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To: Wisconsin Dept of Natural Resources
3911 Fish Hatchery Road
Fitchburg WI 53711

Date: December 27, 1995

Subject: FF/NN Landfill, Ripon Wisconsin

Attn: Mr Steve Ales

Job. No. 30473096

We are sending the following: _X_ Herewith ____ Under Separate Cover

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2	Highway FF/NN Landfill Cap Design Plan Sheets

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cc: Section Chief
WDNR - 101 S. Webster
Madison
1 copy

By: Judy Jassbender

175 N. Corporate Drive, Suite 100, Brookfield, Wisconsin 53045 Telephone (414) 792-1282 Facsimile (414) 792-1310

Questions for Hydro-Search

1) Plan sheet 3 indicates that bumper posts will be removed but wells will be maintained [MW-104, P-104, LC-1, LC-2 and LC-3]. Is it easier to work around the wells, or is it easier to abandon them and re-install them?

2) The gas venting system doesn't show any vents for the NE corner of the landfill. Do your analysis indicate that this area doesn't need it? Too thin of waste mass? Close enough to a trench? Waste too saturated?

3) ~~Plan sheet 3 shows the locations of the gas venting trenches and gas venting wells.~~ Plan sheet 6 shows the locations for the drainage layer outlet pipes. Is there a plan map showing the drainage piping system? Is there a drainage piping system? How does the water move within the drainage layer to a drainage layer outlet pipe?

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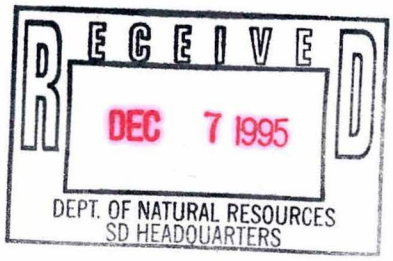

To: WI Department of Natural Resources
Southern District Headquarters
3911 Fish Hatchery Road
Fitchberg, WI 53711-3911

Attn: Mr. Steve Ales

Date: December 6, 1995

Subject: FF/NN Landfill
Ripon, Wisconsin

Job. No. 304733096/2001

We are sending the following: _X_ Herewith ____ Under Separate Cover

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2	RD/RA Workplan for the FF/NN Landfill, Ripon, Wisconsin

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cc: Jane Lemke, SW/3 WDNR 1 copy
Raymond Roder, 1 copy By:
Nelson Olavarria, 1 copy
Rick Kubler, 1 copy
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HYDRO-SEARCH, INC.
A Tetra Tech Company

REMEDIAL DESIGN/REMEDIAL ACTION
WORK PLAN
FF/NN LANDFILL
RIPON, WISCONSIN

December 6, 1995

Prepared For:

PRP Group, FF/NN Landfill
Ripon, Wisconsin

Prepared By:

Hydro-Search, Inc.
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Project No. 304733096

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1.0 INTRODUCTION

1.1 Overview

The FF/NN Landfill occupies approximately 7.3 acres in the northwest corner of Fond du Lac County in the Town of Ripon, Wisconsin (SE 1/4 of the SE 1/4 of Section 7, T16N, R14E; Figure 1-2). During the 16 years the landfill was in operation it accepted municipal, commercial, and industrial solid waste. In 1994 the landfill was placed on the National Priorities List (NPL) and work was begun in conformance with National Contingency Plan (NCP) requirements. Hydro-Search, Inc. (HSI) was contracted by the FF/NN Landfill Cooperating Parties to conduct the Remedial Investigation (RI), Feasibility Study (FS), and Remedial Design (RD) for the operable unit one (OU-1) at the former FF/NN Landfill (Figure 1-1). The work is being completed to meet the requirements of the Wis. Stats. section 144.442 (Contract) and related Statement of Work (SOW) between the Cooperating Parties (Potentially Responsible Party [PRP] Group) and the Wisconsin Department of Natural Resources (WDNR). Pursuant to the Contract, the PRP Group conducted an RI to collect data necessary to adequately characterize the site, prepared an FS to develop and evaluate appropriate remedial action alternatives, are preparing plans and specifications for source control measures in the RD phase, and will implement the source control measures in a Remedial Action (RA) phase. In September of 1995, a Proposed Plan was issued which recommends that source control measures be implemented to improve the landfill cover system, provide for gas migration controls within the fill material, and routinely monitor ground-water quality. These proposed measures are referred to herein as the source control operable unit. The WDNR has determined that no active ground-water control measures are required due to limited risk and corrective measures to remediate ground water which will result from implementing the source control measures. This work plan is based on the Proposed Plan and the Record Of Decision (ROD) issued in November 1995.

1.2 Background

1.2.1 Site History

Landfilling activities occurred at the FF/NN Landfill site from 1967 to 1983. The land was leased from the property owner, Mr. Lyle Sauer, and subsequently, Mrs. Arline Sauer. In 1967 Speed Queen leased the property for disposal of wastes from its facility in Ripon. In 1968 the City of Ripon (City) leased the property. In 1978, the City and Town of Ripon (Town) were signatory to the lease. A license to operate the landfill (#467) was issued by the WDNR to the City of Ripon in 1969. In 1970, the City and Town contracted to share the costs of operating the landfill. The landfill was operated by the City and Town from 1970 to 1983. Throughout its 16 year history the landfill accepted municipal, commercial, and industrial solid waste. After landfilling operations ceased the site was capped with a clay cap in 1985. The site was used for growing hay from 1985 to 1993, and is currently a grassy field site.

Prior to May 1993, the ground-water monitoring program at the site consisted of the quarterly collection and analysis of groundwater samples from five monitor wells which were located adjacent to the landfill, and from three residential wells in the vicinity of the landfill. These samples were analyzed for the Wisconsin Administrative Code (WAC) NR508 indicator parameters (color, odor, turbidity, electrical conductivity, pH, chemical oxygen demand, dissolved iron, chloride, total hardness, total alkalinity, and nitrates/nitrites). The on-site wells were also sampled quarterly for volatile organic compounds (VOCs) and various metals including cadmium, chromium, lead, and zinc. In addition, samples were periodically collected from other private wells located within a 0.5 mile radius of the landfill.

VOCs, primarily vinyl chloride and cis-1,2-dichloroethene, and metals, primarily manganese and iron (likely present as a result of local geology), have been detected in the ground water collected from monitor wells adjacent to and downgradient of the landfill at levels which exceed WAC NR140 Preventative Action Limits (PALs) and Enforcement Standards (ESs).

In 1982, the WDNR began evaluating the landfill for possible inclusion on the federal National Priorities List (NPL). A hazard assessment was performed on the FF/NN Landfill site by the U.S. EPA utilizing the Hazard Ranking System (HRS). The site scored a 51.9 and was recommended by the WDNR for nomination to the NPL. In 1993, the FF/NN Landfill was proposed for listing on the NPL by the U.S. EPA. On May 31, 1994, the landfill was officially listed on the NPL.

The geology of the site is comprised of approximately 170 feet of unconsolidated glacial deposits overlying bedrock. These are ground and end moraine deposits which consist primarily of poorly sorted sand and gravel with minor amounts of silt and clay. The bedrock under the site is sandstone of the Ordovician Prairie du Chien Group or the St. Peter Sandstone, depending on the contact between formations (Olcott, 1968).

Ground water beneath the site occurs in both the unconsolidated deposits and the deeper permeable bedrock aquifer. In the refuse filled area, the water table is found below the refuse. The direction of ground-water flow in the unconsolidated glacial deposits in the vicinity of the site is predominantly towards the southwest. It is influenced by site specific topography and soil characteristics.

The existing clay cover was installed in 1985, and vegetation was subsequently established to minimize erosion of the cover. Also in 1985, a passive gas venting system, along the uphill west edge of the landfill, and a leachate interceptor trench along the eastern side of the landfill, were installed. These are described more fully below.

The principal potential risk to human health posed by the site is associated with future ground-water use through private domestic water supply wells. No private water supply wells currently exist between the landfill and its apparent point of discharge into a nearby wetland. Two previously existing water supply wells located on the former Bosveld property immediately south of the landfill which were impacted have been abandoned. The property served by the wells was subsequently purchased by the City of Ripon. Other than the

impacts to local ground water, no known impacts to the environment have been found in the vicinity of the landfill nor at the wetlands in the downgradient direction.

1.2.2 Existing Landfill Cover

A clay cap was constructed on the FF/NN Landfill in May and June, 1985. The cap was constructed in general accordance with the Abandonment Plan for the site (Donohue, July 1983), and the conditions of Abandonment Plan Approval (WDNR, April 1984). The cap construction was documented in the Engineer's Report - Construction and Adequacy of Clay Cap (Zoppa, 1985).

The surface of the waste was graded to provide reasonable contours for earthwork and runoff. Between 6 and 12 inches of sandy clay was then placed as a grading layer over the refuse. A compacted clay layer was constructed on the grading layer. This clay was reportedly obtained from a borrow source located southeast of Berlin, Wisconsin which was also the clay source for the Green Lake County Landfill. The compacted clay was placed in two 12-inch lifts, and tested for moisture content and density throughout the construction. The testing frequency was slightly more than three tests per acre per lift. The lower lift was compacted to between 84.0% and 93.8% of modified Proctor density (average 84.4%), and the upper lift density measurements ranged from 83.2% and 95.2% (average 90.0%) of modified Proctor, based on available construction documentation.

Proctor curves and permeability test data for the soils were derived from the borrow source soils used as cap material for the Green Lake County Landfill. The same borrow source is reported to have been used at the FF/NN Landfill. Constant head permeability test results for the borrow area soils indicate that permeabilities of 1.1×10^{-7} cm/sec to 2.4×10^{-9} cm/sec were obtained for compacted dry densities of 88.3% to 92.8% of modified Proctor density (STS, March, 1985). No Proctor density curves or permeability tests were performed separately for the clay used to construct the cap on the FF/NN landfill.

