812-427-2500 FAX 812-427-0520
121 2nd St. S. Appleton, Minnesota 55002

SKETCH OF DESCRIPTION
FOR
UNIVERSITY OF MINNESOTA
REAL ESTATE OFFICE
OF
ROSEMOUNT EXPERIMENTAL STATION

220007A.DWG

SHEET 1 OF 1

Sketch of Description

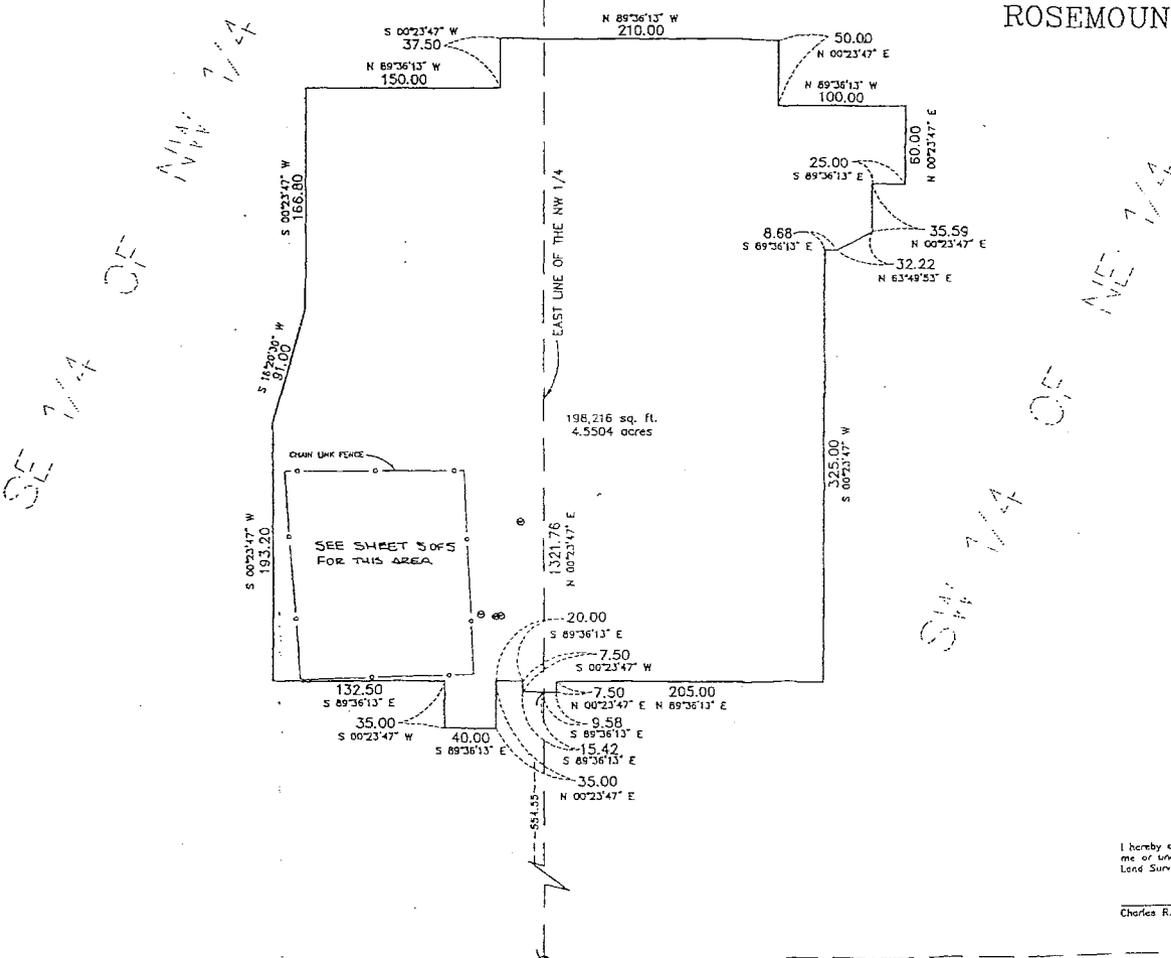
Exhibit B - Parcel B: GUE Shallow Site (Nonrestricted Access)

UNIVERSITY OF MINNESOTA ROSEMOUNT EXPERIMENTAL STATION

PROPOSED PROPERTY DESCRIPTION

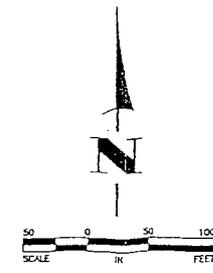
That part of the Southeast Quarter of the Northwest Quarter and the Southeast Quarter of the Northeast Quarter, Section 35, Township 115, Range 19, Dakota County, Minnesota, described as follows:

Commencing at the Southeast corner of said Southeast Quarter of the Northwest Quarter; thence North 00 degrees 23 minutes 47 seconds East, assumed bearing along the east line of said Southeast Quarter of the Northwest Quarter, a distance of 354.55 feet to the actual point of beginning of the land to be described; thence South 89 degrees 36 minutes 13 seconds East a distance of 5.58 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 205.00 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 325.00 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 8.68 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 25.00 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 60.00 feet; thence North 89 degrees 36 minutes 13 seconds West a distance of 100.00 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 50.00 feet; thence North 89 degrees 36 minutes 13 seconds West a distance of 210.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 36.50 feet; thence North 89 degrees 36 minutes 13 seconds East a distance of 130.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 166.80 feet; thence South 16 degrees 20 minutes 00 seconds West a distance of 91.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 193.20 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 132.50 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 35.00 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 40.00 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 35.00 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 20.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 7.50 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 15.42 feet to the point of beginning.



SEE 7/4 OF
1/4 OF
1/4

for
UNIVERSITY OF MINNESOTA
ROSEMOUNT EXPERIMENTAL STATION



I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly Registered Land Surveyor under the laws of the State of Minnesota.

Charles R. Christopherson 18420 Date

**Hakanson
Anderson
Assoc., Inc.**
Engineers, Surveyors & Landscapers Associates
2465 Thurston Ave., Ancker, Minnesota 55303
612-427-5064 FAX 612-427-6552
123 First St. N., Roseville, Minnesota 55122
612-293-3088 FAX 612-293-4488

BOOK 212 PAGE 68-70
JOB No. 220055
27000553.DWG

SE CORNER OF THE SE 1/4 OF THE NW 1/4
SECTION 35, TWP 115, RANGE 19.

SHEET 4 OF 5

Sketch of Description

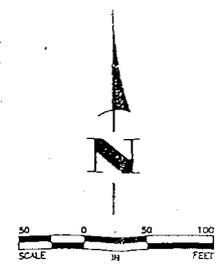
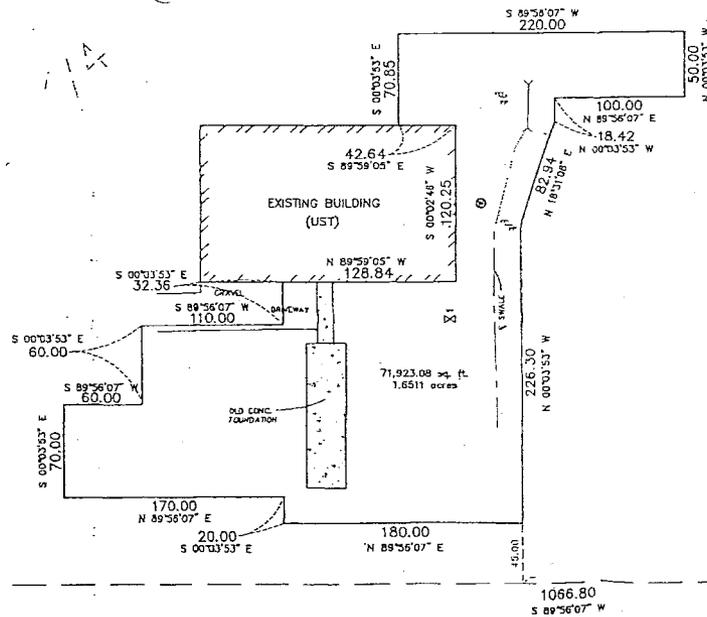
Exhibit C - Parcel C: US Transformer Site (Nonrestricted Access)

UNIVERSITY OF MINNESOTA ROSEMOUNT EXPERIMENTAL STATION

PROPOSED PROPERTY DESCRIPTION

That part of the Northeast Quarter of the Northeast Quarter of Section 35, Township 115, Range 19, Dakota County, Minnesota, described as follows:

