ATTACHMENT 2

STATE OF MINNESOTA
COUNTY OF RAMSEY

MINNESOTA POLLUTION CONTROL AGENCY

In the Matter of the
3M Oakdale Disposal (aka Oakdale Dump) Site
Oakdale, Washington County, Minnesota
under the Minnesota Environmental
Response and Liability Act,
Minn. Stat. §§ 115B.01-115B.24

REQUEST FOR RESPONSE ACTION

To: 3M Company (3M) (formerly known as Minnesota Mining and Manufacturing)

I. NOTIFICATION OF OBLIGATION TO TAKE RESPONSE ACTION

A. This document is issued by the Minnesota Pollution Control Agency (MPCA) and constitutes a Request for Response Action (RFRA), as authorized by Minn. Stat. §§ 115B.17 and 115B.18.

B. YOU ARE HEREBY NOTIFIED that the MPCA has made the following determinations:

1. The 3M Oakdale Disposal Site (Site) located in Oakdale, Washington County, Minnesota, is the location of a release or threatened of hazardous substances or pollutants or contaminants and constitutes a facility[1] within the meaning of Minn. Stat. § 115B.02, subd. 5(3);

2. There have been one or more releases at or from the Site within the meaning of Minn. Stat. § 115B.02, subd. 15 and continue to be releases and threatened releases of hazardous substances or pollutants or contaminants;

3. The substances released are hazardous substances within the meaning of Minn. Stat. § 115B.02, subd. 8;

4. The releases and threatened releases are from one or more facilities;

5. With respect to these releases and threatened releases, 3M Company is a responsible person within the meaning of Minn. Stat. § 115B.03, subd. 1(2);

6. The actions requested in the RFRA are reasonable and necessary to protect the public health or welfare or the environment; and

[1] Terms used in the RFRA and the Exhibits to the RFRA are defined in Attachment III to the Board Item prepared for the issuance of the RFRA.

Exhibit 2301
State of Minnesota v. 3M Co.,
Court File No. 27-CV-10-28862

STATE_02339051

7. The schedule for beginning and completing the requested actions in this RFRA is reasonable.

C. Having made these determinations, the MPCA formally requests that 3M Company take the response actions described in Section III of this RFRA. A timetable for beginning and completing the actions is established in Section IV. The reasons for the requested actions are set out in Section II. Section V describes the intention of the MPCA to take action if 3M fails to take the requested response action within the timetable established in Section IV. Section V also describes the consequences of failure to satisfactorily respond to the RFRA. Cost reimbursement obligations are described in Section VI.

D. 3M must notify the MPCA staff in writing by May 15, 2007 of its intentions to undertake the response actions requested in the RFRA. Failure by 3M to notify the MPCA staff by May 15, 2007 of its intentions to undertake the response actions, may result in a determination by the MPCA under Minn. Stat. § 115B.17, subd. 1(a)(3) that the actions requested will not be taken in the manner and within the time requested.

Notification of the intent should be sent to Gary L. Krueger, Superfund and Emergency Response Section, Remediation Division, Minnesota Pollution Control Agency, 520 Lafayette Road, St. Paul, Minnesota, 55155, telephone number (651) 296-6139.

E. If 3M fails to take the requested actions in the manner and within the time set forth in this RFRA, the MPCA may proceed to make a Determination That Actions Will Not Be Taken in the Manner and Time Requested. Upon making such a determination, the MPCA may authorize litigation to require 3M to take necessary response actions and/or reimburse the state for costs incurred if the state elects to implement response actions. These steps are described more fully in Section V.

II. REASONS FOR THE REQUESTED ACTION

Samples of soil, ground water, surface water, sediment at the Site indicate that releases of perfluorochemicals (PFCs) constituting hazardous substances PFOA and PFOS, specifically perfluorooctanoic acid (PFOA) and perfluorooctanesulfanate (PFOS), have occurred at the Site. The Site meets the definition of a "facility" and is the source of releases or threatened releases of hazardous substances or pollutants or contaminants.

The 3M Oakdale Disposal Site has been the subject of previous environmental investigations and response actions to address releases and threatened releases of hazardous substances other than PFOA and PFOS. MPCA and 3M entered a Consent Order on July 26, 1983(amended on May 22, 1984) with respect to these releases and

threatened releases. Because MPCA had no knowledge of the release or threatened release of PFOA and PFOS at the time the Consent Order was entered, the Consent Order does not apply to releases or threatened releases of PFOA AND PFOS at the 3M Oakdale Disposal Site. At the request of MPCA staff, 3M has taken certain actions with respect to releases and threatened releases of PFOA AND PFOS at the Site since June 7,2004.

Additional investigation is needed to evaluate, select, design and implement additional response actions to address the release and threatened release of PFOA and PFOS at and from the Site. The requested actions set forth in Sections II and III will provide additional information necessary to fully evaluate, select and design appropriate response actions and will provide for the implementation of reasonable and necessary response actions to minimize, abate, control or prevent releases and threatened releases of PFOA and PFOS at the Site.

III. REQUESTED RESPONSE ACTIONS

The MPCA has determined (1) that the actions specified in this Section III constitute removal or remedial actions (response actions) within the meaning of Minn. Stat. § 115B.02, subds. 16, 17 and 18 and (2) that these response actions are reasonable and necessary to protect the public health, welfare or the environment. Consequently, the MPCA hereby formally requests that 3M Company take the response actions within the timetables established in Section IV.

The MPCA's purpose in issuing this RFRA is to expedite the implementation of response actions at the Site. The criteria for selecting the response actions to be implemented at the Site are specified in Parts IV.C. of Exhibit A to this RFRA.

All work plans, reports, or other documents to be submitted by 3M under this RFRA (submittals) are subject to review and approval by the MPCA in accordance with Exhibit A, Part IV.B and Exhibit B, Part V.A .

A. Remedial Investigations and Feasibility Studies

The purpose of a Remedial Investigation and Feasibility Study (RI/FS) is to provide sufficient information to understand the scope and extent of the releases and threatened releases at and from the Site and to evaluate the feasibility and effectiveness of alternative response actions to protect public health and welfare and the environment with respect to the releases and threatened releases. The requirements of the RI/FS are described in Exhibit A to this RFRA. Exhibit A is appended to and made an integral part of this RFRA

B. Response Action Design and Implementation Plans

The purpose of a Remedial Design and Remedial Action Plan (RD/RAP) is to provide a detailed design and an implementation plan for the selected response actions which, upon implementation, will protect the public health and welfare and the environment from the release and threatened release of hazardous substances or pollutants or contaminants associated with the Site. The requirements of the RD/RAP and response action implementation are described in Exhibit B to this RFRA. Exhibit B is appended to and made an integral part of this RFRA.

The response actions requested in this RFRA shall assure that public health is protected with respect to public and/or private drinking water supplies affected by releases of PFOA and PFOS from this Site, and include actions to prevent additional or future releases affecting drinking water supplies, and to provide alternate drinking water supplies or appropriate treatment of drinking water supplies to assure that drinking water affected by these releases meets relevant MDH health-based standards.

C. Reports

The MPCA Commissioner shall be provided with Quarterly progress reports due by the fifteenth day after the last month in each respective quarter. The progress reports shall describe activities conducted pursuant to this RFRA, and results of sample analyses, tests and other data gathered or received, during the preceding three months and activities planned for the next quarter.

Within thirty (30) calendar days of the effective date of this RFRA and quarterly thereafter unless otherwise advised by the Project Manager, 3M shall submit to the MPCA Commissioner a quarterly summary report detailing all activities conducted pursuant to this RFRA, and results of sample analyses, tests and other data gathered or received, during the preceding quarter and activities planned for the next or quarter.