Six to 12 inches of topsoil were placed on top of the compacted clay layer. A grid of 16 auger holes (slightly more than two per acre) was drilled through the cap to verify the thickness of the compacted clay cover. The minimum thickness of clay was determined to be 24 inches, except for one hole which could not be drilled greater than 18 inches deep.

During the RI, the landfill cap was sampled to characterize the existing cover material for comparison with WAC NR500 standards and to confirm construction. The samples indicated that the refuse is overlain by a sandy clay grading layer beneath the clay cap. The total clay thickness ranged from less than 2 feet to 4.0 feet of clay. The topsoil ranged from 0.2 to 0.5 feet in thickness. Roots were noted in the topsoil and clay layer to a depth of 2 feet. The only portion of the landfill cap which has less than 2.0 feet of clay is the area along the western side of the site within 50 feet of County Highway NN based on summer 1995 additional site investigation activities.

Material property testing was performed on eight landfill cap samples including falling head permeability, grain size analysis, moisture content, and Atterburg limits. The results indicate the cover is comprised of silty clay (CH to CL) with a geometric mean hydraulic conductivity of 3.9×10^{-8} cm/sec. The results of this testing are in agreement with the testing done on the soils from the same borrow source used at the Green Lake County Landfill.

1.2.3 Landfill Gas

There are five passive gas vents in the landfill (HSI, 1993; Figure 1-2). As-built documentation of the final construction of the passive landfill gas trench and associated vents is not available, but the location was indicated on a 1984 survey map. The trench is approximately 540 feet in length and is located near the western edge of the landfill.

Landfill gas sampling was conducted for the five passive gas vents, the three leachate wells, and the monitor wells immediately surrounding the landfill in June 1993, and May 1994. Methane concentrations measured in the gas vents ranged from 0% to greater than 50% of

detected within the landfill boundary and at monitoring points outside of the waste. According to NR502.04(3)(e), a landfill must be operated so that methane does not occur in excess of 25% of the LEL beyond the property boundary.

1.3 Purpose and Scope

The purpose of this document is to briefly describe and document the overall management strategy for performing the design, construction, operation, maintenance, and monitoring for the source control operable unit. This document includes a description of the responsibility and authority of personnel involved with the remedy implementation, including a description of the qualifications of key personnel directing the design and construction of the remedy. A project schedule which identifies the timing for initiation and completion of the remedial design is also included in this work plan.

2.0 SELECTED REMEDY DESCRIPTION

2.1 Landfill Cap

The landfill cap that currently exists on the site has minimized the migration of contaminants entering the ground water. Of the alternatives presented in the FS, the composite capping alternative will be the most effective at minimizing future precipitation from infiltrating into the waste, and, therefore, from producing leachate that enters the ground water. Over the long term, limiting the amount of water entering the waste will improve ground-water quality.

The components of the multiple layer final cover system are listed below, beginning from the surface:

- Topsoil layer: 6 inches of fertile topsoil suitable for vegetative growth. The existing topsoil at the site will be removed, stockpiled on adjacent property, reused, and its quantity supplemented as needed. A vegetative cover meeting WDNR specifications will be used to minimize erosion.

- Barrier protection layer: 18 inches of common fill. The primary function of this layer is to protect the hydraulic barrier layer from detrimental effects of natural processes and necessary traffic such as frost, maintenance equipment, etc.

- Drainage layer: 12 inches of clean granular material. This material will have a minimum hydraulic conductivity of 1×10^{-3} cm/sec. The purpose of the layer is to allow precipitation which percolates from above to drain from the soils when it reaches the barrier layer. A drainage pipe around the perimeter of the landfill within this layer will provide for discharge of water outside the cap.

- Geosynthetic barrier layer: 40 mil linear low density polyethylene (LDPE). The hydraulic barrier minimizes the infiltration of water into the landfill mass.

- Clay barrier layer: 24 inches of low hydraulic conductivity compacted clay. This clay layer provides a second barrier to the infiltration of precipitation to the wastes. This clay layer will consist primarily of the existing clay cap which will not be removed and replaced. It has been determined based on data collected during the RI and during the initial RD effort that all areas of the existing clay cap with the exception of a strip along the western edge have the required 2 feet of clay. This area will be supplemented with additional clay from an off-site source in order to provide the minimum 2-foot clay layer over the waste material and other areas will be supplemented with clay to maintain a minimum slope of 2% across the landfill in accordance with state regulations. All of the clay being placed during construction, as well as the top 6 inches of the remaining areas with existing clay, will be compacted and tested in accordance with industry practice and state regulation. Information on the off-site clay source will be submitted to WDNR for approval.

The area of the composite cap will be slightly larger than the existing cap. In all cases, the new cap will extend beyond the existing cap, as well as the wastes as observed at the site. Thus, the extent of the composite cap will be based on the field testing observed limits of waste, the topographic limitations to the north and south, and the highway right of way limitations to the west.

2.2 Landfill Gas Extraction

The waste at the landfill does produce a small volume of landfill gas consistent with expectations for a landfill of this age. Gas generation rates are not high enough to warrant the installation of an active landfill gas venting system. Therefore, a passive gas venting system was determined to be appropriate at this site. The gas design of the collection system ensures that all areas of the landfill are within 75 feet of a gas collection trench.

Landfill gas will be vented from the horizontal gas collection trenches to the atmosphere by means of vertical gas vents. Trenches will be installed into the top of the wastes backfilled with clean granular fill and perforated gas collection piping. The fill material provides a porous medium to collect and control landfill gas in a safe and efficient manner. The piping within the trenches will be connected to a series of passive vents to discharge landfill gases to the atmosphere. These vents will be located at the termination and intersection of each passive gas collection trench. As a result, 12 vents will be constructed. All of these will be constructed within the fill area.

Once the passive landfill gas extraction system has been installed, landfill gas generation at the site will be monitored semi-annually for methane, oxygen, and carbon dioxide. Concentrations, in percent, will be measured at the three leachate wells, 12 passive gas vents and monitor wells MW-101, MW-102, MW-103, and MW-104.

2.3 Ground-Water Monitoring

Ground-water contamination is present at the site. However, its impacts are fairly limited. Contaminated ground water is present between the site and the wetland to the southwest of the site. Concentrations of VOCs, namely vinyl chloride and cis-1,2-DCE, are high near the waste boundary, but diminish greatly with distance from the site. VOC concentrations in the ground water discharging to the wetland are low enough so as not to cause an adverse impact to the wetland. Given the small area of ground-water contamination, the decreasing VOC concentrations with distance from the site, and the lack of impacts to the wetland where the ground-water discharges, the WDNR has determined that active ground-water restoration efforts are not necessary for this site.

With the improved landfill cap and gas venting system in place, monitoring the ground water to detect changes in quality with time was determined by the WDNR to be sufficient to protect human health and the environment. Therefore, a ground-water monitoring program will be implemented for the landfill. Ground-water samples will be collected from select monitor wells and private water supply wells. Semi-annual ground-water samples will be collected from

monitor wells selected to characterize contaminant concentrations and the extent of the contamination as definable with the existing monitor well network. Semi-annual samples will also be collected from the leachate head wells only if sufficient quantity of leachate is available for sample collection. Annual ground-water samples will be collected from down-gradient private wells for analysis of VOCs to confirm that the private wells do not intercept the contaminant plume.

3.0 REMEDIAL DESIGN / REMEDIAL ACTION TASKS

A description of the tasks included for the RD/RA are presented below. The listed task numbers are those presented in the Contract between the PRP Group and the WDNR, and the scope of work follows that required by the Contract.

The RD/RA Work Plan describes the following interrelated tasks:

Task 12: Remedial Design
Task 13: Remedy Construction
Task 14: RD/RA Reports

3.1 Task 12 - Remedial Design

The RD/RA plans and specifications listed below will be submitted to WDNR in order to implement the OU-1 remedy at the site. Before submitting the design plans and specifications, HSI will coordinate and cross check the specifications and drawings, and perform complete review of the edited specifications.

3.1.1 Task 12A - Contents of the Remedial Design Plans

The remedial design plans and specifications will be supplemented by an engineer's report which will provide the pertinent information described below.

1. Design Plans and Specifications

   a. Discussion of the design strategy and the design basis, including:

      (1) Compliance with all applicable or relevant and appropriate environmental and public health requirements; and

(2) Minimization of environmental and public impacts associated with the design and construction of the remedy.

b. Discussion of relevant technical factors including:

(1) Use of currently accepted environmental control measures and technology;

(2) The constructability of the design; and

(3) Use of currently acceptable construction practices and techniques.

c. Description of assumptions made;

d. Discussion of the possible sources of error and listing and discussion of possible operation and maintenance problems;

e. Detailed drawings of the proposed design;

f. Tables listing equipment and instrumentation;

g. Tables giving material balances; and

h. Appendices including:

(1) Sample calculations (one example presented and explained clearly for significant or unique design calculations);

(2) Derivation of equations essential to understanding the report; and

(3) Results of laboratory and field tests.

The Contract indicates the Design Plans and Specifications should be submitted to the WDNR at 60% of completion and 100% of completion. However, the WDNR has agreed that a series of planning meetings at critical design phases and one design plan submittal at 100% completion will be more appropriate. Thus, planning meetings will be substituted for the prefinal design submittal at 60% completion.

2. Operation and Maintenance Plan (O&M Plan)

An O&M plan will be prepared and submitted to WDNR with the OU-1 RD report. In addition, the RD report will include a long-term care plan which defines the schedule and procedures to be utilized for the inspection of the remedial components. A final use plan for the site will be outlined and discussed. The O&M plan will be composed of the following elements:

a. Description of normal O&M, including a schedule showing frequency of each O&M task.

b. Description of potential O&M problems, including:

(1) Description and analysis of potential O&M problems;

(2) Sources of information regarding problems; and

(3) Description of remedies to be implemented to resolve O&M problems.

c. Description of routine monitoring and laboratory testing, as needed;

d. Description of alternate O&M, including:

(1) In the event of partial or total failure of the remedy, alternate procedures which would be implemented to prevent undue hazards; and

(2) Analysis of vulnerability of the landfill cap and gas system and additional resource requirements should partial or total failure occur.

e. Corrective Action:

(1) Description of corrective actions to be implemented in the event that the remedy fails in part or whole, and/or if ground-water action levels are exceeded; and

(2) Schedule for implementing these corrective actions.

f. Safety plan:

(1) Description of precautions, or necessary equipment, etc., for site personnel; and

(2) Safety tasks required in the event of system failures.

g. Description of equipment; and

h. Records and reporting mechanisms required.