Commencing at the Southeast corner of said Northeast Quarter of the Northeast Quarter; thence South 89 degrees 56 minutes 07 seconds West, assumed bearing along the south line of said Northeast Quarter of the Northeast Quarter, a distance of 558.55 feet; thence North 00 degrees 03 minutes 53 seconds West a distance of 45.00 feet to the actual point of beginning of the land to be described; thence continue North 00 degrees 03 minutes 53 seconds West a distance of 226.30 feet; thence North 18 degrees 31 minutes 08 seconds East a distance of 82.94 feet; thence North 00 degrees 03 minutes 53 seconds West a distance of 18.42 feet; thence North 89 degrees 56 minutes 07 seconds East a distance of 100.00 feet; thence North 00 degrees 03 minutes 53 seconds West a distance of 50.00 feet; thence South 89 degrees 56 minutes 07 seconds East a distance of 70.85 feet; thence South 89 degrees 59 minutes 05 seconds East a distance of 42.64 feet; thence South 00 degrees 03 minutes 53 seconds East a distance of 120.00 feet; thence South 00 degrees 03 minutes 53 seconds East a distance of 70.85 feet; thence South 89 degrees 59 minutes 05 seconds West a distance of 128.84 feet; thence South 89 degrees 03 minutes 53 seconds East a distance of 32.36 feet; thence South 89 degrees 56 minutes 07 seconds West a distance of 110.00 feet; thence South 00 degrees 03 minutes 53 seconds East a distance of 60.00 feet; thence South 89 degrees 56 minutes 07 seconds West a distance of 60.00 feet; thence North 89 degrees 59 minutes 05 seconds West a distance of 128.84 feet; thence North 00 degrees 03 minutes 53 seconds East a distance of 170.00 feet; thence North 89 degrees 56 minutes 07 seconds East a distance of 20.00 feet; thence North 89 degrees 56 minutes 07 seconds East a distance of 180.00 feet to the point of beginning.



SE CORNER OF THE NE 1/4 OF THE NE 1/4 SECTION 35, TWP 115, RANGE 19, DAKOTA COUNTY, MINNESOTA

SOUTH LINE OF THE NE 1/4 OF THE NE 1/4

I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly Registered Land Surveyor under the laws of the State of Minnesota.

Charles R. Christopherson Reg. No. 18420 Date

SHEET 3 OF 5

Hakanson Anderson Assoc., Inc.
 Civil, Surveying & Landscape Architects
 2400 University Ave., Suite 1000, Minneapolis, MN 55425
 612-467-2860 FAX 612-467-2322
 100 New St. N., Roseville, Minnesota 55068
 612-255-2868 FAX 612-255-4400

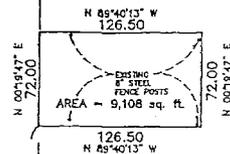
BOOK 313 PAGE 68-70
 JOB No. 2200.05
 22000552.DWG

Sketch of Description

Exhibit D - Parcel D: Burn Pit Site (Nonrestricted Access)

for

UNIVERSITY OF MINNESOTA ROSEMOUNT EXPERIMENTAL STATION



N 00°19'47\"/>

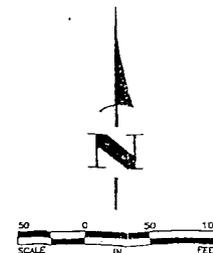
SOUTHWEST CORNER OF THE SW 1/4 OF THE SW 1/4
OF SECTION 35, TWP 11S, RANGE 18,
DAKOTA COUNTY, MINNESOTA

PROPOSED PROPERTY DESCRIPTION

That part of the Southwest Quarter of the Southwest Quarter of Section 35, Township 11S, Range 18, Dakota County, Minnesota, described as follows:

Commencing at the Southwest corner of said Southwest Quarter of the Southwest Quarter; thence North 00 degrees 19 minutes 47 seconds East, assumed bearing along the west line of said Southwest Quarter of the Southwest Quarter a distance of 632.00 feet to the actual point of beginning of the land to be described; thence South 89 degrees 40 minutes 13 seconds East a distance of 126.50 feet; thence North 00 degrees 19 minutes 47 seconds East a distance of 72.00 feet; thence North 89 degrees 40 minutes 13 seconds West a distance of 126.50 feet to the west line of said Southwest Quarter of the Southwest Quarter; thence South 00 degrees 19 minutes 47 seconds West along said west line a distance of 72.00 feet to the point of beginning.

SW 1/4
SW 1/4



I hereby certify that this survey, plan or report was prepared by me or under my direct supervision and that I am a duly Registered Land Surveyor under the laws of the State of Minnesota.

Charles R. Christopherson 18420 Date
Reg. No.

**Hakanson
Anderson
Assoc., Inc.**

Engineers, Surveyors & Landowner Architects
308 Thurston Ave. Suite 2000
St. Paul, MN 55102 TEL 612-427-0860 FAX 612-427-0502
102 Pine St. St. Paul, MN 55101 TEL 612-275-2888 FAX 612-275-2888

BOOK 112 PAGE 10-22
JOB No. 2200.05

COPY DEL'D

2585118

Office of the County Recorder
Dakota County, Minnesota
04/17/2008 at 12:35pm
Certified and filed on
the date and time above.
Joel T. Beckman, County Recorder
By: TB, Deputy

Fee: 46.00 Copy: 2.00
Check: 169967/48.00
Return:
Metro Legal

EPA Region 5 Records Ctr.



302007

METRO LEGAL SERVICES

FIRST AMENDMENT
TO
DECLARATION OF RESTRICTIONS AND COVENANTS

THIS FIRST AMENDMENT TO DECLARATION OF RESTRICTIONS AND COVENANTS is made this 26 day of December, 2007, by Regents of the University of Minnesota, a Minnesota constitutional corporation (hereinafter "University").

WITNESSETH:

WHEREAS, the University is the fee owner of certain real property located in Section 35, Township 115 North, Range 19W, Dakota County, Minnesota, consisting of several parcels including Parcel E as described in Exhibit A hereto (hereinafter "Parcel E" or "the Property"); and

WHEREAS, the University previously executed and recorded that certain Declaration of Restrictions and Covenants dated January 3, 2000 and recorded in the Office of the Dakota County recorder on May 11, 2000 as Document Number 1690212 with respect to the Property (the "Declaration"); and

WHEREAS, the Declaration states in paragraph 2(c) that soil and concrete on Parcel E of the property contain up to 3.5 ppm PCB's by weight; and

WHEREAS, said statement is erroneous and the soil and concrete on Parcel E of the property in fact contain less than 1 ppm PCB's by weight; and

WHEREAS, the University desires to correct the factual error in the Declaration by this First Amendment;

NOW, THEREFORE, the University of Minnesota makes the following amendment to the Declaration:

1. The introductory clause of paragraph 2(c) on page 6 of the Declaration is amended to read as follows:

“Parcel E, where soil and concrete contain less than 1 ppm PCB’s by weight has the following use restrictions:”.

2. Except as expressly amended hereby, the Declaration remains in full force and effect.

In Witness Whereof, this instrument has been executed on the day and year first above written.

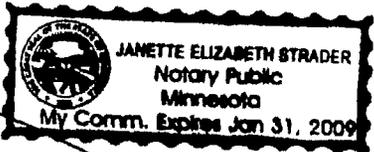
REGENTS OF THE UNIVERSITY OF MINNESOTA

By *RHP Fritzenreiter*
Its Treasurer

State of Minnesota)
) SS
County of Hennepin

The foregoing instrument was acknowledged before me this 26th day of December, 2007 by Richard Fritzenreiter, TREASURER of Regents of the University of Minnesota.

J. Strader
Notary Public



Return

This Instrument Drafted By:
Office of the General Counsel (KAL)
University of Minnesota
200 Oak Street SE, Suite 360
Minneapolis, MN 55455
Attn: Dev Carpenter
Env 104

Accepted on behalf of the Minnesota Pollution
Control Agency Pursuant to Minn. Stat. Sec. 115B.17,
Subd. 15

By Michael Kanna
Its Superfund Manager

State of Minnesota)
) SS
County of Ramsay

The foregoing instrument was acknowledged before me this 11th day of
March, 2008 by Michael Kanna, the
Superfund Manager of the Minnesota Pollution Control Agency, a
Minnesota body politic, on behalf of the State of Minnesota.

Tracy Lynn Finch
Notary Public

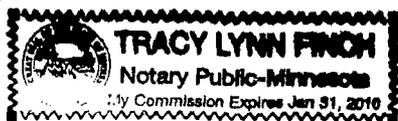


EXHIBIT A

That part of the Southeast Quarter of the Northwest Quarter and the Southwest Quarter of the Northeast Quarter, Section 35, Township 115, Range 19, Dakota County, Minnesota, described as follows:

Commencing at the Southeast corner of said Southeast Quarter of the Northwest Quarter; thence North 00 degrees 23 minutes 47 seconds East, assumed bearing along the east line of said Southeast Quarter of the Northwest Quarter, a distance of 210.00 feet to the actual point of beginning of the land to be described; thence south 89 degrees 36 minutes 13 seconds East a distance of 40.00 feet; thence North 00 degrees 23 minutes 47 seconds East a distance of 260.00 feet; thence North 89 degrees 36 minutes 13 seconds West a distance of 40.00 feet to the east line of said Southeast Quarter of the Northwest Quarter; thence continuing North 89 degrees 36 minutes 13 seconds West a distance of 428.00 feet; thence South 00 degrees 23 minutes 47 seconds West a distance of 40.00 feet; thence North 89 degrees 36 minutes 13 seconds West a distance of 220.00 feet; thence South 89 degrees 36 minutes 13 seconds East a distance of 460.00 feet to the point of beginning.



