12/26/85

CORRESPONDENCE / MEMORANDUM — STATE OF WISCONSIN

DATE: December 19, 1985

FILE REF: 4430

TO: Gary Kulibert - NC
Ed Kruel - NC

FROM: Terry Evanson - SW/3 TAE

SUBJECT: SNE Engineering Report

The following are comments on the SNE Corporation report titled "Engineering Report Summarizing Site Investigation for Pentachlorophenol" by Eder Associates and dated November, 1985.

Field Investigation

1. On page 11, the report states that there was a "possibility . . . of Penta moving in a direction other than downgradient." Yet, the 9/26/85 water table map indicates that the spread of the floating layer of PCP is consistent with the direction of groundwater flow. More permeable layers in the sand and gravel may also affect the movement of the PCP layer.

2. The report should include a discussion of how the thickness of the floating PCP layer is actually measured in the field. The 9/26/85 water table map shows water levels adjusted for the floating layer--how is the adjustment computed?

3. Page 36 of the report states that the source of the VOCs is unknown, but the compounds are commonly used in the mill working industry. Does this mean that the SNE Corporation is the likely source of VOCs or that one of the other local industries is the source of VOCs?

4. Can studies be designed and conducted to determine the actual biological degradation rate for PCP occurring at the site? Is the sand and gravel aquifer a good or poor medium for biological activity? Will the floating product be affected by microbes or only the dissolved constituents? I think these questions are important in determining the extent of a long-term monitoring program and whether the contaminants will continue to move downgradient. Also, can the dioxins be expected to biodegrade?

5. It seems premature to conclude that the floating PCP is no longer moving when the actual extent of the layer is unknown and monitoring of the layer has only been conducted for a short time.

6. The possibility of volatilization of PCP and other contaminants into nearby homes must be investigated. SNE should monitor airborn contaminant levels in basements of selected homes or place soil gas probes (if they will work in this case) near homes.

Remedial Action Alternatives

7. The company's prefered alternative is to allow PCP to naturally degrade and install additional monitoring wells to determine movement of the PCP plume. Most of the issues listed above will have to be addressed before this alternative can be evaluated--namely, degradation time for PCP and the dioxin, volatilization of contaminants into residential areas, and further environmental risk assessment. In any scenario, SNE would have to insure that all sources of PCP to the environment have been eliminated.

8. The second alternative, passive removal of PCP through bailing, seems the least viable of the alternatives. There would be little effect on the volume of PCP in the environment.

9. Installation of one or more depression pumps/skimming systems to remove the floating PCP is the third alternative. SNE claims there are no approved PCP disposal facilities in this country. If this is true, then it is unlikely that PCP removal will be possible. SNE should be required to prove that PCP-contaminated carbon could not be disposed of safely. Carbon from filtration systems is often regenerated by burning. Would the PCP be destroyed in such a process? Results of the carbon adsorption tests being conducted by SNE should be submitted to the Department.

If you have any questions, please call me at (608) 266-0941.

TE:jah
8611S

cc: Bill Dobbins - NC
Rich O'Hara/Mark Giesfeldt - SW/3

12/19/85

NCD - ANTIGO
DNR District

WID006125835
EPA ID Number

STATE OF WISCONSIN
Department of Natural Resources
Hazardous Waste Generation Site Inspection Form
(Subchapter III of NR 181)

Note: Complete this form only for: 1) facilities which generate quantities of hazardous waste greater than those small quantities subject to the special requirements of s. NR 181.13, Wis. Adm. Code; 2) facilities which do not treat or dispose of hazardous waste on-site; and 3) facilities which do not receive hazardous waste from off-site.

I. General Information

Corporate/Facility Name: SNE CORPORATION

Facility Location:

Street: 910 CLEVELAND AVE

City & Zip: WAUSAU 54401 Town: _____ County: MARATHON

Contact Person: PAT WIERZBA Title: Plant Engineer Manager

Facility Mailing Address:

Street: 910 CLEVELAND AVE

City: WAUSAU State: WI Zip Code: 54401

Phone: 715-845-1161

Operator: DAVID BERGHAMMER Title: Plant Manager

Street: 910 CLEVELAND AVE

City: WAUSAU State: WI Zip Code: 54401

Phone: 715-845-1161

Legal Owner: SENTRY INSURANCE CORP

Street: _____

City: Stevens PE State: WI Zip Code: _____

Phone: _____

DNR District Inspector: K.D. Markart Date: 12/19/85

Revised November 1985

II. REQUIREMENTS

A. Notification: (NR 181.06)

1. Has the generator submitted a notification form to the Department and obtained an identification number?

[X] Yes [ ] No — WID 006125835 (Comments or Clarification)

2. If the generator has changed its corporate name or mailing address, has a subsequent notification form been completed?

[ ] Yes [X] No — FORMERLY KNOWN AS CRESTLINE (Comments or Clarification)

3. If the generator has added new hazardous waste activities and/or waste codes, has a letter to DNR and EPA or subsequent notification form been completed?

[X] Yes [ ] No — (Comments or Clarification)

For Department Use

B. Waste Determination: (NR 181.22)

1. Has an adequate determination been made to identify, and if necessary, test a representative sample of each waste in order to obtain enough information to treat, store or dispose of the waste properly off-site?

[X] Yes [ ] No — yes for both fascilities (Comments or Clarification)

Note: Records of any test results, waste analysis or other determinations must be retained for at least 3 years from the date that the waste was last sent to an off-site treatment, storage or disposal facility.

For Department Use

C. Waste Stream Information:

	Waste Type	Potential Hazardous Constitutent/Characteristics	Generator Rate	EPA Waste Code
1.	pentachlorophenol	Flammable MAY HAVE DIOXINS	VARIABLE to 100gal/yr	U242
2.	Toluol	Flammable - Toxic HAS Some Hg	55gal/month	U220
3.	Degreasing Solvents	Flammable	100gal/yr	?
4.	TETRAHYDROFURAN (T.H.F.)	TOXIC	only vapors	U213
5.	Polyurethane base	TOXIC	?	?

Attach Waste Profile or Analysis for each Waste Stream or indicate how facility has compiled with NR 181.22, Hazardous Waste Determination, for each Waste Stream.

For Department Use

D. 90-Day Accumulation: (NR 181.21(5)(a) and NR 181.26(2)(a))

1. Indicate how the hazardous waste is stored:

[X] Containers [ ] Above Ground Tanks [ ] Underground Tanks

Note: Containers and above ground tanks are the only means allowable to store large quantities of hazardous waste and be eligible for the 90-day exemption. Any other means of storage, such as underground tanks and waste piles, require a storage interim or operating license/variance. (See the definitions of container and tank in NR 181.04.)

2. Are the above mentioned containers or tanks marked with the date on which hazardous waste was first placed in the container or tank for accumulation?

[ ] Yes [X] No — Will be done shortly (Comments or Clarification)

3. Are containers marked with the words "Hazardous Waste" before placing them in an accumulation area or on-site storage facility?

[X] Yes [ ] No — (Comments or Clarification)

4. Is the hazardous waste removed from the site before the end of the 90 day accumulation period or treated, stored or disposed of in an approved on-site hazardous waste facility or on-site recycling facility?

[ ] [X] Dioxin contaminated penta could not be disposed
Yes No (Comments or Clarification) of - asking for variance. Material is a result of spill cleanup

Note: Attach to this form, as appropriate, completed container and/or storage tank inspection attachments. Complete the appropriate questions for generators as specified on those forms for generators.

For Department Use

E. Manifest System, Packaging, Labeling, Marking and Shipping: (NR 181.23 - .27)

1. Does the generator initiate a uniform manifest form with all off-site shipments of hazardous waste?

[X] [ ] _____
Yes No (Comments or Clarification)

Note: If the state to which the shipment is manifested (consignment state) supplies the uniform manifest form and requires its use, then the generator shall use that manifest form. If the consignment state does not supply the uniform manifest form, then the generator shall use the Wisconsin uniform manifest form.

2. Are the manifests properly completed?

[X] [ ] _____
Yes No (Comments or Clarification)

3. Are copies of all manifests for the past 3 years retained at the facility and available for review?

[X] [ ] _____
Yes No (Comments or Clarification)

Note: Records of past shipments (manifests) must be retained at the facility for at least 3 years after the date of shipment.

4. Does the manifest specify a designated facility which is approved (if in Wisconsin has an operating license, interim license, variance, waiver, or is exempt from licensing; or if outside of Wisconsin has an EPA permit, interim status, or is exempt from permitting under RCRA; or a permit or approval from an authorized state) to take the waste?

[X] Yes [ ] No Waste Research Reclamation, Inc Eau Claire, WI (Comments or Clarification)

5. Are procedures for exception reporting followed properly, if an exception has occurred?

[X] Yes [ ] No _____ (Comments or Clarification)

6. Is waste packaged in accordance with DOT requirements?

[X] Yes [ ] No _____ (Comments or Clarification)

7. Are waste packages marked and labeled in accordance with DOT regulations concerning hazardous waste materials?

[X] Yes [ ] No _____ (Comments or Clarification)

8. If required, are placards available to the transporter of the hazardous waste?

[ ] Yes [X] No Warsaw Chemical Transporter They have placards (Comments or Clarification)

For Department Use

F. Reporting: (NR 181.24)

1. Have annual reports covering generator activities during the previous calendar years been submitted (they must be submitted by March 1 of the year following the reporting period) to the Department?

[X] Yes [ ] No _____ (Comments or Clarification)

For Department Use

G. Contingency Plan and Emergency Procedures: (NR 181.42(4)(a) &(c))

1. Does the facility have a written contingency plan addressing potential discharge of hazardous waste or hazardous waste constituents to air, land, groundwater, or surface water?

[X] Yes [ ] No plan was furnished upon inspection (Comments or Clarification)

If the answer to #1, above, is yes, then answer questions #2 through #8 below. If the answer to #1, above, is no, then indicate below what measures are being taken to prepare the plan. The Contingency Plan and any revisions to the plan that become necessary are required to be submitted to the Department. The plan must comply with NR 181.42(4)(a) and (c), Wisconsin Administrative Code. An existing spill prevention control and countermeasure (SPCC) plan may be amended to comply with this requirement.

2. Is a copy of the contingency plan kept at the facility?

[X] Yes [ ] No (Comments or Clarification)

3. Has a copy of the contingency plan or a letter stating that the contingency plan is kept at the facility and is available for review been sent to all local police and fire departments, hospitals and emergency response teams who may be called to provide emergency services?

[X] Yes [ ] No (Comments or Clarification)

4. Does the plan identify an Emergency Coordinator who is always on-site when the facility is in operation, and if appropriate, alternates, with names, addresses, phone numbers (office and home) provided?

[X] Yes [ ] No (Comments or Clarification)

5. Does the plan identify an Emergency Coordinator who will be present or on call when the facility is not in operation, and available to respond to an emergency by reaching the facility in a short period of time?

[X] Yes [ ] No (Comments or Clarification)

6. Are the person or persons identified in #4 and #5, above, familiar with all aspects of site activities and contingency plan implementation?

[X] Yes [ ] No _____ (Comments or Clarification)

7. Do the person or persons identified in #4 and #5, above, have the authority to carry out all actions necessary to respond to fire, explosions or any unplanned discharge of hazardous waste to the air, soil or surface water?

[X] Yes [ ] No _____ (Comments or Clarification)

8. Does the plan contain the following:

a. A description of the facility layout, types of waste handled and their associated hazards, places where facility personnel normally work, and entrances to and roads inside the facility?

[ ] Yes [X] No will complete (Comments or Clarification)

b. An evacuation plan for facility personnel, including signal(s) to be used to begin evacuation, evacuation routes, and alternate routes?

[X] Yes [ ] No _____ (Comments or Clarification)

c. Procedures for emergency shutdown of facility operations, and the actions facility personnel must take to comply with NR 181.42(4)(a)1., and NR 181.42(4)(c), in response to fires, explosions or any unplanned discharge of hazardous waste or hazardous waste constituents to the air, land or surface water at the facility, including procedures to:

1) Activate internal facility alarms or communication systems to notify all personnel of an imminent or actual emergency situation, where applicable?

[X] Yes [ ] No _____ (Comments or Clarification)

2) Telephone the division of emergency government and comply with the requirements of s. 144.76, Stats., and ch. NR 158, Wis. Adm. Code?

[X] Yes [ ] No _____ (Comments or Clarification)

3) Immediately identify the character, source, amount, and areal extent of any discharged materials?

[X] Yes [ ] No _____ (Comments or Clarification)

4) Assess possible hazards to human health or the environment that may result from discharge, fire, or explosion?

[X] Yes [ ] No _____ (Comments or Clarification)

5) Immediately notify appropriate local authorities, if an assessment indicates that a discharge, fire, or explosion could threaten human health or the environment outside the facility, and that evacuation of local areas may be advisable?

[X] Yes [ ] No _____ (Comments or Clarification)

6) Take all reasonable measures necessary to ensure that fires, explosions, and discharges do not occur, reoccur, or spread to other hazardous waste at the facility?

[X] Yes [ ] No _____ (Comments or Clarification)

7) Monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes or other equipment, where appropriate, if the facility stops operation in response to a fire, explosion, or discharge?

[X] Yes [ ] No _____ (Comments or Clarification)

8) Provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a discharge, fire, or explosion at the facility, immediately after an emergency?

[X] Yes [ ] No Setting up additional Storage (Comments or Clarification)

9) Ensure that, in the affected areas of the facility, no waste that may be incompatible with the discharged material is treated, stored, or disposed of until cleanup procedures are completed; and all emergency equipment listed in the contingency plan is clean and fit for its intended use before operations are resumed?

[X] Yes [ ] No _____ (Comments or Clarification)

10) Notify the Department before operations are resumed?

[X] Yes [ ] No _____ (Comments or Clarification)

d. Procedures to be used to notify local police and fire departments, hospitals and emergency response teams of a discharge of hazardous waste or a fire or explosion at the facility?

[X] Yes [ ] No Instructed Guard Service at plant (Comments or Clarification)

e. An up-to-date list of all emergency equipment at the facility, including the location, physical description and a brief outline of its capabilities for each item?

[X] Yes [ ] No _____ (Comments or Clarification)

For Department Use

H. Preparedness and Prevention: (NR 181.42(4)(b))

1. Does the facility have the following equipment, as applicable for the type of waste managed?

a. Internal communications and alarm systems:

[X] Yes [ ] No _____ (Comments or Clarification)

b. A device to summon emergency assistance, such as a telephone or a 2-way radio?

[X] Yes [ ] No _____ (Comments or Clarification)

c. Portable fire extinguishers?

[X] Yes [ ] No _____ (Comments or Clarification)

d. Fire control equipment, including special extinguishing equipment and extinguishing agents? (Include type and volume of extinguishing agents in "comments" section.)

[X] Yes [ ] No _____ (Comments or Clarification)

e. Spill control equipment?

[X] Yes [ ] No _____ (Comments or Clarification)

f. Decontamination equipment:

[X] Yes [ ] No _____ (Comments or Clarification)

2. Is all of the equipment mentioned in #1, above, operable?

[X] Yes [ ] No _____ (Comments or Clarification)

3. Is all of the equipment mentioned in #1 tested and maintained as required to assure its proper operation in an emergency?

[X] Yes [ ] No _____ (Comments or Clarification)

4. Specify how often the equipment mentioned in #1 is tested to assure proper operation:

Inspections on an annual basis.

5. Is immediate access provided to internal or external alarms, unless the Department has determined that such devices are not required, for personnel involved in the handling of hazardous waste?

[X] Yes [ ] No _____ (Comments or Clarification)

6. Have the following arrangements, as applicable, been made involving emergency organizations?

a. If more than one police and fire department may respond to an emergency, have agreements designating primary authority and support roles been made?

[X] Yes [ ] No _____ (Comments or Clarification)

b. Have agreements with state emergency response teams, emergency response contractors and equipment suppliers been made to provide response? Have contacted both State and National response teams

[ ] Yes [X] No Have Guard Service at Plant and Spill kits (Comments or Clarification)

c. Arrangements to familiarize local hospitals with the properties of the hazardous waste handled and the types of injuries or illnesses which could result from an incident?

[ ] Yes [✓] No Working on (Comments or Clarification)

Note: An attempt must be made, as appropriate for the type of wastes and the potential need for services, to contact the emergency organization mentioned in #6(a-c), above, and make the arrangements outlined. If the organizations decline to participate the refusal must be documented in the facility's records.

7. Is adequate aisle space provided throughout the hazardous waste facility to allow unobstructed movement of personnel and all emergency equipment mentioned in #1, above?

[✓] Yes [ ] No _____ (Comments or Clarification)

8. If the facility handles ignitable or reactive waste, are wastes separated from sources of ignition or reaction?

[✓] Yes [ ] No _____ (Comments or Clarification)

9. Are "No Smoking" signs posted in areas where there is a hazard from ignitable or reactive wastes?

[✓] Yes [ ] No _____ (Comments or Clarification)

For Department Use

I. Personnel Training/Records: (NR 181.42(5))

1. Does the facility have a program of classroom instruction or on-the-job training for personnel in hazardous waste management procedures?

[X] Yes [ ] No _____ (Comments or Clarification)

If the answer to #1, above, is no, then a training program must be developed.

If the answer to #1, above, is yes, then answer the following questions (#2-4) below:

2. Does this program including training of personnel in Contingency Plan implementation?

[X] Yes [ ] No Conducts monthly Safety meetings (Comments or Clarification)

3. Are the following items included in the program if applicable?

a. Procedures for using, inspecting, repairing and replacing facility emergency and monitoring equipment?

[X] Yes [ ] No _____ (Comments or Clarification)

b. Key parameters for automatic waste feed cut-off systems?

[X] Yes [ ] No _____ (Comments or Clarification)

c. Communications and/or alarm systems?

[X] Yes [ ] No _____ (Comments or Clarification)

d. Response to fires or explosions?

[X] Yes [ ] No _____ (Comments or Clarification)

e. Response to groundwater contamination incidents?

[X] Yes [ ] No Checks portable tank weekly for discrepencies by dip stick. (Comments or Clarification)
- has monitoring wells

f. Shutdown of operations?

[X] Yes [ ] No _____ (Comments or Clarification)

4. Do facility personnel take part in an annual review of the program mentioned in #1, above?

[X] Yes [ ] No _____ (Comments or Clarification)

5. Are records of personnel training maintained at the facility?

[X] Yes [ ] No _____ (Comments or Clarification)

If the answer to #5, above, is no, then these records must be developed and maintained at the facility.

If the answer to #5, above, is yes, then answer the following question (#6).

6. Which of the following items are included in the personnel training records?

a. Job titles and the name of the employee filling each job?

[X] Yes [ ] No _____ (Comments or Clarification)

b. Job descriptions?

[X] Yes [ ] No _____ (Comments or Clarification)

c. Description of training required for each position?

[X] Yes [ ] No _____ (Comments or Clarification)

d. Written documentation that training or job experience has been given and completed?

[X] Yes [ ] No _____ (Comments or Clarification)

Note: Training records of current personnel must be kept until facility closure. Training records of former employees must be kept for at least 3 years from the date the employee last worked at the facility. Personnel training records must accompany personnel transferred within the same company.

For Department Use

J. Other Requirements:

1. Does the generator have underground storage tanks and/or underground spill containment tanks? 8000 gallon tank underground

[X] Yes [ ] No — Contains penta chlorophenol product (Comments or Clarification)

If the answer to #1, above, is yes, complete Attachments 9 and/or 11.

Attachment 9 &/or 11 not completed at time of inspection

2. Does the generator combine absorbent material with waste generated on site?

[X] Yes [ ] No — Penta contaminated absorbents "Sawdust" are treated as hazardous waste. Results from overflow & leaks at valve (Comments or Clarification)

If the answer to #2, above, is yes, complete Attachment 10.

Attachment 10 not completed at time of inspection

For Department Use

III. Facility Status Evaluation

A. Facility Classification Based on District Verification: _____

Signature: _____ Date _____

This facility is also subject to regulation as a:

____ treatment facility

____ exempt treatment facility (specify) _____

____ storage facility

____ disposal facility

____ transporter

____ small quantity off-site accumulation facility

____ large quantity off-site accumulation facility

For Department Use

12/26/85

CORRESPONDENCE / MEMORANDUM — STATE OF WISCONSIN

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FILE REF: 4430

TO: Gary Kulibert - NC
Ed Kruel - NC

FROM: Terry Evanson - SW/3 TAE

SUBJECT: SNE Engineering Report

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If you have any questions, please call me at (608) 266-0941.

TE:jah
8611S

cc: Bill Dobbins - NC
Rich O'Hara/Mark Giesfeldt - SW/3

12/6/85

SNE Corporation

A Sentry Enterprise

910 Cleveland Avenue
P.O. Box 1007
Wausau, WI 54401

715 845-1161

December 6, 1985

Mr. Kenneth Markart
Department of Natural Resources
Box 310
Antigo, WI 54409

Certified Mail

Dear Ken:

This letter confirms our conversation regarding a waste storage extension. As discussed, we have contacted numerous storage facilities and have been unsuccessful in finding anyone who would store our PCP waste until a disposal means was found. We have since pulled together information required to apply for a Waste Storage Variance. This information has been sent to Gregory Rorech of Eder Associates for the purpose of preparing a formal variance application. Gregory has indicated that we will be able to apply for the variance within 30 days. Our current extension will end December 11, 1985.

Please acknowledge the DNR's position to this extension request. If you need additional information, contact me at (715) 845-1161.

Sincerely,

Patrick J. Wierzba
Plant Engineer Manager

PJW/ll

cc: Howard Dolce
Gregory Rorech
Gary Kulibert

Nov 1985

SNE CORPORATION

WAUSAU, WISCONSIN

ENGINEERING REPORT
SUMMARIZING
SITE INVESTIGATION
FOR PENTACHLOROPHENOL

NOVEMBER 1985

PROJECT #509-1

EDER ASSOCIATES

CONSULTING ENGINEERS, P.C.

85 Forest Avenue

Locust Valley, New York 11560

eder associates
consulting engineers, p.c.

November 26, 1985
File #509-1

Mr. Gary Kulibert
Wisconsin Department of Natural Resources
North Central District Headquarters
Box 818
Rhinelander, Wisconsin 54501

Re: SNE Corporation
Wausau, Wisconsin

Dear Mr. Kulibert:

Pursuant to my letter of November 13, 1985 and our recent telephone conversation, enclosed are three copies of our report summarizing the work done to date at SNE Corporation.

In addition to the hydrogeological studies described in the report, we are undertaking the following work which you have requested.

1. An assessment of the impact of vapors, if any, from the floating layer on surrounding homes; and

2. A detailed analysis of the remedial alternatives discussed in Chapter V of this Report.

We hope to have our report on remedial alternatives completed by the middle of December and would like to meet with you in Madison at that time to review our findings.

The study on mineral spirits vapor will be completed as soon as possible.

The drainage improvements have been completed for the courtyard next to the dip line area. An as-built drawing of the changes made will be sent to you shortly. The drainage improvements should prevent any further rainwater from entering the crawl space area near the dip line.

Please call either myself or Bill Warren if you have any questions.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

Leonard J. Eder, P.E.
LJE/nf
Enc.

cc: H. Handzel
S. Kroll
H. Dolce
P. Wierzba
J. Noonan
T. Jirous

85 FOREST AVENUE • LOCUST VALLEY, NEW YORK 11560 • (516) 671-8440

LEONARD J. EDER, P. E. • FREDERICK H. INYARD, P. E. • STEPHEN J. OSMUNDSEN, P. E. • GARY A. ROZMUS, P. E.
JOHN McGUIRE, P. E. • JORGE MOLINA, ING. • WILLIAM J. CUNNINGHAM, P. E. • JOSEPH B. HELLMANN, P. E.

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I. FIELD INVESTIGATION

Introduction

This section describes the monitor well installation and sampling procedures carried out during the spring, summer and fall of 1985 at SNE Corporation, Wausau, Wisconsin. For a further discussion of current and historical plant operations, the reader is referred to the Eder Associates' report of March 1985. That report also contains descriptions of the installation of Monitor Wells W-1 through W-4 and the results of the initial groundwater sample analyses.

Monitor Well Installation

With the exception of W-1 through W-4, all monitor wells installed at and near SNE Corporation (locations are shown on Figure 1) were installed by Wisconsin Test Drilling, Inc., Schofield, Wisconsin, under the supervision of W.M. Warren, Senior Hydrogeologist of Eder Associates. Monitor Wells W-1 through W-4 were installed by Warzyn Test Drilling of Madison, Wisconsin, under the supervision of Joseph Hellmann, P.E. of Eder Associates. The Wisconsin DNR "Guidelines for Monitor Well Installation" (April 9, 1985) were followed during drilling and installation of all monitor wells with hollow stem augers. Strict protocols were followed to prevent cross contamination of monitor wells by drilling and sampling equipment and well materials; and in order to obtain representative samples of the subsoil by split spoon sampling (at five foot intervals).

Four phases of monitor well installation were carried out during the period of May 20 through August 22, 1985. These phases may be characterized as shown in Table 1. Monitor well construction data are presented in Table 2.

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TABLE 1

PHASES OF MONITOR WELL INSTALLATION

Well Numbers	Date Installed	Purpose
W-5 through W-7	May 21-24, 1985	Definition of floating layer of penta on water table in plant area.
W-8 through W-14	May 20-24, 1985	Definition of plume of dissolved penta downgradient and an upgradient background monitor well.
W-1B, W-3B & W-10B	July 23-24, 1985	Definition of vertical extent of dissolved penta at the plant site and downgradient.
W-15 & W-16	July 24th & August 22, 1985, respectively	Definition of floating layer of penta on water table off property to the southeast.

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TABLE 2

MONITOR WELL CONSTRUCTION DATA

Monitor Well No.	Total Depth	Screened Interval	Date Installed
1	43	28-43	December 19, 1984
1B	60	50-60	July 25, 1985
2	42	27-42	December 19, 1984
3	39	24-39	December 20, 1984
3B	60	50-60	July 26, 1985
4	40	25-40	December 20, 1984
5	36	19-37	May 21, 1985
6	40	22-41	May 22, 1985
7	40	22-40	May 23, 1985
8	40	25-40	May 20, 1985
9	23	8-23	May 20, 1985
10	35	20-35	May 21, 1985
10B	58	48-58	July 24, 1985
11	23	8-23	May 21, 1985
12	22	7-22	May 20, 1985
13	40	25-40	May 22, 1985
14	21	6-21	May 23, 1985
15	35	17-35	July 24, 1985
16	29	14-29	August 22, 1985

Table 2 continued . . .

NOTES:

1) All depths are feet below grade - rounded off to nearest foot.

2) All wells, except W-5, W-6, W-7 and W-15, are constructed of two inch diameter, schedule 80 PVC, flush jointed threaded and coupled pipe with machine perforated (0.01 inch) slots.

3) Wells W-5, W-6, W-7, W-8 and W-15 are constructed of two inch diameter black steel threaded and coupled pipe with wire wound galvanized steel well screen (0.01 inch slots).

