

NIROP FRIDLEY

**FEDERAL FACILITY AGREEMENT
AND
RECORD OF DECISION FOR
GROUNDWATER REMEDIATION**

FEDERAL FACILITY AGREEMENT UNDER CERCLA SECTION 120

BETWEEN

THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V

AND

THE UNITED STATES DEPARTMENT OF THE NAVY

AND

THE MINNESOTA POLLUTION CONTROL AGENCY

MARCH 1991

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V
AND THE MINNESOTA POLLUTION CONTROL
AGENCY
AND THE UNITED STATES DEPARTMENT OF THE NAVY

IN THE MATTER OF:)
THE U.S. DEPARTMENT OF THE NAVY) FEDERAL FACILITY
NAVAL INDUSTRIAL RESERVE) AGREEMENT UNDER
ORDNANCE PLANT) CERCLA SECTION 120
FRIDLEY, MINNESOTA)
ADMINISTRATIVE
DOCKET NUMBER:

Based on the information available to the Parties on the effective date of this Federal Facility Agreement (Agreement), and without trial or adjudication of any issues of fact or law, the Parties agree as follows:

Section I.

JURISDICTION

Each Party is entering into this Agreement pursuant to the following authorities:

(i) The U.S. Environmental Protection Agency (U.S. EPA), Region V, enters into those portions of this Agreement that relate to the Remedial Investigation/Feasibility Study (RI/FS) pursuant to Section 120(e)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499 (hereinafter jointly referred to as CERCLA), 42 U.S.C. Section 9620(e)(1), and the Resource Conservation and Recovery

Act (RCRA), 42 U.S.C. Section 6901 et seq. as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA), (hereinafter jointly referred to as RCRA) and Executive Order 12580;

(ii) U.S. EPA, Region V, enters into those portions of this Agreement that relate to Remedial Actions for Operable Units, and final Remedial Actions pursuant to Section 120(e)(2) of CERCLA, RCRA, and Executive Order 12580;

(iii) The United States Department of the Navy (U.S. Navy or Navy) enters into those portions of this Agreement that relate to the RI/FS pursuant to Section 120(e)(1) of CERCLA, 42 U.S.C. Section 120(e)(1), RCRA, Executive Order 12580, the National Environmental Policy Act, 42 U.S.C. Section 4321, and the Defense Environmental Restoration Program (DERP), 10 U.S.C. Section 2701 et seq.;

(iv) The U.S. Navy enters into those portions of this Agreement that relate to remedial actions for operable units and final remedial actions pursuant to Section 120(e)(2) of CERCLA, RCRA, Executive Order 12580 and the DERP;

(v) The Minnesota Pollution Control Agency (MPCA) enters into this Agreement pursuant to CERCLA Section 120 and 121, 42 U.S.C Section 9620 and 9621, RCRA, and Minnesota Statutes

Chapters 115, 115B, and 116, also known as Minnesota Environmental Response and Liability Act (MERLA).

Section II.

PURPOSE

2.1. The general purposes of this Agreement are to:

(A) Ensure that the environmental impacts associated with past and present activities at the Site are thoroughly investigated and appropriate response actions taken as necessary to protect the public health, welfare, and the environment;

(B) Establish a procedural framework and schedule for developing, implementing, and monitoring appropriate response actions at the Site in accordance with CERCLA, the National Contingency Plan, 40 CFR Part 300, Superfund guidance and policy, RCRA, and RCRA guidance and policy and applicable State law; and,

(C) Facilitate cooperation, exchange of information, and participation of the Parties in such actions.

2.2. Specifically, the purposes of this Agreement are to:

(A) Identify alternatives for Remedial Actions for Operable Units which are appropriate at the Site prior to the implementation of final Remedial Actions for the Site. Remedial Action alternatives for Operable Units shall be identified and proposed to the Parties as early as possible prior to formal

proposal of Remedial Action for Operable Units to U.S. EPA and the MPCA pursuant to CERCLA and applicable State law. This process is designed to promote cooperation among the Parties in identifying and selecting Remedial Action alternatives for Operable Units prior to selection of final Remedial Actions.

(B) Establish requirements for the performance of Remedial Investigation(s) for the Site to determine fully the nature and extent of the threat to the public health or welfare or the environment caused by the release and threatened release of hazardous substances, pollutants, or contaminants at the Site and to establish requirements for the performance of Feasibility Studies for the Site to identify, evaluate, and select alternatives for the appropriate remedial actions to prevent, mitigate, or abate the release or threatened release of hazardous substances, pollutants, or contaminants at the Site in accordance with CERCLA and applicable State law.

(C) Identify the nature, objective, and schedule of response actions to be taken at the Site. Response actions at the Site shall attain that degree of cleanup of hazardous substances, pollutants, or contaminants mandated by CERCLA and applicable State law.

(D) Implement the selected Remedial Actions for Operable Units and final Remedial Actions in accordance with

CERCLA and applicable State law and meet the requirements of Section 120(e)(2) of CERCLA, 42 U.S.C. Section 9620(e)(2) for a Federal Facility Agreement among the Parties.

(E) Ensure compliance, through this Agreement, with CERCLA, RCRA, and other Federal and State hazardous waste laws and regulations for matters covered herein.

(F) Coordinate response actions at the Site with the mission and support activities of NIROP Fridley.

(G) Expedite the cleanup process to the extent consistent with protection of human health and the environment.

(H) Provide the U.S. EPA and the MPCA involvement in the initiation, development, selection, and enforcement of remedial actions to be undertaken at the Site, including the review of all applicable data as it becomes available and the development of studies, reports, and action plans; and to identify and integrate Federal and State Applicable or Relevant and Appropriate Requirements (ARARs) into the remedial action process.

(I) Provide for operation and maintenance of any remedial action selected and implemented pursuant to this Agreement.

Section III.

PARTIES

3.1. The Parties to this Agreement are the United States Environmental Protection Agency (U.S. EPA), the Minnesota Pollution Control Agency (MPCA), and the United States Department of the Navy (U.S. Navy or Navy). The terms of this Agreement shall apply to and be binding upon the U.S. EPA, its employees, officers, successors, and assigns; the MPCA, its employees, officers, successors and assigns, and other Minnesota Executive Agencies as identified by the State in Attachment D; and the U.S. Navy, its employees, officers, successors, and assigns.

3.2. Notification of subsequent owners of NIROP Fridley, if any, shall be accomplished pursuant to Section XXXIV, Conveyance of Title, of this Agreement.

Section IV.

DEFINITIONS

The definitions provided in CERCLA and the NCP shall control the meaning of the terms used in this Agreement to the extent that they conflict with following:

A. "Agreement" shall refer to this document and shall include all Attachments to this document. All such Attachments shall be appended to and made a part of this Agreement.

B. "ARAR" shall mean Applicable or Relevant and Appropriate Requirements pursuant to Section 121 of the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. Section 9621, as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499.

C. "CERCLA" shall mean the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. Section 9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub. L. 99-499.

D. "Days" shall mean calendar days, unless business days are specified. Any Submittal, Written Notice of Position, or Written Statement of Dispute that under the terms of this Agreement would be due on a Saturday, Sunday, or Federal or State holiday shall be due on the following business day.

E. "Deadlines" shall mean dates by which draft primary documents are to be submitted to U.S. EPA and MPCA.

F. "Documents" shall mean any reports, writings, correspondence, and all other tangible things on which information has been stored which relates to this Agreement or to any activities to be undertaken relating to this Agreement.

G. "Feasibility Study (FS)" shall mean a study undertaken

by the Navy to develop and evaluate options for remedial action. The FS emphasizes data analysis and is generally performed concurrently and in an interactive fashion with the remedial investigation (RI), using data gathered during the RI. The RI data are used to define the objectives of the response action, to develop remedial action alternatives, and to undertake an initial screening and detailed analysis of the alternatives. The term also refers to a report that describes the results of the study.

H. "MERLA" shall mean the Minnesota Environmental Response and Liability Act, Minn. Stat. Ch. 115B.

I. "MPCA" shall mean the Minnesota Pollution Control Agency Commissioner, staff, and, where appropriate, employees of other Minnesota State Agencies. However, where the citizen board established by Minn. Stat. Section 116.02 is intended, it shall be designated as MPCA Board.

J. "National Contingency Plan (NCP)" shall mean the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300.

K. "NIROP" or "NIROP Fridley" shall mean that portion of the Naval Industrial Reserve Ordnance Plant, located in Anoka County, Minnesota, which is owned by the United States. The remainder of the plant is owned by the FMC Corporation, and is

the subject of a separate Consent Order between FMC Corporation and MPCA.

L. "Operable Unit" shall mean a discrete action that comprises an incremental step toward comprehensively addressing site problems. This discrete portion of a remedial response manages migration, or eliminates or mitigates a release, threat of a release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site. Operable units may address geographical portions of a site, specific site problems, or initial phases of an action, or may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site.

M. "Parties" shall mean the U.S. Navy, U.S. EPA, and MPCA.

N. "Remedial Action (RA)" shall mean actions consistent with permanent remedy to protect the public health, welfare, or the environment.

O. "Remedial Design (RD)" shall mean the technical analysis and procedures which follow the selection of remedy for a site and result in a detailed set of plans and specifications for implementation of the remedial action.

P. "Remedial Investigation" (RI)" shall mean a process undertaken by the Navy to determine the nature and extent of the problem presented by the release. The RI emphasizes data collection and site characterization, and is generally performed concurrently and in an interactive fashion with the feasibility study. The RI includes sampling and monitoring, as necessary, and includes the gathering of sufficient information to determine the necessity for remedial action and to support the evaluation of remedial alternatives.

Q. "Removal Action" or "Removal," shall mean the cleanup or removal of released hazardous substances from the environment; such actions as may be necessary taken in the event of the threat of release of hazardous substances into the environment; such action as may be necessary to monitor, assess, and evaluate the release or threat of release of hazardous substances; the disposal of removed material; or the taking of such other actions as may be necessary to prevent, minimize, or mitigate damage to the public health or welfare or to the environment, which may otherwise result from a release or threat of release.

R. "RCRA" shall mean the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901 et seq., as amended by the Hazardous and Solid Waste Amendments of 1984, Pub. L. 98-616.

S. "Record(s) of Decision (RODs)" shall be the public

documents that explain and set forth the selected remedy and the cleanup alternatives which will be implemented at the Site, and includes the bases for the selection of such remedy. The bases for the selection of the remedy include information and technical analysis generated during the RI/FS and consideration of public comments and community concerns.

T. "Response Action" means remove, removal, remedy, or remedial action.

U. "Schedule" or "Timetable" shall mean a collection of deadlines.

V. "Site" shall mean the Naval Industrial Reserve Ordnance Plant in Fridley, Minnesota (NIROP Fridley) and, for purposes of this Agreement only, includes any area outside or off of NIROP Fridley where a hazardous substance, pollutant, or contaminant has been deposited, stored, disposed of, or placed, or otherwise come to be located, as a result of migration of hazardous substances, pollutants, or contaminants from the property currently identified as NIROP Fridley.

W. "State" shall mean the State of Minnesota.

X. "Target Dates" shall mean dates for submittal of draft secondary documents. The purpose of the target dates are to

assist the Parties in meeting deadlines for submittal of draft primary documents. Target Dates are not enforceable and are not deadlines which may require extension.

Y. "Timetable" or "Schedule" shall mean a collection of deadlines.

Z. "U.S. EPA" shall mean the United States Environmental Protection Agency, its officers, and employees.

AA. "U.S. Navy" shall mean the U.S. Department of the Navy, including the Naval Facilities Engineering Command, Northern Division, and the NIROP Fridley, its officers, and employees, (and the Department of Defense (DOD) to the extent necessary to effectuate the appropriations and Congressional reporting requirements of Section XL, Funding).

BB. "Written Notice of Position" shall mean a written statement by a Party of its position with respect to any matter which any other Party may dispute pursuant to Section XV of this Agreement.

Section V.

STATUTORY COMPLIANCE/RCRA-CERCLA INTEGRATION

5.1 The Navy shall comply with closure requirements under the U.S. EPA-authorized Minnesota hazardous waste rules, Minn. Rules

ch. 7045, and the final permit for U.S. Navy/FMC Corporation/ Naval Industrial Reserve Ordnance Plant/Naval Systems Division Plant (MN3-170-022914), for soil only at Hazardous Waste Storage Area C. The remediation of soil at the NIROP Fridley exclusive of the soil at Hazardous Waste Storage Area C, and all groundwater remediation at the Site, inclusive of Hazardous Waste Storage Area C, shall comply with the requirements of CERCLA through this Agreement. Remediation of soil at Hazardous Waste Storage Area C only shall not be subject to this Agreement, including Section XIV, Consultation, or Section XV, Resolution of Disputes. The Navy and the U.S. EPA retain the right to resolve disputes under applicable federal and State law.

5.2. The Parties intend to integrate the U.S. Navy's CERCLA response obligations and RCRA corrective action obligations which relate to the release(s) and threatened release(s) of hazardous substances, hazardous wastes, pollutants, or contaminants covered by this Agreement into this comprehensive Agreement. Therefore, the Parties intend that activities covered by this Agreement will achieve compliance with CERCLA, 42 U.S.C. Section 9601 et seq.; satisfy the corrective action requirements of Sections 3004(u) and (v) of RCRA, 42 U.S.C. Section 6924(u) and (v), for a RCRA permit, and Section 3008(h), 42 U.S.C. Section 6928(h), for interim status facilities; and meet or exceed all applicable or relevant and appropriate Federal and State laws and regulations, to the extent required by Section 121 of CERCLA, 42 U.S.C.

Section 9621, and applicable State law.

5.3. Based upon the foregoing, the Parties intend that any remedial action selected, implemented, and completed under this Agreement will be protective of human health and the environment, such that remediation of releases covered by this Agreement shall obviate the need for further corrective actions under RCRA (i.e., no further corrective action shall be required). The Parties agree that with respect to releases of hazardous wastes covered by this Agreement, that are associated with the Site, RCRA, and Minn. Rules ch. 7045 shall be considered applicable or relevant and appropriate requirements pursuant to Section 121 of CERCLA, 42 U.S.C. Section 9621. Releases or other hazardous waste activities not covered by this Agreement remain subject to all applicable requirements under Federal and State environmental law.

5.4. The Parties recognize that the requirement to obtain permits for response actions undertaken pursuant to this Agreement shall be as provided for in CERCLA and the National Contingency Plan (NCP). The Parties further recognize that on-going hazardous waste management activities at the Site have required the issuance of permits under Federal and State laws, and may require the issuance of further permits. This Agreement does not affect the requirements, if any, to obtain such permits. However, if additional permits are issued to the U.S. Navy for

on-going hazardous waste management activities at the Site, the U.S. EPA and/or the State shall reference and incorporate any appropriate provisions, including appropriate schedules (and the provision for extension of such schedules), of this Agreement into such permit. With respect to those portions of this Agreement incorporated by reference into permits, the Parties intend that the judicial review of the incorporated portions shall, to the extent review is authorized by law, only occur under the provisions of CERCLA.

Section VI.

DETERMINATIONS

None of the determinations related herein shall be considered admissions by any Party nor are they legally binding upon any Party with respect to any claims unrelated to or by persons that are not a Party to, this Agreement.

On the basis of the review of documents and reports, and of results of the testing and analyses described in Section VII, the Factual Summary, and of the Parties' files and records, the U.S. EPA and the MPCA have determined that:

(1) The Naval Industrial Reserve Ordnance Plant located in Fridley, Minnesota and areas beyond the NIROP Fridley boundary where hazardous substances emanating from NIROP Fridley

have come to be located constitute a "facility" within the meaning of 42 U.S.C. Section 9601(9), Minn. Stat. Section 115B.02, subd. 5, and are subject to the Defense Environmental Restoration Program (DERP), 10 U.S.C. Section 2701, et. seq. NIROP Fridley is a facility under the jurisdiction, custody or control of the Department of Defense (DOD) within the meaning of Executive Order (E.O.) 12580, 52 Fed. Reg. 2923, (Jan. 29, 1987). The U.S. Navy is authorized to act on behalf of the Secretary of Defense for all functions required to be implemented by this Agreement delegated by the President of the United States to the DOD through E.O. 12580.

(2) "Hazardous substances, pollutants, or contaminants" within the meaning of 42 U.S.C. Section 9601(14) and (33), Minn. Stat. Section 115B.02, subds. 8, 9, and 13, have been released or disposed of at the Site;

(3) There have been "releases" and there continue to be "releases and threatened releases" into the environment of hazardous substances, pollutants, or contaminants, as defined in 42 U.S.C. Sections 9601(22), 9604, 9606, and 9607, Minn. Stat. Section 115B.02, subd. 15 and 10 U.S.C. Section 2701(c) at and from the Site;

(4) The U.S. Navy, as a department of the United States Government, is a "person" as defined by 42 U.S.C. Section

9601(21), and Minn. Stat. Section 115B.02 Subd.12. With respect to those releases and threatened releases at the Site, the U.S. Navy is a liable "person" within the meaning of 42 U.S.C. Section 9607 and Minnesota Statute Section 115B.03, 115B.17, and 115B.18;

(5) The response actions to be taken pursuant to this Agreement are reasonable and necessary to protect the public health, welfare, or the environment;

(6) The response actions required by this Agreement will be undertaken pursuant to timetables and deadlines or schedules established or to be developed under this Agreement; and

(7) The U.S. Navy is the authorized delegate of the President of the United States under E.O. 12580 for receipt of notification of State ARARs required by CERCLA Section 121(d)(2)(A)(ii), 42 U.S.C. Section 9621(d)(2)(A)(ii).

Section VII.

FACTUAL SUMMARY

For purposes of this Agreement, the following constitutes a summary of the facts upon which this Agreement is based. None of the facts related herein shall be considered admissions by any Party. This part contains a determination of facts, determined by the U.S. EPA and MPCA, and shall not be used by any person

related or unrelated to this Agreement for purposes other than determining the basis of this Agreement.

1. Since 1940, the United States has owned approximately eighty-three (83) acres of land situated in the northern portion of the Minneapolis-St. Paul metropolitan area, in an area east of East River Road, approximately seven hundred (700) feet east of the Mississippi River in the City of Fridley, Anoka County, Minnesota. The U.S. Navy commenced construction and started operation of the ordnance plant in 1940. The plant, known as the Naval Industrial Reserve Ordnance Plant (NIROP), is bordered on the east by the Burlington Northern railyard, on the north by various industrial facilities, on the south by FMC Corporation, and on the west by East River Road. Since 1941, NIROP has continually been producing naval ordnance weapons systems.

2. In September 1980, Navy officials implemented the nationwide Navy Assessment and Control of Installation Pollutants (NACIP) program to identify and control environmental contamination from past waste management and disposal practices.

3. In December 1980, an anonymous telephone call to the MPCA led to the discovery of the CERCLA hazardous substance trichloroethylene (TCE) in the three NIROP water supply wells finished in the Prairie du Chien/Jordan Dolomite aquifer. These on-site water supply wells were shut down on April 24, 1981. The groundwater flows west/southwest from NIROP Fridley, and then enters the Mississippi River. Sampling at the City of Minneapolis Mississippi River water intake plant also revealed

measurable concentrations of TCE. The City of Minneapolis draws its municipal water from the Mississippi River approximately two thousand feet downstream from the NIROP Site.

4. The Navy Energy and Environmental Support Activity (NEESA) initiated the Initial Assessment Study (IAS) for NIROP Fridley on October 25, 1982 with an on-site survey.

5. Under the NACIP program, Envirodyne Engineers Inc. completed the Initial Assessment Study (IAS) in June 1983. The IAS report determined that drummed wastes had occasionally been buried in trenches or pits eight to ten feet below the surface on site in the northern portion of the NIROP Fridley and that the area beneath the NIROP Fridley production building may be contributing to groundwater contamination. The exact site location of the buried wastes had not been recorded. As a result of the IAS recommendations, the Navy contracted with the U.S. Army Corps of Engineers (COE), Omaha District, to continue investigations.

6. The clean-up activities involved excavation of nine areas that contained forty-three drums and 1200 cubic yards of underlying soils. The forty-three drums and 1200 cubic yards of underlying soils were found to contain volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), oil and grease, pesticides, and metal-bearing wastes. The excavated materials were disposed of at a U.S. EPA-approved landfill.

7. Four phases of groundwater monitoring well installation were initiated in June 1983. The current network consists of fifty-three monitoring wells. Shallow, intermediate, and deep

monitoring wells have been installed in the unconsolidated aquifer underlying the NIROP Fridley. Monitoring wells have also been installed in the Prairie du Chien/Jordan Dolomite aquifer, which underlies the unconsolidated aquifer under the NIROP Fridley. The objective of the monitoring well network is to determine the physical and chemical characteristics of the unconsolidated and Prairie du Chien/Jordan Dolomite aquifers underlying NIROP and adjacent areas.

8. To address the need for further information defining the nature and extent of contamination, the Navy issued a Conceptual Work Plan for Additional Investigations in June 1987.

Implementation of the Conceptual Work Plan was completed between November 1987 and March 1988. The work consisted of installation and sampling of sixteen (16) new groundwater monitoring wells, soil pore gas testing, installation of two shallow aquifer pumping wells, and sampling two storm sewers. The results of these investigations were included in the addendum to the RI Report issued in July 1988.

9. The FS Report was issued in July 1988. Based on the initial screening of the alternatives, three remedial alternatives were recommended for detailed evaluations and comparison. These alternatives consisted of two source control alternatives and an alternative addressing management of contaminant migration.

10. In August 1988, an Addendum to the Feasibility Report was issued. This report accounted for the changes found in the Addendum to the RI Report and recommended a pumping and treating

remedial action that was to be implemented in two phases.

11. On February 8, 1989, the Navy held the initial Technical Review Committee meeting at NIROP Fridley. The committee meets periodically at NIROP Fridley to review progress of the RI/FS and RD/RA.

12. Hazardous Waste Storage Area C located on NIROP Fridley was used for hazardous waste storage and is being addressed by FMC Corp., a Navy contractor. Soils in the storage area will be remediated under the hazardous waste permit which was issued to FMC Corp. and the Navy pursuant to Minn. Rules ch. 7045. The closure plan and schedule in the permit required the removal and disposal of contaminated soil beneath the storage area. During April 1989, approximately 317 tons of contaminated soil and debris were excavated and disposed of from Hazardous Waste Storage Area C. No soils outside the perimeter of Hazardous Waste Storage Area C were removed. Work to characterize the soil contamination will be done in conjunction with the soil boring investigation program at NIROP Fridley.

13. The Navy held a public information meeting to discuss the preferred alternative for groundwater remediation on May 22, 1989.

14. On July 14, 1989, NIROP Fridley was proposed for placement on the National Priorities List. 54 Fed. Reg. 29820 (July 14, 1989).

15. On July 31, 1989, the U.S. Navy established a Public Information Repository for documents relating to the NIROP

Fridley. The repository is located at the Anoka County Branch Library, 410 N.E. Mississippi Street, Fridley, Minnesota. The Transcript of Proceedings from the Public Forum held on May 22, 1989 was placed in the Information Repository at the Anoka County Branch Library, Fridley, Minnesota.

16. On November 21, 1989, NIROP Fridley was placed on the National Priorities List. 54 Fed. Reg.48187 (Nov. 21, 1989).

17. On May 1, 1990, the Proposed Plan for Groundwater Remediation for the operable unit to prevent migration of contaminated groundwater off NIROP Fridley was made available to the public by placing a copy of the Proposed Plan in the Public Information Repository. Prior to and on May 1, 1990, notice of the commencement of a period of public comment was provided by publication of a notice in local newspapers. Members of the public were notified that they had a period of thirty (30) days in which they could provide oral or written comments to the U.S. EPA or Navy concerning the Proposed Plan. A public meeting was held on May 9, 1990, in Fridley, Minnesota during which representatives of the Navy, U.S. EPA, and MPCA answered questions and solicited both written and oral comments from members of the public. The public comment period continued until May 30, 1990.

18. On September 28, 1990, the U.S. Navy, MPCA, and U.S. EPA jointly signed a Record of Decision for Groundwater Remediation concerning the Site.

19. The participation of U.S. EPA in this Agreement concerning

the Site is based on the placement of the Naval Reserve Ordnance Plant in Fridley, Minnesota on the National Priorities List on November 21, 1989.

20. The MPCA has listed NIROP as a unit on the Minnesota Permanent List of Priorities and issued a Request for Response Action (RFRA) to the Navy on May 22, 1984. It is the intent of the MPCA that this Agreement, when effective, will supersede all response action requirements of that Request for Response Action.

Section VIII.

SCOPE OF AGREEMENT

8.1 Under this Agreement the U.S. Navy agrees it shall:

A. Conduct, as necessary, Remedial Actions for Operable Unit(s) at the Site as described in this Agreement and Attachment A;

B. Conduct, as necessary, any Remedial Investigation (RI) at the Site as described in this Agreement and Attachment A;

C. Conduct, as necessary, any Feasibility Study (FS) at the Site as described in this Agreement and Attachment A;

D. Develop response action alternatives for the Site, and implement the September 28, 1990, ROD for the ground water remediation at NIROP and any other remedial action selected pursuant to this Agreement;

E. Perform Remedial Design(s), Remedial Action(s), and Operation and Maintenance to maintain the effectiveness of response actions at the Site, as described in this Agreement and Attachments B and E.

8.2 In the event of any inconsistency between this Agreement up through the signature page and the Attachments to this Agreement, this Agreement up through the signature page shall govern.

Section IX.

REMEDIAL ACTIONS FOR OPERABLE UNIT(S)

The U.S. Navy agrees that, pursuant to this Agreement, it shall develop the Remedial Actions for Operable Unit(s), if necessary, to protect the public health or welfare or the environment and develop monitoring plans, and after consultation with U.S. EPA and MPCA, publish its proposed Remedial Action for Operable Units alternatives pursuant to the procedures contained in Section XII, Remedial Action Selection and Implementation, and Section 117(a) of CERCLA, 42 U.S.C. Section 9617(a) for public review and comment. Following final selection in accordance with the procedures contained in Section XII of this Agreement, the U.S. Navy shall design, propose, and submit a plan for implementation of the selected Remedial Actions for Operable Units, including appropriate timetables and schedules, to U.S. EPA and MPCA for review and comment process set forth in Section XIV, Consultation with U.S. EPA and MPCA, of this Agreement. Following the review and comment process, the U.S. Navy shall implement the Remedial Actions for the Operable Units pursuant to the completed plan and in accordance with the requirements and time schedules set forth in this Agreement. A dispute arising under this Section on any matter other than U.S. EPA's final selection of a Remedial Action

for an Operable Unit shall be resolved pursuant to Section XV, Resolution of Disputes. Section XIV, Consultations, sets forth the review and comment process for documents associated with the Remedial Actions for Operable Units. All documents and elements of work undertaken pursuant to this Section shall be performed in accordance with the requirements and time schedules set forth in this Agreement. The Remedial Actions for Operable Units shall meet the purposes set forth in Section II of this Agreement.

Section X.

REMEDIAL INVESTIGATION

The U.S. Navy agrees to develop, implement, and report upon Remedial Investigation (RI) for work at the Site as required under this Agreement. The RI work shall fulfill the purposes set forth in Section II and the guidelines described in Attachment A of this Agreement. RI work shall include, but not be limited to, tasks described in Attachment A. The RI will be subject to the review and comment process set forth in Section XIV, Consultation, of this Agreement, and shall be submitted in accordance with the deadlines set forth in Section XXXII, Deadlines and Target Dates.

Section XI.

FEASIBILITY STUDY

The U.S. Navy agrees it shall design, propose, undertake and report upon a Feasibility Study (FS) for work at the Site as

required under this Agreement. The FS work shall fulfill the purposes set forth in Section II and the guidelines described in Attachment A of this Agreement. FS work shall include, but not be limited to tasks described in Attachment A. The FS will be subject to the review and comment process set forth in Section XIV, Consultation, of this Agreement, and shall be submitted in accordance with the deadlines set forth in Section XXXII, Deadlines and Target Dates.

Section XII.

REMEDIAL ACTION SELECTION AND IMPLEMENTATION

12.1 Following completion of the review and comment process by U.S. EPA and MPCA of the RI and the FS, the U.S. Navy shall develop a draft Proposed Plan in consultation with U.S. EPA and MPCA pursuant to Section XIV, Consultation. The Proposed plan shall explain the remedial alternatives discussed in the FS, and shall contain a statement of the preferred remedial alternatives. The U.S. Navy shall publish any Final Proposed Plan for public review and written and oral comments, and provide an opportunity for a public meeting, pursuant to Sections 113(k)(2)(B)(iii) and 117(a) of CERCLA, 42 U.S.C. Sections 9613(k)(2)(B)(iii) and 9617(a).

12.2 Following public comment, the Parties will determine if the Proposed Plan should be modified based on the comments received. Pursuant to Section XIV, these modifications will be made by the

Navy and the modified documents will be reviewed by U.S. EPA and MPCA. Any of the Parties may recommend that additional public comment be solicited if modifications to the Proposed Plan substantially change the remedy originally proposed to the public.

12.3 When public comment has been considered, the U.S. Navy, pursuant to this Agreement, shall develop and submit a draft Record of Decision (ROD), including a Responsiveness Summary, to the U.S. EPA and the MPCA. The draft ROD shall be reviewed by the U.S. EPA and MPCA in accordance with Section XIV, Consultation. If the Parties agree on the draft ROD, the draft ROD shall be reissued by the U.S. Navy as the final ROD. If the Parties are unable to reach a consensus on the draft ROD, the U.S. EPA Administrator, in consultation with the MPCA and the U.S. Navy, shall make final selection of the remedial action for the Site and the U.S. EPA shall develop the final ROD. Notice of the final ROD shall be published by U.S. EPA and the final ROD shall be made available to the public prior to commencement of the remedial action in accordance with Section 117(a) of CERCLA, 42 U.S.C. Section 9617(a). The final selection of the remedial action by the U.S. EPA Administrator shall be final and not subject to dispute by the U.S. Navy. Upon request of any Party, if before a Record of Decision is signed, the proposed ROD departs significantly from the Proposed Plan which was subject to public comment, then the public shall be provided another

opportunity to comment.