The progress reports shall be addressed to:

Gary L. Krueger, Project Manager
Minnesota Pollution Control Agency
Superfund and Emergency Response Section
Remediation Division
St. Paul, Minnesota 55155

D. Data and Document Availability and Retention

3M shall permit the MPCA staff and/or its authorized representatives to inspect and copy all sampling, testing, monitoring, or other data transmitted to or generated by 3M pertaining to work undertaken pursuant to this RFRA. 3M shall

allow duplicate/split samples to be collected by the MPCA staff and/or its authorized representatives, of any samples collected by 3M pursuant to this RFRA. 3M shall maintain a central repository of the data, reports and other documents prepared pursuant to this RFRA. All data, reports and other documents prepared pursuant to this RFRA or related to the release or threatened release of PFCs at or from the Site shall be preserved by 3M until 3M is notified otherwise by the MPCA.

E. Actions to Address Other PFCs

If, during implementation of response actions pursuant to this RFRA, the Commissioner, after consultation with MDH, believes that a release or threatened release of any PFC other than PFOA and PFOS (including a release of multiple PFCs), at or from the Site meets the requirements for taking action under MERLA, the Commissioner will notify 3M of his intent to amend the RFRA to address the release or threatened release. The Commissioner will also give notice to the Board and to any persons who have requested notice of MPCA actions regarding the Site. The Commissioner will provide a reasonable period for comment on the proposed RFRA amendment. After considering any timely comments, and unless the matter has been referred to the Board for a decision, the Commissioner may amend the RFRA to address the release or threatened release.

IV. TIMETABLE FOR COMPLETING THE REQUESTED ACTIONS

The MPCA has determined that the following timetable is necessary and reasonable. The timetable refers to specific elements of Exhibits A and B to this RFRA. Unless otherwise specified, "days" means calendar days.

Notice of Intent to Comply	May 15, 2007
Submit RI/FS Report (Complete requirements of Exhibit A)	June 15, 2007
Initiate Interim Response Actions (if appropriate)	Within 30 days of Commissioner's approval of interim response action plan
MPCA Commissioner Issues Minnesota Decision Document	
Retain Consultant to Complete the Requirements of Exhibit B	Within 30 days of Commissioner's approval of the FS Report
Submit RD/RA Work Plan	Within 90 days of Notification of MPCA Commissioner's approval of FS Report
Initiate RA	Within 30 days of Notification of MPCA Commissioner's approval of RD/RA Work Plan
Report Results of RA Implementation	Within 60 days of completion by the MPCA Commissioner that all of the RA objectives and cleanup levels have been met

3M shall promptly notify the MPCA of any anticipated or actual failure to comply with the dates or other terms of this RFRA. Such notice shall include the reasons for the noncompliance and steps proposed for a return to compliance or alternative actions proposed to comply with the intent of this RFRA. The MPCA may accept or modify the proposed alternative actions if the MPCA determines that such measures are adequate and that the need for the modification is not a result of failures within the control of 3M. The MPCA may grant extensions of the time schedules set forth in this RFRA in the event that 3M submits a written request for the extension before the deadline for which the extension is sought, and demonstrates to the MPCA good cause for granting the extension.

V. MPCA'S INTENTION TO TAKE ACTION AND CONSEQUENCES OF RESPONSIBLE PERSON'S FAILURE TO TAKE REQUESTED ACTION

A. YOU ARE HEREBY NOTIFIED that under the Minnesota Environmental Response and Liability Act, if a responsible person fails to take the actions requested in this RFRA in an adequate or timely fashion, the responsible person may be subject to the following actions:

1. the MPCA may undertake or complete the requested response actions and seek recovery from the responsible person for all costs associated with such action; or

2. the responsible person may be subject to an action to compel performance of the requested response actions or for injunctive relief to enjoin the release or threatened release.

In either case, a responsible person who fails to take the response actions requested by the MPCA in an adequate and timely fashion may be subject to civil penalties in an amount to be determined by the court of up to $20,000 per day for each day that the responsible person fails to take reasonable and necessary response actions.

B. YOU ARE HEREBY FURTHER NOTIFIED that if you fail to take the requested response actions, the MPCA intends to take one or more of the actions specified in Parts V. A.

VI. REQUIREMENT TO REIMBURSE THE MPCA

YOU ARE HEREBY FURTHER NOTIFIED that the responsible person, whether or not they complete the requested response action, may be required to:

A. reimburse the MPCA for all reasonable and necessary expenses it incurs, including all response costs, and administrative and legal expenses in the investigation and/or cleanup of the release; and

B. pay damages for any injury to or loss of natural resources resulting from the release of a hazardous substance, pollutant or contaminant.

IT IS SO ORDERED

_____
Commissioner Brad Moore
Chair, Citizens' Board
Minnesota Pollution Control Agency

_____
Date

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Exhibit A
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Exhibit A
REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

I. INTRODUCTION, PURPOSE, AND REQUIREMENTS

I.A. Introduction

Part III.A of the Request for Response Action (RFRA), to which this Exhibit is appended, requests the Responsible Party (RP) to conduct a Remedial Investigation/Feasibility Study (RI/FS) with respect to release(s) or threatened release(s) of hazardous substances or pollutants or contaminants at or from the Oakdale Dump site (Site). This Exhibit sets forth the requirements for completing the RI/FS and is appended to and made an integral part of the RFRA. Terms used in this Exhibit are defined in Attachment I to the RFRA.

I.B. Purpose

The purpose of conducting an RI/FS is to provide information necessary to enable the Minnesota Pollution Control Agency (MPCA) Commissioner to select a final remedy for the Site.

In order to arrive at remedy selection in the most expedient manner, the RI and FS activities will be conducted concurrently. The RI/FS Work Plan shall propose:

- the RI activities; and
- a list of possible remedial technology types.

The RI Report shall:

- report the results of the RI; and
- document the development and screening of possible response action alternatives.

The FS Report shall present:

- the results of treatability studies; and
- the Detailed Analysis Report (DAR).

I.B.1. Remedial Investigation. The RI activities will (1) provide for the complete characterization of the release(s) or threatened release(s) of hazardous substances or pollutants or contaminants at or from the Site and the actual or potential hazard the release(s) or threatened release(s) pose to public health and welfare, and the environment; (2) produce sufficient data and information to allow the RP to submit the RI and FS reports (Part III.E and III.F); and (3) produce data of sufficient quantity and adequate technical content to assess the possible alternative response actions during the FS.

I.B.2. Feasibility Study. The FS activities consist of developing a list of technology types, development and screening of possible response action alternatives, preparing and conducting treatability studies, and conducting a detailed analysis of evaluated alternatives. The MPCA Commissioner will review the FS Report and select the final response action(s) using the Selection of Remedy Criteria set forth in Part IV.C. of this Exhibit.

I.C. **Requirements**

The RI/FS shall be conducted according to the provisions of this Exhibit. The United States Environmental Protection Agency (USEPA) Guidance for Conducting Remedial Investigations and Feasibility Studies under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (October 1988 Interim Final) will provide the RP with specific guidance for completing the actions required under this Exhibit to the extent that this guidance is consistent with the requirements of this Exhibit. The sampling and quality assurance activities (Part III.C.3) shall be consistent with the requirements of the USEPA Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans (QAMS-005/80). Risk assessments (i.e., evaluation, quantitation, tabulation of results, and mechanics of presentation) performed under this Exhibit (Part III.C.6.) shall be based on appropriate MPCA requirements, USEPA's "The Risk Assessment Guidelines of 1986" (EPA/600/8-87/045), "Risk Assessment Guidance for Superfund, Volume 1, Human Health Evaluation Manual (Pt. A, December 1989, Interim Final) and the USEPA Risk Assessment Guidance for Superfund, Vol. 2, Environmental Evaluation Manual (March 1989, Interim Final).

At a minimum, the Site Security and Safety Plan (Part III.C.8) shall incorporate and be consistent with the requirements of:

- OSHA requirements 29 CFR Part 1910.120, Hazardous Waste Operations and Emergency Response;
- OSHA requirements 29 CFR Part 1910 (General Industry Standards) and 1926 (Construction Industry Standards;
- Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, NIOSH/OSHA/USCG/EPA, DHHS (NIOSH) Publication Number 85-115, October 1985.