The contents of the O&M Plan will be discussed at the planning meetings with WDNR personnel and the Prefinal Design submittal (60% completion of Design) will be eliminated. WDNR comments received during the planning meetings will be incorporated into the Final O&M Plan which will be submitted with the Final Design (at 100% completion of design) for WDNR approval.

3. Cost Estimate

Cost estimates will be developed so that the PRP Group is aware of the financial resources necessary to construct and implement the OU-1 remedy. The cost estimate developed in the approved draft final FS will be refined to reflect the more detailed/accurate design plans and specifications being developed. The cost estimate will include both capital, operation and maintenance, and monitoring costs.

4. Construction and Operation Schedule

A Construction and Operation Schedule for construction and implementation of the OU-1 remedy which identifies timing for initiation and completion of all tasks will be compiled and submitted to WDNR. Dates for construction and operation of the OU-1 remedy and major interim milestones will be specified.

No draft schedule will be submitted with the Prefinal Design since the Prefinal Design (60% completion of design) will not be a formal submittal. Rather, schedule concerns will be discussed at planning meetings, and the Final Schedule will be submitted with the Final Design submittal (100% completion).

5. Construction Quality Assurance Objectives

The objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation will be identified and documented. These objectives will be discussed during the planning meetings and in the Final Design submittal (100% completion).

3.1.2 Task 12B - Monitoring Program Plan

A detailed Monitoring Program Plan related to OU-1 describing the type, frequency and schedule for monitoring will be submitted to WDNR. The monitoring plan will address any ground water, gas, or other monitoring requirement for each component of the OU-1 remedy.

As part of the RD report, a monitoring plan which specifies all short and long-term monitoring requirements, necessary to assess the status and effectiveness of the remedy will be submitted to WDNR. The monitoring plan will, at a minimum, contain the following:

- Monitoring device design,
- Analytical parameter list,
- Analytical methodologies,
- Monitoring schedule,
- Reporting requirements, and
- Specified Performance Standards, Levels, and Locations.

As part of the RD report, a plan will be submitted which defines the procedures which will be implemented if the remedial performance monitoring data indicates that the OU-1 remedy or a specific remedial component is not attaining the design objective. This plan will define notification requirements and implementation schedules.

3.1.3 Task 12C - Quality Assurance Project Plan (QAPP)

A QAPP for sampling, analysis and data handling related to the Monitoring Program Plan for OU-1 will be prepared and submitted to WDNR. The RA QAPP will be consistent with the requirements of the RI QAPP submitted and approved pursuant to Remedial Investigation. At a minimum, the QAPP will include the following:

1. Statement of Purpose
2. Project Description

3. Project Organization and Responsibility
4. Sampling Procedures and Objectives
5. Sample Custody and Document Control
6. Calibration Procedures and Frequency
7. Analysis, Data Reduction, Validation, Assessment and Reporting Procedures
8. Internal Quality Control Checks and Frequency
9. Performance System Checks and Frequency
10. Preventive Maintenance Procedures and Frequency
11. Data Precision, Accuracy and Completeness Assessment Procedures
12. Corrective Action (For Data Outside Control Limits)
13. Quality Assurance Reporting

3.1.4 Task 12D - Health and Safety Plan (HSP)

As appropriate, the existing HSP will be modified to address the activities to be performed at the site to implement the OU-1 remedy and will be submitted to WDNR. At a minimum, the safety plan will incorporate and be consistent with the requirements of:

1. Section 111(c)(6) of Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA),
2. EPA Order 1440.3 - Respiratory Protection,
3. EPA Order 1440.2 - Health and Safety Requirements for Employees Engaged in Field Activities,
4. EPA Occupational Health and Safety Manual,
5. OSHA Requirements (29 CFR 1910 and 1926), and
6. Interim Standards Operating Safety Guide (Revised September 1982) by the Office of Emergency and Remedial Response.

3.1.5 Task 12E - Community Relations Support

A community relations program will be continued by WDNR through the RD/RA/OU-1 process. HSI shall assist the PRP Group in cooperating with WDNR, and participating as requested in the preparation of appropriate information to be disseminated to the public by WDNR. If requested by the PRP Group, HSI will formally participate in presentations to be held or sponsored by WDNR to explain activities at or concerning the site including the remedial design, planned or existing RA/OU-1 activities, the schedule, or any minor changes to the OU-1 remedy.

Community relations support will be consistent with CERCLA community relations policies as described in the "Guidance for Implementing the Superfund Program: and Community Relations in Superfund - A Handbook", the NCP, and CERCLA section 117.

3.1.6 Task 12F - Additional Studies

A borrow area investigation is planned to evaluate clay source areas for cap construction materials. The investigation will be conducted in accordance with the requirements of WAC NR512.18 for the identification and characterization of potential borrow sources as appropriate for this site. The results of the investigation will be used to complete the design plans and specifications. Other studies may be needed during the design effort to deal with issues such as material availability, utility and highway rights-of-way, property boundaries, etc. They will be conducted to the extent necessary to complete the design.

3.1.7 Task 12G - Design Phases

3.1.7.1 Prefinal Design Submittal

The Contract refers to Prefinal Design and Final Design Submittals. Based on discussions with Steve Ales of WDNR, we will eliminate the Prefinal Design submittal (60% of completion) and the associated draft Submittals including the Design Plans and Specifications, Draft Operation

and Maintenance Plan, Initial Capital and Operating and Maintenance Cost Estimate, Draft Construction and Operation Schedules, Draft Construction Quality Objectives, Draft Quality Assurance Project Plan, and Draft Health and Safety Plan. In place of the Prefinal Submittals, planning meetings will be held with WDNR so that WDNR comments can be incorporated into the Final Design submittal.

3.1.7.2 Final Design Submittal

HSI will prepare the Final Design submittal at 100% completion of design for submittal to WDNR for review and approval. The Final Design submittal will consist of the Final Design Plans and Specification, the Final Construction Cost, the Final Operation and Maintenance Plan, the Final Quality Assurance Project Plan, the Final Project Schedule, the Final Monitoring Program Plan, and Final Health and Safety Plan.

3.2 Task 13 - Remedy Construction

3.2.1 Task 13A - Preparation of Construction Quality Assurance Program Plan

Following WDNR approval of the Final Design submittal for OU-1, a Construction Quality Assurance (CQA) program that ensures the completed remedy is in substantial conformance with all design criteria, plans and specifications will be developed. The CQA Plan is a site specific document which will be submitted to WDNR for approval prior to the start of the construction. At a minimum, the CQA plan will include the elements which are summarized below:

1. Responsibility and Authority

   The responsibility and authority of all organizations (i.e., technical consultants, construction firms, etc.) and key personnel involved in the construction of the remedy will be described fully in the CQA Plan. The plan will identify a CQA officer and the necessary supporting inspection staff.

2. Construction Quality Assurance Personnel Qualifications

The qualifications of the CQA officer and supporting inspection personnel will be presented in the CQA Plan and will demonstrate that they possess the training and experience necessary to fulfill their identified responsibilities.

3. Inspection Activities

The observations, tests and inspections that will be used to monitor the construction and/or installation of the components of the remedy will be summarized in the CQA Plan. The plan will include the scope and frequency of each type of inspection. Inspections will verify compliance with the environmental requirements and include, but not be limited to, soil testing and geosynthetic construction testing. The inspections will also ensure compliance with all health and safety procedures. In addition to oversight inspections, the following activities will be conducted.

a. Preconstruction Inspection and Meeting
b. Prefinal Inspection
c. Final Inspection

Details of the Preconstruction Inspection and Meeting, Prefinal and Final inspections will be included in the CQA plan.

4. Documentation

Reporting requirements for CQA activities will be described in detail in the CQA Plan. This will include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records will be presented in the CQA Plan.

3.2.2 Task 13B - Implementation of CQA Program Plan (Construction Oversight)

Upon WDNR approval of the RD CQA Plans, the OU-1 remedy will be constructed and implemented in accordance with the approved ROD for OU-1 design, schedule, and the CQA Plan.

3.3 Task 14 - RD/RA Reports

Plans, specifications, and reports will be prepared as set forth in Tasks 12 and 13 to document the design, construction, operation, maintenance, and monitoring of the remedy. The documentation will include, but not be limited to, the following:

3.3.1 Task 14A - Progress Reports

At a minimum, WDNR will be provided with signed, monthly progress reports during the design and construction phases containing:

1. A description and estimate of the percentage of the OU-1 remedy completed;

2. Summaries of all findings;

3. Summaries of all approved changes made in the remedy during the reporting period;

4. Summaries of all problems or potential problems encountered during the reporting period;

5. Actions being taken to rectify problems;

6. Changes in personnel during the reporting period;

7. Projected work for the next reporting period; and

8. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

3.3.2 Task 14B - Draft Plans and Reports

As discussed above, draft plans and reports will not be submitted during the RD/RA/OU-1 phase.

3.3.3 Task 14C - Final Plans and Reports

As directed by WDNR, the RD/RA Project Plans (from Tasks 11, 12, and 13) will be finalized by incorporating WDNR comments received during planning meetings.

4.0 PROJECT ORGANIZATION AND PERSONNEL

4.1 Project Organization

A project organizational chart is presented in Figure 4-1 illustrating the organizations and personnel involved in conducting the RD/RA.

4.2 Enforcement Agencies

4.2.1 Wisconsin Department of Natural Resources (WDNR)

The WDNR is the lead agency and is responsible for providing oversight of contract #SF-92-01 (Contract). The WDNR project coordinator is Mr. Stephen Ales. His responsibilities encompass project oversight, coordinating communications between the PRP Group/HSI, and assuring contract compliance. The WDNR is responsible for final review of the RD and all other deliverables.

