September 18, 2007

Mr. Ed Olson and Allan Timm
Minnesota Pollution Control Agency
Voluntary Investigation and Cleanup Program
520 Lafayette Road North
St. Paul, MN 55155-4194

Re: VRAP, ECP, & Design Modifications Submittal
219 and 223 First Avenue S.W., Rochester, MN
VP12562

Dear Mr. Olson and Mr. Timm:

On behalf of the City of Rochester (the City), Landmark Environmental, LLC (Landmark) has prepared this letter to include modifications to the Voluntary Response Action Plan (VRAP) and Environmental Contingency Plan (ECP) for the above referenced property (the Property). The modifications included in this letter were required by the Minnesota Pollution Control Agency (MPCA) in the Response Action Approval letter dated July 27, 2007, and in the ECP Approval letter dated August 6, 2007. The VRAP and ECP were approved subject to the modifications listed in Attachment B of each of these letters from the MPCA. The Response Action Approval and ECP Approval letters are included in Attachment 1.

VRAP Approval Modifications from Attachment B

Item 1 –

Soils represented by DPRA at boring B-7 from 13 to 15 feet below grade on the 219 parcel exhibited elevated concentrations of volatile organic compounds (VOCs); therefore, the soils in this location have been added to the contaminated soil design drawing and soil excavation summary table included in Attachment 2. Impacted soil excavated from this location will be disposed of off-site at a permitted Subtitle D Landfill consistent with the Hazardous Waste Determination form issued by the RCRA/Superfund Unit staff on July 20, 2006. The Hazardous Waste Determination is included in Attachment 2.

Item 2 –

The following was required by the MPCA in order to ensure conformance with the Interstate Technology & Regulatory Council and United States Environmental Protection Agency's Technical Guidance (3rd ed.) for Active Soil Depressurization Systems as recognized by Voluntary Investigation and Cleanup (VIC) Program staff for vapor intrusion control at the Property:

- The vapor barrier material proposed for the project has been changed to a 40-mil thick polyethylene barrier with protrusion boots, and thermally welded seams. In addition, any barrier joints/seams, both lateral and butt, shall be overlapped at least 12 inches and in accordance with manufacturer's recommended seam completion and testing procedures. Vapor barrier performance, installation, and serviceability assurance details are included in the specification Section 072623, Below-Grade Gas Retarder. Section 072623 is included in Attachment 3 and replaces specification Section 02666, Vapor Barrier, previously submitted to the MPCA by Landmark in the VRAP Addendum – Response Action Design, dated July 17, 2007.
- Updated design drawings, detail drawings, and specifications for the foundation drainage/venting system are included in Attachment 3. Revisions to the specifications include designing the exhaust stack outlets to be located at least 10 feet from any building openings or any public or private access area. The venting system has been configured such that any subsequent upgrade can be made to accommodate an in-line fan for "active service" mode.
- The geotechnical engineer for the project (McGhie & Betts) recommended a foundation drainage system at the Property; therefore, the sub-slab vent piping was designed to also be utilized as the drain tile as shown on the design drawings. Because the venting system is designed to utilize the drain tile, the sub-slab piping is designed to slope such that groundwater drains to the storm sewer. As discussed in the Sub-Slab Venting System Monitoring Plan, included in Attachment 3, the performance of the venting system will be evaluated to determine the effectiveness of the rotary wind turbines to maintain airflow from the subsurface to the atmosphere. If it appears that the sloping of the sub-slab piping is inhibiting the effectiveness of the rotary wind turbines to operate successfully, in-line fans will be installed in the venting system riser pipes for "active" service mode.
- The sub-slab venting system will be operated in the "closed" position until the dual-phase extraction system is permanently decommissioned as approved by the MPCA. At this time, the venting system shut-off valves will be opened to initiate "passive" sub-slab venting of the building. The

Sub-Slab Venting System Monitoring Plan, included in Attachment 3, discusses how the system will be maintained, how performance monitoring will be performed, and what failed performance criteria will be used for deciding to upgrade the "passive" vent system to an "active" vent system.

Item 3 –

The following additional information on the Dual Phase Extraction (DPE) system was required by the MPCA:

- The groundwater and remediation wells previously installed at the property by DPRA were abandoned on August 3, 2007, by Barott Drilling Services, Inc, in accordance with the Minnesota Department of Health (MDH). The MDH Well and Boring Sealing Records are included in Attachment 4.
- The depths and screen intervals of the proposed DPE extraction wells and monitoring wells are included in Attachment 4.
- A discharge permit from the City will be obtained to dispose of groundwater generated by the DPE system. The maximum allowable concentration of total VOCs for discharge to the City Reclamation Plant is 2.13 milligrams per liter. Groundwater discharge sampling analysis will be completed as required under the discharge permit.
- The DPE system will be designed to remove source area perchloroethene (PCE) from the soil and fractured bedrock, resulting in decreasing concentrations of PCE in the groundwater. The DPE system operational goals include achieving asymptotic PCE air exhaust concentrations, and achieving asymptotic mass removal quantities of PCE. The DPE wells will be operated to maximize the amount of PCE removed from the subsurface. The proposed cleanup goal for the groundwater is to reduce the source of PCE to the groundwater. DPE system success will be determined by asymptotic air emissions of PCE, and decreasing groundwater concentrations. Quarterly groundwater monitoring will begin during DPE system startup activities and continue as long as the DPE system is operational. After the MPCA approves decommissioning of the DPE system, groundwater will be monitored quarterly, at a minimum, for a period of one year after the date of DPE system shut-down.
- An updated DPE system layout drawing is included in Attachment 3.

Item 4 –

All of the electrical equipment for the DPE system and the remediation room will be intrinsically safe, and classified by the National Electric Code as Class 1 Division 2.

Item 5 –

The following additional information on the VRAP Attachment 2, Emission Control Plan, was required by the MPCA:

- The Section on Excavation, Loading, Transportation and Reconsolidation shall contain the following additional bullet:
  7. Asbestos Containing Waste Material (ACWM) shall be totally contained in "burrito-style" wrapped plastic.
- The Section on Project Personnel, bullet item #3 should be corrected to read: "The owner of the Property is the City. The City contact is Doug Knott, City of Rochester, 201 4th Street SE, Rochester, MN 55904, phone 507-328-2900.

Item 6 –

The following additional information on the VRAP Attachment 5, DPE System Design Drawings, was required by the MPCA:

- The DPE system will be capable of being programmed to operate the DPE wells automatically. The DPE wells will be capable of operating individually or simultaneously with multiple wells. The system will also be capable of operating a cycle of select DPE wells. During system startup, all of the wells will be operated and evaluated individually, to determine which locations are the most impacted by PCE. The 4 to 6 most impacted wells will be operated either simultaneously or cyclically, depending on results from system startup activities.
- The DPE system exhaust stack outlet shall be at least 10 feet from any building openings or any public or private access areas.

Item 7 –

The following additional information on the VRAP Attachment 6, Division 1 & Division 2 Specifications, was required by the MPCA:

- Attachment 3 includes the updated technical specifications. The Specification numbers have been updated to current CSI format which is also being used by the architect.

ECP Approval Modifications from Attachment B

Item 1 –

The section titled Proposed Activities should include the following in the first paragraph: "The proposed activities are provided as supporting and background information; therefore, some details may not longer be accurate as they have been modified in the course VRAP approval process."

Item 2 –

Soil and debris stockpile procedures will be consistent with details provided in the VRAP, including:

- Individual stockpiles will not be larger than 50 cubic yards in size;
- Asbestos management details in the separately approved Emission Control Plan prepared by Landmark and dated July 2007 (and inclusive of email comments from Jackie Deneen dated July 30, 2007, and provided in Attachment 5); and, comment; and,
- Sample collection, labeling and documentation will be completed in accordance with standard practice as recognized by the MPCA and in order to track, maintain and confirm sample use and integrity.

Item 3 –

In the event a tank is discovered, an MPA notification will be completed in accordance with the MPCA tank rules, as appropriate.

If you have any questions, please call me at (952)887-9601, ext. 205.

Sincerely,

Jason D. Skramstad, P.E.
Enclosures

C: Doug Knott, City of Rochester
Nancy Quattlebaum Burke, Gray Plant Mooty

Attachments

Attachment 1

Minnesota Pollution Control Agency
520 Lafayette Road North | St. Paul, MN 55155-4194 | 651-296-6300 | 800-675-3843 | 651-282-5332 TTY | www.pca.state.mn.us

July 27, 2007

Mr. Douglas Knott
City of Rochester
201 4th Street SE
Rochester, MN 55904

RE: Former Dry Cleaners – Rochester #3 Site, 219 and 223 First Avenue SW, Rochester
MPCA Project Number VP12562
Response Action Plan Approval

Dear Mr. Knott:

The Minnesota Pollution Control Agency (MPCA) staff in the Voluntary Investigation and Cleanup (VIC) Program has reviewed the "Voluntary Investigation and Cleanup, Voluntary Response Action Plan and Preliminary Response Action Design" dated June, 2007, the "Voluntary Response Action Plan Addendum- Response Action Design" dated July 17, 2007, and the electronic correspondence "MN Bio Business Center – DPE Design Revisions and Project Update" dated July 26, 2007 (altogether here as Response Action Plan), prepared by Landmark Environmental, Inc. (Landmark), for the Former Dry Cleaners – Rochester #3 site located at the address referenced above (the Site).

The Site consists of two adjoining parcels serving as a paved, surface-grade parking lot for the area business district. A small remediation shed with Dual Phase Extraction (DPE) system has been operational on the 219 First Avenue SW parcel in conjunction with a separate VIC project at the Site in order to remediate soil and ground water contamination. Historically, the Site supported a former dry cleaners and a movie theater on the 219 and 223 First Avenue SW parcels, respectively. Site documents indicate the building foundation remnants and as much as 15 feet of fill soils containing brick and other building debris remain at the Site. Contaminants identified at the Site include naphthalene, tetrachloroethylene (PCE) and polynuclear aromatic hydrocarbons (PAHs) in the Site soil at concentrations above the MPCA's industrial Soil Reference Values (SRVs) and several volatile organic compounds (VOCs) including PCE in the ground water at concentrations above the Health Risk Limits (HRLs).

VIC staff understands that response actions consist of the following: excavation and off-Site disposal of all impacted soils disturbed by redevelopment activities; field screening of excavated materials; cleanup confirmations sampling of excavation base and sidewalls in accordance with MPCA guidance; maintaining interim cover as necessary for storm water control; capping remaining soils with building expansion; installing a passive soil vapor

mitigation system with a vapor barrier below the new building; installation, maintenance and operation of a new DPE system to complete remediation of volatile organic contaminants; and the preparation and recording of an "Affidavit Concerning Real Property Contaminated with Hazardous Substances" in the event verification sampling results indicate the presence of contaminants remain above the MPCA's residential Soil Reference Values and Soil Leaching Values.

Based upon a review of Site documents, the Response Action Plan is hereby approved pursuant to Minn. Stat. § 115B.17, state response to releases, subd. 14, requests for review, investigation, and oversight, subject to the modifications listed in Attachment B. Please submit modifications to MPCA staff prior to beginning earthwork for review and approval.

Please be advised that the determination made in this letter is subject to the disclaimers found in Attachment A. If you have any questions about the contents of this letter, please contact me at 651-296-8111 or Allan Timm, Hydrogeologist at 651-297-1808.

Sincerely,

Edward P. Olson, CEP
Project Manager
Voluntary Investigation and Cleanup Unit
Superfund and Emergency Response Section
Remediation Division

EPO/jmp

Attachments

cc: The Honorable Aredell F. Brede, Mayor, City of Rochester
Terry Lee, Olmsted County
Ken Haberman, Landmark Environmental LLC.
Nancy Quattlebaum Burke, Gray Plant Mooty

ATTACHMENT A
DISCLAIMERS
Former Dry Cleaners – Rochester #3 Site, VP12562

1. Reservation of Authorities

The MPCA Commissioner reserves the authority to take any appropriate actions with respect to any release, threatened release, or other conditions at the Site. The MPCA Commissioner also reserves the authority to take such action if the voluntary party does not proceed in the manner described in this letter or if actions taken or omitted by the voluntary party with respect to the Site contribute to any release or threatened release, or create an imminent and substantial danger to public health and welfare.

2. No MPCA Assumption of Liability

The MPCA, its Commissioner and staff do not assume any liability for any release, threatened release or other conditions at the Site or for any actions taken or omitted by the voluntary party with regard to the release, threatened release, or other conditions at the Site, whether the actions taken or omitted are in accordance with this letter or otherwise.

3. Letter Based on Current Information

All statements, conclusions and representations in this letter are based upon information known to the MPCA Commissioner and staff at the time this letter was issued. The MPCA Commissioner and staff reserve the authority to modify or rescind any such statement, conclusion or representation and to take any appropriate action under his authority if the MPCA Commissioner or staff acquires information after issuance of this letter that provides a basis for such modification or action.

4. Disclaimer Regarding Use or Development of the Property

The MPCA, its Commissioner and staff do not warrant that the Site is suitable or appropriate for any particular use.

5. Disclaimer Regarding Investigative or Response Action at the Property

Nothing in this letter is intended to authorize any response action under Minn. Stat. § 115B.17, subd. 12.

ATTACHMENT B
RESPONSE ACTION PLAN MODIFICATIONS
Former Dry Cleaners – Rochester #3 Site, VP12562

1. Soils represented by DPRA boring B-7 and sample from 13-15 feet below grade surface on the 219 parcel, cannot be reused and needs to be included in the soils disposed of at the RCRA subtitle D landfill. These soils exhibited elevated concentrations of volatile organic compounds and therefore needs to be included in off-site disposal consistent with the Hazardous Waste Determination form issued by RCRA/Superfund Unit staff on July 20, 2007.

2. The following is needed in order to ensure conformance with the Interstate Technology & Regulatory Council (ITRC) and the U.S. EPA's Technical Guidance (3rd ed.) for Active Soil Depressurization Systems (i.e. radon mitigation standards) as recognized by VIC staff for vapor intrusion control at this Site:

    - The selected sub-floor vapor barrier shall be at least a 40-mil thick barrier with protrusion boots. All seams will be thermally welded. Provide VIC staff vapor barrier performance, installation and serviceability assurance details; The RAP, Attachment 6, Division 1 & Division 2 Specifications - Section 02666, Vapor Barrier, needs significant modification.
    - Any barrier joints/seams, both lateral and butt, shall be overlapped at least 12" and in accordance with manufacturer's recommended seam completion and testing procedures;
    - Provide VIC staff additional sub-slab venting system details including slope of horizontal piping runs toward intake risers (not "storm sewer" as in Attachment 6, Section 02667), and how the system will be maintained as in a valve "open", passive venting condition;
    - Provide VIC staff details as to performance monitoring for effectiveness of the sub-slab venting system (i.e. a minimum of two post-construction monitoring events), and the failed performance criteria to be used in any decision for upgrading the passive vent system to an active vent system by installing in-line fan(s); and
    - All remedial system exhaust stacks outlet shall be located at least 10' distance from any building openings or any public or private access area, and be configured such that any subsequent upgrade to accommodate an in-line fan for "active" service mode.

3. Provide VIC staff information on DPE system including:
    - Sealing the ground water monitoring wells (from DPRA project) and DPE recovery wells. Sealing shall be in accordance with MDH standards;
    - Depths of extraction wells and screen intervals;
    - Permit details for discharge to sanitary service; and
    - Operational goals to ensure diminished contaminant concentrations in the ground water over time, including ground water monitoring on a quarterly basis for at least a one-year period after the date of DPE system shut-down.

4. All electrical equipment for the DPE system and the remediation room shall be intrinsically safe.

5. RAP Attachment 2, Emission Control Plan:
   - Excavation, Loading, Transportation and Reconsolidation – ACWM shall be totally contained in "burrito-style" wrapped plastic.
   - Project Personnel - Clarify information in item 3.

6. RAP Attachment 5, DPE System Design Drawings:
   - Provide a description of automated sequence of operation.
   - Specifications shall specify that exhaust stack outlet be at least 10' distance from any building openings or any public or private access area.

7. RAP Attachment 6, Division 1 & Division 2 Specifications:
   - Significant modification is needed - see also item 2, above.
   - Section 02100, Soil Remediation, Part 3 –EXECUTION, Note: any stockpiles shall not be greater than 50 cubic yards in size.

Minnesota Pollution Control Agency
520 Lafayette Road North | St. Paul, MN 55155-4194 | 651-296-6300 | 800-675-3843 | 651-282-5332 TTY | www.pca.state.mn.us

August 6, 2007

Mr. Douglas Knott
City of Rochester
201 - 4th Street SE
Rochester, MN 55904

RE: Former Dry Cleaners – Rochester #3 Site, 219 and 223 First Avenue SW, Rochester
MPCA Project Number VP12562
Environmental Contingency Plan Approval

Dear Mr. Knott:

The Minnesota Pollution Control Agency (MPCA) staff in the Voluntary Investigation and Cleanup (VIC) Program has reviewed the "Environmental Contingency Plan" dated June 2007 (Contingency Plan), prepared by Landmark Environmental, Inc. (Landmark), for the Former Dry Cleaners – Rochester #3 site located at the address referenced above (the Site).

The Site consists of two adjoining parcels serving as a paved, surface-grade parking lot for the area business district. A small remediation shed with Dual Phase Extraction (DPE) system has been operational on the 219 First Avenue SW parcel in conjunction with a separate VIC project at the Site in order to remediate soil and ground water contamination. Historically, the Site supported up to two former dry cleaners and a movie theater on the 219 and 223 First Avenue SW parcels, respectively. Site documents indicate the building foundation remnants and as much as 15 feet of fill soils containing brick and other building debris remain at the Site. Contaminants identified at the Site include naphthalene, tetrachloroethylene (PCE) and polynuclear aromatic hydrocarbons (PAHs) in the Site soil at concentrations above the MPCA's industrial Soil Reference Values (SRVs) and several volatile organic compounds (VOCs) including PCE in the ground water at concentrations above the Health Risk Limits (HRLs).

VIC staff understands that excavation and demolition activities in conjunction with Site redevelopment activities pose the potential for previously unforeseen contaminant sources to be encountered. Potential contaminant sources concerns include, but not are limited to, underground tanks, asbestos, buried containers, soil observed with field monitoring equipment as containing organic vapors, and visually impacted and stained soil.

The Contingency Plan provides for necessary control measures to be competed by field personnel, including key project staff notification, and environmental consultant-directed activities such as material screening and sampling, contaminant containment and off-Site disposal. Potential media and materials include buried tanks, demolition debris, asbestos containing materials, water wells, recovered excavation water and hazardous materials or contaminated soils.

Based upon a review of Site documents, the Contingency Plan is hereby approved pursuant to Minn. Stat. § 115B.17, state response to releases, subd. 14, requests for review, investigation, and oversight, subject to the modifications listed in Attachment B. Please submit modifications to MPCA staff prior to beginning earthwork for review and approval.

Please be advised that the determination made in this letter is subject to the disclaimers found in Attachment A. If you have any questions about the contents of this letter, please contact me at 651-296-8111 or Allan Timm, Hydrogeologist at 651-297-1808.

Sincerely,

Edward P. Olson, CEP
Project Manager
Voluntary Investigation and Cleanup Unit
Superfund and Emergency Response Section
Remediation Division

EPO:ls

Enclosures

cc: Terry Lee, Olmsted County
Ken Haberman, Landmark Environmental LLC
Nancy Quattlebaum Burke, Gray Plant Mooty

ATTACHMENT A
DISCLAIMERS
Former Dry Cleaners – Rochester #3 Site, VP12562

1. Reservation of Authorities

The MPCA Commissioner reserves the authority to take any appropriate actions with respect to any release, threatened release, or other conditions at the Site. The MPCA Commissioner also reserves the authority to take such action if the voluntary party does not proceed in the manner described in this letter or if actions taken or omitted by the voluntary party with respect to the Site contribute to any release or threatened release, or create an imminent and substantial danger to public health and welfare.

2. No MPCA Assumption of Liability

The MPCA, its Commissioner and staff do not assume any liability for any release, threatened release or other conditions at the Site or for any actions taken or omitted by the voluntary party with regard to the release, threatened release, or other conditions at the Site, whether the actions taken or omitted are in accordance with this letter or otherwise.

3. Letter Based on Current Information

All statements, conclusions and representations in this letter are based upon information known to the MPCA Commissioner and staff at the time this letter was issued. The MPCA Commissioner and staff reserve the authority to modify or rescind any such statement, conclusion or representation and to take any appropriate action under his authority if the MPCA Commissioner or staff acquires information after issuance of this letter that provides a basis for such modification or action.

4. Disclaimer Regarding Use or Development of the Property

The MPCA, its Commissioner and staff do not warrant that the Site is suitable or appropriate for any particular use.

5. Disclaimer Regarding Investigative or Response Action at the Property

Nothing in this letter is intended to authorize any response action under Minn. Stat. § 115B.17, subd. 12.

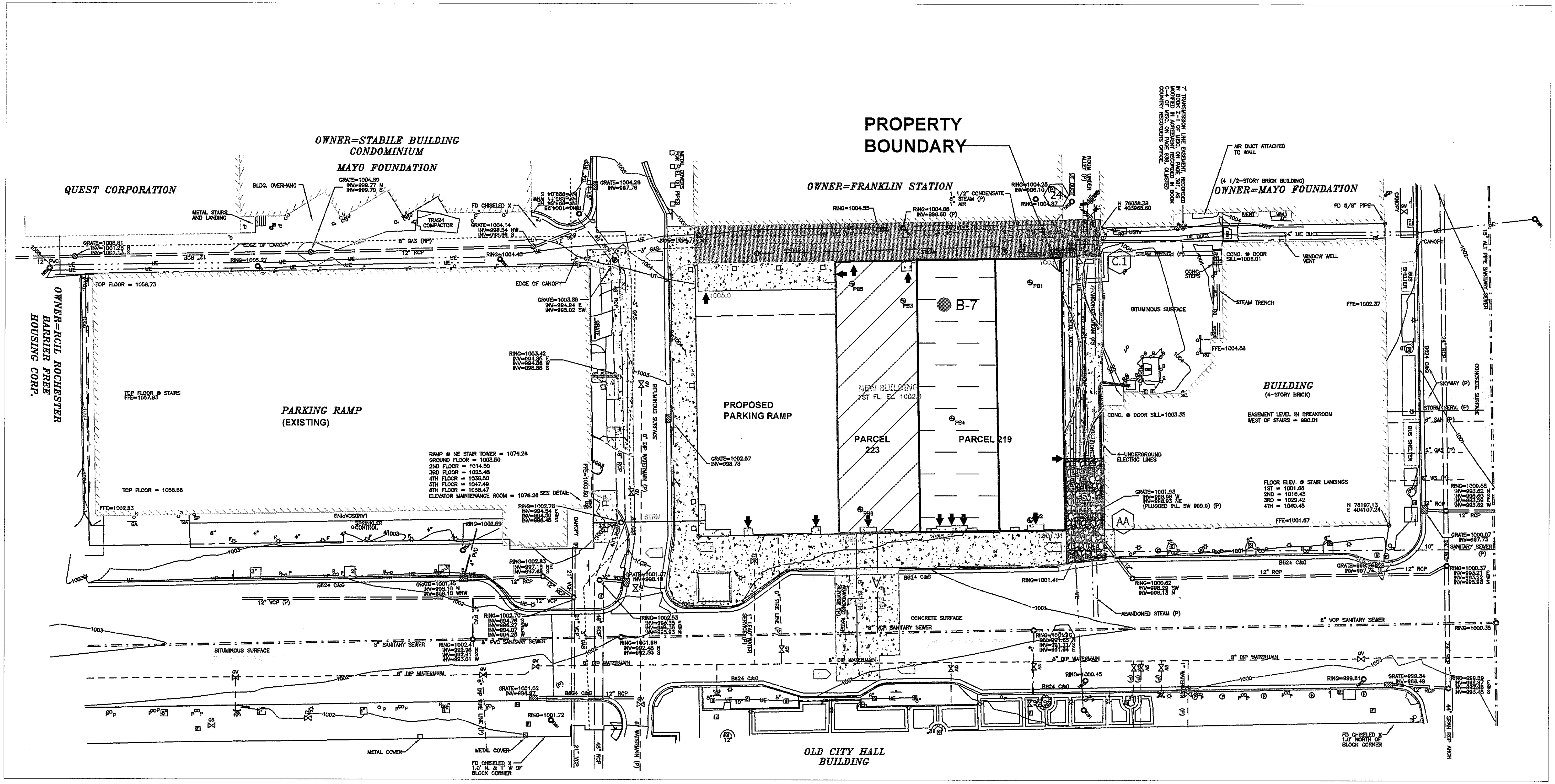
ATTACHMENT B
CONTINGENCY PLAN MODIFICATIONS
Former Dry Cleaners – Rochester #3 Site, VP12562

1. NOTE: The Proposed Activities (pp. 10 and 11) appear to be provided only as background or supporting information, however, some details may no longer be accurate as they have been modified in the course of the Voluntary Response Action Plan (VRAP) approval process.

2. Soil and debris stockpile procedures will be consistent with details provided in the VRAP, including:
   - Individual stockpiles will not be larger than 50 cubic yards in size;
   - Asbestos management details in the separately approved Emission Control Plan prepared by Landmark and dated July, 2007 (and inclusive of email comments from Jackie Deneen dated July 30, 2007); and
   - Sample collection, labeling and documentation will be completed in accordance with standard practice as recognized by the MPCA and in order to track, maintain and confirm sample use and integrity.

3. In the event a tank is discovered, an MPCA notification will be completed in accordance with the MPCA tank rules, as appropriate.