As new versions or future revisions of the documents referenced in this section become available to the public, the latest version of each document shall supersede all previous versions of that document and shall be used for conducting the RI/FS.

II. **RETAIN CONSULTANT**

Within thirty (30) days of the effective date of the RFRA, the RP shall retain a consultant qualified to undertake and complete the requirements of this Exhibit and shall notify the MPCA Project Manager of the name of that consultant.

III. **REMEDIAL INVESTIGATION AND FEASIBILITY STUDY**

III.A. **RI/FS Objectives**

The objectives of the RI/FS are to:

- identify all sources of contamination;
- evaluate the nature and extent of soil, sediment, surface water, ground water, and air contamination at the Site and in any adjacent areas affected by contamination at or from the Site;
- identify all existing and potential migration characteristics and pathways for the hazardous substances or pollutants or contaminants identified at the Site, including the direction, rate, and dispersion of contaminant migration;

- identify alternative response actions and evaluate the feasibility and effectiveness of implementing those alternative response actions to prevent, minimize, or eliminate release(s) or threatened release(s) of hazardous substances or pollutants or contaminants at or from the Site; and
- collect and evaluate the information necessary to prepare a remedial design/response action plan in accordance with Exhibit B to the RFRA.

III.B. RI/FS Work Plan Submittal

Within ninety (90) days of the effective date of the RFRA, the RP shall submit to the MPCA Commissioner for approval pursuant to Part IV.B. and IV.B.1. of this Exhibit, a proposed RI/FS Work Plan and implementation schedule which details all of the activities necessary to complete the RI/FS. The proposed RI/FS Work Plan shall be prepared to enable the RP to meet the RI/FS Objectives (Part III.A) and shall, at a minimum, address all of the elements described in the RI/FS Work Plan Contents (Part III.C.).

III.C. RI/FS Work Plan Contents

The proposed RI/FS Work Plan shall address, at a minimum, each of the following elements:

III.C.1. Project Management. A Project Management section of the RI/FS Work Plan shall describe how the RI/FS will be managed by the RP and its contractors, subcontractors, and consultants. This section shall include an organization chart with the names and titles of key personnel and a description of their individual responsibilities.

III.C.2. Background Evaluation. The RI/FS Work Plan shall include a Background Evaluation that includes these sections: Operational History, Topographic Survey, History of Site Assessment Work and Remedial or Removal Actions, and Identification of Data Gaps.

III.C.2.a. Operational History of The Site. This section shall include a detailed explanation of the operational history of the Site (i.e., all past facilities and a description of their specific operations), including history of property ownership boundaries, and pertinent area and boundary features of the Site. In addition, this section shall include the following detailed information related to the release(s) or threatened release(s) of hazardous substances or pollutants or contaminants at the Site:

- a list of the hazardous substances or pollutants or contaminants that have been stored, used, treated, or disposed of on-Site and their estimated volumes, concentrations, and characteristics;
- a description of what, where, when, how and by whom hazardous substances or pollutants or contaminants were released during the operation of all facilities of record at the Site (e.g., Provide an explanation of how the Site or a specific area became contaminated.);
- a description of contaminant source areas and facilities which release or threaten the release of hazardous substances or pollutants or contaminants to soil, sediment, surface water, ground water, or air;

- a Site map delineating each area where such hazardous substances or pollutants or contaminants were disposed, treated, stored, transferred, handled, or used;
- a description of all industrial processes which are or were related to the use or generation of each hazardous substance or pollutant or contaminant; and
- a description of past disposal practices for hazardous substances or pollutants or contaminants.

Any historical research needs that have not been met by file review may be met by conducting employee interviews, reviews of the RP's records, and aerial photograph investigations.

III.C.2.b. Topographic Survey. This section shall include a description of the general physiography of the Site and surrounding area and one (1) Site map using a one (1) inch = 1000 feet scale and ten (10) foot contour interval.

Additional maps for each identifiable contaminant source area shall be provided using a one (1) inch = 50 feet scale and a two (2) foot contour interval. Surface water features, drainage direction, buildings, process areas, storage tanks, well locations, forested areas, utilities, paved areas, easements, rights-of-way, pipelines (surface and subsurface), landfills, borrow pits, debris piles, raw material piles, and impoundments shall be shown. The maps shall be of sufficient detail and accuracy to locate all current or proposed future work at the Site.

III.C.2.c. History of Site Assessment Work and Remedial or Removal Actions. This section shall include a history of all previous investigation(s) and response action(s) conducted at the Site including:

- a detailed description of regional and local hydrogeology and geology based on published literature and available technical information. Cross Sections and maps shall be included. Include the type and extent of surface soils as presented in the Soil Conservation Service soil surveys;
- a summary of all soil, surface water, ground water, and air assessment work completed to date, including contaminant source area identification, data reduction and interpretation, and the QA/QC procedures which were followed;
- a description of the nature and extent of the release(s) and/or threatened release(s), including a summary of actual and potential on-Site and off-Site health and/or environmental effects; and
- a summary of any previous remedial or removal actions conducted at the Site. This summary shall include cleanup activities and any related field inspections, sampling surveys, or other related;
- technical investigations.

III.C.2.d. Identification of Data Gaps. Gaps in information (data gaps) necessary to fulfill the RI/FS Objectives (Part III.A) shall be identified and recommendations shall be made for additional RI work necessary to meet the RI/FS Objectives and produce sufficient information to support the screening and detailed analysis of response action alternatives in the RI/FS. For each data gap identified, the RP shall provide a list and description of research and field activities necessary to address that data gap.

III.C.3. Sampling and Investigations. The RI/FS Work Plan shall propose activities and methodologies necessary to conduct the investigations specified in Parts III.C.3.c, d, e and f, III.C.6. and propose the plans specified in Parts III.C.3.a and b.

III.C.3.a. Sampling and Analysis Plan. A comprehensive sampling and analysis plan shall be proposed for the investigations required under Parts III.C.3.c, d, e, and f, and III.C.6 below. This plan shall include:

- objectives of the sampling investigation;
- criteria for sampling location selection;
- a map showing all locations that will be sampled;
- a description of the types of samples which will be collected;
- a description of the depth/frequency of sampling at each location;
- a proposed sampling schedule;
- identification of all chemical parameters to be analyzed (analytes), selection rationale, and a corresponding list of chemical analytical methodologies (including USEPA or Standard Method numbers and detection limits) to be performed. Prior to determining a final analyte list, analytes of concern should be separated into carcinogens and non-carcinogens. In addition, representative ground water samples shall be analyzed to identify natural chemical constituents that may affect various treatment methods or that may identify upgradient sources of contamination;
- abiotic and biotic environmental sampling shall be proposed to complete the assessment process required under Part III.C.6. The technical specifications and procedures for soil sampling methods, drilling methods, borehole and surface geophysical methods, and monitoring well and piezometer installations. ASTM procedures shall be used and referenced where appropriate and available;
- provisions for obtaining access to and obtaining samples from the Site and other affected properties (where appropriate);
- a description of quality assurance/quality control procedures for the collection, identification, preservation, holding times, and transportation of samples; type and volume of sample containers;
- the calibration and maintenance of field instruments; decontamination of sampling equipment; and the processing, verification, storage, calculations and statistics, and reporting of field data including field chain-of-custody procedures, identification of qualified persons conducting the sampling, and identification of a laboratory meeting the requirements of Part III.C.3.b.; and
- a description of any computer models to be employed in data analysis. Model descriptions shall include capabilities and limitations, all assumptions or approximations that will be made in calibrating and using the model, specific objectives to be achieved with the model, and justification for use of the model method including a discussion of why the model is the preferred model or method for meeting the objectives stated in the RI/FS Work Plan. The quantities or values that are desired from the model that are not confirmed by direct measurement shall be identified and the sensitivity of the model results to input parameters discussed. All data and programming including any proprietary programs shall be made available to the MPCA staff upon request.