Plant Area - Floating Layer Monitor Wells

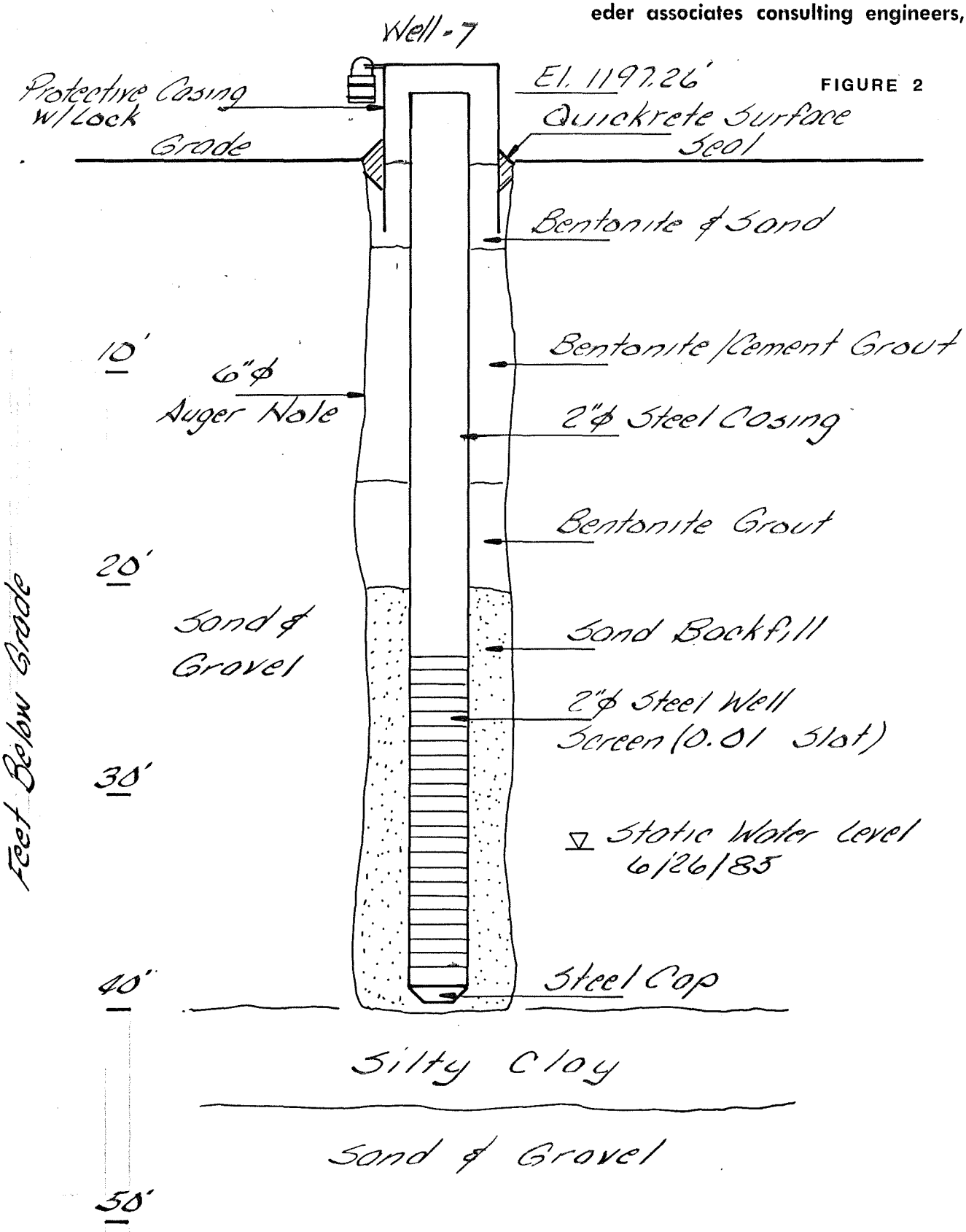
Based on Monitor Wells W-1 through W-4, it was assumed that the floating layer of penta was mostly confined to SNE property. This was assumed on the basis of no floating layer being present downgradient at W-3. Previous experience and published accounts of floating layers indicated that movement, if any, and spreading occurs on the water table, in the downgradient direction. Therefore, the floating layer in the sidegradient monitor well, W-4, was thought to be very near the edge of the spreading floating layer.

Monitor Wells W-5, W-6 and W-7 were installed at locations that would define the floating layer of penta downgradient, sidegradient, and at the source, respectively. These monitor wells were designed in a manner that would allow floating penta to enter the well screen. This was accomplished by placing the 15-foot length of well screen at a depth where five feet of screen was above the water table (as nearly as possible considering the difficulty of determining the static water level while drilling with hollow stem augers). The five feet of screen above the water table allows for a rise in water level after the spring recharge period. Galvanized steel wire-wound well screens were installed in Monitor Wells W-5, W-6 and W-7 to prevent deterioration by the expected solvent nature of penta. Figure 2 shows the typical construction of the floating layer detection wells.

Dissolved Penta Monitor Wells (Upper Water Table)

Groundwater flow directions downgradient of SNE had not been previously defined, although flow toward the discharge point at the Wisconsin River to the east was assumed. Some deviation from the eastward flow direction was expected due to configuration of the River shoreline. In order to intercept all possible groundwater flow paths between the plant and River, a north-south line of monitor wells was installed at right angles to the assumed direction of groundwater flow. The possible changes in groundwater flow directions due to

FIGURE 2



TYPICAL MONITOR WELL - FLOATING LAYER DETECTION

seasonal water level fluctuations were also considered in determining the spatial array of the monitor wells.

Monitor Wells W-8 through W-14 were installed for monitoring the upper 10 feet of the water table with five feet of well screen above the water table to allow for fluctuation. PVC well casing and machine slotted PVC monitor well screen were used in these wells because there was no indication of high concentrations of penta solvents which would attack the PVC. Figure 3 shows a typical dissolved penta plume monitor well.

Dissolved Penta Monitor Wells (Lower Water Table Zone)

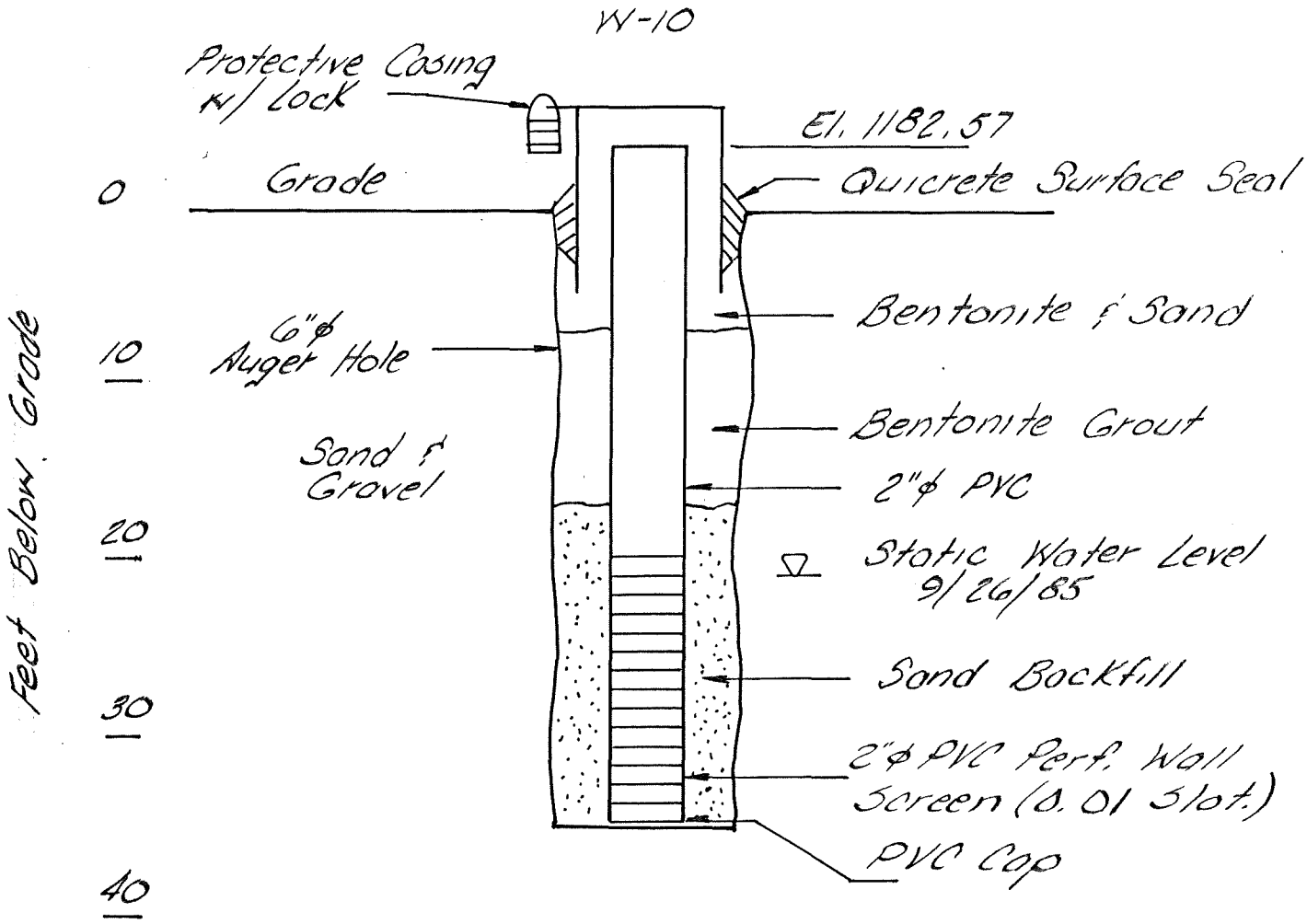
In order to define the vertical extent of dissolved penta in groundwater, three monitor wells (W-1B, W-3B and W-10B) were installed next to existing Monitor Well Nos. W-1, W-3 and W-10. These locations were chosen after receipt of groundwater sample analyses results which revealed the areas where the bulk of dissolved penta was moving with groundwater flow to the Wisconsin River. The on-property upgradient location of W-1 was chosen to determine the amount of upgradient dispersal of penta in the lower zone because penta was detected in the upper water table zone.

Test drilling to the lower zones (below 40 feet) revealed changes in geology to lower permeability clay and sand deposits and bedrock. These PVC wells were installed to monitor the 50 to 60 foot zone and provide groundwater data on the entire saturated thickness of unconsolidated deposits when compared with the adjacent upper water table monitor well (25 to 40 foot zone). Figure 4 shows the typical construction of the lower water table zone monitor wells and the annular seal to isolate the well screen from the shallow water table zone.

Off Property Floating Layer Monitor Wells

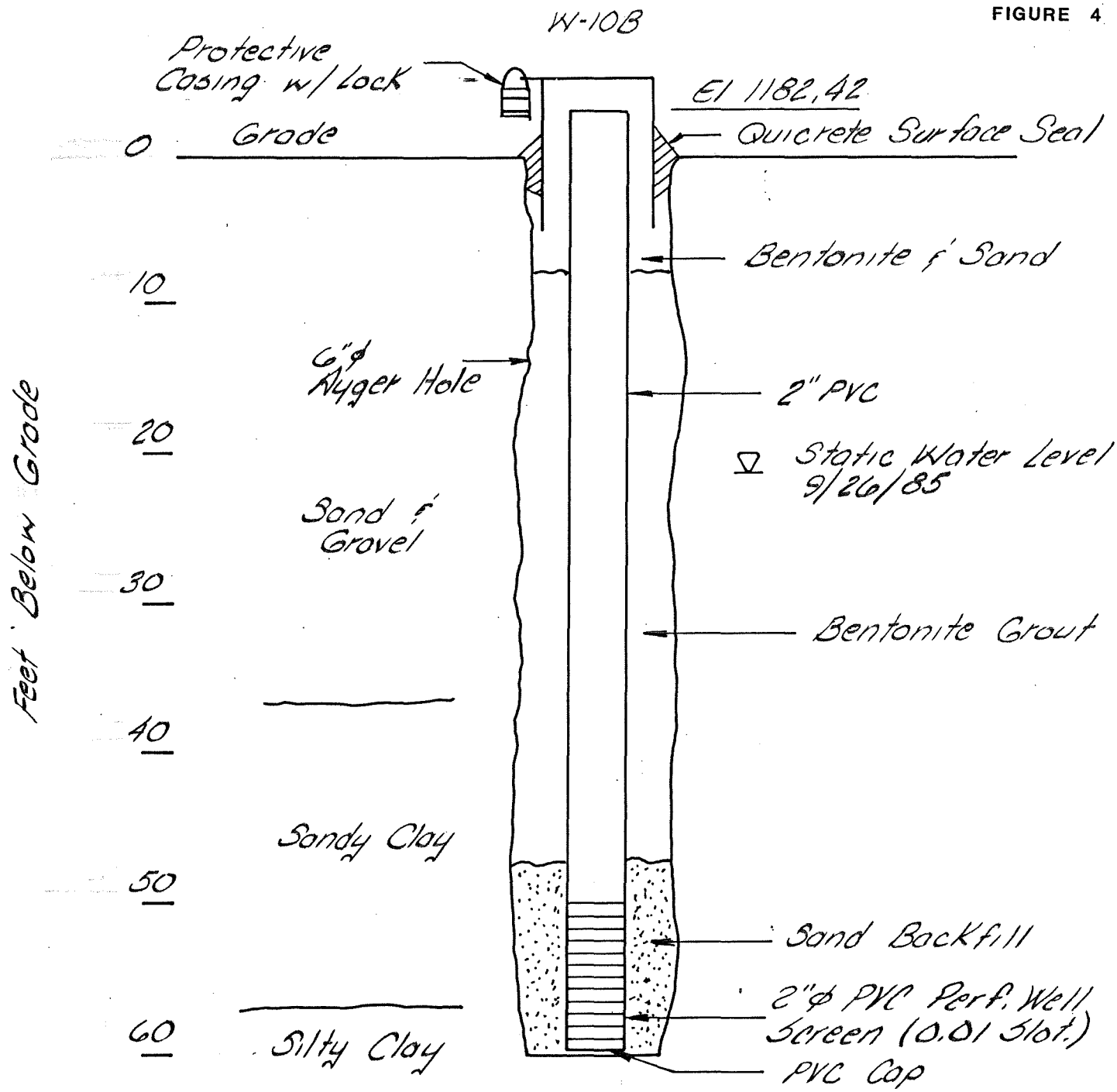
After installation of monitor wells for floating layer and

FIGURE 3



TYPICAL MONITOR WELL - DISSOLVED PENTA DETECTION

FIGURE 4



TYPICAL MONITOR WELL - DISSOLVED PENTA DETECTION

(LOWER WATER TABLE)

dissolved penta plume definition, the possibility of some penta moving in a direction other than downgradient was determined to be a possibility. A location about 300 feet southeast of Monitor Well W-4 was chosen for W-15. A steel well was installed in a similar manner as the other floating layer detection wells. Discovery of a floating layer at W-15 prompted the installation of W-16 which was located by extending a straight line from W-4 through W-15 to a site 250 feet southeast of W-15 (see Figure 1). A PVC well was installed when no penta was discovered at W-16. The upper water table zone is being monitored by Monitor Well W-16.

Monitor Well Sampling

Following the May 1985 drilling program, water samples were collected and analyzed for PCP. Water samples were also collected In June and August 1985 for determination of dissolved concentrations of PCP and VOCs (volatile organic compounds). Mineral spirits concentrations were also quantified for all monitor well samples collected in the August round of samples. Monitor well sampling protocol followed established methods for the prevention of cross contamination and collection of representative groundwater samples. The protocol followed for each monitor well sampling is presented in Appendix A. Chain of custody forms were maintained and the completed forms are also presented in Appendix A.

Water samples were analyzed by Zimpro, Inc., Rothschild, Wisconsin, and by Parker Services, Inc., Stevens Point, Wisconsin. PCP, mineral spirits, and VOC analyses were performed by Zimpro and PCP analyses were performed by Parker Services. Appendix B contains the analytical methods and protocols used by the laboratories.

Tables 3, 4 and 5 present pertinent data on sampling dates, constituents determined, and laboratory used for each monitor well sampling round.

Referring to Table 5, the August 16, 1985, sampling round included

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TABLE 3

MONITOR WELL SAMPLING & ANALYSES DATA

MAY 25, 1985, SAMPLE ROUND

Monitor Well No.	Sample No.	Analyte	Laboratory
W-1	16	PCP	Parker Services, Inc.
W-2	14	PCP	Parker Services, Inc.
W-2*	15	PCP	Parker Services, Inc.
W-3	13	PCP	Parker Services, Inc.
W-8	12	PCP	Parker Services, Inc.
W-9	7	PCP	Parker Services, Inc.
W-10	5	PCP	Parker Services, Inc.
W-10*	6	PCP	Parker Services, Inc.
W-11	4	PCP	Parker Services, Inc.
W-12	3	PCP	Parker Services, Inc.
W-14*	2	PCP	Parker Services, Inc.
W-14*	1	PCP	Parker Services, Inc.
W-13	21	PCP	Parker Services, Inc.
Field Blank**	17	PCP	Parker Services, Inc.
Trip Blank**	18	PCP	Parker Services, Inc.
Quality Control Sample***	CS-1	PCP	Parker Services, Inc.
Quality Control Sample****	CS-2	PCP	Parker Services, Inc.

Table 3 continued . . .

* Blind replicate sample for laboratory quality control.

** Blind field and trip blanks (distilled water) for laboratory quality control.

*** Sample of distilled water used to clean split spoon samplers.

**** Sample of drilling water - Wausau City Water.

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TABLE 4

MONITOR WELL SAMPLING & ANALYSES DATA

JUNE 25, 1985, SAMPLE ROUND

Monitor Well No.	Sample No.	Analytes	Laboratory
W-1	6	PCP/VOCs	Parker/Zimpro
W-2	2	PCP/VOCs	Parker/Zimpro
W-3	4	PCP/VOCs	Parker/Zimpro
W-8	1	PCP/VOCs	Parker/Zimpro
W-9	9	PCP/VOCs	Parker/Zimpro
W-10	8	PCP/VOCs	Parker/Zimpro
W-11	7	PCP/VOCs	Parker/Zimpro
W-12	5	PCP/VOCs	Parker/Zimpro
W-13	10	PCP/VOCs	Parker/Zimpro
W-14	3	PCP/VOCs	Parker/Zimpro

Notes: PCP analysis by Parker Services, Inc. and VOC analysis by Zimpro, Inc.

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TABLE 5

MONITOR WELL SAMPLING & ANALYSES DATA

AUGUST 16, 1985, SAMPLE ROUND

Monitor Well No.	Sample No.	Analytes	Laboratory
W-1	10	VOCs, MS & PCP	Zimpro
W-1B	8 & 9	VOCs, MS & PCP	Zimpro
W-2	18	VOCs, MS & PCP	Zimpro
W-3	24 & 25	PCP	Parker
W-3B	22 & 23	VOCs, MS & PCP	Zimpro/Parker
W-8	1, 2, 3 & 4	VOCs, MS & PCP	Zimpro/Parker
W-9	11	VOCs, MS & PCP	Zimpro
W-10	26, 27, 28 & 29	VOCs, MS & PCP	Zimpro/Parker
W-10B	19 & 20	VOCs, MS & PCP	Zimpro/Parker
W-11	16 & 17	VOCs, MS & PCP	Zimpro/Parker
W-12	12 & 13	VOCs, MS & PCP	Zimpro/Parker
W-13	14 & 15	VOCs, MS & PCP	Zimpro/Parker
W-14	5, 6 & 7	VOCs, MS & PCP	Zimpro/Parker
Field Blank (distilled water)	21	PCP	Parker
Field Blank (distilled water)	30	VOCs, MS & PCP	Zimpro

NOTES:

1) PCP analysis by Parker Services, Inc.; and mineral spirits (MS) and VOCs analyses by Zimpro.

2) Where two or four sample numbers are indicated, the samples were replicated for quality control.

several replicate samples for quality control. This was done because PCP was detected by Parker Services in the June 26, 1985 sample from the upgradient well, W-8. The results of analyses are discussed in a later section of this report.

Wisconsin River Sampling

On September 26, 1985, the Wisconsin River was sampled at the locations shown on Figure 5. The sampling technique consisted of the use of a teflon bailer on a line which was cast out about 20 feet from the Riverbank. These samples were submitted to Parker Services, Inc. for determination of dissolved PCP concentrations.

The purpose of the Wisconsin River water sampling was to determine whether the low concentrations of PCP in groundwater discharge could be detected in the River.

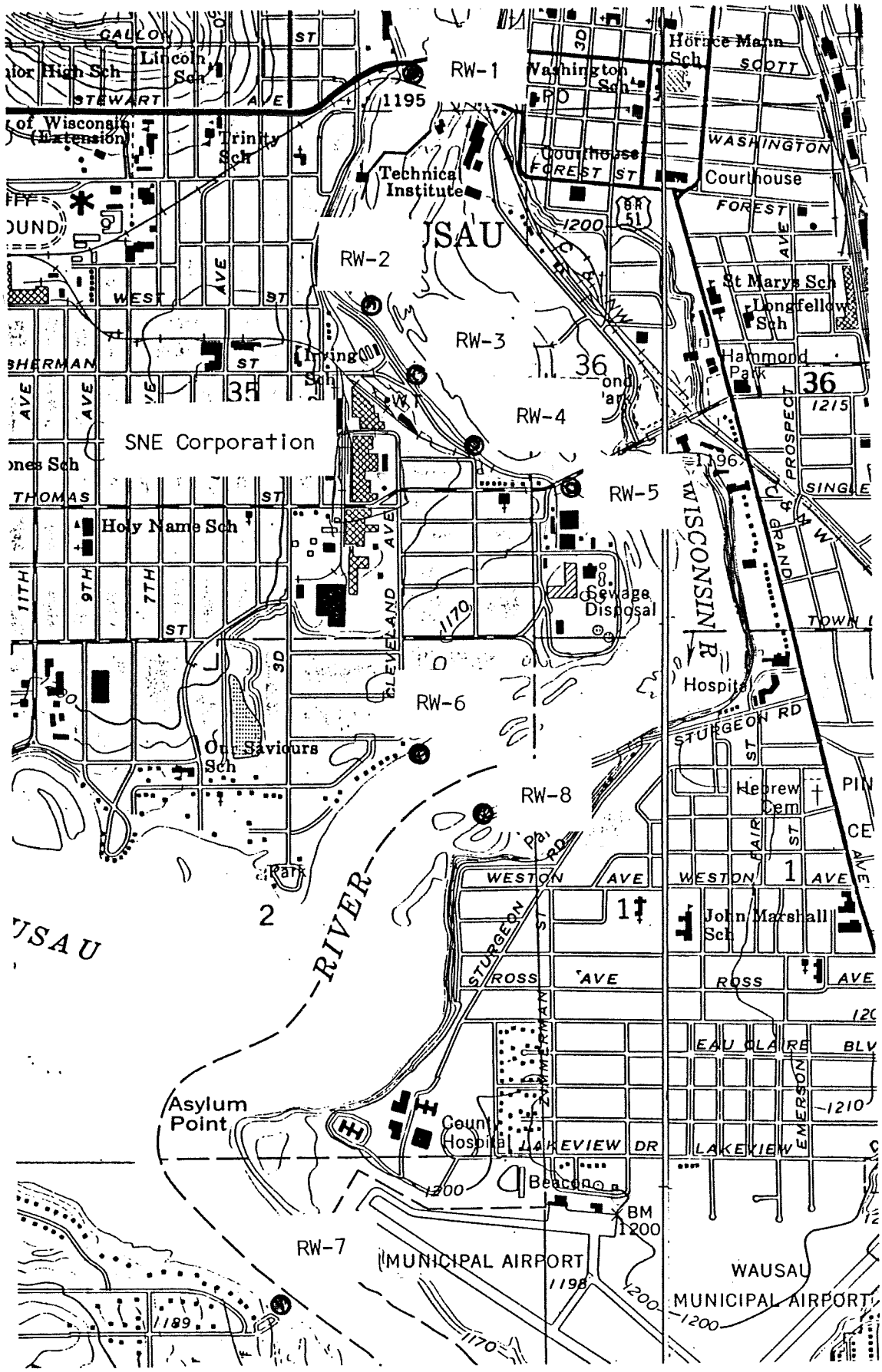
Additional Data Collection

The elevations of monitor well measuring reference points (top of casing) were surveyed and referenced to United States Geological Survey (USGS) benchmark elevation by Edwin R. Abendroth, Registered Land Surveyor, Wausau, Wisconsin (RLS no. 5-798). All water level measurements are referenced to the surveyed elevations. Water level elevations were measured prior to each sample collection event and at other times during the period of May through September, 1985.

Additional field measurements consisted of determining the thickness of floating layers in monitor wells for comparison with water levels and previous layer measurements.

Subsoil borings were also performed next to the 8,000 gallon buried penta storage tank and in the dip line room. The latter boring was attempted with a hand auger because of the very limited access to the room. The subsoil samples collected from these borings and Monitor Wells W-5 through W-16 (and all subsoil samples) are stored under refrigeration at the Parker Services, Inc. laboratory.

FIGURE 5



LOCATION OF WISCONSIN RIVER

SAMPLING POINTS - SEPTEMBER 26, 1985

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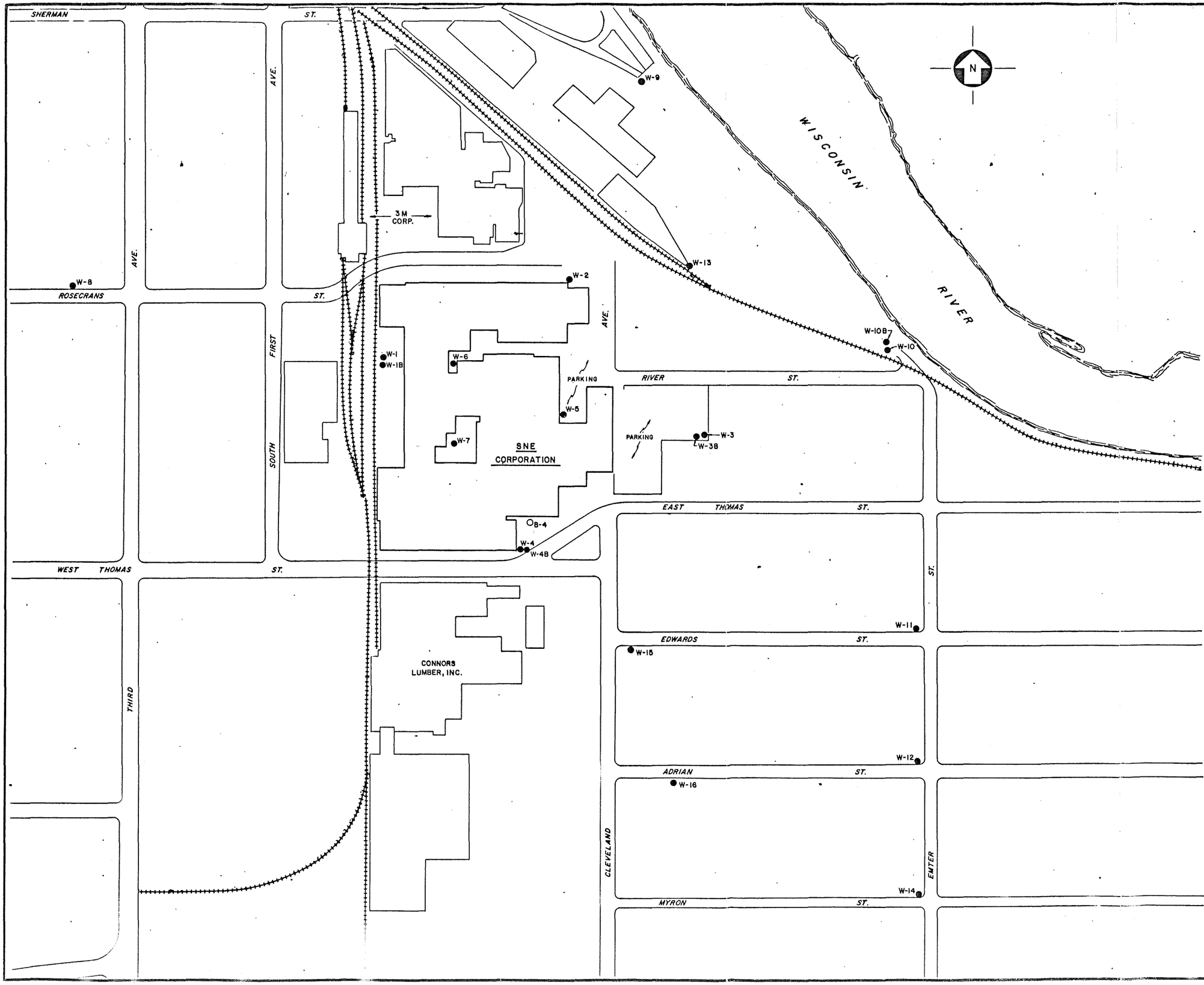
II. RESULTS OF FIELD INVESTIGATION

Geologic Conditions

The results of test drilling indicate a general agreement with published accounts by the USGS and the Wisconsin Geological Survey. The geology of the general area, mapped on a large scale (1:125000), is presented in the USGS Water Supply Paper 2022, "Water Availability in Central Wisconsin - An Area of Near Surface Crystaline Rock". Descriptions of the bedrock geology are provided in the Wisconsin Geological Survey Information Circular Number 45, "Precambrian Geology of Marathon County, Wisconsin". The latter report is of limited value because the site is underlain by unconsolidated deposits of glacio-fluvial origin that blanket the Precambrian bedrock along the Wisconsin River. Water Supply Paper 2022 indicates that the site is located at or near the contact of glacial outwash deposits and alluvium of the Wisconsin River. The distinction between the two types of deposit is minimal since each is comprised of unconsolidated deposits of sand and gravel, with varying amounts of clay and silt occurring as either lenses or in the sand and gravel matrix. Published data indicated that bedrock at the site may be 80 to 100 feet below land surface and probably a syenite rock type. A shallow house well located about 2,000 feet southeast of the site on Chellis Street reportedly penetrated the bedrock surface at a depth of 20 feet. There are reportedly no wells or well records available for the immediate vicinity of the SNE site, and City well inventories indicate that it is doubtful that any wells are located within a one-quarter mile radius of the site. Private wells are prohibited by city ordinance where there is a municipal supply.