4.2.2 U. S. Environmental Protection Agency (U.S. EPA)

The U. S. EPA is responsible for providing Superfund support and federal Applicable, Relevant, and Appropriate Requirements (ARARs).

4.3 PRP Group

A group of companies and municipalities are listed as the PRP Group under Contract SF-92-01. The project coordinator for the PRP Group is Mr. Raymond Roder of Reinhart, Boerner, Van Deuren, Norris & Rieselbach, S.C. Mr. Roder will be the lead contact for correspondence with the WDNR and HSI as well as assuring compliance with the contract requirements. Mr. Roder will also coordinate day-to-day technical decisions and other communications on behalf of the PRP Group.

4.4 Hydro-Search, Inc.

HSI is the contractor for the PRP Group implementing the requirements for the Contract. HSI has assigned specific responsibilities to each member of the HSI project team. Resumes of the key HSI project team members are attached. The technical/administrative functions of each team member are described below.

4.4.1 Project Manager

Ms. Judy Fassbender is the HSI Project Manager. The project manager has primary responsibility for oversight of all activities scheduled to be performed during the RD/RA. Ms. Fassbender will provide technical direction to the project personnel, be responsible for assuring HSI conformance to the contract requirements, and provide technical and financial control. The project Manager will also be responsible for assuring that proper corporate resources are balanced with the project requirements and provide peer review of the project deliverables.

4.4.2 Project Administrator

Mr. Dennis Behr will serve as the Project Administrator. The Project Administrator will provide support and coordination to the Project Manager to ensure awareness of project budgets and schedule deadlines. The Project Administrator will meet with the Project Manager at key financial milestones to determine the status of project progress versus expenditures and whether changes in the scope of work have occurred which require contract modifications and approvals. His evaluation of each project is reported directly to the Project Manager.

4.4.3 Project Quality Assurance (QA) Coordinator

Mr. Steven P. Franks, HSI Director of Engineering, will serve as the RD/RA QA Coordinator. The RD/RA QA Coordinator is responsible for periodically auditing the tasks and responsibilities of the other HSI team members. The RD/RA QA Coordinator will conduct audits to assure that

QA protocols are in conformance with the CQA plan and the QAPP. The RD/RA QA Coordinator will also provide peer review on project deliverables.

4.4.4 Project Health and Safety Officer

Mr. Steven E. Carlson, HSI Director of Health Sciences, will serve as the Project Health and Safety Officer. The Project Health and Safety Officer is responsible for developing a site specific health and safety plan with contingencies to deal with all anticipated hazards specific to tasks to be performed during the field work. In addition, the Health and Safety Officer is responsible for reviewing any site incident reports and implementing any corrective measures deemed necessary to prevent recurrences of incidents.

4.4.5 Project Remedial Design/Remedial Action Task Coordinator

Mr. Gerald DeMers will serve as the RD/RA Task Coordinator. The RD Task Coordinator is responsible for coordinating the design of the remedial actions required by the ROD, and preparation of the associated RD Report. The RD Task Coordinator also provides peer review of other project deliverables related to the RD. The RA Task Coordinator, who is referred to as the project director in the CQA plans, will be responsible for coordinating all on-site activities, including coordinating with sub-contractors and vendors and supervision and documentation of field activities.

4.4.6 Resident Engineers

During RA activities, several personnel will be required on site to document construction activity, provide subcontractor oversight, and implement the CQA Plan. These individuals will be determined when the RA commences, will be directed by the RA Task Coordinator, and audited by the QA Coordinator.

4.4.7 Construction Contractors

HSI will prepare bid specifications for use in the selection of a construction contractor following the approval of the RD by WDNR. HSI will assist the Group in identifying potential qualified contractors and also assist the Group in evaluating submittals for contractor selection.

5.0 PROJECT SCHEDULE

The proposed schedule for conducting the RD is presented in Figure 5-1. It should be noted that several activities depend on the timely completion of other activities and are sequential in task scheduling. The primary factor which may affect the actual scheduling is agency review. If performance of work is delayed by events beyond the PRP Group's control, procedures, as described in Article XIV of the Contract, may need to be followed.

The ROD was issued in November 1995. The Design Plans and Specifications and the Engineer's Report, including the Operation and Maintenance Plan, Construction Quality Assurance Plan, and the Construction Health and Safety Plan, will be submitted in early December 1995. It is assumed that approval for the final design will be received on January 1, 1996. In addition, by mid December 1995, the Monitoring Program Plan, the Ground-Water Monitoring QAPP, and the Ground-Water Monitoring Health and Safety Plan will be issued to the WDNR for review. It is assumed that the WDNR will have completed its review of these plans by February 1, 1996. If this schedule is met, it is anticipated that construction activities will begin in the Spring of 1996.

6.0 REFERENCES

Donohue, July, 1983, Abandonment Plan, City of Ripon Landfill, Fond du Lac County, Wisconsin, Donohue & Associates, Inc., Sheboygan, Wisconsin

Hydro-Search, 1993, Technical Memorandum #1, Source Characterization, Ripon FF/NN Landfill, Ripon, Wisconsin.

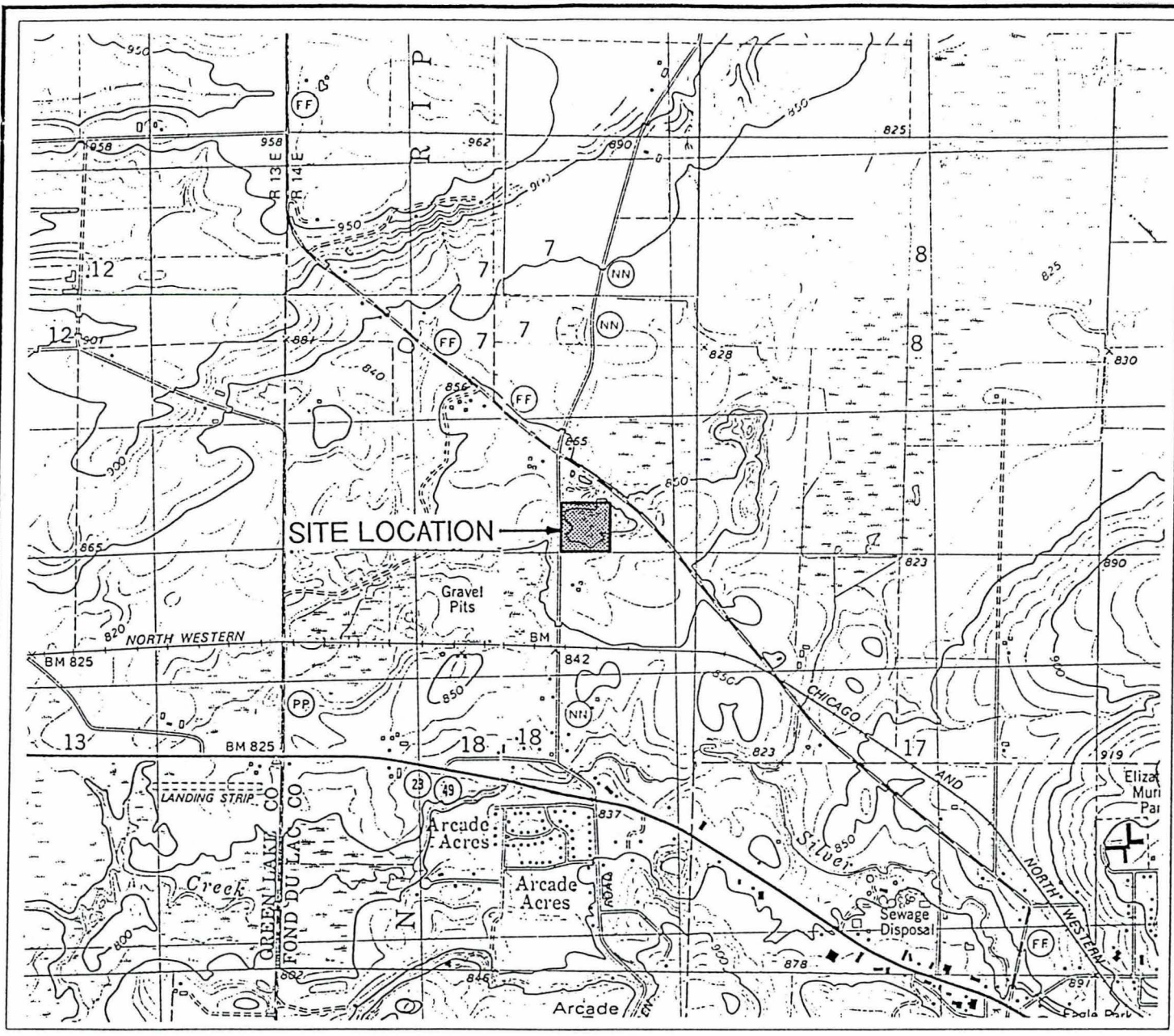
Olcott, P., 1968, Water Resources of Wisconsin Fox-Wolf River Basin, U. S. Geological Survey, Hydrologic Investigations Atlas HA-321.

STS, 1985, Letter to Mr. Nick Sturzl, Foth & Van Dyke and Associates, from Mr. Kenneth D. Kujava, STS Consultants Ltd., Green Bay, Wisconsin.

WDNR, April, 1984, Abandonment Plan Approval, City of Ripon Sanitary Landfill License #467, Letter from Mr. Richard G. Schuff, Wisconsin Department of Natural Resources, Residuals Management and Land Disposal Section, Madison, Wisconsin.

Zoppa, October, 1985, Engineer's Report Construction and Adequacy of Clay Cap, City of Ripon's Abandoned Landfill, Mr. Chris Zoppa, P.E., City Engineer, Ripon, Wisconsin.