12.4 Following finalization of a ROD, the U.S. Navy agrees to draft and implement Remedial Design Reports, Remedial Action Work Plans, and Response Action Final Reports in accordance with the purposes in Section II of this Agreement and Attachment B. The drafts of the Remedial Design, Remedial Action Work Plans, and Response Action Final Reports will be subject to the review and comment process set forth in Section XIV, Consultation, of this Agreement. Each report shall be submitted in accordance to the deadlines set forth in Section XXXII, Deadlines and Target Dates, for each such report.

Section XIII.

REMOVAL AND EMERGENCY ACTIONS

13.1 All removal actions conducted on NIROP Fridley shall be conducted in a manner consistent with this Agreement, CERCLA, 10 U.S.C. Section 2701(c) et seq., (DERP), and the NCP.

13.2 The Navy shall give the U.S. EPA and MPCA adequate opportunity for timely review and comment after the Navy makes any proposal to carry out such non-emergency removal actions and before the Navy initiates any such removal action. Such a proposal to undertake such actions by the Navy shall be consistent with U.S. EPA guidelines for removal actions, shall be submitted to the U.S. EPA and MPCA, and shall include the

following:

- (a) documentation of the actual or threatened release from the Site;
- (b) documentation that the action(s) to be taken will abate the danger and threat which may be posed by the actual or threatened release of hazardous substances from the Site;
- (c) documentation that the action(s) will, to the extent practicable, contribute to the efficient performance of the long-term remedial action with respect to the release or threatened release concerned; and
- (d) a workplan and schedule for the proposed action.

13.3 All reviews conducted by the U.S. EPA and MPCA will be expedited to the extent practicable so as not to jeopardize fiscal resources of the Navy for funding the removal action.

13.4 The opportunity for review and comment for proposed removal actions may not apply if the action is in the nature of an emergency removal taken because of an immediate, imminent, and substantial endangerment to human health or the environment, if the Navy determines that such review and comment is impractical. In the case of such an emergency removal action, the Navy shall provide the U.S. EPA and MPCA with oral notice as soon as possible and written notice within forty-eight (48) hours after the Navy determines that an emergency removal action is

necessary. Promptly after initiating an emergency removal action, the Navy shall provide the U.S. EPA and MPCA with the written basis (factual, technical, and scientific) for such action and any available documents supporting such action. Upon completion of an emergency removal action, the Navy shall state whether, and to what extent, the emergency removal action varied from the description of the action in the written notice provided pursuant to this Section.

* 13.5 If any Party determines that there may be an endangerment to the public health, welfare, or the environment because of an actual or threatened release of a hazardous substance, pollutant, or contaminant at or from the Site, the Party may request that the Navy take such response actions as may be necessary to abate such danger or threat and to protect the public health or welfare or the environment.

13.6 Except to the extent otherwise provided in this Agreement, nothing in this Agreement shall alter the Navy's authority with respect to removal actions conducted pursuant to CERCLA Section 104, 42 U.S.C. Section 9604.

Section XIV.

CONSULTATION WITH U.S. EPA AND MPCAReview and Comment Process for Draft and Final Documents14.1 Applicability:

The provisions of this Section establish the procedures that shall be used by the Parties to provide each other with appropriate notice, review, comment, and response to comments regarding RI/FS and RD/RA documents, specified herein as either primary or secondary documents. In accordance with CERCLA Section 120, 42 U.S.C. Section 9620, and 10 U.S.C. Section 2705, the U.S. Navy will normally be responsible for issuing primary and secondary documents to the MPCA and U.S. EPA unless otherwise agreed to by the Parties in writing. As of the effective date of this Agreement, all draft and final reports for any deliverable document identified herein shall be prepared, distributed, and subject to dispute in accordance with paragraphs 14.2 through 14.9 below. The designation of a document as "draft" or "final" does not affect the obligation of the Parties to issue documents, which may be referred to herein as "final," to the public for review and comment as appropriate and as required by law.

14.2 General Process for RI/FS and RD/RA documents:

(1) Primary documents include those reports that are major, discrete portions of RI/FS and RD/RA activities. Primary documents are initially issued by the U.S. Navy in draft subject to review and comment by U.S. EPA and the MPCA. Following

receipt of comments on a particular draft primary document, the U.S. Navy will respond to the comments received and issue a draft final primary document subject to dispute resolution. The draft final primary document will become the final primary document thirty (30) days after the issuance if dispute resolution is not invoked or as modified by decision of the dispute resolution process.

(2) Secondary documents include those reports that are discrete portions of the primary documents and are typically input or feeder documents. Secondary documents are issued by the U.S. Navy in draft subject to review and comment by U.S. EPA and the MPCA. Although the U.S. Navy will respond to comments received, the draft secondary documents may be finalized in the context of the corresponding primary documents.

14.3 Primary Documents:

(1) The U.S. Navy shall complete and transmit drafts for the following primary documents to U.S. EPA and MPCA for review and comment in accordance with the provisions of this Section:

- (a) Evaluation Report;
- (b) RI/FS Work Plan(s), which shall include QAPP(s), Sampling and Analysis Plan(s), and Site Health and Safety Plan(s);
- (c) RI Report(s), including Risk Assessment(s);
- (d) Alternatives Report;
- (e) FS Report, including Initial Screening of Alternatives;

- (e) Proposed Plan;
- (f) Record(s) of Decision (ROD);
- (g) Final Remedial Design;
- (h) Remedial Action Work Plan(s); and
- (i) Response Action Final Report(s);

(2) Only the draft final reports for the primary documents identified above shall be subject to dispute resolution. The U.S. Navy shall complete and transmit draft primary documents in accordance with the timetable and deadlines established in Section XXXII of this Agreement.

14.4 Secondary Documents:

(1) The U.S. Navy shall complete and transmit drafts of secondary documents to the U.S. EPA and the MPCA for review and comment in accordance with the provisions of this Section.

Secondary documents include:

- (a) Surface Water Investigation Plan;
- (b) Sampling and Data Results;
- (c) Treatability Studies, as needed;
- (d) Responsiveness Summary to Proposed Plan;
- (e) RD/RA Site Security and Health and Safety Plan;
- (f) Remedial Design Phase Documents 35%, 60%, 90%, pump tests, and aquifer sampling results, as required; and
- (g) Community Relations Plan.

(2) Although U.S. EPA and the MPCA may comment on the draft reports for the secondary documents listed above, such documents

shall not be subject to dispute resolution except as provided by paragraph 14.2 hereof. Target dates for the completion and transmission of draft secondary reports are set forth in Section XXXII of this Agreement.

14.5 Meetings of the Project Managers on Development of Reports:

The Project Managers shall meet approximately every ninety (90) days, except as otherwise agreed by the Project Managers, to review and discuss the progress of work being performed at the Site on the primary and secondary documents. Prior to preparing any draft report specified in paragraphs 14.3 and 14.4 above, the Project Managers shall meet to discuss the report and any applicable U.S. EPA or MPCA policy and guidance in an effort to reach a common understanding, to the maximum extent practicable.

14.6 Identification and Determination of Potential ARARs:

(1) For those primary reports or secondary documents that consist of or include ARAR determinations, prior to the issuance of a draft report, the Project Managers shall meet to identify and propose, to the best of their ability, all potential ARARs pertinent to the report being addressed. The MPCA shall identify all potential State ARARs as early in the remedial process as possible consistent with the requirements of CERCLA Section 121(d)(2)(A)(ii), 42 U.S.C. Section 9621(d)(2)(A)(ii), and the NCP. The U.S. Navy shall consider any written interpretations of ARARs provided by the MPCA. Draft ARAR determinations shall be

prepared by the U.S. Navy in accordance with CERCLA Section 121(d)(2), 42 U.S.C. Section 9621(d)(2), the NCP, and pertinent guidance policy issued by U.S. EPA that is consistent with CERCLA and the NCP.

(2) In identifying potential ARARs, the Parties recognize that actual ARARs can be identified only on a site-specific basis and that ARARs depend on the specific hazardous substances, pollutants, and contaminants at a site, the particular actions proposed as a remedy and the characteristics of a site. The Parties recognize that ARAR identification is necessarily an iterative process and that potential ARARs must be re-examined through the RI/FS process until a ROD is issued.

14.7 Review and Comment on Draft Reports or Documents:

(1) The U.S. Navy shall complete and transmit each draft primary reports or documents to the U.S. EPA and the MPCA on or before the corresponding deadline established for the issuance of the report. The U.S. Navy shall complete and transmit the draft secondary document(s) in accordance with the target dates established for the issuance of such reports established pursuant to Section XXXII, Deadlines and Target Dates, of this Agreement.

(2) Unless the Parties mutually agree to another time period, all draft reports shall be subject to a thirty (30) day period for review and comment with the possibility of a twenty (20) day extension. Review of any document by the U.S. EPA and the MPCA may concern all aspects of the report (including

completeness) and should include, but is not limited to, technical evaluation of any aspect of the document, and consistency with CERCLA, the NCP, and any pertinent guidance or policy issued by the U.S. EPA and with applicable State law. Comments by the U.S. EPA or the MPCA shall be provided with adequate specificity so that the U.S. Navy may respond to the comment and, if appropriate, make changes to the draft report. Comments shall refer to any pertinent sources of authority or references upon which the comments are based, and, upon request of the U.S. Navy, the U.S. EPA or the MPCA shall provide a copy of the cited authority or reference. The U.S. EPA or the MPCA, either in consultation with each other or by written request of the Navy, may extend the thirty (30) day comment period for up to an additional twenty (20) days by written notice to the U.S. Navy prior to the end of the thirty (30) day period. On or before the close of the comment period, the U.S. EPA and the MPCA shall transmit their written comments to the U.S. Navy by overnight mail.

(3) Representatives of the U.S. Navy shall make themselves readily available to the U.S. EPA and the MPCA during the comment period for purposes of informally responding to questions and comments on draft reports. Oral comments made during such discussions need not be the subject of a written response by the U.S. Navy on the close of the comment period.

(4) In commenting on a draft report which contains a proposed ARAR determination, the U.S. EPA or the MPCA shall

include a reasoned statement of whether they object to any portion of the proposed ARAR determination. To the extent that U.S. EPA or MPCA does object, it shall explain the basis for its objection in detail and shall identify any ARARs which it believes were not properly addressed in the proposed ARAR determination.

(5) Following the close of the comment period for a draft report, the U.S. Navy shall give full consideration to all written comments on the draft report submitted during the comment period. Within forty-five (45) days of the close of the comment period on a draft secondary report the U.S. Navy shall transmit to the U.S. EPA and the MPCA its written response to comments received within the comment period. Within forty-five (45) days of the close of the comment period on a draft primary report, the U.S. Navy shall transmit to the U.S. EPA and the MPCA a draft final primary report, which shall include the U.S. Navy's response to all written comments received within the comment period. While the resulting draft final report shall be the responsibility of the U.S. Navy, it shall be the product of consensus amongst the Parties to the maximum extent possible.

(6) The U.S. Navy may extend the comment period for either responding to comments on a draft report or for issuing the draft final primary report for up to an additional twenty (20) days by providing notice to U.S. EPA and the MPCA. In appropriate circumstances, this time period may be further extended in accordance with Section XXXIII, Extensions.

14.8 Availability of Dispute Resolution for Draft Final Primary

Documents:

(1) Dispute resolution shall be available to the Parties for draft final primary reports as set forth in Section XV, Resolution of Disputes.

(2) When dispute resolution is invoked on a draft final primary report, work may be stopped in accordance with the procedures set forth in Section XV, Resolution of Disputes.

14.9 Finalization of Reports:

The draft final primary report shall serve as the final primary report if no party invokes dispute resolution regarding the document or, if invoked, at completion of the dispute resolution process should the U.S. Navy's position be sustained. If the U.S. Navy's determination is not sustained in the dispute resolution process, the U.S. Navy shall prepare, within not more than sixty ⁴⁵ ~~(60)~~ days, a revision of the draft final report which conforms to the results of dispute resolution. In appropriate circumstances, the time period for this revision period may be extended in accordance with Section XXXIII, Extensions, of this Agreement.

14.10 Subsequent Re-opening and Modification Process

Following finalization of any primary report pursuant to Paragraph 14.9, any Party may seek to reopen and modify the report, including seeking additional RI, FS, RD, RA work, pilot

studies, computer modeling or other supporting technical work, only as provided in this sub-section.

(A) Any Party may seek to reopen and modify a report after finalization if it determines, based on new information (i.e., information that became available, or conditions that became known, after the report was finalized) that the requested modification is necessary. A Party may seek such a modification by submitting a concise written request to the Project Manager of the other Parties. The request shall specify the nature of the requested modification and how the request is based on new information.

(B) In the event that a consensus is not reached by the Project Managers on the need for reopening and modifying a final primary report, any Party may invoke dispute resolution to determine if such modification shall be conducted. Reopening and modification of a report shall be required only upon a showing that:

(1) The requested modification is based on significant new information; and

(2) The requested modification could be of significant assistance in evaluating impacts on the public health or the environment, in evaluating the selection of remedial alternatives, or in protecting human health and the environment.

(C) Nothing in this Section shall alter U.S. EPA's or MPCA's ability to request the performance of additional work which was not contemplated by this Agreement. The Navy's

obligations to perform such work must be established by either a modification of a report or document or by amendment to this Agreement.

(D) Any additional work to be performed pursuant to a reopening and modification shall be subject to the review and comment process pursuant to Section XIV, Consultation with U.S. EPA and MPCA, and shall be an integral and enforceable part of this Agreement.

(E) Nothing in this Section shall alter the Parties' rights under Section XXXVII, Enforceability, nor shall it alter the Parties' rights to seek an amendment under Section XXIX, Amendment of Agreement, nor shall it alter the Parties rights to seek minor modifications by the Project Managers under Section XIX, Project Managers.

Section XV.

RESOLUTION OF DISPUTES

Except as specifically set forth elsewhere in this Agreement, if a dispute arises under this Agreement, the procedures of this Section shall apply.

All Parties to this Agreement shall make all reasonable efforts to informally resolve disputes at the Project Manager or immediate supervisor level. If resolution cannot be achieved informally the procedures of this Section shall be implemented to resolve a dispute.

15.1. Within thirty (30) days after: (1) the issuance of a draft final primary document pursuant to Section XIV, Consultation, or (2) any action by a Party, or knowledge of that action by another Party's Project Manager, which leads to or generates a dispute, the disputing party shall submit to the other Parties a Written Statement of Dispute setting forth the nature of the dispute, the work affected by the dispute, the disputing Party's position with respect to the dispute, and the technical, legal, or factual information the disputing Party is relying upon to support its position.

15.2. The Dispute Resolution Committee (DRC) will serve as a forum for resolution of disputes for which agreement has not been reached through informal dispute resolution. The Parties shall each designate one individual and an alternate to serve on the DRC. The individuals designated to serve on the DRC shall be employed at the policy level (Senior Executive Service (SES) or equivalent) or be delegated the authority to participate on the DRC for the purposes of dispute resolution under this Agreement. The U.S. EPA representative on the DRC is the Waste Management Division Director of U.S. EPA's Region V. The State representative shall be the MPCA Ground Water and Solid Waste Division Director. The U.S. Navy's designated member is the Commanding Officer, Northern Division, Naval Facilities Engineering Command. Written notice of any delegation of authority from a Party's designated representative on the DRC

shall be provided to all other Parties pursuant to the procedures of Section XIX, Notification.

15.3. Following elevation of a dispute to the DRC, the DRC shall have twenty-one (21) days to unanimously resolve the dispute and issue a written decision signed by all Parties. If the DRC is unable to unanimously resolve the dispute within this twenty-one (21) day period, the written statement of dispute shall be forwarded to the Senior Executive Committee (SEC) for resolution, within seven (7) days after the close of the twenty-one (21) day resolution period.

15.4. The SEC will serve as the forum for resolution of disputes for which agreement has not been reached by the DRC. The U.S. EPA representative on the SEC is the Regional Administrator of U.S. EPA's Region V. The State's representative shall be the Commissioner of the Minnesota Pollution Control Agency. The U.S. Navy's representative on the SEC is the Deputy Director, Environment, Office of the Assistant Secretary of the Navy (Installations and Environment). The SEC members shall, as appropriate, confer, meet, and exert their best efforts to resolve the dispute and issue a written decision signed by all Parties. If unanimous resolution of the dispute is not reached within twenty-one (21) days, U.S. EPA's Regional Administrator shall issue a written position on the dispute. The U.S. Navy or the MPCA may, within twenty-one (21) days of the Regional

Administrator's issuance of U.S. EPA's position, issue a written notice elevating the dispute to the Administrator of U.S. EPA for resolution in accordance with all applicable laws and procedures. In the event no party elects to elevate the dispute to U.S. EPA's Administrator within the designated twenty-one (21) day escalation period, the Parties shall be deemed to have agreed with the Regional Administrator's written position with respect to the dispute.

15.5. Upon escalation of a dispute to the Administrator of U.S. EPA pursuant to Paragraph 15.4 above, the Administrator will review and resolve the dispute within twenty-one (21) days. Upon request, and prior to resolving the dispute, the U.S. EPA Administrator shall meet and confer with the U.S. Navy's Secretariat Representative and MPCA Commissioner to discuss the issue(s) under dispute. Upon resolution, the Administrator shall provide the other Parties with a written final decision setting forth resolution of the dispute. The duties of the Administrator set forth in this Section shall not be delegated.

15.6. The pendency of any dispute under this Section shall not affect the U.S. Navy's responsibility for timely performance of the work required by this Agreement, except that the time period for completion of work affected by such dispute shall be extended for a period of time usually not to exceed the actual time taken to resolve any good faith dispute in accordance with the

procedures specified herein. All elements of the work required by this Agreement which are not affected by the dispute shall continue and be completed in accordance with the applicable schedule.

15.7. When dispute resolution is in progress, work affected by the dispute will immediately be discontinued if the Waste Management Division Director for U.S. EPA's Region V or the Commissioner of MPCA requests, in writing, that work related to the dispute be stopped because, in their opinion, such work is inadequate or defective, and such inadequacy or defect is likely to yield an adverse effect on human health or the environment, or is likely to have a substantial adverse effect on the remedy selection or implementation process. To the extent possible, the U.S. EPA and the MPCA shall consult with the other Parties prior to initiating a work stoppage request. After stoppage of work, if a Party believes that work stoppage is inappropriate or may have potential significant adverse effects, that Party may meet with the other Parties to discuss the work stoppage. Following this meeting, and further consideration of the issues, the U.S. EPA Region V Waste Management Division Director will issue, in writing, a final decision with respect to the work stoppage. The final written decision of the Division Director may immediately be subjected to formal dispute resolution. Such dispute may be brought directly to either the DRC or the SEC, at the discretion of the Party requesting dispute resolution.

15.8. Within twenty-one (21) days of resolution of a dispute pursuant to the procedures specified in this Part, the U.S. Navy shall incorporate the resolution and final determination into the appropriate plan, schedule, or procedures and proceed to implement this Agreement according to the amended plan, schedule, or procedures.

15.9. Resolution of a dispute pursuant to this Section of the Agreement constitutes a final resolution of any dispute arising under this Agreement. All Parties shall abide by all terms and conditions of any final resolution of dispute obtained pursuant to this Section of this Agreement.

Section XVI.

PERMITS

The Navy shall be responsible for obtaining all Federal, State, and local permits, if any be necessary, for the performance of all work required of the Navy under this Agreement.

16.1. The Parties recognize that under Sections 121(d) and 121(e)(1) of CERCLA, 42 U.S.C. Sections 9621(d) and 9621(e)(1), and the NCP, portions of the response actions called for by this Agreement and conducted entirely at the Site are exempted from the procedural requirement to obtain a federal, state, or local permit but must comply with all the applicable or relevant and

appropriate Federal and State standards, requirements, criteria, or limitations and other substantive permit requirements which have been uniformly applied and which would have been included in any such permit.

16.2. Paragraph 16.1 above is not intended to relieve the U.S. Navy from the requirement of obtaining a permit whenever it proposes a response action involving the shipment or movement off the Site of a hazardous substance.

16.3. The U.S. Navy shall notify the U.S. EPA and the MPCA in writing of any permits required for activities outside of NIROP Fridley as soon as they become aware of the requirements. Upon request, the U.S. Navy shall provide the U.S. EPA and the MPCA copies of all such permit applications and other documents related to the permit process.

16.4. If a permit which is necessary for implementation of this Agreement is not issued, or is issued or renewed in a manner which is materially inconsistent with the requirements of this Agreement, the U.S. Navy agrees it shall notify the U.S. EPA and the MPCA of the action taken with respect to the permit issuance within seven (7) calendar days of the Navy's receipt of notification of that action.

16.5. Any U.S. Navy proposed modifications to this Agreement

arising from permit issues shall be subject to the review and comment process in accordance with Section XIV, Consultation, and the reopening and modification process in that Section. However, as to work that can not be so implemented, any corresponding timetable, deadlines, and schedule will be subject to Section XXXIII, Extensions.

16.6. During any appeal by any Party of any permit required to implement this Agreement or during review of any of the U.S. Navy proposed modifications as provided in Paragraph 16.4 above, the U.S. Navy shall continue to implement those portions of this Agreement which can be reasonably implemented pending final resolution of the permit issue(s) under appeal.

Section XVII.

REPORTING

17.1 The U.S. Navy agrees to submit to the U.S. EPA and the MPCA quarterly written progress reports, which may take the form of TRC minutes, that describe the actions which the U.S. Navy has taken during the previous three months to implement the requirements of this Agreement. Progress reports shall also describe the activities scheduled to be taken during the upcoming quarter. Progress reports shall be submitted by the tenth (10) day of each month following the respective quarter after the effective date of this Agreement. The progress reports shall include a detailed statement of the manner and extent to which

the requirements of this Agreement are being met. In addition, the Progress Reports shall identify any anticipated delays in meeting deadlines or target dates, the reason(s) for the delay(s) and actions taken to prevent or mitigate the delay(s), and any need for additional work.

17.2 The Navy shall submit to U.S. EPA and MPCA the minutes of the Technical Review Committee (TRC), which shall include, at a minimum, the following:

- (a) Issues discussed at the TRC meeting;
- (b) The actions which the Navy has taken since the prior TRC meeting to implement the requirements and time schedules of the Agreement;
- (c) A description of all actions scheduled for completion since the prior reporting period that were not completed, a statement indicating why such actions were not completed, and an anticipated completion date for all such activities;
- (d) Identification of any anticipated delays in meeting future time schedules, the reason(s) for such delay(s), and actions taken or to be taken to prevent or mitigate the delay; and
- (e) A description of the actions which are scheduled for the following quarter.

17.3 TRC minutes shall be submitted by the twenty-fifth (25)

day following each TRC meeting. However, if a TRC meeting is not held during a quarter, the Navy shall submit a report by the 120th day following the last TRC meeting which shall include, at a minimum, items (b) through (e) listed above.

Section XVIII.

NOTIFICATION

18.1 Unless otherwise specified, all notice and all formal written reports and comments required by this Agreement shall be sent by overnight mail, hand delivery, or sent by certified mail, return receipt requested, and addressed to:

U.S. Environmental Protection Agency, Region V, 5HS-11
Attn: Thomas R. Bloom
Remedial Project Manager (MN/OH Unit #1)
Waste Management Division
230 South Dearborn Street
Chicago, Illinois 60604

Mark Lahtinen
Project Manager
Division of Ground Water and Solid Waste
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, Minnesota 55155

and

Northern Division
Naval Facilities Engineering Command
Building 77L, Code 1421, Jim Shafer
Philadelphia Naval Base
Philadelphia, PA 19112-5094

Unless otherwise requested or specified in this Agreement, all routine correspondence may be sent via regular United States mail to the above-named persons.

18.2 The Parties shall notify each other of the identity and assigned tasks of each of its contractors and sub-contractors performing work under this Agreement.

Section XIX.

PROJECT MANAGERS

19.1 The following have been designated as Project Managers for the purpose of overseeing the implementation of this Agreement: for the U.S. EPA--Thomas Bloom; for the U.S. Navy--James Shafer; and for the MPCA--Mark Lahtinen. Any Party which elects to designate an Alternate Project Manager shall inform the other Parties of the name and address of such Alternate Project Manager when such designation is made. Any Party may change its designated Project Manager by notifying the other Parties, in writing, within five (5) days of the change. To the maximum extent possible, communications between the Parties concerning the terms and conditions of this Agreement shall be directed through the Project Managers as set forth in Sections XVIII, Notification, and XIX Project Managers, of this Agreement. Each Project Manager shall be responsible for assuring that all communications from the other Project Managers are appropriately disseminated and processed by the entities which the Project Managers represent. The Navy Project Manager shall have all the authority vested in the On-Scene Co-ordinator and Remedial Project Manager by the National Contingency Plan, 40 CFR Part 300.

19.2 Subject to the limitations set forth in Section XXIII, Site Access, Paragraph 23.1, the U.S. EPA and the MPCA Project Managers shall have the authority to: (1) take samples and request split samples of U.S. Navy samples pursuant to Section XXI and ensure that work is performed properly and pursuant to the Attachments and plans incorporated into this Agreement; (2) observe all activities performed pursuant to this Agreement, take photographs and/or films, identifying areas or activities to be filmed at NIROP Fridley to the Commander, Defense Plant Representative Office, NIROP Fridley, and in accordance with NIROP Fridley security procedures, and make such other reports on the progress of the work as the Project Manager deems appropriate pursuant to Section XXIII, Site Access; (3) review records, files and documents relevant to this Agreement; and (4) recommend and request field modifications to the work to be performed pursuant to this Agreement, or in techniques, procedures or design utilized in carrying out this Agreement, which are necessary to the completion of the project.

19.3 Necessary and appropriate adjustments to deadlines or schedules may be proposed by any Party and must be approved in writing by the Parties' Project Managers to be effective. Within five (5) working days following a modification, the Party which requested the modification shall prepare a memorandum detailing the modification and the reasons therefore and shall provide a copy of the memorandum to the other Parties for signature and

return. Any such memorandum for a deadline change shall promptly be placed in the information repository.

19.4 Any Project Manager may also recommend and request minor field modifications to the work to be performed pursuant to this Agreement, or in techniques, procedures, or design utilized in carrying out this Agreement, which are necessary to the completion of response activities. "Minor" for purposes of this paragraph shall be agreed to by mutual oral consent of all three Parties' Project Managers.

19.5 Any field modifications proposed under this Section by a Party must be approved orally by all three (3) Project Managers to be effective. The U.S. Navy Project Manager shall memorialize any agreed upon field modifications in a memorandum which shall be included in the administrative record required for the Site under Section 113 of CERCLA, 42 U.S.C. Section 9613. The U.S. Navy shall provide the U.S. EPA and the MPCA a copy of all such memoranda concerning field modifications. If agreement cannot be reached on the proposed additional work or modification to work, and if the proposed field modification involves modification of an existing final report, then any Party may invoke the subsequent reopening and modification process under Section XIV, Consultation. If no modification for existing final report is involved, then any Party may invoke dispute resolution under Section XV.

19.6 The Project Manager for the U.S. Navy or the local Navy representative shall be physically present at the Site or be reasonably available to oversee work performed at the Site during implementation of the work performed pursuant to this Agreement and shall make himself/herself reasonably available to the U.S. EPA and MPCA Project Managers during the life of this Agreement. The U.S. Navy Project Manager shall notify in writing the U.S. EPA and MPCA Project Manager the oversight authority delegated to the local Navy representative. The absence of the U.S. EPA and/or MPCA Project Manager from the Site shall not be cause for work stoppage.

Section XX.

TECHNICAL REVIEW COMMITTEE (TRC)

Pursuant to 10 U.S.C. Section 2705(c), the U.S. Navy has established a Technical Review Committee (TRC) for NIROP Fridley.

The purpose of the TRC is to afford a forum for cooperation among the Parties, with local community representation, on actions and proposed actions with respect to the Site.

Section XXI.

SAMPLING AND DATA/DOCUMENT AVAILABILITY

21.1 The Parties shall make available to each other quality assured results of sampling, tests, or other data generated by any Party, or on their behalf, with respect to the implementation

of this Agreement within sixty (60) days of their collection or performance. If quality assurance is not completed within sixty (60) days, the Parties performing the sampling shall, upon request of any other Party, obtain the available raw data or results and submit such data to the other Parties in thirty (30) days. Quality assured data or results shall be submitted as soon as they become available.

21.2 At the request of any other Party taking samples, the other Parties shall allow split or duplicate samples to be taken whenever practicable during sample collection conducted during the implementation of this Agreement. Any Project Manager of a Party taking samples shall endeavor to notify the other Project Managers not less than ten (10) business days in advance of any sample collection. If it is not possible to provide ten (10) business days prior notification, the Project Manager shall notify the other Project Managers as soon as possible after becoming aware that samples will be collected.

21.3 If the U.S. EPA or MPCA obtain any samples, before leaving the Site, they shall give the Navy's Project Manager, or his or her designated representative, a receipt describing the sample obtained, and insure that chain of custody procedures are followed. A copy of the results of any analysis made or such samples shall be provided to all Parties.

Section XXII.

RETENTION OF RECORDS

22.1 Each Party to this Agreement shall preserve for a minimum of ten (10) years after termination of this Agreement all documents contained in the Administrative Record, the Public Information Repository and all final primary and secondary documents as defined in Section XIV, Consultations, despite any document retention policy to the contrary. After this ten (10) year period, each Party shall notify other Parties at least forty-five (45) days prior to destruction or disposal of any such documents or records. Upon request by a Party, the other Party shall make available such records or documents to the requesting Agency, unless withholding is authorized and determined to be appropriate pursuant to Section XXVIII, Confidential Information, of this Agreement. Records necessary to comply with notice requirements of Section 120(h)(3) of CERCLA should be retained by the U.S. Navy.

22.2 All such records shall be preserved for a period of seven (7) years following the termination of any judicial action regarding the work performed under this Agreement by any Party to that judicial action. If paragraph 22.1 requires a longer period of retention of records than does paragraph 22.2, paragraph 22.1 shall control.

Section XXIII.