The geologic cross sections are located in Figure 6 and presented in Figures 7 and 8. The sections are based on geologic sampling data collected during the installation of monitor wells at and near the SNE



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GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
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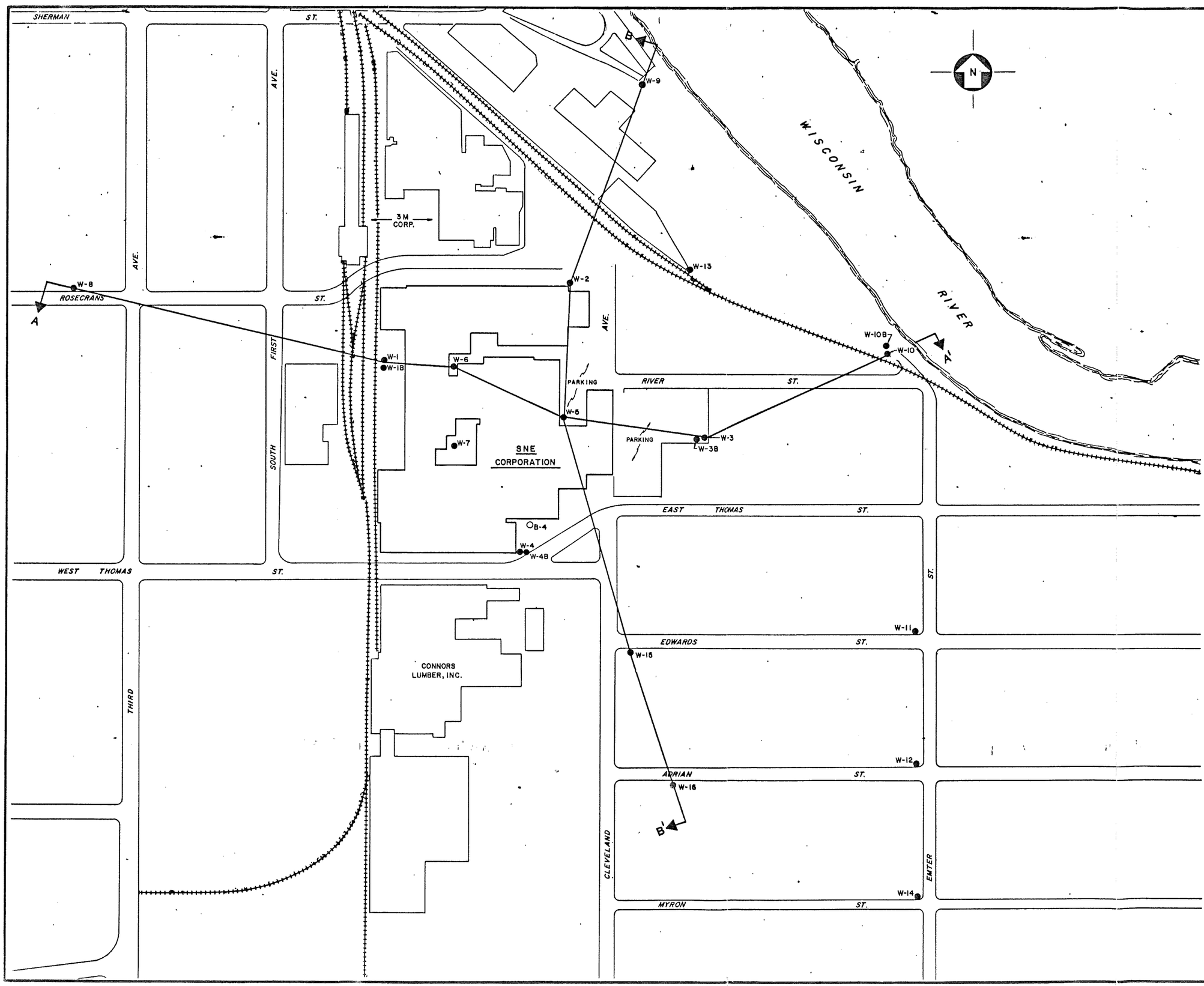
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
LOCATION OF MONITOR WELLS

eder associates consulting engineers, p.c.
85 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY FAO	SCALE 1"=200'
DESIGNED BY NAW	PROJECT NO 309-1
APPROVED BY LE	DWG. NO 1
DATE	



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PROJECT
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WAUSAU, WISCONSIN

TITLE
LOCATION OF HYDROGEOLOGIC CROSS SECTION PROFILES

eder associates consulting engineers, p.c.
66 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

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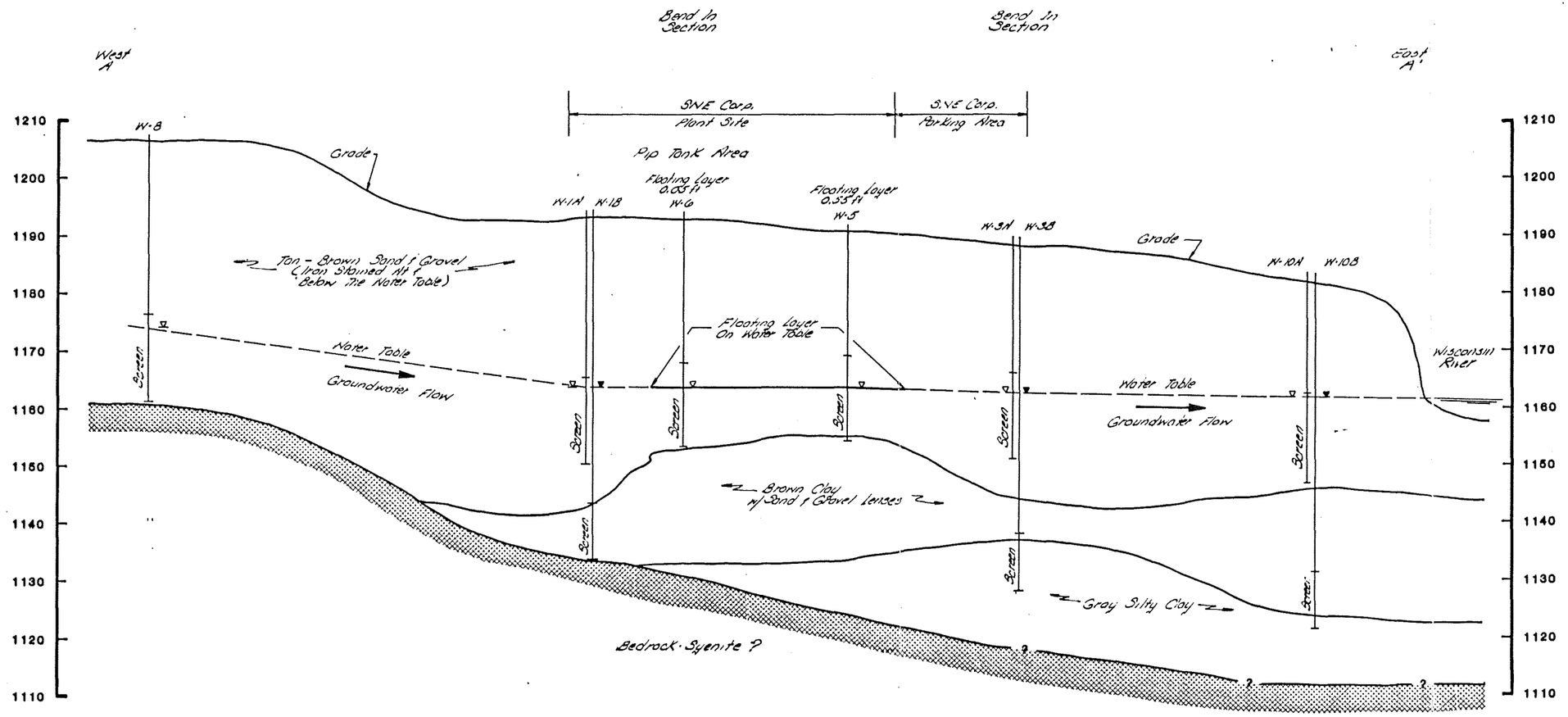
APPROVED BY LVE	DWG. NO 6
DATE November 1985	



LEGEND

▽ Water Level - Water Table Zone
▼ Water Level - Lower Zone
} Meas. 9/26/85

Vertical Exag. = 10x

Note:
Elevations - Feet Above Mean Sea Level

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TITLE
HYDROGEOLOGIC CROSS SECTION A-A'

eder associates consulting engineers, p.c.
88 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

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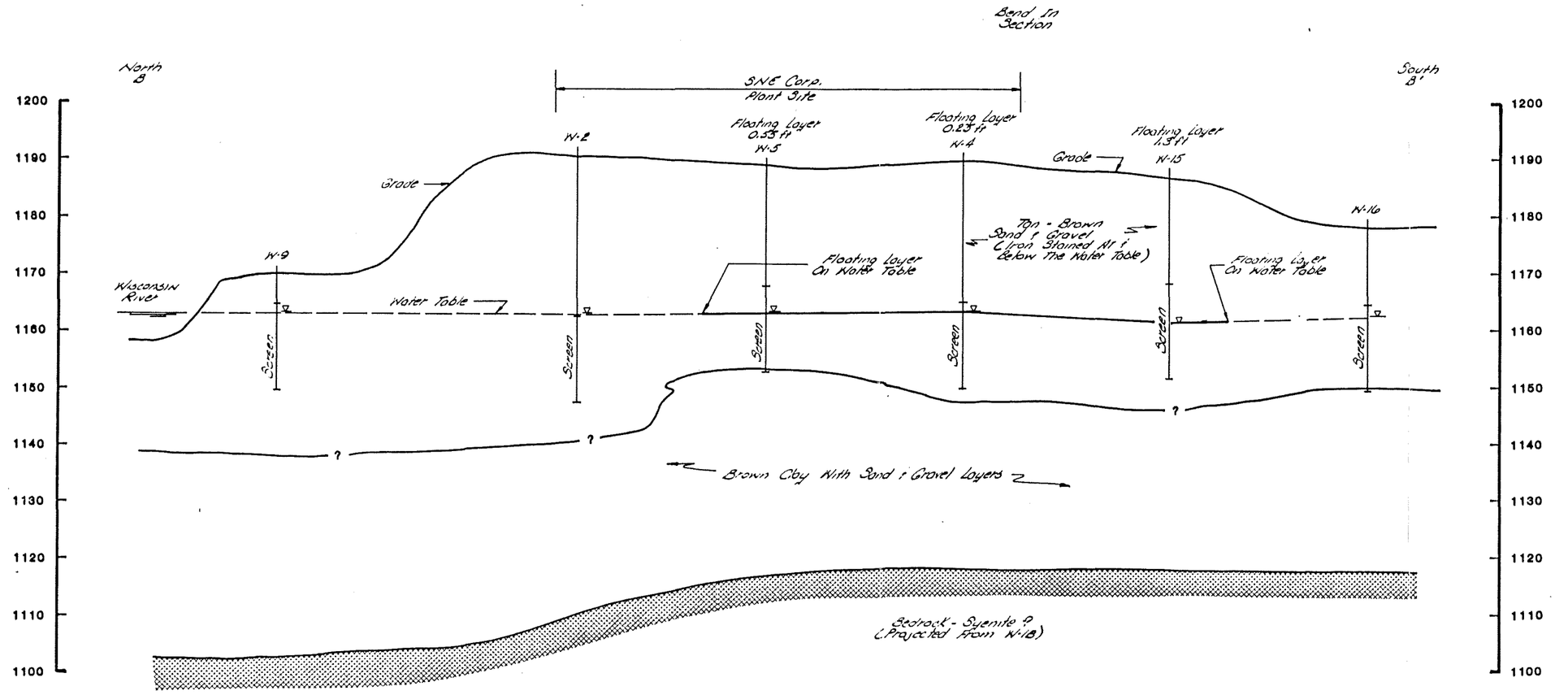
DESIGNED BY [illegible]	PROJECT No 3091
APPROVED BY [illegible]	DWG. No 7
DATE [illegible] 1985	



LEGEND

▽ Water level - Water Table Zone (Nov. 9/26/85)
Vertical Exag. = 10x

Note-
Elevations - Feet Above Mean Sea Level

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TITLE
HYDROGEOLOGIC CROSS SECTION B-B'

eder associates consulting engineers, p.c.
85 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY NFG	SCALE Hor. 1"=20' Ver. 1"=100'
DESIGNED BY NMN	PROJECT No 509-1
APPROVED BY SJO	DWG. No 8
DATE November 1985	

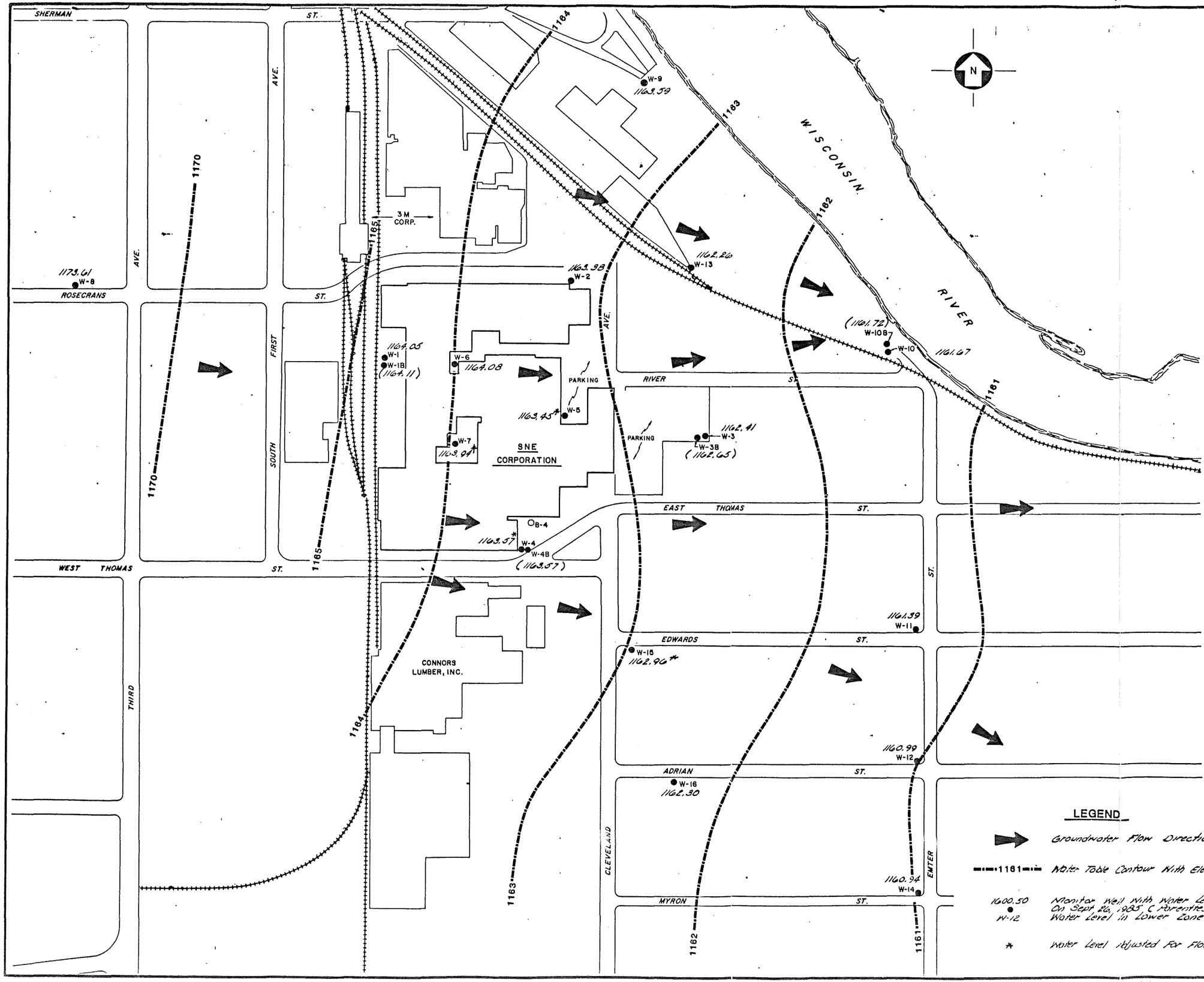
plant site. As shown, bedrock (probably syenite) at SNE is overlain by about 60 to 70 feet of unconsolidated deposits. Figures 7 and 8 show that the upper unconsolidated deposits consist of sand and gravel overlying sandy clay which is in turn underlain by silty clay. Descriptions of geologic samples are presented in Appendix C.

Groundwater Conditions

Water table maps were prepared from water level measurements made on May 25th and September 26, 1985, and are presented on Figures 9 and 10. Water level measurements and measuring point elevations are presented in Appendix D. The September map includes additional measurements made at W-15 and W-16. A comparison of the two maps reveals similar flow patterns except near the Wisconsin River. Above normal rainfall and high River levels in September caused higher groundwater levels along the River and a resultant groundwater flow component more parallel to the River compared to May. The normal range of seasonal water table fluctuations is from lowest levels during February through March to highest levels during April through July. In 1985, groundwater levels were still rising in September as a result of record rainfall amounts through the late summer and fall.

Groundwater flow directions shown on Figure 10 verify a generally easterly flow path from the SNE property to the Wisconsin River. Variations occur near the River as discussed above and southeast of SNE where flow is in a southeasterly direction.

The bulk of groundwater flow occurs in the more permeable near surface sand and gravel, which is shown on the hydrogeologic cross sections (Figures 7 and 8). The average thickness of the sand and gravel is about 35 feet and the lower 10 to 20 feet is saturated. Groundwater flow in the underlying sandy clay and silty clay is much lower than in the sand and gravel due to the lower permeability of these lower zones. The permeability of the sand and gravel is estimated at 10^{-2} cm/sec, compared to 10^{-4} to 10^{-5} cm/sec is estimated for the lower zones.



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SNE CORPORATION
WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
WATER-TABLE MAP
9/26/85

eder associates consulting engineers, p.c.
88 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

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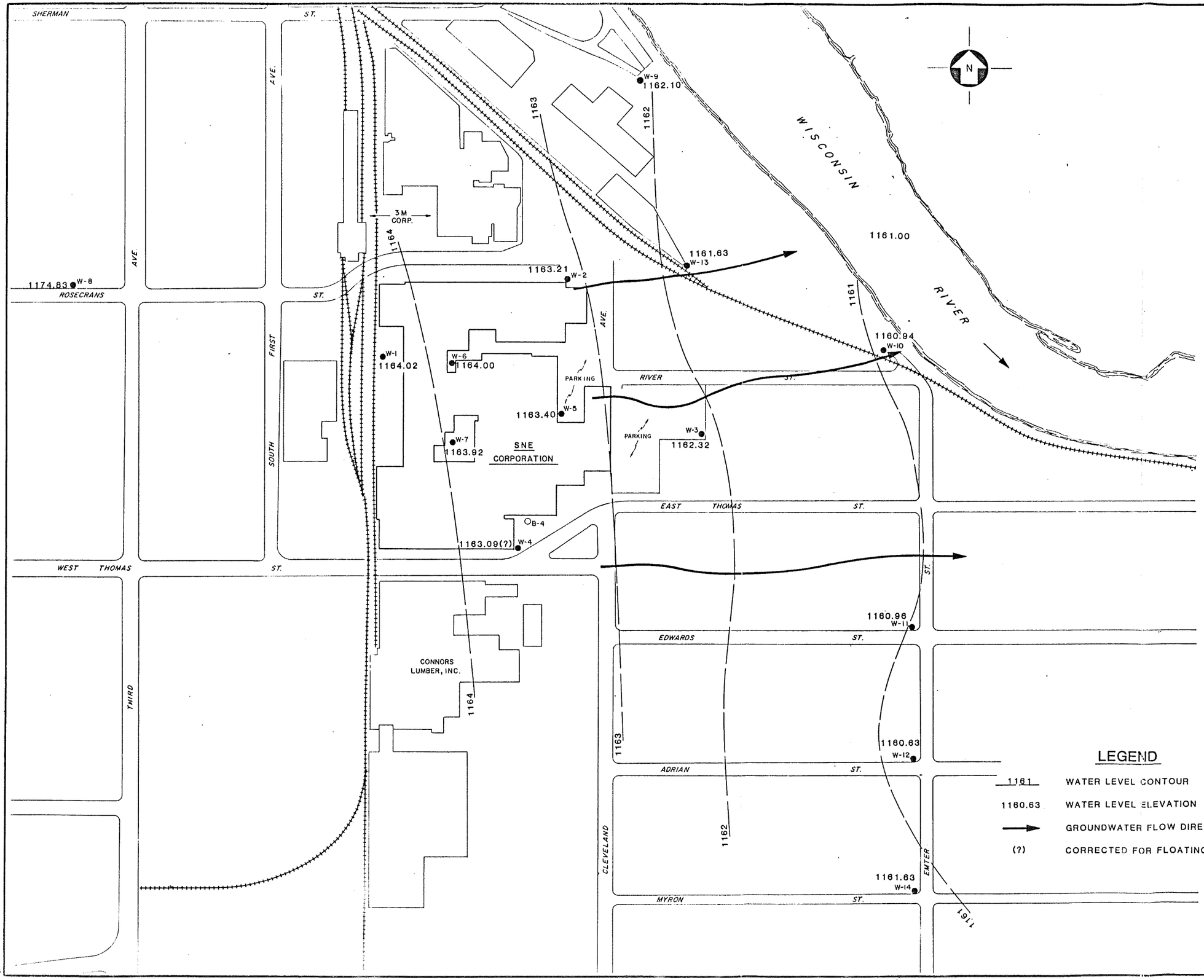
DESIGNED BY N.P.W.	PROJECT NO 509-1
APPROVED BY [illegible]	DWG. NO 10
DATE [illegible]	



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GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
PRELIMINARY
WATERTABLE MAP
5/25/85

eder associates consulting engineers, p.c.
65 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY	SCALE 1"=800'
DESIGNED BY	PROJECT Nº
APPROVED BY	DWG. Nº 9
DATE	

A groundwater flow velocity for the SNE area may be calculated by the following equation (based on Darcy's Law):

$$\text{Average Velocity} = V = \frac{Kdh/dl}{.20}$$

Where:

K = permeability, ft/day (maximum)
dh = change in hydraulic head, ft
dl = length of flow segment, ft
.20 = effective porosity, 20%

For the SNE area:

K = assumed 28 ft/day (10^{-2} cm/sec)
dh = 2 feet
dl = 800 feet

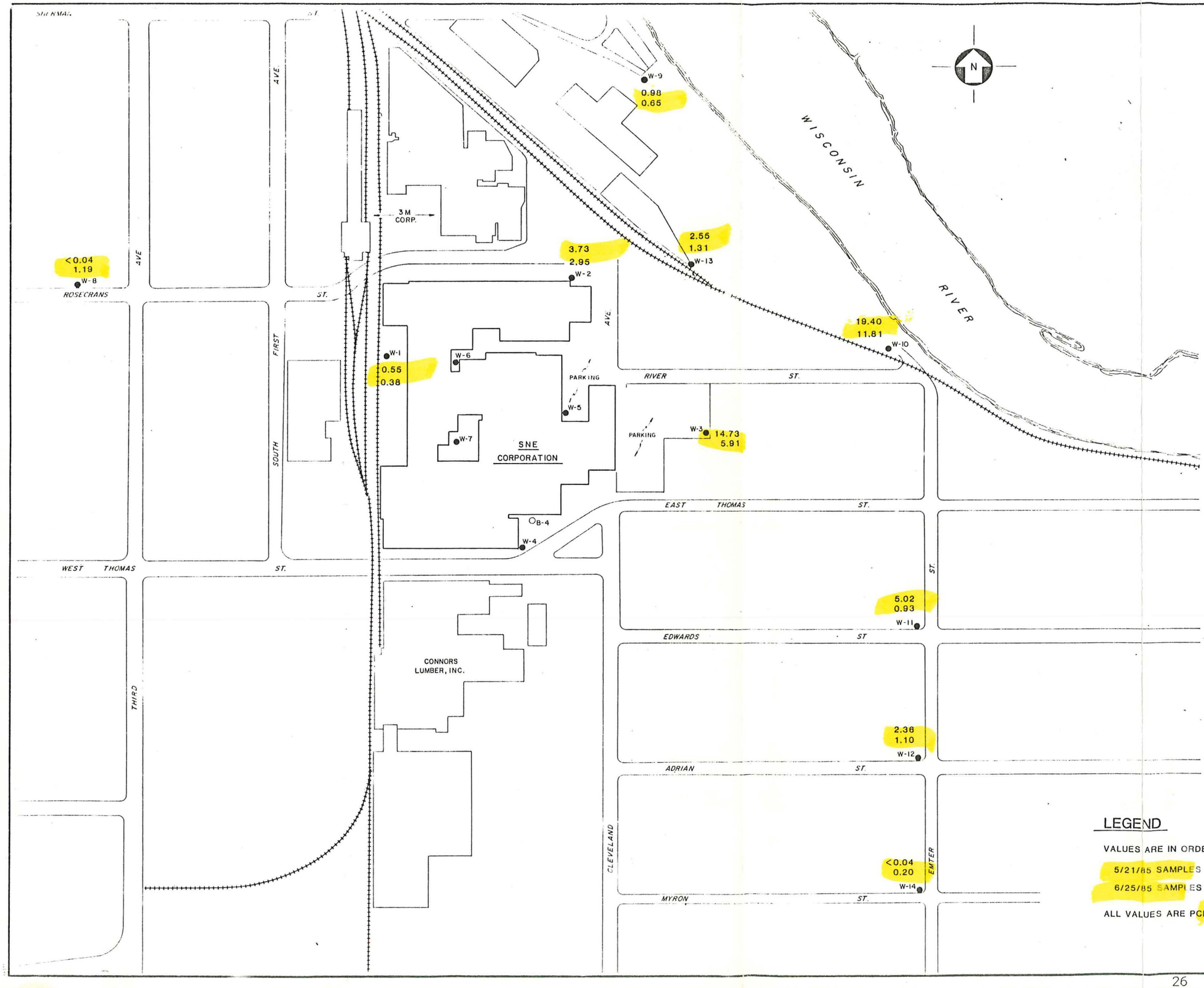
$$V = \frac{(28 \text{ ft/day})(.003)}{0.2}$$