Attachment 2



Basemap from HGA, May 17, 2007.
F:\PROJECTS\Crc-City of Rochester\CAD\Soil Design-revised.dwg

LEGEND

- Parcel 223 -- Excavate, Transport & Dispose at RCRA Subtitle D Landfill
- Excavate and Reuse South of Parcel 223
- B-7 MPCA Area of Concern

N

SCALE (feet)

0 50

NOTES:

1. Soil/fill material from Parcel 223 will be generally excavated to a depth of 12 to 14 feet below the final grade, based on the redevelopment plan. All of the soil/fill material excavated from the 223 Parcel will be transported off-site to an approved permitted RCRA Subtitle D landfill.
2. Soil/fill located north of Parcel 223 can be excavated and reused south of Parcel 223 in former basement as clean backfill.
3. Contractor shall provide Landmark with a Site Safety Plan and use HAZWOPER trained workers for excavation of contaminated soil
4. Landmark will conduct field observation of soil during excavation.
5. Prior to redevelopment, the current dual phase extraction system will be decomissioned and all associated wells will be sealed.
6. Rainwater runoff shall be collected on an impermeable liner in depression and removed from the Property as clean stormwater runoff in accordance with the General Stormwater Construction Permit. Rainwater must be prevented from entering Parcel 223 groundwater to prevent migration of chlorinated VOC contaminated groundwater within Karst/fractured bedrock groundwater.
7. Approximately 3,586 tons of soil from Parcel 223 will be disposed of at a permitted Subtitle D Landfill
8. Approximately 3,236 tons of soil from Parcel 219 will be reused as backfill south of Parcel 223.
9. Approximately 539 tons of weathered bedrock at the bottom of Parcel 219 excavation be disposed of offsite because it will not be reusable as geotechnical fil
10. Soil from MPCA Area of Concern B-7, from 13 - 15 feet below grade, will be disposed of at a Subtitle D Landfill.

Rev	Date	By	Description
1	08-06-07	JDS	MPCA_AREA-OF-CONCERN

LANDMARK ENVIRONMENTAL, LLC
2042 W 98th Street
Bloomington, MN 55431

Contaminated Soil Design
RESPONSE ACTION PLAN

219 AND 223 FIRST AVENUE S.W.
ROCHESTER, MINNESOTA

Landmark Project Number: CRC		
Drawn: SKV	Checked:	Designed:
Scale: 1:50	Date: 07-12-2007	Revision: 00
Drawing Number: DWG NUMBER	Sheet 1 Of	Sheets 1

Attachment 2 - Table 1
Soil Excavation Summary
Minnesota Bio-Business Center Building and 3rd Street Parking Ramp Expansion
219 and 223 First Avenue S.W.
Rochester, Minnesota

Soil Excavation Areas	Sample ID	Sample Interval (ft bgs)	Contaminant	Concentration (mg/kg)	Sample Description	Estimate Area of Excavation					Excavation Dimension Basis	Excavation Verification Samples					Samples to be Analyzed for Disposal (if needed)
						Length (ft)	Width (ft)	Depth (ft)	Volume (CY)	Estimated Weight (tons)		Sidewalls (total # needed)	Floor (total # needed)	Arsenic	PAHs	VOCs	
Parcel 223	GB-3	2-4'	Arsenic	10.2	Geotechnical boring, fill material observed to 12 ft. bgs.	130	38	14	2,561	3,586	Fill with debris to be disposed at a RCRA Subtitle D landfill pending landfill approval. No samples will be collected on the south and north sidewalls because they will not exist.	5	7	12	12	0	1 sample/500 cy (See sample summary table, former samples will be used as part of samples needed.)
	GB-5	4.5-6.5'	Arsenic	8.1	Geotechnical boring, fill material observed to 16 ft. bgs.												
	LGP-4	0-2'	BAPeq.	12.7	Geoprobe boring, boring refusal at 2 ft. bgs on concrete. Fill material to 2 ft.												
Parcel 219	No contaminated soil observed in previous soil investigation. Field screening and stockpile sampling for VOCs will be completed during excavation and reuse in former basement south of 223 Parcel.				Fill, fine to medium grained sand, poorly graded, brown.	130	40	2	385	539	Weathered bedrock at bottom of excavation will likely require disposed off site because it will not be reuseable as geotechnical fill.	9	7	0	0	16	1 sample/500 cy (See sample summary table, former samples will be used as part of samples needed.)
						130	40	12	2,311	3,236	Soil to be reused to backfill south of 223 parcel in former basement.						Soil to be reused onsite will be field screened with a PID and sampled for VOCs.
DPRA Boring B-7	B-7	13-15'	PCE	0.16	Not Available	5	5	5	125	175	Soil to be disposed at a RCRA Subtitle D landfill pending landfill approval.	4	1	0	0	5	1 sample/500 cy (See sample summary table, former samples will be used as part of samples needed.)
Total									5,383	7,536		14	14	12	12	16	4

PID - Photo-ionization detector
BAP eq - benzo (a) pyrene equivalent

Fax Cover Sheet

Minnesota Pollution Control Agency

Remediation Division
St. Paul Office
520 Lafayette Road North - St. Paul, MN 55155

Date:	7/20/07	**Number of pages (including this page):**	2 Doc.Sets/4pp
To:		Ken Haberman	
Company or agency:		Landmark Environmental LLC	
Fax number:		952.887.9605	
Subject:		Hazardous Waste Determinations for Soil at 219 and 223 First Ave.SW., Rochester; Former Dry Cleaners- Rochester #3 Site, VP12562	
Message:		Hi, Ken. Here are the completed reviews for subject Site. Please note that for the 219 location determination, the soil is not a listed hazardous waste...With special note that the soil from DPRA Boring B7 (13-15' bgs, as conducted 5/30/00) cannot be moved for reuse but is suitable for disposal at Subtitle D Landfill.	
From:		Ed Olson, Project Manager	
Division:		Remediation/ Voluntary Investigation & Cleanup Unit	
Telephone number:		651-296-8111	
Fax number:		651-296-9707	
If you have any questions regarding this fax, please call:			651-296-8111

SF-00006-05(4/86)

DEPARTMENT: POLLUTION CONTROL AGENCY

STATE OF MINNESOTA

Office Memorandum

DATE: July 20, 2007

TO: Ed Olson
VIC Unit
Remediation

FROM: Elizabeth Gawrys
RCRA/Superfund Unit
Remediation

PHONE: 651/297-8376

SUBJECT: Hazardous Waste Determination for soil from 219 First Avenue Southwest, the Former Drycleaners Site (Dry Cleaner Parcel) Rochester #3, VP12562 Site.

The Minnesota Pollution Control Agency has been asked to review contaminated soils from the above site. The following paragraph outlines the waste profile according to Minnesota Rules Chapter 7045.

Waste to be evaluated: Soil samples collected from the site were reviewed to determine if the soil needs to be handled a hazardous waste during remediation activities.

__X__Sufficient information was submitted to make a determination on the soil for listed wastes.

_____ Sufficient information was submitted to make a determination on the soil for characteristic waste.

Minn. Rules pt. 7045.0131, subps.2 through 7: Characteristics of Hazardous Waste.

subp. 2 waste exhibits ignitability	_____yes	____no (if yes, waste code is D001)
subp. 4 waste exhibits corrosivity	_____yes	____no (if yes, waste code is D002)
subp. 5 waste exhibits reactivity	_____yes	____no (if yes, waste code is D003)
subp. 6 waste exhibits lethality	_____yes	____no (if yes, waste code is D004)
subp. 7 waste exhibits TC toxicity	_____yes	_____no (see below)

Toxicity characteristic contaminants involved:

Minn. Rules pt. 7045.0135, subps. 2 through 5: Listed Hazardous Wastes.

Subp. 2 nonspecific sources (F-listed)	_____ yes	___X_ no	(code ____)
subp. 3 specific sources (K-listed)	_____yes	___X__no	(code ____)
subp. 4 commercial chemical products (*P- or U- listed)	_____yes	___X__no	(code ____)
subp. 5 PCB related waste	_____yes	___X__no	(code ____)

- P-listed wastes are acute hazardous wastes and are subject to the small quantity exclusions

Based on this evaluation, the above waste has been determined to be:

____The soil contains a listed hazardous waste and as such must be handled in accordance with the Minnesota Hazardous Waste Rules Ch. 7045. This waste may be subject to land disposal restriction (LDR) requirements.

__X_The soil is not a listed hazardous waste at the concentrations evaluated if the soil is managed for disposal at a subtitle D landfill in accordance with the Minnesota Solid Waste Rules. Soil at the Boring B7 (13-15') can not be moved for reuse, but is suitable for disposal at a Subtitle D Landfill.

____Exempted hazardous waste under Minnesota Hazardous Waste Rules 7045.0120, subp. Q. Petroleum contaminated media and debris. Mitigation of this waste must follow the MPCA Tanks and Spills Section procedures.

Additional Comments:
Based on generator's knowledge and the site investigation, it was not necessary to perform laboratory analysis for all hazardous constituents for this hazardous waste determination.

Additional Agency referrals:

Air Quality	_____651/297-8580 (Chris McLain, thermal treatment)
Water Quality	_____651/296-7734 (Marni Karnowski, water quality)
Solid Waste	___X__651/297-8506 (Katie Koelfgen, solid waste)
Hazardous Waste	___X_218/846-0472 (Steve LaRoque, hazardous waste)
Minnesota Department of Transportation	_____651/747-2229 (Jim Fox)

If you have any questions regarding this waste evaluation, please feel free to contact me.

EG/jmp

cc. Steve LaRoque, MPCA, Industrial Division
Joe Hauger, MPCA/Rochester Industrial Division

SF-00006-05(4/86)

DEPARTMENT: POLLUTION CONTROL AGENCY

STATE OF MINNESOTA

Office Memorandum

DATE: July 20, 2007

TO: Ed Olson
VIC Unit
Remediation

FROM: Elizabeth Gawrys
RCRA/Superfund Unit
Remediation

PHONE: 651/297-8376

SUBJECT: Hazardous Waste Determination for soil from 223 First Avenue Southwest, the Former Drycleaners Site (Theatre Parcel) Rochester #3, VP12562 Site.

The Minnesota Pollution Control Agency has been asked to review contaminated soils from the above site. The following paragraph outlines the waste profile according to Minnesota Rules Chapter 7045.

Waste to be evaluated: Soil samples collected from the site were reviewed to determine if the soil needs to be handled a hazardous waste during remediation activities.

__X__ Sufficient information was submitted to make a determination on the soil for listed wastes.

_____ Sufficient information was submitted to make a determination on the soil for characteristic waste.

Minn. Rules pt. 7045.0131, subps.2 through 7: Characteristics of Hazardous Waste.

subp. 2 waste exhibits ignitability	_____yes	____no (if yes, waste code is D001)
subp. 4 waste exhibits corrosivity	_____yes	____no (if yes, waste code is D002)
subp. 5 waste exhibits reactivity	_____yes	____no (if yes, waste code is D003)
subp. 6 waste exhibits lethality	_____yes	____no (if yes, waste code is D004)
subp. 7 waste exhibits TC toxicity	_____yes	_____no (see below)

Toxicity characteristic contaminants involved:

Minn. Rules pt. 7045.0135, subps. 2 through 5: Listed Hazardous Wastes.

Subp. 2 nonspecific sources (F-listed)	_____ yes	___X_ no (code ____)
subp. 3 specific sources (K-listed)	_____yes	___X__no (code ____)
subp. 4 commercial chemical products (*P- or U- listed)	_____yes	___X__no (code ____)
subp. 5 PCB related waste	_____yes	___X__no (code ____)

- P-listed wastes are acute hazardous wastes and are subject to the small quantity exclusions

Based on this evaluation, the above waste has been determined to be:

____The soil contains a listed hazardous waste and as such must be handled in accordance with the Minnesota Hazardous Waste Rules Ch. 7045. This waste may be subject to land disposal restriction (LDR) requirements.

__X_The soil is not a listed hazardous waste at the concentrations evaluated if the soil is managed for disposal at a subtitle D landfill in accordance with the Minnesota Solid Waste Rules.

____Exempted hazardous waste under Minnesota Hazardous Waste Rules 7045.0120, subp. Q. Petroleum contaminated media and debris. Mitigation of this waste must follow the MPCA Tanks and Spills Section procedures.

Additional Comments:
Based on generator's knowledge and the site investigation, it was not necessary to perform laboratory analysis for all hazardous constituents for this hazardous waste determination.

Additional Agency referrals:

Air Quality	_____651/297-8580 (Chris McLain, thermal treatment)
Water Quality	____651/296-7734 (Marni Karnowski, water quality)
Solid Waste	___X__651/297-8506 (Katie Koelfgen, solid waste)
Hazardous Waste	___X_218/846-0472 (Steve LaRoque, hazardous waste)
Minnesota Department of Transportation	_____651/747-2229 (Jim Fox)

If you have any questions regarding this waste evaluation, please feel free to contact me.

EG/jmp

cc. Steve LaRoque, MPCA, Industrial Division
Joe Hauger, MPCA/Rochester Industrial Division

Attachment 3

TECHNICAL SPECIFICATIONS

Minnesota Bio Business Center
Rochester, Minnesota

TABLE OF CONTENTS

CERTIFICATIONS

I hereby certify that Divisions 00, 01, 02, 07, and 33 of these specifications were prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.

Date Jason D. Skramstad, P.E. Reg. No. 43899

SECTION 007316
INSURANCE REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Insurance Requirements

B. Related Sections:
   1. Document 007200 – General Conditions of the Contract for Construction.
   2. Section 017800 – Close Out Submittals.

1.2 GENERAL

A. The City of Rochester shall be named as additional insured on insurance policies and certificates.

B. The name of the project shall be noted on the certificates of insurance.

1.3 CONTRACTOR'S LIABILITY INSURANCE

A. Purchase and maintain insurance as herein specified, which shall be deemed to be minimum requirements, and as will provide protection from claims which may arise out of or result from the Contractor's acts or operations under the Contract, whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. The required insurance shall be written by an insurance company or companies authorized to conduct insurance business in the state in which the Project is located and shall be written for not less than the limits specified, or required by law, whichever is greater. Prior to starting the Work and within ten days after notice of award, the Contractor shall furnish two copies of all certificates of coverage to the Architect on forms provided by the Architect, who will submit to the Owner. The Work shall not be started and no payment on the Contract will be made, until insurance certificates have been filed with and accepted by the Owner.

B. Do not allow insurance to be canceled, lapse, change by decrease in limits or coverage until the Contract has been completed. In event of such change or termination, 15 days written notice shall be given the Architect, Owner and insured parties. Certificates shall bear acknowledgement of the notice requirement. The Surety for the Performance Bond shall be held until any claims (including claims subject to Hold Harmless requirements) have been settled and evidence to such effect suitable to Owner has been furnished.

C. Required liability insurance shall be subject to the following, with the limits indicated considered as minimum requirements, which shall not be construed as any representation by the Owner or Architect as being sufficient or adequate to protect the Contractor's interest or liabilities.
   1. Insurance companies shall waive the right to assert the immunity of Owner (if such immunity exists under the law) as a defense to any claim made under said insurance and such waiver shall be shown on policies or certificates.
   2. Bodily Injury and Property Damage on all liability insurance, including automobile, shall be on an "occurrence" basis.
   3. Contractor's Public Liability Insurance, on Broad Form Basis: Bodily Injury $1,000,000 for each occurrence, $1,000,000 aggregate; Property Damage (Broad Form) $1,000,000 each occurrence, $1,000,000 aggregate. (NOTE: In view of the protective contingent liability under #4 this property damage coverage is not a requirement of subcontractors by the Owner-Contractor Agreement. Determine the Subcontractor's Insurance).
   4. Contractor's Protective Contingent Liability: Same limits as #3 above.
   5. Automobile, including Owned, Hired and Non-Owned Vehicle Coverage: $1,000,000/$1,000,000 bodily injury and $1,000,000 per occurrence property damage.

6. X-C-U Hazards: Same limits as #3 above. Coverage must be shown. Exclusion of any of these hazards will be considered only if a sworn statement of the Contractor is provided which certifies no work involving these hazards will be performed by the Contractor or any of his subcontractors.
7. Completed Operations: Limits noted in #3 above. Maintain a minimum of one year after substantial completion.
8. Personal Injury: Same limits as #3 above.
9. Worker's Compensation: As required by law; employers' liability $500,000.
10. Contractual Hold-Harmless Insurance: Provide insurance coverage for the indemnification agreement specified under Article 3.18 of the General Conditions. Insurance for said agreement shall, as a minimum, provide limits as specified above for any claim arising out of the agreement and said limits shall not be reduced as the result of any claim made under the public liability insurance above. Maintain insurance for the agreement throughout a minimum of a one year period after Project completion.
11. Umbrella Excess Liability: In addition to the above specified coverage, effect and maintain an Umbrella Excess Liability Policy in the minimum amount of $1,000,000 with minimum $10,000 self-retention.
12. Contractor's Pollution liability required for this project:
    a. $2,000,000 each claim and $2,000,000 annual aggregate.
    b. These insurance requirements are not to be construed as recommended or maximum amounts. Contractor is solely responsible for determining the appropriate limits of insurance coverage for injuries or damages from the performance of the work under the Contract Documents.
    c. Policy shall contain no asbestos, PCB (polychlorinated biphenyl) or lead exclusions.
    d. If written on a claims made basis, coverage shall remain in effect for at least two years after final payment.

END OF DOCUMENT

SECTION 011100

SUMMARY OF REMEDIATION WORK

1.01 INTRODUCTION

These Specifications were prepared to supplement the Voluntary Response Action Plan (VRAP) for the Minnesota Bio Business Center, Rochester, Minnesota, which was prepared by Landmark Environmental, LLC (ENGINEER) on behalf of the City of Rochester and Economic Development Authority for the City of Rochester (hereafter collectively referred to as the OWNER), dated June 2007. The OWNER will contract with the ENGINEER to oversee and manage the Work performed by the CONTRACTOR. The work includes the following tasks:

- Prepare and implement a site safety plan.
- Implement runoff control and dust control procedures.
- Coordinate with utility companies for excavation work.
- Excavate soil and fill material (including buried building debris) across the southern portion of the Property (the property previously located at 223 First Avenue S.E. [the 223 Parcel]).
- Excavated soil and fill material from the 223 Parcel will be transported directly (if possible) to an approved permitted RCRA Subtitle D landfill. CONTRACTOR shall excavate, load, transport and dispose soil at an approved permitted RCRA Subtitle D landfill.
- Excavate contaminated soil and dispose in an approved RCRA Subtitle D Landfill
- Contingency contaminated soil that cannot be excavated and transported directly to the landfill shall be stockpiled on poly and covered until ENGINEER can collect and analyze samples.
- Manage contaminated soils in accordance with MPCA requirements.
- Comply with the MPCA, federal and local requirements for removing, transporting, and disposing of contaminated materials.
- Install a dual phase system as part of CP-2.
- Install a vapor barrier and passive venting systems during CP-2.

PART 2: PRODUCTS [NOT USED]
PART 3: EXECUTION [NOT USED]

END OF SECTION 011100

SECTION 013300

SUBMITTAL PROCEDURES

1.01 GENERAL SUBMITTAL PROCEDURES

A. Submittals shall be delivered to Landmark's Project Engineer at the following address:

Landmark Environmental, LLC
Attn: Jason Skramstad
2042 West 98th Street
Bloomington, MN 55431

1.02 LIST OF SUBMITTALS

CONTRACTOR shall submit the following list of submittals, but CONTRACTOR shall submit all other submittals not specifically specified below but called out elsewhere in these Contract Documents.

A. SITE SAFETY PLAN

Four copies of the CONTRACTOR's Health and Safety Plan and one copy of training documentation shall be submitted five days before work starts as discussed in Section 011400. See Section 011400 for more information.

B. SUBCONTRACTOR AND LANDFILL DOCUMENTATION
Subcontractors that will be used on the project and landfill disposal documentation as required by Section 026100 shall be submitted to ENGINEER upon receipt.

PART 2: PRODUCTS [NOT USED]
PART 3: EXECUTION [NOT USED]

END OF SECTION 013300

SECTION 011400

WORK RESTRICTIONS - SAFETY

1.01 GENERAL

A. In accordance with generally accepted construction practices, CONTRACTOR shall be solely and completely responsible for job-site conditions and safety procedures and programs, including safety and health of all persons and property, on those portions of the property affected by or used by CONTRACTOR, CONTRACTOR's employees, subcontractors, agents, and others during performance of the Work. This requirement will apply continuously and not be limited to normal working hours. Observation of the Work and CONTRACTOR's performance by OWNER and ENGINEER is not intended to include review of the adequacy of CONTRACTOR's safety and health procedures and programs on or near the construction site. CONTRACTOR is solely responsible for the protection of property and the safety and health of its employees, Subcontractors, Suppliers, agents and others on or near the property. OWNER and ENGINEER shall have access to all areas of the Property at all times. CONTRACTOR shall make all areas of the Property available at all times to OWNER and ENGINEER.

1.02 SITE SAFETY PLAN

A. CONTRACTOR shall be solely responsible for the health and safety of all persons at the property, specifically including but not limited to, health and safety matters related to the remedial nature of the Work and the potential for encountering hazardous substances in groundwater and soil during the Work. CONTRACTOR shall prepare its own Site Safety Plan (SSP) specifically for performance of the Work. CONTRACTOR's SSP shall, at a minimum, meet the requirements established in ENGINEER's SSP and shall meet the regulatory requirements set forth by the Occupational Safety and Health Administration (OSHA), specifically those set forth in the Code of Federal Regulations (CFR) at 29 CFR Parts 1910 and 1926, in particular 1910.120 (Hazardous Waste Operations and Emergency Response). Specific topics that shall be addressed in CONTRACTOR's SSP are those that are required to be addressed by Laws and Regulations, those that are addressed in ENGINEER's SSP, and the following (if not addressed in ENGINEER's SSP):

1. worker medical surveillance;

2. worker training;

3. a detailed description of the planned movement of labor, equipment and materials from and between work areas as work progresses, including measures

to be employed to prevent recontamination of previously cleaned areas and contamination of areas that do not now contain hazardous materials;

4. a detailed description of the personnel decontamination facilities to be employed including the planned phasing of decontamination facilities between work areas as the work progresses and the methods to be used to collect, store, treat, and ultimately dispose of personnel decontamination waters and wastes;

5. a detailed description of the area for decontamination of vehicles and equipment and the methods to be used to collect above, treat and ultimately dispose of washdown decontamination waters and sediments;

6. personal protective equipment types to be used and conditions for use;

7. personal hygiene and personnel decontamination procedures;

8. respirator protection program and procedures;

9. personnel and ambient air monitoring;

10. emergency and first aid equipment and supply;

11. dust and particulate emission control;

12. monitoring and mitigation of worker heat and cold stress;

13. the types of materials and substances likely to be encountered in the course of the work; and

14. property security, property access, and property control.

In addition, CONTRACTOR's SSP shall detail safety procedures appropriate for the Work.

CONTRACTOR shall submit the SSP to ENGINEER before beginning the Work and will not commence construction activities until its receipt is noted by ENGINEER and distributed as herein below provided. ENGINEER's review will be only to see that CONTRACTOR's SSP meets the minimum requirements set forth in these Specifications. CONTRACTOR shall make reasonable changes required by ENGINEER to make CONTRACTOR's SSP conform to the minimum requirements. CONTRACTOR shall distribute four copies to ENGINEER and one copy to Subcontractors, Suppliers, and all other parties that will be required to enter the property for any purpose. Such distribution shall not impose on any party any obligation to approve CONTRACTOR's SSP, but is intended only for informational

purposes to make parties aware of CONTRACTOR's requirements for entry to the Property. It is not intended that CONTRACTOR's SSP cover routine construction activities that would not otherwise require a project specific health and safety plan under Laws and Regulations were it not for the potential for contact with contaminated soil and water.

CONTRACTOR's SSP shall designate a qualified individual to act as CONTRACTOR's Site Safety Officer for purposes of assuring compliance by all persons with CONTRACTOR's SSP. CONTRACTOR's Site Safety Officer shall be present on the property during all activities that could potentially result in exposure to contaminated soil or groundwater, specifically including but not limited to, excavation, transportation and backfilling. At other times of routine construction, CONTRACTOR shall determine the need for the presence of the designated Site Safety Officer. However, the Site Safety Officer (or a designated alternate(s)) shall be available by telephone continuously during the Contract Time, and shall be available to respond to the property within two hours at any time following request by CONTRACTOR, OWNER or ENGINEER at no additional cost to OWNER.

CONTRACTOR shall hold regularly scheduled safety meetings (at least weekly) that shall be given by CONTRACTOR's Site Safety Officer. That meeting shall also be attended by CONTRACTOR's resident supervisors and Subcontractors involved in the Work during the upcoming period. OWNER and ENGINEER will attend when appropriate. The topic of the meeting shall specifically be limited to safety and attendees shall at a minimum discuss safety problems and requirements related to upcoming work.

CONTRACTOR will not be required to supply personnel protective equipment or monitoring equipment for any persons other than CONTRACTOR's employees. However, CONTRACTOR shall make available CONTRACTOR's decontamination facilities to those persons who reasonably require access to the Work, including OWNER, ENGINEER, and regulatory authorities. CONTRACTOR shall be solely responsible for assuring compliance by all persons with CONTRACTOR's SSP in accordance with paragraph 6.20 of the General Conditions and Supplementary Conditions. CONTRACTOR shall not unreasonably restrict access to the property and shall not proceed with Work that OWNER or ENGINEER request to observe during such time as OWNER or ENGINEER are being denied access to the property because of non-compliance with CONTRACTOR's SSP.