U.S. EPA AND MPCA SITE ACCESS

23.1. Without limitation on any authority conferred on U.S. EPA or MPCA by statute or regulation, the U.S. EPA, MPCA, and/or their authorized representatives, shall have authority to enter the Site at reasonable times for the purposes of, among other things: (A) inspecting records, operating logs, contracts, and other documents relevant to implementation of this Agreement; (B) reviewing the progress of the U.S. Navy in implementation of this Agreement; (C) conducting such tests as the U.S. EPA and the MPCA Project Managers deem necessary; (D) verifying the data submitted to the U.S. EPA and MPCA by the U.S. Navy; and (E) photographing and/or filming cleanup activities, with identification of areas and activities to be filmed at NIROP Fridley made known to the Commander, Defense Plant Representative Office, NIROP Fridley, and such filming to be done in accordance with NIROP Fridley security procedures. The U.S. Navy shall honor all reasonable requests for such access by the U.S. EPA and MPCA upon presentation of proper credentials. However, such access shall be obtained through the U.S. Navy Project Manager in conformance with U.S. Navy security regulations, and in a manner minimizing interference with any military operations at NIROP.

23.2 The Navy shall ensure that all response measures, groundwater rehabilitation measures, and remedial actions of any kind which are undertaken pursuant to this Agreement on any areas

or any structures which a) are presently owned by the United States and which are occupied by the Navy or leased by the Navy to any other entity, or b) are under the control of the Navy or any lessees or agents of the Navy, shall not be impeded or impaired in any manner by any transfer of title, change in occupancy, any transfer of any other interest in real property, or any other change in circumstances of such areas.

23.3 To the extent that access is required to areas of the Site presently owned by or leased to parties other than the U.S. Navy, the U.S. Navy agrees to exercise its authorities to obtain access pursuant to Section 104(e) of CERCLA, 42 U.S.C. Section 9604(e), from the present owners and/or lessees within sixty (60) calendar days after the effective date of this Agreement if such access then appears necessary, or, if appropriate at a later date, within sixty (60) days after the relevant submittals which require access become final pursuant to Section XIV, Consultation. The U.S. Navy shall use its best efforts to obtain access agreements which shall provide reasonable access to U.S. EPA and MPCA and/or their authorized representatives. The access agreements shall also provide that the owners of the Site or of any property where monitoring wells, pumping wells, treatment facilities or other response actions are located shall notify the U.S. Navy, the U.S. EPA and the MPCA Commissioner, by certified mail, at least thirty (30) days prior to any conveyance, of the property owner's intent to convey any interest in the property.

The Navy shall ensure that all response actions, groundwater rehabilitation measures, and remedial actions of any kind which are undertaken pursuant to this Agreement on any non-Navy property shall not be impeded or impaired in any manner by any transfer of title or change in occupancy or any other change in circumstances of such areas.

23.4 The Navy shall provide the U.S. EPA and the MPCA with at least thirty (30) days prior notice of any conveyance of title to or any transfer of an interest in real property which may affect this Agreement or any activities to be taken pursuant to it.

In the event of such proposed conveyance, the Navy, after consultation with U.S. EPA and MPCA, shall inform the U.S. EPA and MPCA of the provisions made for conducting response actions under this Agreement.

23.5 In the event that access is not obtained within the sixty (60) day time period set forth in Paragraph 23.2 above, within fifteen (15) days after the expiration of the sixty (60) day period, the U.S. Navy shall notify the U.S. EPA and the MPCA Commissioner regarding the lack of access and status of efforts to obtain such access agreement. Within fifteen (15) days of any such notice, the U.S. Navy shall submit appropriate modifications to primary or secondary documents in response to such inability to obtain access.

23.6 The U.S. Navy may request the assistance of U.S. EPA and MPCA where access problems arise. The U.S. EPA and MPCA will make every reasonable effort to assist in obtaining access if requested, except nothing herein shall require U.S. EPA and MPCA to take judicial action to obtain access.

23.7 The Parties agree that this Agreement is subject to CERCLA Section 120(j), 42 U.S.C. Section 9620(j), regarding the issuance of Site Specific Presidential Orders as may be necessary to protect the national security. Any Presidential Order issued under Section 120(j) shall be disseminated to all Parties' Project Managers, if releasable.

Section XXIV.

FIVE YEAR REVIEW

If a remedial action is selected that results in any hazardous substances, pollutants, or contaminants remaining at the Site, the U.S. Navy or U.S. EPA, in consultation with the MPCA, shall review such remedial action in accordance with Section 121(c) of CERCLA, 42 U.S.C. Section 9621(c), no less often than each five (5) years after the initiation of on-site remedial action or approval of the ROD(s), whichever occurs earlier, to assure that human health and the environment are being protected by the remedial action being implemented. The U.S. Navy or U.S. EPA, in consultation with to MPCA, shall, within sixty (60) days after conclusion of each 5-year anniversary, report in writing to the

other Parties on the review it has undertaken, any recommendation for additional or modified response actions, the reasons in support of those recommendations, or, if no action is recommended, the reasons therefor. This report shall be reviewed in the same manner as a draft final primary document in accordance with Section XIV of this Agreement concerning consultation and Section XV, Resolution of Disputes, if necessary. The Navy shall implement such additional or modified action as may be determined pursuant to Section XIV, Consultation, and XV, Resolution of Disputes.

Section XXV.

CLAIMS RELATING TO NON-PARTIES

25.1 Nothing in this Agreement shall constitute or be construed as a bar or release from any claim, cause of action, or demand in law or equity by or against any person, firm, partnership, or corporation not a Party to this Agreement for any liability it may have arising out of or relating in any way to the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous substances, hazardous wastes, pollutants, or contaminants found at, taken to, or taken from the Site.

25.2 Neither the U.S. EPA nor the MPCA shall be held as a party to any contract entered into by the U.S. Navy to implement the requirements of this Agreement.

25.3 This Agreement does not constitute any decision or pre-authorization by U.S. EPA of funds under Section 111(a)(2), 42 U.S.C. Section 9611(a) for any person, agent, contractor, or consultant acting for the Navy.

Section XXVI.

OTHER APPLICABLE LAWS

All actions required to be taken pursuant to this Agreement shall be undertaken in accordance with the requirements of all applicable State and federal laws and regulations.

Section XXVII.

CONFIDENTIAL INFORMATION

27.1 The U.S. Navy may possess information which is subject to a confidentiality claim as established by U.S. Navy pursuant to regulations found at 32 CFR Section 701. In the event that the U.S. Navy submits information to the U.S. EPA and the MPCA pursuant to this Agreement which is subject to a confidentiality claim, such information shall be clearly designated by the U.S. Navy as confidential. If no confidentiality claim accompanies the information when it is submitted to the U.S. EPA and the MPCA, the information may be made available to the public without further notice to the U.S. Navy.

27.2 Upon receipt of material claimed as confidential, the U.S. EPA shall review the confidentiality claim pursuant to 40 CFR

Part 2, and shall make an independent confidentiality determination. The U.S. Navy's prior confidentiality determination made pursuant to 32 CFR Part 701 shall be relevant to, but shall not control, the U.S. EPA's confidentiality determination.

27.3 In the event that the U.S. EPA determines that information submitted by the U.S. Navy pursuant this Agreement contains confidential information ("CI"), the U.S. EPA shall manage such information according to U.S. EPA procedures for the management of CI. Information which is also submitted by the U.S. Navy to the MPCA and is determined by the U.S. EPA to constitute CI shall be treated by the MPCA Commissioner as "non-public data" pursuant to Minn. Stat. ch 13.

27.4 In the event that the U.S. EPA determines that information submitted by the U.S. Navy pursuant to this Agreement does not contain CI as established pursuant to 40 CFR Part 2, the Parties to this Agreement recognize that the conflicting confidentiality determinations made by the U.S. EPA and the U.S. Navy give rise to a unique inter-agency dispute. Therefore, in the event of such conflicting determinations, the U.S. EPA and the U.S. Navy agree to jointly elevate the resulting dispute to their respective Office of General Counsel for assistance in resolving the dispute. U.S. EPA and U.S. Navy agree to abide by the final inter-agency resolution of the dispute resulting from such

elevation, including appropriate management of the information in question in accordance with the resolution of dispute. During the pendency of such a dispute the MPCA will treat such information as "non-public data" pursuant to Minnesota Statute Chapter 13. Similarly, in the event that the dispute is resolved in favor of confidential treatment for the information in question, MPCA agrees to manage the information in question as "non-public data" pursuant to Minnesota Statute Chapter 13. In the event that the dispute is resolved in favor of non-confidential treatment for the information in question (i.e., the CI claim is denied), the U.S. Navy agrees that the MPCA may handle the information as non-confidential public data.

27.5 Nothing in this Section shall serve as a limitation on the U.S. Navy's right to classify information for national security purposes pursuant to the national security provisions referenced in Section 120(j)(2) of CERCLA, 42 U.S.C. Section 9620(j)(2), or to seek site-specific Presidential orders under Section 120(j)(1) of CERCLA, 42 U.S.C. Section 9620(j)(1). Any Presidential order issued under Section 120(j) of CERCLA, 42 U.S.C. Section 9620(j) shall be disseminated to all Parties' Project Managers, if releasable. Except as otherwise provided by 42 U.S.C. Section 120(j), analytical data shall not be claimed as confidential by the U.S. Navy.

Section XXVIII.

RECOVERY OF U.S. EPA EXPENSES

The Parties agree to amend this Agreement at a later date in accordance with any subsequent national resolution of the issues of cost reimbursement to U.S. EPA for CERCLA response costs incurred by U.S. EPA.

Section XXIX.

AMENDMENT OF AGREEMENT

Except as provided in Section XIX, Project Managers, Paragraphs 19.2, 19.3, and 19.4, this Agreement may be amended or modified solely upon written consent of all Parties. Such amendments or modifications shall have as the effective date that date on which they are signed by all Parties and notice thereof is provided to each Party pursuant to Section XIX.

Section XXX.

COVENANT NOT TO SUE AND RESERVATION OF RIGHTS

30.1 In consideration for the U.S. Navy's compliance with this Agreement, and based on the information known to the Parties on the effective date of this Agreement, the U.S. EPA and the MPCA agree that compliance with this Agreement shall stand in lieu of any administrative, legal, and equitable remedies against the U.S. Navy available to them regarding the currently known releases or threatened releases of hazardous substances,

hazardous waste, pollutants, or contaminants which are within the scope of this Agreement and which will be addressed by the remedial actions provided for under this Agreement. Nothing in this Agreement shall preclude the U.S. EPA or the MPCA from exercising any administrative, legal, and equitable remedies available to them to require additional response actions by the U.S. Navy pursuant to Section XIV, Consultation, and XXIX, Amendments, of this Agreement or any other authority in the event that: (1) conditions previously unknown or undetected by U.S. EPA or the MPCA arise or are discovered at the Site; or (2) U.S. EPA or the MPCA receive additional information not previously available which they employed in reaching this Agreement, and (3) the implementation of the requirements of this Agreement no longer adequately protects public health or welfare or the environment. Provided, however, with respect to any additional response actions, the Parties shall consider using Paragraph 14.10 Modifications, and Sections XV, Dispute Resolution, and XXIX, Amendments, prior to exercising any administrative, legal, or equitable remedies available to them. If U.S. EPA and MPCA decide to use Paragraph 14.10, Modification, Section XV, Dispute Resolution, and XXIX, Amendments, the Navy agrees, subject to the procedures in these provisions, to implement any such work. In the event that U.S. EPA or MPCA seek any legal or equitable remedy on the basis that conditions (1), (2), or (3) above, nothing in this Agreement shall limit the Navy's right to raise or assert any defense, whether procedural or substantive, in law

or equity, or to raise any issue to jurisdiction or standing of any Party, or any other matter in any proceeding related to this Agreement, which the Navy might otherwise be entitled to raise or assert.

30.2 This Covenant Not To Sue does not affect any claims for natural resource damage assessments or for damages to natural resources.

30.3 Notwithstanding other provisions of this Agreement, Minnesota reserves all statutory rights it may have to obtain judicial review under CERCLA of any final decision of U.S. EPA on selection of remedial actions, including remedial actions for operable units. This reservation includes, without limitation, CERCLA sections 113, 121(e)(2), 121(f), and 310, 42 U.S.C. Sections 9613, 9621(e)(2), 9621(f), and 9659. Absent circumstances which may justify emergency removal action, Minnesota agrees to exhaust its rights under Section XV, Resolution of Disputes, before seeking judicial review.

Section XXXI.

STIPULATED PENALTIES

31.1 In the event that the U.S. Navy fails to submit a primary document set forth in this Agreement to U.S. EPA and MPCA pursuant to the requirements of this Agreement, or fails to comply with a term or condition of this Agreement which relates

to a Remedial Action for an Operable Unit or final Remedial Action, the U.S. EPA may assess, and the MPCA may demand an assessment of, a stipulated penalty against the U.S. Navy. In the event that the U.S. EPA does not assess a stipulated penalty following a demand by MPCA, the matter may be referred to dispute resolution in accordance with Section XV of this Agreement. A stipulated penalty may be assessed in an amount not to exceed five thousand dollars (\$5,000) for the first week (or part thereof), and ten thousand dollars (\$10,000) for each additional week (or part thereof) for which a failure set forth in this Section occurs. If no stipulated penalty is assessed by the U.S. EPA at the conclusion of dispute resolution, the MPCA retains all rights it may have to seek any other judicial penalties or sanctions against the U.S. Navy for the failure alleged including, but not limited to, penalties pursuant to CERCLA.

31.2 Upon determining that the U.S. Navy has failed in a manner set forth in Paragraph 31.1, the U.S. EPA shall so notify the U.S. Navy in writing. If the failure in question is not already subject to dispute resolution at the time such notice is received, the U.S. Navy shall have fifteen (15) days after receipt of the notice to invoke dispute resolution on the question of whether the failure did in fact occur. The U.S. Navy shall not be liable for the stipulated penalty assessed by U.S. EPA if the failure is determined, through the dispute resolution process, not to have occurred. No assessment of a stipulated

penalty shall be final until the conclusion of dispute resolution procedures related to the assessment of the stipulated penalty.

31.3 The annual reports required by Section 120(e)(5) of CERCLA, 42 U.S.C. Section 9620(e)(5), shall include, with respect to each final assessment of a stipulated penalty against the U.S. Navy under this Agreement, each of the following:

- A. The Site responsible for the failure;
- B. A statement of the facts and circumstances giving rise to the failure;
- C. A statement of any administrative or other corrective action taken at the Site, or a statement of why such measures were determined to be inappropriate;
- D. A statement of any additional action taken by or at the Site to prevent recurrence of the same type of failure; and
- E. The total dollar amount of the stipulated penalty assessed for the particular failure.

31.4 Stipulated penalties assessed pursuant to this Section shall be payable only in the manner and to the extent expressly provided for in Acts authorizing funds for, and appropriations to, the Department of Defense. U.S. EPA and MPCA agree to share equally any stipulated penalties paid by the Navy unless

prohibited by law to do so.

31.5 In no event shall this Section give rise to a stipulated penalty in excess of the amount set forth in Section 109 of CERCLA, 42 U.S.C. Section 9609.

31.6 This Section shall not affect the U.S. Navy's ability to obtain an extension of a timetable, deadline, or schedule pursuant to Section XXXIII, Extensions, of this Agreement.

31.7 Nothing in this Agreement shall be construed to render any officer or employee of the U.S. Navy personally liable for the payment of any stipulated penalty assessed pursuant to this Section.

Section XXXII.

DEADLINES

32.1 The U.S. Navy shall complete and transmit to the U.S. EPA and the MPCA drafts for the following primary documents in accordance with the deadlines set forth below:

Primary Documents

Deadlines

- | | |
|---|--------------|
| 1. Evaluation Report | Submitted |
| 2. RI/FS Work Plan, including QAPP, Sampling and Analysis Plan, and Site Health and Safety Plan
(Assumes one round of investigation yet to be conducted) | Oct. 1, 1991 |

- | | |
|--|---|
| 3. RI Report, including Risk Assessment, Initial Screening of alternatives | 365 Days from final RI/FS Work Plan |
| 4. Alternatives Report | 90 Days from final RI Report |
| 5. FS Report, including Detailed Analysis of Alternatives | 90 Days from final Alternatives Report |
| 6. Proposed Plan | 60 Days from final FS Report |
| 7. ROD | 90 Days from end of Public Comment Period |

32.2 Within twenty-one (21) days from the effective date of this Agreement, with respect to the September 28, 1990, ROD for groundwater remediation at NIROP, and within 21 days from the signing of any other ROD, the U.S. Navy shall propose deadlines to the U.S. EPA and MPCA for completion of the following RD/RA draft primary documents:

1. Remedial Design, 100%;
2. Remedial Action Work Plan; and
3. Response Action Final Report.

Within fifteen (15) days of receipt, U.S. EPA and the MPCA shall review and provide comments to the U.S. Navy regarding any RD/RA deadlines proposed under this paragraph. Within fifteen (15) days following the receipt of the comments, the U.S. Navy shall, as appropriate, make revisions and reissue the proposed deadlines. The Parties shall meet as necessary to discuss and finalize the proposed RD/RA deadlines. If the Parties agree on the proposed RD/RA deadlines, the finalized deadlines shall be incorporated into this Agreement. If the Parties fail to agree, within thirty (30)

days, on the proposed RD/RA deadlines, the matter shall immediately be submitted for dispute resolution pursuant to Section XV, Resolution of Disputes, of this Agreement.

32.3 The U.S. Navy shall complete and transmit to the U.S. EPA and MPCA drafts for the following secondary documents in accordance with the target dates set forth below:

<u>Secondary Documents</u>	<u>Target Dates</u>
1. Surface Water Investigation Plan (not previously in RI schedule)	As needed
2. Sampling and Data Results	60 Days from collection.
3. Treatability Studies (not previously in FS schedule)	As needed
5. Responsiveness Summary to Proposed Plan	Submitted with ROD
6. Community Relations Plan	Submitted with RI Report

The Community Relations Plan may be amended as appropriate to address current issues.

Within twenty-one (21) days from the signed ROD, the U.S. Navy shall propose target dates to the U.S. EPA and MPCA for completion of the following RD/RA draft secondary documents:

1. RD/RA Site Security and Health and Safety Plan; and
2. Remedial Design Phase Documents, (30% 60% 90%).

32.4 The deadlines set forth in this Section may be extended pursuant to Section XXXIII, Extensions, of this Agreement. The

Parties recognize that one possible basis for extension of deadlines relating to RI and FS is the identification of significant new Site conditions during the performance of the RI.

Section XXXIII.

EXTENSIONS

33.1 Either a timetable and deadline or a schedule shall be extended upon receipt of a timely request for extension and when good cause exists for the requested extension. Any request for extension by the U.S. Navy shall be submitted in writing and shall specify:

1. The timetable and deadline or schedule that is sought to be extended;
2. The length of the extension sought and the timeliness of the request;
3. The good cause(s) for the extension; and
4. Any related deadline that would be affected if the extension were granted.

33.2 Good cause exists for an extension when sought in regard to:

1. An event of force majeure; as defined in Section XXXVIII;
2. A delay caused by another party's failure to meet any requirement of this Agreement;
3. A delay caused by the good faith invocation of

dispute resolution or the initiation of judicial action;

4. A delay caused, or which is likely to be caused, by the grant of an extension in regard to another timetable and deadline or schedule; and
5. Any other event or series of events mutually agreed to by the Parties as constituting good cause.

33.3 Absent agreement of the Parties with respect to the existence of good cause, the U.S. Navy may seek and obtain determination through the dispute resolution process that good cause exists.

33.4 Within fifteen (15) days of receipt of a request for an extension of a deadline, the U.S. EPA and the MPCA shall advise the U.S. Navy in writing of their respective positions on the request. Any failure by the U.S. EPA or the MPCA to respond within the fifteen (15) day period shall be deemed to constitute concurrence in the request for extension. If U.S. EPA or MPCA does not concur in the requested extension, it shall include in its statement of non-concurrence an explanation of the basis for its position.

33.5 If there is consensus among the parties that the requested extension is warranted, the U.S. Navy shall extend the affected deadline accordingly. If there is no consensus among the Parties

as to whether all or part of the requested extension is warranted, the deadline shall not be extended except in accordance with a determination resulting from the dispute resolution process.

33.6 Within fifteen (15) days of receipt of a statement of non-concurrence with the requested extension, the U.S. Navy may invoke dispute resolution. The U.S. Navy shall be deemed to have waived its right to invoke dispute resolution if the request is not made within the fifteen (15) day period.

33.7 A timely and good faith request for an extension shall toll any assessment of stipulated penalties or application for judicial enforcement of the affected deadline until a decision is reached on whether the requested extension will be approved. If dispute resolution is invoked and the requested extension is denied, stipulated penalties may be assessed and may accrue from the date of the original deadline. Following the grant of an extension, an assessment of stipulated penalties or an application for judicial enforcement may be sought only to compel compliance with the deadline as most recently extended.

Section XXXIV.

CONVEYANCE OF TITLE

No conveyance of title, easement, or other interest in the United States property on which any containment system, treatment

system, monitoring system, or other response action(s) is installed or implemented pursuant to this Agreement shall be consummated by the U.S. Navy without provision for continued maintenance of any such system or other response action(s). At least thirty (30) days prior to any conveyance, the U.S. Navy shall notify U.S. EPA and the MPCA Commissioner of the provisions made for the continued operation and maintenance of any response action(s) or system installed or implemented pursuant to this Agreement.

Nothing in this Agreement shall affect or impair the obligation of the U.S. Navy to comply, or limit in any way the ability of the U.S. Navy to transfer the property in accordance with Section 120(h) of CERCLA, 42 U.S.C. Section 9620(h), concerning property transferred by Federal agencies.

Section XXXV.

PUBLIC PARTICIPATION

35.1 In implementing this Agreement, including any subsequent proposed remedial action alternatives and subsequent plans for remedial action at the Site arising out of this Agreement, the Parties shall comply with the administrative record and public participation requirements of CERCLA, including Sections 113 and 117 and, 42 U.S.C. Sections 9613 and 9617, the NCP, and be consistent with U.S. EPA guidance and/or regulations on public participation and administrative records.

35.2 The U.S. Navy has developed and will continue to implement a Community Relations Plan (CRP) which responds to the need for an interactive relationship with all interested community elements regarding activities and elements of work undertaken by the U.S. Navy both on and off the NIROP Site. The U.S. Navy agrees to develop and implement the CRP in a manner consistent with Section 117 of CERCLA, 42 U.S.C. Section 9617, the NCP, and U.S. EPA guidance.

35.3 To the maximum extent practicable, any Party issuing a formal press release to the media regarding any of the work required by this Agreement shall advise the other Parties of such press release at least three (3) business days before the issuance of such press release.

35.4 The U.S. Navy has established and shall continue to maintain an administrative record near the NIROP Fridley in accordance with Section 113(k) of CERCLA, 42 U.S.C. Section 9613(k). The administrative record shall be maintained in accordance with U.S. EPA guidance. A copy of each document placed in the administrative record will be provided to the U.S. EPA and MPCA. The administrative record developed by the U.S. Navy shall be updated and changes supplied to U.S. EPA and MPCA. An updated index of documents in the administrative record will accompany each update of the administrative record.

Section XXXVI.

PUBLIC COMMENT ON THIS AGREEMENT

36.1 Within fifteen (15) days of the date of the signing of the Agreement by all Parties, the U.S. EPA shall announce the availability of this Agreement to the public for review and comment. The U.S. EPA shall accept comments from the public for a period of forty-five (45) days after such announcement. At the end of the comment period, within thirty (30) days all Parties shall review all such comments and shall either:

(1) Determine that the Agreement should be made effective in its present form, in which case the other Parties shall be notified in writing; the U.S. EPA shall promptly issue a notice to the other Parties that the Agreement shall become effective on the date the notice is issued; or

(2) Determine that modification of the Agreement is necessary, in which case the Parties will negotiate revisions to the Agreement which incorporate appropriate changes. Upon conclusion of such modification, U.S. EPA shall promptly issue a notice to the other Parties that the Agreement shall become effective on the date the notice is issued.

36.2 In the event of public comment on the Agreement, the U.S. EPA shall prepare and publish an appropriate responsiveness summary. The Navy and the MPCA must concur in the contents of the Responsive Summary prior to its publication.

Section XXXVII.

ENFORCEABILITY

37.1 The Parties agree that:

(1) Upon the effective date of this Agreement, any standard, regulation, condition, requirement, or order which has become effective under CERCLA and is incorporated into this Agreement is enforceable by any person pursuant to Section 310 of CERCLA, and any violation of such standard, regulation, condition, requirement, or order will be subject to civil penalties under Sections 310(c) and 109 of CERCLA;

(2) All timetables or deadlines associated with the RI/FS shall be enforceable by any person pursuant to Section 310 of CERCLA, and any violation of such timetables or deadlines will be subject to civil penalties under Sections 310(c) and 109 of CERCLA;

(3) All terms and conditions of this Agreement which relate to Remedial Actions for Operable Units or final Remedial Actions, shall be enforceable by any person pursuant to Section 310 (c) of CERCLA and any violation of such terms or conditions will be subject to civil penalties under Sections 310(c) and 109 of CERCLA; and

(4) Any final resolution of a dispute pursuant to Section XV of this Agreement which establishes a term, condition, timetable, deadline or schedule shall be enforceable by any person pursuant to Section 310(c) of CERCLA, and any violation of such term, condition, timetable, deadline, or schedule will be

subject to civil penalties under Sections 310(c) and 109 of CERCLA.

37.2 Nothing in this Agreement shall be construed as a restriction or waiver of any rights the U.S. EPA or MPCA may have under CERCLA, including but not limited to any rights under Sections 113, 121, and 310, 42 U.S.C. Sections 9613, 9621 and 9659. The U.S. Navy does not waive any rights it may have under CERCLA Section 120, 10 U.S.C. Section 2701 et seq., and Executive Order 12580.

37.3 Nothing in this Agreement shall be construed as authorizing any person to seek judicial review of any action or work where review is barred by any provision of CERCLA, including Section 113(h) of CERCLA, 42 U.S.C. Section 9613(h).

37.4 The Parties agree to exhaust their rights under Section XV, Dispute Resolution, prior to exercising any right to judicial review.

37.5 The Parties agree that all Parties shall have the right to enforce the terms of this Agreement.

Section XXXVIII.

FORCE MAJEURE

A Force Majeure shall mean any event arising from causes beyond

the control of a Party exercising reasonable diligence that causes a delay in or prevents the performance of any obligation under this Agreement, including, but not limited to, acts of God; fire; war; insurrection; civil disturbance; explosion; unanticipated breakage or accident to machinery, equipment, or lines of pipe despite reasonably diligent maintenance; unusual delays in transportation; adverse weather conditions that could not reasonably be anticipated which are so severe as to prevent performance of the work without unreasonable difficulty; restraint by court order or order of public authority; inability to obtain, at reasonable cost and after exercise of reasonable diligence, any necessary authorizations, approvals, permits or licenses due to action or inaction of any governmental agency or authority other than the U.S. Navy; delays caused by compliance with applicable statutes or regulations governing contracting, procurement, or acquisition procedures, despite the exercise of reasonable diligence; and the insufficient availability of appropriated funds, if the U.S. Navy shall have made timely request for such funds as part of the budgetary process as set forth in Section XL, Funding. Should the Navy claim force majeure on the basis of insufficient availability of appropriated funds, MPCA reserves its rights under Paragraph 40.5, but U.S. EPA shall be bound by this force majeure and shall not assess stipulated penalties. A Force Majeure shall also include any strike or other labor dispute, whether or not within the control of the Parties affected thereby. Force Majeure shall not include

increased costs or expenses of Response Actions, whether or not anticipated at the time such Response Actions were initiated.

In any dispute and in any judicial action in which a Force Majeure is an issue, the U.S. Navy shall have the burden of proving the existence and duration of a Force Majeure.

Section XXXIX.

CERTIFICATION AND TERMINATION

39.1 When the Navy determines that any final remedial action, including any groundwater remediation, has been completed in accordance with the requirements of this Agreement, it shall so advise U.S. EPA and MPCA in writing, and shall request from U.S. EPA, in consultation with MPCA, certification that the remedial actions(s) have been completed in accordance with the requirements of this Agreement. Within ninety (90) days of the receipt of the request for U.S. EPA certification, U.S. EPA, in consultation with the MPCA, shall advise the Navy and the MPCA in writing that:

(a) U.S. EPA, in consultation with the MPCA certifies that the remedial action has been completed in accordance with this Agreement, based on conditions known at the time of certification; or

(b) U.S. EPA, in consultation with the MPCA denies the Navy's request for certification, stating in full the basis for the denial.

39.2 If U.S. EPA, in consultation with the MPCA, denies the Navy's request for certification that a remedial action has been completed in accordance with this Agreement, the Navy may invoke Dispute Resolution, Section XV, to review the U.S. EPA's determination. If the U.S. EPA's denial of certification is upheld in dispute resolution, the U.S. EPA shall describe and the Navy shall implement, pursuant to Paragraph 14.10, Modifications, or Section XXIX, Amendments, the additional work needed to bring the remedial action into compliance with the requirements of this Agreement. After performing such additional work pursuant to this Agreement, the Navy shall resubmit a request for certification to U.S. EPA. U.S. EPA, in consultation with the MPCA, shall then grant or deny certification pursuant to the process set forth in this paragraph and the previous paragraph.

39.3 If after consultation with U.S. EPA, MPCA disagrees with U.S. EPA's decision, MPCA may invoke Dispute Resolution, Section XV.

39.4 Any party may propose in writing the termination of this Agreement upon a showing that the objectives of this Agreement have been satisfied. The provisions of this Agreement shall be deemed satisfied and terminated upon receipt by the U.S. Navy of written notice from U.S. EPA and the MPCA that the U.S. Navy has demonstrated that all the terms of this Agreement have been completed. Such a notice may not be unreasonably withheld. The

U.S. EPA and MPCA shall respond promptly to every termination proposal and shall provide a specific, written explanation for any negative determination, which shall be subject to Section XV, Resolution of Disputes.

Section XL.

FUNDING

40.1 It is the expectation of the Parties to this Agreement that all obligations of the U.S. Navy arising under this Agreement will be fully funded. The U.S. Navy agrees to seek sufficient funding through the Department of Defense budgetary process to fulfill its obligations under this Agreement.

40.2 In accordance with Section 120(e)(5)(B) of CERCLA, 42 U.S.C. Section 9620(e)(5)(B), the U.S. Navy shall provide to DOD for inclusion and the Parties intend that DOD shall include in its annual report to Congress the specific cost estimates and budgetary proposals associated with the implementation of this Agreement.