EPA Begins Review of University of Minnesota Rosemount Research Center Superfund Site

Rosemount, Minnesota

The U.S. Environmental Protection Agency is conducting a five-year review of the University of Minnesota Rosemount Research Center Superfund site at 15325 Babcock Ave. E. in Rosemount. The Superfund law requires regular checkups of sites that have been cleaned up – with waste managed on-site – to make sure the cleanup continues to protect people and the environment. This is the fourth five-year review of this site.

Cleanup at the Rosemount Research Center is managed by the University of Minnesota with oversight by the Minnesota Pollution Control Agency. The cleanup consisted of removing, treating and containing soil contaminated with PCBs and lead at several waste disposal sites on the property, as well as installing new water supply wells and a treatment system to deal with ground water contaminated with chloroform.

More information is available at the MPCA office, 520 Lafayette Road N., St. Paul, and at www.epa.gov/R5Super/npl/minnesota/MND980613780.html or at www.umorepark.umn.edu/planning/gowinvestigation/repository/index.htm.

The review should be completed in June.

The five-year review is an opportunity for you to tell the EPA about site conditions and any concerns you have. Contact:

Leah Evison

Remedial Project Manager
651-757-2898
evison.leah@epa.gov

Cheryl Allen

Community Involvement Coordinator
312-353-6196
allen.cheryl@epa.gov

You may also call the EPA toll-free at 800-621-8431, 8:30 a.m. to 4:30 p.m., weekdays.

EPA
Superfund Division
77 W. Jackson Blvd.
Chicago, IL 60604

RT051012

FARMINGTON FIRE DEPARTMENT

Fire truck will cost \$560K

Firefighters will supervise the new truck's construction

Michelle Leonard
Independent staff writer

One more approval, and Farmington could have its new fire truck by as early as the end of this year.

On Monday, Farmington City Council members voted unanimously to approve purchasing a fire rescue truck from the Pierce manufacturing company, for a proposed price of \$560,064, and sending four Farmington firefighters to the Pierce company plant in Appleton, Wis., to oversee its construction.

The city of Farmington has become part of the Houston Galveston Agreement Consortium, which helps governments by establishing competitively priced contracts for things communities need — including fire trucks. HGAC put out a request for proposals on Farmington's behalf, and in return, the city received two proposals. The lower of the two proposals, for \$560,064, met all of the specifications required for the new truck.

In addition, Farmington fire chief Tim Pietsch asked that four members of the department's truck committee be allowed to go to Appleton on three occasions to supervise the truck's construction. They will go once for a pre-construction meeting, then for an inspection of the vehicle before it's painted, and then again, for the final inspection before delivery. Pietsch estimated the cost to send committee members to Appleton at \$2,310.

Council members approved both the purchase of the truck, and the request to send firefighters to Appleton.

Initial discussions with HGAC and Pierce indicate construction on the truck could start sometime in the next couple of weeks.

"We're hoping we can get delivery by the first of the year. It would be nice. Kind of like an early Christmas," Pietsch said.

FFD Explorer Day is Saturday

Event will give teens hands-on experience responding to emergencies

Michelle Leonard
Independent staff writer

There might be a few fire trucks and ambulances driving around Farmington Saturday, Don't worry, though — the calls they're responding to are all simulated events designed to educate area teens.

Saturday will be the second 24-hour duty, shift training for the Farmington Fire Explorer Post 9470, and Fire Explorer Post 9923 and Northfield EMS Post 3300 advisors to come up with a day full of training activities.

The events will be held at locations throughout Farmington and surrounding townships. A number of actors and actresses will be stationed at the various locations, acting out all different types of emergencies.

Last year's culminating event included a simulated accident scene complete with injuries and a car fire. While the Northfield EMS Explorers tended to the victims, the Farmington Post 9470 members put out the blaze. There were members of Farmington's fire/rescue crew on hand just in case the kids needed help.

There are about 45 students participating in Saturday's drills.

"It's going to be huge. It's going to be a lot of work for us, but it's going to be cool," he said.

Farmington Fire Explorers Post 9470 was created in December, 2010. Many of its members have already earned their Firefighter I and II certifications and their CPR certifications. One of the original members has even applied to get into the Farmington Fire Department.

"It's a nice progression to go from an Explorer to firefighter," Matek said. "These kids are awesome. I'm very proud of them."

The truck will be painted white with a blue stripe, like the rest of the rigs in the Farmington Fire Department.

In order to pay for the truck, the city council will use an inter-fund loan from the Farmington Water Board. Water board members will have to approve the transfer at their May 29 meeting. The loan will be paid back through a \$119,000 tax levy over the next five years.

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 Mon-Fri 9 a.m. – 6 p.m. • Sat 9 a.m. – 3 p.m.

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 Dishes, Antiques, Furniture, Baby Clothes, Lamps, Sporting Goods, Tools, Animal Products, Misc. Items

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EPA Begins Review of University of Minnesota Rosemount Research Center Superfund Site

Rosemount, Minnesota

The U.S. Environmental Protection Agency is conducting a five-year review of the University of Minnesota Rosemount Research Center Superfund site at 15325 Babcock Ave. E. in Rosemount. The Superfund law requires regular checkups of sites that have been cleaned up — with waste managed on-site — to make sure the cleanup continues to protect people and the environment. This is the fourth five-year review of this site.

Cleanup at the Rosemount Research Center is managed by the University of Minnesota with oversight by the Minnesota Pollution Control Agency. The cleanup consisted of removing, treating and containing soil contaminated with PCBs and lead at several waste disposal sites on the property, as well as installing new water supply wells and a treatment system to deal with ground water contaminated with chloroform.

More information is available at the MPCA office, 520 Lafayette Road N., St. Paul, and at www.epa.gov/RSSuperfund/Minnesota/MND980613780.html or at www.umorepark.umn.edu/planning/go/winvestigation/repository/index.htm.

The review should be completed in June.

The five-year review is an opportunity for you to tell the EPA about site conditions and any concerns you have. Contact:

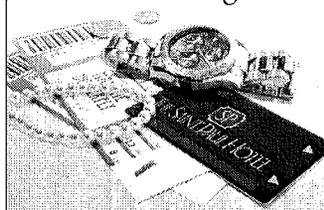
Leah Evison
 Remedial Project Manager
 651-757-2898
evison.leah@epa.gov

Cheryl Allen
 Community Involvement Coordinator
 312-353-6196
allen.cheryl@epa.gov

You may also call the EPA toll-free at 800-621-8431, 8:30 a.m. to 4:30 p.m., weekdays.

EPA
 Superfund Division
 77 W. Jackson Blvd.
 Chicago, IL 60604

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 Farmington, Minnesota
www.farmingtonindependent.com



Over 1,000 Garage Sales in Woodbury, Minnesota for 3 days!

Woodbury Lions Club 35th Annual Garage Sale



Thursday, May 10th,
 Friday, May 11th &
 Saturday, May 12th
 8:00am - 5:00pm

GET YOUR EXCLUSIVE GUIDE TO THE GARAGE SALES AT THE LOCATIONS LISTED BELOW.



- | | | |
|--|---|--|
| CUB FOODS
- 8432 Tamarack Village | KWIK TRIP
- 8477 City Centre Drive
- Co. Rd. 19 & Hudson Rd. | SUPER AMERICA
- 1551 Woodlane Drive
- 6401 Lake Road
- 9910 Norma Lane |
| HOLIDAY STATION
- 757 Radio Drive
- Valley Creek Rd. & Co. Rd. 19 | PDQ
- Valley Creek Rd. & Weir Dr. | WOODBURY BP
- 1561 Woodlane Drive |
| KOWALSKI'S
- Valley Creek Rd. & Radio Dr. | RAINBOW FOODS
- 7050 Valley Creek Plaza,
Woodbury Village | |

Directories listing the Garage Sale locations and merchandise for sale may be purchased for \$5.00 from 5:00-9:30 pm the day before the sale and also after 7:30 am on the days of the sale.