B. The costs of safety and health as specified in this Section 011400 of the Specifications shall be included in the Contract Price and no additional compensation will be provided. Health and safety shall be of paramount importance and shall take precedence over cost and schedule considerations.

C. ENGINEER has prepared a SSP for ENGINEER's employees. A copy of ENGINEER's SSP can be reviewed at the Architect office.

1.03 HAZARD COMMUNICATION PROGRAMS

A. CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between employers at the Property in accordance with Laws and Regulations. All workers shall have access to all material safety data sheets and other hazard communication information.

1.04 EMERGENCIES

A. In emergencies affecting the safety or protection of persons, the Work, or any property adjacent to the Work, CONTRACTOR, without special instruction from OWNER or ENGINEER, is obligated to act to prevent threatened damage, injury, or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been created by such emergency. If ENGINEER or OWNER determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Change Order will be issued to document the consequences of such action.

1.05 PROPERTY CHARACTERIZATION

A. A list of contaminants identified to be on-site is presented in ENGINEER's SSP. More detailed information is contained in documents located at ENGINEER's offices and may be reviewed at ENGINEER's office upon request by CONTRACTOR or CONTRACTOR's designee. A summary of previous investigation results is included in the VRAP.

1.06 SUBMITTALS

A. CONTRACTOR shall submit to ENGINEER proof of worker training and proof of medical surveillance.
B. CONTRACTOR shall submit 4 copies of the CONTRACTOR's SSP to the ENGINEER 5 days prior to Work is scheduled to begin.

PART 2: PRODUCTS [NOT USED]
PART 3: EXECUTION [NOT USED]

END OF SECTION 011400

SECTION 026100

SOIL REMEDIATION

PART 1 - GENERAL

1.1 INTRODUCTION

A. These Specifications were prepared following completion of the (1) Phase I Environmental Assessments for 219 and 223 First Avenue S.W., Rochester, Minnesota, dated March 2007; (2) Phase II Environmental Investigation, dated January, 2007; (3) Voluntary Response Action Plan (VRAP) and Preliminary Response Action Design, dated June 2007; (4) VRAP Addendum – Response Action Design, dated July 17, 2007; and (5) Environmental Contingency Plan (ECP), dated June 2007.

The work (Work) includes the following tasks:

1. Conduct earthwork activities in accordance with Construction Package #2 (CP-2), Construction Documents dated September 14, 2007.
2. Prepare and implement a Site Safety Plan (SSP) for contaminated soil, groundwater and potential soil gas from groundwater.
3. Implement dust control procedures.
4. Excavate soil and fill material from the 223 Parcel for transportation and disposal at an approved permitted RCRA Subtitle D landfill.
5. Excavate fill soil from the 219 Parcel for reuse as fill in the former basement under the proposed parking ramp to be constructed on the property directly south of the 223 Parcel.
6. Manage excavated soil and fill material in accordance with the VRAP and ECP.
7. Comply with the applicable local, state and federal requirements for removing, transporting, and disposing of contaminated materials.
8. Accumulate water in a depression on a liner within the excavation and remove runoff water from the 223 Parcel and properly discharge in accordance with the general stormwater permit. The MPCA requires us to collect runoff water so that it doesn't increase migration of chlorinated VOCs within the karst and fractured bedrock groundwater.

1.2 DESCRIPTION

A. All Work included in this Section shall be done in accordance with the following paragraphs as well as the General Requirements of these Technical Specifications and in accordance with all provisions of the Contract Documents.

1. The Work covered by this section of the Technical Specifications consists of, but is not limited to, furnishing all supervision, labor, equipment, and materials and performing all operations necessary to complete items discussed in 1.1 A discussed above.

B. CONTRACTOR shall conduct all work in accordance with OSHA standards for excavations in 29 CFR Part 1926.

1.3 SUBMITTALS

A. Submittals shall be delivered to Landmark's Project Engineer at the following address. Deliver 1 copy to General Contractor.

Landmark Environmental, LLC
Attn: Jason Skramstad
2042 West 98th Street
Bloomington, MN 55431

B. SITE SAFETY PLAN: Four copies of the CONTRACTOR's SSP and one copy of training documentation shall be submitted five days before work starts as discussed in Section 011400. See Section 011400 for more information.

C. CONTRACTOR shall submit the names of all subcontractors who will be used to haul contaminated soil from the Property to the designated disposal facility. CONTRACTOR shall submit name of proposed permitted lined RCRA Subtitle D landfill for approval by OWNER.

1. CONTRACTOR shall submit copies of all documentation (manifests, analytical testing results, profiles, disposal facility invoices, etc.) that will be used to track the shipment of contaminated materials. CONTRACTOR shall submit copies of all documentation (weight tickets, etc.) that will be used to track the weight and volume of clean fill delivered to the Property.
2. CONTRACTOR shall, if necessary, obtain approval from local, state, or federal agencies for the routes that its vehicles will travel from the Property to the disposal facility, and shall submit copies of the approved routes and all supporting documentation prior to removing any contaminated soil or other material from the Property.
3. CONTRACTOR shall provide clean offsite fill source data and fill samples on each source, a minimum of 15 days before importing material, for chemical analysis by ENGINEER. A sample frequency of 1 sample per 2,000 cubic yards is required. CONTRACTOR shall provide other soil information per CP-2. CONTRACTOR shall submit weigh tickets of clean fill delivered to the Property.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Polyethylene Sheeting for Stockpiles and Collection of Runoff Water: Temporary sheeting shall be a minimum of 10-mil thick reinforced polyethylene sheeting.

2.2 CLEAN FILL

A. Offsite Clean Fill: Clean fill shall meet requirements indicated in CP-2. The backfill shall be clean, free of roots, demolition debris, or other wastes, and not contaminated

with detectable concentrations of volatile organic compounds, semi-volatile organic compounds, petroleum, pesticides or polychlorinated biphenyls, or elevated concentrations of metals, and shall not have any contaminants in excess of the cleanup criteria.

PART 3 - EXECUTION

3.1 PREPARATION

A. The CONTRACTOR shall make arrangements to locate all existing Utilities and Underground Facilities in the areas of work. CONTRACTOR shall provide adequate means of protection during earthwork operations.

B. Prior to beginning excavation of contaminated soils, CONTRACTOR shall complete all of the preparation activities.

C. The CONTRACTOR shall protect structures, fences, utilities, and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

3.2 GENERAL EXCAVATION

A. CONTRACTOR shall perform the excavations in the sequence of work approved by the ENGINEER.

B. During all excavation activities, CONTRACTOR shall be required to maintain stable side slopes.

C. During the excavation and handling of contaminated soils, the CONTRACTOR shall carefully adhere to the SSP. Any violation of the plan will be a basis to stop work until compliance with the plan is restored.

D. Initial excavation shall be as shown on the Drawings or as directed by ENGINEER. Removal of materials beyond indicated excavation limits without specific direction of ENGINEER or OWNER, as well as correction of any defective work directed by ENGINEER or OWNER, shall be at CONTRACTOR's expense. Unauthorized excavations shall be immediately backfilled and compacted as specified for authorized excavations of same classification, unless otherwise directed by ENGINEER.

E. Side slopes of excavations shall comply with applicable Laws and Regulations. CONTRACTOR shall shore or brace excavations where sloping is not possible either because of space restrictions or stability of the material excavated. CONTRACTOR shall maintain sides and slopes of excavations in a safe condition until completion of backfilling.

F. CONTRACTOR shall coordinate with utility companies during excavation in areas of utilities.

3.3 EXCAVATION OF CONTAMINATED SOIL

A. After completion of all necessary site preparation activities, CONTRACTOR shall excavate and load (and as necessary, stockpile) soil as shown on the Drawings. The CONTRACTOR shall excavate in a manner that will minimize the amount of underlying soil that becomes mixed or tracked with contaminated soil. CONTRACTOR shall excavate and load contaminated soil and transport and dispose in an approved landfill.

B. The VRAP includes analytical data from previous investigations.

C. After sample verification conducted by the ENGINEER, the CONTRACTOR may be required to continue excavating additional soil from select areas as directed by the ENGINEER. Volumes are considered estimated quantities.

D. Contaminated soil shall be stockpiled on the Property (for future reuse on the Property) or loaded and transported to the approved permitted RCRA Subtitle D landfill. The stockpiles must not exceed 50 cubic yards of soil.

E. The transportation vehicle shall not be overfilled or filled in such a manner that there is spilling or tracking of contaminated soil in any area other than the contaminated soil portion of the excavation and the stockpile area. In the event there is a spillage of material in areas not allowed above, the excavation may be stopped by the ENGINEER or OWNER until the problem is resolved.

F. Any vehicle used to excavate or transport the contaminated soil shall not leave the Property or be used to excavate or transport any materials except from the contaminated soil excavation until that piece of equipment has been decontaminated. CONTRACTOR shall sequence the work such that equipment used for excavation and transportation of contaminated material is not used for excavation and transportation of clean fill until that equipment has been decontaminated.

G. Prior to leaving the Property, open trucks shall be covered with a secure tarp that will not allow contaminated soil to blow out of the truck.

H. In the event any unexpected materials/liquids, drums, containers, tanks, or any similar material of concern is encountered during the excavation activities, the excavation activities in that area shall immediately be stopped and the ENGINEER notified in accordance with the ECP.

I. Large debris encountered during excavation of contaminated soil shall be segregated, cleaned, and managed in accordance with this Section of the Specifications.

3.4 LOADING, TRANSPORTATION AND DISPOSAL OF CONTAMINATED SOIL

A. CONTRACTOR shall use appropriate methods in the loading, handling, storage and transportation of the materials described in this section of the Technical Specifications.

B. CONTRACTOR shall be in strict compliance with all federal, state, and local laws, regulations, or requirements when transporting any contaminated materials from the Property to an accepted permitted disposal facility.

C. Any spill caused by the CONTRACTOR's handling of any material shall be cleaned up at the CONTRACTOR's expense.

D. CONTRACTOR shall dispose of soil designated for off site disposal at an approved permitted RCRA Subtitle D landfill. CONTRACTOR shall coordinate disposal and submit copies of profiles, manifest, weight tickets and any other documentation to ENGINEER and OWNER.

E. CONTRACTOR shall direct load contaminated soil after acceptance from the disposal facility.

3.5 CONTAMINATED SOIL STOCKPILE(S) FOR UNEXPECTED CONTAMINATED SOIL

A. CONTRACTOR shall place contaminated soil on a polyethylene liner or on asphalt as directed by the ENGINEER for unexpected contaminated soil discovered during excavation.

B. The contaminated soil stockpile(s) shall have berms to prevent runon and runoff of water.

C. The stockpiles shall have stable side slopes and shall not exceed 15 feet in height, and shall not be greater than 50 cubic yards in size.

D. ENGINEER will collect soil stockpile samples and analyze them for landfill disposal purposes.

3.6 CONTAMINATED SOIL IN UTILITY TRENCHES

A. ENGINEER will be notified in accordance with the ECP if contaminated soil is encountered in utility trenches. ENGINEER will field screen and sample soil in accordance with ECP.

3.7 DEBRIS CLEANING

A. If excavated large debris such as concrete are covered with contaminated soils, the CONTRACTOR shall clean the materials by removing any contaminated soil or waste from the debris surface. CONTRACTOR may require the use of hand tools to clean the contaminated demolition materials. All debris shall be cleaned such that no more than 1/8 inch of contaminated soil remains on any surface. The cleaned debris shall be temporarily stockpiled until inspection by the ENGINEER before transportation offsite. If the debris appears to be contaminated it shall be disposed of with the contaminated soil or with the contaminated concrete.

3.8 BACKFILL AND COMPACTION

A. CONTRACTOR shall not backfill contaminated soil excavations until approved by the ENGINEER and shall backfill in accordance with CP-12.

3.9 ROADS/DUST CONTROL

A. CONTRACTOR shall maintain roads to provide access to and from the Property and all affected adjacent facilities for the entire duration of the construction. Roads shall be passable for their intended use at all times in all weather conditions and shall be

maintained. Public roads shall be cleaned and maintained as necessary to minimize tracking of contaminated soil off the Property.

1. CONTRACTOR shall provide all equipment and materials necessary for the control of dust arising during the performance of the Work. Dust shall be kept to an absolute minimum. Dust shall not be a nuisance to area residents or businesses. When requested by ENGINEER or OWNER, or at other times as necessary, CONTRACTOR shall take measures to reduce dust.
2. The cost of Roads/Dust Control shall be included in the Contract Price and no additional compensation will be provided.

3.10 DECONTAMINATION FACILITIES AND PROCEDURES

A. Before work can begin, CONTRACTOR shall delineate decontamination zone and exclusion zones.

B. All equipment introduced to the Property at any time shall be decontaminated at off-site locations by CONTRACTOR prior to entering the Property.

C. Prior to commencing work involving equipment in contact with contaminated material, CONTRACTOR shall supply decontamination equipment and establish a decontamination area or facility. All personnel and equipment shall be decontaminated after working with contaminated material and prior to entering clean areas.
   1. Dry decontamination will be allowed. Equipment can be cleaned with shovels and brushes removing contaminated soil from equipment.

3.11 FIELD QUALITY CONTROL

A. CONTRACTOR shall utilize equipment, materials, and procedures that are anticipated to meet the quality requirements specified.

B. CONTRACTOR shall compact soil in accordance with other Specifications.

3.12 MEASUREMENT AND PAYMENT

A. Excavation, Loading, Transportation and Disposal of Contaminated Soil from Parcel 223 shall be included in the base bid pricing in CP-2.

B. Preparation and implementation of the SSP shall be included in the base bid pricing in CP-1.

C. Remove Contaminated Soil and Debris (off-site disposal): Provide a price per ton for excavation, transportation, and disposal of contaminated soil and debris at a Subtitle D Landfill.

END OF SECTION 026100

SECTION 026200

DUAL PHASE EXTRACTION ABOVEGROUND PIPING

PART I -GENERAL

1.1 INTRODUCTION

A. These Specifications were prepared following completion of the (1) Phase I Environmental Assessments for 219 and 223 First Avenue S.W., Rochester, Minnesota, dated March 2007; (2) Phase II Environmental Investigation, dated January, 2007; (3) Voluntary Response Action Plan (VRAP), dated June 2007; (4) Environmental Contingency Plan (ECP), dated June 2007; and, VRAP Addendum – Response Action Design, July 17, 2007.

1.2 RELATED SECTIONS

B. Section 026200.10 – Remediation Wells.

1.3 SUBMITTALS

A. Pipe line pressure test data shall be submitted to Owner's Representative.

1.4 EXISTING CONDITIONS

A. DPE piping from the wells will be routed along the ceiling of the basement level to the proposed remediation room as shown on the proposed Drawings.

1.5 REGULATORY REQUIREMENTS

A. Contractor shall conform to applicable codes of state, local and federal regulatory authorities. If any information contained within these specifications is contrary to applicable regulations, the Bidder shall notify the Owner's Representative immediately upon discovery.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Provide temporary end caps and closures on piping and fittings. Maintain in place until connections to pipe are made.

B. Protect piping systems from entry of foreign materials by providing temporary covers, completing sections of Work and isolating parts of completed system.

PART 2 - PRODUCTS

2.1 ABOVEGROUND PIPING FROM REMEDIATION WELLS

A. PVC Pipe: ASTM D1785, Schedule 80, flush threaded.

1. Fittings

2. Joints

B. Refer to Drawings.

2.2 MULTI-PHASE EXTRACTION DROP TUBE, WELLHEAD COMPLETION

A. PVC Pipe: ASTM D1785, Schedule 80, flush threaded.

B. Refer to drawings.

2.3 ACCESSORIES

A. None.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Contractor shall verify to Owner's Representative that all piping is installed according to specification and Drawings.

3.2 PREPARATION

A. Cut pipe ends square, ream pipe and tube ends, as required, and remove burrs.

B. Remove debris, scale and dirt, on inside and outside, before assembly.

3.3 CONNECTIONS

A. All connections shall be fused.

3.4 INSTALLATION – REMEDIATION PIPING

A. All piping must be clearly labeled during installation so that piping labels correspond to correct well.
B. Install pipe and fittings in accordance with manufacturer's instructions.

B. Cover pipe ends during installation with cap, tape, or other, to prevent debris and soil from entering the pipe.

C. Install pipe to indicated elevation to within a tolerance of 1 inch. Confirm elevation and slope at every pipe joint with laser or level and stadia rod.

D. Route pipe over or under obstructions (utilities, etc.), provided that there is adequate cover, such that there are no low points in piping runs.

E. Clearances between remediation piping and utilities must meet minimum requirements specified by each individual utility owner.

3.6 AIR PRESSURE TESTING - PREPARATION

A. Upon completed placement of DPE piping, conduct a line pressure test on each new pipeline to determine degree of tightness.

B. Testing shall be performed after piping has been installed but prior to piping connection to DPE wells. Piping shall be terminated at the treatment building location but shall remain unconnected to equipment until testing is completed.

C. Contractor shall seal each piping run. One end of each piping run shall be fitted with a connector to pressurize line for testing purposes and connecting a pressure gauge.

D. Compressed gas source shall be equipped with an adjustable pressure relief regulator and pressure gauge. Connection for piping run will include a ball or other leak-proof valve for isolating pipe line after pressurization for duration of test.

E. Provide all labor, blowers, compressors, other compressed gas sources, piping, connections, gauges, measuring devices and all other appurtenances necessary to conduct testing.

F. Conduct pressure testing at a time acceptable to and in the presence of the Owner's Representative, and in accordance with the requirements of this section.

C. Any detected leaks or reductions in line pressure shall result in failure of the test and require location and elimination of the leak by the Contractor, at no additional cost to Owner's Representative.

3.7 AIR PRESSURE TESTING

A. Pressure testing shall be successfully completed prior to connection to the system manifold and DPE wells.

B. DPE pipelines shall be tested at 15 psig (pounds per square inch gauge).

C. Pressure test all other pipe prior to backfilling by pressurizing the pipe with air to 15 psig and soaping the joints to check for leaks.

D. Contractor shall test each piping run individually, however, individual tests may be performed concurrently.

E. Contractor shall pressurize the pipeline to be tested to the required pressure and then isolate the line from the pressure source by closing the isolation valve.

F. Pipe must maintain 90 percent of the initial pressure for 5 minutes to pass the test.

G. Contractor must complete line-testing form for each pipe run to be tested. Forms must be provided to the Owner's Representative.

F. Contractor shall submit completed forms to Owner's Representative after completion of testing. Any failures in pipe tests shall be specifically and clearly noted and brought to Owner's Representative's attention.

3.8 FIELD QUALITY CONTROL

A. If Work does not meet the requirements specified in the Contract Documents, remove Work and replace until accepted by the Owner's Representative, at no additional cost to the Owner's Representative.

A. Repair and retest all pipe, joints and fittings failing the pressure test at no additional cost to the Owner's Representative.

END OF SECTION

SECTION 026200.10

REMEDIATION WELLS

PART 1 - GENERAL

1.1 INTRODUCTION

A. These Specifications were prepared following completion of the (1) Phase I Environmental Assessments for 219 and 223 First Avenue S.W., Rochester, Minnesota, dated March 2007; (2) Phase II Environmental Investigation, dated January, 2007; (3) Voluntary Response Action Plan (VRAP), dated June 2007; (4) Environmental Contingency Plan (ECP), dated June 2007; and, (5) VRAP Addendum – Response Action Design, dated July 17, 2007.

1.2 RELATED SECTIONS

A. Section 026200 – Dual Phase Extraction Underground Piping

1.3 REFERENCES

B. Minnesota Department of Health Well Code.

C. City specifications, standards, and requirements, City of Rochester, Minnesota.

1.4 EXISTING CONDITIONS

A. The soil and fill material at the property generally exists at depths ranging from 10 to 15 feet bgs. Bedrock exists at depths ranging 13 to 17 feet bgs. A one to two-foot thick layer of weathered bedrock exists between the soil/fill material and the bedrock. The depth to ground water is expected to be approximately 20 to 25 feet bgs.

B. Coring through concrete is not expected for most boring locations.

C. Drilling will occur as shown on Drawings.

1.5 SUBMITTALS

A. Submit to Owner's Representative, signed copies of well records and other documents which may be required by state, local or federal agencies, including permits.

1.6 REGULATORY REQUIREMENTS

A. CONTRACTOR shall conform to applicable codes of state, local and federal regulatory authorities. If anything contained within these specifications is contrary to Minnesota well code or other applicable regulations, the Bidder shall notify the Owner's Representative immediately upon discovery.

B. The CONTRACTOR shall obtain any and all permits including Minnesota Department of Health permits and City of Rochester Street-Use Permits.

1.7 UTILITIES

A. CONTRACTOR shall be responsible for calling Minnesota Gopher State One-Call to locate public utilities a minimum of 72 hours and a maximum of 10 days prior to initiating drilling activities. All areas must be remarked if snowfall, ice cover, or faded paint hinders positive identification of located utilities.

B. CONTRACTOR shall verify with Owner's Representative, location of non-public utilities located in work areas.

PART 2 - PRODUCTS

2.1 WELL PRODUCTS

A. All products shall be new materials and shall be as specified on the Drawings.

B. Schedule 80 PVC well piping shall be flush threaded and shall use Buna O-rings for each connection.

C. The watertight vaults shall be Morrison, 418XAW, New Welded Manhole, available from Morrison Brothers Company, P.O. Box 238, Dubuque, IA 52001, (800) 553-4840, FAX (319) 583-5028, or equivalent.

2.2 SAMPLING PRODUCTS

A. No samples will be collected during drilling activities.

2.3 PRODUCTS FURNISHED BY OWNER'S REPRESENTATIVE

A. Keyed alike locks for wells.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. The CONTRACTOR shall provide adequate safety cones, barriers, signs, and/or other equipment as necessary for automobile and pedestrian traffic control for drilling locations.

B. CONTRACTOR shall protect all structures and utilities near the wells from damage.

3.2 DRILLING

A. Drill borehole to diameters sufficient for proper well installation.

B. Hollow-stem auger method of drilling shall be utilized.

3.3 WELL INSTALLATION

A. Well installation shall be in accordance with Drawings, subject to minor changes as directed in the field by on-site Owner's representative.

B. Above grade and below grade well installations shall be completed as required by MDH well code.

C. Prior to use, the casings and couplings shall be inspected for cuts, deformations, deep scratches, damaged ends, and other imperfections. Any casing or coupling having such defect(s) may not be used. Trim and smooth ends and remove burrs from well casings. Remove any debris or dirt, on inside and outside of casings, before assembly.

D. The well casing and screen assembly shall be constructed during the drilling of the borehole. Place well casing(s) and screen assembly(s) immediately after drilling, with well screen centered in the borehole. Set firmly in place. Allow inspection of casing(s) prior to placement of well construction materials.

E. CONTRACTOR shall ensure that the filter pack and filter pack seal are installed evenly surrounding the well screen and casing over the proper interval by using a tape measure, measuring rod or similar device. The filter pack sand shall not be allowed to bridge. If bridging occurs, the filter pack sand shall be tamped into place to surround the well screen and/or casing.

F. Maintain well openings(s) and casing(s) free of contaminated materials. Do not permit cuttings to enter casing(s) when the top is being cut to final elevation.

G. The CONTRACTOR shall not allow bentonite or other well construction materials to bridge in the augers while constructing wells.

H. Accurately record actual locations of wells, depths, subsoil strata and drilling difficulties encountered.

I. Settling of neat cement must be replaced as necessary to form a proper seal and to bring to grade.

3.4 FLUSH-MOUNT PAD INSTALLATION

A. The flush-mount pad shall be installed at each monitoring well location well location.

B. The wells will terminate at grade and will be protected in a watertight vault installed in concrete with a minimum 28-day compressive strength of 4,000 psi and a unit weight between 140 and 150 lb/ft^3.

C. The covers shall be clearly marked with the standard monitoring well warning symbol and labeled "Monitoring Well."

D. A Minnesota Department of Health unique well number must be assigned to each well and shall be attached to the well casing or shall be permanently engraved or otherwise emplaced into the surface of the unhardened concrete, or as acceptable at applicable code.

3.5 SOIL BORING ABANDONMENT

A. All soil borings that are not completed as wells shall be abandoned according to state guidelines.

3.6 DRILL CUTTINGS

A. Owner's Representative will provide on-site personnel to segregate soil cuttings.

B. Drill cuttings shall be collected and containerized in CONTRACTOR-provided standard, 55-gallon drums. CONTRACTOR shall transport all drums containing drill cuttings to a storage area as directed by the on-site Owner's Representative.

C. All drums shall be labeled as directed by Owner's Representative.

D. Owner's Representative will coordinate disposal of soil cuttings.

3.7 SITE CLEANING

A. Driller shall collect and dispose of all cement, sand pack and bentonite bags, as well as other refuse and materials, and cleaning up and restoring the areas where drilling has taken place.

END OF SECTION

SECTION 027100

CONSTRUCTION DEWATERING & TREATMENT

PART 1: GENERAL

1.01 DESCRIPTION

A. All work included in this Section shall be completed in accordance with the following paragraphs, as well as the General Requirements as set forth in Division 1 of these Technical Specifications and in accordance with all provisions of the Contract Documents.