V = 5 inches/day

Groundwater Quality

Dissolved Compounds

Analytical results for PCP are presented in Figures 11 (May and June) and 12 (August), and the results for indicator VOCs are presented in Figures 13 (June) and 14 (August). The complete results of analyses are presented in Appendix E. A comparison of distributions of PCP and VOCs on the four maps reveal that these compounds overlapped in areal distribution and concentration on each of the sampling dates. For example, the highest downgradient concentrations of PCP and TCE (trichloroethylene) are at Monitor Wells



LEGEND

VALUES ARE IN ORDER

5/21/85 SAMPLES

6/25/85 SAMPLES

ALL VALUES ARE PCP IN mg/l

Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

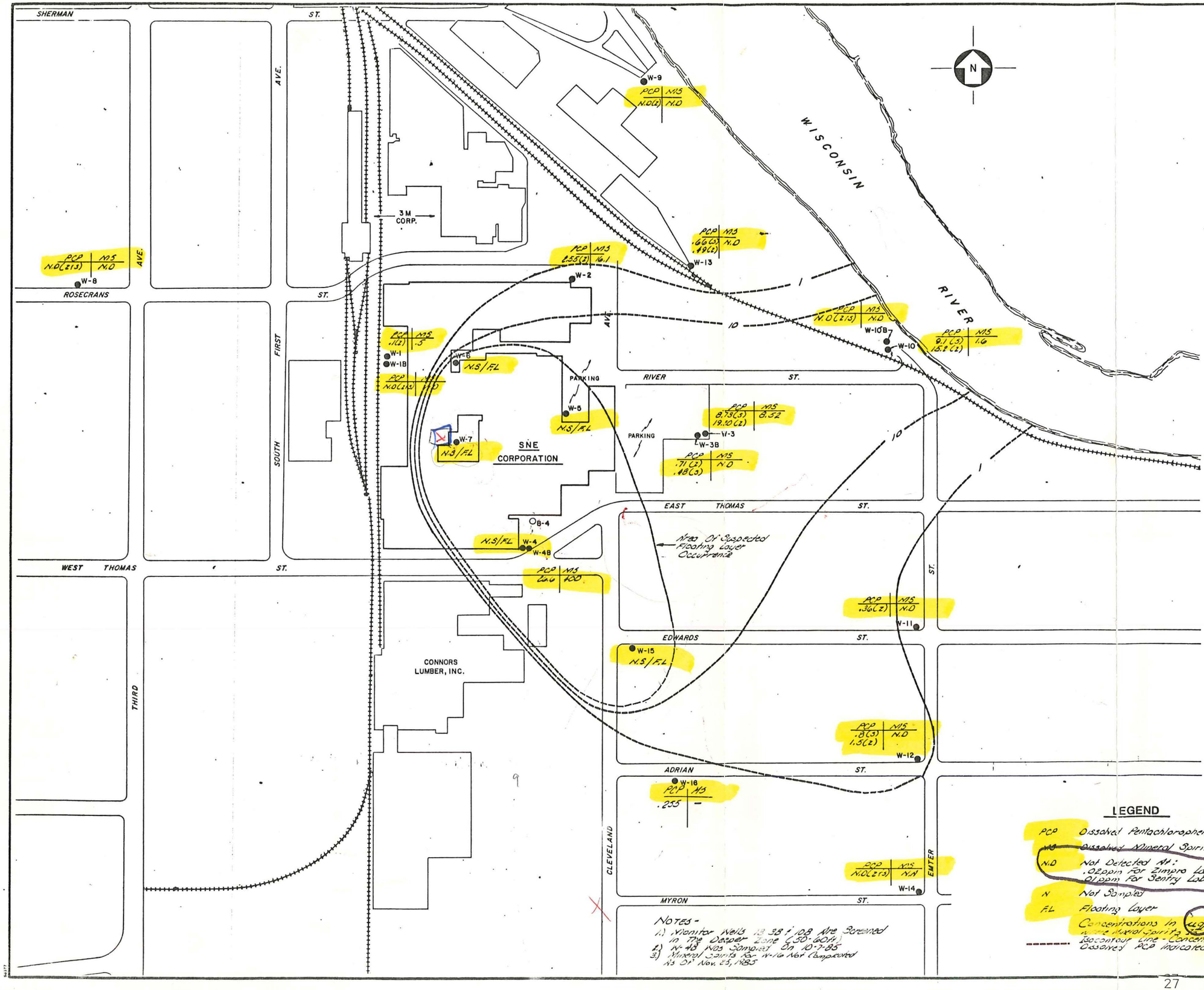
eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
SUMMARY OF 5/21/85 & 6/25/85 PCP ANALYSES

eder associates consulting engineers, pc
85 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY	SCALE
DESIGNED BY	PROJECT Nº
APPROVED BY	DWG Nº 11
DATE	



NOTES -
1.) Monitor Wells W-3B & W-10B Are Screened In The Deeper Zone (430-604')
2.) W-4B Was Sampled On 10-9-85
3.) Mineral Spirits Re- W-16 Not Completed As Of Nov. 25, 1985

LEGEND

PCP	Dissolved Pentachlorophenol
MS	Dissolved Mineral Spirits (Analysis By Zimpro Labs)
N.D	Not Detected At: .02ppm For Zimpro Labs (2) .01ppm For Sentry Labs (3)
N	Not Sampled
FL	Floating Layer
	Concentrations In ug/l Except W-4B Where Mineral Spirits Are In mg/l.
-------	Isocontour Line - Concentration Of Dissolved PCP Indicated In ug/l

Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
SUMMARY OF 8/16/85 PCP & MINERAL SPIRITS ANALYSES

eder associates consulting engineers, p.c.
86 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY FAD	SCALE 1"=100'
DESIGNED BY NWW	PROJECT Nº 509-1
APPROVED BY JE	DWG. Nº 12
DATE November 1985	

SHERMAN ST.

AVE.

ROSECRANS ST.

FIRST AVE.

SOUTH

3M CORP.

WISCONSIN RIVER

W-8: X X X 0.1

W-9: 0.7 3.0 X 1.4

W-13: 1.0 X X 13.5

W-2: 1.4 0.3 7.2 31.2

W-10: 9.8 5.2 24.6 140.0

W-1: X X X 1.0

W-6

PARKING

RIVER ST.

W-5

W-7

SNE CORPORATION

PARKING

W-3: 33.2 9.2 47.2 420.0

EAST THOMAS ST.

B-4

W-4

WEST THOMAS ST.

CONNORS LUMBER, INC.

THIRD

CLEVELAND

EMTER

W-11: 0.6 0.5 1.2 3.9

EDWARDS ST.

W-12: 2.0 0.6 7.8 9.8

ADRIAN ST.

W-14: X X X 0.3

MYRON ST.

LEGEND

VALUES ARE IN ORDER

BENZENE
1,2-DICHLOROETHYLENE
TOLUENE
TRICHLOROETHYLENE

ALL VALUES ARE ug/l

Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
SUMMARY OF 6/25/85 VOC ANALYSES

eder associates consulting engineers, p.c.
85 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY	SCALE 1"=200'
DESIGNED BY	PROJECT Nº
APPROVED BY	DWG Nº 13
DATE	

W-3 and W-10. TCE appears to be the most prevalent VOC detected, both in concentration and distribution in groundwater. Other VOCs, such as benzene and toluene, are found in lower concentrations and in the same monitor wells where PCP and TCE are present.

The iso-contour lines on Figure 12 for PCP concentrations illustrate the extent of dissolved PCP in groundwater downgradient of SNE. The iso-contours also define the area where dissolved mineral spirits, TCE, toluene, and benzene are present in groundwater.

The compound 1,2 dichloroethylene was detected only at Monitor Well W-9 and at a concentration at the detection limit (0.3 ug/l). This is in contrast to the analytical results of June 26, 1985, samples, as shown on Figure 13. Concentrations of 1,2 dichloroethylene ranged as high as 9.2 ug/l at W-3 in June 1985, but the August results indicated the disappearance of this compound. Overall, the August monitor well samples contained lower concentrations of VOCs.

Changes in PCP concentrations between June and August indicate overall lower concentrations in August compared to June which were lower than the May results. VOCs were also lower in August than June. Exceptions to this overall downward trend is noted for dissolved PCP concentrations at W-3 and W-10 which appear to be in the primary flow path from SNE to the Wisconsin River.

Samples taken from the lower water table zone in Monitor Wells W-1B, W-3B and W-10B only revealed the presence of PCP and VOCs at W-3B. This monitor well is next to W-3 which contains the highest concentrations of PCP and VOCs gradient of the site.

Replication of samples analyses for PCP revealed consistent results in each laboratory, but showed substantial variation between Parker Services, Inc. and Zimpro, Inc. Neither laboratory failed to detect PCP, if present, although Parker Services consistently reported

SHERMAN ST.
ROSECRANS
WEST THOMAS ST.
EAST THOMAS ST.
EDWARDS ST.
ADRIAN ST.
MYRON ST.
RIVER ST.
AVE.
FIRST AVE. SOUTH
THIRD
CLEVELAND
EMTER
ST.
WISCONSIN RIVER
3M CORP.
SNE CORPORATION
CONNORS LUMBER, INC.
PARKING
PARKING
N

W-8 N.D N.D N.D
W-9 0.7 0.9 0.2 N.D
W-13 0.9 N.D N.D 11.2
W-2 0.9 N.D 1.2 34.7
W-1 N.D
W-1B N.D N.D N.D 0.9
W-6 N.S/F.L
W-7 N.S/F.L
W-5 N.S/F.L
W-3 22 N.D 42 29.1
W-3B 0.2 N.D 0.1 N.D
W-10B N.D N.D 0.1 N.D
W-10 1.3 N.D N.D 10.4 *
B-4
W-4 N.S/F.L
W-4B N.D N.D N.D 24
W-11 N.D N.D N.D 2.9
W-15 N.A/F.L
W-12 0.6 N.D 0.1 9.2
W-16 N.D. N.D. 0.7 0.9
W-14 N.D N.D N.D N.D

NOTE-
W-4B was Sampled On 10/7/85
W-16 was Sampled On 11/5/85

LEGEND

VALUES ARE IN ORDER
- Benzene
- 1,2 Dichloroethylene
- Toluene
- Trichloroethylene

All Values are in ug/l

N.D Not Detected
F.L Floating Layer
N.S Not Sampled
* Average Of Replicate Analyses

Analyses By Zimpro Labs

№	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
SUMMARY OF 8/16/85 VOC ANALYSES

eder associates consulting engineers, p.c.
68 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY FJO	SCALE 1"=100'
DESIGNED BY N.V.N	PROJECT № 509-1
APPROVED BY L.E	DWG. № 14
DATE 12/27/85	

Sentry

detected - PCP
(mid 9-9-85)

PARKER SERVICES, INC.

Environmental Health Division

Aug. 16, 1985 = Sample Collection

Laboratory Use Only

Client SNE CORP.

Project Number 85-424

Address

Date Received 8-19-85

City State Zip

Date Analyzed 8-21 Analyst Rel

Contact Pat Wiegert Tel.

Data Authorized By Bob Vobrosky

Analytical Request

P.O.#

Analytical Results

Sample No.	Contaminant	Volume (Liters)	Comments	Laboratory Number	Concentration PPM	Analytical Method
Well*						
1-1,2 W8	PCP	500cc	Pentachlorophenol	4472	BDL	EPA 3510/8040
	Min. Sp.		Mineral Spirits		BDL	
2-1,2 W8	PCP			4473	BDL	
	Min. Sp.				BDL	
5-1,2 WA	PCP			4474	BDL	
	Min. Sp.				BDL	
12-1,2 W12	PCP			4475	0.80	
	Min. Sp.				2.86	
14-1,2 W13	PCP			4476	0.66	
	Min. Sp.				7.14	
16-1,2 W11	PCP			4477	0.33	
	Min. Sp.				2.86	
19-1,2 W10B	PCP			4478	BDL	
	Min. Sp.				BDL	
21-1,2 Dist. H_2O	PCP			4479	BDL	
	Min Sp.				BDL	

Parker Services, Inc.
1800 North Point Dr.
Stevens Point, WI 54481
715 346-7786

.01 = DL(ppm)

White Copy — Client Report
Green Copy — Laboratory File

Sentry.

PARKER SERVICES, INC.

Environmental Health Division

Client SNE (Eder Associates)

Address

City State Zip

Contact Pat Wierzbo Tel. 1-845-1161

Laboratory Use Only

Project Number 85-001-B

Date Received 5-21-85

Date Analyzed 6-20 Analyst BJ

Data Authorized By Robert Vobornik

Analytical Request / Analytical Results

Sample No	Contaminant	Volume (Liters)	Comments	Laboratory Number	Concentration PPM	Analytical Method	
CS-1	Pentachlorophenol		250mL Vol.	2059	< 0.04	EPA 8040	
CS-2	"		"	2060	< 0.04		
W-11-1	"		"	2061	0.55	W-11	Wkf #
1	"		"	2062	< 0.04		14
2	"		"	2063	< 0.04		14
3	"		"	2064	2.36		12
4	"		"	2065	5.02		11
5	"		"	2066	23.64		10
6	"		150ml Vol	2067	15.15		10
7	"		250mL Vol	2068	0.98		9
12	"		"	2069	< 0.04		8
13	"		"	2070	14.73		3
14	"		"	2071	5.82		2
15	"		"	2072	1.64		2
16	"		"	2073	0.55		1
17	"		"	2074	< 0.04		6
18	"		"	2075	< 0.04		11
21			"	2076	2.55		13

Parker Services, Inc.
1800 North Point Dr.

SNE Corp.
VOC Analysis (ug/l)
June 25, 1985

	Detection Limit	1	2	3	4	5
Benzene	0.2	X	1.4	X	33.2	2.0
Bromoform	0.5	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X
Carbon Tetrachloride	0.1	X	1.5	X	X	X
Chlorobenzene	0.1	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X
Chloroform	0.1	0.4	5.3	0.5	4.5	3.7
Chloromethane	6.0	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X
Dichlorobromomethane	0.1	X	0.2	X	X	X
1,1-Dichloroethane	0.1	X	X	0.1	0.2	X
1,2-Dichloroethane	0.3	X	X	X	X	X
1,1-Dichloroethylene	0.5	X	X	X	X	X
1,2-Dichloroethylene	0.3	X	0.3	X	9.2	0.6
Dichloromethane	0.2	X	X	X	0.2	X
1,2-Dichloropropane	0.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X	X
Tetrachloroethylene	0.1	0.1	1.3	1.8	1.9	1.1
Toluene	0.1	X	7.2	X	47.2	7.8
1,1,1-Trichloroethane	0.1	0.1	0.1	0.3	1.8	0.1
1,1,2-Trichloroethane	0.1	X	X	X	X	X
Trichloroethylene	0.1	0.1	31.2	0.3	420.	9.8
Vinyl Chloride	0.5	0.9	X	0.6	X	X
Zimpro Analytical No.		11508	11509	11510	11511	11512

X = Analyzed but not detected

SNE Corp.
VOC Analysis (ug/l)
June 25, 1985

	Detection Limit	6	7	8	9	10
Benzene	0.2	X	0.6	9.8	0.7	1.0
Bromoform	0.5	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X
Carbon Tetrachloride	0.1	1.6	X	X	X	2.8
Chlorobenzene	0.1	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X
Chloroform	0.1	2.0	0.9	2.7	0.4	3.8
Chloromethane	6.0	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X
Dichlorobromomethane	0.1	0.2	X	X	X	0.3
1,1-Dichloroethane	0.1	X	X	X	X	X
1,2-Dichloroethane	0.3	X	X	X	X	0.6
1,1-Dichloroethylene	0.5	X	X	X	X	X
1,2-Dichloroethylene	0.3	X	0.5	5.2	3.0	X
Dichloromethane	0.2	X	X	X	X	X
1,2-Dichloropropane	0.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X	X
Tetrachloroethylene	0.1	0.4	0.2	1.3	0.1	1.8
Toluene	0.1	X	1.2	24.6	X	X
1,1,1-Trichloroethane	0.1	X	0.1	1.0	0.2	5.6
1,1,2-Trichloroethane	0.1	X	X	X	X	X
Trichloroethylene	0.1	1.0	3.9	140.	1.4	13.5
Vinyl Chloride	0.5	X	X	X	X	X
Zimpro Analytical No.		11513	11514	11515	11516	11517

X = Analyzed but not detected

lower concentrations. For example, Parker Services reported 8.73 ug/l at W-3, while Zimpro reported 19.2 ug/l in the split sample. Averages were used for the PCP iso-contour lines and both values are presented in Appendix E and Figure 12.

Floating Layer

An estimation of the areal extent of the floating layer of penta is presented on the August 16, 1985, PCP and mineral spirits concentrations map (Figure 12). This is only an estimation because the existing monitor wells do not completely define the area where a floating layer may be present. As shown on Figure 12, part of the floating layer is apparently under property owned by Connors' Lumber, Inc. Access to this area is not available at present.

The thickness of floating layers in Monitor Wells W-4, W-5, W-6, W-7 and W-15 (shown on Figures 6 and 7 for September 26, 1985) is not the actual thickness of the floating layer on the water table. This has been well documented by studies and experiments on floating layers on water tables. The reason for this phenomena has been related to depression of the well water level by the incoming floating layer and subsequent filling by the liquid. Capillary action in the small diameter monitor wells may also wick the liquid into the well. The thicknesses of floating layers have fluctuated considerably during the period since installation in May 1985. The changes in thickness can be directly related to rainfall (groundwater recharge) and changing water levels in monitor wells. This phenomena adds to the probability that the actual floating layer thickness on the water table is less than that found in monitor wells. Table 6 contains floating layer thicknesses and water levels measured in monitor wells during the first week of October 1985.

The data in Table 6 indicates that the floating layer in monitor wells is subject to considerable variations under static conditions. Any attempt to quantify the actual thickness of floating penta on the

SNE CORPORATION

WAUSAU, WISCONSIN

TABLE 6

What about earlier Surveys.

FLOATING LAYER THICKNESS AND WATER LEVEL MEASUREMENTS

OCTOBER 3 to 9, 1985

Monitor Well No.	Beginning Floating Layer	Ending Floating Layer	Beginning Water Level*	Ending Water Level*
W-4	1/2"	1/8"	28'6"	28' ~~11~~ 6
W-5	3-1/2"	0"	26'10"	26'7" 3"
W-7	1-1/4"	1/2"	33'1"	32'9" 4"

w.11's 6, 15 Fl levels?

*Below grade.

water table (such as a factor applied to measured layers in wells) would not provide an accurate estimate of the volume of penta. Floating penta in monitor wells may only be used to state the presence of a floating layer on the water table, but not the actual thickness on the water table.

Wisconsin River Quality

Table 7 presents the results of analyses of River water samples collected on September 26, 1985. As indicated, the water samples did not contain detectable (less than 0.02 ppm) amounts of PCP.

SNE CORPORATION
WAUSAU, WISCONSIN

TABLE 7

RESULTS OF WISCONSIN RIVER SAMPLING
SEPTEMBER 26, 1985
(Analyses by Parker Services, Inc.)

Sample No.	PCP (ppm)
RW-1	< 0.02
RW-2	< 0.02
RW-3	< 0.02
RW-4	< 0.02
RW-5	< 0.02
RW-6	< 0.02
RW-7	< 0.02
RW-8	< 0.02

III. DISCUSSION OF RESULTS

Groundwater

The floating layer is found at a depth of about 25 feet (depth to the water table) in the vicinity of the SNE property. The estimated area of the floating penta layer is about 1,000 feet long and 400 feet wide. About one-third of this area lies outside of SNE property to the southeast. As previously noted, the exact thickness of the floating layer cannot be determined and it follows that the total volume of penta on the water table may not be accurately calculated.

The movement of the floating layer is critical to an assessment of the hazard presented to the environment. For example, the discharge of undissolved penta to the Wisconsin River would be hazard to the environment, but a stationery floating layer of penta on groundwater not utilized for supply may not be an environmental hazard.

A review of published reports reveals two points of view on the movement of a floating layer once the driving force has been stopped. One way that the layer may move is by a head differential across the layer. Assuming the layer spreads evenly, this head differential would be the water table gradient. At SNE, this would be about one foot. A second school of thought argues that there is no driving force to make the layer move. This relates to various thicknesses which might be present in the floating layer, possibly compensating for the head differential of the water table slope. In both of these cases, the viscosity of the fluid must be also considered. Penta would not behave like the well documented cases of gasoline floating layers which move readily along the water table. The empirical proof of the floating penta's lack of movement is presented on Figure 12 which shows the current extent of the floating layer of penta. If penta had been spilled on the site for 40 years, then the layer apparently has not moved beyond what may be expected by spreading.

The presence of the layer to the south is probably related to spreading as new penta was spilled and forced the layer out along a path of least resistance (a more permeable zone oriented to the south).

Downgradient of the SNE plant and floating layer, groundwater contains dissolved PCP and mineral spirits. The primary source of these dissolved components is the floating penta. The source of the VOCs in groundwater at and downgradient of SNE is not known. These compounds (such as solvents) are not commonly used in the mill working industry.

The flow of groundwater containing dissolved PCP, mineral spirits and VOCs is along a path which has been defined by the monitor wells (water table map and results of analyses). The groundwater in this flow path moves primarily through the lower 10 to 20 feet of the sand and gravel deposits. The bottom of this zone is defined by the lower permeability sandy clay zone. PCP, mineral spirits and VOCs were not found in the downgradient lower zone monitor wells. Groundwater in both zones discharge to the Wisconsin River which is about 800 feet east of SNE.

Wisconsin River

The absence of detectable concentrations of PCP in the Wisconsin River indicates that the low concentrations of PCP that is discharged (in groundwater) flow is not affecting the quality of the River.

The concentration of PCP anticipated in the Wisconsin River may be calculated based on the total PCP discharged with groundwater and dilution by the River flow. The following calculation factors are maximum concentrations of PCP detected in Monitor Well W-10 (15.2 mg/l) and low flow conditions (10 year, 7 day drought flow) in the River.

Groundwater Discharge: $Q = KA\ dh/dl$

Where:

Q = groundwater discharge, ft^3/day
K = permeability, ft^2/day (maximum)
dh = change in hydraulic head, ft
dl = length of flow segment, ft
A = cross sectional area of flow segment, ft^2

For the SNE site:

K = assumed 28 ft/day (10^{-2} cm/sec)
dh = 2 feet
dl = 1,000 feet
A = 20 feet saturated thickness x 600 feet width of flow zone = 12,000 ft^2 (sand and gravel zone)

And:

$Q = (28\ ft/day)(12{,}000\ ft^2)(.002)$
$Q = 672\ ft^3/day$
or 22,823 liters/day

Daily discharge of PCP to River:

Q,PCP = (22,823 liters/day)(15.2 mg/l)
Q,PCP = 347 grams/day = 4 mg/sec

Dilution by Wisconsin River (1,000 cfs, 7 day Q_{10})

$$\frac{Q,PCP\ (mg/sec)}{River\ flow,\ (l/sec)} = \frac{4\ mg/sec}{33{,}960\ l/sec} = .00012\ mg/l$$

The calculated dilution by River water of PCP discharged in groundwater represents five orders of magnitude decrease in the concentration of PCP detected in the groundwater at the River's edge.

IV. ENVIRONMENTAL ASSESSMENT

Characteristics of Penta

Penta has a specific gravity of 0.79 and is immiscible with, and only very slightly soluble in, water. PCP (5% of penta) is a solid at room temperature and has a specific gravity of 1.9. It is highly soluble in mineral spirits, and relatively insoluble in water (80 mg/l).

The chemical processes commonly used for PCP production consists of chlorination of phenol to yield isomers of tri- and tetrachlorophenol. Second stage chlorination yields pentachlorophenol (PCP). Normally, the reaction is not complete and tri- and tetrachlorophenols remain in the product. The reported amount of the precursor compounds is from 4% to 12%. The second stage of processing also yields hexa, hepta, octachlorodibenzo-p-dioxins and dibenzofurans by the condensation of tri- and tetrachlorophenols. United States (USEPA) research on the dioxins in PCP revealed that the extremely toxic 2,3,7,8 isomer is not present.

PCP has been shown to be absorbed by most soil types, especially acidic soils containing organic matter. PCP is biodegradable by microbiological activity in the soil. Bacteria and fungi have been isolated which use PCP as a sole source of carbon. The persistence of PCP in soils reportedly ranges from 21 days to five years depending on the microbiological activity.

Standards for Penta Exposure

At present, there is no known human exposure to undissolved or dissolved penta in groundwater at SNE. That is, there are no known wells in the SNE area where there is a floating layer or downgradient

between SNE and the Wisconsin River. Therefore, the following discussion is presented for reference on possible health effects if groundwater containing PCP was consumed, and based on the assumption that there are no illegal wells.

The presence of the floating layer under houses on Cleveland Avenue presents the possibility of exposure to airborne PCP in a nonoccupational setting and this will be discussed.

There are no regulations specifying the maximum permissable concentrations of PCP in drinking water established by either the USEPA or the Wisconsin DNR. The USEPA has established a risk criteria of 1 mg/l relating to teratogenic/fetotoxic effects based on toxicity data. The National Academy of Science/National Research Council has suggested a no adverse impact level (SNARL) of .021 mg/l. The State of New York standards for groundwater (drinking water) also specifies a limit of .021 mg/l. Water containing .03 mg/l PCP exhibits detectable taste and odor.

Exposure to airborne PCP has been documented in case studies in which penta or penta-treated wood were used indoors. There were several cases in California where human illness was associated with the use of penta indoors. In these cases, penta concentrations in the air ranged from 0.5 to 30 ug/m^3.

Discussion

Based on these data and the presence of penta in groundwater at and near SNE, there appears to be no imminent hazard to human health by ingestion of PCP. The absence of PCP in the Wisconsin River water samples and the calculated dilution indicate that the discharge of PCP in groundwater along the River bank will not harm aquatic life or be a hazard to human contact with, or by ingestion of, River water. Additionally, the floating layer of penta on the water table has not exhibited movement.

The matter of PCP vapors rising from the floating layer (through 15 feet of subsoils) will be assessed. It is noted that the low odor threshold of .03 mg/l for PCP dissolved in water indicates that the presence of excessive concentrations in the air should be noticeable. The term excessive is used because there may be other sources of PCP in these houses if, for example, the structural wood has been treated with a fungicide containing PCP; or if a penta product, such as Woodtox, is stored in basement storage area. Penta would not be considered extremely volatile and has a high boiling plant when compared to volatile formulations such as gasoline.

V. ANALYSIS OF REMEDIAL ALTERNATIVES

Based on the information collected during the study, the following courses of action should be evaluated in detail to allow selection of the most environmentally sound and cost-effective solution to the problem.

1. Monitoring and Natural Attenuation In-Place

   Under this alternative, a series of additional monitor wells would be installed and sampled periodically to keep track of both the floating and dissolved compounds of the PCP plume over time. Provided that the dissolved plume did not shift direction or that the floating component did not migrate towards the River, the PCP would be allowed to naturally attenuate and biodegrade to background levels in-place.

2. Continued Passive Floating Layer Removal

   This alternative, intended as a supplement to Alternative 1, would continue efforts at floating layer removal through bailing at existing wells and new wells at locations currently not accessible, such as the Connors' property, in the early spring when the water table stabilizes.

3. Installation of One or More Depression Pump/Skimming Systems to Attempt to Accelerate the Rate of Floating Layer Removal - This Alternative has Several Severe Practical Limitations, such as:

   (a) Treatability of the groundwater using carbon adsorption technology must be confirmed. Bench scale carbon isotherm testing to confirm process design criteria is currently underway.

(b) The collected penta-groundwater mixture and the spent carbon used to treat the groundwater would have to be stored for ultimate disposal some time in the future. There is currently no disposal facility in the United States licensed to dispose of PCP wastes.

(c) Treated groundwater would have to be discharged to the City of Wausau municipal sewage treatment plant in accordance with newly issued EPA pretreatment standards. An unnoticed PCP breakthrough at the carbon treatment system could cause contamination of the City's waste sludge.