III.C.3.b. Laboratory QA/QC Plan. The RI/FS Work Plan shall include a laboratory QA/QC plan which shall consist of the following sections:

- identification of laboratories performing analysis;
- description of laboratory sample chain of custody procedures;
- description of calibration procedures and frequency;
- description of analytical standard operating procedures;
- description of data reduction, validation, and reporting procedures;
- description of internal quality control checks;

- description of performance and system audits;
- description of preventative maintenance procedures;
- description of specific procedures for routine assessment of data precision, accuracy, completeness, and any necessary corrective action; and
- description of quality assurance reports to management.

Refer to EPA QA/QC guidance, which is available through the internet, at http://es.epa.gov/ncer/guidance/qa.html

III.C.3.c Geologic Investigation. This section of the RI/FS Work Plan shall provide a description of the proposed activities which will be undertaken to characterize the geology and contaminant distribution at the Site and other affected properties. The geologic investigation shall be conducted in areas of known and suspected disposal and in areas where ground water contamination exists and no known or suspected contaminant source area has been identified. This section shall include the following:

- a proposal to define the stratigraphy of the consolidated and unconsolidated deposits including the identification of high or low permeability lenses of material in the unsaturated (vadose) zone which may affect contaminant migration or the attenuation of contaminants. This proposal shall also include the extent and type of lithologies of respective consolidated units and unconsolidated materials including relative amounts of organic matter, gravel, sand, silt, and clay according to ASTM soils classification scheme or other acceptable standard procedures;
- proposed tests to define the physical and chemical properties which affect the movement or attenuation of contaminants in the stratigraphic units identified above. These properties include: density, organic matter content, cation exchange capacity, percent clay content, vertical hydraulic conductivity, total porosity, effective porosity, and adsorption potential (Kd). See the soil cleanup guidance for additional parameters.
- proposed methods to define the nature and extent of contamination in the vadose zone;
- a proposal to identify areas disturbed by excavations or other activities that may be routes of contaminant migration (e.g., buried pipes, utility corridors, fill areas, tank basins); and
- a proposal to identify ambient concentrations of analytes in the soil.

III.C.3.d. Hydrogeologic Investigation. This section of the proposed RI/FS Work Plan shall provide a description of activities to be undertaken to characterize the local and regional hydrogeology and the contaminant distribution in the ground water at the Site and other affected properties. This section shall include the following:

- a proposal to identify Quaternary (glacial) and bedrock aquifers, aquitards, and perched water zones;
- a proposal for the installation and development of ground water monitoring wells and/or piezometers or other devices needed to clearly define ground water flow conditions in the glacial and bedrock aquifers, aquitards, and perched water zones. All wells shall be surveyed to the National Geodetic Vertical Datum reference elevation, and procedures shall be specified for measuring water elevations in all wells to the nearest hundredth of a foot;
- a proposal for the installation of ground water monitoring wells which shall be used to define ground water quality upgradient, within, and downgradient of suspected and/or identified contaminant source areas and at the interface between ground water and surface water;

- a proposal for a ground water quality monitoring program to be conducted to define the nature and extent of ground water contamination at the Site and other affected properties. Municipal, industrial, agricultural, domestic and monitoring wells, and springs shall be considered for inclusion in the monitoring program. The monitoring program shall have a minimum frequency of quarterly sampling with water level measurements;
- proposed tests (e.g., slug and/or pumping tests to determine the hydraulic properties, including horizontal hydraulic conductivity and secondary porosity, of aquifers and aquitards at the Site and other affected properties) which shall define ground water flow relationships (directions, gradients, and velocities for both vertical and horizontal flow components) including potential aquifer interconnections, recharge areas, discharge areas, and ground water interactions with surface water. In addition, this section shall propose how the flow relationships will be evaluated with respect to contaminant distribution and the potential future movement of contaminants;
- a proposal to define ground water use(s) and the potential effect water use(s) may have on contaminant movement in both horizontal and vertical directions. Include with this proposal an inventory map showing all active, unused, and abandoned municipal, industrial, agricultural, domestic and monitoring wells, and springs within a one mile radius of the Site, and of high capacity wells and municipal water supply wells within a three mile radius of the Site; and
- a description of visual aids which will be used to present, in the RI Report, the hydrogeologic and hydrogeochemical data gathered during the Hydrogeologic Investigation (e.g., cross sections, piezometric maps, isoconcentration maps, graphical methods, and tables).

III.C.3.e. Surface Water Investigation. This section of the RI/FS Work Plan shall identify all surface water bodies within a one mile radius of the Site including rivers, lakes, ponds, wetlands, bogs, calcareous fens, low-flow streams, creeks, springs, and named and unnamed ditches. Both perennial and intermittent surface water features shall be identified. A map showing the locations of all identified surface water bodies and the location of known or suspected releases of contaminants from the Site to surface water bodies shall be included. This section shall include a proposal to evaluate each surface water body identified, evaluate its potential to be impacted by Site contaminants through releases via ground water, surface run-off, drainage, airborne deposition, and other possible pathways. This proposal shall include a plan to identify the benthic sediments and benthic and other aquatic community conditions underlying and within surface water upgradient, adjacent to, and downgradient of the contaminant source area. In addition, methodologies shall be proposed to determine the mass loading of contaminants to the surface water bodies.

The water use classification for the identified surface water body or bodies, in accordance with Minn. R. ch. 7050 and the wetlands classification in accordance with Minn. Stat. §§ 103G.005, subds. 15 and 18 and 103G.201 (1988), shall be included. Identification of the water use characteristics (e.g., agricultural, recreational, and private or municipal water supply) of the identified surface water bodies shall also be included.

III.C.3.f. Air Investigation: This section of the RI/FS Work Plan shall propose methodologies for investigations to determine the nature and extent of contaminants that are or may become airborne (e.g., vapors, gases, mists, or particulates) through either natural phenomenon or as a result of activities at the Site.

III.C.4. List of Possible Technology Types and Proposed Treatability Studies. The RI/FS Work Plan shall include a comprehensive list of technology types that may be applicable to the release(s) or threatened release(s) at or from the Site. This list shall be developed considering the Remedy Selection Criteria (Part IV.C.). This list shall include: 1) technology types that prevent or eliminate the release(s) or threatened release(s) by completely destroying, detoxifying, or immobilizing hazardous substances or pollutants or contaminants and leave materials on-Site that require no long-term management; 2) technology types that prevent or minimize the release(s) or threatened release(s) by treatment process options that reduce the toxicity, mobility, or volume of the hazardous substances or pollutants or contaminants; 3) technology types that control the threats posed by the release(s) or threatened release(s) of hazardous substances or pollutants or contaminants by containment; and 4) a general description of the treatability studies necessary to evaluate the respective technology types identified under 1, 2 or 3 above. At a minimum, excavation and capping remedies for soils and activated carbon or anionic resin filtration remedies for ground water shall be considered.

III.C.5. Record Retention. The RI/FS Work Plan shall provide a description of how the data obtained pursuant to this Exhibit will be managed and preserved by the RP in accordance with Part II.D of the RFRA.

III.C.6. Risk Assessment[1]. The RI/FS Work Plan shall provide a detailed description of activities that will be undertaken to conduct separate ecological and human health Baseline Risk Assessments. Ecological and human health Baseline Risk Assessments are evaluations of the actual and potential threat to public health and welfare, and the environment posed by the release(s) or threatened release(s) of hazardous substances or pollutants or contaminants, in the absence of any remedial action.

The risk assessment activities shall be conducted so as to generate the information necessary to meet the reporting requirements of the Baseline Risk Assessment as specified in Part III.E.2.

Formats, technology, and mathematical symbols used in the Baseline Risk Assessments shall correspond as closely as possible to those presented in USEPA's Superfund risk assessment guidance referred to under Part I.C. Any alternative formats, technology, mathematical models shall be proposed in the RI/FS Work Plan.