B. The work covered by this Section consists of furnishing all supervision, labor, materials, and equipment and performing all operations necessary to properly manage, store, treat and dispose of water from the excavation areas and to manage liquids on-site as required herein. This work may include:

1. Sump pumps or other means necessary to maintain dry conditions for the excavation areas.

2. Acquiring any permits necessary for discharge.

3. Treatment to remove sediments if necessary and discharge of water to an approved facility.

1.02 SUBMITTAL

A. EXCAVATION CONTRACTOR shall provide OWNER and ENGINEER with a copy of the discharge permits.

B. EXCAVATION CONTRACTOR shall submit a Wastewater Control Plan.

PART 2: PRODUCTS [NOT USED]

PART 3: EXECUTION

3.01 GENERAL

A. The EXCAVATION CONTRACTOR shall furnish, construct, install, operate, and maintain a water collection system that may include an excavated sump area, sumps, pumps, pipes, hoses, valves, generators, and any other equipment or operations

necessary to dewater the excavation area, if necessary; and treat and discharge the water to an approved facility. All water collection and treatment equipment shall be removed from the site upon completion of the Work.

B. All recovered water shall be treated if necessary. Assume treatment is for removal of sediment if water is in contact with contaminated soil. If the water is not in contact with contaminated soil, no treatment will be necessary.

C. Landmark shall be responsible for obtaining permission or acquiring any permits from the City of Rochester Water Reclamation Plant or other approved facility for discharge of wastewater. EXCAVATION CONTRACTOR shall call ENGINEER to perform any analytical testing required by the City of Rochester or other facility prior to discharge and EXCAVATION CONTRACTOR shall pay discharge fees. EXCAVATION CONTRACTOR shall haul water if necessary for discharge to facility.

D. EXCAVATION CONTRACTOR shall be responsible for obtaining all necessary dewatering permits from the Minnesota Department of Natural Resources.

PART 4: MEASUREMENT AND PAYMENT

4.01 UNIT PRICES

A. Dewatering and Contaminated Water Disposal.

1. All water shall be measured in gallons as measured by the disposal facility.

2. EXCAVATION CONTRACTOR will be paid a unit price per 1,000 gallons of water properly disposed. This unit price shall be payment in full for the cost of all supervision, labor, materials, equipment, installation of pumps, pipes, and all operations necessary to remove water from the excavation, treat if necessary for sediment, transport, and dispose of all water at an approved facility, complete as specified. The first 1,000 gallons should include setup of the system and necessary submittals and permitting requirements and operation and maintenance of the system and the remaining gallons unit price schedule will include primarily operation and maintenance of the system and necessary reporting.

END OF SECTION 027100

SECTION 072623
BELOW-GRADE GAS RETARDER

PART 1 GENERAL

1.1 SUMMARY

A. Below-grade gas retarder system for both vertical wall and sub slab gas retarder installation.
   1. HDPE and LLDPE geomembranes with both smooth and textured surfaces.

B. Provide Work in accordance with the Voluntary Response Action Plan and the Environmental Contingency Plan for the Property as approved by the Minnesota Pollution Control Agency.

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. D 638, Standard Test Method for Tensile Properties of Plastics.
   2. D 751, Standard Test Methods for Coated Fabrics.
   3. D 792, Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
   4. D 1004, Standard Test Method for Initial Tear Resistance of Plastic Film and Sheeting.
   5. D 1204, Standard Test Method for Linear Dimensional Changes of Non Rigid Thermoplastic Sheeting or Film at Elevated Temperature.
   6. D 1238, Standard Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer.
   7. D 1505, Standard Test Method for Density of Plastics by Density-Gradient Technique.
   8. D 1603, Standard Test Method for Carbon Black in Olefin Plastics.
   9. D 3895, Test Method for Oxidative Induction Time of Polyolefins by Thermal Analysis.
   10. D 4218, Test Method for Determination of Carbon Black Content in Polyethylene Compounds by the Muffle-Furnace Technique.
   11. D 4437, Standard Practice for Determining the Integrity of Field Seams Used in Joining Flexible Polymeric Sheet Geomembranes.
   12. D 4833, Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products.
   13. D 5199, Standard Test Method for Measuring Nominal Thickness of Smooth Geomembranes.
   14. D 5397, Standard Test Method for Evaluation of Stress Crack Resistance of Polyolefins using Notched Constant Tensile Load Test.
   15. D 5596, Standard Practice for Microscopical Examination of Pigment Dispersion in Plastic Compounds.
   16. D 5641, Standard Practice for Geomembrane Seam Evaluation by Vacuum Chamber.
   17. D 5721, Practice for Air-Oven Aging of Polyolefin Geomembranes.
   18. D 5820, Test Method for Air Testing.
   19. D 5885, Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High Pressure Differential Scanning Calorimetry.
   20. D 5994, Standard Test Method for Measuring Nominal Thickness of Textured Geomembranes
   21. D 6365, Standard Practice for the Nondestructive Testing of Geomembrane Seams using The Spark Test
   22. D5820-95, Pressurized Air Channel Test for Dual Seamed Geomembranes

B. Geosynthetic Research Institute (GRI):
   1. GRI GM 9, Cold Weather Seaming of Geomembranes
   2. GRI GM 10, The Stress Crack Resistance of HDPE Geomembrane Sheet
   3. GRI GM 13, Test Properties, Testing Frequency for High Density Polyethylene (HDPE) Smooth and Textured Geomembranes
   4. GRI GM 14, Test Frequencies for Destructive Seam Testing Selecting, variable intervals for taking geomembrane destructive samples using the method of attributes.

5. GRI GM 12, Measurement of the Asperity Height of Textured Geomembranes Using a Depth Gage
6. GRI GM 17, Test Methods, Test Properties and Testing Frequency for Linear Low Density Polyethylene (LLDPE) Smooth and Textured Geomembranes
7. GRI GM 19, Seam Strength and Related Properties of Thermally Bonded Polyolefin Geomembranes

1.3 SUBMITTALS

A. Submit under provisions of Section 01300, Submittals.

B. Documentation of manufacturer's qualifications.

C. A material properties sheet, including at a minimum all properties specified in GRI GM 13, including test methods used.
   1. Sample of the material.
   2. Documentation of Installer's qualifications, as specified below.
      a. Submit a list of at least ten completed facilities. For each installation, provide: name and type of facility; its location; the date of installation; name and telephone number of contact at the facility; type and thickness of geomembrane and; surface area of the installed geomembrane.
      b. Submit resumes or qualifications of the Installation Supervisor, Master Seamer and Technicians to be assigned to this project.
      c. Quality Control Program.
   3. Example Material Warranty and Liner Installation Warranty

D. Shop Drawings
   1. Submit copies of shop drawings for engineer's approval within a reasonable time so as not to delay the start of geomembrane installation. Shop drawings shall show the proposed panel layout identifying seams and details. Seams should generally follow the direction of the slope. Butt seams or roll-end seams should not occur on a slope unless approved by the Owner's Representative. Butt seams on a slope, if allowed, should be staggered.
   2. Placement of geomembrane should not be allowed to proceed until Owner's Representative has received and approved the shop drawings.

E. Additional Submittals (In-Progress and at Completion)
   1. Manufacturer's warranty
   2. Geomembrane installation warranty.
   3. Daily written acceptance of subgrade surface.
   4. Low-temperature seaming procedures if applicable.
   5. Prequalification test seam samples.
   6. Field seam non-destructive test results.
   7. Field seam destructive test results.
   8. Daily field installation reports.
   9. Installation record drawing.

F. Submit certification that the geomembrane and welding rod supplied for the project are made from the same material type and are compatible.

1.4 QUALITY CONTROL

A. Manufacturer's Qualifications: The manufacturer of geomembrane of the type specified or similar product shall have at least five years experience in the manufacture of such geomembrane. In addition, the geomembrane manufacturer shall have manufactured at least 1,000,000 square meters (10,000,000 square feet) of the specified type of geomembrane or similar product during the last five years.

B. Installer's Qualifications

1. The Geomembrane Installer shall be the Manufacturer, approved Manufacturer's Installer or a contractor approved by the Owner's Representative to install the geomembrane.
2. The Geomembrane Installer shall have at least three years experience in the installation of the specified geomembrane or similar. The Geomembrane Installer shall have installed at least 10 projects involving a total of 500,000 square meters (5,000,000 square feet) of the specified type of geomembrane or similar during the last three years.
3. Installation shall be performed under the direction of a field Installation Supervisor who shall be responsible throughout the geomembrane installation, for geomembrane panel layout, seaming, patching, testing, repairs, and all other activities of the Geomembrane Installer. The Field Installation Supervisor shall have installed or supervised the installation and seaming of a minimum of 10 projects involving a total of 500,000 square meters (5,000,000 square feet) of geomembrane of the type specified or similar product.
4. Seaming shall be performed under the direction of a Master Seamer (who may also be the Field Installation Supervisor or Crew Foreman) who has seamed a minimum of 300,000 square meters (3,000,000 square feet) of geomembrane of the type specified or similar product, using the same type of seaming apparatus to be used in the current project. The Field Installation Supervisor and/or Master Seamer shall be present whenever seaming is performed.
5. All seaming, patching, other welding operations, and testing shall be performed by qualified technicians employed by the Geomembrane Installer.

C. Geomembrane Pre-Construction Meeting shall be held at the site prior to installation of the geomembrane. At a minimum, the meeting shall be attended by the Geomembrane Installer, Owner, Owner's representative (Engineer and/or CQA Firm), and the Earthwork Contractor.

1. Topics for this meeting shall include:
   a. Health and Safety
   b. Lines of authority and communication. Resolution of any project document ambiguity.
   c. Methods for documenting, reporting and distributing documents and reports.
   d. Procedures for packaging and storing archive samples.
   e. Review of time schedule for all installation and testing.
   f. Review of panel layout and numbering systems for panels and seams including details for marking on geomembrane.
   g. Procedures and responsibilities for preparation and submission of as-built panel and seam drawings.
   h. Temperature and weather limitations. Installation procedures for adverse weather conditions. Defining acceptable subgrade, geomembrane, or ambient moisture and temperature conditions for working during liner installation.
   i. Subgrade conditions, dewatering responsibilities and subgrade maintenance plan.
   j. Deployment techniques including allowable subgrade for the geomembrane.
   k. Plan for controlling expansion/contraction and wrinkling of the geomembrane.
   l. Covering of the geomembrane and cover soil placement.
   m. Measurement and payment schedules.
   n. Responsibilities of each party.
2. The meeting shall be documented by a person designated at the beginning of the meeting and minutes shall be transmitted to all parties.

1.5 DELIVERY, STORAGE AND HANDLING

A. Each roll of geomembrane delivered to the site shall be labeled by the manufacturer. The label shall be firmly affixed and shall clearly state the manufacturer's name, product identification, material thickness, roll number, roll dimensions and roll weight.

B. Geomembrane shall be protected from mud, dirt, dust, puncture, cutting or any other damaging or deleterious conditions.

C. Rolls shall be stored away from high traffic areas. Continuously and uniformly support rolls on a smooth, level prepared surface.

1.6 PROJECT CONDITIONS

A. Geomembrane should not be installed in the presence of standing water, while precipitation is occurring, during excessive winds, or when material temperatures are outside the limits specified in Section 3.03.

1.7 WARRANTY

A. The Geomembrane Installer shall guarantee the geomembrane installation against defects in the installation and workmanship for 1 year commencing with the date of final acceptance.

PART 2 - PRODUCTS

2.1 GEOMEMBRANE (VR-6)

A. New membrane designed and manufactured specifically for intended use for this Work

B. Geomembrane rolls shall be seamless, high density polyethylene (HDPE - Formulated Sheet Density ≥ 0.94g/cc) or linear low density polyethylene (LLDPE - Formulated Sheet Density ≤ 0.939 g/cc) containing no plasticizers, fillers or extenders and shall be free of holes, blisters or contaminants, and leak free verified by 100 percent n line spark or equivalent testing. The geomembrane shall be supplied as a continuous sheet with no factory seams in rolls.

C. The geomembrane will meet the property requirements as shown in Table A (GRI GM 13) or Table B (GRI GM 17)

D. The geomembrane seams shall meet the property requirements as shown in Table 2, (Attachment B) or as required by project specifications

2.2 SOURCE QUALITY CONTROL

A. Test methods and frequencies used by the manufacturer for quality control/quality assurance of the above geomembrane prior to delivery, shall be in accordance with GRI GM 13 for HDPE geomembrane or GRI GM 17 for LLDPE geomembrane, or modified as required for project specific conditions.

PART 3 - EXECUTION

3.1 SUBGRADE PREPARATION

A. The subgrade shall be prepared in accordance with the project specifications. The geomembrane subgrade shall be uniform and free of sharp or angular objects that may damage the geomembrane prior to installation of the geomembrane.

B. The Geomembrane Installer and Owner's Representative shall inspect the surface to be covered with the geomembrane on each day's operations prior to placement of geomembrane to verify suitability.

C. The Geomembrane Installer and Owner's Representative shall provide daily written acceptance for the surface to be covered by the geomembrane in that day's operations. The surface shall be maintained in a manner, during geomembrane installation, to ensure subgrade suitability.

D. All subgrade damaged by construction equipment and deemed unsuitable for geomembrane deployment shall be repaired prior to placement of the geomembrane. All repairs shall be approved by the Owner's Representative and the Geomembrane Installer. This damage, repair, and the responsibilities of the contractor and Geomembrane Installer shall be defined in the preconstruction meeting.

3.2 GEOMEMBRANE PLACEMENT

A. No geomembrane shall be deployed until the applicable certifications and quality control certificates listed in subsection 1.03 of this Section are submitted to and approved by the Owner's Representative within the timeframe specified in the Contract Documents. If the material does not meet project specifications it shall be removed from the work area.

B. The geomembrane shall be installed below grade on vertical walls and beneath the slab to the limits shown on the project drawings included in the MPCA approved VRAP.

C. No geomembrane material shall be unrolled and deployed if the material temperatures are lower than 0 degrees C (32 degrees F) unless otherwise approved by the Owner's Representative. The specified minimum temperature for material deployment may be adjusted by the Owner's Representative. Temperature limitations should be defined in the preconstruction meeting. Typically, only the quantity of geomembrane that will be anchored and seamed together in one day should be deployed.

D. No vehicular traffic shall travel on the geomembrane other than an approved low ground pressure Vehicle or equivalent.

E. Sand bags or equivalent ballast shall be used as necessary to temporarily hold the geomembrane material in position under the foreseeable and reasonably - expected wind conditions. Sand bag material shall be sufficiently close- knit to prevent soil fines from working through the bags and discharging on the geomembrane.

F. Geomembrane placement shall not be done if moisture prevents proper subgrade preparation, panel placement, or panel seaming. Moisture limitations should be defined in the preconstruction meeting.

G. Damaged panels or portions of the damaged panels which have been rejected shall be marked and their removal from the work area recorded.

H. The geomembrane shall not be allowed to "bridge over" voids or low areas in the subgrade. The geomembrane shall rest in intimate contact with the subgrade.

I. Wrinkles caused by panel placement or thermal expansion should be minimized in accordance with section 1.09 B11.

J. Considerations on Site Geometry: In general, seams shall be oriented parallel to the line of the maximum slope. In corners and odd shaped geometric locations, the total length of field seams shall be minimized. Seams shall not be located at low points in the subgrade unless geometry requires seaming at such locations and if approved by the Owner's Representative.

K. Overlapping: Any barrier joints/seams, both lateral and butt, shall be overlapped at least 12 inches and in accordance with manufacturer's recommended seam completion and testing procedures.

L. Vertical Wall Instructions:

1. Install an approved waterproofing membrane according to the manufacturer's installation instructions. This may include sheet goods, or liquid applied membranes be they roll, brush or spray.
2. While the membrane is still tacky, install the geomembrane. Use a termination bar with concrete nails at the termination of the water proofing membrane.
3. Supervised care shall be taken during back filling against the material so that it is n ot damaged or punctured. If damage occurs, patch using the techniques outlined above.

3.3 SEAMING PROCEDURES

A. Cold weather installations should follow guidelines as outlined in GRI GM9.

B. No geomembrane material shall be seamed when liner temperatures are less than 0 degrees C (32 degrees F) unless the following conditions are complied with:

1. Seaming of the geomembrane at material temperatures below 0 degrees C (32 degrees F) is allowed if the Geomembrane Installer can demonstrate to the Owner's Representative, using pre-qualification test seams, that field seams comply with the project specifications, the safety of the crew is ensured, and geomembrane material can be fabricated (i.e. pipeboots, penetrations, repairs, etc.) at sub-freezing temperatures.
2. The Geomembrane Installer shall submit to the Owner's Representative for approval, detailed procedures for seaming at low temperatures, possibly including the following:
   a. Preheating of the geomembrane
   b. The provision of a tent or other device if necessary to prevent heat losses during seaming and rapid heat losses subsequent to seaming.
   c. Number of test welds to determine appropriate seaming parameters

C. No geomembrane material shall be seamed when the sheet temperature is above 75 degrees C (170 degrees F) as measured by an infrared thermometer or surface thermocouple unless otherwise approved by the Owner's Representative. This approval will be based on recommendations by the manufacturer and on a field demonstration by the Geomembrane Installer using prequalification test seams to demonstrate that seams comply with the specification.

D. Seaming shall primarily be performed using automatic fusion welding equipment and techniques. Extrusion welding shall be used where fusion welding is not possible such as at pipe penetrations, patches, repairs and short (less than a roll width) runs of seams.

E. Fishmouths or excessive wrinkles at the seam overlaps shall be minimized and when necessary cut along the ridge of the wrinkles back into the panel so as to effect a flat overlap. The cut shall be terminated with a keyhole cut (nominal 10 mm (1/2 in) diameter hole) so as to minimize crack/tear propagation. The overlay shall subsequently be seamed. The key hole cut shall be patched with an oval or round patch of the same base geomembrane material extending a minimum of 150 mm (6 in.) beyond the cut in all directions.

3.4 PIPE AND STRUCTURE PENETRATION SEALING SYSTEM

A. Complete penetration and pipe sealing system as recommended by the manufacturer.

B. Penetrations shall be constructed from the base geomembrane material, flat stock, prefabricated boots and accessories as recommended by the manufacturer. The pre-fabricated or field fabricated assembly shall be field welded to the geomembrane as recommended by the manufacturer so as to prevent leakage. This assembly shall be tested. Where field non destructive testing can not be performed, attachments will be field spark tested by standard holiday leak detectors in accordance with ASTM 6365

C. Spark testing should be done in areas where both air pressure testing and vacuum testing are not possible.

1. Equipment for Spark testing shall be comprised of but not limited to: A hand held holiday spark tester and conductive wand that generates a high voltage.
2. The testing activities shall be performed by the Geomembrane Installer by placing an electrically conductive tape or wire beneath the seam prior to welding. A trial seam containing a non welded segment shall be subject to a calibration test to ensure that such a defect (non welded segment) will be identified under the planned machine settings and procedures. Upon completion of the weld, enable the spark tester and hold approximately 25mm (1 in) above the weld moving slowly over the entire length of the weld in accordance with ASTM 6365. If there is no spark the weld is considered to be leak free.
3. A spark indicates a hole in the seam. The faulty area shall be located, repaired and retested by the Geomembrane Installer.
4. Care should be taken if flammable gases are present in the area to be tested.

3.5 FIELD QUALITY CONTROL

A. The Owner's Representative shall be notified prior to all pre qualification and production welding and testing, or as agreed upon in the pre construction meeting.

B. Prequalification Test Seams

1. Test seams shall prepare and tested by the Geomembrane Installer to verify that seaming parameters (speed, temperature and pressure of welding equipment) are adequate.
2. Test seams shall be made by each welding technician and tested in accordance with ASTM D 4437 at the beginning of each seaming period. Test seaming shall be performed under the same conditions and with the same equipment and operator combination as production seaming. The test seam shall be approximately 3.3 meters (10 feet) long for fusion welding and 1 meter (3 feet) long for extrusion welding with the seam centered lengthwise. At a minimum, tests seams should be made by each technician 1 time every 4–6 hours; additional tests may be required with changes in environmental conditions.
3. Two 25 mm (1 in) wide specimens shall be die-cut by the Geomembrane Installer from each end of the test seam. These specimens shall be tested by the Geomembrane Installer using a field tensiometer testing both tracks for peel strength and also for shear strength. Each specimen should fail in the parent material and not in the weld, "Film Tear Bond"(F.T.D. failure). Seam separation equal to or greater than 25 percent of the track width shall be considered a failing test.
4. The minimum acceptable seam strength values to be obtained for all specimens tested as specified. Four specimens shall pass for the test seam to be a passing seam.
5. If a test seam fails, an additional test seam shall be immediately conducted. If the additional test seam fails, the seaming apparatus shall be rejected and not used for production seaming until the deficiencies are corrected and a successful test seam can be produced.
6. A sample from each test seam shall be labeled. The label shall indicate the date, geomembrane temperature, number of the seaming unit, technician performing the test seam and pass or fail description. The sample shall then be given to the Owner's Representative for archiving.

C. Field Seam Non-destructive Testing

1. All field seams shall be non-destructively tested by the Geomembrane Installer over the full seam length before the seams are covered. Each seam shall be numbered or otherwise designated. The location, date, test unit, name of tester and outcome of all non-destructive testing shall be recorded and submitted to the Owner's Representative.
2. Testing should be done as the seaming work progresses, not at the completion of all field seaming, unless agreed to in advance by the Owner's Representative. All defects found during testing shall be numbered and marked immediately after detection. All defects found should be repaired, retested and remarked to indicate acceptable completion of the repair.
3. Non-destructive testing shall be performed using vacuum box, air pressure or spark testing equipment.
4. Non-destructive tests shall be performed by experienced technicians familiar with the specified test methods. The Geomembrane Installer shall demonstrate to the Owner's Representative all test methods to verify the test procedures are valid.
5. Extrusion seams shall be vacuum box tested by the Geomembrane Installer in accordance with ASTM D 4437 and ASTM D 5641 with the following equipment and procedures:
   a. Equipment for testing extrusion seams shall be comprised of but not limited to: a vacuum box assembly consisting of a rigid housing, a transparent viewing window, a soft rubber gasket attached to the base, port hole or valve assembly and a vacuum gauge; a vacuum pump assembly equipped with a pressure controller and pipe connections; a rubber pressure/vacuum hose with fittings and connections; a plastic bucket; wide paint brush or mop; and a soapy solution.
   b. The vacuum pump shall be charged and the tank pressure adjusted to approximately 35 kPa (5 psig).

c. The Geomembrane Installer shall create a leak tight seal between the gasket and geomembrane interface by wetting a strip of geomembrane approximately 0.3m (12 in) by 1.2m (48 in) (length and width of box) with a soapy solution, placing the box over the wetted area, and then compressing the box against the geomembrane. The Geomembrane Installer shall then close the bleed valve, open the vacuum valve, maintain initial pressure of approximately 35 kPa (5 psig) for approximately 5 seconds. The geomembrane should be continuously examined through the viewing window for the presence of soap bubbles, indicating a leak. If no bubbles appear after 5 seconds, the area shall be considered leak free. The box shall be depressurized and moved over the next adjoining area with an appropriate overlap and the process repeated.

d. All areas where soap bubbles appear shall be marked, repaired and then retested.

e. At locations where seams cannot be non destructively tested, such as pipe penetrations, alternate nondestructive spark testing as specified or equivalent should be substituted.

f. All seams that are vacuum tested shall be marked with the date tested, the name of the technician performing the test and the results of the test.

6. Double Fusion seams with an enclosed channel shall be air pressure tested by the Geomembrane Installer in accordance with ASTM D 5820 and ASTM D 4437 and the following equipment and procedures:

a. Equipment for testing double fusion seams shall be comprised of but not limited to: an air pump equipped with a pressure gauge capable of generating and sustaining a pressure of 210 kPa (30 psig), mounted on a cushion to protect the geomembrane; and a manometer equipped with a sharp hollow needle or other approved pressure feed device.

b. The Testing activities shall be performed by the Geomembrane Installer. Both ends of the seam to be tested shall be sealed and a needle or other approved pressure feed device inserted into the tunnel created by the double wedge fusion weld. The air pump shall be adjusted to a pressure of 210 kPa (30 psig), and the valve closed,. Allow 2 minutes for the injected air to come to equilibrium in the channel, and sustain pressure for 5 minutes. If pressure loss does not exceed 28 kPa (4 psig) after this five minute period the seam shall be considered leak tight. Release pressure from the opposite end verifying pressure drop on needle to ensure testing of the entire seam. The needle or other approved pressure feed device shall be removed and the feed hole sealed.

c. If loss of pressure exceeds 28 kPa (4 psig) during the testing period or pressure does not stabilize, the faulty area shall be located, repaired and retested by the Geomembrane Installer.

d. Results of the pressure testing shall be recorded on the liner at the seam tested and on a pressure testing record.

D. Destructive Field Seam Testing

1. One destructive test sample per 150 linear m (500 linear ft) seam length or another predetermined length in accordance with GRI GM 14 shall be taken by the Geomembrane Installer from a location specified by the Owner's Representative. The Geomembrane Installer shall not be informed in advance of the sample location. In order to obtain test results prior to completion of geomembrane installation, samples shall be cut by the Geomembrane Installer as directed by the Owner's Representative as seaming progresses.

2. All field samples shall be marked with their sample number and seam number. The sample number, date, time, location, and seam number shall be recorded. The Geomembrane Installer shall repair all holes in the geomembrane resulting from obtaining the seam samples. All patches shall be vacuum box tested or spark tested. If a patch cannot be permanently installed over the test location the same day of sample collection, a temporary patch shall be tack welded or hot air welded over the opening until a permanent patch can be affixed.

3. The destructive sample size shall be 300 mm (12 in) wide by 1 m (36 in) long with the seam centered lengthwise. The sample shall be cut into three equal sections and distributed as follows: one section given to the Owner's Representative as an archive sample; one section given to the Owner's Representative for laboratory testing as specified in paragraph 5 below; and one section retained by the Geomembrane Installer for field testing as specified in paragraph 4 below.