The environmental consequences, ultimate disposal problems, potential social benefits, capital and operating costs, and potential long-term liability of each should be fully evaluated before a final decision is reached.

APPENDIX A

MONITOR WELL SAMPLING PROTOCOL

AND COMPLETED CHAIN OF CUSTODY FORMS

SNE CORPORATION
WAUSAU, WISCONSIN

MONITOR WELL SAMPLING PROTOCOL

1. Unlock the protective well cap.

2. Measure depth to water below top of PVC casing at reference point. Record monitor well number and water level measurement in log book (to the nearest .01 foot).

3. Calculate standing water as follows:
   (well depth*-water depth) x .16 gals/ft. x 3
   - gallons of water to be bailed
   *Well depths are given in the attached table.

4. Place new plastic sheeting around the well.

5. Evacuate three well volumes of water (as calculated above) using a clean teflon bailer and heavy cotton rope.

6. Remove a bailer of water from the well and fill a 500 ml. glass sample bottle from the bailer. Seal the cap with plastic tape.

7. Immediately label sample with date, time, sample identification number, and collector's initials. Place sample in refrigerated storage.

8. Remove one bailer of water from the well and carry out tests for temperature, specific conductance, and pH. Record measurements in log book.

9. Lock the protective well cap.

10. Deliver sample to laboratory within 24 hours of collection while maintaining chain custody forms and sample security.

SNE CORPORATION

WAUSAU, WISCONSIN

SAMPLING SPLITTING PROCEDURES
(SENTRY & ZIMPRO LABS)

(1) After well evacuation (item 5 on the monitor well sampling protocol), remove a sufficient volume of water to fill all sample bottles and pour into a suitable glass intermediate container.

(2) Pour water samples directly from the intermediate glass container into the sample bottles and seal the bottles with plastic tape.

(3) Resume sampling procedure at item 7 of the protocol.

(4) Thoroughly clean the intermediate container prior to sampling the next monitor well.

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Ground Water

Parker Services, Inc.

CONTAINER	FIELD		TRANSPORT		LABORATORY			
	COLLECTED	INITIAL	RECEIVED	INITIAL	RECEIVED	INITIAL	ANALYSIS	INITIAL
1-1	6-25	PJW	6-25	PJW	6-25	DG	7-9	R.U.
1-2	"	PJW	"	PJW	"	DG	7-9	R.U.
2-1	"	PJW	"	PJW	"	DG	7-9	R.U.
2-2	"	PJW	"	PJW	"	DG	7-9	R.U.
3-1	"	PJW	"	PJW	"	DG	7-9	R.U.
3-2	"	PJW	"	PJW	"	DG	7-9	R.U.
4-1	"	PJW	"	PJW	"	DG	7-9	R.U.
4-2	"	PJW	"	PJW	"	DG	7-9	R.U.
5-1	"	PJW	"	PJW	"	DG	7-9	R.U.
5-2	"	PJW	"	PJW	"	DG	7-9	R.U.
6-1	"	PJW	"	PJW	"	DG	7-9	R.U.
6-2	"	PJW	"	PJW	"	DG	7-10	R.U.
7-1	"	PJW	"	PJW	"	DG	7-10	R.U.
7-2	"	PJW	"	PJW				

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Groond Water

Parker Services, Inc.

		FIELD		TRANSPORT		LABORATORY			
	CONTAINER	COLLECTED	INITIAL	RECEIVED	INITIAL	RECEIVED	INITIAL	ANALYSIS	INITIAL
①	1-1	8-16-85	PJW	8-16-85	PJW	8-16-85	DG	8-19-85	R.C.V.
	1-2	"	PJW	"	PJW	"	DG		
②	2-1	"	PJW	"	PJW	"	DG	8-19-85	R.C.V.
	2-2	"	PJW	"	PJW	"	DG		
③	5-1	"	PJW	"	PJW	"	DG	8-19-85	R.C.V.
	5-2	"	PJW	"	PJW	"	DG		
④	24-1	"	PJW	"	PJW	"	DG	8-19-85	R.C.V.
	24-2	"	PJW	"	PJW	"	DG		
⑤	22-1	"	PJW	"	PJW	"	DG	8-20-85	R.C.V.
	22-2	"	PJW	"	PJW	"	DG		
⑥	12-1	"	PJW	"	PJW	"	DG	8-20-85	R.C.V.
	12-2	"	PJW	"	PJW	"	DG		

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Ground Water

Parker Services, Inc.

	CONTAINER	FIELD COLLECTED	FIELD INITIAL	TRANSPORT RECEIVED	TRANSPORT INITIAL	LABORATORY RECEIVED	LABORATORY INITIAL	LABORATORY ANALYSIS	LABORATORY INITIAL
	16-1	8-16-85	PJW	8-16-85	PJW	8-16-85	DG	8-20-85	R.C.V.
(7)	16-2	"	PJW	"	PJW	"	DG		
	26-1	"	PJW	"	PJW	"	DG	8-21-85	R.C.V.
(8)	26-2	"	PJW	"	PJW	"	DG		
	27-1	"	PJW	"	PJW	"	DG	8-21-85	R.C.V.
(9)	27-2	"	PJW	"	PJW	"	DG		
	19-1	"	PJW	"	PJW	"	DG	8-21-85	R.C.V.
(10)	19-2	"	PJW	"	PJW	"	DG		
	14-1	"	PJW	"	PJW	"	DG	8-21-85	R.C.V.
(11)	14-2	"	PJW	"	PJW	"	DG		
	21-1	"	PJW	"	PJW	"	DG	8-21-85	R.C.V.
(12)	21-2	"	PJW	"	PJW	"	DG		

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Grand Water

Zimpro, Inc.

CONTAINER	FIELD COLLECTED	FIELD INITIAL	TRANSPORT RECEIVED	TRANSPORT INITIAL	LABORATORY RECEIVED	LABORATORY INITIAL	LABORATORY ANALYSIS	LABORATORY INITIAL
3-1	8-16-85	PJW	8-17-85	PJW	0805 8/17/85			
3-2	"	PJW	"	PJW				
3-3	"	PJW	"	PJW				
4-1	"	PJW	"	PJW				
4-2	"	PJW	"	PJW				
4-3	"	PJW	"	PJW				
18-1	"	PJW	"	PJW				
18-2	"	PJW	"	PJW				
18-3	"	PJW	"	PJW				
6-1	"	PJW	"	PJW				
6-2	"	PJW	"	PJW				
6-3	"	PJW	"	PJW				

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Ground water

Zympro, Inc.

CONTAINER	FIELD COLLECTED	FIELD INITIAL	TRANSPORT RECEIVED	TRANSPORT INITIAL	LABORATORY RECEIVED	LABORATORY INITIAL	LABORATORY ANALYSIS	LABORATORY INITIAL
28-1	8-16-85	PJW	8-17-85	PJW	0805 8/17/85			
28-2	"	PJW	"	PJW				
28-3	"	PJW	"	PJW				
29-1	"	PJW	"	PJW				
29-2	"	PJW	"	PJW				
29-3	"	PJW	"	PJW				
20-1	"	PJW	"	PJW				
20-2	"	PJW	"	PJW				
20-3	"	PJW	"	PJW				
11-1	"	PJW	"	PJW				
11-2	"	PJW	"	PJW				
11-3	"	PJW	"	PJW				

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Groundwater

Zympro, Inc.

CONTAINER	FIELD COLLECTED	FIELD INITIAL	TRANSPORT RECEIVED	TRANSPORT INITIAL	LABORATORY RECEIVED	LABORATORY INITIAL	LABORATORY ANALYSIS	LABORATORY INITIAL
7-1	8-16-85	PJW	8-17-85	PJW	0805 8/17/85			
7-2	"	PJW	"	PJW				
7-3	"	PJW	"	PJW				
25-1	"	PJW	"	PJW				
25-2	"	PJW	"	PJW				
25-3	"	PJW	"	PJW				
23-1	"	PJW	"	PJW				
23-2	"	PJW	"	PJW				
23-3	"	PJW	"	PJW				
13-1	"	PJW	"	PJW				
13-2	"	PJW	"	PJW				
13-3	"	PJW	"	PJW				

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Ground water

Zympro, Inc.

	FIELD		TRANSPORT		LABORATORY			
CONTAINER	COLLECTED	INITIAL	RECEIVED	INITIAL	RECEIVED	INITIAL	ANALYSIS	INITIAL
15-1	8-16-85	PJW	8-17-85	PJW	0805 8/17/85			
15-2	"	PJW	"	PJW				
15-3	"	PJW	"	PJW				
30-1	8-17-85	PJW	"	PJW				
30-2	"	PJW	"	PJW				
30-3	"	PJW	"	PJW				

CHAIN OF CUSTODY LOG
SNE CORPORATION

SAMPLE: Groundwater

Zympro, Inc.

	FIELD		TRANSPORT		LABORATORY			
CONTAINER	COLLECTED	INITIAL	RECEIVED	INITIAL	RECEIVED	INITIAL	ANALYSIS	INITIAL
10-1	8-16-85	PJW	8-17-85	PJW	0805 8/17/86			
10-2	"	PJW	"	PJW				
10-3	"	PJW	"	PJW				
8-1	"	PJW	"	PJW				
8-2	"	PJW	"	PJW				
8-3	"	PJW	"	PJW				
9-1	"	PJW	"	PJW				
9-2	"	PJW	"	PJW				
9-3	"	PJW	"	PJW				
17-1	"	PJW	"	PJW				
17-2	"	PJW	"	PJW				
17-3	"	PJW	"	PJW				

TCQI FOR
- PCP
- MINERIAL SPIRITS
- V.O.C.'s

CHAIN OF CUSTODY LOG
SNE CORPORATION

Zympo, Inc.

SAMPLE IDENTIFICATION	FIELD DATE COLLECTED	FIELD INITIAL	TRANSPORT DATE RECEIVED	TRANSPORT INITIAL	LABORATORY DATE RECEIVED	LABORATORY INITIAL	LABORATORY DATE ANALYZED	LABORATORY INITIAL
4(1)6	10-7-85	PJW	10-7-85	PJW	10-7-85	SB.		
4(2)6	10-7-85	PJW	"	PJW	10-7-85	SB		
4(3)6	10-7-85	PJW	"	PJW	10-7-85	SB		

APPENDIX B

ANALYTICAL METHODS AND PROTOCOLS

Bill Barr

ZIMPRO INC.

July 8, 1985

Mr. Pat Wierzba
SNE Corp.
910 Cleveland Ave.
Wausua, WI 54401

Dear Mr. Wierzba:

Attached are the VOC results for the samples you submitted June 26, 1985. The samples were analyzed according to EPA method 601. PID (10.2 eV) and Hall detectors in series were used for identification and quantitation of the compounds present.

If you have any questions, please call.

Sincerely,

ZIMPRO INC.

Mary C. Christie

Mary C. Christie
Instrumentation Chemist

MCC/ls

cc: J.W. Barr
J.R. Salkowski

Sentry®

PARKER SERVICES, INC.

Risk Management Services

July 29, 1985

Bill Warren
Eder Associates
85 Forest Avenue
Locust Valley, NY 11560

ANALYTICAL PROTOCOL - PENTACHLOROPHENOL

The enclosed information describes the sample handling procedure used by Parker Services, Inc. with regard to analyzing the SNE well water samples for pentachlorophenol. The analytical protocol describes the sample preservation, sample extraction, sample analysis, and quality control of the analysis of pentachlorophenol in our laboratory.

If you have any questions concerning pentachlorophenol analyses, please do not hesitate to call.

Robert C. Voborsky

Robert C. Voborsky, CIH
Industrial Hygiene Laboratory Supervisor

RCV:ljl

Environmental Health Division
1800 North Point Drive
Stevens Point, WI 54481

715 346 7786

Sentry®

PARKER
SERVICES, INC.

Risk Management Services

SAMPLE HANDLING PROCEDURE - SNE CORPORATION

Water samples are collected in Wheaton glass bottles with a teflon seal and transported to the Parker Services, Inc, (PSI) Laboratory the day of collection. The SNE Corporation Chain of Custody Log accompanies each set of samples. The Chain of Custody Log is signed and dated by the person(s) collecting, transporting, receiving, and analyzing the samples.

ANALYTICAL PROTOCOL - PARKER SERVICES, INC.

I. Sample Preservation

The samples are entered in the laboratory log and assigned a sample number and analyte designation which is pentachlorophenol. Each sample is checked for pH and is acidified with 1 to 1 Sulfuric Acid to a pH equalling 2, and immediately refrigerated at 44° F.

II. Sample Extraction

Samples are extracted with Baker-"Resi Analyzed" grade Methylene Chloride, according to EPA Method 3510 - SEPARATORY FUNNEL LIQUID - LIQUID EXTRACTION.

III. Sample Analysis

The extracted samples are analyzed by Gas Chromatography, with Flame Ionization Detection (Perkin-Elmer Model SIGMA-3B). The samples are analyzed according to EPA Method 8040 "Phenols". The analytical column used for separation of pentachlorophenol is a 6' x 2 millimeter glass column packed with SP-1240-DA on Supelcoport 80/100.

Environmental Health Division
1800 North Point Drive
Stevens Point, WI 54481

715 346 7786

IV. Quality Control

A reagent blank accompanies each set of samples submitted to the laboratory for analysis. During the extraction phase, a spike containing a known amount of PCP is processed, along with field samples. The gas chromatograph is calibrated with a series of dilutions of a PCP standard purchased from Supelco, Inc. (Standard #4-8692, Lot #LA-12639, 500 µg/ml). The detection limit for the analytical procedure is 1 µg/ml of extracted sample. The overall detection limit varies, depending upon the total amount of water sample submitted for analysis (Example - 0.02 PPM for 500 ml water sample).

ZIMPRO INC.
A SUBSIDIARY OF STERLING DRUG INC.
POLLUTION CONTROL SYSTEMS

October 7, 1985

Mr. Pat Wierzba
SNE Corportion
910 Cleveland Ave.
Wausau, WI 54401

Dear Pat:

Attached are the results for the monitoring well samples collected on August 16, 1985. The VOC results were determined using EPA Method 601 with PID (9.5 eV) and Hall detectors in series. Due to interferences, a few samples (25, 28, and 29) had to be diluted with organic free water before analysis. This dilution changed the VOC detection limits and are so noted in their respective tables. The interferences also prevented quantitation toluene and ethylbenzene in a few cases.

Pentachlorophenol was determined by HPLC using a UV detector at 303 nm. Samples were concentrated with a C_{18} Sep Pak cartridge prior to analysis. The mineral spirits were extracted with methylene chloride solvent and concentrated. A gas chromatograph equipped with an FID detector was used quantitate the mineral spirits. Quantitation of the mineral spirits was based upon an average of several peaks since it is composed of several compounds.

There were three samples (10, 28, and 29) where the identification of mineral spirits was somewhat questionable. The profile of these samples appeared to be somewhat different from the mineral spirits detected in samples 18 and 25. This difference may be a result of stratification or decomposition of the mineral spirits. A more likely possibility is contamination due to a different source. The three samples in question were quantitated as mineral spirits in order to give you an idea of the contamination levels.

MILITARY ROAD
ROTHSCHILD, WISCONSIN 54474
TELEPHONE (715) 359 7211 TELEX 29 0495

If you have any questions concerning these results, please give me a call.

Sincerely,

ZIMPRO INC.

David L. Schumacher
Instrumentation Chemist

DLS/ls

cc: J.W. Barr
J.R. Salkowski
Bill Warren - Edder Associates

APPENDIX C

DESCRIPTIONS OF GEOLOGIC SAMPLES

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausau, Wisconsin

Boring No. 1
Surface Elevation
Job No. C 810433
Sheet 1 of 2

1402 EMIL STREET • P.O. BOX 9404 MADISON, WIS. 53715 • TEL • (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type	↓	↓	N	Depth		q_u	W	LL	PL	D
						2" ASPHALT 6" Black Fine to Medium SAND and GRAVEL					
1	SS	X	M	59	5	Brown Fine to Medium SAND and GRAVEL, Trace Silt					
2	SS	X	M	34	10	Less Silt					
3	SS	X	M	19	15	Less Gravel					
4	SS	X	M	27	20						
5	SS	X	M	41	25	More Gravel					
6	SS	X	W	41	30	Sand in Auger 1.5' Decided to Auger to 45' Pull Back 3' Drive Out Plug					
					35						
					40						
					45						

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausua, Wisconsin

Boring No. 1
Surface Elevation
Job No. C 810433
Sheet 2 of 2

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type	↓	↓	N	Depth		qu	W	LL	PL	D
						Brown Fine to Medium SAND and GRAVEL, Trace Silt					
					50	End Boring at 50'					
					55						
					60						
					65						
					70						
					75						
					80						
					85						

WATER LEVEL OBSERVATIONS

While Drilling 30'
Upon Completion of Drilling
Time After Drilling
Depth to Water
Depth to Cave In

GENERAL NOTES

Start 12/19/84 Complete 12/19/84
Crew Chief JHR Rig 9120
Drilling Method

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausau, Wisconsin

Boring No. W-2
Surface Elevation
Job No. C 810433
Sheet 1 of 2

1402 EMIL STREET • P.O. BOX 9404 MADISON, WIS. 53715 • TEL • (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type	↓	↓	N	Depth		qu	W	LL	PL	P
						ASPHALT					
						Rotten GRANITE (FILL)					
						Dark Brown Silty Coarse to Fine SAND with Gravel (FILL					
1	SS	X	M	48	5	CONCRETE FILL					
						Dark Brown SAND, Very Coarse to Medium with Gravel & Cobbles (FILL)					
2	SS	X	M	50	10						
						Brown Coarse to Fine SAND, Trace Silt, Trace Gravel					
3	SS	X	M	24	15						
4	SS	X	M	71	20	Brown Coarse to Fine SAND Trace Silt with Gravel					
5	SS	X	M	64	25						
6	SS	X	W	148	30						
						*					
						Brown Very Coarse to Fine SAND, Some Silt with Gravel					
					35						
						*Black Very Coarse to Medium SAND with Gravel					
					40						
						Well at 43'					
					45						
						End Boring at 45'					

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausau, Wisconsin

Boring No. W-2
Surface Elevation
Job No. C 810433
Sheet 2 of 2

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type	↓	↓	N	Depth		qu	W	LL	PL	D
					50						
					55						
					60						
					65						
					70						
					75						
					80						
					85						

WATER LEVEL OBSERVATIONS

While Drilling
Upon Completion of Drilling
Time After Drilling
Depth to Water

GENERAL NOTES

Start 12/19/84 Complete 12/19/84
Crew Chief RL Rig 45-C
Drilling Method

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausau, Wisconsin

Boring No. W-3
Surface Elevation
Job No. C 810433
Sheet 1 of 1

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

SAMPLE No.	Type	Recovery	Moisture	N	Depth	VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES qp	W	LL	PL	D
						ASPHALT					
						Dark Brown Coarse to Fine SAND, SomeSilt with Cobbles and Gravel Fill					
1	SS	X	M	19	5						
2	SS	X	M	27	10						
						Brown, Coarse to Fine SAND, Trace Silt, Occasional Gravel					
3	SS	X	M	41	15						
4	SS	X	M	40	20						
5	SS	X	W	41	25						
					30						
					35	Well at 37'					
						Brown Clayey Silty SAND with Some Clay					
					40	End Boring at 40'					

WATER LEVEL OBSERVATIONS

While Drilling 25'
Upon Completion of Drilling
Time After Drilling 1/4 hour
Depth to Water 25'
Depth to Cave In

GENERAL NOTES

Start 12/20/84 Complete 12/20/84
Crew Chief RL Rig 45-C
Drilling Method

W-1

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausau, Wisconsin

Boring No. 4
Surface Elevation
Job No. C 810433
Sheet 1 of 2

1402 EMIL STREET • P.O. BOX 9401 MADISON, WIS. 53715 • TEL • (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type	↓	↓	N	Depth		qu	W	LL	PL	D
						2" ASPHALT					
						6" GRAVEL					
						12" Black Fine to Medium SAND					
1	SS	X	M	17	5	Brown Fine to Medium SAND and GRAVEL, Trace Silt					
2	SS	X	M	60	10						
3	SS	X	M	49	15						
4	SS	X	M	29	20						
5	SS	X	M	41	25						
6	SS	X	W	54	30						
7	SS	X	W	81 /6"	35						
					40	Install Well at 40'					
						Dense CLAY					
					45	End Boring at 45'					

EXPLORATION TECHNOLOGY INC.

LOG OF TEST BORING

Project: Eder & Associates
SNE Corporation
Location: Wausau, Wisconsin

Boring No.: 4
Surface Elevation:
Job No.: C 810433
Sheet: 2 of 2

1402 EMIL STREET • P.O. BOX 9404, MADISON, WIS. 53715 • TEL. (608) 258-9550

SAMPLE						VISUAL CLASSIFICATION and Remarks	SOIL PROPERTIES				
Recovery			Moisture								
No.	Type	↓	↓	N	Depth		qu	W	LL	PL	D
					50						
					55						
					60						
					65						
					70						
					75						
					80						
					85						

WATER LEVEL OBSERVATIONS

While Drilling: 28'
Upon Completion of Drilling:
Time After Drilling:
Depth to Water:
Depth to Cave In:

GENERAL NOTES

Start: 12/20/84 Complete: 12/20/84
Crew Chief: JHR Rig: Bomb
Drilling Method:

SNE CORPORATION
Wausau, Wisconsin

Descriptive Logs

W-5

Sample No.	Depth Interval	Description
1	2 - 3.5	Sand & gravel, fine to medium, clayey; pebbles brown to dark brown, staining (fill).
2	5 - 6.5	Sand & gravel, as above, tan; pebbles.
3	10-11.5	Sand & gravel; sand, medium, (uniform), tan
4	15-16.5	As above
6 (2 samples)	25-26.5	As above, coarser, orange-tan
7	30-31.5	As above, silty (pcp odor)
8	35-36.5	As above; clay, silty, dense, with gravel, tan (pep odor)
9	40-41.5	Clay, as above (very slight or no pcp odor)

Descriptive Logs

W-6

Sample No.	Depth Interval	Description
1	1-2.5	Sand & gravel fill and asphalt
2	5-6.5	Sand & gravel medium-uniform, tan; pebbles
3	10-11.5	Sand, medium-uniform, tan
4	15-16.5	As above; gravel, trace
5(6)	20-21.5	Sand & gravel, fine csc, brown; pebbles
7	25-26.5	Sand, medium-uniform, tan; pebbles; silty clay, brown trace
8	35-36.5	Sand & gravel, fine csc, brown; pebbles silty (pcp odor)
9	40-41.5	As above (pcp odor, less)
10	45-46.5	As above; clayey; (pcp odor, less)

Descriptive Logs

W-7

Sample No.	Depth Interval	Description
	no sample 1-3	
4	15-16.5	Sand & gravel, fine tan to brown; pebbles
5	20-21.5	Sand, fine, tan
6	25-26.5	Sand & gravel, fine csc, orange-brown
7	30-31.5	As above; silty; pebbles
8	35-36.5	Sand, fine-coarse, tan-brown (pcp odor)
9	40-41.5	Clay, silty, with gravel, dense, tan (slight or no pcp odor)
10	45-46.5	Sand & gravel, fine-coarse, silty orange-brown (no pcp odor)

Descriptive Logs

W-8

Sample No.	Depth Interval	Description
1	5-6.5	Sand, fine, tan; silt brown, trace; pebbles
	no sample number 2	
3	15-16.5	Sand & gravel, medium-coarse, brown; pebbles
4	20-21.5	Sand, fine-medium, tan-brown
5	25-26.5	Sand, fine, tan
6	30-31.5	Sand & gravel, medium-coarse, brown; clay, brown, silty with fine gravel, dense
7	35-36.5	As above
8	40-41.5	Sand & gravel, as above; clay, as above, trace

Descriptive Logs

W-9

Sample No.	Depth Interval	Description
1	5-6.5	Sand & gravel, fine-medium, tan; pebbles
2	10-11.5	Sand & gravel, fine-coarse, silty, red-brown
3	15-16.5	As above, clayey
4	20-21.5	As above, no clay, silty

Descriptive Logs

W-10

Sample No.	Depth Interval	Description
1	5-6.5	Sand & gravel, fine-coarser, tan, pebbles
2	10-11.5	As above, coarser
3	15-16.5	As above, iron staining
4	20-21.5	As above; silty
5	25-26.5	As above

Descriptive Logs

W-11

Sample No.	Depth Interval	Description
1	5-6.5	Sand & gravel, fine-coarse, tan
2	10-11.5	As above
3	15-16.5	As above, iron stained
4	20-21.5	As above, brown, less staining

Descriptive Logs

W-12

Sample No.	Depth Interval	Description
	no sample number 1	
2	10-11.5	Sand & gravel, fine-coarse, dark brown; pebbles
3	15-16.5	As above, silty iron, stained
4	20-21.5	As above, tan-red

Descriptive Logs

W-13

Sample No.	Depth Interval	Description
1	5-6.5	Sand & gravel, fine-coarse, silty, dark brown; pebbles
2	10-11.5	Sand & gravel, fine-coarse, tan-red; sand, medium-unif, red-tan; pebbles
3	15-16.5	As above, iron stained
4	20-21.5	As above
5	25-26.5	As above, silty
6	30-31.5	As above
7	35-36.5	As above

Descriptive Logs

W-14

Sample No.	Depth Interval	Description
1	5-6.5	Sand & gravel, fine-coarse, silty iron stained; pebbles
2	10-11.5	As above, dark brown, no staining
3	15-16.5	Sand, fine-coarse, iron stained
4	20-21.5	Sand & gravel, medium-coarse, iron stained

Descriptive Logs

W-15

Sample No.	Depth Interval	Description
1	5-6.5	Sand, fine, brown; and gravel (fill)
2	10-11.5	Sand, fine-medium, tan
3	15-16.5	No recovery
4	20-21.5	Sand, fine-medium, tan; and pebbles
5	25-26.5	Sand, fine-coarse, dark brown; and pebbles (lower 4" black stained, PCP odor)
6	30-31.5	Sand and gravel, fine-coarse; and pebbles (iron stained, PCP odor)
7	35-36.5	Sand and gravel, coarse; and clay (bottom 4" of sample)

W-16

Sample No.	Depth Interval	Description
1	5-6.5	Sand, fine-coarse, brown; and gravel, trace
2	10-11.5	Sand and gravel, coarse, tan
3	15-16.5	Same as above
4	20-21.5	Same
5	25-26.5	Same
6	30-31.5	Clay, sandy, brown, with gravel

Descriptive Logs

W-1B

Sample No.	Depth Interval	Description
(See boring log for W-1 for 0-50 feet descriptions)		
1	45-46.5	Sand, fine-coarse, silty, brown
2	50-51.5	As above, dense, trace clay
3	55-56.5	No recovery

Bedrock at 58 feet = Syenite

W-3B

Sample No.	Depth Interval	Description
(See boring log for W-3 for 0-40 feet descriptions)		
1	45-46.5	Sand, fine, clayey, tan; and clayey sand and gravel
2	50-51.5	Clay, silty-sandy, brown, compact
3	55-56.5	Clay, gray, compact

No sample at 60 and 65 feet, still in clay and peat

4	70-71.5	Clay, sandy, gray; and clay, gravelly (hard pan)

Descriptive Logs

W-10B

Sample No.	Depth Interval	Description
(See sample descriptions for W-10 for 0 to 26.5 feet descriptions)		
1	40-41.5	No recovery (clay)
2	42-43.5	Clay, tan; and sand, medium, tan
3	50-51.5	Clay, tan, sandy
4	55-56.5	Sand, fine-medium, tan; and clay, layers, tan
5	60-61.5	Clay, silty, gray, dense, and clay,
6	65-66.5	Clay, silty, gray; and peat, 6" layer