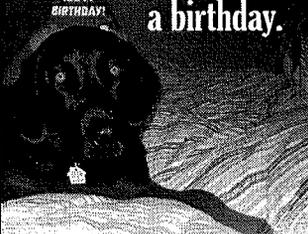
For additional Garage Sale Information:
www.woodburylions.org

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EPA Begins Review of University of Minnesota Rosemount Research Center Superfund Site
 Rosemount, Minnesota



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Leah Evison Remedial Project Manager 651-757-2898 evison.leah@epa.gov	Cheryl Allen Community Involvement Coordinator 312-353-6196 allen.cheryl@epa.gov
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Documents Reviewed

- Remedial Investigation Report, UMore East, prepared for the University of Minnesota (February 2012) (sections related to the Superfund Site areas only)
- Institutional Control documents for the Site (2000/2008)
- Third Five Year Review (June 2007)
- Site Deletion (February 2001)
- Final Closeout Report (PCOR) (1996)
- Record of Decision (ROD) (June 1990)
- Minnesota Enforcement Decision Document (MEDD) (December 1986)
(attached to ROD above)

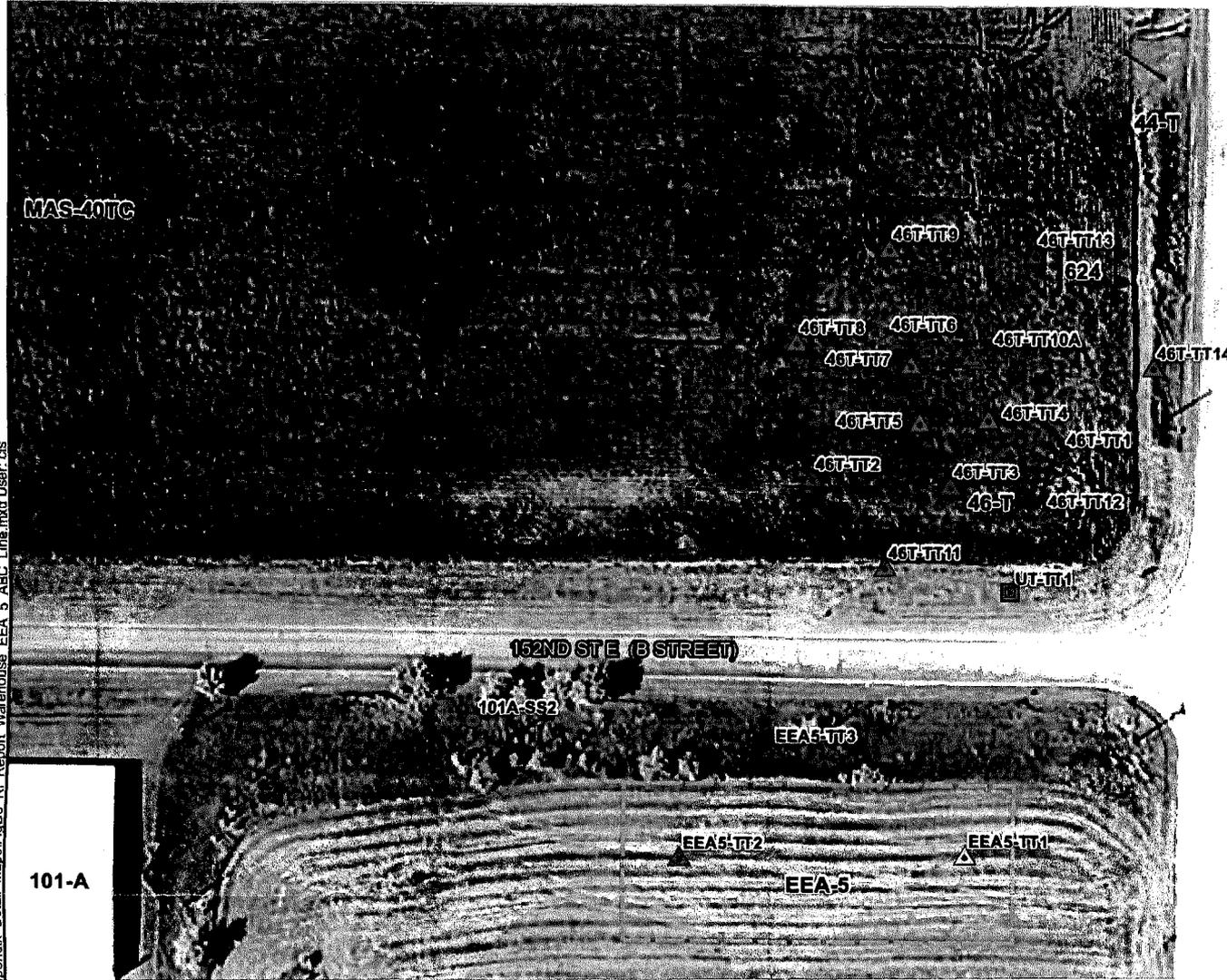
		Sys Loc Code	MW-23D	MW-28	MW-29	MW-A5-018	MW-A6-006
		Sample Date	7/14/2011	7/14/2011	7/12/2011	12/7/2011	7/13/2011
		Sample Type Code	N	N	N	N	N
Chemical Name	Total or Dissolved	EPA Maximum Contaminant Limit	MN GW Values Table				
Effective Date		7/1/2002	08/03/2011				
Exceedance Key		Bold	No Exceed				
General Parameters							
Alkalinity, total	NA			290000 ug/l	340000 ug/l	310000 ug/l	260000 ug/l
Chloride	NA			11000 ug/l	14000 ug/l	20000 ug/l	4400 ug/l
Nitrate + Nitrite	NA	10000 ug/l		9000 ug/l	10000 * ug/l	11000 ug/l	600 ug/l
Perchlorate	NA			< 100 ug/l	< 100 ug/l	< 100 ug/l	< 100 ug/l
Sulfate	NA			33000 ug/l	26000 ug/l	25000 ug/l	8500 ug/l
Metals							
Arsenic	Dissolved	10 ug/l		< 10 ug/l	< 10 ug/l	< 10 ug/l	< 10 ug/l
Barium	Dissolved	2000 ug/l	2000 HRL93 ug/l	51 ug/l	66 ug/l	70 ug/l	48 ug/l
Cadmium	Dissolved	5 ug/l	4 HRL93 ug/l	< 1.0 ug/l	< 1.0 ug/l	< 1.0 ug/l	< 1.0 ug/l
Calcium	Dissolved			94000 ug/l	110000 ug/l	100000 ug/l	75000 ug/l
Chromium	Dissolved	100 ug/l	100 CR ug/l	< 10 ug/l	< 10 ug/l	< 10 ug/l	< 10 ug/l
Lead	Dissolved	15 TT(7) ug/l		< 3.0 ug/l	< 3.0 ug/l	< 3.0 ug/l	< 3.0 ug/l
Magnesium	Dissolved			34000 ug/l	36000 ug/l	35000 ug/l	22000 ug/l
Mercury	Dissolved	2 ug/l		< 0.20 ug/l	< 0.20 ug/l	< 0.20 ug/l	< 0.20 ug/l
Potassium	Dissolved			1500 ug/l	2000 ug/l	1600 ug/l	1400 ug/l
Selenium	Dissolved	50 ug/l	30 HRL93 ug/l	< 20 ug/l	< 20 ug/l	< 20 ug/l	< 20 ug/l
Silver	Dissolved		30 HRL93 ug/l	< 5.0 ug/l	< 5.0 ug/l	< 5.0 ug/l	< 5.0 ug/l
Sodium	Dissolved			4600 ug/l	4400 ug/l	5300 ug/l	6700 ug/l
SVOCs							
1,2,4-Trichlorobenzene	NA	70 ug/l	4 HBV11 (1) ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l
1,2-Dichlorobenzene	NA	600 ug/l	600 HRL93 ug/l	< 0.31 ug/l	< 0.31 ug/l	< 0.31 ug/l	< 0.31 ug/l
1,3-Dichlorobenzene	NA			< 0.29 ug/l	< 0.29 ug/l	< 0.29 ug/l	< 0.29 ug/l
1,4-Dichlorobenzene	NA	75 ug/l	10 HRL94 ug/l	< 0.27 ug/l	< 0.27 ug/l	< 0.27 ug/l	< 0.27 ug/l
2,3,4,6-Tetrachlorophenol	NA			< 0.89 ug/l	< 0.89 ug/l	< 0.89 ug/l	< 0.89 ug/l
2,4,5-Trichlorophenol	NA			< 0.55 ug/l	< 0.55 ug/l	< 0.55 ug/l	< 0.55 ug/l