4. For field testing, the Geomembrane Installer shall cut 10 identical 25 mm (1 in) wide replicate specimens from his sample. The Geomembrane Installer shall test five specimens for seam shear strength and five for peel strength. Peel tests will be performed on both inside and outside weld tracks. To be acceptable, 4 of 5 test specimens must pass the stated criteria in section 2.02 with less than 25 percent separation. If 4 of 5 specimens pass, the sample qualifies for testing by the testing laboratory if required.
5. If independent seam testing is required by the specifications it shall be conducted in accordance with ASTM 5820 or ASTM D4437 or GRI GM 6.
6. Reports of the results of examinations and testing shall be prepared and submitted to the Owner's Representative.
7. For field seams, if a laboratory test fails, that shall be considered as an indicator of the possible inadequacy of the entire seamed length corresponding to the test sample. Additional destructive test portions shall then be taken by the Geomembrane Installer at locations indicated by the Engineer; typically 3 m (10 ft) on either side of the failed sample and laboratory seem tests shall be performed. Passing tests shall be an indicator of adequate seams. Failing tests shall be an indicator of non-adequate seams and all seams represented by the destructive test location shall be repaired with a cap-strip extrusion welded to all sides of the capped area. All cap-strip seams shall be non-destructively vacuum box tested until adequacy of the seams is achieved. Cap strip seams exceeding 50 M in length (150 FT) shall be destructively tested.

E. Identification of Defects

1. Panels and seams shall be inspected by the Installer and Owner's Representative during and after panel deployment to identify all defects, including holes, blisters, undispersed raw materials and signs of contamination by foreign matter.

F. Evaluation of Defects: Each suspect location on the liner (both in geomembrane seam and non-seam areas) shall be non-destructively tested using one of the methods specified. Each location which fails non-destructive testing shall be marked, numbered, measured and posted on the daily "installation" drawings and subsequently repaired.

1. If a destructive sample fails the field or laboratory test, the Geomembrane Installer shall repair the seam between the two nearest passed locations on both sides of the failed destructive sample location.
2. Defective seams, tears or holes shall be repaired by reseaming or applying a extrusion welded cap strip.
3. Reseaming may consist of either:
   a. Removing the defective weld area and rewelding the parent material using the original welding equipment; or
   b. Reseaming by extrusion welding along the overlap at the outside seam edge left by the fusion welding process.
4. Blisters, larger holes, and contamination by foreign matter shall be repaired by patches and/or extrusion weld beads as required. Each patch shall extend a minimum of 150 mm (6 in) beyond all edges of the defects.
5. All repairs shall be measured, located and recorded.

G. Verification of Repairs on Seams: Each repair shall be non-destructively tested using either vacuum box or spark testing methods. Tests which pass the non-destructive test shall be taken as an indication of a successful repair. Failed tests shall be reseamed and retested until a passing test results. The number, date, location, technician and test outcome of each patch shall be recorded.

H. Daily Field Installation Reports: At the beginning of each day's work, the Installer shall provide the Engineer with daily reports for all work accomplished on the previous work day. Reports shall include the following:

1. Total amount and location of geomembrane placed;
2. Total length and location of seams completed, name of technicians doing seaming and welding unit numbers;
3. Drawings of the previous day's installed geomembrane showing panel numbers, seam numbers and locations of non-destructive and destructive testing;
4. Results of pre-qualification test seams;

5. Results of non-destructive testing; and
6. Results of vacuum testing of repairs.
7. Destructive test results shall be reported prior to covering of liner or within 48 hours.

3.6 DISPOSAL OF SCRAP MATERIALS

A. On completion of installation, the Geomembrane Installer shall dispose of all trash and scrap material in a location approved by the Owner, remove equipment used in connection with the work herein, and shall leave the premises in a neat acceptable manner. No scrap material shall be allowed to remain on the geomembrane surface.

ATTACHMENT A.

Table 1(a) – Seam Strength and related Properties of Thermally Bonded Smooth and Textured Linear Low Density Polyethylene (LLDPE) Geomembrane (English Units)

Geomembrane Nominal Thickness	20 mils	30 mils	40 mils	50 mils	60 mils	80 mils	100 mils	120 mils
Hot Wedge Seams [1]								
shear strength[2], lb/in.	30	45	60	75	90	120	150	180
shear elongation at break[3], %	50	50	50	50	50	50	50	50
peel strength [2], lb/in.	25	38	50	63	75	100	125	150
peel separation, %	25	25	25	25	25	25	25	25
Extrusion Fillet Seams [1]								
shear strength[2], lb/in.	30	45	60	75	90	120	150	180
shear elongation at break[3], %	50	50	50	50	50	50	50	50
peel strength [2], lb/in.	25	34	44	57	66	88	114	136
peel separation, %	25	25	25	25	25	25	25	25

Table 1(b) – Seam Strength and related Properties of Thermally Bonded Smooth and Textured Linear Low Density Polyethylene (LLDPE) Geomembrane (S.I. Units)

Geomembrane Nominal Thickness	0.50 mm	0.75 mm	1.0 mm	1.25 mm	1.5 mm	2.0 mm	2.5 mm	3.0 mm
Hot Wedge Seams [1]								
shear strength[2], N/25mm	131	197	263	328	394	525	657	788
shear elongation at break[3], %	50	50	50	50	50	50	50	50
peel strength [2], N/25mm	109	166	219	276	328	438	547	657
peel separation, %	25	25	25	25	25	25	25	25
Extrusion Fillet Seams [1]								
shear strength[2], N/25mm	131	197	263	328	394	525	657	788
shear elongation at break[3], %	50	50	50	50	50	50	50	50
peel strength [2], N/25mm	95	150	190	250	290	385	500	595

peel separation, %	25	25	25	25	25	25	25	25

Notes for Tables 1(a) and 1(b):

1. Also for hot air and ultrasonic seaming methods
2. Value listed for shear and peel strength are for 4 out of 5 test specimens; the 5th specimen can be low as 80% of the listed values
3. Elongation measurements should be omitted for field testing

Table 2(a) – Seam Strength and related Properties of Thermally Bonded Smooth and Textured linear High Density Polyethylene (HDPE) Geomembrane (English Units)

Geomembrane Nominal Thickness	30 mils	40 mils	50 mils	60 mils	80 mils	100 mils	120 mils
Hot Wedge Seams [1]							
shear strength[2], lb/in.	57	80	100	120	160	200	240
shear elongation at break[3], %	50	50	50	50	50	50	50
peel strength [2], lb/in.	45	60	76	91	121	151	181
peel separation, %	25	25	25	25	25	25	25
Extrusion Fillet Seams [1]							
shear strength[2], lb/in.	57	80	100	120	160	200	240
shear elongation at break[3], %	50	50	50	50	50	50	50
peel strength [2], lb/in.	39	52	65	78	104	130	156
peel separation, %	25	25	25	25	25	25	25

Table 2(b) – Seam Strength and related Properties of Thermally Bonded Smooth and Textured High Density Polyethylene (HDPE) Geomembrane (S.I. Units)

Geomembrane Nominal Thickness	0.75 mm	1.0 mm	1.25 mm	1.5 mm	2.0 mm	2.5 mm	3.0 mm
Hot Wedge Seams [1]							
shear strength[2], N/25mm	250	350	438	525	701	876	1050
shear elongation at break[3], %	50	50	50	50	50	50	50
peel strength [2], N/25mm	197	263	333	398	530	661	793
peel separation, %	25	25	25	25	25	25	25
Extrusion Fillet Seams [1]							
shear strength[2], N/25mm	250	350	438	525	701	876	1050
shear elongation at break[3], %	50	50	50	50	50	50	50
peel strength [2], N/25mm	170	225	285	340	455	570	680
peel separation, %	25	25	25	25	25	25	25

Notes for Tables 2(a) and 2(b):

1. Also for hot air and ultrasonic seaming methods
2. Value listed for shear and peel strength are for 4 out of 5 test specimens; the 5th specimen can be low as 80% of the listed values
3. Elongation measurements should be omitted for field testing

SECTION 334600
FOUNDATION DRAINAGE SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Sub-soil drainage system.
   2. Coordinate Work of this Section with Voluntary Response Action Plan and the Environmental Contingency Plan for the Property as approved by the Minnesota Pollution Control Agency. See Section 334600.10 by Owner's consultant for requirements. Refer to environmental information referenced in Section 003100.

B. Reference Standards:
   1. ASTM: American Society for Testing and Materials.

C. Related Sections:
   1. Section 310000 – Earthwork
   2. Section 312333 – Trenching and Backfilling
   3. Section 334613 - Prefabricated Drainage Composite (Geomat).
   4. DIVISION 22 - PLUMBING.
   5. Section 003100 – Available Project Information

PART 2 PRODUCTS

2.1 MATERIALS

A. Foundation Drainpipe (PVC): Poly-Vinyl-Chloride PVC perforated SDR 26 pipe in accordance with the requirements of ASTM D2241. Pipe fittings to meet the requirements of ASTM D3212. Provide 4-inch diameter pipe unless designated otherwise on the drawings. Provide factory perforated holes as noted below.
   1. Perforations to be 0.2 to 0.4-inches in diameter.
   2. 4-inch diameter - 2 rows of perforations 3-inches on center.
   3. 6-inch diameter - 4 rows of perforations 3-inches on center.

B. Fine filter aggregate: In accordance with ASTM C144 Aggregate for Masonry Mortar or must meet the criteria of ASTM section C33 for Fine Aggregate (Concrete Sand).

C. Coarse filter aggregate: In accordance with ASTM C33 Concrete aggregates for a size number 6, (3/4-inch to 3/8-inch material).

D. Type 1 Geotextile (Filter Fabric) in conformance with the following requirements:
   1. A nonwoven polypropylene or polyester geotextile fabric manufactured for use as a soil fabric.
   2. Permeability: The geotextile shall have a minimum flow rate of 170 gpm/min/sf per ASTM D-4491. MIRAFI Co. Products 140NL and 140N meet the above criteria.

E. Cleanouts: Provide Zurn Inc. Model Z-1400-G Galvanized Cast Iron adjustable cleanout or approved equal.
   1. Match the size of the riser to horizontal line to be serviced up to an 8-inch diameter. Pipes greater than 8-inchdiameter may use an 8-inch cleanout.
   2. If the drawings call for a "frost proof" cleanout, provide a large enough cleanout and riser pipe so that an internal PVC riser and threaded plug can be used.

F. TEE for venting riser pipe: 4-inch by 4-inch by 6-inch expanding tee schedule 80 PVC tee.

PART 3 EXECUTION

3.1 INSTALLATION (PVC) SYSTEM

A. Excavate to provide a minimum 4-inch depth under the drainpipe and 8-inches on each side of the drainpipe for bedding material. Hydraulically connect the "drainage zone" material to the drain pipe backfill.

B. Place the geotextile on the undisturbed earth, and then place a 4-inch minimum thickness of coarse filter aggregate (CFA) as fill to obtain the invert elevation. Compact this material with a vibratory compactor. Place the drainpipe in the coarse filter aggregate material, and then place an additional 6-inch minimum of CFA over the drainpipe and 12-inch minimum of CFA along sides of drainpipe. Wrap the geotextile down over the CFA with the edges overlapping a minimum of by 12-inches.

C. Backfill with a minimum of 6-inch of fine filter aggregate to cover the top of the geotextile. Continuation of the backfill above the fine filter aggregate shall follow the "drainage zone" criteria of Earthwork Section.

D. A 4-inch by 4-inch by 6-inch schedule 80 PVC expanding tee shall be installed in the foundation drainage pipe at locations where venting system riser piping will be installed.

3.2 TESTS

A. Provide mechanical analysis (AASHO T-27) of filter aggregates. Mechanical analysis to be performed by an independent testing laboratory. If the material used is purchased as a product from a quarry, submit information on gradation and quality control.

END OF SECTION

SECTION 334600.10
FOUNDATION VENTING SYSTEM

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Venting system riser piping and venting stack. The sub-soil venting system consists of the foundation drainage system included in Section 334600. Refer to environmental information referenced in Section 003100.
   2. Provide Work of this Section in accordance with the Voluntary Response Action Plan and the Environmental Contingency Plan for the Property as approved by the Minnesota Pollution Control Agency.

B. Reference Standards:
   1. ASTM: American Society for Testing and Materials.
   2. ASTM D1785-88 Standard Specifications for Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, and 80, Tables 1 and 2, Annual Book of ASTM Standards (December 1988).

C. Related Sections:
   1. Section 003100 – Available Project Information
   2. Section 310000 – Earthwork
   3. Section 312333 – Trenching and Backfilling
   4. Section 334613 - Prefabricated Drainage Composite (Geomat).
   5. Section 334600.00 – Foundation Drainage System.
   6. DIVISION 22 - PLUMBING.

PART 2 PRODUCTS

2.1 MATERIALS

A. Riser piping: Refers to all PVC pipe or approved equal that is NOT slotted. PVC riser pipe and couplings shall be new schedule 80 PVC 6-inch diameter pipe size and shall conform to Minnesota Department of Health (MDH) Water Well Construction Code, Plastic Well Casing, Sections 4725.2550 through 4725.2650.

B. Exhaust stack: Shall consist of a 6-inch schedule 80 PVC 90 degree elbow connected to the lateral riser pipe located immediately outside the west building wall.

C. Shut-off valve: butterfly valve, 6-inch PVC Butterfly Valve, Standard Valve Design with lever handle, Viton Seats/O-ring material Part # 723311-060 by Spears Manufacturing Co. or equal.

D. Rotary Turbine Ventilator: Shall be 6-inches in diameter and consist of 26-28 gauge rigid galvanized steel.

PART 3 EXECUTION

3.1 INSTALLATION (PVC) SYSTEM

A. The 6-inch diameter schedule 80 PVC riser pipes shall connect to the 4-inch by 4-inch by 6-inch schedule 80 PVC expanding TEE installed in the foundation drainage system. The 6-inch diameter riser pipes extend vertically to the ceiling of the second floor. At the ceiling of the second floor, each riser pipe shall be directed laterally to the west side of the building where the riser pipe shall be vented to the atmosphere through a penetration in the building wall. The lateral runs of riser piping shall slope such that condensation drains towards the foundation drainage system.

B. A 6-inch diameter shut-off valve shall be installed on the riser pipe and accessible from the basement of the building.

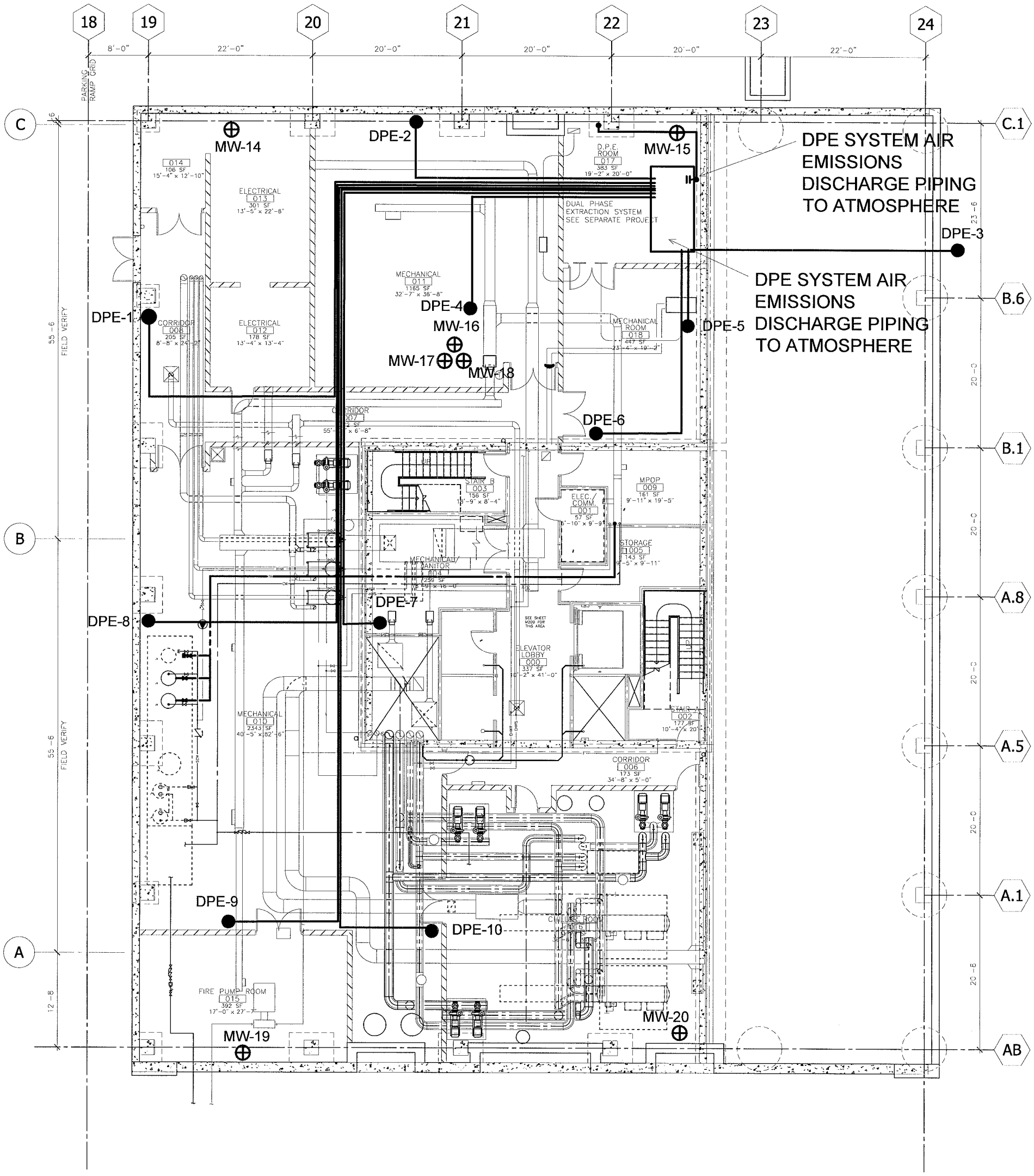
C. The vent stack shall consist of section of riser pipe connecting to the 90 degree elbow and extending vertically, approximately, one foot in length above the elbow. The riser pipe exhaust stack outlet shall be located at least 10 feet from any building openings or any public or private access area, and be configured to accommodate the future installation of an in-line fan for "active" service mode.

D. To complete the riser pipe exhaust stack, a 6-inch rotary turbine ventilator shall be installed at the top of the vertical section of pipe.

3.2 TESTS

A. Field Pressure Testing: Pressure testing shall be conducted after completion of the riser vent piping to ensure there are no leaks in the section of riser piping from the slab to the venting stack. Testing shall be completed in accordance with applicable building code. Pressure testing data shall be provided to Owner's Consultant upon completion of the methane mitigation system.

END OF SECTION



1 BASEMENT FLOOR PLAN
1/8" = 1'-0"

BASEDRAWINGS PROVIDED BY HGA
F:/Projects/CRC/CAD/basement planview/20070829 DPE sys-draft.dwg

NOTES:

1. DPE system piping shall be installed above the basement slab from the DPE wellheads to the basement ceiling.
2. At the basement ceiling the horizontal DPE system piping from each of the wells shall slope down towards the system location so that condensation drains towards the DPE system location.
3. The DPE system piping from the DPE wellheads shall consist of 2-inch SCH 80 PVC pipe.
4. The DPE piping shall be installed and pressure tested as described in the technical specifications and proposed drawings.
5. The DPE wells and horizontal piping shall be installed as shown on the proposed drawings.
6. The DPE system equipment and manifold shall be installed as shown on the proposed drawings.
7. Groundwater generated from the DPE system shall be discharged to the sanitary sewer. A groundwater treatment system may be required based on system start-up sampling
8. DPE exhaulst emissions shall be discharged to the atmosphere through riser piping that exits the building through the proposed building's west wall of the second level ceiling. Ail emissions treatment may be required based on system start-up analytical results.

LEGEND

N

NOT TO SCALE

- ● DPE-1 — Proposed DPE Well Location
- ⊕ MW-14 — Proposed Monitoring Well Location
- ——— Proposed DPE Piping Location

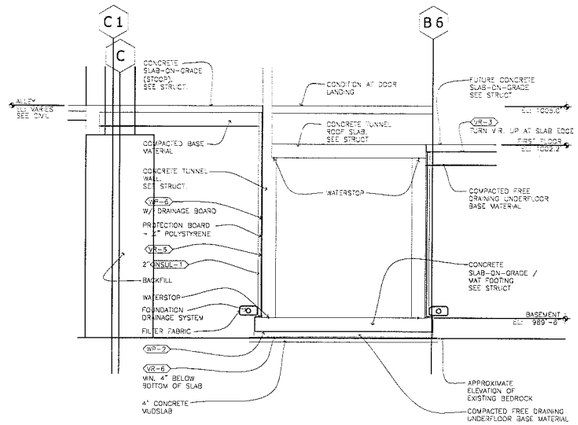
Rev	Date	By	Description
1	7/26/07	JS	design mods.
2	8/06/07	JS	design mods.
3	8/30/07	JS	design mods.

LANDMARK ENVIRONMENTAL, LLC
2042 West 98th Street
Bloomington, MN 55431

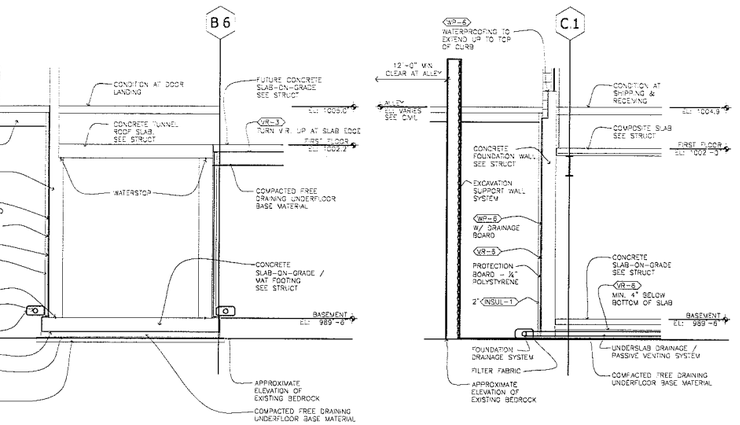
DUAL PHASE EXTRACTION SYSTEM LAYOUT

219 AND 223 FIRST AVENUE S.W.
ROCHESTER, MINNESOTA

Landmark Project Number: CRC		
Drawn: JDS	Checked:	Designed: JDS
Scale: NONE	Date: 8/29/2007	Revision: 3
Drawing Number:	Sheet 1 Of 1 Sheets	



10 FOUNDATION DETAIL
1/4" = 1'-0"

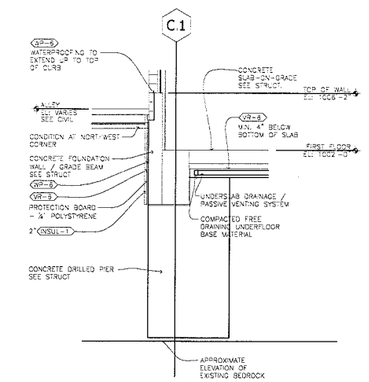


7 FOUNDATION DETAIL
1/4" = 1'-0"

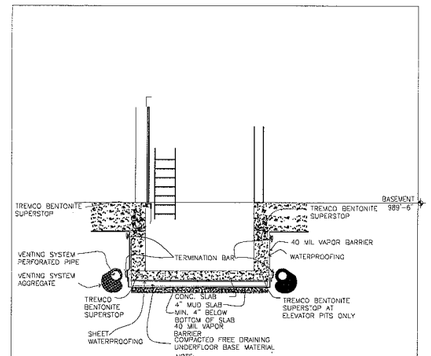
1. PASSIVE VENTING SYSTEM AND VAPOR BARRIER SYSTEM ARE PART OF THE ENVIRONMENTAL REMEDIATION AND ARE DESIGNED BY LANDMARK ENVIRONMENTAL SERVICES.