FIGURES



QUADRANGLE LOCATION

SCALE

0 5000

FEET

N

Base map from U.S.G.S. 7.5' Berlin (1980), Green Lake (1980), Ripon (1980), and Rush Lake (1980), WI topographic quadrangle maps.

Hydro-Search, Inc.

HYDROLOGISTS
GEOLOGISTS
ENGINEERS

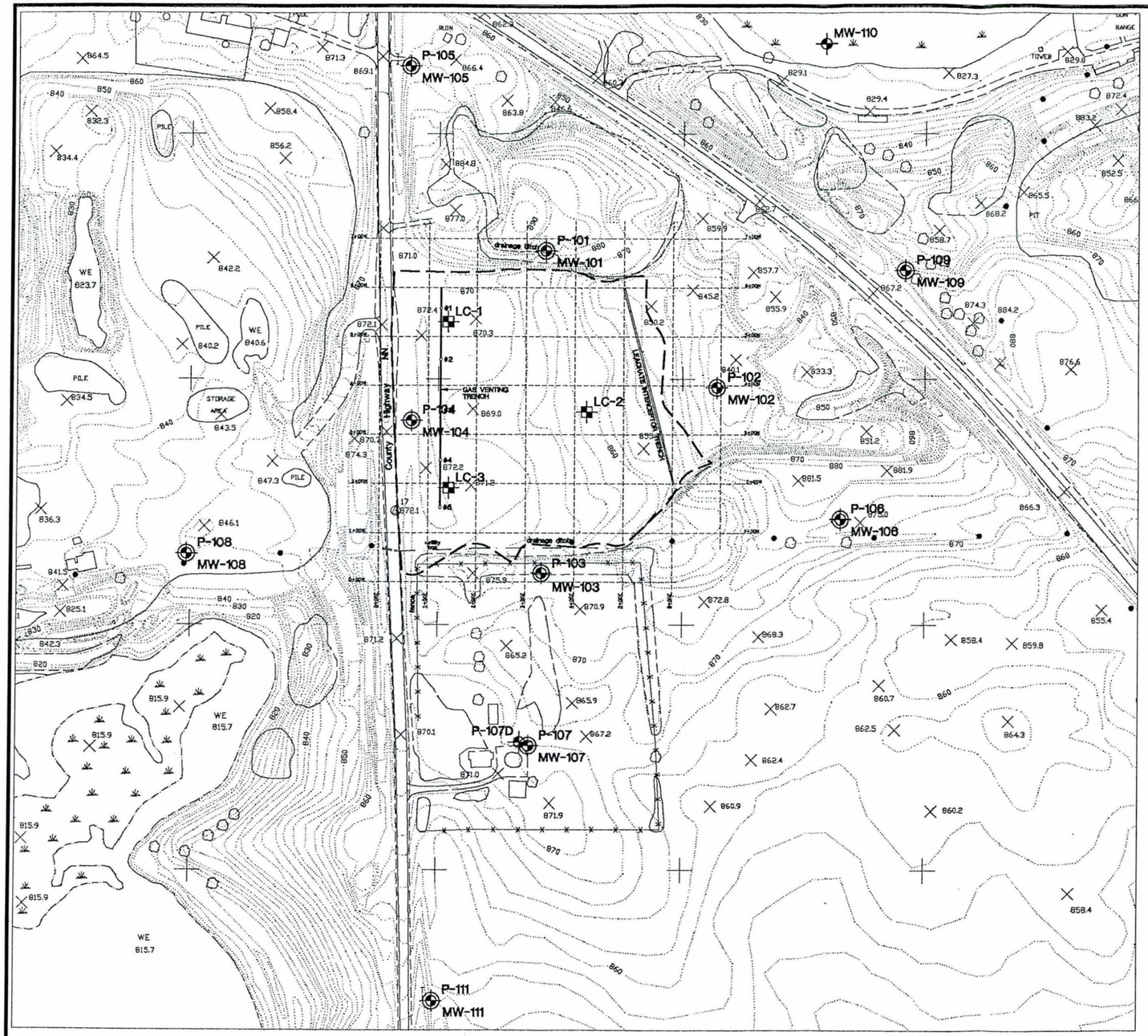
Reno Denver Milwaukee Irvine

PROJECT: 473115113 | DATE: 11/14/91

RIPON FF/NN LANDFILL
RIPON, WISCONSIN

SITE LOCATION and LOCAL TOPOGRAPHY

DRAWING NO.: | FIGURE: 1-1



EXPLANATION

MW-105
P-105 — NESTED MONITOR WELL/PIEZOMETER LOCATION AND DESIGNATION

LC-1 — LEACHATE WELL LOCATION AND DESIGNATION

#1 — PASSIVE GAS VENT LOCATION AND DESIGNATION

APPROXIMATE EXTENT OF REFUSE

N

SCALE

0 500

Feet

Base map from Ayers Associates, 1992 for the City of Ripon

RIPON FF/NN LANDFILL
RIPON, WISCONSIN

EXISTING CONDITIONS (August 1993)

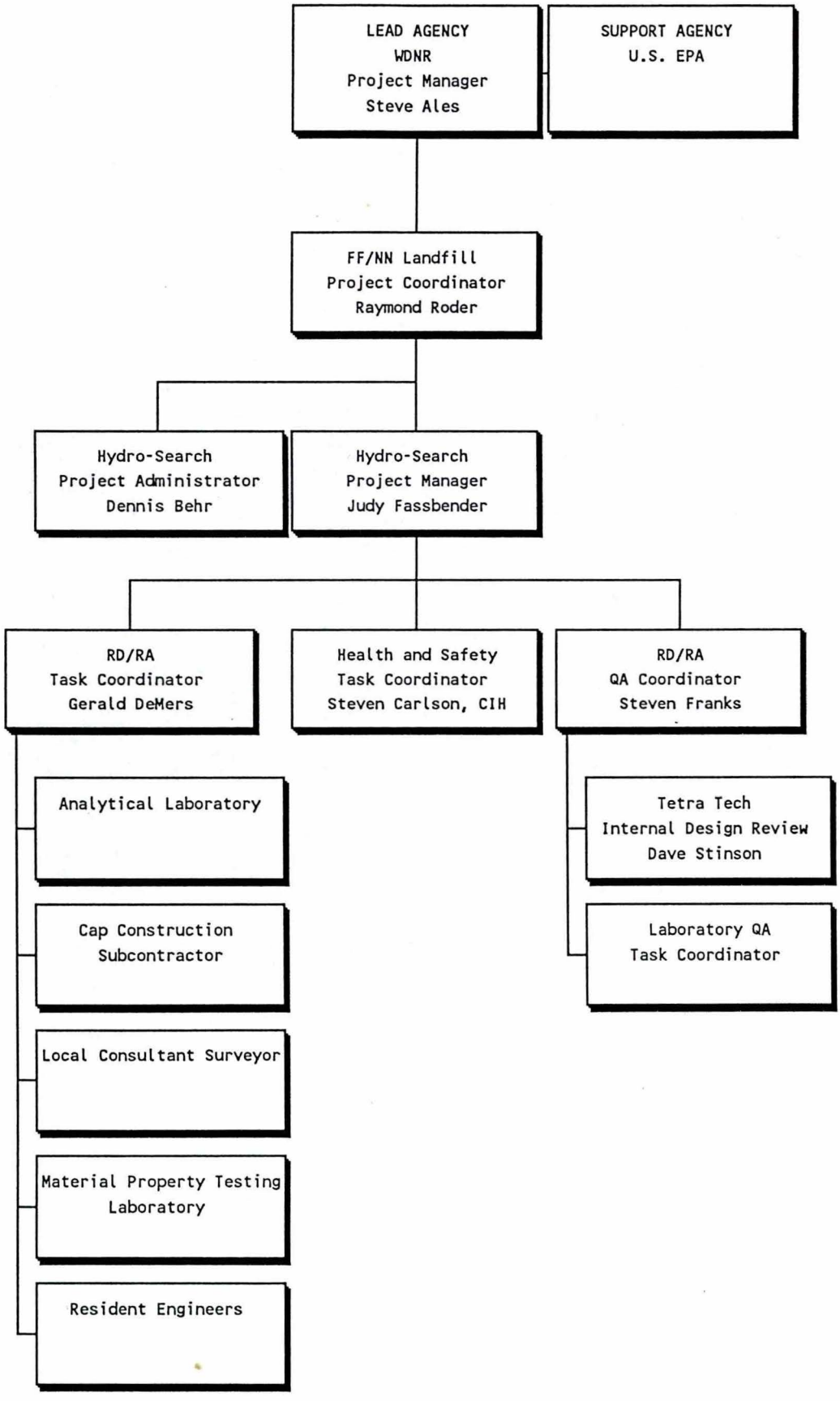
DATE:	09/24/93
DESIGNED:	mcl
CHECKED:	jlf
APPROVED:	gld
DRAWN:	mcl
PROJ:	304733096

HYDRO-SEARCH, INC.
A Tetra Tech Company

Figure 1-2

/hsl/473/3096/1511-7

PROJECT ORGANIZATION
AND PERSONNEL



WORK SCHEDULE

PROJECT: FF/NN Landfill Remedial Design
PREPARED BY: Hydro-Search, Inc.
PREPARED FOR: FF/NN Landfill, Ripon, Wisconsin

TASK DESCRIPTION		Week	Sept 24	October 1	8	15	22	29	November 5	12	19	26	December 3	10	17	24	31	January 7	14	21	28		
Public Comment Period	WDNR		////																				
ROD (60 Days Maximum)	WDNR								//														
RD/RA/OU-1 Work Plan (60 Days Maximum)	PRP								////////////////////														
Approval of Work Plan (60 Days Maximum)	WDNR													/////////									
Monitoring Program Plan	PRP						//																
Monitoring HASP	PRP						//																
Monitoring QAPP	PRP						//																
Approval of Monitoring Plans	WDNR																//////////////////////						
Design Plans and Specifications	PRP			//																			
Engineer's Report	PRP			//																			
Approval of Plans & Specs and Eng. Rpt.	WDNR														//////////////								

COMMENTS: If this schedule can be met, it is assumed the project will go out for bid in February 1996.
Contractor selection will begin in March 1996.
Construction will begin in May of 1996.