III.C.7. Interim Response Actions. The RI/FS Work Plan shall propose any Interim Response Action (IRA) that can be implemented prior to completion of the RI/FS to stabilize, contain, and/or mitigate any release(s) or threatened release(s) of hazardous substances or pollutants or contaminants, which is reasonable and necessary to protect public health or welfare, or the environment. At a minimum, the RP shall propose to conduct an IRA for the contaminated soils in the former disposal areas. The design for any proposed IRA shall be consistent with the Remedial Design (Exhibit B, Part III.A.).

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[1] **An RP lacking significant risk assessment experience should be prepared to subcontract such work to qualified organization. The Baseline Risk Assessment shall be thoroughly reviewed by a technical editor to ensure that the text will be understandable by the MPCA technical staff, the MPCA Board, and the interested public.**

III.C.8. Site Security and Safety Plan. A Site-specific security and safety plan shall be prepared as a separate part of the RI/FS Work Plan, describing all measures including contingency plans and Site access restrictions which will be implemented during field activities to (1) ensure protection of public health and welfare, and the environment and (2) protect the health and safety of personnel involved in the RI/FS. These measures should consider the recommendations in the April 1989 Health Assessment and February 1993 Site Update, prepared by the Agency for Toxic Substances and Disease Registry, even though these documents did not identify perfluorochemicals as contaminants of concern.

III.C.9. Community Relations. The RI/FS Work Plan shall include a community relations section providing procedures for (1) informing local residents, municipalities, environmental groups, and interested parties about activities at the Site; (2) responding to inquiries from concerned citizens; and (3) cooperation with the MPCA Community Relations efforts. Refer to the MPCA community relations guidance document, entitled "Community Involvement in Risk Based Decision Making", located on the MPCA web site at http://www.pca.state.mn.us/cleanup/pubs/coor9_98.pdf.

III.C.10. Schedule. The RI/FS Work Plan shall propose a schedule that provides specific time frames and dates for completion of each activity and report conducted or submitted under the RI/FS Work Plan. The proposed schedule shall reflect the timelines specified in Part III of the RFRA, for conducting the RI and FS activities.

III.D. RI/FS Work Plan Implementation

Within thirty (30) days of the MPCA Commissioner approval of the RI/FS Work Plan, the RP shall initiate the RI and development and screening of response action alternatives. The RP shall complete the RI with one hundred fifty (150) days of initiating the RI activities. The RI/FS shall be conducted in accordance with all applicable federal, state, and local laws, rules, regulations, and ordinances including but not limited to Minn. Stat. ch. 1031 and Minn. R. ch. 4725 for the installation of any ground water monitoring wells.

Any necessary additional RI activities not included in RI/FS Work Plan shall be identified and proposed in the quarterly reports submitted pursuant to Part II.C of the RFRA. The impact of the additional RI activities on the List of Possible Technology Types and Proposed Treatability Studies (Part III.C.4) shall also be described in the quarterly reports. If any additional RI activities will adversely affect work scheduled through the end of the upcoming month or will require significant revisions to the approved RI/FS Work Plan, the RP shall notify the MPCA Project Manager immediately of the situation followed by a written explanation within ten (10) days of the initial notification.

III.E. Remedial Investigation Report

Within sixty (60) days after completion of the RI, an RI Report detailing: (1) the data and results of the RI; (2) baseline risk assessment; and (3) screening of possible response action alternatives shall be prepared and submitted to the MPCA Commissioner. The RI Report shall organize and present all data generated as a result of implementation of the approved RI/FS Work Plan including, at a minimum, analytical results, assessment of completion of QA objectives, boring logs, field data sheets, and test results including data reduction and interpretation of all results. Further, the RI Report shall include:

III.E.1. Nature and Extent of the Release or Threatened Release. The RI Report shall include a description of the following:

- the nature and extent of hazardous substances or pollutants or contaminants released or threatened to be released to the soils, surface water, sediments, ground water, and air;
- the contaminant fate and migration pathways within each media;
- an evaluation of the reliability, and accuracy of the results of any computer models employed for data interpretation.

III.E.2. Baseline Risk Assessment. The results of two Baseline Risk Assessments, one addressing human health risks and one addressing ecological risks (Part III.C.6.), shall be reported as separate chapters in the RI Report.

Each chapter of the Baseline Risk Assessment shall include an executive summary written in layman's terms. A narrated videotape walk-through of the Site and surrounding areas shall be included to highlight information presented in the Baseline Risk Assessment text.

The risk assessment reports shall provide:

III.E.2.a. Data Evaluation. An evaluation of the results of the RI showing the actual and projected concentrations of hazardous substances, pollutants or contaminants present in relevant media (e.g., soil, surface water, ground water, air, sediment, and biota).

III.E.2.b. Toxicity Assessment. An identification of the hazard and toxicological properties of each contaminant identified through sampling and investigations. A comparison between the list of contaminants known to have been deposited on the Site versus those found through analyses. Identification of the chemical specific Applicable or Relevant and Appropriate Requirements (ARARs) for hazardous substances, or pollutants or contaminants identified at the Site.

III.E.2.c. Exposure Assessment. A comprehensive exposure pathways table. An inclusion/exclusion analysis and supporting rationale shall be included for each pathway. Following the inclusion/exclusion analysis, a determination of the extent and likelihood of exposure to contaminants at or from the Site. Identification of the potential receptor populations. Provide in-depth environmental fate and transport analysis for completed exposure pathways including physical and biological degradation processes and hydrogeologic conditions.

III.E.2.d. Risk Characterization. Both a maximum exposure case analysis and a Reasonable Maximum Exposure (RME) shall be provided for each pathway.

III.E.2.e. Uncertainty and Sensitivity Analysis. If there is or will be more than one analyte of concern associated with the Site, a chemical mixtures risk assessment addressing additivity and synergism shall be conducted and reported upon.

As part of the uncertainty analysis a Synergistics Effects Uncertainty Analysis (SEUA) shall be conducted and reported upon which assumes risks posed by conditions at the Site may be underestimated by an additivity based risk characterization. The SEUA shall provide modified remediation levels necessary to compensate for possible synergistic effects.

III.E.3. Development and Screening of Response Action Alternatives. The RI Report shall include a Development and Screening of Response Action Alternatives chapter that provides an evaluation of (a) each of the response action alternatives assembled from the List of Possible Technology Types and Proposed Treatability Studies (Part III.C.4), except for those technology types that have been eliminated from further consideration by the MPCA Commissioner in approving the RI/FS Work Plan, and (b) any other technology types identified by the RP or the MPCA Commissioner prior to approval of the RI Report.

The purpose of this chapter is to document the development of response action alternatives by combining or assembling technology types and their respective process options which will be applied to specific operable units or the Site as a whole. After the response action alternatives have been developed, they will be screened to assure that only those alternatives that will likely achieve the response action objectives and cleanup levels (Part IV.A.) will be retained for further analysis in the DAR.

III.E.3.a. Describe Process Options and Document the Screening of Response Action Alternatives. All development and screening decisions shall be thoroughly documented. This documentation shall include both written description and summary tables.

The development and screening of response action alternatives is accomplished by conducting the following tasks:

Development

From the list of technology types, as approved in the RI/FS Work Plan, develop the response action alternatives by describing the process options for each technology type and assemble the technology types with respective process options into response action alternatives. This step is accomplished by following the procedures outlined below:

- array the technology types and describe all possible process options for each technology type;
- for each process option, list the action and location specific ARARs;
- establish the volumes of contaminants and the volumes and types of contaminated media or areas of the Site to which the response action alternative will be applied (e.g. operable units); and
- assemble one or more technology type(s) and the respective process option into one response action alternative.

Screening

Once the response action alternatives have been developed, the response action alternatives are evaluated and screened using the Site Specific Response Action Objectives and Cleanup Levels (Part IV.A). Those response action alternatives that do not meet the Response Action Objectives and the Cleanup Levels are eliminated from further consideration. Response Action Alternatives that pass this screening are designated as "evaluated alternatives" and shall be further evaluated in the DAR.