APPENDIX D

WATER LEVEL MEASUREMENTS AND ELEVATIONS

SNE CORPORATION

WAUSAU, WISCONSIN

TABLE 1

WATER LEVEL ELEVATIONS

SNE MONITOR WELLS

SEPTEMBER 26, 1985

Well No.	Depth to Water[1]	Elevation of Measured Point[2]	Water Level Elevations[2]
W-1A	29.98	1194.03	1164.05
W-1B	30.70	1194.81	1164.11
W-2	30.08	1193.46	1163.38
W-3A	25.30	1187.71	1162.41
W-3B	25.10	1187.75	1162.65
W-4	28.74	1192.27	1163.53
W-5	27.07	1190.60	1163.53
W-6	29.27	1193.35	1164.08
W-7	33.28	1197.26	1163.98
W-8	33.02	1206.63	1173.61
W-9	9.18	1172.77	1163.59
W-10A	20.90	1182.57	1161.67
W-10B	20.70	1182.42	1161.72
W-11	13.86	1175.25	1161.39
W-12	12.96	1173.95	1160-99
W-13	26.49	1188.75	1162.26
W-14	11.47	1172.41	1160.94
W-15	25.87	1189.04	1163.17
W-16	18.28	1180.58	1162.30

1. Feet below top of pvc casing
2. Feet above mean sea level

SNE CORPORATION

WAUSAU, WISCONSIN

TABLE 2

WATER LEVEL ELEVATIONS

SNE MONITOR WELLS

MAY 25, 1985

Well No.	Depth to Water[1]	Elevation of Measured Point[2]	Water Level Elevations[2]
W-1	30.10	1194.12	1164.02
W-2	30.38	1193.59	1163.21
W-3	25.46	1187.78	1162.32
W-4	--	1192.78	--
W-5	27.27	1190.67	1163.40
W-6	29.37	1193.37	1164.00
W-7	33.37	1197.29	1163.92
W-8	31.82	1206.65	1174.83
W-9	10.71	1172.81	1162.10
W-10	21.70	1182.64	1160.94
W-11	14.32	1175.28	1160.96
W-12	13.28	1174.01	1160.63
W-13	27.17	1188.80	1161.63
W-14	10.83	1172.46	1161.63

1. Feet below top of pvc casing
2. Feet above mean sea level

APPENDIX E

RESULTS OF ANALYSES

SNE Corp. Analysis (ug/l)
August 16, 1985

	Detection Limit	W-1B 9	W-1 10	W-9 11	W-12 13	W-13 15
Benzene	Ø.2	X	X	Ø.7	Ø.6	Ø.3 ✓
Bromoform	Ø.5	X	X	X	X	X
Bromomethane	1.Ø	X	X	X	X	X
Carbon Tetrachloride	Ø.1	X	1.5	X	X	2.5
Chlorobenzene	Ø.1	X	X	X	X	X
Chloroethane	1.Ø	X	X	X	X	X
2-Chloroethylvinyl Ether	2.Ø	X	X	X	X	X
Chloroform	Ø.1	5.1	2.7	Ø.2	3.7	2.8 ✓
Chloromethane	6.Ø	X	X	X	X	X
Dibromochloromethane	Ø.1	X	X	X	X	X
1,2-Dichlorobenzene	Ø.3	X	X	X	X	X
1,3-Dichlorobenzene	Ø.3	X	X	X	X	X
1,4-Dichlorobenzene	Ø.3	X	X	X	X	X
Dichlorobromomethane	Ø.1	Ø.2	Ø.1	X	X	X
1,1-Dichloroethane	Ø.1	X	X	X	X	X
1,2-Dichloroethane	Ø.3	X	X	X	X	X
1,1-Dichloroethylene	Ø.5	X	X	X	X	X
1,2-Dichloroethylene	Ø.3	X	X	Ø.3	X	X
Dichloromethane	Ø.2	X	X	X	Ø.2	X
1,2-Dichloropropane	Ø.5	X	X	X	X	X
cis-1,3-Dichloropropene	Ø.3	X	X	X	X	X
trans-1,3-Dichloropropene	1.Ø	X	X	X	X	X
Ethylbenzene	Ø.2	X	X	X	Ø.8	X
1,1,2,2-Tetrachloroethane	Ø.1	X	X	X	X	X
Tetrachloroethylene	Ø.1	Ø.7	Ø.6	X	1.1	1.6
Toluene	Ø.1	X	X	Ø.2	Ø.1	X
1,1,1-Trichloroethane	Ø.1	X	X	Ø.3	Ø.2	4.8
1,1,2-Trichloroethane	Ø.1	X	X	X	X	X
Trichloroethylene	Ø.1	Ø.5	Ø.3	X	9.2	11.2
Vinyl Chloride	Ø.5	X	X	X	X	X
Pentachlorophenol	2Ø.Ø	X	1ØØ	X	15ØØ	49Ø
Mineral Spirits	2Ø.Ø	X	5ØØ	X	X	X
Zimpro Analytical No.		12923	12924	12925	12926	12927

X = Analyzed but not detected

SNE Corp. Analysis (ug/1)
November 5, 1985

	Detection Limit	Well 16
Benzene	0.2	X
Bromoform	0.5	X
Bromomethane	1.0	X
Carbon Tetrachloride	0.1	X
Chlorobenzene	0.1	X
Chloroethane	1.0	X
2-Chloroethylvinyl Ether	2.0	X
Chloroform	0.1	0.2
Chloromethane	6.0	X
Dibromochloromethane	0.1	X
1,2-Dichlorobenzene	0.3	X
1,3-Dichlorobenzene	0.3	X
1,4-Dichlorobenzene	0.3	X
Dichlorobromomethane	0.1	X
1,1-Dichloroethane	0.1	X
1,2-Dichloroethane	0.3	X
1,1-Dichloroethylene	0.5	X
1,2-Dichloroethylene	0.3	X
Dichloromethane	0.2	0.5
1,2-Dichloropropane	0.5	X
cis-1,3-Dichloropropene	0.3	X
trans-1,3-Dichloropropene	1.0	X
Ethylbenzene	0.2	X
1,1,2,2-Tetrachloroethane	0.1	X
Tetrachloroethylene	0.1	0.4
Toluene	0.1	0.7
1,1,1-Trichloroethane	0.1	X
1,1,2-Trichloroethane	0.1	X
Trichloroethylene	0.1	0.9
Vinyl Chloride	0.5	X
Pentachlorophenol	20.0	255
Mineral Spirits	20.0	Not Completed
Zimpro Analytical No.		14797

X = Analyzed but not detected

Sentry

Recd 10/9/85

PARKER SERVICES, INC.

Environmental Health Division

Client SNE CORP

Address

City Warren State Zip

Contact P. Wierzba Tel.

Laboratory Use Only

Project Number 85-498

Date Received 9-27

Date Analyzed 10-3 Analyst RL

Data Authorized By Robert Vobinsky

Analytical Request

P.O.#

Analytical Results

Sample No.	Contaminant	Volume (Liters)	Comments	Laboratory Number	Concentration PPM	Analytical Method
WR-1	PCP			5025	BDL	EPA 8040
WR-2	"			5026	BDL	
WR-3	"			5027	BDL	
WR-4	"			5028	BDL	
WR-5	"			5029	BDL	
WR-6	"			5030	BDL	
WR-7	"			5031	BDL	
WR-8	"			5032	BDL	
WR-900(1)	"			5033	BDL	
WR-10(2)						

Detection Limit: 0.02

Parker Services, Inc.
1800 North Point Dr.
Stevens Point, WI 54481
715-346-7786

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SNE Corp. Analysis (ug/l)
August 16, 1985

	Detection Limit	Trip Blank	W-8 3	W-8 4	W-14 6	W-14 7	W-18 8
Benzene	0.2	X	X	X	X	X	X
Bromoform	0.5	X	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X	X
Carbon Tetrachloride	0.1	X	X	X	X	X	X
Chlorobenzene	0.1	X	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X	X
Chloroform	0.1	X	0.2	0.2	0.6	0.6	5.3
Chloromethane	6.0	X	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X	X
Dichlorobromomethane	0.1	X	X	X	X	X	0.2
1,1-Dichloroethane	0.1	X	X	X	X	X	X
1,2-Dichloroethane	0.3	X	X	X	X	X	X
1,1-Dichloroethylene	0.5	X	X	X	X	X	X
1,2-Dichloroethylene	0.3	X	X	X	X	X	X
Dichloromethane	0.2	X	X	X	X	X	X
1,2-Dichloropropane	0.5	X	X	X	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X	X	X	X
trans-1,3-Dichloropropene	1.0	X	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X	X	X
Tetrachloroethylene	0.1	X	0.2	X	1.6	1.5	0.8
Toluene	0.1	X	X	X	0.1	X	X
1,1,1-Trichloroethane	0.1	X	X	X	0.2	0.2	X
1,1,2-Trichloroethane	0.1	X	X	X	X	X	X
Trichloroethylene	0.1	X	X	X	X	X	0.4
Vinyl Chloride	0.5	X	X	X	X	X	X
Pentachlorophenol	20.0	*	20	70	X	X	X
Mineral Spirits	20.0	*	X	X	X	X	X
Zimpro Analytical No.		12936	12918	12919	12920	12921	12922

X = Analyzed but not detected
* Not analyzed

SNE Corp. Analysis (ug/l)
August 16, 1985

Field Blank Dist. H_2O

	Detection Limit	W-11 17	W-2 18	W-10B 20	W-3B 23	30
Benzene	0.2	X	0.9	X	0.2	X
Bromoform	0.5	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X
Carbon Tetrachloride	0.1	X	1.5	X	X	X
Chlorobenzene	0.1	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X
Chloroform	0.1	0.5	4.8	0.5	1.1	X
Chloromethane	6.0	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X
Dichlorobromomethane	0.1	X	0.1	X	X	X
1,1-Dichloroethane	0.1	X	X	X	X	X
1,2-Dichloroethane	0.3	X	X	X	X	X
1,1-Dichloroethylene	0.5	X	X	X	X	X
1,2-Dichloroethylene	0.3	X	X	X	X	X
Dichloromethane	0.2	X	0.7	X	0.2	0.5
1,2-Dichloropropane	0.5	X	X	X	X	X
cis-1,3-Dichloropropene	0.3	X	X	X	X	X,
trans-1,3-Dichloropropene	1.0	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	X	*
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X	X
Tetrachloroethylene	0.1	0.9	1.2	X	X	0.2
Toluene	0.1	X	2.5	0.1	0.1	*
1,1,1-Trichloroethane	0.1	X	0.1	X	X	0.1
1,1,2-Trichloroethane	0.1	X	X	X	X	X
Trichloroethylene	0.1	2.9	34.7	X	X	X
Vinyl Chloride	0.5	X	X	X	X	X
Pentachlorophenol	20.0	380	2550	X	710	X
Mineral Spirits	20.0	X	16,100	X	X	X
Zimpro Analytical No.		12928	12929	12930	12931	12935

X = Analyzed but not detected
* Interferences around these compounds

SNE Corp. Analysis (ug/l)
August 16, 1985

	Detection Limit	W-10 28	W-10 29
Benzene	2.0	18.0	8.0
Bromoform	5.0	X	X
Bromomethane	10.0	X	X
Carbon Tetrachloride	1.0	X	X
Chlorobenzene	1.0	X	X
Chloroethane	10.0	X	X
2-Chloroethylvinyl Ether	20.0	X	X
Chloroform	1.0	2.0	2.0
Chloromethane	60.0	X	X
Dibromochloromethane	1.0	X	X
1,2-Dichlorobenzene	3.0	X	X
1,3-Dichlorobenzene	3.0	X	X
1,4-Dichlorobenzene	3.0	X	X
Dichlorobromomethane	1.0	X	X
1,1-Dichloroethane	1.0	X	X
1,2-Dichloroethane	3.0	X	X
1,1-Dichloroethylene	5.0	X	X
1,2-Dichloroethylene	3.0	X	X
Dichloromethane	2.0	2.0	2.0
1,2-Dichloropropane	5.0	X	X
cis-1,3-Dichloropropene	3.0	X	X
trans-1,3-Dichloropropene	10.0	X	X
Ethylbenzene	2.0	**	**
1,1,2,2-Tetrachloroethane	1.0	X	X
Tetrachloroethylene	1.0	2.0	2.0
Toluene	1.0	**	**
1,1,1-Trichloroethane	1.0	1.0	X
1,1,2-Trichloroethane	1.0	X	X
Trichloroethylene	1.0	106.	102.
Vinyl Chloride	5.0	X	X
Pentachlorophenol	20.0	15,200	15,200
Mineral Spirits	20.0	1,600	1,600
Zimpro Analytical No.		12933	12934

X = Analyzed but not detected

** Interferences around these compounds

SNE Corp. Analysis (ug/l)
August 16, 1985

	Detection Limit	W-3 25
Benzene	4.0	22.0
Bromoform	10.0	X
Bromomethane	20.0	X
Carbon Tetrachloride	2.0	X
Chlorobenzene	2.0	X
Chloroethane	20.0	X
2-Chloroethylvinyl Ether	40.0	X
Chloroform	2.0	4.0
Chloromethane	120.0	X
Dibromochloromethane	2.0	X
1,2-Dichlorobenzene	6.0	X
1,3-Dichlorobenzene	6.0	X
1,4-Dichlorobenzene	6.0	X
Dichlorobromomethane	2.0	X
1,1-Dichloroethane	2.0	X
1,2-Dichloroethane	6.0	X
1,1-Dichloroethylene	10.0	X
1,2-Dichloroethylene	6.0	X
Dichloromethane	4.0	4.0
1,2-Dichloropropane	10.0	X
cis-1,3-Dichloropropene	6.0	X
trans-1,3-Dichloropropene	20.0	X
Ethylbenzene	4.0	**
1,1,2,2-Tetrachloroethane	2.0	X
Tetrachloroethylene	2.0	X
Toluene	2.0	42.0
1,1,1-Trichloroethane	2.0	X
1,1,2-Trichloroethane	2.0	X
Trichloroethylene	2.0	294.
Vinyl Chloride	10.0	X
Pentachlorophenol	20.0	19,200
Mineral Spirits	20.0	8,520

Zimpro Analytical No. 12932

X = Analyzed but not detected

** Interferences around these compounds

Sentry

PARKER SERVICES, INC.

Environmental Health Division

page 2 of 2

Client _____

Address _____

City _____ State _____ Zip _____

Contact _____ Tel. _____

Laboratory Use Only

Project Number 85-424

Date Received 8-19-85

Date Analyzed 8-21 Analyst RW

Data Authorized By Bob Udenfriend

Analytical Request

P.O.# _____

Analytical Results

Sample No. well #	Contaminant	Volume (Liters)	Comments	Laboratory Number	Concentration PPM	Analytical Method
22-1,2 W3B	PCP			4480	0.48	
	Min. Sp.				4.28	
24-1,2 W3	PCP			4481	8.73	
	Min. Sp.				278.00	
26-1,2 W10	PCP			4482	9.60	
	Min. Sp.				317.00	
27-1,2 W10	PCP			4483	8.70	
	Min. Sp				280.00	
	Detection Limit:					
	PCP	0.01 PPM (500cc sample)				
	Min. Sp.	0.5 PPM	"			

Parker Services, Inc.
1800 North Point Dr.
Stevens Point, WI 54481
715 346-7786

White Copy — Client Report
Green Copy — Laboratory File

11/26/85

eder associates
consulting engineers, p.c.

SNE file

November 26, 1985
File #509-1

Mr. Gary Kulibert
Wisconsin Department of Natural Resources
North Central District Headquarters
Box 818
Rhinelander, Wisconsin 54501

Re: SNE Corporation
Wausau, Wisconsin

Dear Gary:

Enclosed are three copies of our report entitled "Engineering Report Summarizing Site Investigation for Pentachlorophenol".

Please call either myself or Bill Warren if you have any questions.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

Leonard J. Eder, P.E.

LJE/nf
Enc.

cc w/enc.: H. Handzel
S. Kroll
H. Dolce
P. Wierzba
J. Noonan
T. Jirous

85 FOREST AVENUE • LOCUST VALLEY, NEW YORK 11560 • (516) 671-8440

LEONARD J. EDER, P. E. • FREDERICK H. INYARD, P. E. • STEPHEN J. OSMUNDSEN, P. E. • GARY A. ROZMUS, P. E.
JOHN McGUIRE, P. E. • JORGE MOLINA, ING. • WILLIAM J. CUNNINGHAM, P. E. • JOSEPH B. HELLMANN, P. E.

(AD-75)

W. Smith 11/25/85

CORRESPONDENCE/MEMORANDUM

STATE OF WISCONSIN

Date: November 25, 1985 *File Ref:* 4430

To: Mark Giesfeldt - SW/3

From: Gary Kulibert

Subject: Dioxin Sampling

This is to confirm our recent conversation concerning the SNE Corporation in Wausau. They have acquired a company originally called Crestline. After acquiring it, they looked at their product handling systems and found, for a long period of time, possibility greater than 20 years, pentachlorophenol and mineral spirits have been leaked from the site. They have done some initial work on the site and found free product on top of the groundwater and a dissolved fraction to depths of 64 feet in the groundwater. Also, they found this solution is being discharged to the Wisconsin River via the groundwater system.

Our major concern, of course, is with the penta and possible dioxin contaminants that may be included. The consultant for SNE has done a sample for the most toxic dioxin and have not found any. However, their research indicates there is a good chance that other dioxin components will be present. We will asking them to do the sampling, however, I feel very strongly that the DNR should also split sample for penta and dioxin to ensure ourselves of what may or may not be present. Dioxin is a very politically sensitive problem throughout the country. Second, the Department's past policy is to have some sampling information of our own. This is used to assure the Department and the public that the consultant and the entity's information submittal is correct. Also, we have adequate evidence just in case we have to seek enforcement activity. I feel this case is no different, even though the sampling may be more expensive.

I am requesting a contract to have five samples analyzed for dioxin. In particular, a screen of the material to indicate if any of the different isomores of dioxin are present. Second, if any are found, we need to have quantity and quality information provided on the different species of dioxin present. We would be sampling both free product and contaminated groundwater.

The work on recovery of free product would hopefully start in December. I would like to be in the position to split samples with the company by then. Because there are very few labs in the country that can run the dioxin, I would strongly suggest that whoever develops the contracts works with Jack Sullivan in Water Resources Management to insure proper QA,QC. Many dioxin samples have gone to a lab in Nebraska. However, recently it was found that the QA,QC was not up to Department standards. Because of the cost involved, it is imperative we have a lab with QA acceptable QC doing the work. Because of analysis time (possibly several months), it is imperative this contract be pursued in an aggressive manner so we can sample in December. Delays in developing the contract will only put us into a more precarious position concerning public health. The product we are looking at is in the City of Wausau and underneath several blocks of homes. Health risks are a great concern. It is imperative we pursue this contract as soon as possible.

If you have any questions, please do not hesitate in contacting me.

GFK:dim
cc: D. Urso, Rhinelander
W. Smith, Rhinelander

11/21/85

State of Wisconsin \ **DEPARTMENT OF NATURAL RESOURCES**

Antigo Area Headquarters
P.O. Box 310
Antigo, WI 54409

Carroll D. Besadny
Secretary

November 21, 1985

File Ref: 4400

Mr. Patrick Wierzba
Plant Engineering Manager
SNE Corporation
P.O. Box 1007
Wausau, WI 54401

CERTIFIED MAIL

Dear Mr. Wierzba:

A written request for a 30-day storage extension from SNE Corporation, Wausau, Wisconsin dated November 11, 1985 was received by the Wisconsin Department of Natural Resources, Antigo. Due to SNE Corporation's unforeseen, temporary and uncontrollable circumstances in finding a waste disposal firm to handle your pentachlorophenol (PCP) waste, which contains dibenzo-p-dioxins and dibenzofurans, the Department of Natural Resources grants a thirty (30) day extension from the date of this letter. This 30-day extension is pursuant to Section NR 181.21(5)(b), Wisconsin Administrative Code.

SNE Corporation shall continue to make a continued effort during this extension period to properly dispose of the PCP waste. Storage of this waste shall be in a safe and secure location, where leaks or spills are readily containable and human health and safety are not jeopardized.

Please feel free to contact me at 715-627-4317 if you have any question regarding this letter.

Sincerely,
North Central District

Kenneth D. Markart
Area Solid Waste Specialist

KDM:bb
cc: Gary Kulibert - Rhinelander
Ed Lynch - SW/3

11/19/85

eder associates
consulting engineers, p.c.

November 19, 1985
File #509-1

Mr. Gary Kullibert
Wisconsin Department of
Natural Resources
North Central District Headquarters
Box 818
Rhinelander, Wisconsin 54501

Dear Gary:

A draft of our report has been submitted to SNE Corporation for review. In the meantime, I am forwarding the following analytical data:

1. Results of VOC, PCP, and mineral spirits analyses of samples collected August 16, 1985 from monitor wells.

2. Results of analyses of Wisconsin River water samples collected at the locations shown on the enclosed map on September 26, 1985.

We should be forwarding the final draft of our report to you within the next two weeks.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

William M. Warren
Senior Hydrogeologist

WMW/tg
Enc.

cc: L. Eder
S. Kroll
H. Dolce
J. Noonan
T. Jirous
J. Derouin

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(AD-75)

11/15/85

CORRESPONDENCE/MEMORANDUM

STATE OF WISCONSIN

Date: November 15, 1985 *File Ref:* 4430

To: The File

From: Gary Kulibert GK

Subject: SNE Corporation

On November 14, 1985, at approximately 11 a.m, I talked with Pat Wierzba, plant engineering manager, concerning the report addressing their penta problem. I asked Pat where the report was, and he indicated that they were hoping to receive the report tomorrow and meet with Edder & Associates on November 21 to discuss what activities are being proposed. I expressed that a number of people were getting very nervous concerning this penta problem, including the Department of Health as it relates to the penta and dioxin, as well as DNR staff. I went on to indicate that some Department staff were considering the possibility of calling in EPA's immediate response group or utilizing the Spill Fund to begin activites if progress is not being made.

Pat Wierzba also indicated that they were bringing in carbon to begin testing to size the various carbon columns. It is hoped that this material will be in Monday, with the test being run either Monday or Tuesday and the results the week of Thanksgiving.

I ended the conversation, again assuring him that we want to work with him but it is imperative that some action be taken quickly; otherwise, other alternatives would be used.

GK:ck

11/13/85

eder associates
consulting engineers, p.c.

November 13, 1985
File #509-1

Mr. Gary F. Kulibert
Solid Waste Coordinator
State of Wisconsin
Department of Natural Resources
North Central District Headquarters
Box 818
Rhinelander, Wisconsin 54501

Re: SNE Corporation - Wausau, Wisconsin

Dear Gary:

This letter is in response to your letter of October 14, 1985 to Howard Dolce of SNE and confirms previous telephone conversations between yourself and Bill Warren of this office.

Pursuant to your request, we are evaluating the design of a depression pump-skimming for floating layer removal at SNE Corporation. The effluent from the depression well would have to be pretreated to a level of 0.15 mg/l average and 0.25 mg/l maximum PCP concentration in order to be acceptable for discharge into the City sewer system. Activated carbon adsorption is the recommended form of treatment.

Bench scale carbon isotherm tests are necessary prior to system design to:

(1) Determine whether this concentration can be achieved;

(2) If it can, determine the quantity of carbon necessary for treatment; and

(3) Assess the effect of remnant mineral spirit concentrations on carbon utilization ratio.

These tests have been scheduled for November 18th and 19th. The results should be available by the first week of December depending on laboratory response time.

We are also in the process of completing our report on the investigations undertaken to date. This report, containing all information collected, will be sent to you before Thanksgiving.

Continued . . .

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JOHN McGUIRE, P. E. • JORGE MOLINA, ING. • WILLIAM J. CUNNINGHAM, P. E. • JOSEPH B. HELLMANN, P. E.

Mr. Gary F. Kulibert
State of Wisconsin
Department of Natural Resources
November 13, 1985

Should you have any questions or require any further information, please do not hesitate to call either Bill or myself.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

Leonard J. Eder, P.E.

LJE/nf

cc: S. Kroll
H. Dolce
P. Wierzba

10/14/85

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES
North Central District Headquarters
Box 818
Rhinelander, Wisconsin 54501
(715)362-7616

Carroll D. Besadny
Secretary

October 14, 1985

File Ref: 4400

Mr. Howard E. Dolce
Director of Manufacturing
SNE Corporation
P. O. Box 1007
Wausau, Wisconsin 54401

Dear Mr. Dolce:

This is to confirm our conversation on October 7, 1985, concerning Eder Associates' September 14, 1985, proposal. Their proposal relates to the recovery of PCP and mineral spirits floating on the groundwater table.

After reviewing the information submitted and discussing the situation with a number of people, I have a major concern. The system, as proposed, will recover only minimal amounts of product over a long period of time. There is no great attractants for penta to flow laterally or upgradient to an extract well. For this reason, the passive system, as proposed, is not acceptable.

A special concern, on the Department's part, is the penta on the groundwater does contain trace amounts of dioxins. Even though this particular dioxin may not be a major health concern at this time, the fact that it is there is a good reason to have an aggressive program to correct the situation. Therefore, it is imperative that a groundwater depression system or similar system be pursued to remove the floating product as soon as possible.

At this time, I am requesting SNE to begin development, and possible installation, of such a system within the next 30 days. The plans should be submitted to the Department for review and approval. Once obtained, you will be asked to proceed quickly with installation.

There is some concern of what to do with the water from the depression pumps. This water will have to be analyzed, and, if found to contain contaminants, either treated on-site using technology such as activated carbon or air stripping or discharged to the sanitary sewer, provided it can be accepted by the City of Wausau.

We also discussed the Department's need for additional information. In reviewing our files, I find that the last information we received was on July 22, 1985. Since that time, additional wells have been installed and information gathered. Please submit this as soon as possible so that we can continue our review of the project.

Another problem discussed was gaining access to the Connor property. You indicated that the president of your firm has been meeting with the president of Connors to discuss this matter. If agreements cannot be worked out, the Department will review the situation to determine alternative options.

Another area of concern is the dip-tank area located in the plant. I have requested, on a number of occasions, soil samples be taken in that area to determine the degree of contamination of the soils. My concern is, if this area is not properly cleaned up, it will be an ongoing source of contamination to the area for years to come. I am in need of the soil boring information and the soil analysis. Based on that, I will be able to make recommendations on the type of activities the Department will consider necessary.

It has also been brought to my attention that vapors will escape from the free-floating product. With the upcoming winter season, vapors that are vented throughout the soils may not be able to because of the frozen ground. There are a number of cases where vapors have followed sewer lines or entered basements and caused problems. I am asking SNE to evaluate the situation and determine if basement monitoring in selected homes in the area should take place. It is important that we evaluate all health concerns that may be related to the release of any of these types of materials, chronic or acute.

If you have any questions concerning this matter, please do not hesitate in contacting me at the District office. It has been noted that SNE has made an effort to resolve this situation on their own and should be commended. However, we have reached the point where it is important to proceed quickly in the installation of the system to begin the recovery of the product. Once this is done, we can evaluate the degree of groundwater contamination from the dissolved fraction and determine if additional work efforts will be needed.

Sincerely,

Gary F. Kulibert
Solid Waste Coordinator

GFK:dim
cc: E. Kreul, Rhinelander
SW/3, GEF II

9/25/85

SNE Corporation
A Sentry Enterprise

910 Cleveland Avenue
P.O. Box 1007
Wausau, WI 54401
715 845-1161

September 25, 1985

Mr. Gary Kulibert
Solid Waste Coordinator
Department of Natural Resources
North Central District Headquarters
Box 818, 107 Sutliff Street
Rhinelander, WI 54501

Dear Gary:

Enclosed is a proposal from Eder Associates stating what is planned for SNE in their continuing effort to recover the floating layer of PCP and mineral spirits from the water table at our plant site here in Wausau.

This is the current, updated informtion as to the status of the project. If you have any questions, please call.