2,4,6-Trichlorophenol	NA		30 HRL93 ug/l	< 0.55 ug/l	< 0.55 ug/l	< 0.55 ug/l	< 0.55 ug/l
2,4-Dichlorophenol	NA		20 HRL93 ug/l	< 0.58 ug/l	< 0.58 ug/l	< 0.58 ug/l	< 0.58 ug/l
2,4-Dimethylphenol	NA		100 HRL93 ug/l	< 0.53 ug/l	< 0.53 ug/l	< 0.53 ug/l	< 0.53 ug/l
2,4-Dinitrophenol	NA		10 HRL94 ug/l	< 1.1 ug/l	< 1.1 ug/l	< 1.1 ug/l	< 1.1 ug/l
2,4-Dinitrotoluene	NA			< 0.42 ug/l	< 0.42 ug/l	< 0.42 ug/l	< 0.42 ug/l
2,6-Dichlorophenol	NA			< 0.46 ug/l	< 0.46 ug/l	< 0.46 ug/l	< 0.47 ug/l
2,6-Dinitrotoluene	NA			< 0.49 ug/l	< 0.49 ug/l	< 0.49 ug/l	< 0.50 ug/l
2-Chloronaphthalene	NA			< 0.56 ug/l	< 0.56 ug/l	< 0.56 ug/l	< 0.56 ug/l
2-Chlorophenol	NA		30 HRL93 ug/l	< 0.36 ug/l	< 0.36 ug/l	< 0.36 ug/l	< 0.36 ug/l
2-Methyl-4,6-dinitrophenol	NA			< 0.93 ug/l	< 0.93 ug/l	< 0.93 ug/l	< 0.93 ug/l
2-Methylnaphthalene	NA			< 0.81 ug/l	< 0.81 ug/l	< 0.81 ug/l	< 0.82 ug/l
2-Nitroaniline	NA			< 0.56 ug/l	< 0.56 ug/l	< 0.56 ug/l	< 0.56 ug/l
2-Nitrophenol	NA			< 0.86 ug/l	< 0.86 ug/l	< 0.86 ug/l	< 0.87 ug/l
3,3'-Dichlorobenzidine	NA		0.8 HRL93 ug/l	< 6.7 ug/l	< 6.7 ug/l	< 6.7 ug/l	< 6.7 ug/l
3-Nitroaniline	NA			< 1.0 ug/l	< 1.0 ug/l	< 1.0 ug/l	< 1.0 ug/l
4-Bromophenyl phenyl ether	NA			< 0.39 ug/l	< 0.39 ug/l	< 0.39 ug/l	< 0.39 ug/l
4-Chloro-3-methylphenol	NA			< 0.44 ug/l	< 0.44 ug/l	< 0.44 ug/l	< 0.45 ug/l
4-Chloroaniline	NA			< 1.2 ug/l	< 1.2 ug/l	< 1.2 ug/l	< 1.2 ug/l
4-Chlorophenyl phenyl ether	NA			< 0.29 ug/l	< 0.29 ug/l	< 0.29 ug/l	< 0.29 ug/l
4-Nitroaniline	NA			< 0.83 ug/l	< 0.83 ug/l	< 0.83 ug/l	< 0.84 ug/l
4-Nitrophenol	NA			< 0.72 ug/l	< 0.72 ug/l	< 0.72 ug/l	< 0.72 ug/l
Acenaphthene	NA		400 HRL93 ug/l	< 0.56 ug/l	< 0.56 ug/l	< 0.56 ug/l	< 0.56 ug/l
Acenaphthylene	NA			< 0.51 ug/l	< 0.51 ug/l	< 0.51 ug/l	< 0.51 ug/l
Aniline	NA			< 1.5 ug/l	< 1.5 ug/l	< 1.5 ug/l	< 1.5 ug/l
Anthracene	NA		2000 HRL93 ug/l	< 0.52 ug/l	< 0.52 ug/l	< 0.52 ug/l	< 0.52 ug/l
Azobenzene	NA			< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l
Benzidine	NA			< 7.0 ug/l	< 7.0 ug/l	< 7.0 ug/l	< 7.1 ug/l
Benzo(a)anthracene	NA			< 0.46 ug/l	< 0.46 ug/l	< 0.46 ug/l	< 0.47 ug/l
Benzo(a)pyrene	NA	0.2 ug/l		< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l
Benzo(b)fluoranthene	NA			< 0.41 ug/l	< 0.41 ug/l	< 0.41 ug/l	< 0.41 ug/l
Benzo(g,h,i)perylene	NA			< 0.43 ug/l	< 0.43 ug/l	< 0.43 ug/l	< 0.43 ug/l
Benzo(k)fluoranthene	NA			< 0.45 ug/l	< 0.45 ug/l	< 0.45 ug/l	< 0.46 ug/l
Benzoic Acid	NA		30000 HRL93 ug/l	< 0.48 ug/l	< 0.48 ug/l	< 0.48 ug/l	< 0.49 ug/l
Benzyl alcohol	NA			< 1.1 ug/l	< 1.1 ug/l	< 1.1 ug/l	< 1.1 ug/l
Bis(2-chloroethoxy)methane	NA			< 0.25 ug/l	< 0.25 ug/l	< 0.25 ug/l	< 0.25 ug/l
Bis(2-chloroethyl)ether	NA		0.3 HRL93 ug/l	< 0.20 ug/l	< 0.20 ug/l	< 0.20 ug/l	< 0.21 ug/l
Bis(2-chloroisopropyl)ether	NA			< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l
Bis(2-ethylhexyl)phthalate	NA	6 ug/l	6 MCL ug/l	< 0.75 ug/l	< 0.75 ug/l	< 0.75 ug/l	< 0.76 ug/l
Butyl benzyl phthalate	NA		100 HRL93 ug/l	< 0.42 ug/l	< 0.42 ug/l	< 0.42 ug/l	< 0.42 ug/l
Carbazole	NA			< 0.31 ug/l	< 0.31 ug/l	< 0.31 ug/l	< 0.31 ug/l