The RP shall provide its recommendation and rationale regarding which response action alternatives should not be given further consideration for implementation at the Site.

III.E.3.b. Treatability Studies. This chapter of the RI Report shall provide:

- a description of all completed treatability studies and the results of any pilot studies, bench tests, or other activities that were performed to evaluate technology types and process options; and
- proposals, with time frames, for any additional treatability studies that are needed to further evaluate any response action alternatives that pass the screening and are to be further analyzed in the DAR.

III.F. Feasibility Study Report

Within ninety (90) days of the MPCA Commissioner's approval of the RI Report (Part IV.B.2), the RP shall prepare and submit to the MPCA Commissioner an FS Report consisting of the results of any treatability studies and a DAR. The DAR shall address all the evaluated alternatives specified by the MPCA Commissioner in approving or modifying the RI Report.

III.F.1. Treatability Studies. This section of the FS Report shall include the results of all completed and ongoing bench or pilot studies identified in the RI Report (Part III.E.3.b). In addition, for each of the technologies that have undergone treatability studies, the following factors shall be addressed and presented:

- effectiveness in treating the hazardous substances, pollutants or contaminants;
- reliability and past successes of the technology under similar conditions to those at the Site; and
- availability of the technology type and specific process option for implementation at the Site.

III.F.2. Detailed Analysis Report. This section of the FS Report shall analyze evaluated alternatives in detail considering the Remedy Selection Criteria (Part IV.C.). The DAR shall include the following elements for each evaluated alternative:

III.F.2.a. Detailed Description. Each evaluated alternative shall be described and individually assessed against the Balancing Criteria (Part IV.C.2.), namely, long term effectiveness, implementability, short term risks, total cost, and community acceptance. At a minimum, the detailed description for each evaluated alternative shall include:

- the operable unit to which the evaluated alternative would be applied;
- a description of the technology type and process option;
- a description of the engineering considerations required for implementation (e.g., for a pilot treatment facility, any additional studies that may be needed to proceed with final response action design);
- a description of operation, maintenance, and monitoring requirements;
- a description of off-Site disposal needs and transportation plans;
- a description of temporary storage requirements;
- a description of safety requirements associated with implementation, including both on-Site and off-Site health and safety considerations;
- a description of how any of the other evaluated alternatives could be combined with this evaluated alternative and how any of the combinations could best be implemented to produce significant cost savings and/or better achieve the Site Specific Response Action objectives and Cleanup Levels (Part IV.A);

- a description/review of on-Site or off-Site treatment or disposal facilities which could be utilized to ensure compliance with ARARs; and
- a description of the evaluated alternative response action dismantling to be conducted upon completion of response action.

III.F.2.b. Comparative Analysis of Evaluated Alternatives. Once the evaluated alternatives have been described and individually assessed against the Balancing Criteria (Part IV.C.2.) a comparative analysis shall be conducted to evaluate the relative performance of each evaluated alternative. The purpose of this comparative analysis is to identify the advantages and disadvantages of each evaluated alternative relative to one another with respect to each of the Balancing Criteria (Part IV.C.2), in order to facilitate selection of an appropriate remedy.

The comparative analysis shall include both a table and a narrative discussion describing the strengths and weaknesses of the evaluated alternatives relative to one another by using each specific component of each Balancing Criterion to evaluate the relative performance of each evaluated alternative. The narrative shall discuss how likely changes in variables could alter each evaluated alternative's relative performance.

This section shall be organized in the following manner; under each individual Balancing Criterion, discuss the evaluated alternative that performs the best overall under that Balancing Criterion. Other evaluated alternatives shall be discussed in the order in which they perform. For innovative technologies, their potential advantages in performance or cost and the degree of uncertainty in their expected performance, as compared with more demonstrated technologies, shall also be discussed.

The presentation of differences among the evaluated alternatives can be measured either qualitatively or quantitatively, as appropriate, and shall identify substantive differences (e.g., greater short-term risk concerns or greater cost). Quantitative information that was used to assess the evaluated alternatives (e.g., specific cost estimates, time until the Site-specific response action objectives and cleanup levels are met, and levels of residual contamination) shall be included in these discussions.

III.F.2.c. Recommended Evaluated Alternative(s) and Conceptual Design. The RP shall include in the DAR its recommendation of the evaluated alternative (or combination of evaluated alternatives) which should be implemented at the Site. The purpose of preparing a conceptual design is to illustrate all aspects of the RP-recommended evaluated alternative (or combination) in sufficient detail to enable the MPCA Commissioner to fully evaluate the RP-recommended evaluated alternative (or combination). The conceptual design for the RP-recommended evaluated alternative (or combination) shall include, but not be limited to, the elements listed below:

- a conceptual plan view drawing of the overall site, showing general locations for response action components;
- conceptual layouts (plan and cross sectional views where required) for the individual components to be installed, or actions to be implemented;
- conceptual design criteria and rationale;
- a description of types of equipment required, including approximate capacity, size, and materials of construction;
- process flow sheets, including chemical consumption estimates and a description of the process;

- an operational description of process units or other components;
- a description of unique structural concepts for components;
- a description of operation and maintenance requirements;
- a discussion of potential construction problems;
- right-of-way requirements;
- additional engineering data required to proceed with design;
- a discussion of permits that are required pursuant to environmental and other statutes, rules, and regulations;
- implementation cost estimate;
- annual O&M cost estimates;
- remedial action dismantling cost; and
- estimated implementation schedule.

IV. MPCA COMMISSIONER ACTIONS

IV.A. **Establishment of Site Specific Response Action Objectives and Cleanup Levels**. The MPCA Commissioner shall assess data as they are obtained through implementation of the RI. When sufficient data exist, the MPCA Commissioner shall specify and notify the RP of the Site-specific response action objectives and cleanup levels for the contaminants, environmental media of concern, and exposure pathways associated with the Site. The Site-specific objectives and cleanup levels shall be determined using ARARs, the "Compilation of Ground Water Rules and Regulations MPCA Superfund Program," dated March 27, 1991, Attachment I, the MPCA Risk-Based Site Evaluation Manual (available on the MPCA web site at http://www.pca.state.mn.us/cleanup/riskbasedoc.html), and documented case studies. The MPCA Commissioner will notify the RP of the Site-specific response action objectives and cleanup levels no later than the approval of the RI Report.

IV.B. **Review of Submittals**. The RP shall submit to the MPCA Commissioner all work plans, reports, or other documents (submittals) required by this Exhibit. The review and approval, modification, or rejection of submittals shall be in accordance with this Section and Part IV of the RFRA. Given the MPCA preference for implementing response actions in an expedient manner, the MPCA Commissioner may request implementation of an IRA at any point during the RI/FS.

IV.B.1. Approval of RI/FS Work Plan. The MPCA Commissioner shall review and approve, approve with modifications and/or a request for additional information, or reject the RI/FS Work Plan. Modifications by the MPCA Commissioner are final.

If the MPCA Commissioner approves the RI/FS Work Plan with a requirement to provide additional information, the Commissioner will: 1) specify the deficiencies in the RI/FS Work Plan that necessitate the need for additional information; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the additional information; and 4) specify the time frame for submission or conveyance of the requested additional information.

If the MPCA Commissioner rejects the RI/FS Work Plan, the Commissioner will: 1) specify the deficiencies in the RI/FS Work Plan that necessitate the rejection; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the information necessary to correct the deficiencies; and 4) specify the time frame for submission or conveyance of the revised RI/FS Work Plan.

As part of reviewing the RI/FS Work Plan, the MPCA Commissioner will eliminate from further consideration any possible technology types that are clearly not feasible or effective considering the Remedy Selection Criteria (Part IV.C.), and may identify other possible technology types and process options to be analyzed in the Development and Screening of Response Action Alternatives chapter (Part III.E.3) of the RI Report.

Site security and safety are the responsibility of the RP. The MPCA Commissioner may comment on the Site Security and Safety Plan but will neither approve nor disapprove that plan. Within ten (10) days of notification of the MPCA Commissioner's approval of the RI/FS Work Plan, the RP shall implement the Site Security and Safety Plan, taking into account the comments of the MPCA Commissioner.