40.3 Any requirement for the payment or obligation of funds, including stipulated penalties, by the U.S. Navy established by the terms of this Agreement shall be subject to the availability of appropriated funds, and no provision herein shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. Section 1341. In

cases where payment or obligation of funds would constitute a violation of the Anti-Deficiency Act, the dates established requiring the payment or obligation of such funds shall be appropriately adjusted.

40.4 If appropriated funds are not available to fulfill the U.S. Navy's obligations under this Agreement, U.S. EPA reserves the right to initiate an action against any other person; or to take any response action, which would be appropriate absent this Agreement.

40.5 The Navy maintains that any requirement for the payment or obligation of funds under this Agreement is subject to the availability of appropriated funds, and that the unavailability of such funds constitutes a valid defense to any judicial action that might be brought to enforce the terms of this Agreement. Notwithstanding Paragraphs 40.1-40.4 above, the MPCA does not agree that lack of appropriation or funding constitutes a valid defense to performance by the Navy. However, the Parties agree and stipulate that it is premature to raise and adjudicate the validity of such a defense at this time. If sufficient funds are not available to fulfill the Navy's obligations under this Agreement, the Parties shall meet to discuss the funding shortfall, the ways of resolving it, and whether it is appropriate to adjust the deadlines set forth in Section XXXII which are affected by the funding shortfall. Any Party may

elevate the issue(s) directly to the SEC for resolution. Six (6) months following the failure of the Navy to meet a deadline or six (6) months following the first extension of a deadline because of lack of funding, MPCA shall have the right to seek judicial enforcement of this Agreement and of the Navy's obligations under CERCLA. This Paragraph is not subject to Section XV, Resolution of Disputes, but does not exclude the consensual use of Section XXXII, Extensions. Acceptance of Paragraph 40.5 does not constitute a waiver by the Navy of the applicability of any appropriate provisions of the Anti-Deficiency Act, 31 U.S.C. section 1341, to the terms of this Agreement.

40.6 Funds authorized and appropriated annually by Congress under the "Environmental Restoration, Defense" (ERD) appropriation in the Department of Defense Appropriation Act and allocated by the Deputy Assistant Secretary of Defense for the Environment (DASD(E)) to the U.S. Navy will be the source of funds for activities required by this Agreement consistent with Section 211 of CERCLA, 10 U.S.C. Chapter 160. However, should the ERD appropriation be inadequate in any year to meet the total of the U.S. Navy's national implementation requirements, the DOD shall employ, and the U.S. Navy shall follow, a standardized DOD prioritization process which allocates that year's appropriations in a manner which maximizes the protection of human health and the environment. A standardized DOD Priority System shall be

developed and used with the assistance of U.S. EPA and the states.

Section XLI.

EFFECTIVE DATE

This Agreement shall be effective pursuant to Paragraph 36.1 of this Agreement.

Section XLII.

RECOVERY OF STATE RESPONSE COSTS

42.1 On or after October 1, 1991, the MPCA will submit to the Navy an Accounting of all State response costs regarding the Site which were actually incurred prior to October 17, 1986, the date of the passage of the Superfund Amendments and Reauthorization Act of 1986. Such Accounting shall be accompanied by cost summaries and be supported by documentation which meets the following federal auditing requirements. The cost summaries will set forth employee-hours and other expenses by major type of support service. All costs submitted must be for work not inconsistent with either the National Contingency Plan (NCP) or the requirements described in OMB Circulars A-87 (Cost Principles for State and Local Governments), A-128 (Audits for State and Local Cooperative Agreements with State and Local Governments), and Standard Forms 424 and 270. The Navy has the right to audit any cost reports used by the State to develop these costs

summaries.

42.2 The Accounting will not exceed \$26,759.40.

42.3 Within ninety (90) days of receipt of the Accounting, the Navy shall reimburse the State in the amount set forth in the Accounting.

42.4 In the event the Navy disputes any of the costs set forth in the Accounting, or a dispute arises on any matter controlled by this Section including, but not limited to, allowability of expenses and limits on reimbursement, such a dispute shall be resolved through the bilateral dispute resolution process described in this Section. Such a dispute shall not be resolved through Section XV, Resolution of Disputes, of this Agreement. While it is the intent of the Navy and the MPCA that this Section shall govern the resolution of all disputes concerning State reimbursement, the Navy and MPCA agree to attempt informal dispute resolution whenever practicable.

(a) The Navy and MPCA Project Managers shall be the initial points of contact for coordination of dispute resolution under this Section.

(b) If the Navy and MPCA Project Managers are unable to resolve a dispute the matter shall be referred to the Commanding

Officer, Northern Division, Naval Facilities Engineering Command, or his designated representative and the Director, Division of Groundwater and Solid Waste, MPCA, as soon as practicable, but in any event within fifteen (15) working days after the dispute is elevated by the Navy and MPCA Project Managers.

(c) If the Commanding Officer, Northern Division, Naval Facilities Engineering Command, and the Director, Division of Groundwater and Solid Waste, MPCA, are unable to resolve the dispute within fifteen (15) working days, the matter shall be elevated to the Office of the Assistant Secretary of the Navy (Installations and Environment) and the Commissioner of the MPCA.

(d) In the event the Office of the Assistant Secretary of the Navy (Installations and Environment) and the Commissioner of the MPCA are unable to resolve a dispute within sixty (60) days, the State retains any legal remedies it may have to recover these pre-October 17, 1986 expenses.

42.5 Any reimbursement provided under this Section shall be in settlement of any and all claims against the Navy for State response costs incurred prior to October 17, 1986 with regard to the Site, except as to disputed reimbursement claims not resolved under Paragraph 42.4.

42.6 With regard to any and all response costs incurred by the

State after October 17, 1986, the MPCA agrees to negotiate in good faith for sixty (60) days, or longer if mutually agreed upon by the MPCA and the Department of Defense (DOD), a Department of Defense/State Memorandum of Agreement (DSMOA). In the event that the State is unable to reach agreement with DOD, the MPCA agrees to negotiate in good faith for sixty (60) days, or longer if mutually agreed upon by the MPCA and the Navy, to attempt to resolve any claims for reimbursement of State costs which were incurred after October 17, 1986. In the event that the MPCA is unable to reach an agreement with the Navy, the State reserves its rights to bring a cost recovery action against the Navy regarding State expenses incurred after October 17, 1986 with regard to the Site.

42.7 It is the expectation of the Navy that all obligations of the Navy arising under this Section will be fully funded. The Navy agrees to seek sufficient funding through the Department of Defense budgetary process to fulfill its obligations under this Section. Any requirement for the payment or obligation of funds by the Navy established by this Section shall be subject to the availability of appropriated funds, and no provision herein shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. Section 1341.

42.8 Paragraph 40.6 of this Agreement shall not be applicable to this Section of the Agreement.

Each undersigned representative of a Party certifies that he or she is fully authorized to enter into the terms and conditions of and to legally bind such Party to the Agreement.

IT IS SO AGREED:

FOR THE UNITED STATES DEPARTMENT OF THE NAVY

By: _____ Date _____
Jacqueline Schafer
Assistant Secretary of the Navy (Installations & Environment)

FOR THE MINNESOTA POLLUTION CONTROL AGENCY

By: _____ Date _____
Commissioner
Minnesota Pollution Control Agency

By: _____ Date _____
Chairman
Minnesota Pollution Control Agency
Board

By: _____ Date _____
Attorney General
State of Minnesota

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

By: _____ Date _____
Valdas V. Adamkus
Regional Administrator, Region V
U.S. Environmental Protection Agency

Each undersigned representative of a Party certifies that he or she is fully authorized to enter into the terms and conditions of and to legally bind such Part to the Agreement.

IT IS SO AGREED:

FOR THE UNITED STATES DEPARTMENT OF THE NAVY

By: *Jacqueline E. Schafer* 25 March 1991
Jacqueline Schafer Date
Assistant Secretary of the Navy (Installations & Environment)

FOR THE MINNESOTA POLLUTION CONTROL AGENCY

By: *Daniel D. Foley MD* 3/26/91
Daniel D. Foley, M.D., Chairman Date
Minnesota Pollution Control Agency
Board

By: *Stephen Shakman* 3/26/91
for Hubert H. Humphrey, III Date
Attorney General
State of Minnesota

FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

By: *Valdas V. Adamkus* 3/28/91
Valdas V. Adamkus Date
Regional Administrator, Region V
U.S. Environmental Protection Agency

By: *Jerome Kujawa* March 27, 1991
Jerome Kujawa Date
Assistant Regional Counsel, Region V
U.S. Environmental Protection Agency

ATTACHMENT A

GUIDELINES FOR REMEDIAL INVESTIGATION AND FEASIBILITY STUDY

I. INTRODUCTION

The U.S. Department of the Navy (Navy) has agreed, pursuant to Section X, "Remedial Investigation" and Section XI, "Feasibility Study", of this Federal Facility Agreement (Agreement), to conduct Remedial Investigations (RIs) and Feasibility Studies (FSs) as determined necessary by U.S. Environmental Protection Agency in consultation with the State. This Attachment outlines tasks required under the RI/FS process. It is based upon the requirements of CERCLA as detailed in the NCP promulgated on March 8, 1990, (55 Federal Register 8666). All RI/FS work shall adhere to the procedures and terminology identified in U.S. EPA's October 1988 Interim Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (OSWER Directive 9355.30. If additional U.S. EPA and MPCA guidance or policy applies to RI/FS work to be conducted, the U.S. EPA and MPCA will provide the Navy with the applicable guidance or policy prior to RI Work Plan completion. If guidance documents discussed in this Attachment are revised after this Agreement becomes final, the most recent revision of that document should be used.

Insofar as previously submitted reports address specified requirements of an RI, ~~these~~ may be referenced with specificity as to their applicability. If the Parties agree that previously submitted reports fulfill requirements described in, "Remedial Investigation", Section X and, "Feasibility Study", Section XI, the Navy shall use the previously submitted reports. A previously submitted RI and FS was used to select a remedy for contaminated ground water at the Site. A Record of Decision

regarding remediation of ground water was signed on September 28, 1990.

✓ II. RETAIN CONSULTANTS

The Navy shall retain a consultants qualified to undertake and complete requirements of this Agreement and shall notify the U.S. EPA and MPCA Project Managers of the names of the consultants, and a description of the tasks assigned to the consultants.

III. SITE SECURITY AND HEALTH AND SAFETY PLAN (Submitted for Ground
Water Operable Unit)

A. The Navy shall prepare and submit to the U.S. EPA and MPCA as set forth in, "Consultation with U.S. EPA and MPCA", Part XIV of this Agreement a Site Security Plan. The Site Security Plan can be a compilation of existing Navy Security Plans to limit and control the general public's access to the Site.

B. The Navy shall prepare and submit to the U.S. EPA and MPCA as set forth in, "Consultation with U.S. EPA and MPCA", Section XIV of this Agreement, a Health and Safety Plan. The Health and Safety Plan shall provide information on provisions to protect site visitors, personnel responsibilities, protective equipment, procedures, protocols, decontamination methods, and medical surveillance. The Health and Safety Plan should identify problems or hazards that may be encountered and their solutions. The Navy shall prepare the Health and Safety Plan to incorporate and be consistent with requirements of:

1. Occupational Safety and Health Administration (OSHA) requirements 29 CFR Part 1910.120, Hazardous Waste Operations and Emergency Response; Interim Final Rule. Federal Register, December 19, 1986.
2. OSHA requirements 29 CFR Part 1910 (General Industry Standards) and

1926 (Construction Industry Standards).

3. Occupational Safety and Health Guidance Manual for Hazardous Waste Activities, NIOSH/OSHA/USCG/EPA, DHHS (NIOSH) Publication Number 85-115, October 1985.

The management of site security and health and safety are the responsibility of the Navy. The Navy shall implement the Site Security and Health and Safety plans, and shall take into account the comments of the U.S. EPA and the MPCA, pursuant to, "Consultation with U.S. EPA and MPCA", Section XIV.

IV. REMEDIAL INVESTIGATIONS (Submitted for Ground Water Operable Unit)

The Navy shall design, implement, and complete a Remedial Investigation or any additional remedial investigations which accomplish the purposes and meet the requirements of this part. The purposes of RIs are (1) to identify all sources of contamination; (2) to identify the extent and magnitude of soil, subsoil, surface water, and ground water contamination; (3) to gather all necessary data to support the FS and Risk Assessment, and (4) to provide information and data needed for the selection and implementation of response actions at the Site.

For any additional RI activities not included in an approved RI Work Plan, the approved RI Work Plan shall be revised in accordance with the process described in, "Re-Opening and Modification", Subsection 14.10, of "Consultation with U.S. EPA and MPCA", Section XIV. If any additional RI activities will adversely affect work scheduled through the end of the upcoming quarter, the procedures specified in, "Extensions", Section XXXIII of the Agreement shall be followed. The requirements for future Remedial Investigations are set forth in Tasks A through C. The

RI's shall include, but not be limited to, the following tasks.

Task A. Submit an Initial Evaluation Report, Remedial Investigation Work Plans, Quality Assurance Project Plans, Sampling and Analysis Plans and Surface Water Investigation Plan

The Navy shall submit to the U.S. EPA and MPCA for review and comment, an Initial Evaluation Report, Remedial Investigation Work Plans, Quality Assurance Project Plans (QAPP), Sampling and Analysis Plans (SAP) and Surface Water Investigation Plan. An RI Work Plan, QAPP, and SAP have been submitted for a ground water operable unit. For future RI's, the RI Work Plan shall contain the information set forth in Task A.2. If the Parties agree that information contained in the previously submitted RI fulfill requirements detailed in Task A.2, duplication of that specific task will not be required.

1. Initial Evaluation Report (Submitted)

An initial evaluation study was performed under the Navy Assessment and Control of Installation Pollutants (NACIP) program. In June of 1983, the Initial Assessment Study of Naval Industrial Reserve Ordnance Plant was published. This document serves as the Navy's version of an Initial Evaluation Report.

2. Remedial Investigation Work Plans

The Navy shall submit RI Work Plans which upon implementation are intended to: (1) provide for the complete characterization of the Site and its actual or potential hazard to public health, welfare and the environment; (2) produce sufficient data and information to allow the Navy to submit the report described in Task C, below; and (3) produce data of sufficient quantity and adequate technical content to assess

possible alternative response actions during the Feasibility Study. RI Work Plans, which follow a phased approach, contain the following elements:

a. Hazardous Substance, Pollutant or Contaminant Characterization

A process to identify any hazardous substances, pollutants or contaminants that have been stored, used or disposed of at the Site.

b. Source Investigation

A process to define all areas and facilities (i.e. waste storage and disposal facilities, pits and trenches), which release or threaten the release of hazardous substances, pollutants or contaminants to soil, surface water or ground water.

c. Hydrologic Investigation

A process to characterize ground water flow and contaminant transport in the area of the Site. Ground water flow patterns and directions, both horizontal and vertical, must be defined. Contaminant concentrations and their variations must be defined.

The Hydrologic Investigation includes the following:

- (1) Proposal for the installation of ground water monitoring wells or piezometers which shall be needed to clearly define ground water conditions. The elevations of all wells at the Site shall be surveyed to a common reference point. Water elevations/levels in all wells shall be measured.
- (2) Proposal for the installation of ground water monitoring wells which shall be used to define conditions upgradient and downgradient of suspected source areas.
- (3) Proposal for tests (i.e aquifer/pump tests) to be conducted which

shall be performed to determine the hydraulic properties of the water bearing formations near and under the Site. Determinations shall be made of the ground water flow rates in the horizontal and vertical directions.

(4) Proposal for a ground water quality monitoring program to be conducted which shall contain a schedule for the periodic sampling of ground water and recording of water levels. After these sampling rounds, the Navy may propose a reduced list of parameters and/or lessen the frequency of further monitoring. The periodic sampling rounds should be scheduled so as to adequately represent seasonal fluctuations in water levels and/or water quality.

d. Soils Investigation

A process to investigate the sources contributing to ground water and soil contamination at the Site. Soil sampling including split spoon sampling, test trenching or other methods shall be proposed to obtain samples for analysis. The soil samples shall be analyzed for parameters listed in an approved QAPP. The soil sampling program shall be conducted in areas of known or suspected disposal or in areas where ground water contamination exists and known or suspected sources have been identified.

3. Quality Assurance Project Plan (QAPP)

The Navy shall submit a QAPP that is specific to the Site and will be used in implementing the RI Work Plan. The QAPP shall be consistent with the requirements of the EPA's Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans (QAMS-005/80), and Region V's Content Requirements for QAPP, (Feb. 87, revised Jan 89). The QAPP shall consist of three parts: Specific Project Information; Sampling and

Analysis Plan; and the Laboratory Quality Assurance/Quality Control (QA/QC) Plan.

Prior to drafting the QAPP, the U.S. EPA will schedule a pre-QAPP meeting. The purpose of the meeting will be to clearly define data quality objectives and tasks required in the QAPP approval process.

The QAPP shall include the following:

a. Specific Project Information

1) Title Page and Table of Contents;

2) Project Description: a general description of the project including anticipated start and completion dates for field work and sample analysis, intended use of data and location and description of sampling points; and

(3) Project Organization and Responsibility: a table or chart of the project organization and the line authority including those responsible for sampling, analysis and QA/QC.

b. Sampling and Analysis Plan

The Sampling and Analysis Plan shall be specific to the Site and consists of the following sections:

(1) Data Quality (DQ) and QA objectives for measurements of data in terms of defined limits, precision, accuracy, completeness, representativeness, comparability and the U.S. EPA or standard method numbers; and

(2) Sampling procedures including a description of the following criteria for sampling; site location, monitoring well installation methods, procedures for sample collection, sample container identification, chain-of-custody, transport, storage and decontamination procedures.

c. Laboratory QA/QC Plan

The laboratory QA/QC Plan consists of the following sections:

- (1) Title Page;
- (2) Table of Contents;
- (3) Project Description;
- (4) Project Organization and Responsibility;
- (5) DQ and QA Objectives for Measurement Data in Terms of Precision Accuracy, Completeness, Representativeness and Comparability;
- (6) Sampling Procedures;
- (7) Sample Custody;
- (8) Calibration Procedures and Frequency;
- (9) Description of Analytical Procedures;
- (10) Data Reduction, Validation and Reporting;
- (11) Internal Quality Control Checks;
- (12) Performance and System Audits;
- (13) Preventive Maintenance;
- (14) Specific Routine Procedures used to assess Data Precision, Accuracy and Completeness;
- (15) Corrective Action; and
- (16) Quality Assurance Reports to Management.

4. Surface Water Investigation Plan

The Site is located on land that is in close proximity to the Mississippi River. If it is demonstrated that contaminants from the Site are entering or are about to enter the Mississippi River via surface drainage or storm sewer outfalls, the Navy shall propose a plan to quantify the migration of such material and the impact on nearby surface water. The

information provided in various reports on the Site indicate that ground water flows toward the Mississippi River, although the exact extent of impact on the River from the Site has not been determined. If additional surface water investigations are required, the process detailed in Section XIV, "Consultation with U.S. EPA and MPCA", Subsection 14.10, "Subsequent Re-opening and Modification Process" shall be used.

Task B. Report Results of Remedial Investigations

In Draft RI Reports, the Navy shall organize and present all data, analytical results, boring logs and results. Further, the Draft RI Reports shall include a detailed description of the following:

1. Site Characterization Summary of the Release or Threatened Release at Site

- a. The type, physical states and amounts of hazardous substances, pollutants and contaminants on the Site;
- b. Any medium (e.g., ground water, surface water, soils, air) affected by the hazardous substances, pollutants and contaminants at the Site;
- c. All pathways (e.g., leachate, multi-aquifer wells, runoff) by which contamination reached the media;
- d. The extent and magnitude of hazardous substances, pollutants and contaminants in the soil on the Site;
- e. The extent and magnitude of hazardous substances, pollutants and contaminants in the ground water beneath and around the Site;
- f. If necessary, the extent and magnitude of hazardous substances, pollutants and contaminants in the surface water near the Site;
- g. The impact of any ground water contamination identified at Site;
- h. The impact of any surface water contamination identified.

2. Initial Screening of Possible Alternative Response Actions

The Navy shall include in the Draft RI Reports an Initial Screening of Possible Alternative Response Actions, based upon the analysis of data obtained during the RI. The Initial Screening shall include an analysis on whether the RI has produced sufficient information to allow for a Detailed Analysis during the Feasibility Study of each possible response action.

3. Risk Assessments

The Navy shall prepare Risk Assessments of actual and potential exposure risks by human populations as well as the environment, including animals and vegetation. A Risk Assessment shall be incorporated in the Draft RI Reports. Risk Assessments shall be consistent with requirements described in U.S. EPA's Risk Assessment Guidance for Superfund, Volumes 1 & 2, OERR (EPA540/1-89/001, 3/89 & 002, 12-89). The Risk Assessment process should be divided into four components: 1) Contaminant Identification, 2) Exposure Assessment, 3) Toxicity Assessment, and 4) Risk Characterization. At a minimum, Risk Assessments shall describe and evaluate the following:

- a. The contaminants release and their pathways through the ground water and surface water, through the soil air space, as well as through the atmosphere;
- b. The environmental fate and transport in the various media of the releases and their byproducts;
- c. Estimated actual and potential exposures of human and animal populations as well as vegetation by the releases and their byproducts;
- d. Exposure scenarios and a risk characterization of the population and

the environment at risk.

V. FEASIBILITY STUDIES (Submitted for Ground Water Operable Unit)

The purpose of Feasibility Studies are to evaluate the feasibility and effectiveness of implementing alternative Response Actions at the Site.

An FS shall contain sufficient information and analysis to make the determination of the appropriate extent of remedy. An FS shall use and build upon the information generated by the RI and shall consist of the following Tasks.

Task A. Alternatives Report(s)

Following the finalization of RI Reports, the Navy shall develop and submit to the U.S. EPA and MPCA an Alternatives Report pursuant to the target date established in, "Deadlines and Target Dates", Section XXXII.

An Alternatives Report shall provide an evaluation of (a) each possible alternative response action identified in Section IV Task B.2 of this Attachment, and (b) any other alternative identified by the Parties.

The purpose of preparing an Alternatives Report is to provide sufficient information on each of the possible alternative response action to enable the Parties to reject any possible alternate response actions which are not feasible or effective. For each evaluated alternative, the following shall be addressed and presented in the Alternatives Report:

1. Compliance with Applicable, Relevant and Appropriate Requirements

(ARARs)

An assessment of the ability of the evaluated alternatives in meeting all identified ARARs, criteria and guidance. For the ground water operable unit, the Safe Drinking Water Act, Maximum Contaminant Levels (MCLs) for Volatile Organic Compounds have been identified as clean up goals.

2. Cost

A preliminary estimate of the capital cost, along with operation and maintenance cost associated with installing or implementing each evaluated alternative.

3. Protection of Human Health and Environmental Effects

A general discussion of the expected adverse effects which each evaluated alternative may have on protection of human health and the environment.

4. Short Term Effectiveness

A discussion which addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during construction and implementation period until cleanup goals have been met.

5. Long Term Effectiveness and Permanence

A discussion referring to the ability of each alternative to maintain reliable protection of human health and the environment over time, once cleanup goals have been met.

6. Technical Feasibility and Implementability

An analysis of the technical feasibility and implementability of each evaluated alternative both in relation to the location and conditions of the release or threatened release and in relation to the reliability of the technologies which could be employed to implement the evaluated alternative.

7. Toxicity, Mobility and Volume Reduction

An assessment of the reduction of the toxicity, mobility and volume of the contaminants by each evaluated alternative. The Navy shall include in the Alternatives Report its recommendation and rationale regarding which

evaluated alternative should be given further consideration for implementation at the Site. The Navy shall base its recommendations on the extent on which each of the evaluated alternatives meets response action objectives and seven criteria set forth in Task C below.

8. State Acceptance

A preliminary assessment evaluating the technical and administrative issues and concerns of the State regarding each of the alternatives discussed.

9. Community Acceptance

A preliminary assessment evaluating the issues and concerns the public may have regarding each of the alternatives.

The Community and State acceptance criteria will also be addressed in the ROD once comments on the RI/FS report and the Proposed Plan have been received.

Task B. Treatability Studies

Following finalization of the RI Report and prior to completion of an FS Report, the Navy shall develop and submit to the U.S. EPA and MPCA any appropriate Treatability Studies. Treatability Studies can also be developed and submitted during the Remedial Design/Remedial Action (RD/RA) phase of remediation. Any Treatability Study shall include the cleanup standard requirements stated in CERCLA Section 121, 42 U.S.C. Section 9621, by providing an explanation of the various treatment technologies which may be employed to implement each of the evaluated alternatives, as they apply specifically to the Site. For each of the technologies considered in any Treatability Study the following factors shall be addressed and presented in any Treatability Study:

1. Effectiveness in treating the hazardous substances, pollutants and contaminants of concern;
2. Reliability and past success of technologies under consideration; and use of past data results associated with the technology, and
3. Availability of each specified technology applicable to the situation at the Site.

Task C. Review of Alternatives Report and any associated Treatability Studies

Upon receipt of the Alternatives Report and any Treatability Studies submitted pursuant to Task A and B above, the U.S. EPA and MPCA will review and comment on the evaluated Alternatives Report and any Treatability Studies pursuant to, "Consultation with U.S. EPA and MPCA", Section XIV. The Parties will consider the extent to which each of the evaluated alternatives meets the following criteria:

1. Compliance with ARARs

Evaluated alternatives that do not achieve all identified ARARs criteria and guidance will be eliminated unless specific waiver conditions could be reasonably invoked.

2. Cost

An evaluated alternative whose estimated costs far exceed those of other evaluated alternatives, in relation to the benefits which the evaluated alternatives will produce, will be eliminated unless any of the Parties explicitly express the desire to further consider the evaluated alternative, and could provide adequate justification to do so.

3. Protection of Human Health and Environmental Effects

Evaluated alternatives that inherently present significant adverse human

health and/or environmental effects will be excluded from further consideration.

4. Short Term Effectiveness

Evaluated alternatives which do not achieve protection and may pose adverse impacts on human health and the environment during construction and implementation period until the period in which cleanup goals have been met, will be excluded from further consideration.

5. Long Term Effectiveness and Permanence

Evaluated alternatives which do not demonstrate the ability to maintain reliable protection of human health and the environment over the period of time after cleanup goals have been met, will be excluded from further consideration.

6. Technical Feasibility and Implementability

Evaluated alternatives that may prove extremely difficult to implement, or that rely on unproven technologies will generally be excluded from further consideration. Evaluated alternatives that are not reliable will be excluded from further consideration.

7. Toxicity, Mobility and Volume Reduction

Evaluated alternative will be reviewed regarding their capabilities of addressing these conditions, and eliminated from further consideration if they do not achieve significant reduction.

Task D. Draft Feasibility Study Reports

Following review and comment on an Alternatives Report and any Treatability Study, the Navy shall prepare and submit to the U.S. EPA and the MPCA a Draft Feasibility Study Report by deadlines established in "Deadlines and Target Dates", Section XXXII. The Draft FS shall

incorporate the Alternatives Report and any Treatability Studies and shall also present a detailed analysis of remedial alternatives. The detailed analysis portion of the Draft FS Report shall include the following elements for the remaining evaluated alternatives.

1. Detailed Description

At a minimum, a detailed description shall include for each evaluated alternative:

- a. A description of the appropriate treatment and disposal technology for each evaluated alternative;
- b. A description of the special engineering considerations required to implement each evaluated alternative (e.g., for a pilot treatment facility any additional studies that may be needed to proceed with final response action design);
- c. A description of operation, maintenance, and monitoring requirements for each evaluated alternative;
- d. A description of the off-site disposal needs and transportation plans for each evaluated alternative;
- e. A description of temporary storage requirements for each evaluated alternative;
- f. A description of safety requirements associated with implementation of each evaluated alternative, including both on-site and off-site health and safety considerations;
- g. 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 environmental improvements or cost savings;

- h. A description/review of on-site or off-site treatment or disposal facilities for each remaining evaluated alternative which could be used to ensure compliance with applicable requirements of the Resource Conservation and Recovery Act, the MPCA hazardous waste rules, and the U.S. and Minnesota Departments of Transportation rules; and
- i. An evaluation of the environmental effects, an analysis of measures to mitigate the adverse effects, the physical or legal constraints, and the compliance with Federal and State regulatory requirements for each evaluated alternative.

2. Cost Analysis

A cost analysis shall include a detailed breakdown of the present value capital costs and annualized capital costs of implementing each evaluated alternative (and each phase of each evaluated alternative) as well as the present value annual operating and maintenance costs. The analysis shall be presented as both a total cost and an equivalent annual costs.

3. Recommended Evaluated Alternatives and Conceptual Design

The Navy shall include in Draft FS Reports its recommended evaluated alternatives for the Site and provide a conceptual design summary for each of these alternatives. The purpose of preparing a conceptual design for each alternative recommended is to sufficiently illustrate the recommended alternatives in order to enable the U.S. EPA and MPCA to evaluate the recommended alternatives. Information which is to be included in the conceptual design, and which has been prepared earlier pursuant to other parts of this Attachment may be included by reference. Conceptual design summaries for the recommended alternative shall include, but not be limited to, the elements listed below.

- a. A conceptual plan view drawing of the overall Site, showing locations for project actions and facilities.
- b. Conceptual layouts (plan and cross sectional views where required) for the individual facilities, other items to be installed, actions to be implemented.
- c. Conceptual design criteria and rationale.
- d. A description of types of equipment required.
- e. Process flow sheets and a description of the process.
- f. An operational description of process units or other facilities.
- g. A description of any unique structural concepts for facilities.
- h. A description of operation and maintenance requirements.
- i. A discussion of potential construction problems.
- j. Right-of-way requirements.
- k. Additional engineering data required to proceed with design.
- l. A discussion of permits that are required pursuant to environmental and other statutes, rules and regulations.
- m. Estimated implementation schedule.

Task E. Review and Comment on the Draft FS Reports

The U.S. EPA and MPCA shall review and comment on Draft FS Reports pursuant to, "Consultation with U.S. EPA and MPCA", Section XIV of this Agreement.