				Sys Loc Code	MW-23D	MW-28	MW-29	MW-A5-018	MW-A6-006
				Sample Date	7/14/2011	7/14/2011	7/12/2011	12/7/2011	7/13/2011
				Sample Type Code	N	N	N	N	N
Chemical Name	Total or Dissolved	EPA Maximum Contaminant Limit	MN GW Values Table						
Effective Date		7/1/2002	08/03/2011						
Exceedance Key		Bold	No Exceed						
Chloroethane	NA			< 0.27 ug/l	< 0.27 ug/l	< 0.27 ug/l	< 0.27 ug/l	< 0.27 ug/l	< 0.27 ug/l
Chloroform	NA	80 (2) ug/l	30 HRL08 (1,2) ug/l	5.0 ug/l	7.9 ug/l	1.2 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l
Chloromethane	NA			< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l
Chlorotoluene o-	NA			< 0.081 ug/l	< 0.081 ug/l	< 0.081 ug/l	< 0.081 ug/l	< 0.081 ug/l	< 0.081 ug/l
Chlorotoluene p-	NA			< 0.11 ug/l	< 0.11 ug/l	< 0.11 ug/l	< 0.11 ug/l	< 0.11 ug/l	< 0.11 ug/l
Cumene (isopropyl benzene)	NA		300 HRL93 ug/l	< 0.12 ug/l	< 0.12 ug/l	< 0.12 ug/l	0.34 j ug/l	< 0.12 ug/l	< 0.12 ug/l
Cymene p- (Toluene isopropyl p-)	NA			< 0.14 ug/l	< 0.14 ug/l	< 0.14 ug/l	< 0.14 ug/l	< 0.14 ug/l	< 0.14 ug/l
Dibromomethane (methylene bromide)	NA			< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l
Dichlorodifluoromethane (CFC-12)	NA		700 HBV09 (1) ug/l	< 0.25 ug/l	< 0.25 ug/l	< 0.25 ug/l	< 0.25 ug/l	< 0.25 ug/l	< 0.25 ug/l
Dichlorofluoromethane (CFC-21)	NA			< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l
Ethyl benzene	NA	700 ug/l	50 HBV10 (2) ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l
Ethyl ether	NA		200 RAA10 (1) ug/l	< 0.27 ug/l	< 0.27 ug/l	< 0.27 ug/l	< 0.27 ug/l	< 0.27 ug/l	< 0.27 ug/l
Hexachlorobutadiene	NA		1 HRL93 ug/l	< 0.42 ug/l	< 0.42 ug/l	< 0.42 ug/l	< 0.42 ug/l	< 0.42 ug/l	< 0.42 ug/l
Methyl ethyl ketone	NA		4000 HRL94 ug/l	< 0.65 ug/l	< 0.65 ug/l	< 0.65 ug/l	< 0.65 ug/l	< 0.65 ug/l	< 0.65 ug/l
Methyl isobutyl ketone	NA		300 HRL94 ug/l	< 0.40 ug/l	< 0.40 ug/l	< 0.40 ug/l	< 0.40 ug/l	< 0.40 ug/l	< 0.40 ug/l
Methyl tertiary butyl ether (MTBE)	NA			< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l
Methylene chloride	NA	5 ug/l	5 MCL ug/l	< 0.85 ug/l	< 0.85 ug/l	< 0.85 ug/l	< 0.85 ug/l	< 0.85 ug/l	< 0.85 ug/l
Naphthalene	NA		70 HBV11 (1) ug/l	< 0.30 ug/l	< 0.30 ug/l	< 0.30 ug/l	< 0.30 ug/l	< 0.30 ug/l	< 0.30 ug/l
Propylbenzene	NA			< 0.094 ug/l	< 0.094 ug/l	< 0.094 ug/l	< 0.094 ug/l	< 0.094 ug/l	< 0.094 ug/l
Styrene	NA	100 ug/l		< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l
Tetrachloroethylene	NA	5 ug/l	5 MCL ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l
Tetrahydrofuran	NA			< 0.75 ug/l	< 0.75 ug/l	< 0.75 ug/l	< 0.75 ug/l	< 0.75 ug/l	< 0.75 ug/l
Toluene	NA	1000 ug/l	200 HBV09 ug/l	< 0.10 ug/l	< 0.10 ug/l	< 0.10 ug/l	< 0.10 ug/l	< 0.10 ug/l	< 0.10 ug/l
Trichloroethylene	NA	5 ug/l	5 MCL ug/l	0.92 j ug/l	0.75 j ug/l	< 0.18 ug/l	< 0.18 ug/l	< 0.18 ug/l	< 0.18 ug/l
Trichlorofluoromethane	NA		2000 HRL93 ug/l	< 0.29 ug/l	< 0.29 ug/l	< 0.29 ug/l	< 0.29 ug/l	< 0.29 ug/l	< 0.29 ug/l
Trichlorotrifluoroethane (Freon 113)	NA		200000 HRL93 ug/l	< 0.25 ug/l	< 0.25 ug/l	< 0.25 ug/l	< 0.25 ug/l	< 0.25 ug/l	< 0.25 ug/l
Vinyl chloride	NA	2 ug/l	0.2 HRL08 (1) ug/l	< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l	< 0.21 ug/l
Xylene m & p	NA		300 HRL10 (1,2) ug/l	< 0.57 ug/l	< 0.57 ug/l	< 0.57 ug/l	< 0.57 ug/l	< 0.57 ug/l	< 0.57 ug/l
Xylene, o-	NA		300 HRL10 (1,2) ug/l	< 0.19 ug/l	< 0.19 ug/l	< 0.19 ug/l	< 0.19 ug/l	< 0.19 ug/l	< 0.19 ug/l
Explosives									
1,3,5-Trinitrobenzene	NA		0.3 HRL93 ug/l	--	--	--	--	--	--
1,3-Dinitrobenzene	NA			--	--	--	--	--	--
2,4,6-Trinitrotoluene	NA			--	--	--	--	--	--
2,4-Dinitrotoluene	NA			--	--	--	--	--	--
2,6-Dinitrotoluene	NA			--	--	--	--	--	--
2-Amino-4,6-dinitrotoluene	NA			--	--	--	--	--	--
2-Nitrotoluene	NA			--	--	--	--	--	--
3-Nitrotoluene	NA			--	--	--	--	--	--
4-Amino-2,6-dinitrotoluene	NA			--	--	--	--	--	--
4-Nitrotoluene	NA			--	--	--	--	--	--
Hexahydro-1,3,5-Trinitro-s-triazine(RDX)	NA			--	--	--	--	--	--
Nitrobenzene	NA			--	--	--	--	--	--
n-methyl-2,4,6-Tetranitro-aniline	NA			--	--	--	--	--	--
Octahydro-1,3,5,7-Tetranitro-tetrazocine (HMX)	NA			--	--	--	--	--	--