Figure 5-1

HYDRO-SEARCH, INC. A Tetra Tech Company

APPENDIX A
RESUMES

Dennis J. Behr

Summary of Qualifications

Eighteen years of professional experience in the areas of contracts administration, financial analysis, budgeting and office management.

Professional Experience

HYDRO-SEARCH, Milwaukee, Wisconsin (1990 to Present), *Contracts Administrator*
AMERICAN APPRAISAL ASSOCIATES, INC., Milwaukee, Wisconsin (1988 - 1990), *Financial Analyst*
AMERICAN APPRAISAL ASSOCIATES, INC., (1985 - 1988), *Professional Services Coordinator*
AMERICAN APPRAISAL ASSOCIATES, INC., (1980 - 1985), *Assistant Manager of Contract Administration*

Professional Affiliations

National Contract Management Association Member

Project Related Experience

* Negotiates contractual terms and conditions with clients and subcontractors.
* Provides support and coordination to the project manager to ensure awareness to project budgets and schedule deadlines.
* Schedules staff on projects to meet client report deliverables.
* Responsible for identifying and anticipating project budget problems and coordinate with the project manager to ensure cost-overruns are avoided.
* Meets with project managers at key financial milestones to determine the status of the project versus expenditures.
* Determines with client whether changes in the scope of services have occurred which require contract modifications and client approval.
* Works with project manager to insure adherence to contractual obligations and deadlines.

Education

BS, Business Management, Cardinal Stritch College, Milwaukee, Wisconsin, 1987
Associate of Applied Science, Business Administration, Milwaukee Area Technical College, Milwaukee, Wisconsin, 1985

Steven E. Carlson

Summary of Qualifications

Over 14 years of professional consulting and corporate experience in the following aspects of industrial and environmental health: laboratory research, occupational exposure assessments of airborne contaminants, heat and noise, hazard communication, hazardous materials management, training, respiratory protection, waste site health and safety, environmental audits and assessments, and regulatory compliance.

Professional Experience

HYDRO-SEARCH, Milwaukee, Wisconsin (1989 to Present), *Director of Health Sciences*
BOELTER ASSOCIATES, Chicago, Illinois (1987-1989), *Senior Consultant*
CERAC, INC., Milwaukee, Wisconsin (1983 - 1987), *Health and Safety Coordinator*
VELSICOL CHEMICAL CORP., Chicago, Illinois (1981 - 1983), *Occupational Health Specialist*
UNIVERSITY OF WISCONSIN - PARKSIDE (1980 - 1981), *Research Assistant*

Professional Affiliations

American Academy of Industrial Hygiene
American Industrial Hygiene Association (AIHA), Full Member
AIHA, Wisconsin Section
Federation of Environmental Technologists
Academy of Hazardous Materials Management

Education

MBA, Graduate School of Business, University of Wisconsin, Milwaukee, 1986
B.S., Industrial & Environmental Hygiene; Chemistry/Life Science Minors, University of Wisconsin, Parkside, 1980

Certification

American Board of Industrial Hygiene - Comprehensive Practice - No. 3350
Institute of Hazardous Materials Management - Senior Level Certified Hazardous Materials Manager - No. 1237

Project Experience

Environmental

* Environmental assessments for a variety of properties including malls, schools, commercial buildings, industrial sites, vacant land, residential and apartment complexes, office complexes and hotels.

* Indoor air quality investigations of hotels, schools, offices, residences, apartments, and retail shops.

* Environmental and regulatory compliance audits for a variety of manufacturers including a custom metal machining plant, paint manufacturer, water fixture manufacturer, wood furniture shop, office furniture manufacturer, aircraft gear manufacturer, and motorized access equipment manufacturer.

* Revised and updated SPCC plan and hazardous materials spill response procedures for a building products plant.

* Provided assistance with state regulatory and permitting requirements for process air discharges to several manufacturers.

* Provided SARA Title III Community Right to Know reporting assistance to laboratory furniture manufacturer.

Health and Safety Experience

* Administrator of Hydro-Search corporate health and safety program, including policy and procedures development, training, and site heath and safety plans compilation.

* Numerous industrial hygiene sampling surveys for solvents, acid gases, ozone, phosgene, formaldehyde, metals, noise, PCBs, bioaeorsols and other occupational health hazards.

* Conducted industrial hygiene compliance audits for nine different sites for a multi-national client. Sites included specialty chemicals plants, a rocket assembly and testing site, a dye plant and a salt mine and processing facility.

* Provided corporate health and safety oversight of contractor remediation of a company-owned hazardous waste site. Also collected personal exposure data for on-site personnel.

* Involved in numerous projects involving asbestos inspections and removals at schools, office buildings and industrial sites.

* Health and Safety Coordinator for a Milwaukee based specialty chemical manufacturer. Developed and administered procedures and policies for accident and loss prevention, including accident investigations, training, hot work permits, fork lifts, safety and specific hazardous materials handling techniques. Conducted industrial hygiene surveys to document exposure to heavy metals, acid gases, solvents, noise, heat and nuisance dusts. Designed and recommended control methods including ventilation systems, work procedures and personal protective equipment. Responsible for company compliance with the EPA and state environmental laws for hazardous waste, water discharges and Nuclear Regulatory Commission requirements for procurement, use and disposal of low specific activity radioactive materials.

* Provide customized training for a variety of clients. Training covered such topics as hazard communication, respiratory protection, hazardous waste sites, and ionizing radiation.

* Worked under contract to the Occupational Safety & Health Administration (OSHA) to conduct feasibility study of compliance with the lead standard by several industries including battery breaking and ingot production. Provided technical support for OSHA during hearing on lead standard compliance.

Gerald L. DeMers, P.E.

Summary of Qualifications

Fifteen years of consulting experience providing a range of environmental engineering services to industries and local governments. Project Manager for RI/FS of Sauk County, Wisconsin NPL landfill and for RCRA cap construction and hydrogeologic investigation of a former hazardous waste landfill in Wilsonville, Illinois.. Responsible for Environmental Engineering projects relating to solid waste management, hazardous wastes, ground-water remediation, industrial waste treatment, air pollutants, underground tanks and environmental audits. Responsible for remedial investigations at landfills, leaking underground storage tank facilities, and other impacted ground water and soil sites. Author of several solid waste management plans, incineration studies, and landfill investigations. Provided expert testimony at several landfill siting hearings in Illinois, and prepared Hazardous Waste storage permit applications for over 60 facilities in 20 states. Prepared assessments for over 75 aboveground and below ground hazardous waste storage tanks in 30 states.

Professional Experience

HYDRO-SEARCH, Milwaukee, Wisconsin (1989 to Present), *Senior Environmental Engineer*
GRAEF, ANHALT, SCHLOEMER & ASSOCIATES, Milwaukee, Wisconsin (1979 - 1989), *Associate and Environmental Engineer*
UNIVERSITY OF WISCONSIN, Madison (1988 to Present), *Lecturer, "Designing Facilities for the Storage and Handling of Hazardous Materials," and "Successfully Siting Waste Handling Facilities."*

Professional Affiliations

American Society of Civil Engineers
Engineers and Scientists of Milwaukee (Treasurer and a Member of the Board of Directors)
Federation of Environmental Technologists; Solid and Hazardous Waste Committee
Tau Beta Pi, Chi Epsilon and Alpha Sigma Nu Honor Societies
Volunteers in Technical Assistance

Education

B.S., Civil Engineering, Magna Cum Laude, Marquette University, Milwaukee, 1978
M.S., Environmental Health Engineering, Northwestern University, Evanston, Illinois, 1979
Graduate and continuing education classes included Hydrogeology, Geotechnical Engineering, Industrial Waste Treatment, and Hazardous Wastes.

Registration

Professional Engineer in:

Wisconsin
South Carolina
Illinois

Project Experience

NPL Superfund

* Oversaw preparation of a Feasibility Study for the Ripon FF/NN Landfill site near Ripon, Wisconsin.

* Oversaw preparation of a Feasibility Study for source control and ground water for the Refuse Hideaway Landfill NPL site near Middleton, Wisconsin for the Wisconsin Department of Natural Resources.

* Managed site assessment report, work plans, and Remedial Investigation (RI) for Sauk County Landfill NPL Site near Baraboo, Wisconsin. Prepared Feasibility Study (FS) which evaluated various cap alternatives for former landfill. Prepared mathematical documentation showing that the landfill is no longer contaminating ground water.

Landfill Services

* Project manager for RCRA type cap closure and hydrogeologic investigation of the former hazardous waste landfill in Wilsonville, Illinois. Work also included an evaluation of remedial options for ground-water remediation.

* Managed ground-water assessment site life and site operation studies for Whiteside County, Illinois landfill. Also, prepared Remedial Action Plan for the closed landfill, which evaluated capping alternatives, leachate and gas removal, and ground-water treatment. Oversaw clay cap construction and interim ground-water remediation measures.

* Evaluated Material Recovery Facility and double composite lined landfill proposed for municipal waste disposal in McHenry County, Illinois.

* Evaluated site suitability for expansion of existing landfill in Boone County, Illinois.

* Prepared a report justifying the need for a proposed landfill expansion in northern Illinois, and consistency with the local solid waste management plan. Project will include testimony at a public hearing regarding the site.

* Evaluated the design, plan of operation, and need for three sanitary landfill sites proposed by private developers in McHenry County, Illinois; one in DeKalb County, Illinois; one in Whiteside County, Illinois; and one in LaSalle County, Illinois. Landfills were evaluated under the Landfill Siting Law (SB172). Prepared reports on all six sites and provided expert testimony at public hearings for them.

* Prepared guidelines for a new solid waste disposal facility in McHenry County, Illinois. Work included over 50 meetings with elected officials, citizen groups, private waste companies, and county staff to arrive at a consensus which included landfilling and waste processing.