VII. Proposed Plan and Record of Decision, including Responsiveness

Summary

Following the finalization of FS Reports, the Navy shall prepare and submit a Draft Proposed Plan in accordance with Interim Final Guidance on Preparing Superfund Decision Documents (OSWER Directive 9355.3-02), to U.S. EPA and MPCA for review and comment pursuant to, "Consultation with U.S. EPA and MPCA", Section XIV and by the deadline established in,

"Deadlines and Target Dates", Section XXXII. The Navy shall publish the Final Proposed Plan for public review and comment pursuant to Section 117(a) of CERCLA, 42 U.S.C. Section 9617(a). At the close of the public comment period, Community and State acceptance shall be evaluated in a Responsiveness Summary. The Navy shall develop and submit a draft Record of Decision (ROD), including Responsiveness Summary, to the U.S. EPA and MPCA. The draft ROD shall be reviewed by the U.S. EPA and MPCA in accordance with, "Consultation with U.S. EPA and MPCA", Section XIV. If the Parties agree on the draft ROD, the draft ROD shall be reissued by the Navy as the final ROD. If the Parties are unable to reach a consensus on the draft ROD, the U.S. EPA Administrator, in consultation with the MPCA and the Navy, shall make final selection of remedial actions for the Site and the U.S. EPA shall develop the final ROD. Notice of the signed ROD shall be published by and the signed ROD shall be made available to the public prior to commencement of the remedial action in accordance with Section 117(b) of CERCLA. The final selection of remedial actions by the U.S. EPA Administrator shall be final and not subject to dispute by the Parties.

PROJECT MANAGERS AGREEMENT:
ADJUSTMENT TO DEADLINES OR SCHEDULES

The Navy is currently required to submit the Annual Monitoring Report by January 1 of each year, as specified by Section IV, Task B.4.b of Attachment B to the Federal Facility Agreement (FFA) dated March 1991, between the USEPA, US Navy, and MPCA. This agreement documents approval by the USEPA, US Navy, and MPCA Project Managers to adjust this deadline from January 1 of each year to March 31 of each year. This adjustment is made in accordance with Section XIX, PROJECT MANAGERS, paragraph 19.3 of the FFA as a necessary and appropriate adjustment to a deadline or schedule.

This adjustment is considered necessary and appropriate since the groundwater analytical results for a fourth quarter sampling event are not available for inclusion into a report that is submitted by January 1. The adjustment to March 31 would allow for validated fourth quarter data to be included into the report, thereby providing an Annual Monitoring Report that includes all the data for a given year.

THIS ADJUSTMENT IS SO AGREED BY:

US Navy



Scott Glass
Navy Remedial Project Manager

3/25/97

Date

USEPA

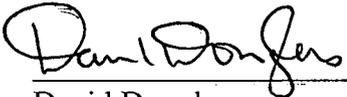


Tom Bloom
EPA Region V Remedial Project Manager

4/10/97

Date

MPCA



David Douglas
MPCA Project Manager

4-15-97

Date

ATTACHMENT B

GUIDELINES FOR REMEDIAL DESIGN AND REMEDIAL ACTION

I. INTRODUCTION

The U.S. Department of the Navy (Navy), has agreed to prepare a Remedial Design (RD) and Remedial Action Work Plan (RAWP) to implement Remedial Actions (RAs) at the Site. The purpose of this Attachment is to assist in implementation of Record(s) of Decision for the Site.

U.S. EPA Remedial Design and Remedial Action Guidance, the Record(s) of Decision, the approved Remedial Design and Remedial Action Work Plan, additional guidance provided by U.S. EPA/MPCA, and this Attachment shall be followed in designing, implementing, and submitting deliverables detailed in, "Deadlines and Target Dates", Section XXXII, for the RD/RAS at the Site. This Attachment outlines the RD/RA process for the Site.

It is based upon the requirements of CERCLA, as amended, as detailed in the NCP promulgated on March 8, 1990, (55 Federal Register 8666): All RD/RA work shall adhere to the procedures and terminology identified in U.S. EPA's June 1986 Superfund Remedial Design and Remedial Action Guidance (OSWER Directive 9355.0-4A). If additional U.S. EPA and MPCA guidance or policy applies to RD/RA work to be conducted, the U.S. EPA and MPCA will provide the Navy with the applicable guidance or policy (such as Guidance on Oversight of PRP Performed RD/RA, OSWER Directive 9355.5-01, Feb. 1990), prior to completion of the Remedial Action Work Plan. If guidance documents discussed in this attachment are revised after this Agreement becomes final, the most recent revision of that document shall be used.

II. RETAIN CONSULTANT

Following the issuance of a ROD, the Navy shall retain the services of

qualified professionals to undertake and complete the requirements of the Agreement and shall notify the U.S. EPA and MPCA Project Managers of the names of the qualified professionals and a description of the tasks assigned to the qualified professionals.

III. SITE SECURITY AND HEALTH AND SAFETY PLANS

A. The Navy shall prepare and submit to the U.S. EPA and MPCA for comment, as set forth in "Consultation with U.S. EPA and MPCA", Section XIV of the Agreement a Site Security Plan. The Site Security Plan can be a compilation of existing Navy Security Plan to limit and control the general public's access to the Site. If the Site Security Plan submitted during the Remedial Investigation/Feasibility Study (RI/FS), applies to work being performed during the RD/RA, the Parties shall agree to use the previously submitted plan. If the RI/FS Site Security Plan is not applicable, the Navy shall prepare and submit to the U.S. EPA and MPCA for comment, as set forth in "Consultation with U.S. EPA and MPCA", Section XIV of this Agreement a Site Security Plan relating to RD/RA work.

B. The Navy shall prepare and submit to the U.S. EPA and MPCA for comment, as set forth in "Consultation with U.S. EPA and MPCA" Section XIV of this Agreement a Health and Safety Plan for RD/RA work to be performed. The Health and Safety plan shall provide information on provisions to protect site visitors, personnel responsibilities, protective equipment, procedures, protocols, decontamination methods, and medical surveillance. The Health and Safety Plan should identify problems or hazards that may be encountered and their solutions. The Navy shall prepare the Health and Safety Plan to incorporate and be consistent with the following requirements:

1. OSHA requirements 29 CFR Part 1910.120. Hazardous Waste Operations and Emergency Response; Interim Final Rule. Federal Register, December 19, 1986.
2. OSHA requirements 29 CFR Part 1910 (General Industry Standards) 1926 (Construction Industry Standards).
3. Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities, NIOSH/OSHA/USCG/EPA, DHHS (NIOSH) Publication Number 85-115, October 1985.

The management of site security and health and safety are the responsibility of the Navy. The U.S. EPA and MPCA may comment on the Site Security and Health and Safety Plans. The Navy shall implement the Site Security and Health and Safety Plans taking into account the comments of the U.S. EPA and the MPCA, if any, when they implement the RAs pursuant to Remedial Action Section and Implementation, Section XII, of this Agreement. The Navy shall ensure that no lapse in site security or safety occurs in the time intervals between completion of remedial investigation/feasibility study actions, during additional investigations, and during the implementation of remedial actions.

IV. REMEDIAL ACTION WORK PLAN (RAWP)

The Navy shall prepare and submit to the U.S. EPA and MPCA a Draft Remedial Action Work Plan (RAWP) in accordance with, " Consultation with U.S. EPA and MPCA", Section XIV of this Agreement and by the deadline established in "Deadlines and Target Dates", Section XXXII. The proposed RAWP shall consist of the following:

Task A. Quality Assurance Project Plan (QAPP)

The Navy shall submit a draft QAPP specific to the Site to be utilized in implementing the RAWP. The draft QAPP shall be consistent with the requirements of the U.S. Environmental Protection Agency's Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans

(QAMS-005/80) and Region V's Content Requirements for QAPP, (Feb. 87 revised Jan 89). The draft QAPP shall consist of three parts: Specific Project Information, the Site Specific Sampling and Analysis Plan, and the Laboratory Quality Assurance/Quality Control (QA/QC) Plan. The U.S. EPA and the MPCA will review and comment on the draft QAPP in accordance with "Consultation with U.S. EPA and MPCA", Part XIV of the Agreement. Prior to drafting the QAPP, the U.S. EPA will schedule a pre-QAPP meeting. The purpose of the meeting will be to clearly define requirements and tasks required in the QAPP approval process.

The QAPP shall include the following:

1. Specific Project Information

- a. Title Page and Table of Contents;
- b. Project Description: a general description of the project including anticipated start and completion dates for field work and sampling analysis, intended use of data and location and description of sampling points; and
- c. Project Organization and Responsibility: a table or chart of the project organization and line authority including those responsible for sampling, analysis and QA/QC.

2. Site Specific Sampling and Analysis Plan

The Site Specific Sampling Plan shall be specific to the Site and shall consist of the following sections:

- a. Data Quality (DQ) and QA objectives for measurements of data in terms of detection limits, precision, accuracy, completeness, representativeness, comparability and the U.S. EPA or standard method numbers; and
- b. Sampling procedures including a description of the following: criteria

for sampling site location, monitoring well installation method and procedures for sample collection, sample container identification, chain-of-custody, transport, storage and decontamination procedures.

3. Laboratory QA/QC Plan

The Laboratory QA/QC Plan shall consist of the following sections:

- a. Title Page;
- b. Table of Contents;
- c. Project Description;
- d. Project Organization and Responsibility;
- e. DQ and QA objectives for Measurement Data in Terms of Precision, Accuracy, Completeness, Representativeness and Comparability;
- f. Sampling Procedures;
- g. Sample Custody;
- h. Calibration Procedures and Frequency;
- i. Description of Analytical Procedures;
- j. Data Reduction, Validation and Reporting;
- k. Internal Quality Control Checks;
- l. Performance and System Audits;
- m. Preventive Maintenance;
- n. Specific Routine Procedures used to assess Data Precision, Accuracy and Completeness;
- o. Corrective Active; and
- p. Quality Assurance Reports to Management.

Task B. Remedial Action Monitoring Plan

As part of the proposed RAWP, the Navy shall submit a proposed remedial action monitoring plan (Monitoring Plan) for the Site. The purpose of the

Monitoring Plan is to specify all short- and long-term monitoring of surface water, sediments, sludges, soils, and ground water, which is necessary to determine the status and effectiveness of the Remedial Actions to be implemented at and near the Site. The U.S. Navy shall implement a ground water monitoring plan as identified in this section, or as required in implementation of future Remedial Actions by U.S. EPA and MPCA for the Site. The ground water monitoring plan shall be designed to detect changes/increases in the chemical concentration of contaminated ground water at and adjacent to the site. The Monitoring Plan shall, at a minimum, contain the following:

1. Analytical Parameter List

The Navy shall propose a list of parameters, including water level measurements, that shall be monitored and analyzed as part of the Monitoring Plan.

2. Monitoring Facility Location and Design

The Navy shall propose the design and location of all monitoring facilities including both on-site and off-site wells and surface water stations that shall be included in the Monitoring Plan.

3. Sampling Schedule

The Navy shall propose a sampling schedule for the parameters proposed in the Monitoring Plan for all monitoring locations.

4. Reporting Requirements

The Navy shall report the results of long-term monitoring to the U.S. EPA and the MPCA. These reports shall at a minimum, contain the following:

a. Periodic Monitoring Reports

The Navy shall submit the analytical and water level results to the U.S.

EPA and the MPCA during the period following the sampling for all analysis completed during the previous period. Information required under this section may be presented and recorded during the quarterly-scheduled, Technical Review Committee (TRC) meetings.

b. Annual Monitoring Reporting

The Navy shall submit an Annual Monitoring Report to the U.S. EPA and the MPCA each ~~January 31~~ ^{see TRC #23 notes} ~~following commencement of remedial action.~~ ^{March 31 (see PM Agreement dated 4/15/97)} The Annual

Monitoring Report shall contain the following information:

- (1) The results of all water level measurements and parameter analyses for the previous year;
- (2) A water level contour map for the regional ground water aquifer for high and low piezometric and surface water elevations;
- (3) A map showing each well with the concentration of pollutant for each sampling event;
- (4) Graphs illustrating the concentrations over the time using data from each sampling event (this graph shall be cumulative showing water quality for all previous years as well as the reporting year); and
- (5) 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 wells.

V. Remedial Design

The Navy shall submit in accordance with, " Consultation with U.S. EPA and MPCA", Section XIV of this Agreement and by the deadline established in "Deadlines and Target Dates", Section XXXII, a proposed remedial design for the Site to the U.S. EPA and the MPCA. The remedial design shall include, but not be limited to, construction phase specifications (i.e.

30%, 60%, 90%, and Final Design Plans), Construction Quality Assurance Plans, (i.e disposal methods, necessary permits, closure and postclosure plans), and a Contingency Plan.

Final Design Plans include: Operation and Maintenance Plan, Cost Estimate, Project Schedule, and Construction Quality Assurance Objectives. A discussion follows detailing: Operation and Maintenance Plan, Cost Estimate, Project Schedule, and Construction Quality Assurance Objectives.

Task A. Operation and Maintenance Plan ✓

The U.S. Navy shall prepare an Operation and Maintenance (O&M) Plan to cover both implementation and long term maintenance of the Remedial Actions. An initial draft O&M Plan should be submitted with the 90% design document and the final O&M Plan should be submitted with the final design document. The O&M Plan shall be composed of the following elements:

1. **Description of normal operation and maintenance (O&M);**
 - a. Description of tasks for operation
 - b. Description of tasks for maintenance
 - c. Description of prescribed treatment or operation conditions
 - d. Schedule showing frequency of each O&M task
2. **Description of potential operating problems;**
 - a. Description and analysis of potential operation problems
 - b. Sources of information regarding problems
 - c. Common and/or anticipated remedies
3. **Description of routine monitoring and laboratory testing;**
 - a. Description of monitoring tasks
 - b. Description of required laboratory tests and their interpretation
 - c. Required data collection and approved QAPP

- d. Schedule of monitoring frequency and date
- e. Description of triggering mechanisms (re-start system), for ground water monitoring results

4. Description of alternate O&M;

- a. Should systems fail, alternate procedures to prevent release or threatened releases of hazardous substances, pollutants or contaminants which may endanger public health and the environment or exceed cleanup standards.
- b. Analysis of vulnerability and additional resource requirements should a failure occur.

5. Corrective Action;

- a. Description of corrective action to be implemented in the event that cleanup performance standards are not achieved.
- b. Schedule for implementing these corrective actions

6. Safety Plan;

- a. Description of precautions, of necessary safety equipment, etc., for Site personnel
- b. Safety tasks required in event of systems failure

7. Description of equipment;

- a. equipment identification
- b. Installation of monitoring components
- c. maintenance of Site equipment
- d. replacement schedule for equipment and installed components

8. Records and reporting mechanisms required

- a. Daily operating logs
- b. laboratory records

- c. Records for operating costs
- d. Personnel and maintenance records
- f. Monthly/annual reports to regulatory agencies

Task B. Cost Estimate

The U.S. Navy shall refine the cost estimate developed in the FS to reflect the more detailed/accurate design plans and specifications being developed. The cost estimate shall include both capital and O&M costs. An initial cost estimate can be submitted with the 90% design plan and the final cost estimate with the final design document.

Task C. Project Schedule

The U.S. Navy shall develop a Project Schedule for construction and implementation of the Remedial Actions which identifies timing for initiation and completion of all critical path tasks. The U.S. Navy shall specifically identify dates for completion of the project and major interim milestones. An initial Project Schedule should be submitted with the 90% design document and the final Project Schedule with the final design document. The Project Schedule shall be updated quarterly, if major interim milestone completion dates change during that quarter.

Task D. Construction Quality Assurance Objectives

The U.S. Navy shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority of all organizations (i.e. technical consultants, construction firms, etc); personnel qualifications; inspection activities (i.e. a summary of observations and tests that will be used to monitor the construction and/or installation of the components of RAs; sampling requirements and

documentation (as detailed in an approved QAPP).

VI. REMEDIAL ACTION IMPLEMENTATION

The Navy shall implement a Remedial Action as set forth in the ROD, after finalization of the RD & RAWP pursuant to, "Consultation with U.S. EPA and MPCA", Part XIV of this Agreement. The purpose of the RAs implementation is to take those actions which will protect the public health, welfare, and the environment for the threatened or actual release of hazardous substances, pollutants and contaminants associated with the Site. The requirements for implementation of remedial actions are set forth in the Tasks below.

Task A. Conduct Remedial Actions

Following the finalization of the RD & RAWP, the Navy shall initiate the implementation of the RAs. The Navy shall implement the RAs in accordance with the methodologies and time schedule set forth in the approved Final Remedial Action Work Plan.

Task B. Progress Reports of Remedial Actions

The U.S. Navy shall prepare and submit to the U.S. EPA and the MPCA a quarterly Remedial Action Progress Reports which includes the following:

1. All the data and results of the RAs implementation;
2. Summaries of all changes made in the RD/RA reporting period.
3. A certification that all work plans, specifications and schedules have been implemented and completed in accordance with the approved RAWP.
4. An identification of difficulties encountered during the RAs implementation which may impair or otherwise reduce the effectiveness of implementation to minimize or mitigate the release of hazardous substances, pollutants and contaminants from the Site or which require unanticipated

operational or maintenance actions to maintain the effectiveness of any of the implemented RAs. Information required under this section may be presented and recorded during the quarterly-scheduled, Technical Review Committee (TRC) meetings.

Task C. Submittal of the Draft Response Action Final Reports

Following the completion of the implementation of a Remedial Action specified in an approved RAWP, the U.S. Navy prepare and submit to the U.S. EPA and the MPCA a draft Response Action Final Report. The U.S. EPA and MPCA shall review and comment on the draft Response Action Final Report pursuant to "Consultation with U.S. EPA and MPCA", Part XIV of this Agreement and by the deadline established in, "Deadlines and Target Dates", Part XXXII of Agreement. The Response Action Final Report shall include, but not be limited to the following elements:

1. Synopsis of the Remedial Action and certification of the design and construction.
2. Explanation of any modifications to the plans and why these were necessary for the project.
3. Listing of the criteria, established before the Remedial Action was initiated, for judging the functioning of the Remedial Action and also explaining any modification to these criteria.
4. Results of Site monitoring, indicating the Remedial Action will meet or exceed the performance criteria.
5. Explanation of the operation and maintenance (including monitoring) to be undertaken at the Site as outlined in Section VI, Task A of this attachment.

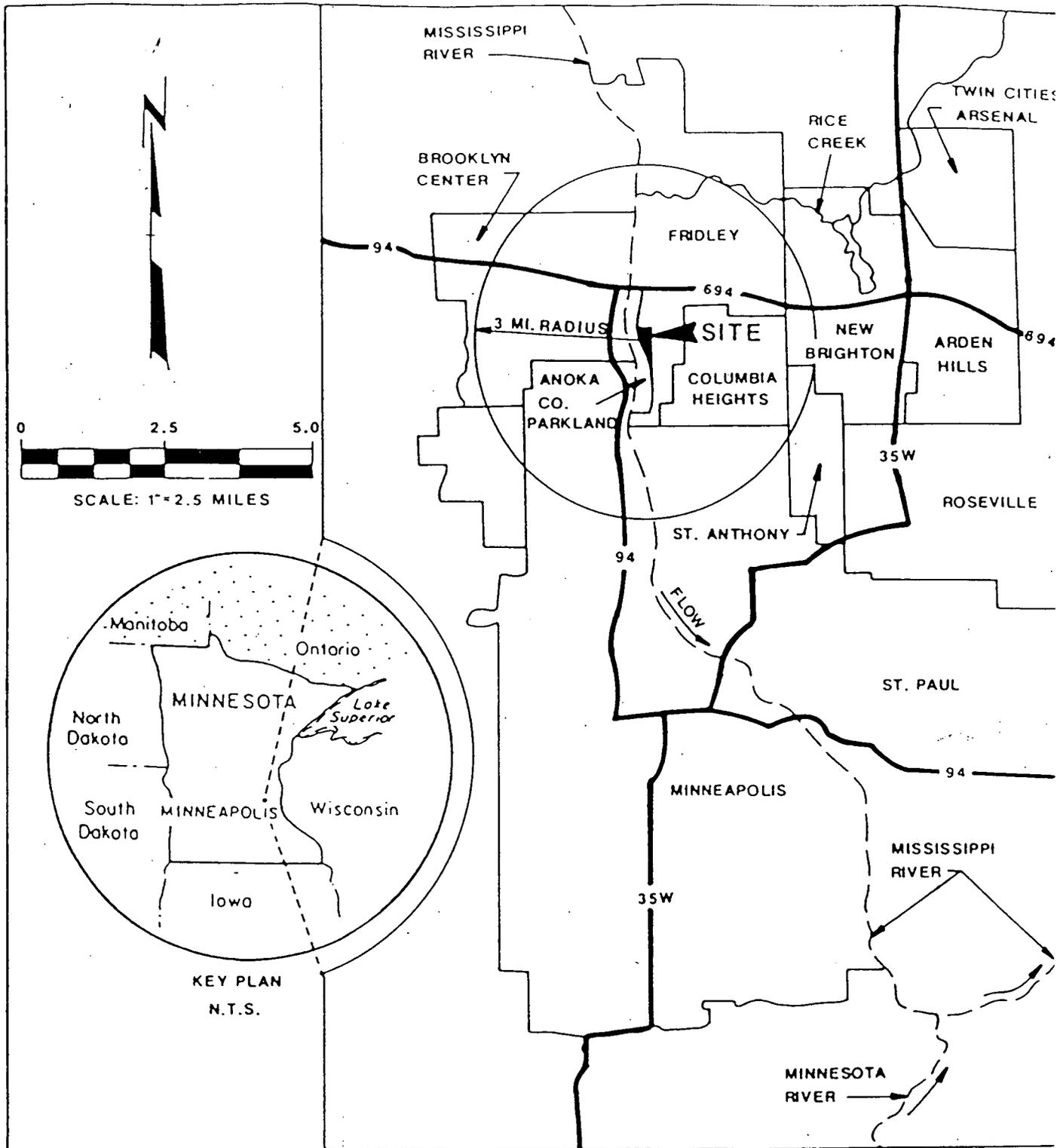
Task D. Prefinal and Final Inspections

Upon preliminary project completion, the U.S. Navy shall notify U.S. EPA and MPCA for the purposes of conducting a prefinal inspection. The prefinal inspection shall consist of a walk-through inspection of the entire Site. The inspection is to determine whether the project is complete and consistent with the U.S. EPA and MPCA approved Remedial Action. Any outstanding construction items discovered during the inspection shall be identified and noted. Additionally, treatment equipment shall be operationally tested by the U.S. Navy. The U.S. Navy shall certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting will be completed where deficiencies are revealed. The U.S. Navy shall outline in a Prefinal Inspection Report, the outstanding construction items, actions required to resolve items, completion date for these items, and date for final inspection. Upon completion of any outstanding construction items, the U.S. Navy shall notify the U.S. EPA and MPCA for the purposes of conducting a final inspection. The final inspection shall consist of a walk-through inspection of the Site. The Prefinal Inspection Report will be used as a checklist with the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved.

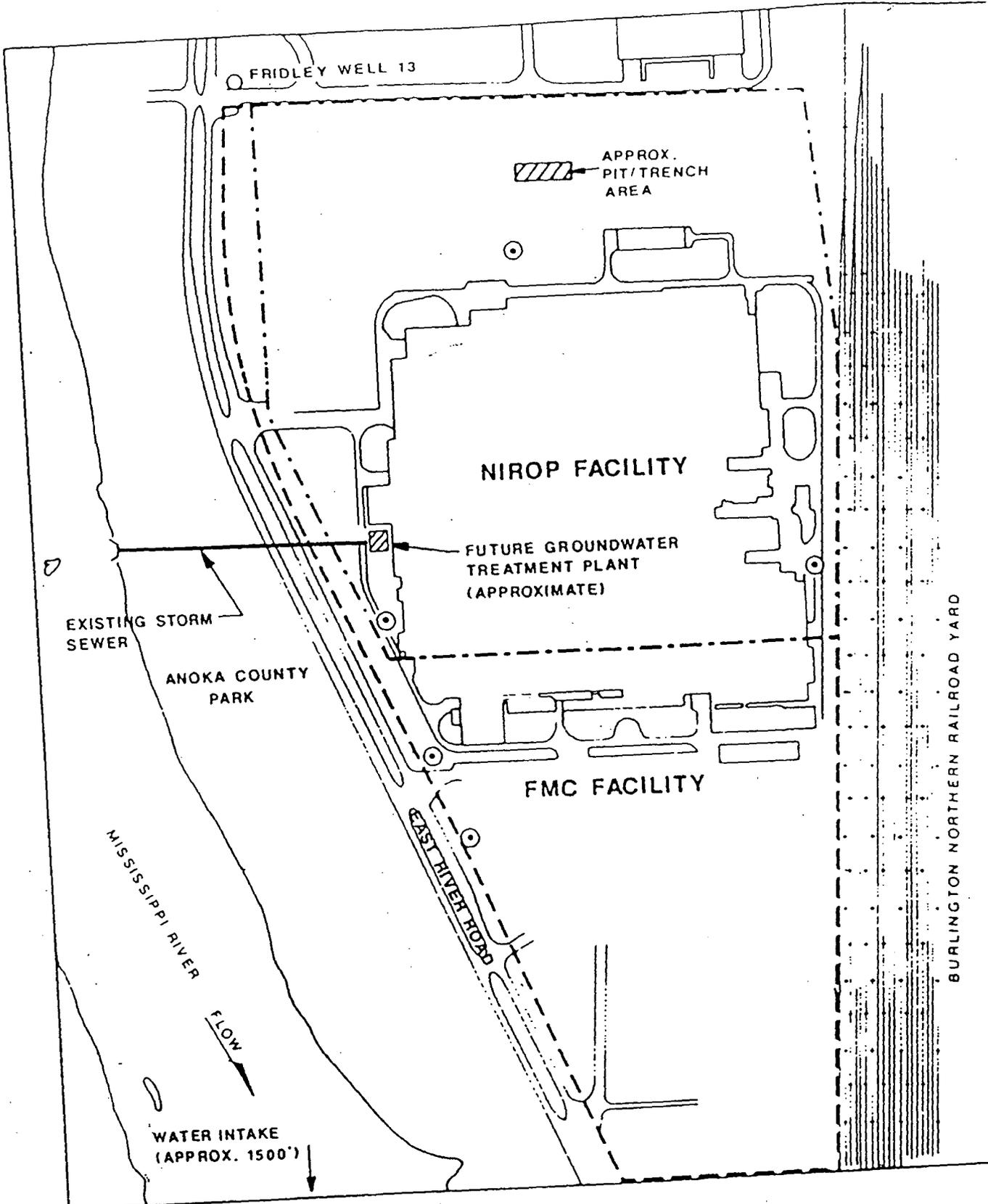
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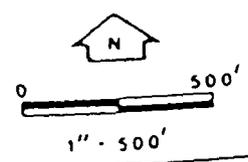
LOCATION MAP

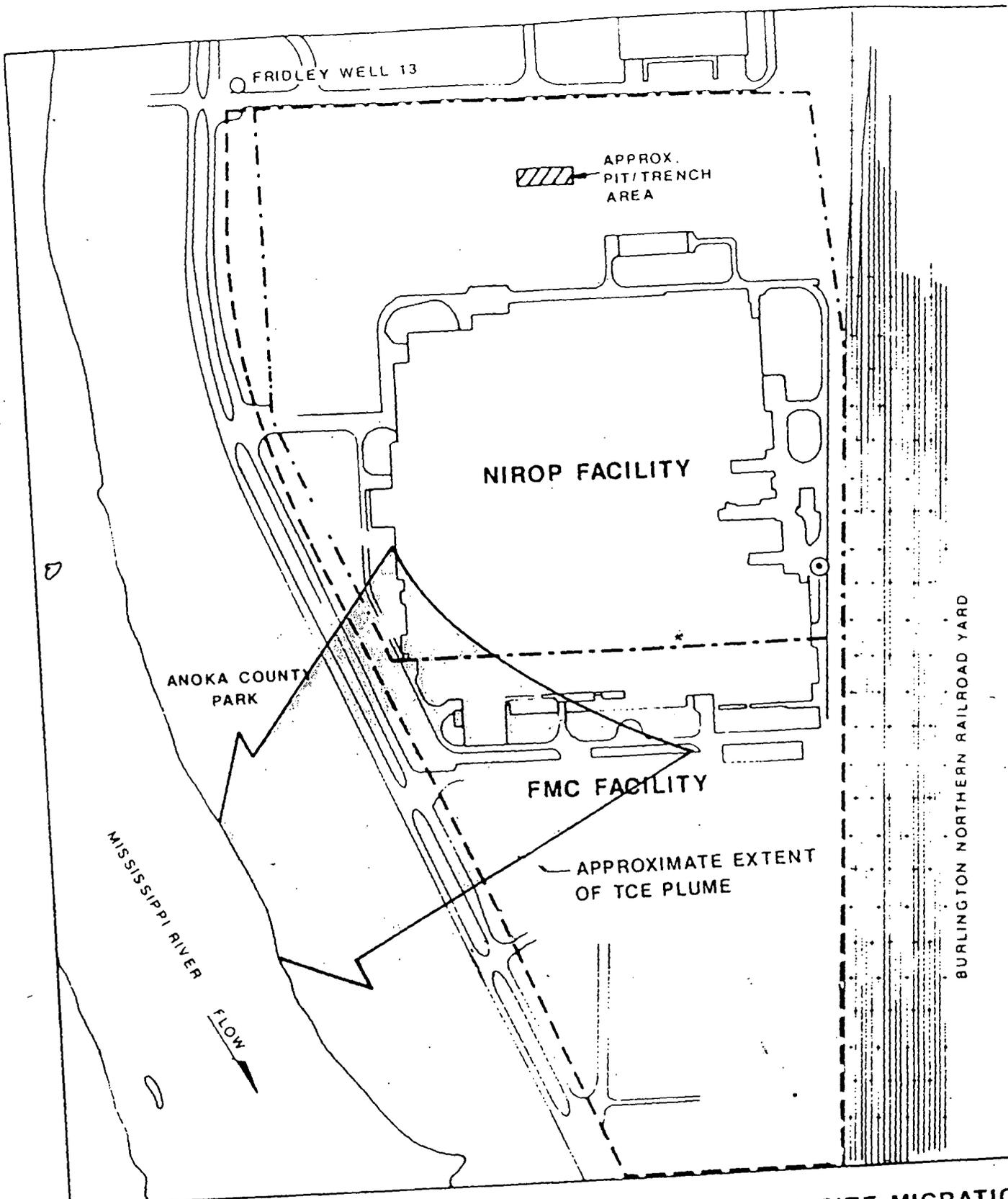


LEGEND

- NIROP PROPERTY BOUNDARY
- FMC FACILITY BOUNDARY
- PROPOSED GROUNDWATER RECOVERY WELL (APPROXIMATE LOCATIONS. FINAL LOCATIONS BASED ON UPCOMING PUMP TESTS.)