Very truly yours,

SNE CORPORATION

Howard

Howard E. Dolce
Director of Manufacturing

called 10/7/85 I will send

September 19, 1985
File #509-1

eder associates
consulting engineers, p.c.

Mr. Howard Dolce
SNE Corporation
910 Cleveland Avenue
Wausau, Wisconsin 54401

Dear Mr. Dolce:

This is our proposal for the continuation of efforts to recover the floating layer of PCP and mineral spirits from the water table at the SNE Corporation plant site, Wausau, Wisconsin. As discussed in our telephone conversation of September 17, 1985, we want to give static product recovery (Auto Skimmer) every chance to work before resorting to water-table depression techniques and extensive groundwater treatment prior to release.

The two active recovery wells (W-4 and 7) are not producing enough floating layer for the Auto Skimmer to work. We believe the decrease in floating layer in these wells is related to the recent heavy rainfall and the reduced effective open area of the perforations in the PVC well screen in W-4. Additionally, the infiltration galleries above W-7 have undoubtedly increased the amount of infiltrating rainfall in that area. The phenomenon of disappearing floating layers in wells related to rainfall periods is well documented in other cases and is not peculiar to the SNE site. In the floating layer recovery process, this decrease in recovery during rainfall periods would be allowed for even if water table depression pumps were in operation.

The Connors' property appears to be the best off-site location for floating layer recovery. Connors has indicated in their recent response to your request for access that any drilling on their property will be delayed for at least a month. Off-site product recovery should be attempted on Connors' property, when available, and monitoring of the layer in W-15 would indicate whether the product is being pulled toward the recovery wells on Connors' property. If it cannot be shown that the off-site recovery wells are cleaning up the floating layer at W-15, then a suitable location for recovery must be found east of Cleveland Avenue. Pat Wierzba reports that the City of Wausau would not allow installation of any recovery facility in the alleys off Cleveland Avenue because they must remain clear and open to vehicular traffic.

The present situation demands that the static recovery method be proven effective (or ineffective) and product recovery proceed in compliance with the Wisconsin DNR informal orders. We recommend that an 8-inch diameter well be installed near W-4 and the Auto Skimmer be put on the new well. This location was chosen for its accessibility and the suspected inefficiency of the two-inch PVC well (W-4). The new well would be installed by the cable tool drilling method under a subcontract by Wisconsin Test Drilling Company which has installed all monitor wells at the site.

Continued . . .

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This work is scheduled to begin on September 23, 1985, and will include the sampling of the Wisconsin River at ten (10) locations to determine if dissolved PCP is present in the river. The analyses of these samples will be performed by Parker Services, Inc.

In the event that the new 8-inch diameter well does not recover product when the Auto Skimmer is placed into service, it may be necessary to abandon the static recovery program and resort to some form of water table depression pumping using the new 8-inch well. This will be evaluated after two weeks of Auto Skimmer activity on the new well.

Please advise if further clarification is required.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

William M. Warren
Senior Hydrogeologist

WMW/tg

cc: S. Kroll
J. Derouin
J. Noonan
P. Wierzba

(AD-75)

9/17/85

CORRESPONDENCE/MEMORANDUM

STATE OF WISCONSIN

Date: September 17, 1985 *File Ref:* 3200

To: Gary F. Kulibert

From: Ed Kreul

Subject: SNE Corporation

As you indicated in a recent conversation, the extent of discreet product on the water table at SNE appears to be greater than previously anticipated. This finding raises concerns about the entrance of fugitive vapors into the basements in the area. Perhaps it would be wise to require SNE to do a survey of homes in the vicinity of the apparent contamination.

Winter is nigh upon us and people will be closing their houses soon increasing the risks of exposure if vapors are reaching their basements. I urge you to contact SNE in the near future and request this work.

If you would like to discuss this, let me know.

EK:dim

8/30/85

SNE Corporation

A Sentry Enterprise

910 Cleveland Avenue
P.O. Box 1007
Wausau, WI 54401

715 845-1161

August 29, 1985

Inspector Bresnahan
Fire Inspector Central Station
606 E. Thomas Street
Wausau, WI 54401

TANK ABO.

Dear Inspector Bresnahan:

SNE Corporation owns two penta underground storage tanks. Penta is a wood preservative consisting of a five percent solution of pentachlorophenol in mineral spirits. The size of these two tanks are 3,000 and 4,000 gallons. Wood treating operations associated with these two tanks were curtailed in November of 1984, and the remaining penta solution was transferred to another penta process line. The transfer of penta was completed by the middle of May. After both tanks were emptied, we proceeded to triple rinse the tanks, connecting piping, and pump with mineral spirits. This was accomplished by the middle of June. After rinsing, the connecting piping and pump were disconnected from the tanks. The mineral spirits used to rinse the tank were placed into our other penta process line.

Because of the location of our two tanks, we elected to abandon the tanks in place. As you witnessed on August 26th, Walts Petroleum supervised the filling of these two tanks with concrete. After they were pressure filled, we buried the remaining fill pipes with concrete.

If you need additional information regarding the abandonment of these tanks, contact me at your convenience

Sincerely,

Patrick Wierzba
Plant Engineering Manager

PJW/11

cc: Gary Kulibert - DNR
Howard Dolce

7/23/85

eder associates
consulting engineers, p.c.

July 23, 1985
File #509-1

Mr. Gary Kulibert
Solid Waste Coordinator
Department of Natural Resources
North Central District Headquarters
Box 818, 107 Sutliff Street
Rhinelander, WI 54501

Re: Errata to Our 7/28/85
Status Report

Dear Gary:

Please note that the eighteenth compound down the left hand column of Table 2 in our 7/23/85 status report should read, "1,2-Dichloroethylene" instead of 1,2-Dichloroethylane, on both pages of the table.

We apologize for the error.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

Leonard J. Eder, P.E.
LJE/mw

cc: E. Kruel
H. Dolce
S. Kroll
P. Wierzba

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JOHN McGUIRE, P. E. • JORGE MOLINA, ING. • WILLIAM J. CUNNINGHAM, P. E. • JOSEPH B. HELLMANN, P. E.

7/26/85

eder associates
consulting engineers, p.c.

July 23, 1985
File #509-1

Mr. Gary Kulibert
Solid Waste Coordinator
Department of Natural Resources
North Central District Headquarters
Box 818, 107 Sutliff Street
Rhinelander, WI 54501

Re: Status Report
Hydrogeological Investigations at
SNE Corporation
Wausau, Wisconsin

Dear Gary:

Our engineering report dated December, 1984 presented a site investigation plan to determine the source and extent of pentachlorophenol (PCP) in the groundwater in the vicinity of the SNE Corporation plant in Wausau.

A report summarizing the initial phases of the investigation was submitted to you in March, 1985.

Bill Warren's letter to SNE, dated May 9, 1985, a copy of which was supplied to the Department of Natural Resources (DNR), presented a two-phase approach to the continuing investigation. Phase I recommended the installation of six additional monitoring wells to determine the lateral extent of PCP contamination in the area. These wells were completed and sampled twice on May 21, 1985 and June 25, 1985. The results are summarized on Table 1 and Drawing 1 attached. Wells 4, 5, 6 and 7 were not sampled in order to allow any floating layer of mineral spirits which may be present to build-up for quantification. The data shows a defined plume of PCP moving from the plant in an easterly direction toward the Wisconsin River.

The monitor well samples collected on June 25, 1985 were also analyzed for VOCs using EPA method 601 by Zimpro labs in Rothschild. The results reported are summarized in Table 2. Drawing 2 presents the areal distribution of the major compounds found, i.e. benzene, toluene, trichloroethylene and 1,2 Dichloroethylene. The areal distribution of these compounds is the same general pattern and magnitude as the PCP plume. The direction of groundwater flow is also confirmed by the water table contour map presented on Drawing 3.

Continued . . .

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JOHN McGUIRE, P. E. • JORGE MOLINA, ING. • WILLIAM J. CUNNINGHAM, P. E. • JOSEPH B. HELLMANN, P. E.

Table 3 presents a brief summary of the uses of the major VOC's detected. SNE's major supplier of PCP indicates that benzene and toluene are impurities found in the mineral spirits used to dissolve the PCP. The source of the trichloroethylene is not known at this time. The 1,2 Dichloroethylene is probably a decomposition product of trichloroethylene.

Based upon the monitor well results, the following work plan has been initiated:

(1) Install one additional shallow monitor well at the N.E. corner of Edwards and Cleveland to verify groundwater flow direction.

(2) Install deep wells next to W-1, W-3 and W-10 to determine the vertical extent of the contamination.

(3) Resample all wells for VOC and PCP.

Bill Warren will be in Wausau from July 23 to July 26 to observe the installation of the new monitor wells and collect the necessary hydrogeological information. SNE will supervise the resampling of the wells.

Phase II of Bill's May 9, 1985 letter dealt with the alternatives available for removal of the floating layer of mineral spirits beneath the plant. Well W-4 has been bailed twice per day since April 4, 1985. Wells W-5, W-6 and W-7 have not been sampled or disturbed during the last 60 days to allow measurement of the maximum thickness of floating layer which could be expected at each point. The floating layer present in each will be monitored this week.

Preliminary proposals have been received from Groundwater Technology of Minneapolis to use their recovery system at the site. However, this system involves the generation of large quantities of contaminated water from water table draw down wells, which would have to be discharged to the City's municipal wastewater treatment system. A literature study has been initiated to determine the treatability of the groundwater at the City's plant and to insure that the discharge will not cause future problems with the City's waste sludge.

Because of the problems associated with the disposal of the mineral spirits recovered, SNE has decided to reuse the material to the maximum extent possible within its manufacturing process.

Continued . . .

Mr. Gary Kulibert
Department of Natural Resources
July 23, 1985

SNE has begun the formal procedures necessary to abandon in place, the two empty PCP tanks in the area of the dip line. In addition to tank abandonment, a drainage plan will be developed for the courtyard area above the tanks to insure that rainfall is carried off by the plant storm sewers and does not reach the crawl space area surrounding the dip line which has been contaminated by PCP.

We anticipate being able to again advise you of project status including a final plan for removal of the floating layer within three weeks after the receipt of this week's sample results.

Should you have any questions or require any further information, please do not hesitate to call.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

Leonard J. Eder, P.E.

LJE/mw

cc: E. Kruel
H. Dolce
S. Kroll
P. Wierzba

SNE CORPORATION
WAUSAU, WISCONSIN

TABLE 1

SUMMARY OF WELL ANALYSES FOR PCP

Well No.	PCP in mg/l	
	5/21/85	6/25/85
8	.04	1.19
9	0.98	0.65
1	0.55	0.38
2	3.73	2.95
13	2.55	1.31
10	19.40	11.81
3	14.73	5.91
11	5.02	0.93
12	2.36	1.10
14	.04	0.20

SNE CORPORATION

WAUSAU, WISCONSIN

TABLE 2

Mon. Well

VOC ANALYSIS (ug/l)

JUNE 25, 1985

	Detection Limit	Well # 8	2	14	3	12
Benzene	0.2	X	1.4	X	33.2	2.0
Bromoform	0.5	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X
Carbon Tetrachloride	0.1	X	1.5	X	X	X
Chlorobenzene	0.1	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X
Chloroform	0.1	0.4	5.3	0.5	4.5	3.7
Chloromethane	6.0	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X
Dichlorobromomethane	0.1	X	0.2	X	X	X
1,1-Dichloroethane	0.1	X	X	0.1	0.2	X
1,2-Dichloroethane	0.3	X	X	X	X	X
1,1-Dichloroethylene	0.5	X	X	X	X	X
1,2-Dichloroethane	0.3	X	0.3	X	9.2	0.6
Dichloromethane	0.2	X	X	X	0.2	X
1,2 Dichloropropane	0.5	X	X	X	X	X
cis-1,3 Dichloropropene	0.3	X	X	X	X	X
trans-1,3 Dichloropropene	1.0	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X	X
Tetrachloroethylene	0.1	0.1	1.3	1.8	1.9	1.1
Toluene	0.1	X	7.2	X	47.2	7.8
1,1,1-Tetrachloroethane	0.1	0.1	0.1	0.3	1.8	0.1
1,1,2-Trichloroethane	0.1	X	X	X	X	X
Trichloroethylene	0.1	0.1	31.2	0.3	420.	9.8
Vinyl Chloride	0.5	0.9	X	0.6	X	X
Zimpro Analytical No.		11508	11509	11510	11511	11512

X = Analyzed but not detected

Table 2 Continued . . .

	Detection Limit	Well # 1	11	10	9	13
Benzene	0.2	X	0.6	9.8	0.7	1.0
Bromoform	0.5	X	X	X	X	X
Bromomethane	1.0	X	X	X	X	X
Carbon Tetrachloride	0.1	1.6	X	X	X	2.8
Chlorobenzene	0.1	X	X	X	X	X
Chloroethane	1.0	X	X	X	X	X
2-Chloroethylvinyl Ether	2.0	X	X	X	X	X
Chloroform	0.1	2.0	0.9	2.7	0.4	3.8
Chloromethane	6.0	X	X	X	X	X
Dibromochloromethane	0.1	X	X	X	X	X
1,2-Dichlorobenzene	0.3	X	X	X	X	X
1,3-Dichlorobenzene	0.3	X	X	X	X	X
1,4-Dichlorobenzene	0.3	X	X	X	X	X
Dichlorobromomethane	0.1	0.2	X	X	X	0.3
1,1-Dichloroethane	0.1	X	X	X	X	X
1,2-Dichloroethane	0.3	X	X	X	X	0.6
1,1-Dichloroethylene	0.5	X	X	X	X	X
1,2-Dichloroethane	0.3	X	0.5	5.2	3.0	X
Dichloromethane	0.2	X	X	X	X	X
1,2 Dichloropropane	0.5	X	X	X	X	X
cis-1,3 Dichloropropene	0.3	X	X	X	X	X
trans-1,3 Dichloropropene	1.0	X	X	X	X	X
Ethylbenzene	0.2	X	X	X	X	X
1,1,2,2-Tetrachloroethane	0.1	X	X	X	X	X
Tetrachloroethylene	0.1	0.4	0.2	1.3	0.1	1.8
Toluene	0.1	X	1.2	24.6	X	X
1,1,1-Tetrachloroethane	0.1	X	0.1	1.0	0.2	5.6
1,1,2-Trichloroethane	0.1	X	X	X	X	X
Trichloroethylene	0.1	1.0	3.9	140.	1.4	13.5
Vinyl Chloride	0.5	X	X	X	X	X
Zimpro Analytical No.		11513	11514	11515	11516	11517

X = Analyzed but not detected

SNE CORPORATION

WAUSAU, WISCONSIN

TABLE 3

USES OF VOC'S FOUND IN GROUNDWATER

Benzene:

- A solvent for waxes, oils and resins;
- A constituent of motor fuels; and
- Used in the manufacture of medicinal chemicals, dyes, artificial leather, linoleum, oil cloth, varnishes and lacquers.

Toluene:

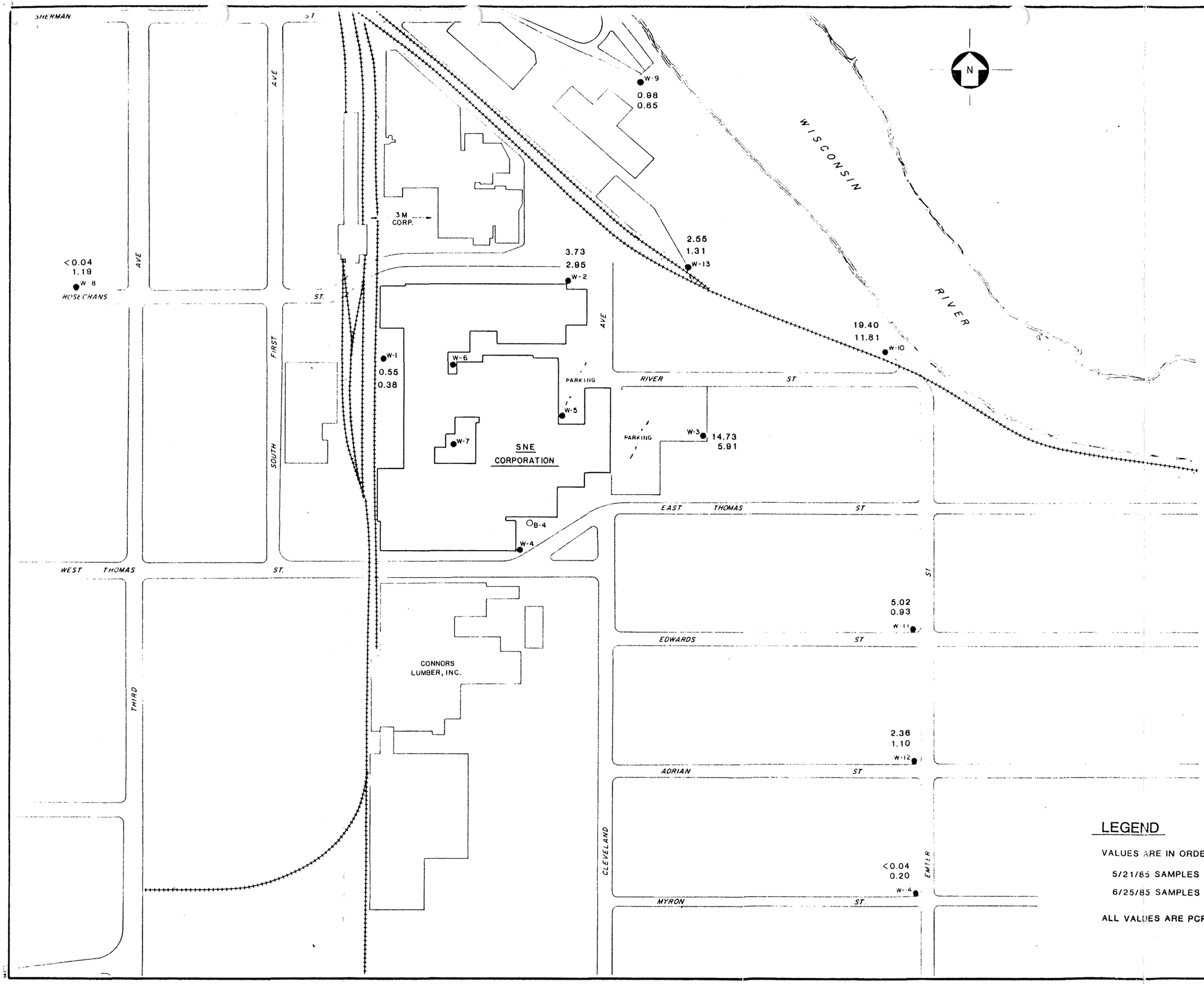
- A constituent of motor fuels;
- Used as a thinner for paints, lacquer, coatings and dyes;
- Used as a paint remover;
- Used as a solvent in pharmaceutical chemical rubber and plastic industries; and
- Used in the manufacture of artificial leather, fabric, coatings and spray surface coating, and as a diluent for cellulose ester lacquers.

Trichloroethylene:

- Used as a solvent for fats, waxes, oils, resins, varnishes and cellulose esters; and
- Used for solvent extraction, degreasing, dry cleaning and organic chemical manufacturing.

1,2 Dichloroethylene:

- A low-temp solvent for heat-sensitive substances in extraction of caffeine, perfume oils and fats for animal flesh;
- Used as solvent in gums, waxes, oils, camphor and phenol, solvent mixtures for esters and ether derivatives, lacquers, resins, thermoplastics and artificial fibers;
- Liquid dry cleaning agent, cleaning solution for printed circuit boards, food packaging adhesives and germicidal fermegants; and
- A decomposition by-product of trichloroethylene.



LEGEND

VALUES ARE IN ORDER

5/21/85 SAMPLES

6/25/85 SAMPLES

ALL VALUES ARE PCP IN mg/l

NO	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

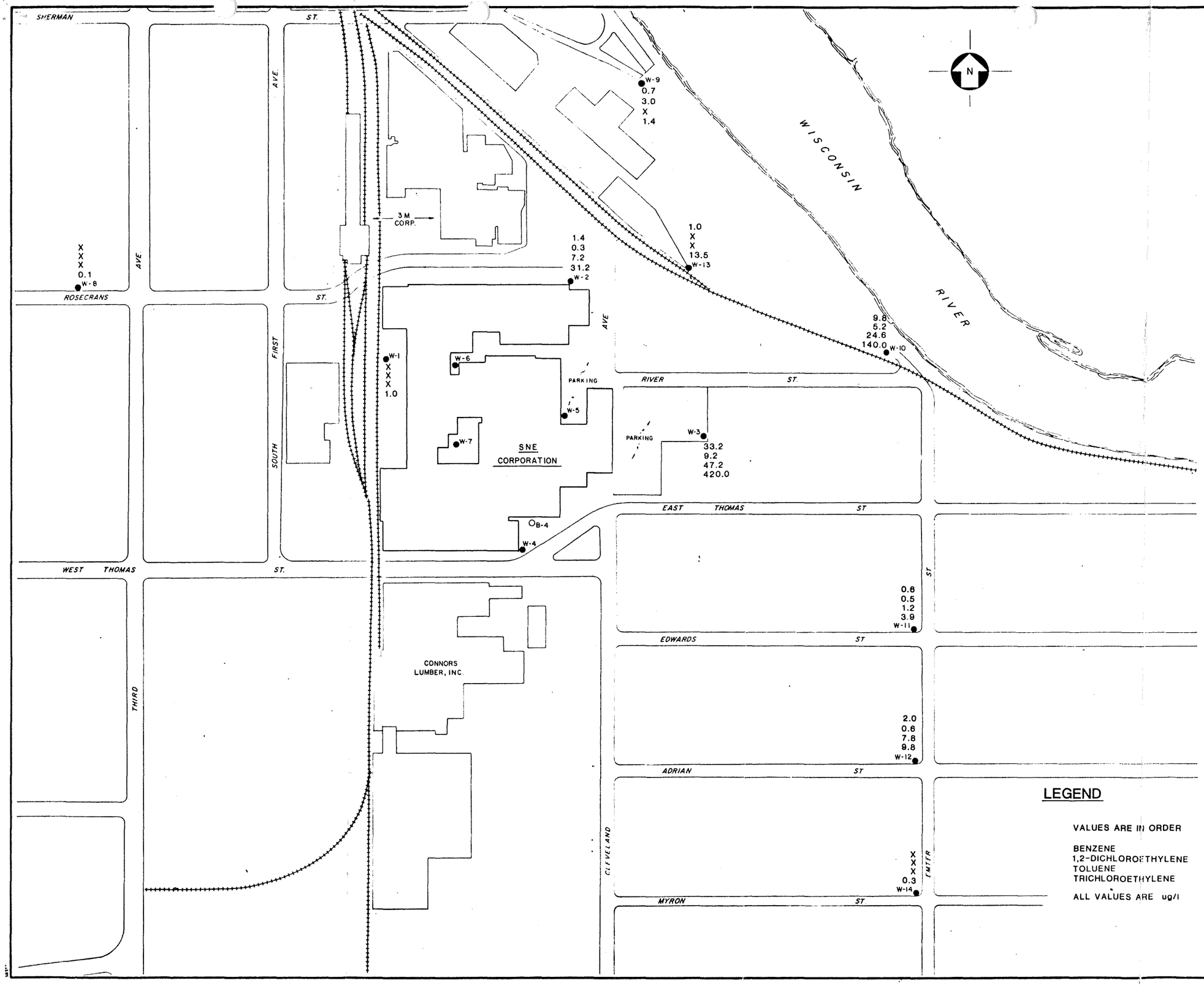
eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
SUMMARY OF 5/21/85 & 6/25/85 PCP ANALYSES

eder associates consulting engineers, pc
85 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY	SCALE
DESIGNED BY	PROJECT NO
APPROVED BY	DWG NO 1
DATE	



LEGEND

VALUES ARE IN ORDER

BENZENE
1,2-DICHLOROETHYLENE
TOLUENE
TRICHLOROETHYLENE

ALL VALUES ARE ug/l

Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

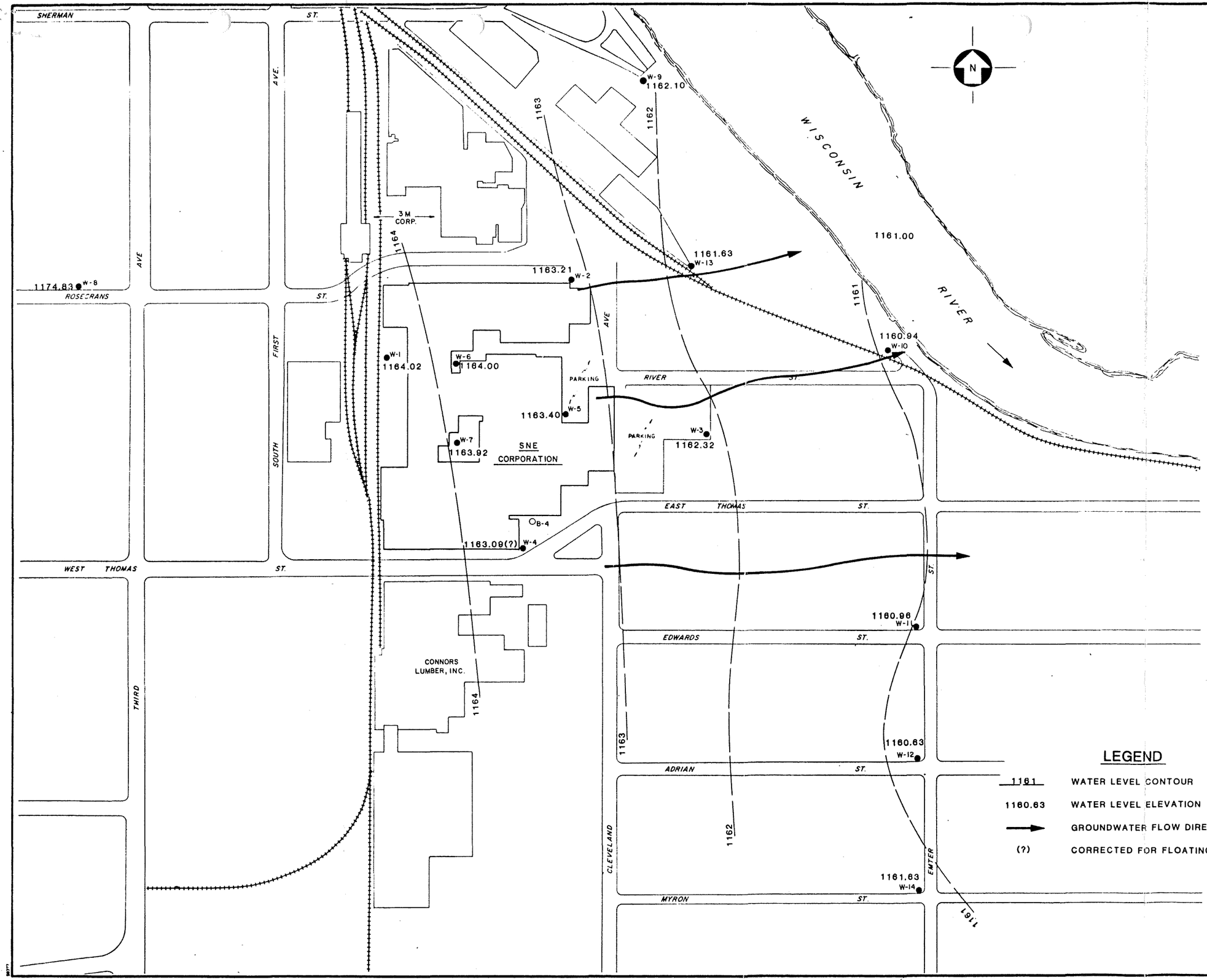
eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
SUMMARY OF 6/25/85 VOC ANALYSES

eder associates consulting engineers, pc
88 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY	SCALE
DESIGNED BY	PROJECT Nº
APPROVED BY	DWG Nº 2
DATE	



LEGEND

1161	WATER LEVEL CONTOUR
1160.63	WATER LEVEL ELEVATION
→	GROUNDWATER FLOW DIRECTION
(?)	CORRECTED FOR FLOATING PCP LAYER

Nº	REVISIONS	DATE	BY

GROUNDWATER SAMPLING PROGRAM

SNE CORPORATION

WAUSAU, WISCONSIN

eder associates consulting engineers, p.c.