IV.B.2. Approval of the RI Report. The MPCA Commissioner shall review and approve, approve with modifications and/or a request for additional information, or reject the RI Report. Modifications by the MPCA Commissioner are final.

If the MPCA Commissioner approves the RI Report with a requirement to provide additional information, the Commissioner will: 1) specify the deficiencies in the RI Report that necessitate the need for additional information; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the additional information; and 4) specify the time frame for submission or conveyance of the requested additional formation.

If the MPCA Commissioner rejects the RI Report, the Commissioner will: 1) specify the deficiencies in the RI Report that necessitate the rejection; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the information necessary to correct the deficiencies; and 4) specify the time frame for submission or conveyance of the revised RI Report.

IV.B.2.a. Evaluation of the Response Action Alternatives

The MPCA Commissioner shall, as part of reviewing the RI Report, evaluate the response action alternatives presented in the Development and Screening of Response Action Alternatives chapter (Part III.E.3). In determining whether to eliminate a particular response action alternative from further consideration, the MPCA Commissioner will determine whether that alternative meets the response action objectives and cleanup levels (Part IV.A) specified for the Site. In approving the RI Report the MPCA Commissioner will specify the evaluated alternatives to be addressed in the DAR.

IV.B.3. Approval of Feasibility Study Report. The MPCA Commissioner shall review and approve, approve with modifications and/or a request for additional information, or reject the FS Report. Modifications by the MPCA Commissioner are final.

If the MPCA Commissioner approves the FS Report with a requirement to provide additional information, the Commissioner will: 1) specify the deficiencies in the FS Report that necessitate the need for information necessary to correct the deficiencies; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the additional information; and 4) specify the time frame for submission or conveyance of the revised FS Report.

If the MPCA Commissioner rejects the FS Report, the Commissioner will: 1) specify the deficiencies in the FS Report that necessitate the rejection; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the information necessary to correct the deficiencies; and 4) specify the time frame for submission or conveyance of the revised FS Report.

IV.C. **Remedy Selection Criteria**. The purpose of implementing any response action is to protect the public health, welfare, and the environment by preventing, minimizing or eliminating the release(s), or threatened release(s) of hazardous substances, pollutants, or contaminants. Protection of public health, welfare, and the environment is best achieved by implementing a permanent remedy for the Site. An implemented remedy is considered permanent when it allows for unrestricted use of all land and natural resources impacted by the contaminants and, except for the purpose of treatment, does not involve removal of the contaminants to another site and minimizes exchange of the contaminants to other environmental media. Refer to the MPCA guidance document on remedy selection, located on the MPCA web site at http://www.pca.state.mn.us/cleanup/pubs/rem9_98.pdf

The MPCA Commissioner will apply the following threshold, balancing criteria and community acceptance to select a final response action from amongst evaluated alternatives.

IV.C.1. Threshold Criterion. Each response alternative or evaluated alternatives must meet the threshold criterion of providing overall protection for the public health and welfare, and the environment. This criterion is met if the response action alternative or the evaluated alternative will achieve the response action objectives and cleanup levels identified pursuant to the Establishment of Site Specific Response Action Objectives and Cleanup Levels (Part IV.A.) or provides for a permanent remedy.

IV.C.2. Balancing Criteria. Evaluated alternatives that meet the threshold criterion of overall protection of public health and welfare, and the environment shall be evaluated using the Balancing Criteria listed below. The evaluated alternative that provides the best balance among the Balancing Criteria in consideration of the site specific circumstances shall be selected as the final response action. The Balancing Criteria are listed in order of priority with long-term effectiveness being the most important.

- Long-Term Effectiveness

  Long-term effectiveness is the ability of an evaluated alternative to maintain the desired level of protection of public health and welfare, and the environment over time. Permanent remedies provide absolute long-term effectiveness. In the event a permanent remedy is not feasible, evaluated alternatives that significantly alter the hazardous substances or pollutants or contaminants to produce significant reductions in toxicity, mobility, or volume through treatment will be preferred.

In addition, the ability of the alternative to obtain and/or manage treatment residuals, minimize transfer of contaminants to another environmental media, and maintain established response action objectives and cleanup levels over time shall be a major consideration;

- Implementability
  The technical and administrative feasibility of implementing the evaluated alternative and the availability of goods and services needed to implement the evaluated alternative shall be considered;
- Short-Term Risks
  The short-term risks that may be posed as a result of implementing an evaluated alternative shall be considered and weighted against the ultimate long-term benefits of implementing that evaluated alternative;
- Total Costs
  The complete cost breakdown of implementation of the evaluated alternative including the projected costs of any long-term monitoring, operation and maintenance, and response action dismantling shall be considered. The future costs to replace the alternative or respond to a future release shall also be considered in this evaluation.

IV.C.3. Community Acceptance. The degree of community acceptance shall be determined for each evaluated alternative.

The community shall be consulted regularly in regard to the response action alternatives available for remediation at the Site. Efforts will be made to inform the community about the hazards of the Site and the advantages and disadvantages of various approaches to remediation and to gain an understanding of the concerns and preferences of the community with regard to the final remedy for the Site. The community's concerns and response action preferences will be considered when the MPCA Commissioner selects a remedy.

IV.D. Selection of Response Action and Record of Decision

The MPCA Commissioner will select the final response action(s) and will document this selection in a Record of Decision (ROD) or Minnesota Decision Document (MDD). The final RI and FS Reports, as approved by the MPCA Commissioner, will, with the MPCA Site file, form the basis for the selection of the final response action for the Site and will provide the information necessary to support the development of the ROD/MDD. The ROD/MDD will identify the selected evaluated alternative (or combination of evaluated alternatives) to be implemented by the RP pursuant to Exhibit B to the RFRA. The ROD/MDD shall be appended to and made an integral part of the RFRA.

EXHIBIT B
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Exhibit B

REMEDIAL DESIGN AND RESPONSE ACTION IMPLEMENTATION

I. INTRODUCTION

Part III.B. of the Request for Response Action (RFRA), to which this Exhibit is appended, requests the Responsible Party (RP) to prepare a Remedial Design/Response Action Plan (RD/RA Plan) and implement Response Actions (RAs) at the Site. This Exhibit sets forth the requirements for preparing the RD/RA Plan and implementing the RAs, which have been selected by the Minnesota Pollution Control Agency (MPCA) Commissioner pursuant to Part IV.D. of Exhibit A to the RFRA, and is appended to and made an integral part of the RFRA.

II. RETAIN CONSULTANT

The RP shall retain a consultant qualified to undertake and complete the requirements of this Exhibit. If the RP retains the same consultant used to complete Exhibit A to the RFRA, the RP shall proceed immediately with preparation of the RD/RA Plan. If the RP chooses to retain a different consultant, the RP shall retain the consultant and notify the MPCA project manager of the name of that consultant within thirty (30) days of notification of approval of the FS Report by the MPCA Commissioner.

III. REMEDIAL DESIGN/RESPONSE ACTION PLAN

III.A. RD/RA Plan Submittal

Within ninety (90) days of notification of approval of the FS Report by the MPCA Commissioner, the RP shall prepare and submit to the MPCA Commissioner for review and approval a RD/RA Plan which shall be based on the approved RI/FS reports and the Record of Decision (ROD) or Minnesota Decision Document (MDD) issued by the MPCA Commissioner under Exhibit A to the RFRA.

III.B. RD/RA Plan Contents

The purpose of the RD/RA Plan is to provide a detailed design, an implementation schedule, and a monitoring plan for the RAs specified in the ROD/MDD which, upon implementation, will protect the public health and welfare, and the environment from the release or threatened release of hazardous substances, pollutants or contaminants, at or from the Site.