2. FOUNDATION AND UNDERFLOOR SLAB DRAINAGE SYSTEM SERVES ALSO TO COLLECT SOIL GAS AND CONNECTS TO PASSIVE VENTING SYSTEM REFER TO PLUMBING DRAWINGS FOR ROUTING

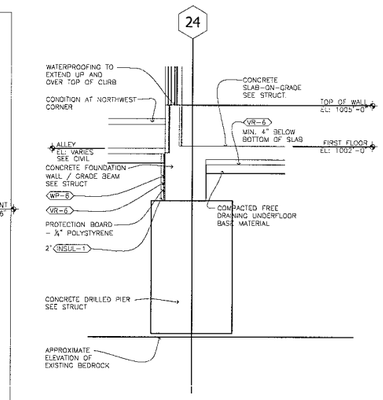
4 GENERAL NOTES
1/4" = 1'-0"



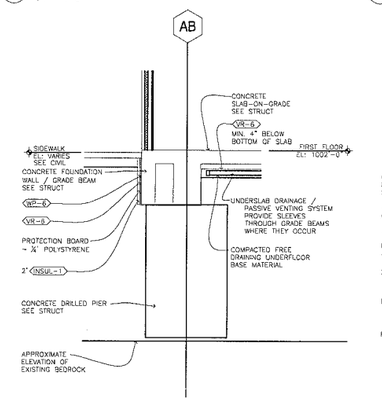
1 FOUNDATION DETAIL
1/4" = 1'-0"



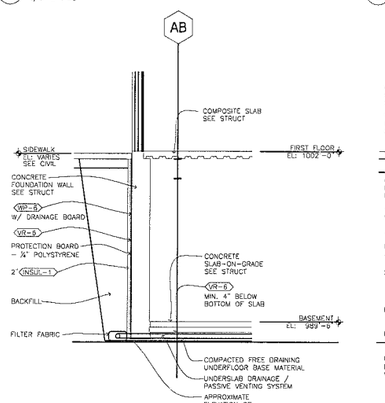
13 FOUNDATION DETAIL
1/4" = 1'-0"



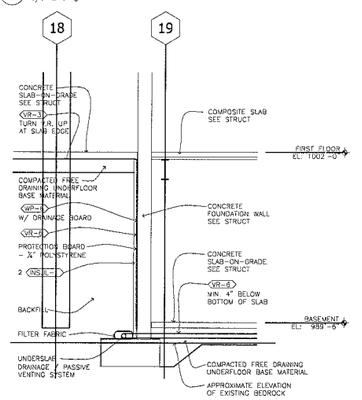
11 FOUNDATION DETAIL AT NORTH WALL OF TOWER
1/4" = 1'-0"



8 FOUNDATION DETAIL
1/4" = 1'-0"

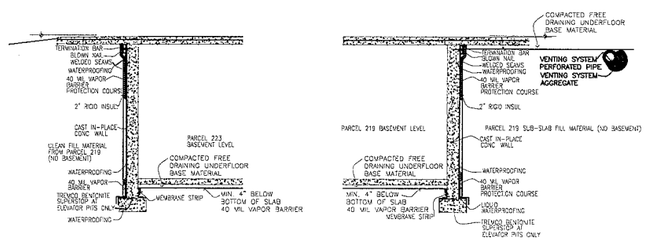


5 FOUNDATION DETAIL
1/4" = 1'-0"



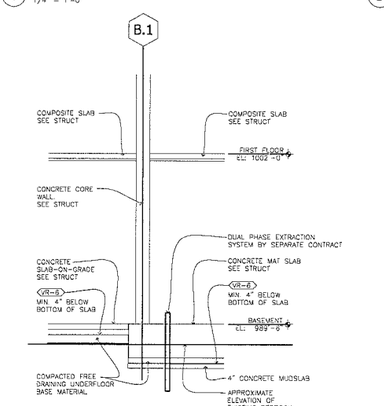
2 FOUNDATION DETAIL
1/4" = 1'-0"

THESE DETAILS PROVIDED BY LANDMARK ENVIRONMENTAL SERVICES

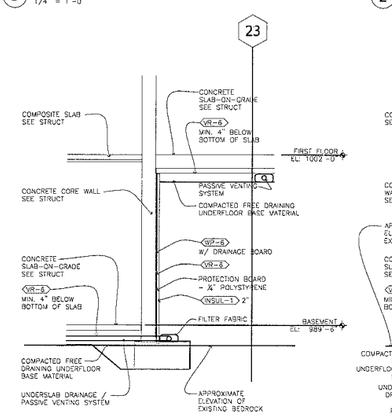


14 FOUNDATION DETAIL
1/4" = 1'-0"

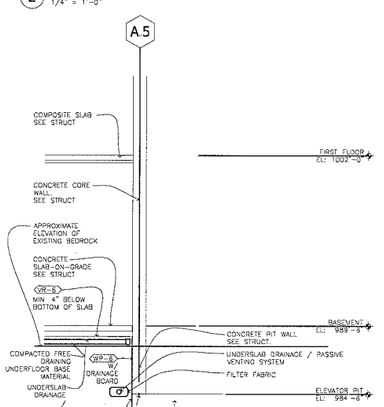
12 FOUNDATION DETAIL
1/4" = 1'-0"



9 FOUNDATION DETAIL
1/4" = 1'-0"



6 FOUNDATION DETAIL
1/4" = 1'-0"



3 FOUNDATION DETAIL
1/4" = 1'-0"

NOTE: Detail drawings provided by HGA; however, venting and vapor barrier systems shown in the details were designed by Landmark Environmental LLC.

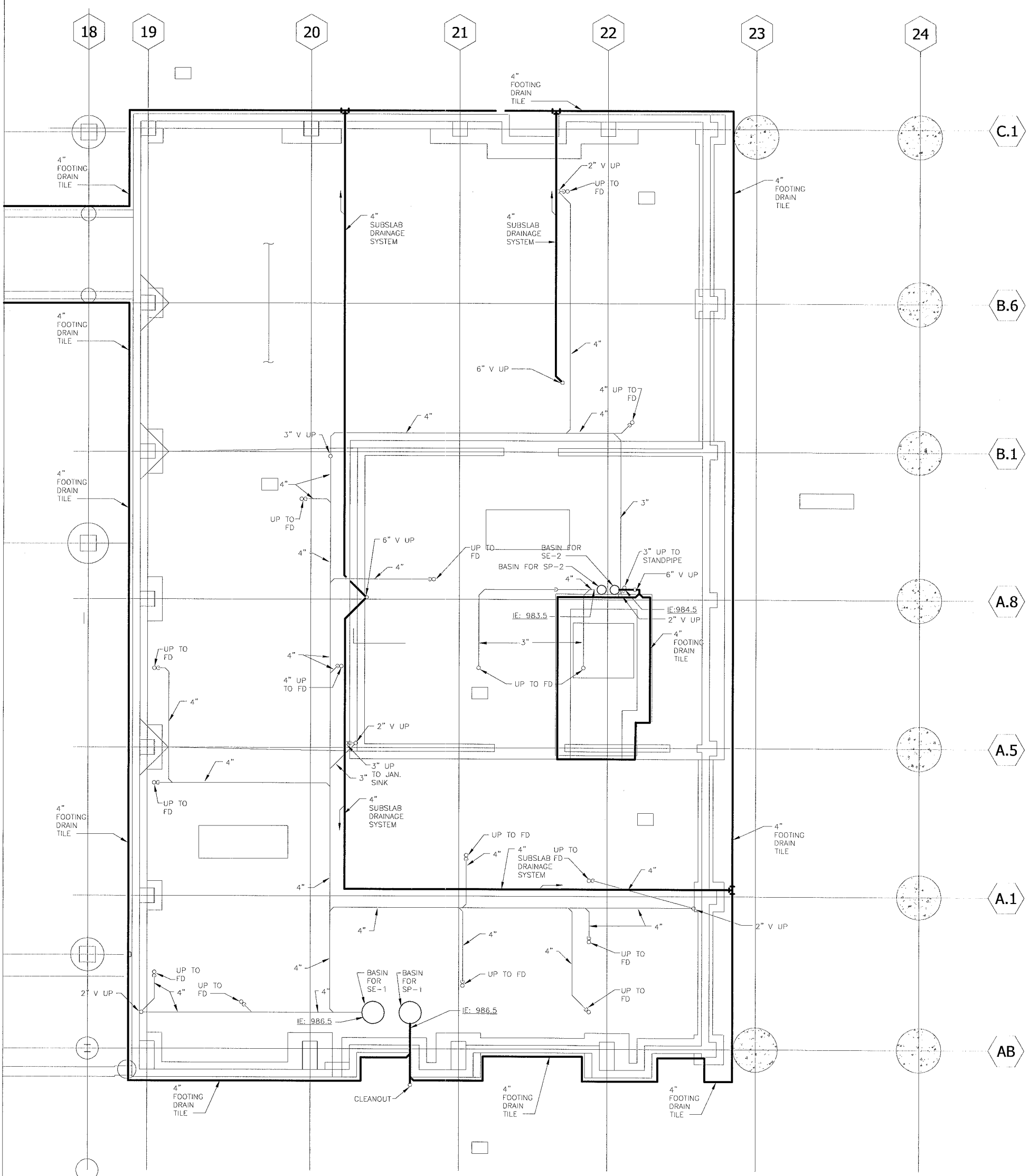
Rev	Date	By	Description
.	.	.	.

LANDMARK
ENVIRONMENTAL, LLC
2042 W 98th Street
Bloomington, MN 55431

VAPOR BARRIER AND PASSIVE VENTING SYSTEM DETAILS

219 AND 223 FIRST AVENUE S W
ROCHESTER, MINNESOTA

Landmark Project Number: CRC			
Drawn: JDS	Checked: JDS	Designed: JDS	
Scale: NONE	Date: 9/18/07	Revision:	
Drawing Number:	Sheet Of 1	Sheets 1	



NOTE: Drawing provided by HGA; however, the venting system was designed by Landmark Environmental LLC.

LEGEND

——— Venting System

N ➡ NOT TO SCALE

Rev	Date	By	Description

LANDMARK ENVIRONMENTAL, LLC
2042 W. 98th Street
Bloomington, MN 55431

BASEMENT LEVEL SUB-SLAB - FOUNDATION VENTING AND DRAINAGE SYSTEM

219 AND 223 FIRST AVENUE S.W.
ROCHESTER, MINNESOTA

Landmark Project Number: CRC			
Drawn: JDS	Checked: JDS	Designed: JDS	
Scale: NONE	Date: 9-18-07	Revision:	
Drawing Number:		Sheet 1 Of	Sheets 4

DPE SYSTEM AIR EMISSIONS DISCHARGE PIPING TO ATMOSPHERE

DPE SYSTEM GROUNDWATER DISCHARGE PIPING TO SANITARY SEWER

19 20 21 22 23 24 C.1 B.6 B.1 A.8 A.5 A.1 AB

2 PSI GAS UP
SPRINKLER ZONE BOUNDARY
9 TYP MW-14
DPE-2
MW-15
014
ELECTRICAL 013
SSR
2" 2 PSI GAS
FD-A
2" V DN
2"
D.P.E. ROOM 017
DUAL PHASE EXTRACTION SYSTEM SEE SEPARATE DOCUMENTS
5
6
PROVIDE UPRIGHT SPRINKLER HEADS IN BASEMENT LEVEL TO MEET COVERAGE REQUIREMENTS
MECHANICAL 011
4" SUBSLAB DRAINAGE/ VENTING SYSTEM
DPE-3
DPE-1 CORRIDOR 008
ELECTRICAL 012
DPE-4
BUTTERFLY VALVE
MW-16 9 TYP
6" DN TO SUBSLAB VENTING SYSTEM
MW-17
MW-18
MECHANICAL ROOM 018
9 TYP. DPE-5
FROM DPE SYSTEM (10 GPM PEAK FLOW)
UNEXCAVATED
SLEEVE VENT SYSTEM PIPING THROUGH GRADE BEAM (5 TYP.)
3" V DN
3"
CORRIDOR 007
FE-3
6"
3" DPE-6
FD-A CO
2" TO FD
4" VENT STACK
6" WASTE STACK
4" UP TO WC'S
6" V UP BUTTERFLY VALVE
2" TO FD
STAIR B 003
UP
6" V UP
6" F.P STAND PIPE
2" UP TO LAV'S
MPOP 009
ELEC./ COMM. 001
4" STUBBED FOR FUTURE
STORAGE 005
4"
STANDPIPE
i-i/4" SEWAGE EJECTOR DISCHARGE INTO SAFEWASTE STANDPIPE
BUTTERFLY VALVE
6" V DN
2" DRAIN RISER
6" COMBINATION STANDPIPE AND SPRINKLER RISER
ELEVATOR SUMP SE-2
2" VENT
9 P700
BUTTERFLY 6" VALVE
5 FD-A
MECHANICAL/ JANITOR 004
SP-2
3/4" TO BOILERS MAKE-UP WATER
DPE-8
9 TYP
2 P700
BOILERS
DPE-7
i-i/4"
1-1/4" 2 PSI GAS UP
3/4" HW
1" CW
3/4" HOSE-BIBB
ELEVATOR LOBBY 000
2" SPRINKLER DRAIN DISCHARGE TO MOP BASIN
STAIR A 002
MECHANICAL 010
F-5
1-1/4" 2 PSI GAS (1000 MBH EA. 3 TYP.)
THERMAL EXPANSION ABSORBER TEA-1
1-1/2" V
8" RW UP
CORRIDOR 006
3/4" CW TO CHILLERS MAKE-UP WATER
BSSMT SPRINKLER ZONE ASSEMBLY
JP CONTROLLER
FP CONTROLLER
DPE-9
DPE-10
CHILLER ROOM 016
TUBE PULL
2" V DN
FIRE PUMP ROOM 015
11 P700
SEWAGE EJECTOR SE-i
SUMP PUMP SP-1
MW-19 9 TYP
MW-20
I.E. = 994.0
FIRE PUMP FP-i
JP-i
7 P700
8 P700
1-i/4"
I.E. = 999.0
10" STORM SEWER
6" SANITARY SEWER

NOTE: Drawing provided by HGA; however, the venting and DPE systems were designed by Landmark Environmental, LLC.

LEGEND

Venting and DPE System Piping

N NOT TO SCALE

Rev	Date	By	Description

LANDMARK ENVIRONMENTAL, LLC
2042 W. 98th Street
Bloomington, MN 55431

BASEMENT LEVEL - FOUNDATION VENTING AND DRAINAGE SYSTEM AND DPE SYSTEM EFFLUENT PIPING

219 AND 223 FIRST AVENUE S.W.
ROCHESTER, MINNESOTA

Landmark Project Number: CRC
Drawn: JDS | Checked: JDS | Designed: JDS
Scale: NONE | Date: 9-18-07 | Revision:
Drawing Number: | Sheet 2 Of Sheets 4

DPE SYSTEM AIR EMISSIONS DISCHARGE PIPING TO ATMOSPHERE

18 19 20 21 22 23 24

C.1 B.6 B.1 A.8 A.5 A.1 AB

ADF-2
SHIPPING & RECEIVING 119
ORW
FE-3
FIRE COMMAND CENTER 117
SSF-1
CORRIDOR
CW
STAIR B 103
WOMEN'S TOILET 105
ELEC./ COMM. 101
6" V UP & DN
MECH./ JANITOR 104
MEN'S TOILET 106
ELEVATOR EL. 1
ELEVATOR EL. 2
ELEVATOR LOBBY 100
ELEVATOR EL. 3
ELEVATOR EL. 4
STAIR A 102
CORRIDOR 107
FEC-3
PNLG-1
LEASE SPACE 111
COMMON AREA 108
LEASE SPACE 109
PNLC-1
VESTIBULE 112
VESTIBULE 110

NOTE: Drawing provided by HGA; however, the venting and DPE systems were designed by Landmark Environmental, LLC.

LEGEND

O Venting and DPE System Piping

N NOT TO SCALE

Rev	Date	By	Description

LANDMARK ENVIRONMENTAL, LLC
2042 W. 98th Street
Bloomington, MN 55431

FIRST FLOOR - FOUNDATION VENTING AND DRAINAGE SYSTEM AND DPE SYSTEM EFFLUENT PIPING

219 AND 223 FIRST AVENUE S.W.
ROCHESTER, MINNESOTA

Landmark Project Number: CRC
Drawn: JDS | Checked: JDS | Designed: JDS
Scale: NONE | Date: 9-18-07 | Revision:
Drawing Number: | Sheet 3 Of Sheets 4

DPE SYSTEM AIR EMISSIONS EXHAUST STACK

6" V UP TO TURBINE VENT

6" V UP TO TURBINE VENT

6" V UP TO TURBINE VENT

DPE SYSTEM AIR EMISSIONS DISCHARGE PIPING TO ATMOSPHERE

LEASE SPACE 209

18 19 20 21 22 23 24

C.1 B.6 B.1 A.8 A.5 A.1 AB

STAIR B 203 DN UP

WOMEN'S TOILET 205

ELEC./ COMM. 201

MECH./ JANITOR 204

MEN'S TOILET 206

ELEVATOR EL. 1

ELEVATOR EL. 2

ELEVATOR LOBBY 205

ELEVATOR EL. 3

ELEVATOR EL. 4

STAIR A 202 UP DN

CORRIDOR 208

FEC-3

CORRIDOR 207

ORW RW

BUILDING SKYWAY 210

SKYWAY TO 201 BUILDING 212

RW

ORW

FEC-3

FEC-3

NOTE: Drawing provided by HGA; however, the venting and DPE systems were designed by Landmark Environmental, LLC.

LEGEND

N

NOT TO SCALE

Venting and DPE System Piping

Rev	Date	By	Description

LANDMARK ENVIRONMENTAL, LLC
2042 W. 98th Street
Bloomington, MN 55431

SECOND FLOOR - FOUNDATION VENTING AND DRAINAGE SYSTEM AND DPE SYSTEM EFFLUENT PIPING

219 AND 223 FIRST AVENUE S.W.
ROCHESTER, MINNESOTA

Landmark Project Number: CRC			
Drawn: JDS	Checked: JDS	Designed: JDS	
Scale: NONE	Date: 9-18-07	Revision:	
Drawing Number:		Sheet 4 Of	Sheets 4

Venting System Operation And Maintenance Plan

This Venting System Operation and Maintenance Plan (O&M Plan) describes the monitoring that will be conducted for remedial verification and long-term monitoring after the dual phase extraction system is decommissioned and Response Actions (RAs) are completed at 219 and 223 First Avenue S.W., Rochester, Minnesota ("the Property"). The purpose of this Operation and Maintenance Plan (O&M Plan) is to address the following: 1.) the air monitoring procedures; 2.) the performance of the passive venting system; and 3.) the criteria for upgrading the passive system to an active system. The procedures outlined in this O&M Plan will be implemented as part of the Voluntary Response Action Plan ("VRAP") previously submitted to the MPCA for review and approval under separate cover.

Air monitoring of the venting system will be conducted quarterly by Landmark Environmental (Landmark) for a minimum of two years following completion of the RAs. Quarterly air monitoring reports will be submitted to the MPCA on an annual basis following completion of the RAs. Air monitoring locations will include the 4 indoor suction points, which are located in the basement level of the building and designated SP-1 through SP-4, the 3 exhaust points designated R-1 through R-3 and located outside the west side of the building on the second level.

Air monitoring of organic vapors will be conducted during the long-term monitoring period. The air monitoring will involve the use of field equipment that provides a direct readout of the results. The sampling equipment to be used to measure organic vapors will be a PID (with 11.7 eV bulb). Vacuum and differential pressure measurements will be made with various equipment including magnehelic gauges, electronic digital manometer, and a digital thermo-anemometer. Vacuum and differential pressure data will be collected to determine the quantity and direction of air flow through the venting system riser piping. The air flow through the riser piping will also be evaluated quantitatively by documenting whether or not the rotary wind turbines on the venting system exhaust stacks are moving air through them. Weather data will also be collected during each monitoring event including; temperature, barometric pressure, dew point, wind speed and wind direction. Monitoring procedures are described in the indoor air monitoring standard operating procedures ("SOPs") included in Attachment 1.

Quantitative and qualitative data collected will be evaluated to determine the effectiveness of the rotary wind turbines to maintain airflow from the subsurface to the atmosphere. Quantitatively, the effectiveness of the rotary wind turbines on the passive venting system can be determined just by verifying if turbine is spinning or not. If the turbine is spinning, air is being evacuated from the subsurface of the building through the exhaust stack. If the turbine is not spinning, the monitoring data will have to be evaluated to determine if the passive venting system is operating effectively or not. Vacuum readings and differential pressure may be used to determine flow rates and direction if there is enough air flow through the pipes to obtain accurate field readings. Another way to verify that the passive venting system is working is to detect organic vapors at the venting system exhaust stacks. In-line fans will be installed in the venting system riser pipes for "active" service mode if evaluation of the quantitative and qualitative data collected indicates the passive venting system with the rotary wind turbines is not working.

Attachment 1

Monitoring Locations

SOPs For Venting System Air Monitoring

Monitoring post-construction of the interior office space of the Building will include sampling for airborne concentrations of methane, hydrogen sulfide, organic vapors, carbon monoxide and oxygen. The results of the sampling will be used to measure the effectiveness of the sub-slab depressurization system.

The depressurization system monitoring will be conducted by Landmark after the post construction/remodeling is completed. The sampling equipment used to measure methane will be an Industrial Scientific MDU420 dual range methane monitor. Carbon monoxide, hydrogen sulfide, and oxygen levels will be measured using a Rae Systems MultiRae Plus four gas monitor. The sampling equipment to be used to measure organic vapors will be a PID (with 11.7 eV bulb). Vacuum measurements will be made with various equipment including; magnehelic gauges, electronic digital manometer, and a digital thermo-anemometer. Weather data will be collected at the Property and may be supplemented with local media information. During each monitoring event the temperature, barometric pressure, dew points, wind speed and wind direction will be collected.

The air monitoring will involve the use of field equipment that provides a direct readout of the results. The results from the air monitoring will be used for direct sampling activities and to evaluating potential exposure or unsafe situations during construction and RA implementation activities.

The main objectives for air monitoring are to:

1. Identify and quantify airborne contaminants;
2. Evaluate the potential risk posed by the presence of airborne contaminants;
3. Track changes in airborne contaminants that occur during seasonal fluctuations;

The frequency of monitoring during the post construction/remodeling will be quarterly from the third quarter of 2007 through the second quarter of 2008. At a minimum, monitoring will be performed during the fall, winter, spring and summer months. Unscheduled monitoring will be conducted if conditions change at the Property or if AAA request monitoring at specific times.

The monitoring activities will be conducted in accordance with Landmark's SOPs. The SOPs were developed based on Section 8.0 (Monitoring and Sampling) of the MPCA's Risk Based Site Characterization and Sampling Guidance (Internal Review Draft, August 29, 1997).

Methane Monitoring

The following procedure will be used for methane gas monitoring with the Industrial Scientific MDU420 dual range methane monitor:

1. The calibration of this monitor will be checked in the field to determine if recalibration is required. This monitor utilizes an automatic calibration system that has the ability to detect when calibration is necessary. If necessary, the monitor will be calibrated in the field per the manufacturer's instructions.

2. This monitor provides direct readings of methane and will be used to collect data in locations discussed in the VRAP.

Oxygen, Hydrogen Sulfide, and Carbon Monoxide Monitoring

The following procedure will be used for oxygen, hydrogen sulfide, and carbon monoxide gas monitoring with the Rae Systems MultiRae Plus four gas monitor:

1. This monitor will be calibrated no less than every 30 days, or if it does not pass a fresh air reading, or if it does not pass a field verification. The sensors in this monitor will be calibrated per the manufacturer's instructions which consist of a two step process as using fresh air and span gas.

2. This monitor provides direct readings of oxygen, hydrogen sulfide, and carbon monoxide and will be used to collect data in locations discussed in the VRAP.

Organic Vapor Monitoring

The following procedure will be used for organic vapor monitoring with a PID (with 11.7 eV bulb):

1. This monitor will be calibrated in the field daily per the manufacturer's instructions which consist of a two step process as using fresh air and span gas.

2. This monitor provides direct readings of organic vapors and will be used to collect data in locations discussed in the VRAP.

Attachment 4

FAX TRANSMITTAL COVER SHEET

Date	*08/23/2007*
To	JASON KRAMSTAD
Company	
Phone	
Fax #	952-887-9605
From	LYNN
Company	BAROTT DRILLING SERVICES, INC.
Phone	651-484-0198
Fax #	651-484-0465
# OF PAGES	17

Message

JASON : HERE ARE THE WELL LOGS FOR THE CITY OF ROCHESTER, CALL ME WITH ANY QUESTIONS. THANKS LYNN 651-484-0198

Recover Well

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No. H258121
Minnesota Unique No. or W-series No. 735213

WELL OR BORING LOCATION

County Name: OLMSTED

Township Name	Township No.	Range No.	Section No.	Fraction		Date Sealed	Date Well or Boring Constructed
ROCHESTER	106	14	2	NW 1/4 NE	1/4 NW	1/4 8/03/07	11/10/05

GPS LOCATION: Latitude Degrees Minutes Seconds; Longitude Degrees Minutes Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location
219 1ST AVENUE SW ROCHESTER 55904

Show exact location of well in section grid with "X"

Sketch map of well location. Showing property lines, roads and buildings.

PROPERTY OWNER'S NAME
CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above.
201 4TH STREET

ROCHESTER MN 55904

WELL OWNER'S NAME
CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above.
201 4TH STREET SE

ROCHESTER MN 55904

Depth Before Sealing _____ ft.

AQUIFER(S): ☐ Single Aquifer ☐ Multiaquifer

WELL/BORING: ☐ Water Supply Well ☐ Monit Well ☐ Env.Boring Hole Other

STATIC WATER LEVEL: ☐ Measured ☐ Estimated _____ ft ☐ below ☐ above land surface

CASING TYPE(S): ☒ Steel ☐ Plastic ☐ Tile ☐ Other _____

WELLHEAD COMPLETION

OUTSIDE:			
	Well House		Basement Offset
	Pitless Adp		Well Pit
	Well Pit		Buried
	Buried		

CASING

Diameter	Depth		Set in oversize hole?	Annular space initially grouted?
4 in.	from 12	to _____ ft.	☐ Yes ☐ No	☐ Yes ☐ No ☐ Unknown
_____ in.	from _____	to _____ ft.	☐ Yes ☐ No	☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐

Screen from _____ to _____ ft. Open Hole from _____ to _____ ft.

OBSTRUCTIONS: ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction

Type of Obstructions (Describe) _____

Obstructions removed? Yes No Describe _____

PUMP

Type _____

☐ Removed ☐ Not Present ☐ Other _____

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS OR CASING AND BORE HOLE

☒ No Annular Space Exists ☐ Annular Space grouted with tremie pipe ☐ Casing Perforation/Removal

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

Type of perforator _____

☐ Other _____

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Clay	Brown	med	0	15
Limestone	Brown	med	15	17
Limestone	Brown	Hard	17	30

Use a second sheet, if needed

GROUTING MATERIAL(S)

Grouting Material

Bent	from 0	to 10 ft.	____ yards	3 bags
_____	from _____	to _____ ft.	_____ yards	_____ bags
_____	from _____	to _____ ft.	_____ yards	_____ bags

REMARKS, ELEVATION, SOURCE OF DATA etc.