* Provided review and subsequent expert testimony for litigation regarding landfill gas at an abandoned landfill site in Waukesha, Wisconsin.

* Prepared initial site reports for two potential landfill sites and a ground-water monitoring plan for an existing landfill.

* Prepared a landfill closure plan for the Allis Chalmers foundry sand landfill in Greenfield, Wisconsin. Also implemented closure plan by placement of a clay cover and installations of ground-water monitoring wells.

* Prepared solid waste management plans for Green County, Wisconsin and McHenry County, Illinois, and co-authored a plan for Racine County, Wisconsin.

* Performed a marketing study for the sale of energy from a solid waste incinerator for Racine County. This was followed by an Incineration Site Selection Study which evaluated each of the potential energy customers and provided preliminary planning considerations including cost estimates and the environmental impact of 100-ton per day incineration facility.

Hydrocarbon Investigations

* Managed remedial investigations and preliminary remedial design of soil and ground-water impacts at two bulk petroleum terminals.

* Managed investigation of impacts from spills of cutting oils from an oil blending facility.

RCRA Compliance

* Supervised and certified the closure of a hazardous waste storage facility in Manawa, Wisconsin.

* Prepared Part B Hazardous Waste Storage Permit Application for over 60 facilities in 20 states, and feasibility studies for 8 hazardous waste facilities in Wisconsin.

* Prepared assessments of over 75 proposed and existing hazardous waste storage facilities in 30 states.

* Supervised and certified the closure of hazardous waste storage areas for General Electric Medical Systems and Johnson Controls, in Milwaukee.

* Responsible for six hydrogeologic investigations for permitting of hazardous waste storage facilities in Michigan and Louisiana.

* Managed closure of an unlicensed hazardous waste facility at East Troy, Wisconsin Airport where solvents were disposed in a septic system. Closure involved soil excavation, a ground-water impact assessment, and ground-water remediation.

Remedial Design & Remedial Action

* Managed remedial design for hydrocarbon impacts at a gas station in Kenosha, Wisconsin. Remediation included vapor extraction from soils, free product recovery, and treatment of ground water.

Underground Storage Tank Services

* Managed remedial investigations of impacts from gasoline and fuel oil storage tanks at several facilities. Activities included tank removal, contaminated soil disposal and investigations to determine the extent of impacts.

Environmental Assessments

* Managed environmental audits for property transfer at four facilities.

Clean Water Act Compliance

* Prepared various environmental compliance reports for industrial compliance, including WPDES reports, NR101 monitoring reports and pre-treatment compliance reports.

* Served as the engineer for a pilot study by the Milwaukee Water Pollution Abatement Program to identify sewer infiltration and inflow from private property. Was responsible for all data collection and analysis and coordinated all field work.

* Evaluated process discharges from two electroplating facilities. Prepared conceptual designs for pretreatment systems.

* Prepared Spill Prevention Counter Measure Control (SPCC) Plans for three industries.

* Prepared a facilities plan for wastewater collection and treatment system for Wallace Lake, Wisconsin and co-authored a similar plan for Fox Lake, Wisconsin. The plans analyzed various collection and treatment alternatives for each area. Designed rapid infiltration land disposal system for the treated waste water from the Fox Lake Treatment Plant.

* Prepared a feasibility study for the removal of volatile organic compounds from the air emissions of Phoenix Products, Milwaukee. Also prepared Air Emission Inventories and Mandatory Operating Permits for several southeastern Wisconsin industries.

* Evaluated a manufacturer's product line for its compliance with California's Proposition 65 hazardous materials right-to-know law.

Publications/Presentations

DeMers, G. L., "Exercising Flow Control Alternatives", Waste Age, vol. 22, no. 3., pp. 253-256, March, 1991.

DeMers, G. L., "The Weighty Matter in the Mailbox", Waste Age, vol. 21, no. 12, pp. 63-64, December, 1990.

DeMers, G. L., "The Use of Historic VOCs in Ground Water to Evaluate the Integrity of a Landfill Cap," presented at Superfund XV Conference, December 1, 1994, Washington, DC.

Judy L. Fassbender

Summary of Qualifications

Experience in geologic and hydrogeologic studies of commercial, industrial, and solid waste facilities as well as residential areas, involving releases of volatile and semi-volatile organic compounds, petroleum hydrocarbons and heavy metals. Proficient in managing complex community relations situations and dealing with the general public. Project management responsibilities have included: providing overall direction for RI/FSs at four Superfund sites in Wisconsin; conducting hydrogeologic characterization studies and environmental site assessments; providing hydrogeologic oversight and on-site management for soil and ground-water remediation; coordination of, and participation in , field data acquisition (borehole logging, monitor well installation and abandonment, hydraulic testing, soil and ground-water sampling, surveying and construction inspection); evaluation of geologic, hydrogeologic and chemical data; technical report and feasibility study preparation; work plan/cost proposal preparation and promotion of good client relations.

Professional Experience

HYDRO-SEARCH, Milwaukee, Wisconsin (1989 to Present), *Senior Hydrogeologist*
UNIVERSITY OF WISCONSIN, MILWAUKEE (1987 - 1988), *Research Assistant, Project Assistant*
WISCONSIN DEPARTMENT OF NATURAL RESOURCES, Northern Highlands/American Legion State Forest (1980 - 1983), *Public Relations*

Professional Affiliations

American Water Resources Association - Wisconsin Section
Association For Women Geoscientists
Engineers and Scientists of Milwaukee, Inc.
National Alliance of Women in Waste
National Ground Water Association
Wisconsin Ground-Water Association
Women in Science of Southeastern Wisconsin

Education

M.S., Hydrogeology, University of Wisconsin - Milwaukee, 1991
Graduate Studies in Geosciences, University of Alaska, Fairbanks, 1984-1985 (no degree)
B.S. Geology, University of Wisconsin, Oshkosh, 1984
OSHA Health and Safety Training for Superfund and RCRA Remediation Site Personnel, per OSHA 1910.120
CPR and First Aid Certification
State of Wisconsin Certified Site Assessor #00298

Project Experience

Superfund

* Author of Site Evaluation Reports and RI/FS Project Plans (including Work Plans, Sampling and Analysis Plans, Quality Assurance Project Plans (QAPP), Data Management Plans, Health and Safety Plans, and Baseline Risk Assessment Plans) for four NPL sites in Wisconsin (U.S. EPA Region V).

* Author of a QAPP for a NPL industrial facility in southern California (U.S. EPA Region X).

* Project Manager for an RI/FS at an NPL landfill site in Dane County, Wisconsin, under the direction of the Wisconsin Department of Natural Resources, where a contaminant plume primarily consisting of VOCs extends 3/4 of a mile from the landfill.

* Project Manager for an RI/FS at an NPL site in Fond du Lac County, Wisconsin where VOC and metal contaminants are present and a VOC contaminant plume extends several hundred feet below the site to Precambrian basement rocks.

* Project Manager for a RI/FS at an NPL former electroplating facility in east central Wisconsin with high levels of metal and VOC contamination in soil and ground water. The RI/FS was conducted under contract to the Wisconsin Department of Natural Resources with direction from the U.S. EPA.

* RI/FS Task Coordinator for the RI/FS at an NPL landfill in central Wisconsin under contract with the county municipality. Assisted in convincing the Wisconsin Department of Natural Resources and U.S. EPA to change their proposed remedy, a composite landfill cap, to maintenance of the existing cap with continued ground-water monitoring, resulting in a savings to the County of over one million dollars.

Landfill Services

* Field Supervisor with project management responsibility for a ground-water remedial investigation at a closed proposed NPL landfill.

* Project Hydrogeologist for ground-water compliance monitoring at one large closed landfill and several other smaller closed landfills in southeastern Wisconsin.

* Staff Hydrogeologist for installation of a ground-water monitoring network at an active landfill.

* Developer of a monitoring program for a closed landfill in south central Wisconsin for the Department of Natural Resources. The landfill has recently been added to the NPL.

Remedial Design & Remedial Action

* Conceptual Designer of remedial systems for several manufacturing facilities in south central and southeastern Wisconsin.

* Developer of monitoring plans for compliance and progress monitoring at several sites with active or passive remedial systems in operation and also for two NPL landfills relying on natural attenuation for remediation.

Hydrocarbon Investigations

* Field Supervisor for a ground-water investigation of petroleum contamination of unknown source. Investigation occurred in a small rural community.

* Project Hydrogeologist for emergency investigation of hydrocarbon release of unknown origin at an air transportation facility in southeast Wisconsin.

* Project hydrogeologist for monitoring of a hydrocarbon remediation project at a high pressure pipeline accident site.

* Project Hydrogeologist for conducting several investigations at sites with ground-water contamination resulting from former USTs or past manufacturing practices in Wisconsin, Minnesota, Illinois and Iowa.

Underground Storage Tank Services

* Project Hydrogeologist for the removal of fifteen underground storage tanks (USTs) and related impacted soils, ground-water remedial investigation, and inspection of the installation of new USTs and leak detection systems for a major engine manufacturer with four facilities in Milwaukee, Wisconsin.

* Project Hydrogeologist providing oversight for preliminary remedial design and testing at several former UST locations in southeastern Wisconsin.

Environmental Assessments

* Project Hydrogeologist for real estate transaction environmental assessment studies for a real estate agency, an electroplating facility, a paint manufacturing company, and a former private air field at various locations in Wisconsin, Illinois, and Minnesota.

General Site Investigations

* Hydrogeologist for a site investigation to determine the magnitude and extent of soil and ground water contaminated with solvents at a former manufacturing facility. The investigation included determining the extent of a DNAPL plume.

* Hydrogeologist for a hydrogeologic characterization and ground-water quality assessment study at an industrial facility in Iowa to investigate volatile organic compound impacts to shallow and deep aquifers at the site.

* Project Hydrogeologist providing assistance in the development of work plans to investigate multiple former manufactured gas plant sites throughout southern Wisconsin to provide data necessary for remediation at the sites.