Chemical Name	Total or Dissolved	EPA Maximum Contaminant Limit	MN GW Values Table	Sys Loc Code	MW-23D	MW-28	MW-29	MW-A5-018	MW-A6-006
				Sample Date	7/14/2011	7/14/2011	7/12/2011	12/7/2011	7/13/2011
				Sample Type Code	N	N	N	N	N
Effective Date		7/1/2002	08/03/2011						
Exceedance Key		Bold	No Exceed						
Chrysene	NA			< 0.56 ug/l	< 0.56 ug/l	< 0.56 ug/l	< 0.56 ug/l	< 0.57 ug/l	< 0.56 ug/l
Dibenz(a,h)anthracene	NA			< 0.51 ug/l	< 0.51 ug/l	< 0.51 ug/l	< 0.51 ug/l	< 0.51 ug/l	< 0.51 ug/l
Dibenzofuran	NA			< 0.55 ug/l	< 0.55 ug/l	< 0.55 ug/l	< 0.55 ug/l	< 0.55 ug/l	< 0.55 ug/l
Diethyl phthalate	NA		6000 HRL93 ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l	< 0.28 ug/l
Dimethyl phthalate	NA		70000 HRL94 ug/l	< 0.31 ug/l	< 0.31 ug/l	< 0.31 ug/l	< 0.31 ug/l	< 0.31 ug/l	< 0.31 ug/l
Di-n-butyl phthalate	NA		700 HRL93 ug/l	< 0.36 ug/l	< 0.36 ug/l	< 0.36 ug/l	< 0.36 ug/l	< 0.36 ug/l	< 0.36 ug/l
Di-n-octyl phthalate	NA			< 0.62 ug/l	< 0.62 ug/l	< 0.62 ug/l	< 0.63 ug/l	< 0.62 ug/l	< 0.62 ug/l
Fluoranthene	NA		300 HRL93 ug/l	< 0.56 ug/l	< 0.56 ug/l	< 0.56 ug/l	< 0.57 ug/l	< 0.57 ug/l	< 0.56 ug/l
Fluorene	NA		300 HRL93 ug/l	< 0.48 ug/l	< 0.48 ug/l	< 0.48 ug/l	< 0.49 ug/l	< 0.48 ug/l	< 0.48 ug/l
Hexachlorobenzene	NA	1 ug/l	0.2 HRL93 ug/l	< 0.37 ug/l	< 0.37 ug/l	< 0.37 ug/l	< 0.37 ug/l	< 0.37 ug/l	< 0.37 ug/l
Hexachlorobutadiene	NA		1 HRL93 ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l
Hexachlorocyclopentadiene	NA	50 ug/l		< 0.32 ug/l	< 0.32 ug/l	< 0.32 ug/l	< 0.33 ug/l	< 0.32 ug/l	< 0.32 ug/l
Hexachloroethane	NA			< 0.31 ug/l	< 0.31 ug/l	< 0.31 ug/l	< 0.31 ug/l	< 0.31 ug/l	< 0.31 ug/l
Indeno(1,2,3-cd)pyrene	NA			< 0.36 ug/l	< 0.36 ug/l	< 0.36 ug/l	< 0.36 ug/l	< 0.36 ug/l	< 0.36 ug/l
Isophorone	NA		100 HRL93 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l
Naphthalene	NA		70 HBV11 (1) ug/l	< 0.48 ug/l	< 0.48 ug/l	< 0.48 ug/l	< 0.49 ug/l	< 0.48 ug/l	< 0.48 ug/l
Nitrobenzene	NA			< 0.34 ug/l	< 0.34 ug/l	< 0.34 ug/l	< 0.35 ug/l	< 0.34 ug/l	< 0.34 ug/l
N-Nitrosodimethylamine	NA			< 0.44 ug/l	< 0.44 ug/l	< 0.44 ug/l	< 0.45 ug/l	< 0.44 ug/l	< 0.44 ug/l
N-Nitrosodi-n-propylamine	NA			< 0.23 ug/l	< 0.23 ug/l	< 0.23 ug/l	< 0.23 ug/l	< 0.23 ug/l	< 0.23 ug/l
N-Nitrosodiphenylamine	NA		70 HRL93 ug/l	< 0.35 ug/l	< 0.35 ug/l	< 0.35 ug/l	< 0.36 ug/l	< 0.35 ug/l	< 0.35 ug/l
o-Cresol	NA		30 HRL93 ug/l	< 0.44 ug/l	< 0.44 ug/l	< 0.44 ug/l	< 0.45 ug/l	< 0.44 ug/l	< 0.44 ug/l
p & m Cresol	NA		3 MP ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l
Pentachlorophenol	NA	1 ug/l	1 MCL ug/l	< 0.83 ug/l	< 0.83 ug/l	< 0.83 ug/l	< 0.84 ug/l	< 0.83 ug/l	< 0.83 ug/l
Phenanthrene	NA			< 0.32 ug/l	< 0.32 ug/l	< 0.32 ug/l	< 0.33 ug/l	< 0.32 ug/l	< 0.32 ug/l
Phenol	NA		4000 HRL93 ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l	< 0.38 ug/l
Pyrene	NA		200 HRL93 ug/l	< 0.61 ug/l	< 0.61 ug/l	< 0.61 ug/l	< 0.62 ug/l	< 0.61 ug/l	< 0.61 ug/l
VOCs									
1,1,1,2-Tetrachloroethane	NA		70 HRL93 ug/l	< 0.29 ug/l	< 0.29 ug/l	< 0.29 ug/l	< 0.29 ug/l	< 0.29 ug/l	< 0.29 ug/l
1,1,1-Trichloroethane	NA	200 ug/l	9000 HRL08 (1) ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l
1,1,2,2-Tetrachloroethane	NA		2 HRL94 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l
1,1,2-Trichloroethane	NA	5 ug/l	3 HRL93 ug/l	< 0.19 ug/l	< 0.19 ug/l	< 0.19 ug/l	< 0.19 ug/l	< 0.19 ug/l	< 0.19 ug/l
1,1-Dichloro-1-propene	NA			< 0.14 ug/l	< 0.14 ug/l	< 0.14 ug/l	< 0.14 ug/l	< 0.14 ug/l	< 0.14 ug/l
1,1-Dichloroethane	NA		100 RAA (1) ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l
1,1-Dichloroethylene	NA	7 ug/l	200 HBV09 (1) ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l	< 0.24 ug/l
1,2,3-Trichlorobenzene	NA			< 0.35 ug/l	< 0.35 ug/l	< 0.35 ug/l	< 0.35 ug/l	< 0.35 ug/l	< 0.35 ug/l
1,2,3-Trichloropropane	NA		0.003 HBV10 (1) ug/l	< 0.22 ug/l	< 0.22 ug/l	< 0.22 ug/l	< 0.22 ug/l	< 0.22 ug/l	< 0.22 ug/l
1,2,4-Trichlorobenzene	NA	70 ug/l	4 HBV11 (1) ug/l	< 0.30 ug/l	< 0.30 ug/l	< 0.30 ug/l	< 0.30 ug/l	< 0.30 ug/l	< 0.30 ug/l
1,2,4-Trimethylbenzene	NA		100 RAA10 (1,2) ug/l	< 0.072 ug/l	< 0.072 ug/l	< 0.072 ug/l	< 0.072 ug/l	< 0.072 ug/l	< 0.072 ug/l
1,2-Dibromo-3-chloropropane	NA	0.2 ug/l		< 0.40 ug/l	< 0.40 ug/l	< 0.40 ug/l	< 0.40 ug/l	< 0.40 ug/l	< 0.40 ug/l
1,2-Dibromoethane	NA	0.05 ug/l	0.004 HRL93 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l
1,2-Dichlorobenzene	NA	600 ug/l	600 HRL93 ug/l	< 0.12 ug/l	< 0.12 ug/l	< 0.12 ug/l	< 0.12 ug/l	< 0.12 ug/l	< 0.12 ug/l
1,2-Dichloroethane	NA	5 ug/l	1 HBV11 (1) ug/l	< 0.26 ug/l	< 0.26 ug/l	< 0.26 ug/l	< 0.26 ug/l	< 0.26 ug/l	< 0.26 ug/l
1,2-Dichloroethylene, cis	NA	70 ug/l	50 HRL08 (1) ug/l	< 0.12 ug/l	< 0.12 ug/l	< 0.12 ug/l	< 0.12 ug/l	< 0.12 ug/l	< 0.12 ug/l
1,2-Dichloroethylene, trans	NA	100 ug/l	100 HBV11 (1) ug/l	< 0.056 ug/l	< 0.056 ug/l	< 0.056 ug/l	< 0.056 ug/l	< 0.056 ug/l	< 0.056 ug/l
1,2-Dichloropropane	NA	5 ug/l	5 HRL94 ug/l	< 0.19 ug/l	< 0.19 ug/l	< 0.19 ug/l	< 0.19 ug/l	< 0.19 ug/l	< 0.19 ug/l
1,3,5-Trimethylbenzene	NA		100 HRL08 (1,2) ug/l	< 0.11 ug/l	< 0.11 ug/l	< 0.11 ug/l	< 0.11 ug/l	< 0.11 ug/l	< 0.11 ug/l
1,3-Dichloro-1-propene trans	NA			< 0.14 ug/l	< 0.14 ug/l	< 0.14 ug/l	< 0.14 ug/l	< 0.14 ug/l	< 0.14 ug/l
1,3-Dichloro-1-propene, cis	NA			< 0.18 ug/l	< 0.18 ug/l	< 0.18 ug/l	< 0.18 ug/l	< 0.18 ug/l	< 0.18 ug/l
1,3-Dichlorobenzene	NA			< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l
1,3-Dichloropropane	NA		2 HRL94 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l	< 0.16 ug/l
1,4-Dichlorobenzene	NA	75 ug/l	10 HRL94 ug/l	< 0.081 ug/l	< 0.081 ug/l	< 0.081 ug/l	< 0.081 ug/l	< 0.081 ug/l	< 0.081 ug/l
2,2-Dichloropropane	NA			< 0.66 ug/l	< 0.66 ug/l	< 0.66 ug/l	< 0.66 ug/l	< 0.66 ug/l	< 0.66 ug/l
Acetone	NA		4000 HBV10 (1) ug/l	< 3.8 ug/l	< 3.8 ug/l	< 3.8 ug/l	< 3.8 ug/l	< 3.8 ug/l	< 3.8 ug/l
Allyl Chloride	NA		30 HRL94 ug/l	< 0.51 ug/l	< 0.51 ug/l	< 0.51 ug/l	< 0.51 ug/l	< 0.51 ug/l	< 0.51 ug/l
Benzene	NA	5 ug/l	2 HRL08 (1) ug/l	< 0.071 ug/l	< 0.071 ug/l	< 0.071 ug/l	< 0.071 ug/l	< 0.071 ug/l	< 0.071 ug/l
Bromobenzene	NA			< 0.082 ug/l	< 0.082 ug/l	< 0.082 ug/l	< 0.082 ug/l	< 0.082 ug/l	< 0.082 ug/l
Bromochloromethane	NA			< 0.20 ug/l	< 0.20 ug/l	< 0.20 ug/l	< 0.20 ug/l	< 0.20 ug/l	< 0.20 ug/l
Bromodichloromethane	NA	80 (2) ug/l	6 HRL93 ug/l	< 0.23 ug/l	< 0.23 ug/l	< 0.23 ug/l	< 0.23 ug/l	< 0.23 ug/l	< 0.23 ug/l
Bromoform	NA	80 (2) ug/l	40 HRL93 ug/l	< 0.26 ug/l	< 0.26 ug/l	< 0.26 ug/l	< 0.26 ug/l	< 0.26 ug/l	< 0.26 ug/l
Bromomethane	NA		10 HRL93 ug/l	< 0.32 ug/l	< 0.32 ug/l	< 0.32 ug/l	< 0.32 ug/l	< 0.32 ug/l	< 0.32 ug/l
Butyl benzene	NA			< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l
Butylbenzene sec	NA			< 0.11 ug/l	< 0.11 ug/l	< 0.11 ug/l	< 0.11 ug/l	< 0.11 ug/l	< 0.11 ug/l
Butylbenzene tert-	NA			< 0.091 ug/l	< 0.091 ug/l	< 0.091 ug/l	< 0.091 ug/l	< 0.091 ug/l	< 0.091 ug/l
Carbon tetrachloride	NA	5 ug/l	1 HBV10 (1) ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l	< 0.15 ug/l
Chlorobenzene	NA	100 ug/l	100 HRL93 ug/l	< 0.20 ug/l	< 0.20 ug/l	< 0.20 ug/l	< 0.20 ug/l	< 0.20 ug/l	< 0.20 ug/l
Chlorodibromomethane	NA	80 (2) ug/l		< 0.26 ug/l	< 0.26 ug/l	< 0.26 ug/l	< 0.26 ug/l	< 0.26 ug/l	< 0.26 ug/l