RW# 1

OTHER WELLS AND BORINGS
Other unsealed and unused well or boring on property? ☐ Yes ☐ No How Many? ____

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules Chapter 1725. The information contained in this report is true to the best of my knowledge

BAROTT DRILLING SERVICES,INC. 1860
Contractor Business Name Lic. or Reg. No.

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. H258121

WELL OR BORING LOCATION

County Name OLMSTED

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No. H258123
Minnesota Unique No. or W-series No. 643537

Township Name	Township No.	Range No.	Section No.	Fraction
ROCHESTER	106	14	2	NW 1/4 NE 1/4 NW 1/4

Date Sealed 8-3-07

Date Well or Boring Constructed 5-31-2007

GPS LOCATION Latitude Degrees Minutes Seconds

Latitude Degrees Minutes Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location
219 1ST AVENUE SW ROCHESTER 55904

Depth Before Sealing _____ ft.

AQUIFER(S) ☐ Single Aquifer ☐ Multiaquifer

WELL/BORING ☐ Water Supply Well ☒ Monit. Well ☐ Env. Boring Hole ☐ Other

STATIC WATER LEVEL ☐ Measured ☐ Estimated
_____ ft. ☐ below ☐ above land surface

Show exact location of well in section grid with "X".

Sketch map of well location. Showing property lines, roads and buildings.

CASING TYPE(S) ☒ Steel ☐ Plastic ☐ Tile ☐ Other _____

WELLHEAD COMPLETION

OUTSIDE:	☐ Well House	☐	Basement Offset
☐	☐ Pitless Adp	☐	Well Pit
☐	☐ Well Pit	☐	Buried
☐	☐ Buried		

PROPERTY OWNER'S NAME
CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above.
201 4TH STREET SE

ROCHESTER MN 55904

CASING

Diameter	Depth	Set in oversize hole?	Annular space initially grouted?
2 in.	from 22 1/2 to 32 1/2 ft.	☐ Yes ☒ No	☐ Yes ☐ No ☐ Unknown
_____ in.	from _____ to _____ ft.	☐ Yes ☐ No	☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐

Screen from _____ to _____ ft. Open Hole from 4 1/2 to 32 1/2 ft.

OBSTRUCTIONS ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction

Type of Obstructions (Describe) _____

Obstructions removed? Yes No Describe _____

WELL OWNER'S NAME
CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above.
201 4TH STREET SE

ROCHESTER MN 55904

PUMP

Type _____

☐ Removed ☒ Not Present ☐ Other _____

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Sandfill	Brown	med. c	0	13
Sand	Brown	med F	13	15
Sand Dolomite	Brown	med	15	18
Limestone	Brown	Hard	18	32 1/2

Use a second sheet, if needed

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE

☐ No Annular Space Exists ☐ Annular Space grouted with tremie pipe ☐ Casing Perforation/Removal

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

Type of perforator _____

☐ Other _____

GROUTING MATERIAL(S)

Grouting Material				
Bento	from 0	to 19 ft.	_____ yards	2 bags
_____	from _____	to _____ ft.	_____ yards	_____ bags
_____	from _____	to _____ ft	_____ yards	_____ bags

REMARKS, ELEVATION, SOURCE OF DATA, etc.

OTHER WELLS AND BORINGS
Other unsealed and unused well or boring on property? ☐ Yes ☐ No How Many? _____

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

BAROTT DRILLING SERVICES, INC. 1860
Contractor Business Name Lic. or Reg. No.

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. H258123

WELL OR BORING LOCATION

County Name: OLMSTED

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No.: H258128
Minnesota Unique No. or W-series No.: 651502

Township Name	Township No.	Range No.	Section No.	Fraction
ROCHESTER	106	14	2	NW 1/4 NE 1/4 NW 1/4

Date Sealed: 8-3-07

Date Well or Boring Constructed:

GPS LOCATION: Latitude Degrees Minutes Seconds; Longitude Degrees Minutes Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location
319 1ST AVE SW ROCHESTER 55904

Show exact location of well in section grid with "X"

Sketch map of well location. Show property lines, roads and buildings

PROPERTY OWNER'S NAME
CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above
201 4TH STREET SE

ROCHES

WELL OWNER'S NAME
CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above
201 4TH STREET SE

ROCHESTER MN 55904

Depth Before Sealing _____ ft.

AQUIFER(S): ☐ Single Aquifer ☐ Multiaquifer

WELL/BORING: ☐ Water Supply Well ☑ Monit Well ☐ Env Boring Hole ☐ Other

STATIC WATER LEVEL: ☐ Measured ☐ Estimated _____ ft ☐ below ☐ above land surface

CASING TYPE(S): ☑ Steel ☐ Plastic ☐ Tile ☐ Other _____

WELLHEAD COMPLETION

OUTSIDE: ☐ Well House ☐ Basement Offset ☐ Pitless Adp ☐ Well Pit ☐ Well Pit ☐ Buried ☐ Buried

CASING

Diameter	Depth	Set in oversize hole?	Annular space initially grouted?
2 in	from 14 to 3.5-52 ft.	☐ Yes ☑ No	☐ Yes ☐ No ☑ Unknown
_____ in	from _____ to _____ ft	☐ Yes ☐ No	☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐

Screen from _____ to _____ ft. Open Hole from _____ to _____ ft.

OBSTRUCTIONS: ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction

Type of Obstructions (Describe) _____

Obstructions removed? Yes No Describe _____

PUMP

Type _____

☐ Removed ☑ Not Present ☐ Other _____

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Asphalt/Sand	Blk/Br	med	0	3
Sandy Clay/Sand	Brn/wt	med	3	5
Sand	Brown	med.	5	10
Sand Rock	Brown	med-H	10	16
Limestone	Tan/wht/brn	hard	16	31

Use a second sheet, if needed

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE

☐ No Annular Space Exists ☐ Annular Space grouted with tremie pipe ☐ Gravity Placement/Removal

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

Type of perforator _____

☐ Other

GROUTING MATERIAL(S)

Grouting Material

Bent from 0 to 11 ft. _____ yards 1 bags

_____ from _____ to _____ ft. _____ yards _____ bags

_____ from _____ to _____ ft. _____ yards _____ bags

OTHER WELLS AND BORINGS

Other unsealed and unused well or boring on property? ☐ Yes ☐ No How Many? _____

REMARKS, ELEVATION, SOURCE OF DATA, etc.

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725.
The information contained in this report is true to the best of my knowledge.

BAROTT DRILLING SERVICES,INC. 1860

Contractor Business Name Lic. or Reg. No.

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. H258128

WELL OR BORING LOCATION

County Name OLMSTED

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No. H258127
Minnesota Unique No or W-series No. 651503

Township Name	Township No	Range No	Section No.	Fraction
ROCHESTER	106	14	2	NW 1/4 NE 1/4 NW

Date Sealed 1/4 9-3-07

Date Well or Boring Constructed 8-4-2006

GPS LOCATION Latitude Degrees Minutes Seconds

Latitude Degrees Minutes Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location
219 1ST AVENUE SW ROCHESTER 55904

Show exact location of well in section grid with "X".

Sketch map of well location. Showing property lines, roads and buildings.

Depth Before Sealing 23 ft.

AQUIFER(S) ☐ Single Aquifer ☐ Multiaquifer

WELL/BORING ☐ Water Supply Well ☑ Monit.Well ☐ Env.Boring Hole ☐ Other

STATIC WATER LEVEL ☐ Measured ☐ Estimated
_____ ft ☐ below ☐ above land surface

CASING TYPE(S) ☑ Steel ☐ Plastic ☐ Tile ☐ Other _____

WELLHEAD COMPLETION

OUTSIDE: ☐	Well House ☐	Basement Offset
☐	Pitless Adp ☐	Well Pit
☐	Well Pit ☐	Buried
☐	Buried	

PROPERTY OWNER'S NAME
CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above.
201 4TH STREET SE

ROCHESTER MN 55904

CASING

Diameter	Depth	Set in oversize hole?	Annular space initially grouted?
3 in.	from 13 to 3.65 ft.	☐ Yes ☑ No	☐ Yes ☐ No ☒ Unknown
_____ in.	from _____ to _____ ft.	☐ Yes ☐ No	☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐

Screen from _____ to _____ ft. Open Hole from _____ to _____ ft.

OBSTRUCTIONS ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction

Type of Obstructions (Describe) _____

Obstructions removed? Yes No Describe _____

WELL OWNER'S NAME
CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above.
201 4TH STREET SE

ROCHESTER MN 55904

PUMP

Type _____

☐ Removed ☑ Not Present ☐ Other _____

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Asphalt/Surface	Brown	Medium	0	14
Limestone	Tan/White	Hard	14	23

Use a second sheet, if needed

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE

☐ No Annular Space Exists ☐ Annular Space grouted with tremie pipe ☐ Casing Perforation/Removal

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

Type of perforator _____

☐ Other _____

GROUTING MATERIAL(S)

Grouting Material

Bent	from 0 to 16 ft.	_____ yards	1	bags
_____	from _____ to _____ ft.	_____ yards	_____	bags
_____	from _____ to _____ ft.	_____ yards	_____	bags

REMARKS, ELEVATION, SOURCE OF DATA, etc.

OTHER WELLS AND BORINGS

Other unsealed and unused well or boring on proterty? ☐ Yes ☐ No Now Many? _____

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

BAROTT DRILLING SERVICES,INC. 1860
Contractor Business Name Lic. or Reg. No

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. H258127

WELL OR BORING LOCATION

County Name: OLMSTED

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No.: H258126
Minnesota Unique No. or W-series No.: 651504

Township Name	Township No.	Range No.	Section No.	Fraction
ROCHESTER	106	14	2	NW 1/4 NE 1/4 NW

Date Sealed: 1/4 8-3-07

Date Well or Boring Constructed: 8-14-2000

GPS LOCATION: Latitude Degrees Minutes Seconds; Latitude Degrees Minutes Seconds

Depth Before Sealing: 24 ft.

AQUIFER(S): ☐ Single Aquifer ☐ Multiaquifer

STATIC WATER LEVEL: ☐ Measured ☐ Estimated ____ ft. ☐ below ☐ above land surface

WELL/BORING: ☐ Water Supply Well ☒ Monit.Well ☐ Env.Boring Hole ☐ Other

Numerical Street Address or Fire Number and City of Well or Boring Location
219 1ST AVENUE SW ROCHESTER 55904

Show exact location of well in section grid with "X".

Sketch map of well location. Showing property lines, roads and buildings.

CASING TYPE(S): ☒ Steel ☐ Plastic ☐ Tile ☐ Other

WELLHEAD COMPLETION

OUTSIDE: ☐ Well House ☐ Basement Offset ☐ Bitless Adp ☐ Well Pit ☐ Well Pit ☐ Buried ☐ Buried

PROPERTY OWNER'S NAME
CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above.
201 4TH STREET SE

ROCHESTER MN 55904

CASING

Diameter	Depth	Set in oversize hole?	Annular space initially grouted?
2 in.	from 14 to 3 ft.	☐ Yes ☒ No	☐ Yes ☐ No ☐ Unknown
____ in.	from ____ to ____ ft.	☐ Yes ☐ No	☐ Yes ☐ No ☒ Unknown

WELL OWNER'S NAME
CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above.
201 4TH STREET SE

ROCHESTER MN 55904

SCREEN/OPEN HOLE ☐ ☐

Screen from ____ to ____ ft. Open Hole from ____ to ____ ft.

OBSTRUCTIONS: ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction

Type of Obstructions (Describe)

Obstructions removed? Yes No Describe

PUMP

Type

☐ Removed ☒ Not Present ☐ Other

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Asphalt/Fill	Black	Brittle	0	2
Sandy Sand(Clay)	Brwn	med	2	14½
Limestone	Tan/Wt	hard	14½	27

Use a second sheet, if needed

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE

☐ No Annular Space Exists ☐ Annular Space grouted with tremie pipe ☐ Casing Perforation/Removal

____ in. from ____ to ____ ft. ☐ Perforated ☐ Removed

____ in. from ____ to ____ ft. ☐ Perforated ☐ Removed

Type of perforator

☐ Other

GROUTING MATERIAL(S)

Grouting Material				
Bent	from 0 to 11 ft.	____ yards	3	bags
____	from ____ to ____ ft.	____ yards	____	bags
____	from ____ to ____ ft.	____ yards	____	bags

REMARKS, ELEVATION, SOURCE OF DATA, etc.

OTHER WELLS AND BORINGS

Other unsealed and unused well or boring on proterty? ☐ Yes ☐ No Now Many? ____

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725
The information contained in this report is true to the best of my knowledge

BAROTT DRILLING SERVICES,INC. 1860
Contractor Business Name Lic. or Reg. No.

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. H258126

WELL OR BORING LOCATION

County Name: OLMSTED

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No.: H258125
Minnesota Unique No. or W-series No.: 651501

Township Name	Township No	Range No.	Section No.	Fraction
ROCHESTER	106	14	2	NW 1/4 NE 1/4 NW

Date Sealed: 1/4 8-23-07

Date Well or Boring Constructed: 9-16-2005

GPS LOCATION: Latitude Degrees Minutes Seconds; Longitude Degrees Minutes Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location
219 1ST AVENUE SW ROCHESTER 55904

Depth Before Sealing _____ ft.

AQUIFER(S): ☐ Single Aquifer ☐ Multiaquifer

WELL/BORING: ☐ Water Supply Well ☑ Monit Well ☐ Env Boring Hole ☐ Other

STATIC WATER LEVEL: ☐ Measured ☐ Estimated
_____ ft. ☐ below ☐ above land surface

Show exact location of well in section grid with "X"

Sketch map of well location. Showing property lines, roads and buildings.

CASING TYPE(S): ☑ Steel ☐ Plastic ☐ Tile ☐ Other _____

ATTACHED COMPLETION

CUTTINGS:		Well House	Basement Offset
		Fitless Adp	Well Pit
		Well Pit	Buried
		Buried	

PROPERTY OWNER'S NAME
CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above
201 4TH STREET SE

ROCHESTER MN 55904

CASING
Diameter Depth Set in oversize hole? Annular space initially grouted?
2 in from 35 to 3.6.55 ft. ☐ Yes ☐ No ☐ Yes ☐ No ☐ Unknown
_____ in from _____ to _____ ft. ☐ Yes ☐ No ☐ Yes ☐ No ☐ Unknown

WELL OWNER'S NAME
CITY OF ROCHESTER

SCREEN/OPEN HOLE ☐ ☐
Screen from ____ to ____ ft. Open Hole from ____ to ____ ft.

Well owner's mailing address if different than property owner's address indicated above
201 4TH STREET SE

ROCHESTER MN 55904

OBSTRUCTIONS
☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction
Type of Obstructions (Describe) _____
Obstructions removed? Yes No Describe _____

PUMP
Type _____
☐ Removed ☑ Not Present ☐ Other _____

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Sphault Sand	Blk/Brown	Med	0	3
Gravelly Sand	Brown/Wet	Med	3	5
Sand	Brown	Med	5	10
Sand Rocks	Brown	Med+	10	16
Limestone	Tan/Wet	Hard	16	40

Use a second sheet, if needed

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS OR CASING AND BORE HOLE
☐ No Annular Space Exists ☐ Annular Space grouted with tremie pipe ☐ Casing Perforated/Removed
_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed
_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed
Type of perforator _____
☐ Other _____

GROUTING MATERIAL(S)
Grouting Material
Bent from 0 to 30 ft _____ yards 2 bags
_____ from _____ to _____ ft _____ yards _____ bags
_____ from _____ to _____ ft. _____ yards _____ bags

REMARKS, ELEVATION, SOURCE OF DATA, etc

OTHER WELLS AND BORINGS
Other unsealed and unused well or boring on property? ☐ Yes ☐ No Now Many? ____

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725.
The information contained in this report is true to the best of my knowledge.

BAROTT DRILLING SERVICES,INC. 1860
Contractor Business Name Lic. or Reg. No.

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. H258125

WELL OR BORING LOCATION

County Name OLMSTED

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No. H258124
Minnesota Unique No. or W-series No. 657809

Township Name	Township No	Range No.	Section No.	Fraction	Date Sealed	Date Well or Boring Constructed
ROCHESTER	106	14	2	NW 1/4 NE 1/4 NW	1/4 9-3-07	1-3-2001

GPS LOCATION Latitude Degrees Minutes Seconds

Latitude Degrees Minutes Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location
219 1ST STREET AVENUE SW ROCHESTER 55904

Show exact location of well in section grid with "X".

Sketch map of well location. Showing property lines, roads and buildings.

Depth Before Sealing _____ ft.

AQUIFER(S) ☐ Single Aquifer ☐ Multiaquifer

WELL/BORING ☐ Water Supply Well ☐ Monit.Well ☐ Env.Boring Hole ☐ Other

STATIC WATER LEVEL ☐ Measured ☐ Estimated
_____ ft. ☐ below ☐ above land surface

CASING TYPE(S) ☒ Steel ☐ Plastic ☐ Tile ☐ Other _____

WELLHEAD COMPLETION

OUTSIDE:	☐	Well House	☐ Basement Offset
	☐	Pitless Adp	☐ Well Pit
	☐	Well Pit	☐ Buried
	☐	Buried	

PROPERTY OWNER'S NAME
CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above.
201 4TH STREET SE

ROCHESTER MN 55904

CASING
Diameter Depth Set in oversize hole? Annular space initially grouted?
2 in from 70 to 3[illegible] ft ☐ Yes ☒ No ☐ Yes ☐ No ☐ Unknown
_____ in from _____ to _____ ft ☐ Yes ☐ No ☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐
Screen from 70 to 78 ft. Open Hole from _____ to _____ ft

OBSTRUCTIONS ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction
Type of Obstructions (Describe) _____
Obstructions removed? Yes No Describe _____

WELL OWNER'S NAME
CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above.
201 4TH STREET SE

ROCHESTER MN 55904

PUMP
Type _____
☐ Removed ☒ Not Present ☐ Other _____

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Sand	Brown	med	0	17
Limestone	Brown	Hard	17	97

Use a second sheet, if needed

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS OR CASING AND BORE HOLE
☐ No Annular Space Exists ☐ Annular Space grouted with tremie pipe ☐ Casing Perforation/Removal

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

Type of perforator _____

☐ Other _____

GROUTING MATERIAL(S)

Grouting Material					
Bent	from 0	to 64 ft.	_____ yards	3	bags
_____	from _____	to _____ ft.	_____ yards	_____	bags
_____	from _____	to _____ ft.	_____ yards	_____	bags

REMARKS, ELEVATION, SOURCE OF DATA, etc.

OTHER WELLS AND BORINGS
Other unsealed and unused well or boring on property? ☐ Yes ☐ No Now Many? _____

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

BAROTT DRILLING SERVICES,INC. 1860
Contractor Business Name Lic. or Reg. No

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. H258124

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No. H258129
Minnesota Unique No. or W-series No. 165716

WELL OR BORING LOCATION

County Name: OLMSTEAD

Township Name	Township No	Range No.	Section No.	Fraction	Date Sealed	Date Well or Boring Constructed
ROCHESTER	106	14	2	NW 1/4 NE 1/4 NW 1/4	8-3-07	01-02-2001

GPS LOCATION: Latitude Degrees / Minutes / Seconds; Longitude Degrees / Minutes / Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location: 219 1ST AVENUE SW ROCHESTER 55904

Show exact location of well in section grid with "X".

Sketch map of well location. Showing property lines, roads and buildings.

Depth Before Sealing _____ ft.

AQUIFER(S): ☐ Single Aquifer ☐ Multiaquifer

WELL/BORING: ☐ Water Supply Well ☐ Monit.Well ☐ Env.Boring Hole ☐ Other

STATIC WATER LEVEL: ☐ Measured ☐ Estimated _____ ft. ☐ below ☐ above land surface

CASING TYPE(S): ☒ Steel ☐ Plastic ☐ Tile ☐ Other _____

WELLHEAD COMPLETION

OUTSIDE:			
	Well House		Basement Offset
	Pitless Adp		Well Pit
	Well Pit		Buried
	Buried		

PROPERTY OWNER'S NAME: CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above.

201 4TH STREET

ROCHESTER MN 55904

CASING

Diameter	Depth	Set in oversize hole?	Annular space initially grouted?
2 in.	from 16 1/2 to 36.5 ft	☐ Yes ☒ No	☐ Yes ☐ No ☒ Unknown
_____ in.	from _____ to _____ ft	☐ Yes ☐ No	☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐

Screen from _____ to _____ ft. Open Hole from _____ to _____ ft.

OBSTRUCTIONS: ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction

Type of Obstructions (Describe) _____

Obstructions removed? Yes No Describe _____

WELL OWNER'S NAME: CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above.

201 4TH STREET

ROCHESTER MN 55904

PUMP

Type _____ ☐ Removed ☒ Not Present ☐ Other _____

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Sand	Brown	med	0	8
Sand Boulder	Brown	med	8	10
Sandy Silt Clay	Brown	med	10	16
Limestone	Brown	Hard	16	33

Use a second sheet, if needed

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE

☒ No Annular Space Exists ☐ Annular Space grouted with tremie pipe ☐ Casing Perforation/Removal

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

Type of perforator _____

☐ Other _____

GROUTING MATERIAL(S)

Grouting Material				
Bent	from 0 to 13 1/2 ft.	_____ yards	7	bags
_____	from _____ to _____ ft.	_____ yards	_____	bags
_____	from _____ to _____ ft.	_____ yards	_____	bags

REMARKS, ELEVATION, SOURCE OF DATA, etc.

OTHER WELLS AND BORINGS

Other unsealed and unused well or boring on property? ☐ Yes ☐ No How Many? _____

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

BAROTT DRILLING SERVICES,INC. 1860

Contractor Business Name / Lic. or Reg. No.

Authorized Representative Signature / Date

Name of Person Sealing Well or Boring

SEALING NO. H258129

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No. H258130
Minnesota Unique No. or W-series No. 657812

WELL OR BORING LOCATION

County Name CLMSTEAD

Township Name	Township No.	Range No	Section No	Fraction	Date Sealed	Date Well or Boring Constructed
ROCHESTER	104	14	2	NW 1/4 NE 1/4 NW 1/4	8-3-07	1-3-2001

GPS LOCATION Latitude Degrees Minutes Seconds
Latitude Degrees Minutes Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location
219 1ST AVENUE SW ROCHESTER 55904

Depth Before Sealing 33 ft.

AQUIFER(S) ☐ Single Aquifer ☐ Multiaquifer

WELL/BORING ☐ Water Supply Well ☒ Monit. Well ☐ Env Boring Hole ☐ Other

STATIC WATER LEVEL ☐ Measured ☐ Estimated
_____ ft. ☐ below ☐ above land surface

Show exact location of well in section grid with "X".

Sketch map of well location Showing property lines, roads and buildings.

CASING TYPE(S) ☒ Steel ☐ Plastic ☐ Tile ☐ Other _____

WELLHEAD COMPLETION

OUTSIDE:	☐	Well House	☐ Basement Offset
	☐	Pitless Adp	☐ Well Pit
	☐	Well Pit	☐ Buried
	☐	Buried	

PROPERTY OWNER'S NAME
CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above.
201 4TH STREET

ROCHESTER MN 55904

CASING
Diameter Depth Set in oversize hole? Annular space initially grouted?
2 in from 1 1/2 to 31.53 ft. ☐ Yes ☒ No ☐ Yes ☐ No ☐ Unknown
_____ in from _____ to _____ ft. ☐ Yes ☐ No ☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐
Screen from _____ to _____ ft. Open Hole from _____ to _____ ft.

OBSTRUCTIONS ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction
Type of Obstructions (Describe) _____
Obstructions removed? Yes No Describe _____

WELL OWNER'S NAME
CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above.
201 4TH STREET

ROCHESTER MN 55904

PUMP
Type _____
☐ Removed ☒ Not Present ☐ Other _____

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Sand Brown	Brown	med	0	12
Sand Cobbles	Brown	med	12	15
Sand	Brown	Hard	15	17
Limestone	Brown	Hard	17	33

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE
☐ No Annular Space Exists ☒ Annular Space grouted with tremie pipe ☐ Casing Perforation/Removal
_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed
_____ in from _____ to _____ ft ☐ Perforated ☐ Removed
Type of perforator _____
☐ Other _____

GROUTING MATERIAL(S)
Grouting Material
Bent from 0 to 13 1/2 _____ yards 4 bags
_____ from _____ to _____ ft _____ yards _____ bags
_____ from _____ to _____ ft _____ yards _____ bags

Use a second sheet, if needed

OTHER WELLS AND BORINGS
Other unsealed and unused well or boring on proterty? ☐ Yes ☐ No Now Many? _____

REMARKS, ELEVATION, SOURCE OF DATA, etc.

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

BAROTT DRILLING SERVICES,INC. 1860
Contractor Business Name Lic. or Reg. No.

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. H258130

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No. H258131
Minnesota Unique No. or W-series No. 657811

WELL OR BORING LOCATION

County Name OLMSTEAD

Township Name	Township No.	Range No.	Section No.	Fraction	Date Sealed	Date Well or Boring Constructed
ROCHESTER	106	14	2	NW 1/4 NE 1/4 NW 1/4	8-3-07	1-3-2001

GPS LOCATION Latitude Degrees Minutes Seconds
Latitude Degrees Minutes Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location
219 1ST AVE SW ROCHESTER 55904

Show exact location of well in section grid with "X".

Sketch map of well location. Showing property lines, roads and buildings

Depth Before Sealing 23 ft.