SITE PLAN

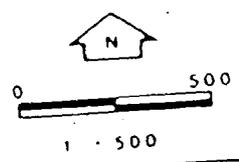




LEGEND

- - - - NIROP PROPERTY BOUNDARY
- - - - FMC FACILITY BOUNDARY

**EXTENT OF OFF-SITE MIGRATION
OF VOC'S IN GROUND WATER**



STATE OF MINNESOTA

OFFICE OF THE GOVERNOR
130 STATE CAPITOL
SAINT PAUL 55155



ARNE H. CARLSON
GOVERNOR

The Honorable Dick Cheney
Secretary of Defense
Washington, D.C. 20510

Dear Secretary Cheney:

As Governor of the state of Minnesota, I, Arne Carlson, hereby authorize the Minnesota Pollution Control Agency (MPCA) to represent all executive departments and agencies of the state of Minnesota insofar as the proposed Interagency Agreement (IAG) is concerned, regarding the environmental activities undertaken or to be undertaken at the U.S. Naval Industrial Reserve Ordnance Plant (NIROP), located in Fridley, Minnesota. These activities include any and all remedial investigations and remedial and/or response actions undertaken at NIROP for the purposes of cleaning up all the releases or threatened releases of hazardous substances, pollutants, contaminants or petroleum at NIROP. The MPCA will also have the authority to represent all executive departments regarding reimbursement of expenses, with the exception of permit fees not administered by the MPCA.

This authorization does not extend to the Office of the Minnesota Attorney General, which is a separate constitutional office under the Minnesota Constitution. However, you should note that the Minnesota Attorney General will ratify this IAG, along with the Chairman and the Commissioner of the MPCA, when the U.S. Navy agrees to its provisions. Therefore, all the relevant Minnesota departments, agencies and offices will be bound by this IAG.

This authorization shall be valid for the duration of the investigation and response actions at NIROP and shall be strictly limited to such actions on NIROP or areas affected by contaminants which originated at NIROP.

Sincerely,

ARNE CARLSON
Governor



RECORD OF DECISION
FOR
GROUND WATER REMEDIATION

NAVAL INDUSTRIAL RESERVE ORDNANCE PLANT
FRIDLEY, MINNESOTA

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DECLARATION

SITE NAME AND LOCATION

Naval Industrial Reserve Ordnance Plant
Fridley, Minnesota

STATEMENT OF BASIS AND PURPOSE

This decision document presents a selected remedial action which will provide hydraulic containment and recovery of ground water (operable unit) at the Naval Industrial Reserve Ordnance Plant (NIROP) site in Fridley, Minnesota. This decision document was developed in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). Through this document, the Navy plans to remedy the threat to human health, welfare, or the environment posed by VOC-contaminated ground water by hydraulic containment, recovery, and treatment. This decision document is based on the administrative record for this site.

The Minnesota Pollution Control Agency (MPCA) and United States Environmental Protection Agency (USEPA) concur with the selected remedy.

On-going work at the NIROP is defining the extent of soils contamination. A subsequent Record of Decision (ROD) may be issued in the future for a soils operable unit.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the NIROP, if not addressed by implementing the response action selected in this Record of Decision, may present a threat to public health, welfare, or the environment.

DESCRIPTION OF THE SELECTED REMEDY

This action addresses the principal threat posed by the NIROP by preventing endangerment of public health, welfare, or the environment by implementation of this Record

of Decision through hydraulic containment and recovery of all future migration of contaminated ground water from the NIROP and by recovery, to the extent feasible, of contamination downgradient of the NIROP.

The selected remedy includes installation and operation of ground water containment and recovery wells; with a two-phased plan for disposal of the ground water from the well system.

Under Phase I, the contaminated ground water from the containment and recovery well system will be discharged directly to the existing sanitary sewer system, for treatment at the local wastewater treatment facility. Pretreatment will be provided if necessary to meet local discharge requirements. Phase I activities will also include field testing of the recovered ground water, followed by design of a ground water treatment plant at the NIROP. Prior to start-up of the ground water containment system, the Navy will submit a ground water monitoring program for approval by the USEPA and MPCA, to confirm that containment of the ground water plume is effective.

During the first 90 days of recovery system operation, the Navy will collect data to determine whether hydraulic containment is being effectively achieved. This determination will be summarized in a document which will be sent to the USEPA and MPCA for review and approval at the end of the 90-day period. The USEPA and MPCA will provide written approval of, or comments on, the determination document within 30 days after its receipt. If the USEPA and MPCA do not approve the determination document, the Navy will submit a revised determination document to the USEPA and MPCA within 60 days after the Navy is notified of specific deficiencies in the document. If the determination document, after its approval by the USEPA and MPCA, indicates that effective hydraulic containment is not being provided by the ground water recovery system, the Navy will prepare and submit to USEPA and MPCA a written plan for upgrading the recovery system to assure that the performance objectives of the containment system are met, and the Navy will implement the finally approved plan.

Under Phase II, within 365 days after the USEPA and MPCA approve the determination that the ground water containment and recovery system is effective, design documents for a ground water treatment system will be completed by the Navy and approved by the USEPA and MPCA. Treated ground water will be discharged to the Mississippi River via a National Pollutant Discharge Elimination System (NPDES) storm sewer discharge.

A portion of the aquifer within the Anoka County Parkland closest to the Mississippi River may not fall within the zone of capture of the ground water recovery system. However, should this occur, contaminants in any uncaptured portion of the aquifer are expected to dissipate by natural means over time to levels that are protective of human health and the environment. Should the City of Minneapolis or another community decide in the future to develop a supplemental water supply well system in the Anoka County Parkland, the Navy will control the health risk within acceptable levels by implementation of a ground water treatment system or other measures as approved by the MPCA and the USEPA.

STATUTORY DETERMINATIONS

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element. Because this remedy may result in hazardous substances remaining in on-site ground water above health-based cleanup levels, a review will be conducted by the Navy, the USEPA, and the MPCA within 5 years after start-up of the ground water containment and recovery well system to ensure that the remedy continues to provide adequate protection of human health and the environment. This review will be conducted at least every 5 years as long as hazardous substances remain in ground water on-site above health-based cleanup levels.

United States Navy

By: Regueline E. Schaefer
ASSISTANT SECRETARY of the NAVY
(INSTALLATIONS + ENVIRONMENT) (Title)

25 September 1990
Date

Minnesota Pollution Control Agency

By: Gerald L. Willet
Commissioner (Title)

9-26-90
Date

United States Environmental Protection Agency

By: Naldan V. Adamczyk
REGIONAL ADMINISTRATOR
REGION 5 (Title)

28 September 1990
Date

DECISION SUMMARY

1. SITE NAME, LOCATION, AND DESCRIPTION

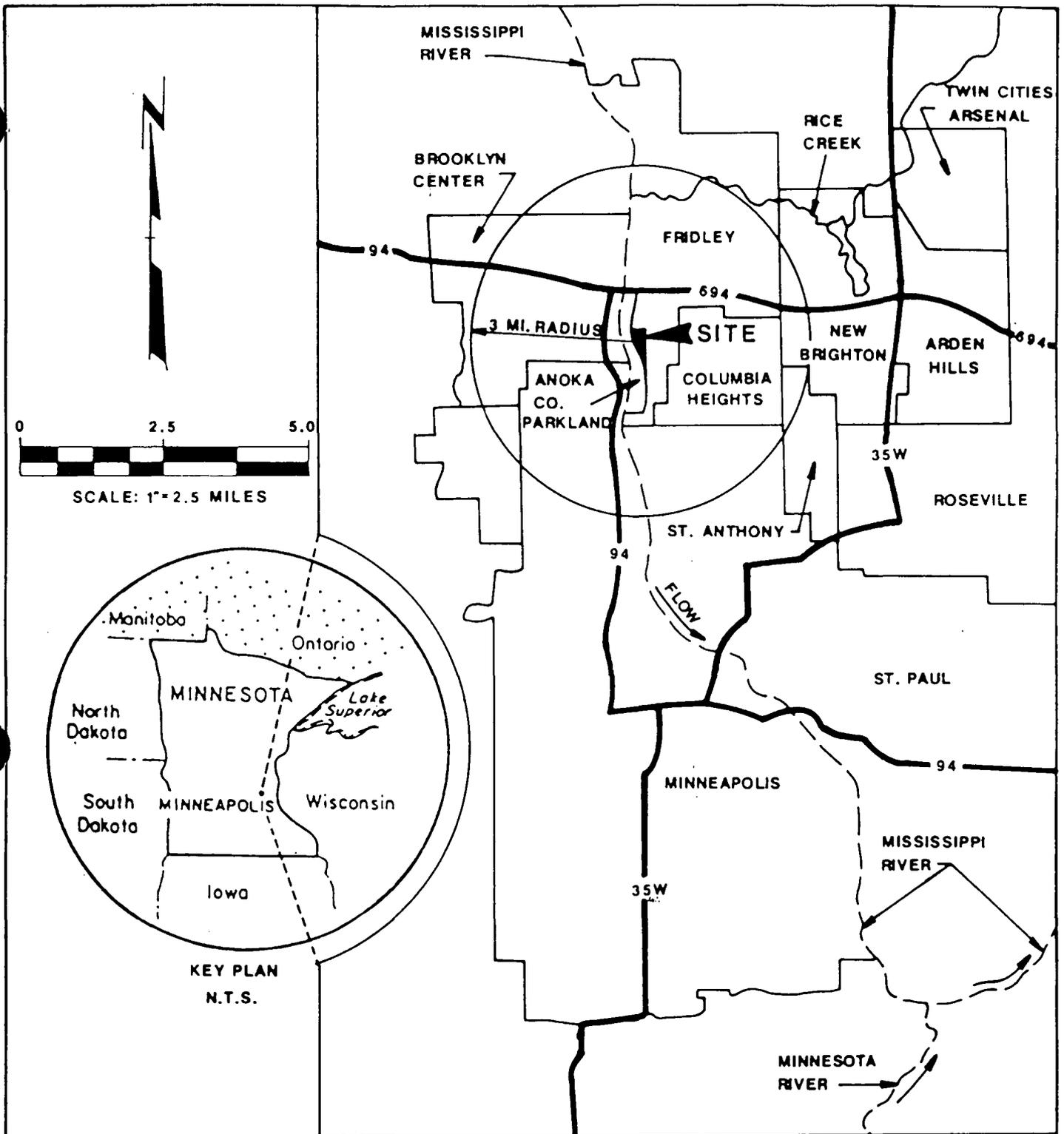
The Naval Industrial Reserve Ordnance Plant (NIROP) is located in the northern portion of the Minneapolis/St. Paul Metropolitan Area within the city limits of Fridley, Minnesota (Figure 1). Advanced naval weapons systems are designed and manufactured at the NIROP. The northern portion of the plant is government-owned and operated by a private contractor (FMC Corporation - Naval Systems Division), and the remainder of the plant is owned independently by FMC (Figure 2). The government-owned portion of the plant constitutes what is referred to within this document as "the NIROP." The word "site," wherever used in this document, includes the NIROP as well as the areal extent of contamination and all suitable areas in very close proximity to the contamination necessary for implementation of the response action.

The NIROP comprises approximately 82.6 acres, most of which are covered with buildings or pavement. The NIROP is situated on a broad, flat outwash terrace which is approximately 30 feet above and 700 feet east of the Mississippi River.

Adjacent land use consists of the following:

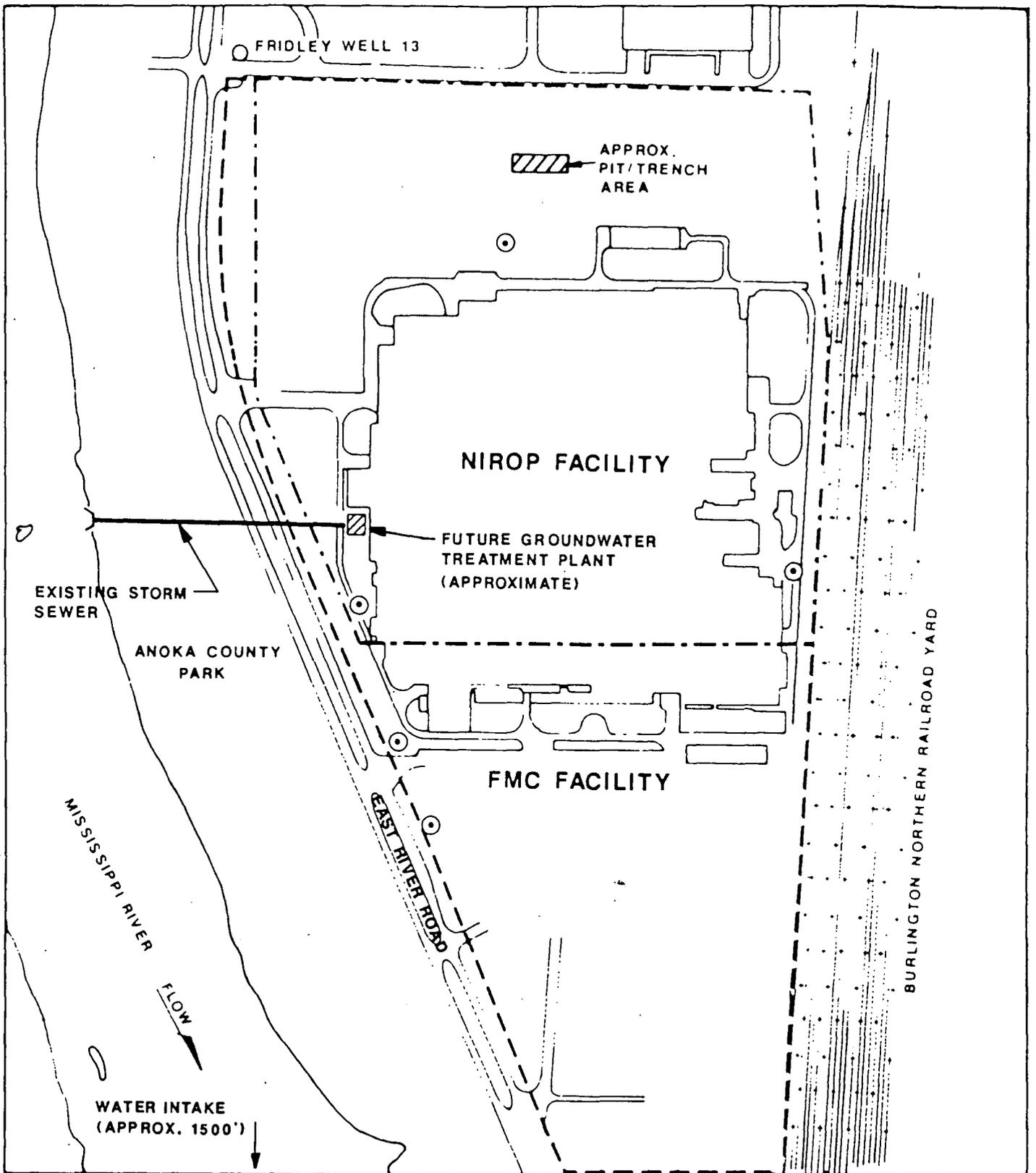
- To the north - Commercial and light industrial
- To the south - Industrial
- To the west - Recreational
- To the east - Railyards and commercial/light industrial

Natural resource use in the area consists of recreational activities in the Anoka County Parkland, which is directly across East River Road from the NIROP, and on the Mississippi River. Use of these resources does not result in access to the NIROP itself, which is highly restricted by the Department of Defense. There are no federal or state fresh-water wetlands located within 1 mile of the site. No critical habitats of endangered species or national wildlife refuges have been identified in the vicinity of the site.



LOCATION MAP

FIGURE 1



LEGEND

- NIROP PROPERTY BOUNDARY
- FMC FACILITY BOUNDARY
- ⊙ PROPOSED GROUNDWATER RECOVERY WELL (APPROXIMATE LOCATIONS, FINAL LOCATIONS BASED ON UPCOMING PUMP TESTS.)

SITE PLAN

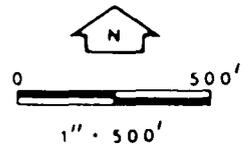


FIGURE 2

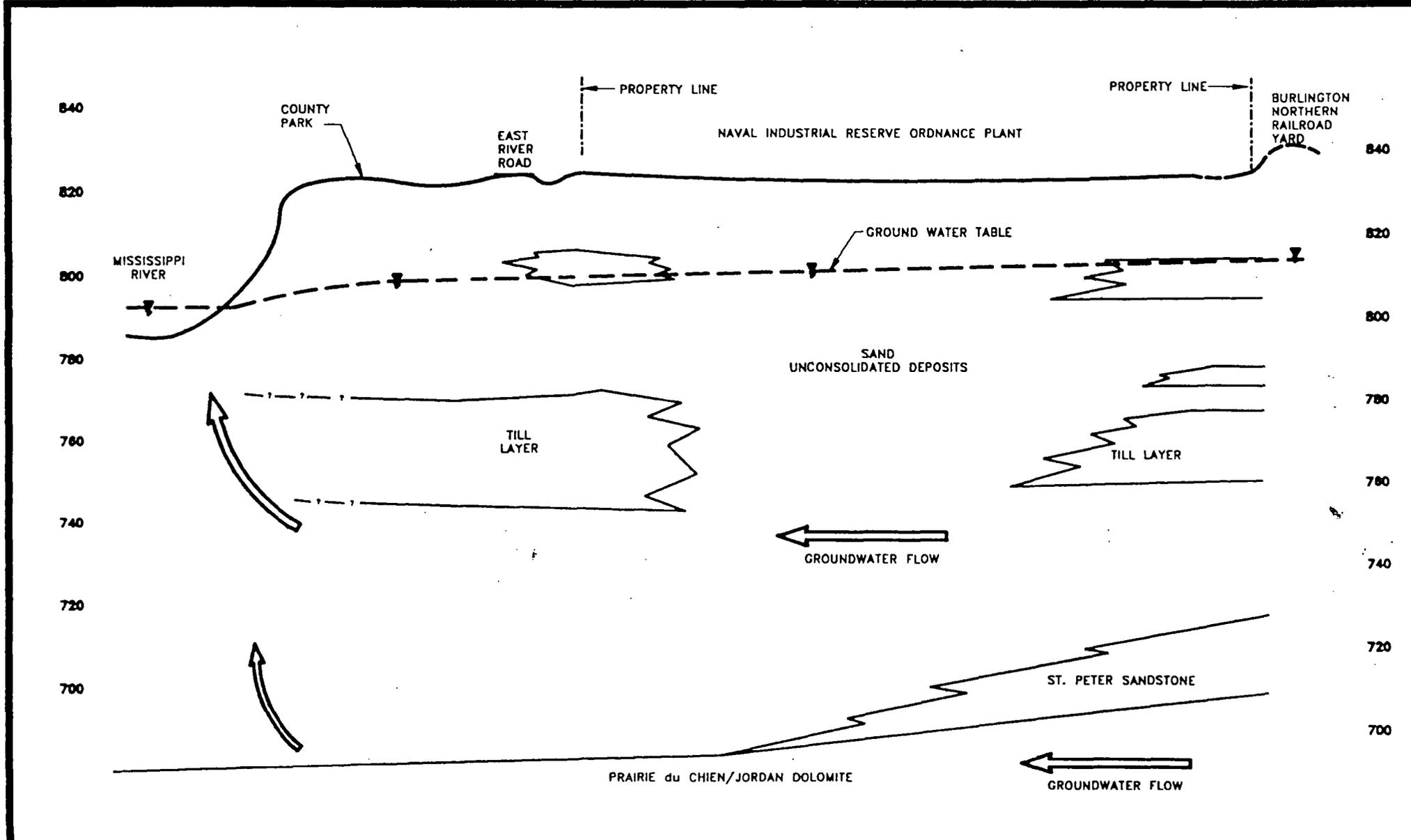
The City of Minneapolis water supply treatment plant withdraws water from the Mississippi River less than 1 mile downstream from the NIROP. The population of the area served by the City of Minneapolis Water Supply treatment plant is approximately 500,000 people.

Ground water use in the vicinity of the NIROP consists primarily of high-capacity industrial production wells which draw water from the Prairie du Chien/Jordan (PCJ) aquifer system. The City of Fridley maintains a backup potable water supply well (Fridley well 13 - Figure 2) which also draws water from the PCJ immediately north of the NIROP. During peak demand periods, Fridley Well 13 is used to supplement the current water supply system. The total population served by ground water within a 3-mile radius is 29,000 residents. Contamination has not been found above detection levels in Fridley Well 13. There are no ground water wells or users downgradient of the NIROP between the NIROP and the Mississippi River.

An aquifer within unconsolidated sediments overlies the PCJ in the vicinity of the NIROP. The thickness of the unconsolidated aquifer ranges from 100 feet to 140 feet under the NIROP. Except for an area at the southern end of the NIROP where the St. Peter Sandstone has been eroded, the unconsolidated aquifer is hydraulically separated from the PCJ by a silty to shaly layer of the St. Peter Sandstone, which acts as an aquitard. The unconsolidated aquifer is in contact and hydraulically connected with the PCJ in the eroded area, at the southern side of the NIROP. A conceptual representation of the aquifer and geology beneath the NIROP is shown on Figure 3.

The location of nearby populations is limited to a residential neighborhood approximately 200 feet east of the adjacent railyards.

There are presently no known major underground structures at the NIROP with the exception of typical industrial and utility piping. Previously disposed drums have been excavated and removed, as discussed in Section 2.



TYPICAL EAST-WEST CROSS SECTION

The FMC facility to the south of the NIROP has been the subject of separate response actions under CERCLA. A Record of Decision signed by the United States Environmental Protection Agency Regional Administrator on September 30, 1987, selected a site remedy consisting of ground water extraction to control a plume of contaminated ground water. The origins, migration, and remediation of the FMC plume are distinct from those at the NIROP. FMC has also excavated approximately 38,600 cubic yards of contaminated soil on the FMC facility to the south of the NIROP which were placed in an on-site storage vault served by a ground water monitoring system. The excavated area was capped with a multi-layer cover and revegetated.

2. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A chronological summary of significant events and activities at the NIROP leading to the current remedial action is as follows:

1940 - 1941	Naval ordnance manufacturing facility was constructed; owned by the government and Northern Pump Company.
1942 - 1964	Northern Ordnance, Inc., a subsidiary of Northern Pump Company, operated the naval ordnance manufacturing complex.
1964	FMC Corporation purchased the southern portion of the manufacturing facility property from Northern Pump Company, and has remained the operating contractor to the U.S. Navy for the entire facility from 1964 to the present.
Early 1970s	Limited disposal at the NIROP of paint sludge and chlorinated solvents in pits and trenches was performed.
December 1980	Anonymous telephone call to the Minnesota Pollution Control Agency (MPCA) concerning past waste disposal practices at the NIROP.
March and April 1981	Trichloroethylene (TCE) identified at 0.035 to 0.200 mg/L in NIROP water supply wells No. 2 and 3 and FMC Well No. 1.
April 24, 1981	NIROP water supply wells shut down.
December 31, 1981	First quantifiable concentrations of TCE identified at the Minneapolis water treatment plant intake (0.0012 mg/L).

In response to these events, the following investigations, remedial actions, and CERCLA enforcement activities have taken place:

September 1980	U.S. Navy implemented the Navy Assessment and Control of Installation Pollutants (NACIP) program.
March 1982	The NACIP program was implemented at the NIROP.
May 1983	U.S. Navy authorized the current Installation Restoration (IR) program.

1983	Initial Assessment Study (IAS) at the NIROP was performed under NACIP. The IAS identified that drummed waste was disposed in the northern portion of the NIROP in 8- to 10-foot-deep trenches or pits. Ground water monitoring wells were installed and sampling began.
November 1983 - March 1984	Approximately 1,200 cubic yards of contaminated soil and 43 drums were excavated and disposed off-site in a USEPA-approved landfill.
May 22, 1984	The MPCA issued a Request for Response Action at the site to the U.S. Navy and FMC Corporation.
June 1986	A remedial investigation (RI) and feasibility study (FS) was initiated by the U.S. Army Corps of Engineers, for the U.S. Navy.
March 1987	All use of trichloroethylene at the NIROP was discontinued. 1,1,1-trichloroethane was put into use in place of trichloroethylene.
June 1987	Final RI report was issued. Additional investigations recommended.
November 1987 - February 1988	Additional investigations were performed at the NIROP.
July 1988	FS report and an Addendum to the RI report were issued.
August 1988	Addendum to the FS report was issued.
February 8, 1989	The U.S. Navy establishes the Technical Review Committee (TRC) for the project and convenes the first meeting. TRC membership includes the following: USEPA, MPCA, U.S. Navy, Corps of Engineers, Anoka County, City of Fridley, FMC Corp., Metropolitan Waste Control Commission, Minnesota Department of Natural Resources, and RMT, Inc.
April 13, 1989	TRC meeting #2 held.
May 22, 1989	Public meeting to present the RI/FS held in Fridley, Minnesota.
June 15, 1989	TRC meeting #3 held.
July 14, 1989	NIROP listed as a proposed site on the NPL by the USEPA.

September 13, 1989	TRC meeting #4 held.
November 21, 1989	NIROP listed as a final site on the NPL by the USEPA.
February 7, 1990	TRC Meeting #5 held.
May 1, 1990	U.S. Navy issues final Proposed Plan for ground water remediation after review by the MPCA and USEPA.
May 9, 1990	TRC Meeting #6 held.
May 9, 1990	Public meeting to present the Proposed Plan held in Fridley, Minnesota.
May 1, 1990 - May 30, 1990	Public comment period for the proposed ground water remedial action.
May 22, 1990	Special Notice letter from USEPA received at the NIROP.

3. COMMUNITY RELATIONS HISTORY

A statement of the basis and purpose of the selected action can be found on page 1 of this document. The RI/FS documents and Proposed Plan were made available to the public in both the Administrative Record and information repositories maintained at the USEPA Region V Docket Room in Chicago and the Anoka County Library in Fridley. The notice of availability of these documents and a notice for the public meeting were published in various local and area newspapers. Fact sheets explaining the Proposed Plan were mailed to approximately 400 residents prior to the public meeting. Copies of the Proposed Plan were mailed to TRC members and other interested local officials.

The public comment period occurred from May 1 to May 30, 1990. A public meeting was held on May 9, 1990, at the Fridley Community Education Center. At this meeting, representatives from the U.S. Navy, USEPA, and the Minnesota Pollution Control Agency (MPCA) answered questions about the NIROP and the Proposed Plan. Responses to verbal, as well as written, public comments are contained in the Responsiveness Summary included in this Record of Decision.

Prior to the public comment period in May 1990, there was limited community involvement in activities at the NIROP. In May 1989, newspaper announcements were placed for a public meeting presented by the U.S. Navy and other members of the Technical Review Committee in Fridley on May 22, 1989, to discuss the results of the RI/FS. There was no attendance at this meeting.

Local input to the selection of the preferred remedy has come predominantly through the Technical Review Committee (TRC) established by the U.S. Navy in February 1989. TRC membership has included the USEPA, the MPCA, the U.S. Navy, the Corps of Engineers, Anoka County, the City of Fridley, FMC Corp., the Metropolitan Waste Control Commission, the Minnesota Department of Natural Resources (MDNR), and RMT, Inc. Subsequent meetings have been held in April, June, and September 1989, and in February and May 1990. Involvement through the TRC has facilitated remedial planning and has alerted local groups to the proposed activities.

4. SCOPE AND ROLE OF OPERABLE UNIT WITHIN SITE STRATEGY

Prior to the RI/FS work for this site, the Navy had conducted a removal action in 1983 and 1984 to address the immediate threat of hazardous substances posed by past waste disposal practices. Approximately 1,200 cubic yards of contaminated soil and 43 drums were excavated and disposed off-site in a USEPA-approved landfill.

The RI/FS work for this site addressed both the soil and ground water media. During the evaluation of alternatives, it was determined that the available data were not sufficient to determine an appropriate response, if any was required, for contaminated soil. Additional investigative work concerning the source of the contamination was requested by the USEPA and MPCA and is presently being organized by the U.S. Navy.

This ROD addresses the remedial action planned for a ground water operable unit at the site. The principal threat posed by the site is the continuing migration of TCE via ground water to the Mississippi River. This remedial action addresses the principal threat by providing total hydraulic containment to prevent migration of all contaminated ground water off the NIROP, and by recovering, to the extent feasible, contaminated ground water beneath the Anoka County Parkland. The need for future action, possibly as a separate operable unit, to address potential contamination sources at the NIROP will be addressed pending the results of the upcoming investigative work.

The Navy believes that the combination of source remediation, if any subsequent RI/FS concerning the source indicates such remediation is necessary, and ground water remediation should address all contamination at the site. By remediation of contaminated soils, if found to be present, contaminant loading to ground water and risks posed by the contaminated soils at the NIROP would be reduced. By remediation of contaminated ground water, the Navy believes that present and future risks posed by migration of contaminated ground water will be reduced. This remedial action for hydraulic containment and recovery of ground water at the NIROP, and to the extent feasible, ground water downgradient of the NIROP, will stop future migration of contaminated ground water from the NIROP and will provide protection to the City of Minneapolis water supply intake.

5. SUMMARY OF SITE CHARACTERISTICS

The first phase of the remedial investigation began in June 1986, and an RI report was submitted in June 1987. Based on the initial RI work, a follow-up investigation was performed between November 1987 and February 1988. An RI addendum report was submitted in July 1988.

Analysis of information gathered during the two phases of the remedial investigation indicates the site characteristics listed below.

TCE Usage and Potential Source Areas

All use of TCE at the NIROP was discontinued by April 1, 1987. Plant operations which previously used TCE now use 1,1,1-trichloroethane. A solvent management program is currently in place at the NIROP, and disposal of solvents is in accordance with state and federal regulations.

Elevated concentrations of TCE and dichloroethylene were found in soil pore gas near the former pit/trench disposal area, near a concrete pad in the north storage yard area, and at several locations near the north property boundary.