* Research Assistant for a hydrogeologic investigation to determine the flux and chemical contribution of ground water to a marl lake in southeastern Wisconsin at the University of Wisconsin-Milwaukee. Project work included retrieval of lake bottom sediments and performance and analysis of lead-210 dating and x-ray diffraction.

Additional Project Experience

* Technical Advisor overseeing the preparation of standard operating procedures for performing various subsurface characterization techniques and also various sampling methods for several media..

Steven P. Franks

Summary of Qualifications

Sixteen years of professional experience in engineering design and environmental consulting. Managed and provided oversight for numerous large scale CERCLA/RCRA remedial projects, water and air pollution control facilities as well as smaller scale hydrocarbon remediation projects. Expertise includes evaluation, design, permitting, and construction management of remediation systems for air, soil, and ground-water contaminated with organic and inorganic compounds and treatment systems for process wastewater. Experience with several innovative treatment methods including soil vapor extraction, air sparging, thermal desorption, solvent extraction, oxidation, and soil washing.

Professional Experience

HYDRO-SEARCH, Milwaukee, Wisconsin (1994 to Present), *Director of Engineering*
GERAGHTY & MILLER, INC., Chicago, Illinois (1990 to 1994), *Technical Director CERCLA Program*
CH$_2$M HILL, INC., Redding, California (1987 - 1990), *Project Engineer/Manager*
STEARNS CATALYTIC CORPORATION, Denver, Colorado (1978 - 1987), *Area Lead Process Engineer*

Professional Affiliations

American Institute of Chemical Engineers (AICHE)
National Society of Professional Engineers (NSPE)
Tau Beta Pi - Engineering Honorary

Education

Biochemical Engineering Studies, Colorado State University, Fort Collins, 1986
B.S., Chemical Engineering, Magna Cum Laude, Rose-Hulman Institute of Technology, Terre Haute, Indiana, 1978

Registration

Registered Professional Engineer - Colorado #22617

Project Experience

NPL Superfund

* Completed feasibility study for industrial landfill in Wisconsin which included conceptual design for cap, leachate collection and treatment, ground-water recovery and treatment, and SVE system. After ROD was issued, managed design effort for cap, leachate collection, and treatment which included innovative cap design and leachate system which was subsequently approved by the WDNR. Prepared justification for use of ACLs as alternative ground-water standards and aided in negotiating the scope of the ground-water remedy.

* Managed RD/RA effort for NPL Site in Michigan. Initial work included preparation of public comment and negotiation of scope of work. Coordinated large pre-design effort including aquifer test, ground-water modeling, air-flow modeling, SVE pilot test, etc. which ultimately produced innovations which reduced scope and cost of both the SVE and ground-water systems. Prepared design plans and documentation for ground-water treatment facility and SVE installation. Provided management of construction and startup phases of ground-water facility. Worked in concert with PRP group, regulatory agencies, and public in negotiating ROD Amendment for the soils containing PCB and metals contamination to incorporate Michigan Act 307 Type C risk-based cleanup standards and allow use of innovative PCB treatment technologies thermal desorption, soil washing or solvent extraction

* Currently providing review and oversight of design effort for a composite cap and gas collection system for a combined municipal/industrial landfill site in central Wisconsin which is on the NPL. Successfully negotiated a ROD which provides for monitoring only of ground water to assess impact of cap on aquifer quality.

* Also currently preparing a groundwater operable unit FS for an NPL site in northern Wisconsin which was the site of chrome and zinc plating facilities. Several innovative techniques for chrome treatment are being investigated.

* Provided engineering support for feasibility study on two CERCLA sites in Arizona with widespread VOC contamination. Evaluated multiple stripping towers and pipelines. Also included evaluation of unique end use alternatives to preserve scarce water resources. Provided oversight for design and installation of portion of overall air stripping remedy.

* Prepared ambient air monitoring program for CERCLA site in Arizona with VOC impacts. Completed air sampling and evaluated data as part of RI. Also managed SVE pilot test at same facility.

* Managed investigative activities and prepared feasibility study for NPL site in Fresno, California which was formerly a lube oil re-refining facility. Evaluated ground-water treatment for VOCs and metals, and soil excavation and treatment for heavy hydrocarbons. Completed sophisticated air monitoring evaluation to determine excavation impacts. Also completed treatability tests for alternative soils treatment technologies.

* Provided comment and oversight of PRP-led RI/FS efforts working as contractor for USEPA at numerous sites in California, Washington, and Arizona.

* Prepared feasibility study of engineering alternatives for CERCLA acid-mine drainage site in California which included laboratory testing of precipitation alternatives, and evaluation of infiltration reduction and surface water diversion as options to reduce impacts to Sacramento River.

* Prepared position paper for industrial group on containment remedies versus incineration. Paper was presented to congressional subcommittee during Superfund reauthorization debate. Also participated in Ambassador program run by the USEPA Superfund Revitalization Office in 1994 during which consultants and industries were interviewed on benefits and problems in the Superfund program.

* Provided oversight and negotiation support for several voluntary remedial efforts aimed at eventual cost recovery under CERCLA. This included providing guidance and review on preparation of RI/FS particularly with respect to remedy selection and community relations. Efforts also included strategic use of NCP removal actions to save money and improve schedule while remaining NCP compliant.

* Provided NCP compliance review and support to legal teams on several projects where cost recovery was being pursued. Reviewed project documentation and provided an assessment of strengths and weaknesses of effort with respect to key issues involved in compliance with the NCP.

Remedial Design/Remedial Action

* Completed pilot test and subsequent design specifications and drawings for SVE system at manufacturer in Rockford. Procured construction contractor, managed and performed oversight of installation, performed startup, managed O&M effort. Recently was able to shutdown system upon achieving remedial objectives after two years of operation.

* Managed and prepared feasibility study for abandoned municipal landfill in central Wisconsin which included conceptual design of cap, landfill gas collection, and ground-water recovery and treatment system. Project was completed as part of unique joint effort funded in part by both PRPs and the WDNR.

* Managed, subcontracted and provided oversight and data evaluation for treatability studies on indirect and direct thermal treatment of hydrocarbon soil/sludges at two CERCLA sites in California.

* Completed literature search for PCB treatment technologies for site in Michigan which led to subcontracting and oversight for treatability studies on soil washing, thermal desorption and solvent extraction. Compiled and evaluated data and produced report on alternative treatment for agency consideration.

* Providing construction oversight and startup services at a unique remedial project in Milwaukee, where a dual extraction SVE/ground water system has been integrated with new building construction in the downtown area. Project is a model for brownfield development and requires close coordination with contractors, building owners, and city inspectors

* Providing design, construction management, and O&M services for several hydrocarbon and solvent remediation sites in Wisconsin, some of which are reimbursable under Wisconsin PECFA program. Requires close coordination of staff, detailed record keeping, and cost effective design, monitoring and management techniques.

* Prepared and completed vadose zone investigation and SVE pilot testing program for portion of the Savannah River DOE facility in South Carolina.

* Completed pilot test of applicability of SVE for plastics manufacturer in Idaho. Following successful test, completed conceptual design of SVE system as part of RCRA permit application.

* Provided senior review and oversight for air sparging/SVE system installed on fast track basis at manufacturing facility in Illinois.

* Completed remedial design and permitting for ground-water treatment facility at wood preserving site in Northern California. Negotiated unique arrangement with local POTW and state regulators to allow discharge to POTW.

* Provided construction oversight of consolidation and capping of mine tailings at site in Northern California. Also provided oversight for design, construction, and operation of lime precipitation treatment facility for mine drainage.

* Completed design and specifications for several ground-water/soil treatment facilities in California for filling stations which included a variety of treatment modules and unit operations including SVE, air stripping, carbon treatment, and catalytic incineration.

* Optimized design and provided specifications and drawings for air stripping unit for removal of volatile pesticides at site in Hawaii.

* Completed series of treatment tests for lagoon sludge at fiberglass manufacturer including oxidation using hydrogen peroxide and biological degradation. Biological treatment was chosen as the most cost effective treatment alternative.

Other Engineering Projects

* Waste minimization study and compliance audit for metal plating line at aerospace manufacturer in Illinois. Suggested several alternatives for improving rinse operations and alleviating discharge violations which allowed facility to continue to operate.

* Completed waste minimization studies at several industrial/commercial facilities for San Jose Water Treatment District. Waste minimization studies were conducted for printer, photo laboratory, automobile repair shop, circuit board manufacturer, disk manufacturer, and electroplating shop. Included assessment of wastes generated, potential reclamation activities, process modifications, and improved treatment facilities.

* Completed process review and engineering analysis of tank loading operation and air emissions abatement facility at Alyeska Pipeline terminal in Valdez. Recommended operating improvements and incinerator modifications.

* Completed evaluation of wastewater collection and treatment facility at phenol manufacturing plant. Recommended changes were made which allowed discharge to POTW without violations.

* Performed detailed process design and equipment specification for ARCO gas and oil processing facility at Kuparuk field on North Slope. Also provided construction oversight and startup assistance.

* Performed process simulation activities, conceptual design, detailed design, and equipment and instrument specification for shale oil processing facility in Colorado. Also performed construction oversight for facility.

* Performed construction oversight and startup assistance for natural gas processing facility in Wyoming, both for water treatment/utility area and sulfur recovery air treatment unit.

* Performed process design for polymer production facility in Wyoming.

Publications/Presentations

Franks, S.P., "Soil Gas Venting and Treatment," American Ecology Services, Remedial Strategies and Decision Making Seminar, 1993

Franks, S.P., "Innovative Remedies for Groundwater," Executive Enterprises, Remediation Technologies Seminar, Chicago, Illinois, March 1994

Franks, S.P., "Superfund Program Overview," Executive Enterprises, Environmental Regulation Seminar, Baltimore, Maryland, August 1994

Franks, S.P. and Lala, K.A., "Groundwater Discharge from Remediation Sites: Impact and Regulation," Water Environment Federation, 67th Annual Conference and Exhibition, Chicago, Illinois, October 1994