AQUIFER(S) ☐ Single Aquifer ☐ Multiaquifer

WELL/BORING ☐ Water Supply Well ☒ Monit Well ☐ Env.Boring Hole ☐ Other

STATIC WATER LEVEL ☐ Measured ☐ Estimated
_____ ft. ☐ below ☐ above land surface

CASING TYPE(S) ☒ Steel ☐ Plastic ☐ Tile ☐ Other _____

WELLHEAD COMPLETION

OUTSIDE: ☐	Well House ☐	Basement Offset
☐	Pitless Adp ☐	Well Pit
☐	Well Pit ☐	Buried
☐	Buried	

PROPERTY OWNER'S NAME
CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above.
201 4TH STREET
ROCHESTER MN 55094

WELL OWNER'S NAME
CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above
201 4TH STREET
ROCHESTER MN 55904

CASING
Diameter Depth Set in oversize hole? Annular space initially grouted?
2 in. from 16 1/2 to 3 163 ft. ☐ Yes ☐ No ☐ Yes ☐ No ☐ Unknown
_____ in. from _____ to _____ ft. ☐ Yes ☐ No ☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐
Screen from _____ to _____ ft. Open Hole from _____ to _____ ft.

OBSTRUCTIONS ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction
Type of Obstructions (Describe) _____
Obstructions removed? Yes No Describe _____

PUMP
Type _____
☐ Removed ☒ Not Present ☐ Other _____

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Sand	BRN	med C	0	16
Limestone	BRN	hard	16	23

Use a second sheet, if needed

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS OR CASING AND BORE HOLE
☐ No Annular Space Exists ☐ Annular Space grouted with tremie pipe ☐ Casing Perforation/Removal
_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed
_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed
Type of perforator _____
☐ Other _____

GROUTING MATERIAL(S)
Grouting Material
Bent from 0 to 13 1/2 ft. _____ yards 4 bags
_____ from _____ to _____ ft. _____ yards _____ bags
_____ from _____ to _____ ft. _____ yards _____ bags

OTHER WELLS AND BORINGS
Other unsealed and unused well or boring on proterty? ☐ Yes ☐ No How Many? _____

REMARKS, ELEVATION, SOURCE OF DATA, etc

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725.
The information contained in this report is true to the best of my knowledge

BAROTT DRILLING SERVICES,INC. 1860
Contractor Business Name Lic. or Reg. No

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. H258131

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No. H258132
Minnesota Unique No. or W-series No. VPH4

WELL OR BORING LOCATION

County Name OLMSTEAD

Township Name	Township No.	Range No.	Section No.	Fraction		Date Sealed	Date Well or Boring Constructed
ROCHESTER	106	14	2	NW 1/4 NE	1/4 NW	1/4 8-3-2007	

GPS LOCATION Latitude Degrees Minutes Seconds
Latitude Degrees Minutes Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location
1 ST AVENUE SW ROCHESTER

Depth Before Sealing _____ ft.

AQUIFER(S) ☐ Single Aquifer ☐ Multiaquifer

WELL/BORING ☐ Water Supply Well ☐ Monit.Well ☐ Env.Boring Hole Other

STATIC WATER LEVEL ☐ Measured ☐ Estimated
_____ ft ☐ below ☐ above land surface

Show exact location of well in section grid with "X"

Sketch map of well location. Showing property lines, roads and buildings.

CASING TYPE(S) ☒ Steel ☐ Plastic ☐ Tile ☐ Other _____

WELLHEAD COMPLETION

OUTSIDE: ☐ Well House ☐ Basement Offset
☐ Pitless Adp ☐ Well Pit
☐ Well Pit ☐ Buried
☐ Buried

PROPERTY OWNER'S NAME
CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above.
201 4TH STREET

ROCHESTER MN 55904

CASING
Diameter Depth Set in oversize hole? Annular space initially grouted?
2 in. from 16 1/2 to 36 ft. ☐ Yes ☒ No ☐ Yes ☐ No ☒ Unknown
_____ in. from _____ to _____ ft. ☐ Yes ☐ No ☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐
Screen from _____ to _____ ft. Open Hole from _____ to _____ ft

OBSTRUCTIONS ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction
Type of Obstructions (Describe) _____
Obstructions removed? Yes No Describe _____

WELL OWNER'S NAME
CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above.
201 4TH STREET

ROCHESTER MN 55904

PUMP
Type _____
☐ Removed ☒ Not Present ☐ Other _____

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Sand	BRN	med-c	0	13
Sand Silty Sand	BRN	med-c	13	15
Sandy Silt Limestone	BRN	Hard	15	17
Limestone	BRN	Hard	17	22½

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE
☐ No Annular Space Exists ☐ Annular Space grouted with tremie pipe ☒ Casing Perforation/Removal

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

Type of perforator _____

☐ Other _____

GROUTING MATERIAL(S)

Grouting Material					
Bent	from 0	to 6 ft.	_____ yards	13	bags
Bent	from 6	to 8 ft.	_____ yards	1	bags
	from _____	to _____ ft.	_____ yards	_____	bags

Use a second sheet, if needed

OTHER WELLS AND BORINGS
Other unsealed and unused well or boring on proterty? ☐ Yes ☐ No Now Many? _____

REMARKS, ELEVATION, SOURCE OF DATA, etc.

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725.
The information contained in this report is true to the best of my knowledge.

BAROTT DRILLING SERVICES,INC. 1860
Contractor Business Name Lic. or Reg. No.

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. H258132

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No. H258133
Minnesota Unique No. or W-series No. VP #5

WELL OR BORING LOCATION

County Name: OLMSTEAD

Township Name	Township No.	Range No.	Section No.	Fraction
ROCHESTER	106	14	2	NW 1/4 NE 1/4 NW 1/4

GPS LOCATION: Latitude Degrees Minutes Seconds; Longitude Degrees Minutes Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location: 1ST AVENUE SW ROCHESTER 55904

Show exact location of well in section grid with "X".

Sketch map of well location. Showing property lines, roads and buildings.

Date Sealed: 1/4 20 '12

Date Well or Boring Constructed: 5-8-2001

Depth Before Sealing: 20 1/2 ft

AQUIFER(S): ☐ Single Aquifer ☐ Multiaquifer

STATIC WATER LEVEL: ☐ Measured ☐ Estimated ____ ft ☐ below ☐ above land surface

WELL/BORING: ☐ Water Supply Well ☐ Monit.Well ☐ Env.Boring Hole Other

CASING TYPE(S): ☒ Steel ☐ Plastic ☐ Tile ☐ Other

WELLHEAD COMPLETION

OUTSIDE: ☐ Well House ☐ Basement Offset ☐ Pitless Adp ☐ Well Pit ☐ Well Pit ☐ Buried ☐ Buried

PROPERTY OWNER'S NAME
CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above.
201 4TH STREET
ROCHESTER MN 55904

WELL OWNER'S NAME
CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above.
201 4TH STREET
ROCHESTER MN 55904

CASING

Diameter	Depth	Set in oversize hole?	Annular space initially grouted?
2 in.	from 15 1/2 to 3.653 ft.	☐ Yes ☒ No	☐ Yes ☐ No ☒ Unknown
____ in.	from ____ to ____ ft.	☐ Yes ☐ No	☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐
Screen from ____ to ____ ft. Open Hole from ____ to ____ ft.

OBSTRUCTIONS: ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction
Type of Obstructions (Describe)
Obstructions removed? Yes No Describe

PUMP
Type
☐ Removed ☒ Not Present ☐ Other

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE
☐ No Annular Space Exists ☐ Annular Space grouted with tremie pipe ☐ Casing Perforation/Removal
____ in. from ____ to ____ ft ☐ Perforated ☐ Removed
____ in. from ____ to ____ ft ☐ Perforated ☐ Removed
Type of perforator
☐ Other

GROUTING MATERIAL(S)
Grouting Material
Bent from 0 to 8 ft ____ yards 1 bags
____ from ____ to ____ ft ____ yards ____ bags
____ from ____ to ____ ft ____ yards ____ bags

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Clay	BRN	med	0	13
Clay/limestone	BRN	med	13	15
limestone	BRN	Hard	15	20½

Use a second sheet, if needed

OTHER WELLS AND BORINGS
Other unsealed and unused well or boring on proterty? ☐ Yes ☐ No How Many? ____

REMARKS, ELEVATION, SOURCE OF DATA, etc.

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725
The information contained in this report is true to the best of my knowledge.

BAROTT DRILLING SERVICES,INC. 1860
Contractor Business Name Lic. or Reg. No.

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. H258133

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No. H258134
Minnesota Unique No. or W-series No. VP #6

WELL OR BORING LOCATION

County Name: OLMSTEAD

Township Name	Township No.	Range No.	Section No.	Fraction
ROCHESTER	106	14	2	NW 1/4 NW 1/4 NW

GPS LOCATION: Latitude Degrees ____ Minutes ____ Seconds ____ Latitude Degrees ____ Minutes ____ Seconds ____

Numerical Street Address or Fire Number and City of Well or Boring Location
1 ST AVE SW ROCHESTER 55904

Show exact location of well in section grid with "X".

Sketch map of well location. Showing property lines, roads and buildings.

Date Sealed 1/4 8-3-07

Date Well or Boring Constructed 6-8-01

Depth Before Sealing 20 ½ ft.

AQUIFER(S) ☐ Single Aquifer ☐ Multiaquifer

STATIC WATER LEVEL ☐ Measured ☐ Estimated ____ ft. ☐ below ☐ above land surface

WELL/BORING ☐ Water Supply Well ☐ Monit.Well ☒ Env.Boring Hole ☐ Other

CASING TYPE(S) ☒ Steel ☐ Plastic ☐ Tile ☐ Other ____

WELLHEAD COMPLETION

OUTSIDE: ☐ Well House ☐ Basement Offset ☐ Pitless Adp ☐ Well Pit ☐ Well Pit ☐ Buried ☐ Buried

PROPERTY OWNER'S NAME
CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above.
201 4TH STREET
ROCHESTER MN 55904

WELL OWNER'S NAME
CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above.
201 4TH STREET
ROCHESTER MN 55904

CASING
Diameter 2 in. Depth from 0 ½ to 3 ½ ft. ☐ Yes ☐ No ☐ Yes ☐ No ☒ Unknown
____ in. from ____ to ____ ft. ☐ Yes ☐ No ☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐
Screen from ____ to ____ ft. Open Hole from ____ to ____ ft

OBSTRUCTIONS ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction
Type of Obstructions (Describe) ____
Obstructions removed? Yes No Describe ____

PUMP
Type ____ ☐ Removed ☐ Not Present ☐ Other ____

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE
☐ No Annular Space Exists ☐ Annular Space grouted with tremie pipe ☐ Casing Perforation/Removal
____ in. from ____ to ____ ft. ☐ Perforated ☐ Removed
____ in. from ____ to ____ ft. ☐ Perforated ☐ Removed
Type of perforator ____
☐ Other ____

GROUTING MATERIAL(S)
Grouting Material
Bent from 0 to 8 ft. ____ yards 1 bags
____ from ____ to ____ ft. ____ yards ____ bags
____ from ____ to ____ ft. ____ yards ____ bags

OTHER WELLS AND BORINGS
Other unsealed and unused well or boring on property? ☐ Yes ☐ No How Many? ____

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Sand	BRN	Medc	0	13
Sand Gravel	BRN	Medc	13	17
Gravel/limestone	BRN	Hard	17	20½

Use a second sheet, if needed

REMARKS, ELEVATION, SOURCE OF DATA, etc.

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725
The information contained in this report is true to the best of my knowledge

BAROTT DRILLING SERVICES, INC. 1860
Contractor Business Name Lic. or Reg. No.

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. H258134

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No: B258435
Minnesota Unique No. or W-series No.: VP 87

WELL OR BORING LOCATION

County Name: OLMSTEAD

Township Name	Township No	Range No	Section No	Fraction
ROCHESTER	106	14	20	NW 1/4 NE 1/4 NW

GPS LOCATION: Latitude Degrees Minutes Seconds; Longitude Degrees Minutes Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location: 1ST AVE SW ROCHESTER 55904

Show exact location of well in section grid with "X"

Sketch map of well location. Showing property lines, roads and buildings.

PROPERTY OWNER'S NAME: CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above: 201 4TH STREET

ROCHESTER MN 55904

WELL OWNER'S NAME: CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above: 201 4TH STREET

ROCHESTER MN 55904

Date Sealed: 8-3-07

Date Well or Boring Constructed: 05-02-61

Depth Before Sealing: ft

AQUIFER(S): ☐ Single Aquifer ☐ Multiaquifer

WELL/BORING: ☐ Water Supply Well ☐ Monit Well ☐ Env Boring Hole ☒ Other

STATIC WATER LEVEL: ☐ Measured ☐ Estimated ft ☐ below ☐ above land surface

CASING TYPE(S): ☒ Steel ☐ Plastic ☐ Tile ☐ Other

WELLHEAD COMPLETION

Pitless		Well House	Basement Direct
		Pitless Adp	Well Pit
		Well Pit	Buried
		Buried	

CASING: Diameter / Depth / Set in oversize hole? / Annular space initially grouted?

2 in. from 13 ft to 3.60 ft ☐ Yes ☒ No ☐ Yes ☐ No ☒ Unknown

in. from ft to ft ☐ Yes ☐ No ☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐

Screen from to ft. Open Hole from to ft

OBSTRUCTIONS: ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction

Type of Obstructions (Describe):

Obstructions removed? Yes No Describe

PUMP: Type ☐ Removed ☐ Not Present ☐ Other

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE: ☐ No Annular Space Exists ☐ Annular Space grouted with neat pipe ☐ Lateral Perforation/Removed

in. from to ft ☐ Perforated ☐ Removed

in. from to ft ☐ Perforated ☐ Removed

Type of perforator:

☐ Other

GROUTING MATERIAL(S)

Grouting Material: Bent from 0 to 7 ft yards 1 bags

from to ft yards bags

from to ft yards bags

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Sand	Brown	med-c	0	13
Silty Sand/Limestone	BRN	med	13	15
Silty Sand/Limestone	BRN	Hard	15	17
Limestone	BRN	Hard	17	30½

Use a second sheet, if needed

OTHER WELLS AND BORINGS: Other unsealed and unused well or boring on property? ☐ Yes ☐ No How Many?

REMARKS, ELEVATION, SOURCE OF DATA, etc

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules Chapter 4725. The information contained in this report is true to the best of my knowledge.

BAROTT DRILLING SERVICES,INC. 1869
Contractor Business Name Lic. or Reg. No.

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

SEALING NO. B258435

MINNESOTA DEPARTMENT OF HEALTH
WELL AND BORING SEALING RECORD
Minnesota Statutes Chapter 1031

Minnesota Well and Boring Sealing No. B258136
Minnesota Unique No. or W-series No. VP#8

WELL OR BORING LOCATION

County Name: OLMSTEAD

Township Name	Township No.	Range No.	Section No.	Fraction
ROCHESTER	106	14	2	NW 1/4 NE 1/4 NW

GPS LOCATION: Latitude Degrees Minutes Seconds; Latitude Degrees Minutes Seconds

Numerical Street Address or Fire Number and City of Well or Boring Location: 1ST AVE SW ROCHESTER 55904

Show exact location of well in section grid with "X"

Sketch map of well location. Showing property lines, roads and buildings.

PROPERTY OWNER'S NAME: CITY OF ROCHESTER

Property owner's mailing address if different than well location address indicated above: 201 4TH STREET

ROCHESTER MN 55904

WELL OWNER'S NAME: CITY OF ROCHESTER

Well owner's mailing address if different than property owner's address indicated above: 201 4TH STREET

ROCHESTER MN 55904

GEOLOGICAL MATERIALS	COLOR	HARDNESS	FROM	TO
Fine Sand	BRN	Soft	0	13
and silty sand	BRN	Med	13	15
Limestone	BRN	Hard	15	20½

Use a second sheet, if needed

REMARKS, ELEVATION SOURCE OF DATA etc.

SEALING NO. B258136

Date Sealed: 8-3-07

Date Well or Boring Constructed: 5-2-01

Depth Before Sealing _____ ft.

AQUIFER(S): ☐ Single Aquifer ☐ Multiaquifer

STATIC WATER LEVEL: ☐ Measured ☐ Estimated _____ ft. ☐ below ☐ above land surface

WELL/BORING: ☐ Water Supply Well ☐ Monit Well ☑ Env Boring Hole ☐ Other

CASING TYPE(S): ☑ Steel ☐ Plastic ☐ Tile ☐ Other _____

WELLHEAD COMPLETION

OUTSIDE: ☐ Well House ☐ Basement Slab
☐ Pitless Adp ☐ Well Pit
☐ Well Pit ☐ Buried
☐ Buried

CASING: Diameter Depth Set in oversize hole? Annular space initially grouted?
2 in. from 15½ to 3.52 ft. ☐ Yes ☐ No ☐ Yes ☐ No ☐ Unknown
_____ in. from _____ to _____ ft. ☐ Yes ☐ No ☐ Yes ☐ No ☐ Unknown

SCREEN/OPEN HOLE ☐ ☐

Screen from _____ to _____ ft. Open Hole from _____ to _____ ft.

OBSTRUCTIONS: ☐ Rods/Drop Pipe ☐ Check Valve(s) ☐ Debris ☐ Fill ☐ No Obstruction

Type of Obstructions (Describe) _____

Obstructions removed? Yes No Describe _____

PUMP: Type _____ ☐ Removed ☑ Not Present ☐ Other _____

METHOD USED TO SEAL ANNULAR SPACE BETWEEN 2 CASINGS, OR CASING AND BORE HOLE: ☐ No Annular Space Exists ☐ Annular Space grouted with Tremie pipe ☐ Casing Perforation/Retrieval

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

_____ in. from _____ to _____ ft. ☐ Perforated ☐ Removed

Type of perforator _____

☐ Other _____

GROUTING MATERIAL(S)

Grouting Material
Bent from 0 to 8 ft. _____ yards 1 bags
_____ from _____ to _____ ft. _____ yards _____ bags
_____ from _____ to _____ ft. _____ yards _____ bags

OTHER WELLS AND BORINGS: Other unsealed and unused well or boring on property? ☐ Yes ☐ No How Many? _____

LICENSED OR REGISTERED CONTRACTOR CERTIFICATION

This well or boring was sealed in accordance with Minnesota Rules, Chapter 4725. The information contained in this report is true to the best of my knowledge.

BAROTT DRILLING SERVICES,INC. 1860
Contractor Business Name Lic. or Reg. No.

Authorized Representative Signature Date

Name of Person Sealing Well or Boring

ATTACHMENT 4 - TABLE 1

MONITORING WELL CONSTRUCTION SUMMARY
(elevations are in feet above mean sea level)

Former Dry Cleaners
219 First Avenue SW
Rochester, Minnesota

Monitoring Well	Date Installed	Date Abandoned	Actual Top of Casing Elevation[1]	Actual Ground Surface Elevation[1,2]	Actual Top of Seal Elevation[1]	Actual Top of Filter Pack Elevation[1]	Actual Top of Well Screen Elevation[1]	Actual Bottom of Well Screen Elevation[1]	Screen Interval (feet)	Actual Bottom of Well Elevation[1]	Actual Well Depth (feet)	MDH Completed Well Depth (feet)
Abandoned Wells												
MW-1	5/30/2000	8/3/2007	1004.46	1004.68	986.68	984.68	983.18	973.18	10	971.68	32.78	32.5
MW-2	8/10/2000	8/3/2007	1003.64	1003.68	993.68	992.68	989.68	979.68	10	972.68	30.96	24
MW-3	8/10/2000	8/3/2007	1002.38	1002.38	991.38	990.38	988.38	978.38	10	975.38	27	23
MW-4	8/10/2000	8/3/2007	1002.41	1002.28	992.28	991.28	989.28	979.28	10	978.78	23.63	24
MW-5	8/10/2000	8/3/2007	1004.28	1004.28	976.28	974.28	969.08	964.08	5	962.28	42	40
MW-6	1/2/2001	8/3/2007	1004.18	1004.28	938.28	936.28	934.28	929.28	5	929.28	74.9	78
MW-8	2/3/2001	11/11/2005	1012.25	1012.28	992.28	990.78	988.78	978.78	10	978.78	33.47	33.5
MW-9	2/3/2001	11/11/2005	1012.23	1012.28	977.78	975.28	971.28	966.28	5	965.28	46.95	47
MW-10	2/4/2001	11/11/2005	1016.71	1016.68	994.68	992.18	990.18	980.18	10	979.68	37.03	38
MW-11	2/4/2001	11/11/2005	1016.71	1016.68	974.18	971.68	969.68	964.68	5	964.68	52.03	52
MW-12	3/3/2001	6/23/2004	1001.96	1001.98	985.98	983.98	981.98	971.98	10	965.98	35.98	36
MW-13	3/3/2001	6/23/2004	1001.83	1001.88	965.88	963.88	961.88	956.88	5	955.88	45.95	47
VP-1	1/2/2001	8/3/2007	1004.68	1004.88	991.38	989.38	988.38	981.88	6.5	981.88	22.8	23
VP-2	1/3/2001	8/3/2007	1004.31	1004.39	990.89	988.89	987.89	981.39	6.5	981.39	22.92	23
VP-3	1/3/2001	8/3/2007	1003.88	1004.09	990.59	988.59	987.59	981.09	6.5	980.88	23	23
VP-4	5/8/2001	8/3/2007	1004.25	1004.41	998.41	996.41	987.91	981.91	6	981.91	22.34	22.5
VP-5	5/8/2001	8/3/2007	1003.29	1003.53	997.53	995.53	988.03	983.03	5	983.03	20.26	20.5
VP-6	5/8/2001	8/3/2007	1002.75	1003.04	997.04	995.04	987.54	982.54	5	982.54	20.21	20.5
VP-7	5/8/2001	8/3/2007	1003.83	1004.01	999.01	997.01	988.51	983.51	5	983.51	20.32	20.5
VP-8	5/8/2001	8/3/2007	1003.09	1003.38	997.18	995.18	987.68	982.68	5	982.68	20.41	20.5
RW-1	11/10/2005	8/3/2007	1004.18	1004.44	990.44	988.44	986.44	974.44	12	974.44	29.74	30
Proposed Wells												
MW-14	NA	NA	NA	989.5	989	984	983	973	10	971	18.5	NA
MW-15	NA	NA	NA	989.5	989	984	983	973	10	971	18.5	NA
MW-16	NA	NA	NA	989.5	989	984	983	973	10	971	18.5	NA
MW-17	NA	NA	NA	989.5	989	971	969	964	5	962	27.5	NA
MW-18	NA	NA	NA	989.5	989	936	934	929	5	929	60.5	NA
MW-19	NA	NA	NA	989.5	989	984	983	973	10	971	18.5	NA
MW-20	NA	NA	NA	989.5	989	984	983	973	10	971	18.5	NA
DPE-1	NA	NA	991.5	989.5	989.5	986	986	974	12	974	15.5	NA
DPE-2	NA	NA	991.5	989.5	989.5	986	986	974	12	974	15.5	NA
DPE-3	NA	NA	991.5	989.5	989.5	986	986	974	12	974	15.5	NA
DPE-4	NA	NA	991.5	989.5	989.5	986	986	974	12	974	15.5	NA
DPE-5	NA	NA	991.5	989.5	989.5	986	986	974	12	974	15.5	NA
DPE-6	NA	NA	991.5	989.5	989.5	986	986	974	12	974	15.5	NA
DPE-7	NA	NA	991.5	989.5	989.5	986	986	974	12	974	15.5	NA
DPE-8	NA	NA	991.5	989.5	989.5	986	986	974	12	974	15.5	NA
DPE-9	NA	NA	991.5	989.5	989.5	986	986	974	12	974	15.5	NA
DPE-10	NA	NA	991.5	989.5	989.5	986	986	974	12	974	15.5	NA

(1) = Actual benchmark elevation of 1003.18 feet at the top nut of the fire hydrant located on the east side of First Ave SW as surveyed by McGhie and Betts on 7/30/07. This benchmark elevation was verified by the City of Rochester's Public Works Department in 1992.

(2) = The Actual Ground Surface elevation represents the elevation of the basement level floor slab for all of the proposed wells.

NA: Not applicable.

Attachment 5

Jason Skramstad

From: Deneen, Jackie [Jackie.Deneen@state.mn.us]
Sent: Monday, July 30, 2007 3:01 PM
To: jskramstad@landmarkenv.com
Cc: dknott@ci.rochester.mn.us; nancy.burke@gpmlaw.com; khaberman@landmarkenv.com; Olson, Edward; Timm, Allan
Subject: City of Rochester ECP

Jason: Below are my commments on the ECP. The ECP is approved if the following revisions are incorporated.

I sent these comments to Ed Olson this morning but found out due to the rush nature of this approval, the RAP approval letter was sent on Friday 7/27/07 without my comments on the ECP.

If you would like a formal approval letter from me, please let me know. I do not remember receiving a copy of the ECP. Could you please have an official copy sent to me once the changes are incorporated.

Thank you,

Jackie Deneen
Asbestos Program Coordinator
jackie.deneen@pca.state.mn.us
Phone: 651/297-5847
Cell: 651/253-7879
Fax: 651/215-1593 or 651/297-8683

Comments on the 219 & 223 First Av SW, Rochester ECP.

Page 1, paragraph 2: Volume, Description, and Present Condition of the ACWM - "It is unknown . . . an asbestos certified personnel . . ." Personnel should be inspector.

Page 4, 5. Excavation, Loading, Transporting and Reconsoilidation - "The ACWM will be covered with soil or plastic at the end of the work day." Add: If stockpiling, ACWM will be placed on plastic or an impervious surface.

Are they removing all ACWM of-site or will there be reconsolidation of ACWM on site? If reconsolidation, how much will be left on-site? A deed restriction will be required if reconsolidation occurs.