		GUE									
		George's Used Equipment (Bid. 716B)									
Sys Loc Code	716A-SB5	716A-SB6	716A-SB1	716A-SB2	716A-SB3	716A-SB4	716A-SB5	716B-SB1	71-60-716B	71-60-716B	
Sample Date	10/18/2011	10/18/2011	6/24/2011	10/14/2011	10/14/2011	10/14/2011	10/14/2011	10/18/2011	9/1/2008	9/1/2008	
Depth Interval (ft.)	12-12	12-12	0.5-0.5	0.5-0.5	0.5-0.5	0.5-0.5	0.5-0.5	12-12	0-1	1.5-1.5	
Sample Type Code	N	N	N	N	N	N	N	N	N	N	
Chemical Name	MN Tier 1										
Effective Date	06/22/2009										
Exceedance Key	Bohd										
Metals											
Arsenic	9 mg/kg	4.8 mg/kg	1.3 mg/kg	--	--	--	--	1.7 mg/kg	2.431 mg/kg	3.365 mg/kg	
Barium	1100 mg/kg	230 mg/kg	14 mg/kg	--	--	--	--	16 mg/kg	136.3 mg/kg	163 mg/kg	
Cadmium	25 mg/kg	< 0.30 mg/kg	< 0.26 mg/kg	--	--	--	--	< 0.24 mg/kg	0.116 mg/kg	5.31 mg/kg	
Chromium	44000 CR mg/kg	15 mg/kg	5.5 mg/kg	--	--	--	--	7.1 mg/kg	16.3 mg/kg	47.3 mg/kg	
Lead	300 mg/kg	9.8 mg/kg	1.3 mg/kg	--	--	--	--	1.8 mg/kg	24.7 mg/kg	897 mg/kg	
Mercury	0.5 mg/kg	< 0.12 mg/kg	< 0.10 mg/kg	--	--	--	--	< 0.088 mg/kg	0.02 mg/kg	5.5 mg/kg	
Selenium	160 mg/kg	< 1.2 mg/kg	< 1.0 mg/kg	--	--	--	--	< 0.98 mg/kg	< 0.5 mg/kg	< 0.5 mg/kg	
Silver	160 mg/kg	< 0.30 mg/kg	< 0.26 mg/kg	--	--	--	--	< 0.24 mg/kg	0.052 mg/kg	0.407 mg/kg	
SVOCs											
Benzo(a)anthracene	T	--	--	--	--	--	--	--	--	13.11 mg/kg	
Benzo(a)pyrene	T	--	--	--	--	--	--	--	--	10.54 mg/kg	
Benzo(b)fluoranthene	T	--	--	--	--	--	--	--	--	15.26 mg/kg	
Benzo(k)fluoranthene	T	--	--	--	--	--	--	--	--	5.846 mg/kg	
Chrysene	T	--	--	--	--	--	--	--	--	14.51 mg/kg	
Dibenz(a,h)anthracene	T	--	--	--	--	--	--	--	--	2.943 mg/kg	
Indeno(1,2,3-cd)pyrene	T	--	--	--	--	--	--	--	--	6.63 mg/kg	
BaP equivalent, non-detects at zero for the detection limit. ¹	2.1 mg/kg	--	--	--	--	--	--	--	--	16 mg/kg	
BaP equivalent, non-detects at half of the detection limit. ¹	2.1 mg/kg	--	--	--	--	--	--	--	--	17 mg/kg	
Benzo(g,h,i)perylene	--	--	--	--	--	--	--	--	--	6.082 mg/kg	
2,4-Dinitrotoluene	50 mg/kg	--	--	--	--	--	--	--	--	< 0.045 mg/kg	
2,6-Dinitrotoluene	25 mg/kg	--	--	--	--	--	--	--	--	< 0.05 mg/kg	
2-Methylnaphthalene	100 mg/kg	--	--	--	--	--	--	--	--	0.571 mg/kg	
Acenaphthene	1200 mg/kg	--	--	--	--	--	--	--	--	2.916 mg/kg	
Acenaphthylene	--	--	--	--	--	--	--	--	--	< 0.034 mg/kg	
Acetophenone	--	--	--	--	--	--	--	--	--	< 0.041 mg/kg	
Anthracene	7880 mg/kg	--	--	--	--	--	--	--	--	5.873 mg/kg	
Bis(2-ethylhexyl)phthalate	570 mg/kg	--	--	--	--	--	--	--	--	< 0.09 mg/kg	
Butyl benzyl phthalate	580 mg/kg	--	--	--	--	--	--	--	--	< 0.035 mg/kg	
Carbazole	700 mg/kg	--	--	--	--	--	--	--	--	--	
Dibenzofuran	104 mg/kg	--	--	--	--	--	--	--	--	1.787 mg/kg	
Diethyl phthalate	--	--	--	--	--	--	--	--	--	< 0.04 mg/kg	
Di-n-butyl phthalate	2440 mg/kg	--	--	--	--	--	--	--	--	< 0.08 mg/kg	
Diphenylamine	--	--	--	--	--	--	--	--	--	< 0.054 mg/kg	
Fluoranthene	1080 mg/kg	--	--	--	--	--	--	--	--	23.5 mg/kg	
Fluorene	850 mg/kg	--	--	--	--	--	--	--	--	3.647 mg/kg	
Isophorone	--	--	--	--	--	--	--	--	--	< 0.8 mg/kg	
Naphthalene	10 mg/kg	--	--	--	--	--	--	--	--	1 mg/kg	
N-Nitrosodimethylamine	--	--	--	--	--	--	--	--	--	< 0.09 mg/kg	
Pentachlorophenol	80 mg/kg	--	--	--	--	--	--	--	--	--	
Phenanthrene	--	--	--	--	--	--	--	--	--	21.58 mg/kg	
Pyrene	890 mg/kg	--	--	--	--	--	--	--	--	23.15 mg/kg	
VOCs											
1,2,3-Trichlorobenzene	--	--	< 0.076 mg/kg	--	--	--	--	--	--	< 0.14 mg/kg	
1,2,4-Trichlorobenzene	200 mg/kg	--	< 0.034 mg/kg	--	--	--	--	--	--	< 0.06 mg/kg	
1,2,4-Trimethylbenzene	8 mg/kg	--	< 0.023 mg/kg	--	--	--	--	--	--	< 0.04 mg/kg	
1,2-Dichlorobenzene	26 mg/kg	--	< 0.025 mg/kg	--	--	--	--	--	--	< 0.075 mg/kg	
1,3-Dichlorobenzene	26 mg/kg	--	< 0.033 mg/kg	--	--	--	--	--	--	< 0.085 mg/kg	
1,4-Dichlorobenzene	30 mg/kg	--	< 0.021 mg/kg	--	--	--	--	--	--	< 0.06 mg/kg	
Acetone	340 mg/kg	--	0.82 lb mg/kg	--	--	--	--	--	--	< 0.8 mg/kg	
Benzene	6 mg/kg	--	< 0.019 mg/kg	--	--	--	--	--	--	< 0.03 mg/kg	
Butyl benzene	30 mg/kg	--	< 0.034 mg/kg	--	--	--	--	--	--	< 0.05 mg/kg	
Carbon tetrachloride	0.3 mg/kg	--	< 0.043 mg/kg	--	--	--	--	--	--	< 0.05 mg/kg	
Methylene chloride	97 mg/kg	--	0.16 lb mg/kg	--	--	--	--	--	--	< 0.06 mg/kg	
Naphthalene	10 mg/kg	--	< 0.069 mg/kg	--	--	--	--	--	--	< 0.15 mg/kg	
Tetrahydrofuran	--	--	0.40 lb mg/kg	--	--	--	--	--	--	< 0.5 mg/kg	
Toluene	107 mg/kg	--	< 0.020 mg/kg	--	--	--	--	--	--	< 0.05 mg/kg	
Xylene, o-	M	--	< 0.031 mg/kg	--	--	--	--	--	--	< 0.04 mg/kg	
PCBs											
Aroclor 1248	--	< 0.24 mg/kg	< 0.20 mg/kg	< 0.22 mg/kg	< 0.21 mg/kg	< 0.21 mg/kg	< 0.22 mg/kg	< 0.21 mg/kg	< 0.21 mg/kg	< 0.04 mg/kg	
Aroclor 1260	--	< 0.24 mg/kg	< 0.20 mg/kg	1.0 mg/kg	1.3 mg/kg	0.32 mg/kg	< 0.22 mg/kg	< 0.21 mg/kg	< 0.21 mg/kg	0.0579 mg/kg	
Polychlorinated Biphenyls	1.2 mg/kg	ND mg/kg	ND mg/kg	1 mg/kg	1.3 mg/kg	0.32 mg/kg	ND mg/kg	ND mg/kg	ND mg/kg	0.058 mg/kg	
Total Petroleum Hydrocarbons	--	--	--	--	--	--	--	--	--	--	
Diesel Range Organics											
Explosives											
2,4-Dinitrotoluene	50 mg/kg	--	--	--	--	--	--	--	--	--	
2,6-Dinitrotoluene	25 mg/kg	--	--	--	--	--	--	--	--	--	
General Parameters											
Nitrocellulose	--	--	--	--	--	--	--	--	--	--	

Appendix Detail Maps\FigD5_RI_Report_Warehouse_EEA_5_ABC_Line.mxd User.dwg



- Pre-RI Sample Locations**
- Pre-RI Sample Location
 - Wells and Borings Surveyed by Barr
- 2011 RI Investigation Locations**
- ◆ Sewer Sediment Sample
 - Soil Boring
 - Surface Soil Sample
 - ▲ Test Trench

— Laminex Woodbox Sewer

*Red symbols indicate locations of soil samples with Tier I SRV exceedances
 *Gray symbols indicate investigation locations where no soil data was collected

Data Sources: Barr Engineering Company, University of Minnesota, Dakota County.
 Background: 2009 Aerials Express Photography (Twin Cities)

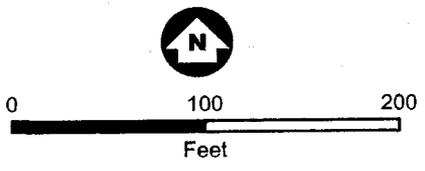


Figure D5 (2009)
 UST and
 GOW WAREHOUSE
 (BLD. EEA5) & LEAD
 BURNER SHOP (BLD. TC-46)
 ABC Line
 UMore East RI Report
 Dakota County, MN

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