The former pit/trench disposal area (and immediate vicinity) in the northern region of the NIROP is considered an on-site source area. Findings from the soil pore gas survey and on-going occurrence of TCE in the ground water suggest that it is likely that some VOC residuals and/or VOC-contaminated soil still exist in this area. Investigations showed TCE at the intermediate depth of the unconsolidated aquifer in the southeast corner of the NIROP.

Unidentified sources are suspected at the NIROP near the eastern NIROP property boundary, and east and northeast of the NIROP property.

Because TCE is present in upgradient wells, upgradient sources may also be contributing to ground water contamination originating at the NIROP.

The NIROP includes controlled access to plant grounds and buildings.

TCE is a probable human carcinogen. Remediation of TCE will concurrently address risks posed by other constituents.

Hydrogeology

Site hydrogeology consists of an unconsolidated sand and gravel aquifer overlying a bedrock aquifer. The unconsolidated aquifer consists of 85 feet of saturated thickness. The water table is 20 to 25 feet below the surface. A discontinuous till layer is present at approximately 50 to 80 feet (Figure 3).

The underlying bedrock consists of the Prairie du Chien/Jordan (PCJ) dolomite. The St. Peter Sandstone overlies the PCJ across the northern portion of the NIROP. The St. Peter Sandstone acts as a confining layer where it is present; where it is absent, the unconsolidated aquifer is hydraulically connected to the PCJ.

Ground water flow in the unconsolidated aquifer is generally from the northeast to the southwest across the NIROP. The aquifer discharges to the Mississippi River, and is the predominant migration pathway.

There are currently no ground water users downgradient of the NIROP in the Anoka County parklands. The United States Geological Survey (USGS) has studied the parklands for potential development of a supplemental water supply system for the City of Minneapolis. No decision has been made to date on whether any community in the area will install wells in the future for a water supply in Anoka County Park land downgradient of the NIROP.

Extent of Migration via Ground Water

Ground water in the unconsolidated aquifer beneath the NIROP contains volatile organic compounds (VOCs), including the following: TCE, 1,1,1-trichloroethane, 1,2-dichloroethylene, tetrachloroethylene, 1,1-dichloroethane, toluene, xylene, and ethylbenzene. Concentrations of these constituents are listed in Table 1.

TCE was found more frequently and at higher concentrations than any other VOC, and is therefore the best indicator chemical. The approximate extent of TCE in ground water is illustrated on Figures 4 and 5.

Concentrations of TCE in ground water reaching the Mississippi River are probably on the order of 1 to 10 mg/L. This range of TCE concentrations can be expected to continue if no remedial action is taken, given the TCE levels detected at the southwest corner of the NIROP.

The investigations show concentrations of VOCs below drinking water standards in the Prairie du Chien bedrock aquifer.

Extent of Migration via Storm Sewers

One round of samples was collected from storm sewers serving the NIROP. No VOCs were found.

TABLE 1

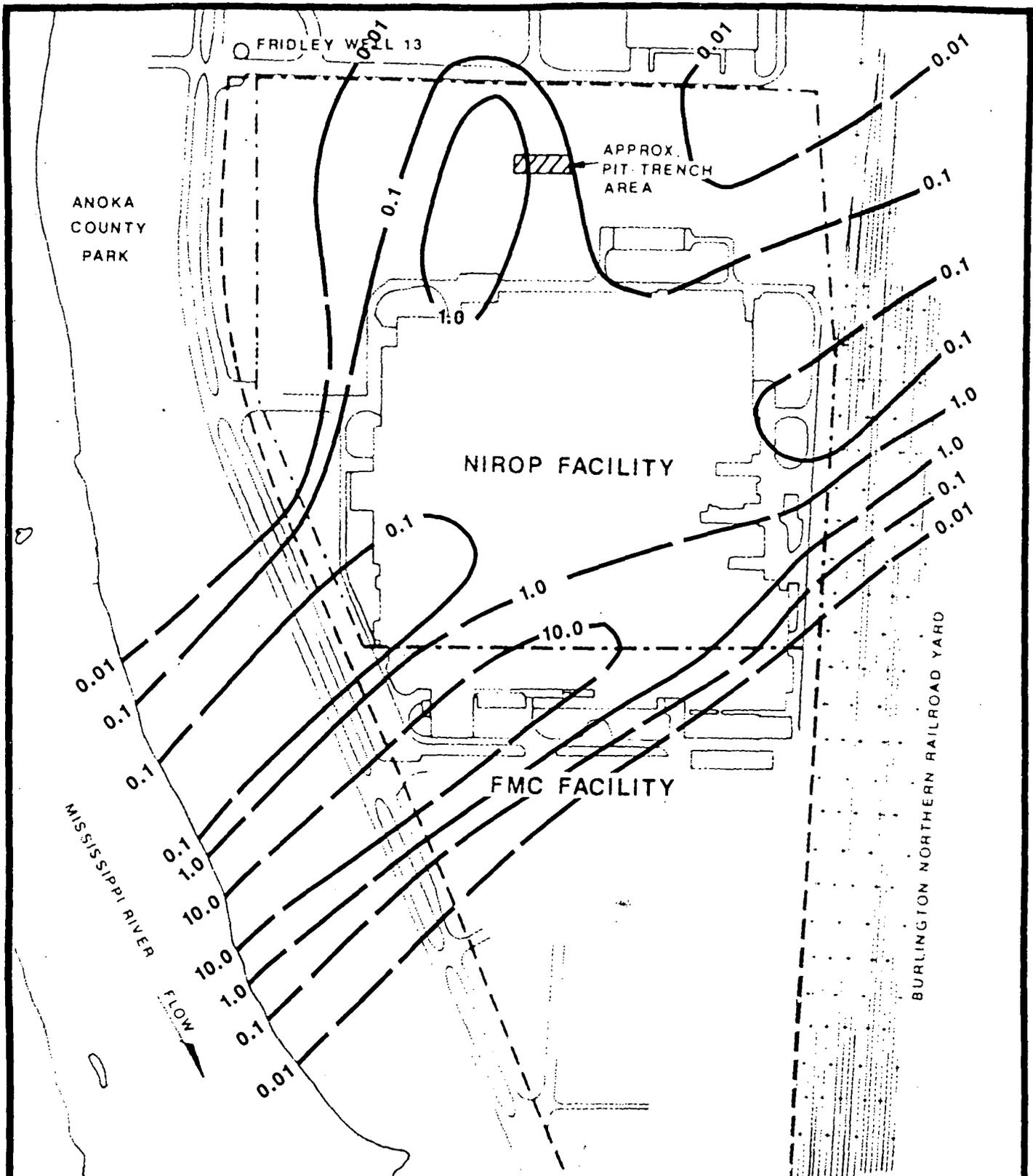
RANGE OF VOCs IN GROUND WATER (mg/L)

CONSTITUENT	MCL	UPGRADIENT WELLS		ON-SITE WELLS		DOWNGRADIENT WELLS	
		SHALLOW	DEEP*	SHALLOW	DEEP*	SHALLOW	DEEP*
Trichloroethylene	0.005	< 0.005 - 0.17	< 0.005 - 0.004	< 0.005 - 28.0	< 0.005 - 37.0	< 0.005 - 12.7	< 0.005 - 10.8
1,1,1-Trichloroethane	0.20	< 0.005 - 0.002	< 0.005	< 0.005 - 0.39	< 0.005 - 0.287	< 0.005	< 0.005 - 0.0086
1,2-Dichloroethylene	NP	< 0.005	< 0.005	< 0.005 - 0.31	< 0.005 - 1.41	< 0.005 - 2.44	< 0.005 - 0.092
Tetrachloroethylene	0.005	< 0.005 - 0.001	< 0.005	< 0.005 - 0.22	< 0.005 - 0.141	< 0.005 - 0.021	< 0.005
1,1-Dichloroethane	NP	< 0.005	< 0.005 - < 0.010	< 0.005 - 0.066	< 0.005 - 0.106	< 0.005 - 0.009	< 0.005 - 0.003
Toluene	NP	< 0.005	< 0.005	< 0.005 - 0.010	< 0.005 - 0.012	< 0.005	< 0.005 - 0.0082
Xylene	NP	< 0.005	< 0.005	< 0.005	< 0.005 - 0.036	< 0.005	< 0.005
Ethylbenzene	NP	< 0.005	< 0.005	< 0.005 - 0.037	< 0.005 - 0.21	< 0.005	< 0.005

* Deep wells include piezometers installed at various depths in the unconsolidated aquifer. VOCs were not detected in bedrock wells above MCLs.

NP - No MCL Promulgated.

Values listed which are below the detection limit (0.005 mg/L) are estimated values ('J' qualifiers).



LEGEND

— 1.0 — ISO-CONCENTRATION LINE, mg/L TCE
(DASHED WHERE INFERRED)

**EXTENT OF TCE IN UPPER ZONE
OF UNCONSOLIDATED AQUIFER**

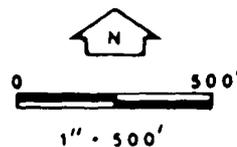
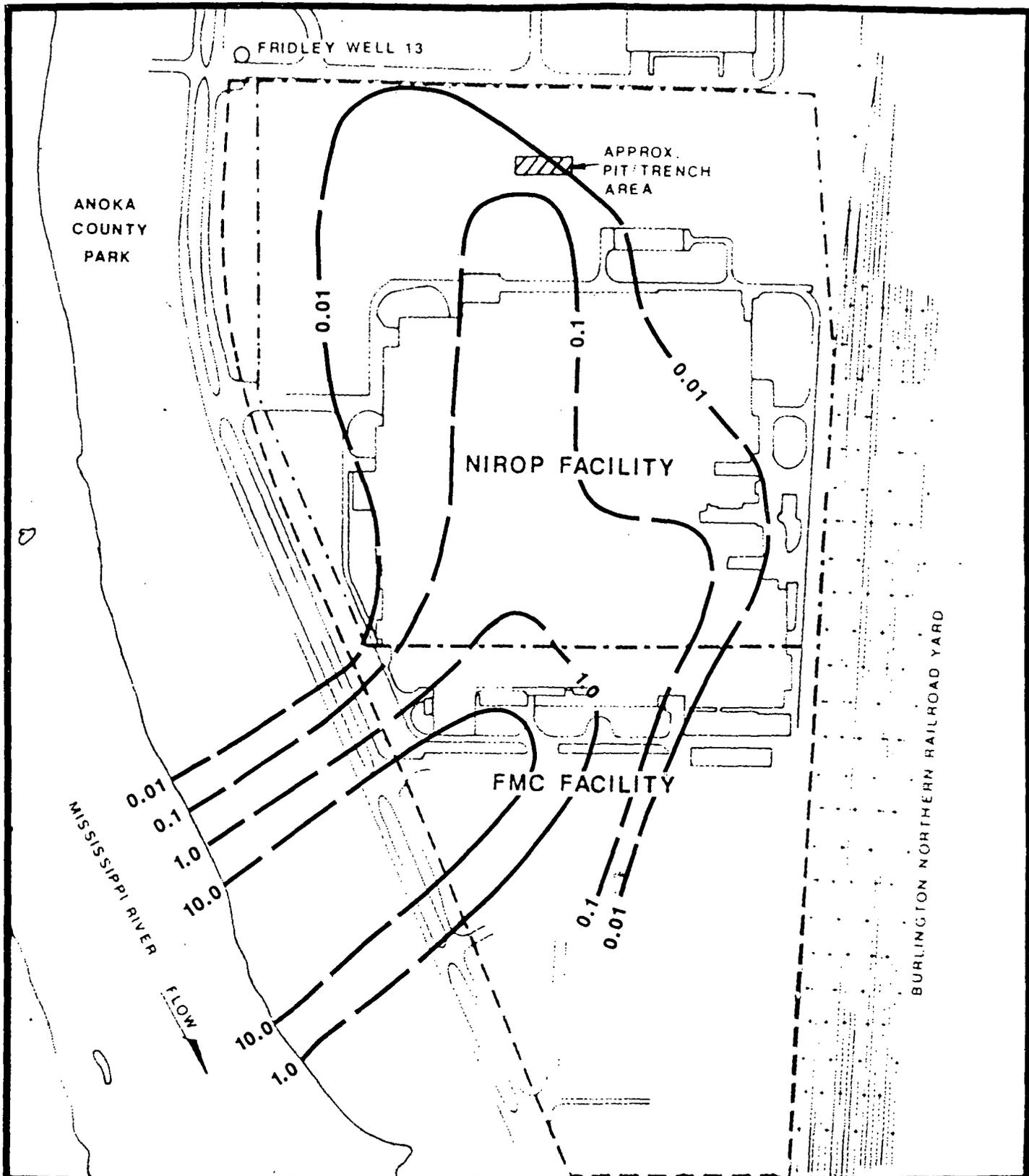


FIGURE 4



EXTENT OF TCE IN LOWER ZONE OF UNCONSOLIDATED AQUIFER

LEGEND

1.0 — ISQ-CONCENTRATION LINE, mg/L TCE (DASHED WHERE INFERRED)

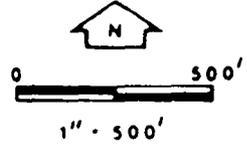


FIGURE 5

6. SUMMARY OF SITE RISKS

Actual Human Risks

The primary concern resulting from contamination from the NIROP is human ingestion of VOC contaminants in ground water, either directly or via the Minneapolis water treatment plant intake on the Mississippi River. Concern is focused on trichloroethylene (TCE) since it represents the predominant constituent at the NIROP and has been widely detected in concentrations above the drinking water standards Maximum Contaminant Level (MCL) in ground water. Of the highest observed VOC concentrations in shallow and deep wells downgradient of the NIROP, TCE accounts for over 90 percent of the total VOCs. Other constituents pose considerably lower risks in comparison to TCE; therefore, TCE provides a good indicator of total risk. In addition, remediation designed to recover TCE will concurrently address other constituents.

In the short term, the only potential point of significant human exposure is via ingestion of drinking water from the Minneapolis water treatment plant. The intake for the plant is located on the Mississippi River approximately 1,500 feet south of the NIROP, and could potentially be affected by ground water entering the river near the NIROP. Based on RI data, it was estimated that ground water entering the river would mix with from 10 to 100 percent of the total river flow before reaching the city water treatment plant intake farther downstream. It was assumed that there would be no volatilization or other losses of TCE within the river or during the treatment process within the city water treatment plant.

TCE is a probable human carcinogen. As a result, the excess lifetime cancer risk to the exposed population would be approximately 2×10^{-5} and 2×10^{-6} , respectively, under 10- and 100-percent mixing estimates using the 7-day, 10-year low river flow and a typical TCE concentration in the ground water discharge of 10 mg/L. These risk estimates are based on the assumed presence of TCE in the city water treatment plant intake. No TCE has been found in samples collected annually by FMC at the intake for the past 3 years, at a detection

limit of 5 µg/L. Therefore, if an exposed population does not exist, the actual risk is zero. TCE had been previously detected in 26 of 40 samples collected by the MPCA from 1981 to 1983 at the city water treatment plant intake, at concentrations less than 5 µg/L.

Potential Human Risks

Possible future effects on public health would vary depending on whether the concentration of TCE in ground water discharging to the river increases or decreases. In the long term, possible future effects may also include the creation of a completely new exposure pathway. At the present time, there is no consumption of ground water or surface water between the NIROP property line and the city water treatment plant intake on the Mississippi River approximately 1,500 feet south of the NIROP. The installation of a new water supply well downgradient of the NIROP, before ground water enters the river, would create a new exposure pathway. The United States Geological Survey (USGS) has investigated the suitability of this area for supplemental water supply purposes for the City of Minneapolis. Although no decisions have yet been made on whether or not to use ground water from this area, the existing contamination is one factor that would influence the selection of this potential water source area. Since ground water in this location contains higher concentrations of VOCs than would exist at the city intake, the risk level would increase under such an exposure scenario.

Maximum and typical ground water VOC concentrations in downgradient wells are listed in Table 2 with the corresponding potential risk. These risks represent the risks associated with ingestion of ground water. Since the exact exposure point concentration is not known, and may change in the future, the range of typical values reported in Table 2 represents typical concentrations encountered in ground water which may be recovered under the future use scenario. TCE accounts for the majority of risk in comparison to other carcinogens.

TABLE 2

POTENTIAL RISKS ASSOCIATED WITH VOCs IN GROUND WATER
DOWNGRAIDENT OF THE NIROP

Carcinogen	Concentration (mg/L)		CDI ⁽¹⁾ (mg/kg-d)		CSF ⁽²⁾ (mg/kg-d) ⁻¹	Potential Risk	
	Maximum	Typical	Maximum	Typical		Maximum	Typical
Trichloroethylene	12.7	1-10	0.363	0.028-0.28	1.1 E ⁻²	4 E ⁻³	3 E ⁻⁴ - 3 E ⁻³
Tetrachloroethylene	0.21	< 0.003	0.0006	< 0.00014	5.1 E ⁻²	3 E ⁻⁵	< 7 E ⁻⁶
1-1-Dichloroethane	0.009	< 0.005	0.0003	< 0.00014	9.1 E ⁻²	2 E ⁻⁵	< 1 E ⁻⁵
TOTAL						4 E ⁻³	3 E ⁻⁴ - 3 E ⁻³

⁽¹⁾ CDI = Chronic Daily Intake

⁽²⁾ Source: USEPA, January/April 1990. Health effects assessment summary tables: First/second quarter 1990. OERR 9200.6 - 303(90-1/2). CSF = Cancer Slope Factor

The land between the NIROP property and the Mississippi River currently serves as a park owned by Anoka County. Access to existing potable water supplies provided along East River Road is available, which would eliminate the necessity for installation of any new water supply well in the parkland immediately downgradient of the NIROP. However, if ground water in the narrow strip of parkland between the NIROP and the Mississippi River is used in the future for potable water supplies, the Navy will control the health risk within acceptable levels by implementation of a ground water treatment system or other measures as approved by the MPCA and the USEPA. (This alternative was evaluated during the FS.)

Actual or Potential Environmental Risks

Potential environmental risks resulting from present conditions at the site consist of ingestion or uptake of TCE and other VOCs by aquatic organisms in the Mississippi River. Since VOCs readily evaporate from surface waters and since they typically do not bioaccumulate, the risk to aquatic organisms is not believed to be significant. The acute and chronic Ambient Water Quality Criteria for TCE are 45.0 and 21.9 mg/L, respectively. The typical range of TCE in the plume migrating to the river is 1 to 10 mg/L (maximum value = 12.7 mg/L), indicating that these criteria will not be exceeded.

7. DESCRIPTION OF ALTERNATIVES

The Feasibility Study developed a total of eight remedial alternatives to respond to the conditions defined during the remedial investigation. These alternatives addressed both soil and ground water at the NIROP, although the preferred alternative presently addresses only the ground water operable unit, pending additional investigation of soil at the NIROP.

No-Action Alternative

The Superfund program requires that the "no-action" alternative be considered at every site. Under this alternative, no specific action would be taken to prevent exposure to soil or ground water at the NIROP. A long-term ground water monitoring program would be developed and implemented using previously installed monitoring wells to further assess present and future conditions.

Alternative A: Capping

This alternative consists of the construction of a 6,000-square-foot concrete cap over a potential source area of ground water contamination at the NIROP. The contamination source addressed by this alternative is the residual concentrations of VOCs contained in soil in the vicinity of the previous pit/trench disposal area located at the north end of the NIROP. This alternative would reduce infiltration and subsequent contaminant loading to ground water. The area would be graded to promote surface water drainage away from the cap. Precipitation which accumulates on the cap would be drained via modifications to the facility's storm water collection system. A long-term ground water monitoring program would also be implemented.

Alternative B1: Soil Excavation and Disposal in an Off-site Landfill

This alternative consists of the excavation of approximately 300 cubic yards of soil containing residual concentrations of VOCs, and disposal in an off-site RCRA Subtitle C landfill. Excavation would be centered around the trench locations originally excavated in 1983. This alternative would reduce contaminant loading to the ground water. The excavation would be backfilled with clean soil. A long-term ground water monitoring program would be implemented.

Alternative B2: Soil Excavation and Disposal in a Landfill at the NIROP

This alternative is analogous to alternative B1 with the exception that disposal would be in a newly constructed RCRA-permitted landfill at the NIROP.

Alternative C: Soil Excavation Treatment and Disposal

This alternative would consist of the aeration of approximately 300 cubic yards of excavated soil at the NIROP prior to backfilling in the original excavation. VOCs would be removed down to an established treatment performance level.

Alternative D: Soil Treatment Using In-situ Vacuum Extraction

This alternative involves treatment of soil in the vicinity of the former disposal pits and trenches. In-situ vacuum extraction technology would be used to remove residual concentrations of VOCs by inducing a negative pressure on the unsaturated soil. Enhanced airflow through the soil would volatilize adsorbed constituents, and the recovered air would be vented to the atmosphere. If necessary, the system would be equipped with air treatment equipment to meet local air emission requirements. A long-term ground water monitoring program would be implemented.

Alternative E: Ground Water Pumping and Disposal

This alternative consists of ground water recovery using a series of pumping wells and direct discharge to the Metropolitan Waste Control Commission sanitary sewer system. An option to discharge directly to local storm sewers was also considered.

Alternative F: Ground Water Pumping Treatment and Disposal

This alternative involves the pumping of ground water from source areas and downgradient locations. For evaluation purposes, it was assumed that five hydraulic containment and recovery wells would operate at a combined flow rate of up to 650 gpm. Although various disposal options were considered, the base-line alternative specified a phased ground water remediation plan. Under Phase I, recovered ground water would be discharged to the Metropolitan Waste Control Commission (MWCC) sanitary sewer system, where it would be treated at the Pig's Eye Wastewater Treatment Plant. Pre-treatment would be used, if necessary, to meet MWCC requirements.

During Phase II, one of two treatment process options would be incorporated into the pumping program, pending the results of testing on recovered water during Phase I:

- Option A: Treatment of ground water at the NIROP by two-stage air stripping, with disposal through an existing NPDES-permitted storm sewer outfall, and treatment of air emissions using vapor-phase granular activated carbon. Spent activated carbon would be regenerated at a permitted off-site facility.
- Option B: Treatment of ground water at the NIROP using aqueous-phase granular activated carbon, with disposal through an existing NPDES-permitted storm sewer outfall. Spent activated carbon would be regenerated at a permitted off-site facility.

Two additional alternatives were presented in the Feasibility Study to address the possibility that the City of Minneapolis may decide to develop a supplemental water supply well system downgradient of the NIROP, located within the TCE plume. One of these alternatives included a "point of use" ground water treatment system utilizing granular

activated carbon, to be installed at the location of the potential well field. Spent activated carbon from the treatment system would be regenerated at a permitted off-site facility. The second additional alternative considered the possibility of relocating the proposed water supply well system, and providing additional piping and construction easements, as necessary. The alternatives would be available if future decision-making called for development of a supplemental water supply system in the Anoka County Parkland.

8. SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

8.1 Overall Protection of Human Health and the Environment

The No-Action alternative would not provide increased protection of human health or the environment above existing conditions.

Alternative A would reduce potential contaminant loadings to ground water over the long term, but would not reduce potential exposures from existing conditions.

Similarly, Alternatives B1, B2, C, and D would remove a long-term source of contaminant loading by excavation and/or treatment. However, Alternative B1 would result in re-disposal of NIROP materials at an off-site disposal facility, which could result in possible future migration from the off-site facility. None of these alternatives address the more immediate potential exposures resulting from constituent migration via ground water.

Alternatives E and F would provide a high degree of overall protection by reducing potential ingestion of VOCs in ground water affected by the NIROP, and by mitigating continued discharge of VOCs to the Mississippi River. Alternative F would be implemented with state and local discharge approvals that specify protective levels for air and water emissions.

8.2 Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

For soil, chemical-specific ARARs have not been identified. Certain remedial alternatives would be subject to action-specific ARARs under the Resource Conservation and Recovery Act (RCRA) for source area capping (Alternative A) and soil disposal (Alternatives B1 and B2). RCRA treatment standards may also be ARARs for soil treatment under Alternative C. Off-site disposal would be subject to RCRA land disposal restrictions.

For ground water, the Maximum Contaminant Level (MCL) for TCE has been identified as relevant and appropriate as a ground water cleanup target at the site. Alternatives E and F would seek to meet this ARAR by hydraulic containment and direct

ground water removal. Alternatives A, B1, B2, C, and D would provide source control, but would not directly meet the MCL ARARs for ground water.

Discharges of ground water under Alternatives E and F would meet local and state requirements. Air emissions under Alternatives D and F (and possibly C) would be subject to state air emission requirements.

A summary of major ARARs for each alternative is provided in Table 3.

8.3 Long-Term Effectiveness and Permanence

The No-Action alternative would provide no long-term effectiveness or permanence.

The remaining alternatives would provide long-term effectiveness in varying ways. Alternatives E and F would provide long-term migration control and permanent contaminant removal from the saturated zone, but not the unsaturated zone. Alternatives A, B1, B2, C, and D would permanently remove contaminant sources in the unsaturated zone, with the likely result of a gradual improvement in ground water quality over time.

8.4 Reduction of Toxicity, Mobility, and Volume

The No-Action alternative would not reduce the toxicity, mobility, or volume of contaminants in soil or ground water.

Alternative A would reduce future mobility of contaminants from unsaturated soil to ground water by limiting the infiltration of precipitation, but would not reduce toxicity or volume.

Alternatives B1, B2, C, and D would reduce mobility, toxicity, and volume by removing a contaminant source. Alternative B1 would provide the highest degree of reduction by disposal of excavated soil off-site. Alternatives C and D would transfer contaminants from a solid **matrix** to the air matrix, with possible recovery and destruction of contaminants from the air matrix under Alternative D.

TABLE 3

ACTION-SPECIFIC ARARS

No Action	RCRA Subtitle C, Subpart F, Ground Water Monitoring
A. Capping	RCRA Subtitle C, Subpart F and Capping Requirements
B1. Soil Excavation and Disposal in an Off-Site Landfill	RCRA Subtitle C, Subpart F; DOT Transport Requirements; Land Disposal Restrictions
B2. Soil Excavation and Disposal in a Landfill at the NIROP	RCRA, Subtitle C, Subpart F, TSD Requirements, Closure and Minimum Technology Requirements
C. Soil Excavation, Treatment, and Disposal	RCRA Subtitle C, Subpart F, TSD Requirements, Closure and Minimum Technology Requirements; CAA - NAAQs for VOCs
D. Soil Treatment Using In-Situ Vacuum Extraction	RCRA Subtitle C, Subpart F, TSD Requirements; CAA - NAAQs for VOCs
E. Ground Water Pumping and Disposal	RCRA Subtitle C, Subpart F; MWCC Pretreatment Requirements; NPDES Permit for Storm Sewer Discharge
F. Ground Water Pumping, Treatment, and Disposal	
Option A: Air Stripping	RCRA Subtitle C, Subpart F, TSD Requirements; CAA - NAAQ's for VOCs; CWA - NPDES for VOCs; WQS - MCLs; Land Disposal Restrictions and DOT Requirements for Spent Activated Carbon.
Option B: Aqueous Granular Activated Carbon	RCRA Subtitle C, Subpart F, TSD Requirements; CWA - NPDES for VOCs; WQS - MCLs; Land Disposal Restrictions and DOT Requirements for Spent Activated Carbon.

Alternatives E and F provide direct reductions in the toxicity, mobility, and volume of contaminants in ground water. Emissions of contaminants via air or water discharges would be within state limits.

8.5 Short-Term Effectiveness

The No-Action alternative would provide no short-term effectiveness.

Alternatives E and F would provide the highest degree of effectiveness in the short term by directly mitigating the movement of constituents via ground water to the Mississippi River and potential subsequent receptors.

Alternatives A, B1, B2, C, and D would provide limited short-term effectiveness because they primarily address constituents only in the unsaturated zone. They would not provide immediate migration control.

8.6 Implementability

All of the alternatives are implementable. Alternative A is the most straightforward from an engineering standpoint, and would involve simple construction methods. Alternative B1 is also straightforward, but implementation would require off-site disposal approval.

Alternatives B2, C, and D would involve either more sophisticated construction techniques or a form of soil treatment. Although more complex, they are readily implementable.

Alternatives E and F would involve a relatively higher degree of uncertainty due to the complexities of ground water flow and recovery technology. This can be overcome by a program of effectiveness monitoring and treatment monitoring, with system adjustments as needed. Discharge approvals would be required.

8.7 Costs

The estimated capital and total present worth costs for each alternative are summarized below.

Alternative	Estimated Costs (\$1,000s)	
	Capital	Total Present Worth*
No Action	40	490
A Capping ⁽²⁾	210	310
B1 Excavation and Off-Site Disposal ⁽¹⁾	170	170
B2 Excavation and Disposal at the NIROP ⁽¹⁾	370	530
C Excavation, Treatment, and Disposal ⁽¹⁾	150	150
D In Situ Vacuum Extraction ⁽²⁾	1,000	1,000
E Pump and Dispose of Ground Water ⁽¹⁾	320	7,300
F Pump, Treat, and Dispose of Ground Water ⁽²⁾		
Option 1: Air Stripper	1,100	3,700
Option 2: GAC	800	4,100
<p>GA - Granular Activated Carbon. * - Present worth based on 30-year period and 10% interest rate.</p> <p>Note: For Alternative E, a substantial portion of the estimated present worth is due to an estimated publicly owned treatment works (POTW) discharge fee at \$1.08 per 1,000 gallons of water.</p> <p><u>Source:</u></p> <p>⁽¹⁾ RMT, Inc. 1988. Feasibility Study Report. ⁽²⁾ RMT, Inc. 1988. Feasibility Study Addendum Report.</p>		

8.8 Agency Acceptance

The MPCA and the USEPA have provided comments on the RI and FS. The MPCA and the USEPA agree with the recommended remedial action for a ground water operable unit.

8.9 Community Acceptance

The community has not been strongly for or against any one of the alternatives. Several questions have been raised over whether implementation of Alternative F would deplete a ground water resource which may have otherwise had beneficial uses. The hydrogeologic setting at the site has been reviewed, and it has been determined that pumping of shallow ground water at the NIROP will not adversely affect other potential users. These questions have also been addressed in the Responsiveness Summary.