The RD/RA Plan shall set forth in detail the steps necessary to implement the Site remedy specified in ROD/MDD. The RD/RA Plan shall include a restatement of the response action objectives and cleanup levels specified in the ROD/MDD. The RD/RA Plan shall include, at a minimum, the following:

III.B.1. Remedial Design. The purpose of the remedial design is to specify detailed methods and time schedules for the implementation of the RAs specified in the ROD/MDD. This section shall include, at a minimum, the following elements:

- design criteria and rationale;
- a plan view drawing of the overall Site, showing general locations for response action components;
- technical and operational plans and engineering designs for implementation of the response action including plan and cross sectional views for the individual components to be installed or actions to be implemented;
- a description of the types of equipment to be employed, including capacity, size, and materials or construction;
- an operational description of process units or other RA components;
- process flow sheets, including process material (e.g., chemical or activated carbon) consumption rates, and a description of the process;
- a discussion of potential construction problems and respective contingency plans;
- a schedule for implementing the construction phase;
- a Site-specific hazardous waste transportation plan (if necessary);
- the identity of all contractors, transporters, or other persons conducting removal or response actions at the Site;
- a description of any permits or licenses required to implement the RA;
- a description of the post RA operation and maintenance procedures and schedules; and
- a description of activities to be undertaken by the RPs during RA implementation to fulfill the requirements of Part III, Sections C.1. (Project Management), C.3. (Sampling and Investigations), C.5. (Record Retention), C.8. (Site Security and Safety Plan), and C.9. (Community Relations) of Exhibit A to the RFRA as they pertain to the removal or response actions and operation and maintenance activities.

III.B.2. RA Monitoring Plan. The RD/RA Plan shall propose an RA monitoring plan for the Site. The purpose of post-RA implementation monitoring is to determine the status and effectiveness of the implemented RAs. The RA monitoring plan shall, at a minimum, contain the following in order to determine that the cleanup levels specified in the ROD/MDD are achieved:

III.B.2.a. Environmental Media and Analytical Parameter List. The environmental media (soil, ground water, surface water, sediments, biota, and air) and a corresponding list of analytes to be monitored shall be proposed, along with the selection rationale, and a corresponding list of chemical analytical methodologies (including U.S. Environmental Protection Agency or Standard Method numbers and detection limits) to be performed.

III.B.2.b. Monitoring Facility Location and Design. The design and location of all monitoring facilities/locations shall be proposed.

III.B.2.c. Sampling Schedule. A sampling schedule for the analytical parameters proposed in the RA monitoring plan for all monitoring locations shall be proposed. Sampling shall, at a minimum, be conducted on a quarterly basis.

III.B.2.d. Reporting Plan. A schedule for reporting the results of long-term monitoring to the MPCA shall be proposed. The schedule shall, at a minimum, contain the following:

1. Quarterly Monitoring Reports. The RP shall submit quarterly analytical results to the MPCA Commissioner. The reporting schedule shall comply with Part II.C of the RFRA.

2. Annual Monitoring Reports. The RP shall submit an Annual Monitoring Report to the MPCA Commissioner on or before April 1, 2008, and each April 1st thereafter. Any remedial technology employed in implementation of the RD/RA Plan shall be left in place and operated by the RP until the MPCA Commissioner authorizes the RP in writing to discontinue, move, or modify some or all of the remedial technology. The RP may request discontinuation of the remedial technologies in the annual report, when the cleanup levels set forth in the ROD/MDD have been achieved. The RP shall move or modify the remedial technology when the movement or modifications, as approved by the MPCA Commissioner, may better achieve the remedial action objectives set forth in the ROD/MDD.

The Annual Monitoring Report shall contain the following:

- a Site map showing all monitoring locations;
- the results of all parameter analyses for the previous year;
- the results of all water level measurements for the previous year;
- regional and Site specific ground water piezometric maps for each aquifer including surface water elevations;
- cross section(s) indicating relative communication between aquifers;
- a map for each sampling event showing each monitoring location with contaminant concentrations and isoconcentration lines for selected parameters;
- graphs and tables illustrating the concentrations over time using data from each sampling event (these graphs and tables shall be cumulative showing parameter analyses for all previous years as well as the reporting year); and
- a sampling plan for the next year with an assessment of the monitoring parameters, sampling frequencies, and the need for the addition or deletion of monitoring locations and parameters.

III.C. RD/RA Plan Implementation

Within thirty (30) days of the MPCA Commissioner approval of the RD/RA plan, the RP shall initiate the RA. The purpose of RA implementation is to take those actions that will protect public health and welfare, and the environment, from the release or threatened release of hazardous substances or pollutants or contaminants at or from the Site.

The RD/RA Plan, as approved or modified by the MPCA Commissioner shall be implemented in accordance with the time schedules set forth in Part III of the RFRA and Part III.B. of this Exhibit. The implementation of RAs shall be conducted in accordance with all applicable federal and state ARARs, and local laws, rules, regulations, and ordinances.

During implementation of the RD/RA Plan, the MPCA Commissioner may specify such additions and/or revisions to the RD/RA Plan as the Commissioner deems necessary to protect public health and welfare, and the environment.

III.D. RA Implementation Report

Within sixty (60) days of the completion of implementation of the RAs specified in the approved RD/RA Plan, a RA Implementation Report which includes the following elements, shall be submitted to the MPCA Commissioner:

- the data and results of the RA implementation;
- the follow-up actions, if any, to be taken in the following one-year period;
- a certification that all work plans, specifications, and schedules have been implemented and completed in accordance with the RD/RA Plan as approved or modified by the MPCA Commissioner;
- discussion of difficulties encountered during the implementation that may alter and/or impair or otherwise reduce the effectiveness of the RA implementation to prevent, eliminate, or minimize the release or threatened release of hazardous substances or pollutants or contaminants, at or from the Site, or which may require unanticipated operational or maintenance actions to maintain the effectiveness of any of the implemented RAs; and
- a discussion of any necessary modifications to the operation and maintenance procedures as approved.

IV. REPORT ON COMPLETION OF RA

Within sixty (60) days of notification, by the MPCA Commissioner, that all Site-specific Response Action Objectives and Cleanup Levels (Exhibit A, Part IV.A.) have been met, a Report on Completion of RA, which includes the following elements, shall be submitted to the MPCA Commissioner.

- a summary of the response action objectives and cleanup levels and a history of how they were met;
- certification that all RAs have been properly dismantled, including supporting documentation (e.g., monitoring well sealing records);
- a summary of any ongoing institutional controls (e.g., deed restrictions);
- a final cost summary.

V. MPCA COMMISSIONER ACTIONS

The RP shall submit to the MPCA Commissioner all plans, reports, or other documents (submittals) required by this Exhibit. The review and approval, approval with modifications and/or a request for additional information, or rejection of submittals shall be in accordance with this section and Part IV of the RFRA. The Site Safety and Security Plan does not require MPCA Commissioner approval.

V.A. Approval Of The RD/RA Plan, RA Implementation Report, And Report On Completion Of RA

The MPCA Commissioner shall review and approve, approve with modifications and/or a request for additional information, or reject the RD/RA Plan, RA Implementation Report, and the Report on Completion of RA based on the requirements of Parts III.B, III.D, and IV respectively. Modifications by the MPCA Commissioner are final.

If the MPCA Commissioner approves the RD/RA Plan, RA Implementation Report, or the Report on Completion of RA with a requirement to provide additional information, the Commissioner will: 1) specify the deficiencies in the RD/RA Plan, RA Implementation Report, or the Report on Completion of RA that necessitate the need for additional information; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the additional information; and 4) specify the time frame for submission or conveyance of the requested additional information.

If the MPCA Commissioner rejects the RD/RA Plan, RA Implementation Report, or the Report on Completion of RA, the Commissioner will: 1) specify the deficiencies in the RD/RA Plan, RA Implementation Report, or Completion of RA Report that necessitate the rejection; 2) provide direction to address the deficiencies; 3) specify the manner in which the RP shall document or otherwise convey the information necessary to correct the deficiencies; and 4) specify the time frame for submission or conveyance of the information necessary to correct the deficiencies.