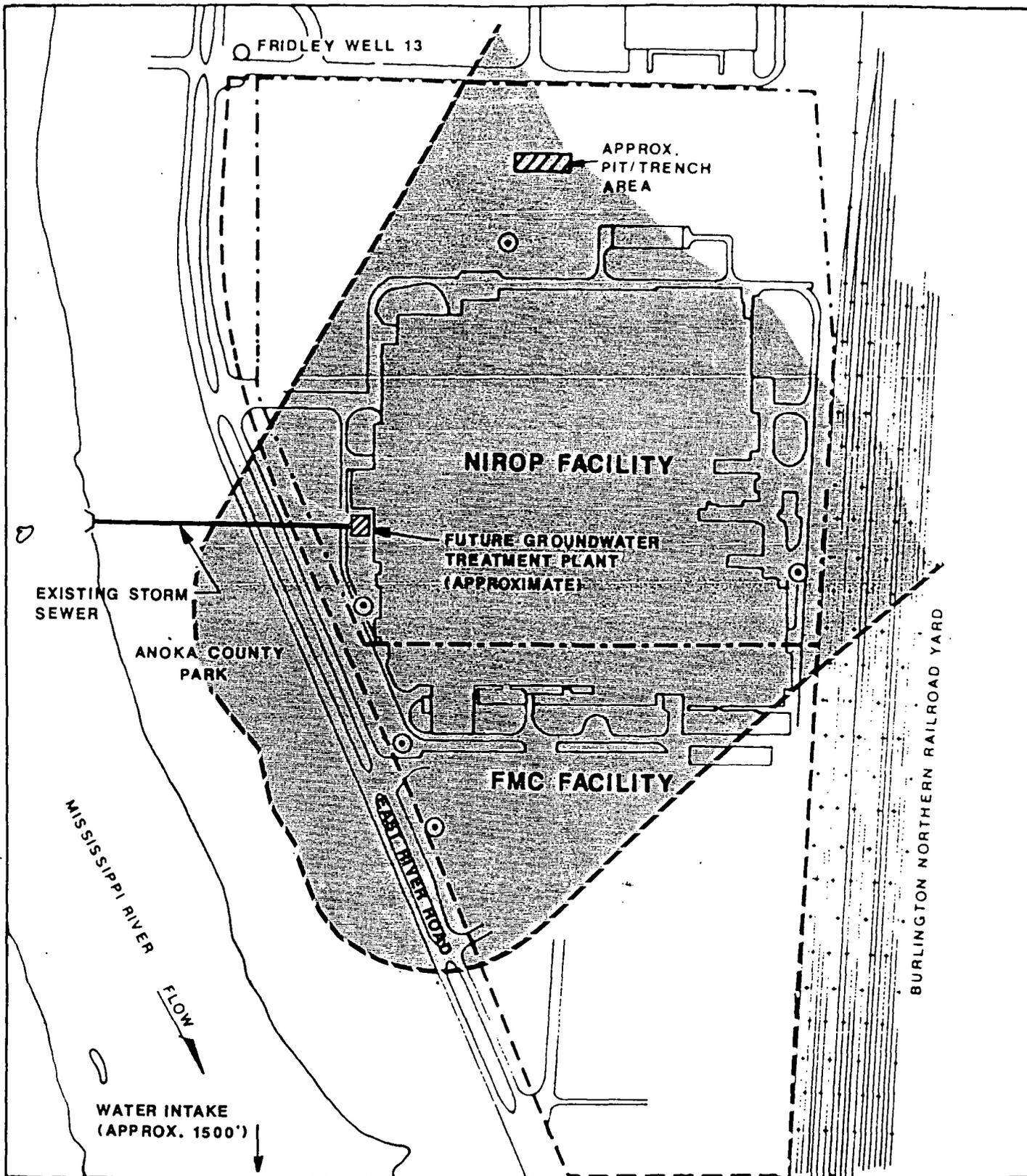
9. THE SELECTED REMEDY

The selected remedial alternative to address the presence and migration of TCE and other constituents in ground water at the NIROP is Alternative F: Ground Water Pumping, Treatment, and Disposal. The objective of this alternative is to address the principal threat posed by the site by providing hydraulic containment to prevent further migration of contaminated ground water off the NIROP and by recovering, to the extent feasible, contaminated ground water beneath the Anoka County Parkland. Based on the results of the RI/FS, this alternative provides the best balance among the alternatives with respect to the nine evaluation criteria specified under the National Contingency Plan.

The selected remedy will provide long-term effectiveness in satisfying the objective of reducing future exposures to VOCs in ground water. The alternative provides a high degree of permanence by recovering contaminated ground water at the site and treating contaminated ground water using approved and proven methods. Future migration and potential exposure to ground water beneath the Anoka County Parkland will be mitigated. In this manner, both the mobility and volume of VOCs migrating to the Mississippi River are reduced.

The initial goal of the selected alternative is to contain and recover contaminated ground water from both the NIROP and, to the extent feasible, the Anoka County Parklands. The targeted capture zone is illustrated on Figure 6. The ultimate goal is to restore ground water quality in the unconsolidated aquifer at the site to Maximum Contaminant Levels (MCLs). These goals comply with all identified Applicable or Relevant and Appropriate Requirements (ARARs).

A portion of the aquifer within the Anoka County Parkland closest to the Mississippi River may not fall within the zone of capture of the ground water recovery system. However, should this occur, contaminants in any uncaptured portion of the aquifer are expected to dissipate by natural means over time to levels that are protective of human health and the



LEGEND

- NIROP PROPERTY BOUNDARY
- FMC FACILITY BOUNDARY
- ⊙ PROPOSED GROUNDWATER RECOVERY WELL (APPROXIMATE LOCATIONS. FINAL LOCATIONS BASED ON UPCOMING PUMP TESTS.)
- TARGETED ZONE OF CAPTURE

ZONE OF CAPTURE FOR CONTAINMENT AND RECOVERY OF GROUNDWATER

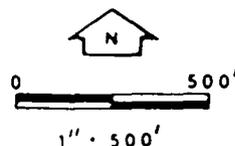


FIGURE 6

environment. Should the City of Minneapolis or another community decide in the future to develop a supplemental water supply well system in the Anoka County Parkland, the Navy will control the health risk within acceptable levels by implementation of a ground water treatment system or other measures as approved by the MPCA and the USEPA.

Components of the Selected Remedy

The design concepts for the selected remedy as developed in the Feasibility Study (FS) are illustrated on Figure 7, and include the following:

Phase I

Installation and operation of five ground water recovery wells at a combined design flow rate of up to 650 gpm. Two wells will be installed at source locations to capture the ground water plume containing higher concentrations of TCE. The three remaining wells will be installed at the downgradient side of the NIROP to control migration and recover ground water which has already moved off the NIROP to the fullest extent possible.

Discharge of ground water to the local sanitary sewer. The discharge will meet local regulations, and the water will be treated at the Metropolitan Waste Control Commission (MWCC) Pig's Eye Wastewater Treatment Facility. If necessary to meet MWCC requirements, pretreatment will be provided.

Testing and design of a treatment system located at the NIROP. During Phase I, testing will be performed on pumped ground water to establish design parameters for the full-scale treatment system. The phased approach to the ground water remediation will allow the start-up of ground water recovery operations while testing, remedial design, and construction of the treatment system proceed.

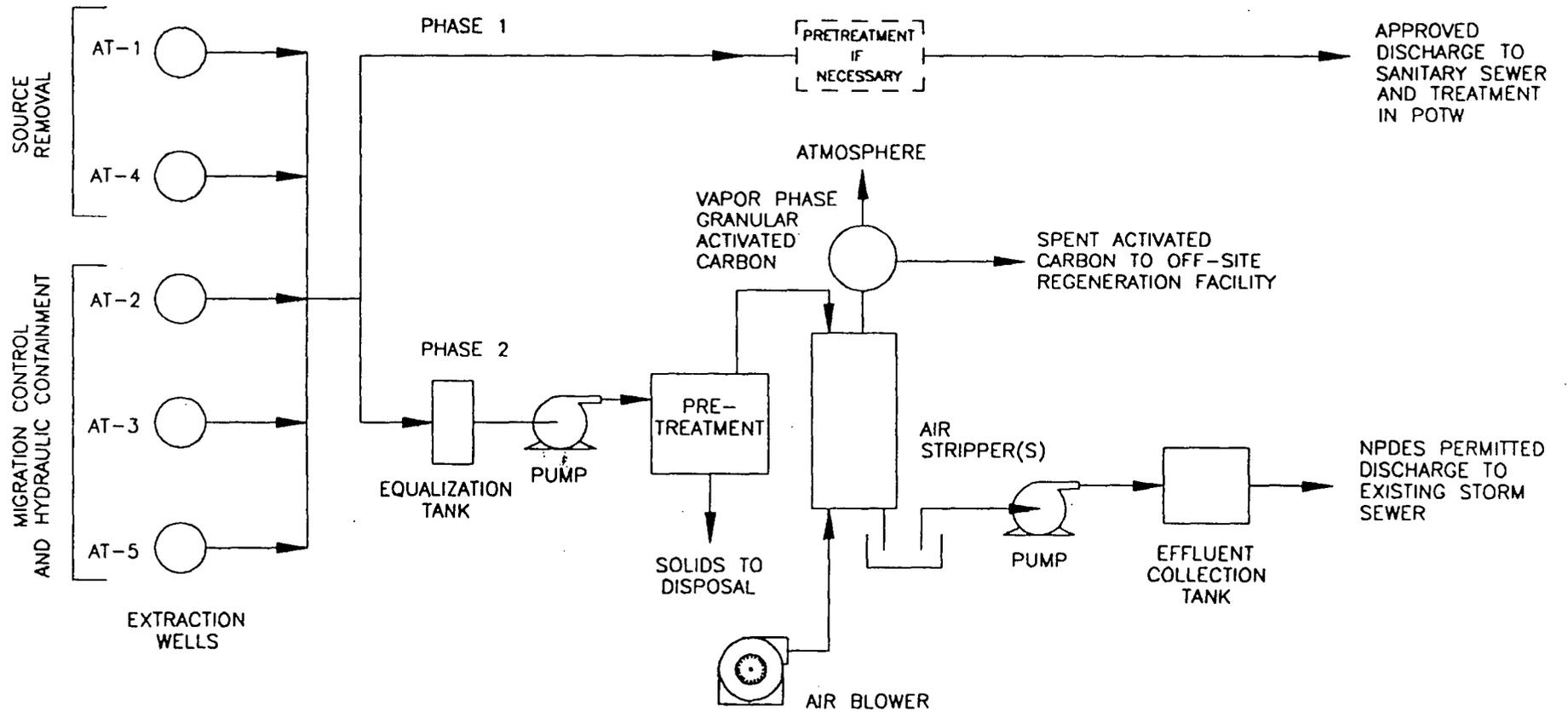
Phase II

Construction and operation of a ground water treatment system, with discharge of treated ground water through an NPDES-permitted outfall to the Mississippi River. The unit operations for the treatment system as described in the FS include two-stage air stripping with treatment of the off-gas using granular activated carbon. The final unit operations will be determined during remedial design based on the discharge requirements established by the state during the NPDES submittal review process, and based on the results of treatability testing performed during Phase I.

Long-term monitoring of ground water quality changes and capture effectiveness. A network of monitoring wells will be established and sampled to determine ground water quality changes during remediation and the effectiveness of ground water capture. Based on determinations of capture effectiveness, the pumping rates for individual wells will be adjusted as needed to optimize recovery. If necessary to achieve hydraulic control, additional wells will be installed.

Operations and Effectiveness Monitoring

The ground water recovery and treatment systems will be monitored for proper operation during the course of the remediation. This will include the following activities:



PREFERRED ALTERNATIVE: GROUND WATER PUMPOUT, TREATMENT AND DISPOSAL PROCESS FLOW DIAGRAM

FIGURE 7

- . Collection of combined flow water samples prior to discharge to the MWCC Pig's Eye Wastewater Treatment Facility.
- . Hydraulic evaluation of the capture effectiveness of the recovery well network. The initial evaluation will occur within 90 days after start-up and will be submitted to the USEPA and the MPCA by the U.S. Navy.
- . Periodic inspection of the ground water pumps, piping, and controls, and routine maintenance as required.
- . Recording flow rates from individual wells and computing cumulative recovery volumes for payment of sewer use charges.
- . Collection of individual well head samples for analysis of VOCs and other indicator constituents.
- . Periodic inspection of pumps, blowers, piping, and other mechanical components of the treatment system, and routine maintenance as required.
- . Collection and analysis of effluent samples from the ground water treatment plant to demonstrate compliance with approved discharge limits.

A ground water monitoring program will be implemented to determine the effectiveness of the remediation. This will include the following:

- . Measurement of water levels in local monitoring wells to calculate the effective ground water capture zone. Additional wells will be added, if necessary.
- . Adjustment of pumping rates as necessary to optimize ground water capture.
- . Collection of ground water samples and analysis for VOCs and other indicator constituents.
- . Calculation methods for determining if MCLs have been reached in the aquifer, and whether or not Alternative Concentration Limits (ACLs) are necessary.

A detailed operation, maintenance, and monitoring plan will be developed by the U.S. Navy during the remedial design phase. The plan will document specific operations and effectiveness monitoring techniques. The plan will be submitted for USEPA and MPCA review and approval prior to implementation.

During the first 90 days of recovery system operation, the Navy will collect data to determine whether hydraulic containment is being effectively achieved. This determination will be summarized in a document which will be sent to the USEPA and MPCA for review and

approval at the end of the 90-day period. The USEPA and MPCA will provide written approval of, or comments on, the determination document within 30 days after its receipt. If the USEPA and MPCA do not approve the determination document, the Navy will submit a revised determination document to the USEPA and MPCA within 60 days after the Navy is notified of specific deficiencies in the document. If the determination document, after its approval by the USEPA and MPCA, indicates that effective hydraulic containment is not being provided by the ground water recovery system, the Navy will prepare and submit to USEPA and MPCA a written plan for upgrading the recovery system to assure that the performance objectives of the containment system are met, and will implement the finally approved plan.

In addition, if it is determined by the Navy that pretreatment of water during the Phase I discharge is necessary to meet MWCC requirements, the Navy will submit an implementation plan to the USEPA and the MPCA within 30 days after this determination is made, which when approved by the USEPA and MPCA will be implemented by the Navy.

10. STATUTORY DETERMINATIONS

10.1 Protection of Human Health and the Environment

The selected remedy protects human health and the environment through hydraulic containment, recovery, and treatment of TCE-contaminated ground water. TCE and other VOCs will be permanently removed from the ground water by air-stripping or another appropriate treatment technology. Air emissions from this treatment will be set at protective levels established by the MPCA.

Recovery of the VOC-contaminated ground water will also eliminate the threat of exposure from ingestion of VOCs via ground water or surface water. The present potential carcinogenic risk of 2×10^{-5} to 2×10^{-6} will be reduced even further by hydraulically limiting the migration of TCE-contaminated ground water to the Mississippi River. The future potential carcinogenic risk of 3×10^{-3} to 3×10^{-4} will be reduced to a protective level based on the MCL for TCE, which will be the target cleanup level for the site (see discussion below).

There are no short-term threats associated with the selected remedy that would weigh against the long-term protection. No adverse cross media impacts are expected.

10.2 Compliance with ARARs

Chemical-Specific ARARs

Because of the potential for the placement of a supplemental well field in the contaminated ground water downgradient of the NIROP to provide additional drinking water to the city of Minneapolis, and questions regarding the permanence of existing prohibitions on placement of private wells in the parkland, federal and state health-based standards for drinking water were considered in determining the cleanup level required for the contaminated ground water aquifer. These include standards established under the Federal Safe Drinking Water Act (SDWA) and the State of Minnesota Recommended Allowable Limits (RALs) for drinking water.

The SDWA established Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) for specific contaminants to ensure the quality of drinking water supplies. MCLGs are non-enforceable health goals, set at levels where no known or anticipated adverse health effects will occur in exposed people and which allow for a margin of safety. Technical feasibility or cost are not taken into account. MCLs are enforceable limits for the concentration of certain contaminants in public water supplies. They are required to be at levels as close to MCLGs as feasible, taking into account use of the best available treatment technologies, costs to public water systems, and analytical limits of detection. The MCLG for TCE is 0. The promulgated MCL for TCE is 5.0 µg/L.

The MCLs and MCLGs apply at the tap to "public water systems," which are water systems having at least 15 service connections or which regularly serve at least 25 individuals. They would thus be applicable to water supplied to users of the Minneapolis public water supply. They would be applicable to ground water in the aquifers at the Anoka County Park if the aquifers were used directly for public drinking water. At this time, there are no wells downgradient of the NIROP supplying public drinking water. The Minneapolis water treatment plant intake receives some portion of the ground water, but this is diluted with river water, and the water is treated before delivery to users. The SDWA standards would apply after such dilution and treatment at the tap.

The SDWA standards are "relevant" cleanup standards for the remediated ground water, however, because the ground water may in the future be accessed through wells for a drinking water supply, and because it may be drawn into the Minneapolis public water supply intake in the Mississippi River downstream of the NIROP. The USEPA has determined that MCLs are relevant and appropriate standards for ground water that may be used for drinking water unless, under the circumstances at a site, more stringent standards must be applied to ensure protection of public health or the environment.

The Minnesota Department of Health's Recommended Allowable Limits (RALs) for drinking water may also be considered in establishing target ground water cleanup levels. Although these recommended contaminant levels are not promulgated state standards, and therefore are not ARARs, such nonpromulgated federal or state advisory levels may be considered in determining target cleanup levels. Similar to MCLs, these levels are in the 10^{-4} to 10^{-6} cancer risk range, which the USEPA has determined to be acceptable for carcinogens. The RAL for TCE is 31 $\mu\text{g/L}$. However, since the MCL is more protective, and since state guidance specifies that RALs should not be used in place of MCLs, the MCL for TCE (5 ppb) will serve as the target cleanup goal for ground water for the site.

Attainment of Cleanup Targets

The achievable concentration of any constituent in ground water from a pumping program cannot be predicted with certainty. At this site, there is a medium to high uncertainty that cleanup targets can be achieved within a reasonable time frame. Despite extensive recovery efforts, very low concentrations of TCE may persist in the aquifer above the target cleanup level. If at some time in the future, the Navy believes that achieving the target cleanup level (MCL) is technically impracticable, at that time the Navy will apply for an Alternate Concentration Limit (ACL) in accordance with guidance for implementation of ACLs. The Navy plans to use a mathematical formula to determine if concentrations have dropped to an asymptotic level. This asymptotic level will be used to show technical impracticability.

The procedures to be used to determine whether an asymptotic level has been reached, and when it has been reached, will be included in the ground water monitoring program plan to be submitted to the USEPA and the MPCA for review and approval prior to start-up of the ground water recovery system. In addition, if it is shown, based on the facts at the time, that upgradient sources are contributing VOCs to the ground water, the U.S. Navy

will request approval of an alternate cleanup target level or approval to terminate ground water recovery operations.

Action-Specific ARARs

The contaminated ground water extracted by pumping will be discharged under Phase I to the sanitary sewer for treatment at the Pig's Eye Wastewater Treatment Facility, a publicly owned treatment works (POTW). Section 307(b) of the Clean Water Act, 33 U.S.C. §1317(b), and regulations promulgated thereunder (40 CFR 403), require POTWs to develop and enforce pretreatment standards (specific effluent limitations regulating the amounts of pollutants that may be discharged to the POTW) to prevent interference with operation of the POTW and pass-through of pollutants through the wastewater treatment system to surface water. These requirements are applicable to this remedial action because, during Phase I, the contaminated ground water will be discharged to a POTW. The MWCC has established a discharge limit for total VOCs of 10 mg/L, and 3 mg/L for any single VOC to be met at the point of discharge to the existing sanitary sewer prior to mixing with any other wastewater. If necessary, pretreatment equipment will be installed to meet MWCC limits. During the discharge period, periodic monitoring will be conducted to demonstrate the effectiveness of hydraulic containment.

Under Phase II, the discharge of treated ground water to the Mississippi River will be subject to state NPDES requirements. The MPCA will set numerical limits for contaminant concentrations in the treated ground water. These limits will form the basis for final design of the ground water treatment plant at the NIROP.

Location-Specific ARARs

No location-specific ARARs have been identified.

Other Requirements

In addition to the regulations described above, the U.S. Navy will be responsible for obtaining all other federal, state, and local approvals which are necessary for performance of the ground water remedial action. The following requirements have been discussed with the USEPA and the MPCA for the remedial action at the NIROP:

- . Minnesota Department of Health approval for all ground water recovery well installations.
- . Minnesota Department of Natural Resources approval for ground water resource appropriation.
- . Minnesota Pollution Control Agency agreement with respect to the state nondegradation policy for surface water discharges.
- . Minnesota Pollution Control Agency approval for a point-source air discharge from the air stripping columns in the ground water treatment facility.
- . Metropolitan Waste Control Commission, Anoka County, and City of Fridley approvals for access to and construction of sewer tie-ins as needed.

The U.S. Navy has also obtained approval from FMC for placement of recovery and monitoring wells on FMC property.

The MPCA, MWCC, Anoka County, and the City of Fridley have been active in TRC meetings and are aware of the proposed remedial action. This prior knowledge and participation in project planning should facilitate the approval process.

10.3 Cost-Effectiveness

The selected remedy is cost effective because it provides a degree of protection commensurate with its cost. The present-worth cost estimate for the selected alternative (Alternative F) is \$3,700,000. Of the two alternatives providing direct ground water recovery (Alternatives E and F), the selected remedy is the less costly.

10.4 Utilization of Permanent Solutions and Alternative Treatment Technologies

The selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner. Treatment is a principal element of the remedy as it will be applied to the recovered ground water. The remedy is permanent because it results in removal of TCE and other constituents from the aquifer.

The remedy represents the best balance among the nine criteria used in the alternatives evaluation. Of the available alternatives evaluated, it provides the highest degree of protection in reducing potential present and future exposure to TCE. The remedy will comply with ARARs by meeting the MCL for TCE as the target cleanup level for the site. The alternative will reduce the toxicity, mobility, and volume of TCE in the aquifer. By meeting the MCL for TCE, other VOCs will also be reduced proportionately. The alternative is implementable and is effective in both the short-term and long-term. The MPCA and the USEPA concur with the remedy.

10.5 Preference for Treatment as a Principal Element

Ground water will be treated during the initial Phase I period at the Pig's Eye Wastewater Treatment Plant and during the long-term Phase II period at a treatment plant at the NIROP specifically designed and constructed for that purpose. Therefore, the statutory preference for remedies that employ treatment as a principal element is satisfied.

RESPONSIVENESS SUMMARY

OVERVIEW

At the time of the public comment period, the U.S. Navy had selected a preferred remedy to address ground water contamination at the NIROP. This preferred remedy was selected in coordination with the USEPA and the MPCA. Other members of the Technical Review Committee (TRC) for this project were also involved in discussions and planning of the ground water recovery and treatment alternative. Technical details of the alternative have been discussed, and no fundamental objections to its selection have been raised.

The sections below describe the background of community involvement on the project and the U.S. Navy's responses to verbal and written comments received during the public comment period.

BACKGROUND OF COMMUNITY INVOLVEMENT

Prior to the public comment period in May 1990, there was limited community involvement in activities at the NIROP. In May 1989, newspaper announcements were placed for a public meeting presented by the U.S. Navy in Fridley to discuss the results of the RI/FS. There was no attendance at this meeting.

Local input to the selection of the preferred remedy has come predominantly through the TRC, established by the U.S. Navy. Meetings held approximately quarterly since early 1989 have brought together local representatives of the water and wastewater utilities, and the city and county. This involvement has facilitated remedial planning by the U.S. Navy and has alerted affected local groups to the proposed activities.

SUMMARY OF COMMENTS RECEIVED DURING PUBLIC COMMENT PERIOD

During the public comment period, two letters were received. At the public meeting on May 9, 1990, several questions and comments were raised.

The written and verbal comments can be divided into two broad categories: those related to the protectiveness of the preferred remedy and those related to effects on the local and regional aquifer system. Specific comments are addressed below:

Protectiveness of the Preferred Remedy

1. Comment (verbal): Is the activity at NIROP related to that at FMC?

Response: The ground water cleanup planned for the NIROP is distinct from that at FMC. Although the contamination and remedies at the two locations have similarities, the projects are implemented, managed, and monitored separately.
2. Comment (verbal): The "no-action" alternative is not a reasonable alternative.

Response: The U.S. Navy agrees.
3. Comment (verbal): Do VOCs pose a fire potential?

Response: In concentrated form, VOCs may pose a flammable or explosive hazard. In dilute concentrations in ground water, such as would be recovered from the NIROP, no such hazard would exist.
4. Comment (verbal): Since TCE is heavier than water, how does it migrate into the Mississippi River?

Response: In its pure form, TCE is heavier than water and would tend to settle to the bottom of an aquifer. However, when it is dissolved in water at relatively low concentrations such as found at the NIROP, it is free to migrate along with ground water flow. Ground water at the NIROP enters the Mississippi River and carries dissolved TCE with it.
5. Comment (verbal): During a flood event, could the ground water pumpout and discharge system be shut down to avoid additional flow in the river?

Response: Yes. Although it is desirable to maintain continuous operation over a long period of time, the system can be shut off, as needed, under any emergency situation. The ground water discharge would also be very small in comparison to the river flow.

6. Comment (verbal): Is there a potential for leakage from the sewers which receive ground water from the pumpout system?
- Response: Sewers are typically not completely watertight. The NIROP intends to temporarily discharge untreated ground water into a 96-inch-diameter sanitary interceptor sewer. Ground water will be diluted with industrial and municipal wastewater flowing into the sewer. The effect of ground water on the overall quality of wastewater in the sewer is expected to be negligible. If leaks occurred, the effect of contaminants from the temporary contribution of NIROP ground water versus contaminants contributed from the other wastewater sources would not be significant.
7. Comment (verbal): Does the Pig's Eye Wastewater Treatment Plant have the capacity to accept the volume of water from the NIROP?
- Response: Approval for the ground water discharge will be obtained from the Metropolitan Waste Control Commission (MWCC). In initial discussions, the MWCC has not indicated that the expected flow from the NIROP will be a problem.
8. Comment (verbal): The Pig's Eye Plant is a secondary treatment plant which is not equipped to remove chemicals from the wastewater.
- Response: It is true that the Pig's Eye Plant does not provide a tertiary level of treatment specifically for synthetic chemicals. However, the aeration and biological treatment provided by the plant will serve to reduce volatile organics, such as TCE. Also, the quality of the plant's treated water discharge is established by a state permit which is based on protection of the receiving water body.
9. Comment (verbal): What will the quality of water be after on-site treatment?
- Response: The quality of treated ground water will be set by the MPCA for discharge to the Mississippi River. The allowable limits will be based on protection of the river environment and downstream users.
10. Comment (verbal): Will packed tower aeration be considered as a treatment technology? Can the water be treated by distillation?
- Response: Packed tower aeration (air stripping) will likely be part of the treatment process. Other options, either singly or in combination with air stripping, will be reviewed during final system design to determine the best way to meet the ground water treatment objectives. Distillation is appropriate to recover solvents such as TCE from concentrated liquids, but not from the dilute concentrations found in the ground water.

11. Comment (verbal): Chlorine gas would be produced from regeneration of activated carbon used to treat the ground water.
- Response: Activated carbon, if used for ground water treatment at the NIROP, would be regenerated at an off-site facility designed to perform that function. Air emissions from the regeneration process would be regulated by state air permits, which would establish emission limits protective of the local area.

Effects on the Local Ground Water Resource

12. Comment (verbal): What is the origin of ground water beneath the NIROP?
- Response: Ground water beneath the NIROP originates as rain and snowmelt that infiltrates through the soil to the aquifer. The area over which this infiltration takes place extends to the north and east of the NIROP.
13. Comment (written): What effect will the pumpout system have on shallow, private wells in the area?
- Response: No shallow, private wells have been identified in the immediate vicinity of the NIROP. The calculations completed for the radius of influence of the capture wells indicate that the off-site effect of the pumping will extend only into the Anoka County Park, west of the NIROP.
14. Comment (written): What effect will pumping have on the moisture content of clay layers (and subsequent strength relative to settlement) beneath the Horizon Circle and Crown Road area?
- Response: The pumpout system will not affect the hydraulic head in the vicinity of Horizon Circle and Crown Road. The calculation of the radius of influence indicates that the effect of the pumping will be limited to the immediate vicinity of the pumpout system wells.
15. Comment (verbal): The City of Fridley draws water from the Prairie du Chien formation where water levels have been dropping. Will the pumpout system deplete the amount of water in the aquifer available to communities?
- Response: The pumpout system will not deplete the amount of water available to local communities. The pumpout system will be constructed in an aquifer that overlies the Prairie du Chien formation. The hydrogeologic data obtained during the RI indicate that there is little interconnection between the Prairie du Chien and the overlying aquifer in the vicinity of the NIROP.

16. Comment (verbal): To alleviate demand on city supplies, can pumped ground water be used beneficially as cooling water in the plant?
- Response: FMC considered this option when designing their ground water pumpout program, but found it to be infeasible from an engineering perspective. However, the U.S. Navy will consider this option during final design of its system to determine if it is viable.
17. Comment (written): The water should be cleaned and used in Fridley.
- Response: The U.S. Navy agrees that the water resource should not be wasted. It will consider options for beneficial re-use if plans or proposals are developed and forwarded by the City or others.
18. Comment (written): Will the discharge to the MWCC be metered so that Fridley will not be charged for the water usage?
- Response: Yes. The U.S. Navy will pay the MWCC for discharges from its system.
19. Comment (verbal): Will the diversion of this amount of ground water, which currently enters the river, cause more severe problems with low river flow if the recent drought conditions were to continue?
- Response: The ground water will only be diverted from eventual discharge into the river during the Phase I pumpout period, when the ground water will be discharged to the local sanitary sewer. Phase I is planned to last no more than 3 years. When the on-site ground water treatment system is started up under Phase II, the treated ground water will be discharged to the river near the NIROP, thus maintaining the same ground water flow to the river as under present conditions. The slightly reduced river flow resulting from ground water discharge of up to 650 gallons per minute to the sanitary sewer during Phase I is not expected to have an adverse impact during potential drought conditions, due to the substantial volume of river flow compared to the volume of pumped ground water flow even under the drought conditions. (For example, even during the drought period of 1988, the lowest river flow was approximately 400,000 gallons per minute.)