PROJECT
GROUNDWATER SAMPLING PROGRAM
SNE CORPORATION
WAUSAU, WISCONSIN

TITLE
PRELIMINARY
WATERTABLE MAP
5/25/85

eder associates consulting engineers, pc
65 FOREST AVENUE, LOCUST VALLEY, NEW YORK, 11560

DRAWN BY TAC	SCALE 1"=100'
DESIGNED BY MMP	PROJECT Nº 5-19-1
APPROVED BY CJF	DWG Nº 3
DATE May 1985	

6/7/85

SNE Corporation

A Sentry Enterprise

910 Cleveland Avenue
P.O. Box 1007
Wausau, WI 54401

715 845-1161

June 7, 1985

Gary F. Kulibert
District Solid Waste Management
Coordinator
State of Wisconsin/Department of
Natural Resources
North Central District Headquarters
Box 818
Rhinelander, WI 54501

Dear Mr. Kulibert:

Enclosed is your copy of our proposal for proceeding with the handling of contaminated ground at SNE. This copy contains the amended changes, as we understood them, from our meeting on May 13, 1985.

In addition, please find an addendum which covers what has transpired since our meeting. Please pay special attention to suggestion/request number four which deals with a product recovery system.

Yours truly,

Howard E. Dolce

Howard E. Dolce
Director of Manufacturing

HED:mwi
cc: J. Noonan
J. Derouin

eder associates
consulting engineers, p.c.

May 14, 1985
File #509-1

Mr. Seymour Kroll
President
SNE Corporation
910 Cleveland Avenue
Wausau, Wisconsin 54401

Dear Mr. Kroll:

Pursuant to your request, this letter provides an overview of the proposed PCP investigation and possible future actions that may be required at the SNE facility in Wausau, Wisconsin. Eder Associates Consulting Engineers, P.C. (EA) proposes that the investigation be divided into two studies to be performed consecutively. The first phase would be the determination and fate of dissolved PCP in groundwater downgradient of the SNE facility. The second phase would be the investigation of undissolved PCP floating on the water table directly below the SNE facility.

Phase I

Since PCP has been detected in groundwater at the SNE site, the downgradient fate of that PCP must be determined. A test drilling and monitor well installation program would be required in order to define the vertical and horizontal extents of PCP in groundwater. This program would be limited to the saturated portion of the unconsolidated materials (shallow groundwater) at the present time. Depending on the findings of the recommended program, groundwater in the bedrock may or may not require investigation. At present, it will be assumed that there is an upward groundwater gradient in the bedrock zone and that downward movement of shallow groundwater into the bedrock is not an immediate concern. This assumption is based on conditions reported during water-well drilling in the general area.

The recommended test drilling program is designed to define groundwater flow directions at, and downgradient of, the SNE site by the preparation of a water table map. The water table map would be used with the results of groundwater sample analyses to map the lateral extent of PCP occurrence in groundwater. In the event that PCP is detected in shallow groundwater downgradient of the site, it will be necessary to install a second well at these locations to define the vertical extent of PCP.

Based on the available data, it is assumed that groundwater at the site flows toward the Wisconsin River where it discharges; PCP occurrence is limited to the saturated unconsolidated zone; and PCP and mineral spirits (in a dissolved form or a discrete phase on the water table) are the primary compounds in groundwater at SNE.

Continued . . .

85 FOREST AVENUE • LOCUST VALLEY, NEW YORK 11560 • (516) 671-8440
LEONARD J. EDER, P. E. • FREDERICK H. INYARD, P. E. • STEPHEN J. OSMUNDSEN, P. E. • GARY A. ROZMUS, P. E.
JOHN McGUIRE, P. E. • JORGE MOLINA, ING. • WILLIAM J. CUNNINGHAM, P. E. • VINCENT J. FRISINA, P. E.

The strategy for the phased groundwater investigation is to first define the possible flow paths along which PCP may be migrating toward the discharge area at the Wisconsin River and to bracket this zone for future monitoring. Once the flow path has been determined, additional downgradient monitoring wells may be required to determine if PCP dissolved in groundwater discharges to the River.

As recommended in our report of March 8, 1985, six monitoring wells would be installed at locations shown on the enclosed map to determine whether PCP and/or mineral spirits are present in groundwater downgradient of the SNE plant site. Each monitoring well would be drilled to a maximum depth of approximately 10 feet below the water table and screened from 5 feet above the water table to 10 feet below the water table. All monitoring wells will be constructed according to the suggested guideline promulgated unofficially by the Wisconsin Department of Natural Resources (DNR) (diagram enclosed, "Observation Well").

EA would provide an on-site consulting hydrogeologist during all drilling operations and sample collection. The hydrogeologist would maintain logs of geologic conditions revealed by test drilling and all other observations significant to the definition of the site hydrogeology. The hydrogeologist would also maintain a quality control and assurance program to insure the use of proper protocols during the drilling, installation, and water sampling of each monitoring well.

Upon completion, each well (including existing W-1 through W-4) will be sampled according to Environmental Protection Agency (EPA) protocol for the collection of representative groundwater samples. Each well will be developed properly and sampled one week later. A second round of samples will be collected two weeks later. The DNR will be informed of the analytical method and the compounds to be detected. Koppers Company will be asked for help in identifying the chemical composition of mineral spirits and whether it is virgin or recycled product. A scan for volatile organic compounds will also be performed by the laboratory. All water samples would be analyzed for PCP and mineral spirits by Sentry Labs including replicate samples and blanks for quality assurance.

Upon completion of all monitoring wells, a professional land surveyor would determine the elevation of the top of each well casing cap to an accuracy of 0.01 foot using standard surveying methods. EA's hydrogeologist would measure water levels in monitoring wells during

Continued . . .

the drilling program and synoptically when static water levels have stabilized. Water level readings will be made one week after well development, additional readings will be made three days later, followed by another reading after three more days. Water level measurements will be made prior to water sampling. These water levels would be used for the preparation of a water table map which will be revised for water level charges.

Phase II

The immediate concern of the DNR is the removal of any floating layer of PCP and mineral spirits from the water table surface. We propose that the extent of the floating layer be defined by a test drilling and monitoring well installation program, to be followed, if necessary, by a product removal program based on the results of the monitor wells. A minimum of three, 2-inch diameter monitor wells are required to approximately define the extent of the floating PCP. These wells would be located as shown on the enclosed map, and constructed as shown on the enclosed diagram.

After installation, these wells would be monitored for the formation of a floating layer of PCP which may require at least a month to form. Monitor wells containing a floating layer would be used as recovery wells (MW-4 is known to contain PCP and would be a recovery well).

To expedite the flow of PCP liquid into the wells, it would be necessary to create a gradient on the water table surface toward the recovery wells. This is usually accomplished by pumping a well screened in a slightly deeper zone to create a cone of depression in its vicinity. The optimum location for the pumping well is near the center of the floating layer, which is usually near the point where the product entered the ground. Pending the results of the monitor wells, it may be assumed that the center of the floating layer is at or near the dip line area. In that case, a pumping well would be installed adjacent to the proposed monitoring well in the open area near the dip line, as shown on the enclosed map. After a cone of depression has been created by the pumping well, the monitor wells containing a floating layer of PCP may be used as recovery wells.

Since the quantity of PCP on the water table may not be very large and the PCP would enter the wells slowly, mechanical pumping systems would not be advisable. Instead, the PCP could be removed by bailing the small amounts flowing into the recovery wells. An automated recovery

Continued . . .

system of this type is marketed by Wright Associates of Harrisburg, Pennsylvania. This unit may be moved from well to well because it is mounted on a self contained trailer.

The pumping well and recovery systems would be operated until PCP liquid ceased forming a layer in the wells. An additional period of recovery may be required to remove any residual PCP from the water table which may be in an emulsified state. The PCP liquid removed from recovery wells could probably be stored on-site in 55-gallon drums, pending proper disposal. The main problem with any system of this type is the discharge of groundwater pumped from the drawdown well because it will contain PCP in low concentrations. It may be possible to discharge this flow into the sanitary sewer system, but permission must first be obtained from the City of Wausau.

It is recommended that SNE take immediate steps to determine whether an extensive layer of PCP is floating on the water table at the site prior to the initiation of a product recovery program which would involve groundwater pumpage for water table depression. An expert on product recovery will be brought to the site during the field investigation to begin the planning of a product recovery system. It is also recommended that soil samples be collected from the dip line room and near the 8,000 gallon tank, and analyzed for PCP as described in Mr. Kulibert's letters. These would be shallow borings (10-20 feet in depth) and not wells. The three small diameter wells should be installed and monitored for floating PCP which may take one month to form. At that time, additional recommendations for PCP removal, if required, would be presented by EA. It would be advantageous to install these three wells at the same time as the downgradient monitor wells to minimize contractor mobilization costs.

Project Objectives

The program that EA has set forth for SNE should provide an adequate data base for the implementation of a monitoring program or a remediation program, if required. The Wisconsin DNR has indicated that their immediate concern is the removal of any undissolved PCP which may be floating on the water table below the SNE site. Since there is a floating layer at monitor well W-4, it is assumed that SNE will be required to initiate a PCP removal program. The level of effort required will be determined by the results of the test wells in the plant area. The level of effort, at a minimum, would involve the continuation of the present daily bailing of W-4. The maximum level would involve pumping a water well to create a gradient toward recovery wells and skimming the recovery wells for PCP.

Continued . . .

As for the downgradient fate of PCP, the presently available data indicates that the floating layer is relatively immobile and PCP only moves downgradient in a dissolved form at low concentrations. There do not appear to be any water wells between SNE and the Wisconsin River. Therefore, there is no immediate health hazard associated with low levels of PCP in groundwater (due to non-use).

If low levels are discharging to the Wisconsin River, dilution may reduce the concentration to an acceptable level as defined by the Wisconsin DNR regulations. If these two criteria (groundwater non-use and acceptable dilution in the Wisconsin River) are met, it may be possible for SNE to maintain a program of water quality monitoring to assure that the existing conditions do not change.

SNE should be aware that while the DNR is authorized to require the removal of hazardous materials from soil and groundwater, the DNR also considers alternatives which include plume management where there is no imminent danger to human health. While plume management is less costly than cleanup, the DNR must necessarily emphasize the human health aspects rather than cost to industry when deciding whether cleanup is required.

Please advise if further clarification is required.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

William M. Warren

William M. Warren
Senior Hydrogeologist

WMW/mw

cc: J. Derouin
J. Noonan

COST ESTIMATE
PCP INVESTIGATION

Phase I

Monitor Well Investigation	
Subcontractor - Exploration Technology Inc., Madison, Wisconsin	
Six monitoring wells	$10,000
Consulting Services - Eder Associates	
Field hydrogeologic investigation	12,500
Includes field expenses	
Date analysis and report preparation	11,000
Water Sample Analysis	
Subcontractor - Zimpro Lab, Wausau, Wisconsin	
Mineral Spirits	1,500
Sentry Lab	
Water Analysis for PCP*	--
Surveying Monitoring Well Elevations*	500
TOTAL	$35,500

Phase II

Well Installation[1]	$ 5,000
Consultative Services of EA's	
Senior Hydrogeologist,	
(includes field expenses[2])	5,000
Laboratory Analyses[1]	
Four water samples for PCP	
Five soil samples for PCP	
Surveying of well head elevations[1]	250
TOTAL	$10,250
TOTAL, Phase I	$35,500
GRAND TOTAL	$45,750

*Assumed direct billing to SNE Corporation

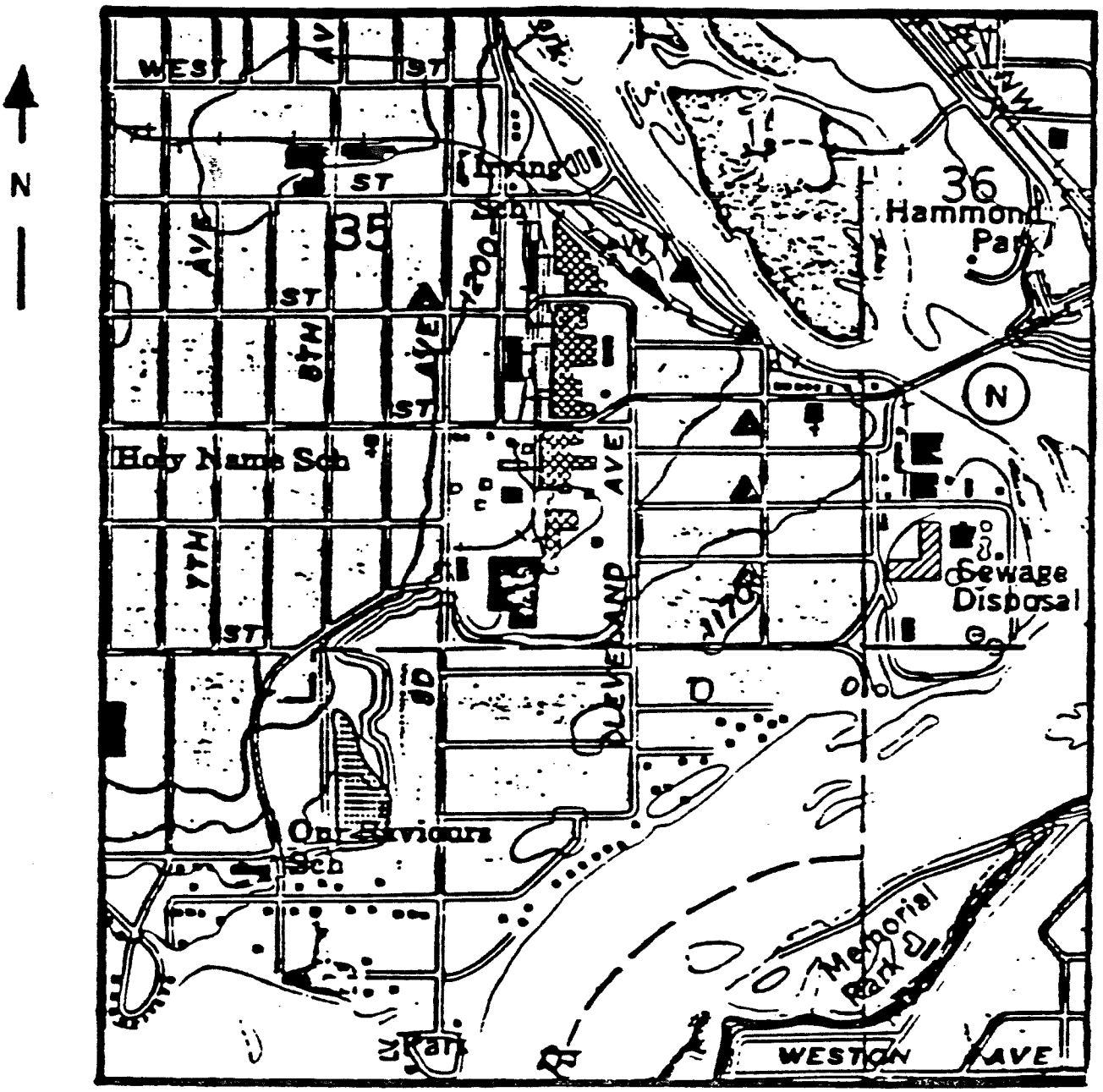
1) Direct billing to SNE Corporation.
2) Assuming one-time mobilization for installation of all monitor wells proposed by EA.

SNE CORPORATION

WAUSAU, WISCONSIN

LOCATION OF RECOMMENDED

MONITORING WELLS



Legend:

▲ Proposed Monitoring Well Location

Scale: 1" = 1000 feet

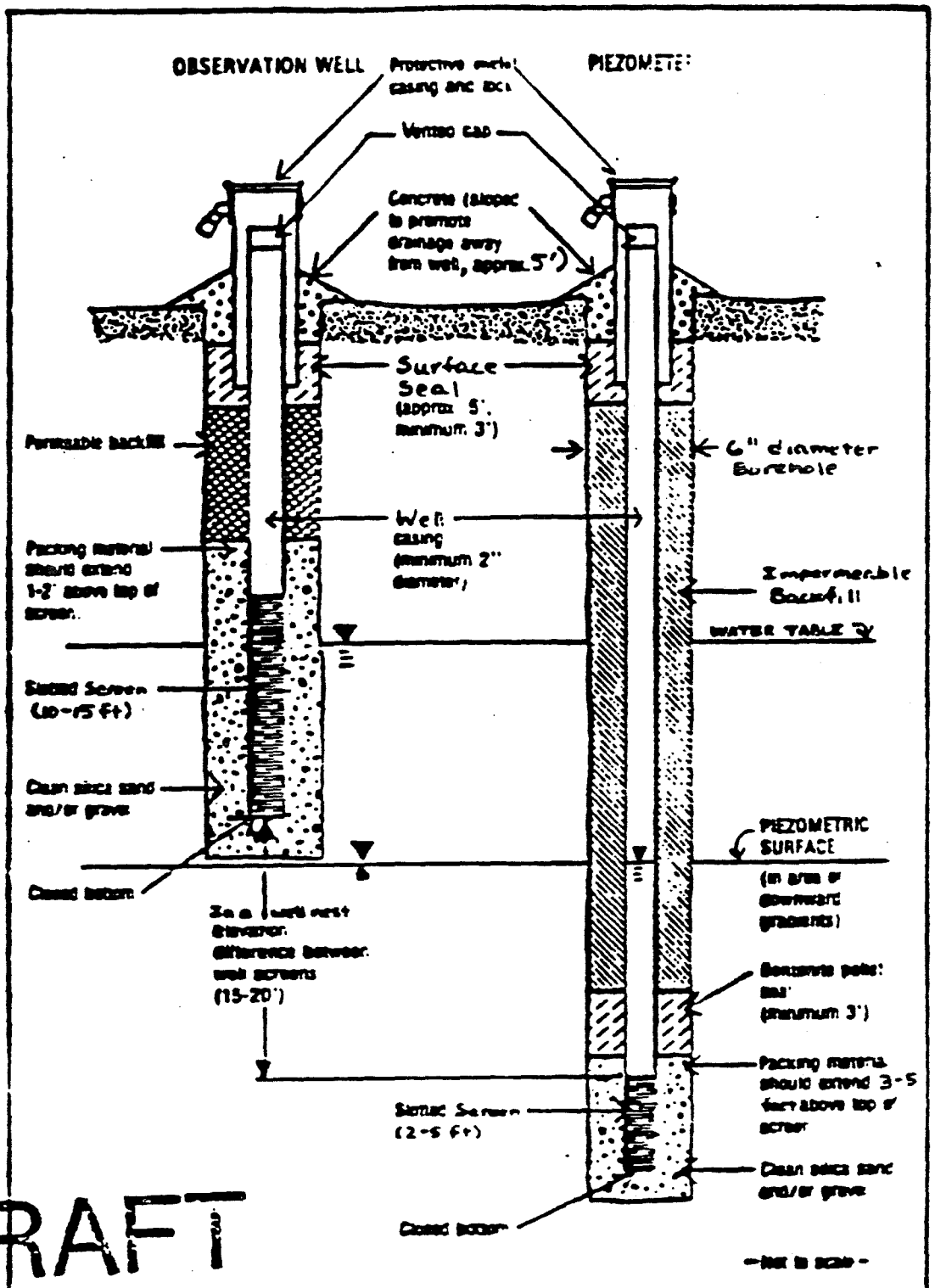
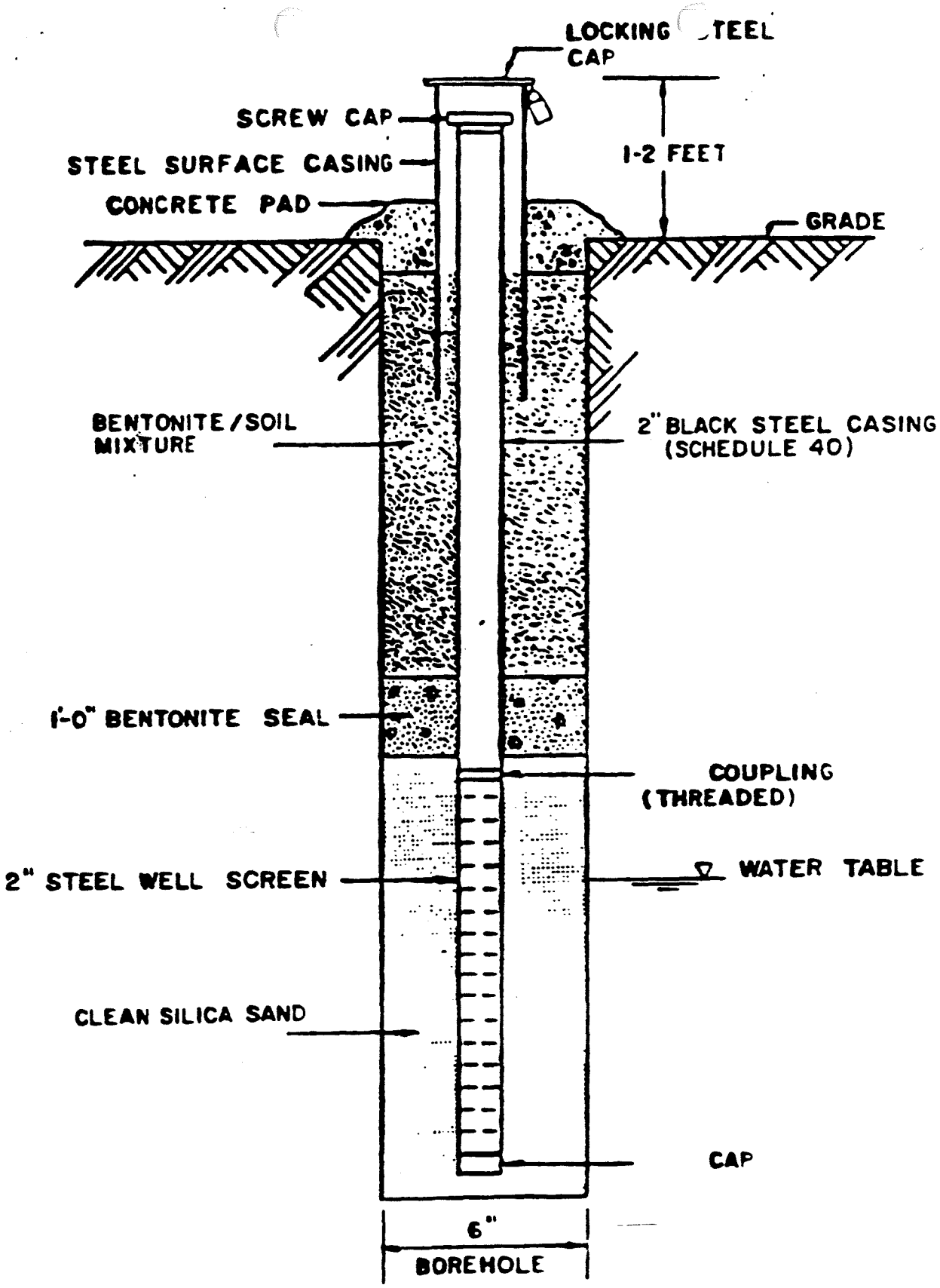
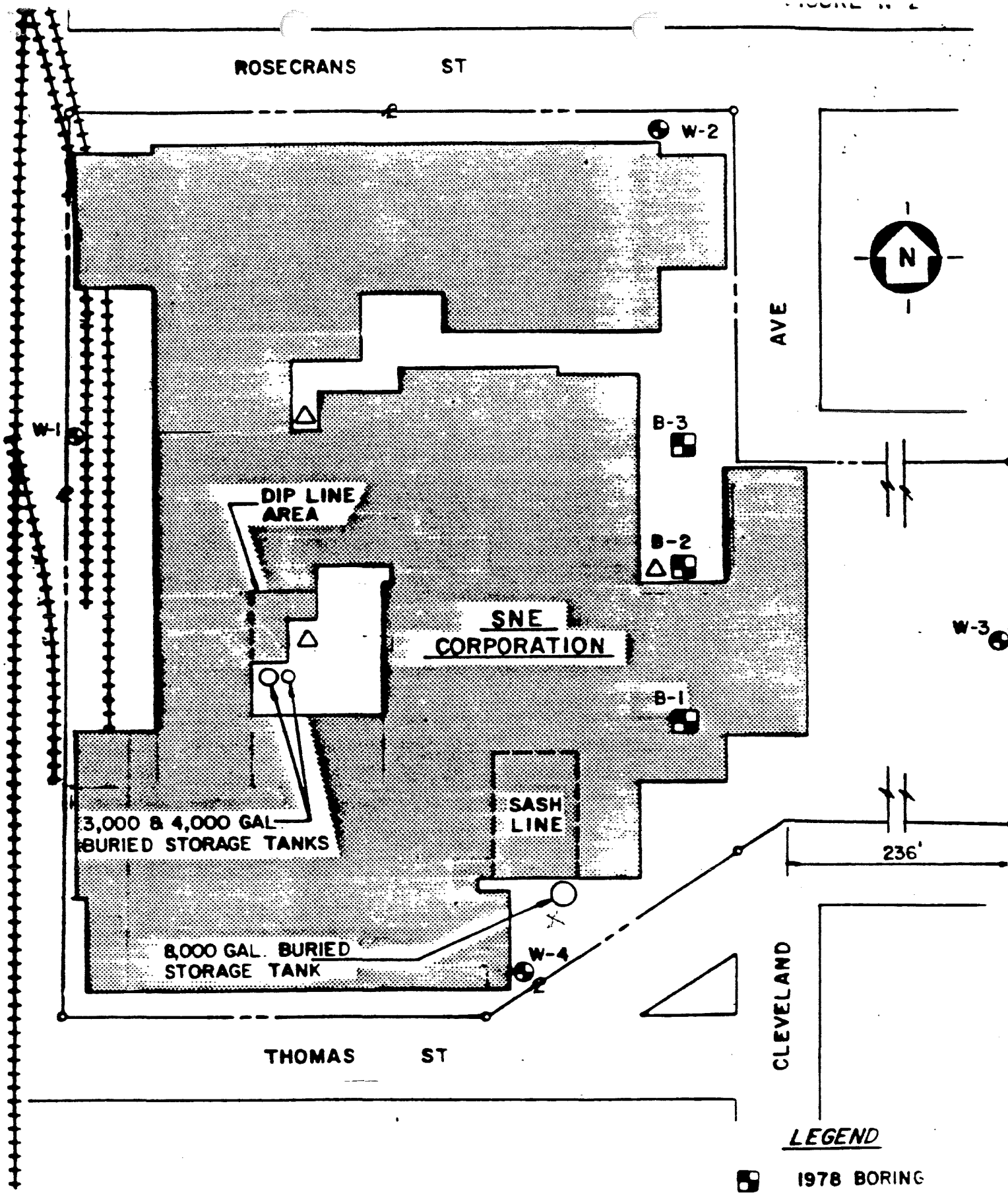


Figure 1: Typical water table observation well and piezometer construction details



MONITORING WELL CONSTRUCTION DETAILS



SITE PLAN

SCALE: 1" = 100'

ADDENDUM

PROPOSAL OF MAY 14, 1985
SUBSEQUENT FIELD MODIFICATIONS
BY EDER ASSOCIATES CONSULTING ENGINEERS, P.C.
(JUNE 3, 1985)

Suggestion/Request No. 1

As suggested by the Department of Natural Resources (DNR), all monitor wells installed (May 20-25, 1984) were screened at an interval intersecting the water table. In all cases, an attempt was made to place the screen five feet above, and 10 feet below, the water table. Water level measurements made after well installation revealed that the wells' screens were two to seven feet above the measured water level. Water levels are presently at the highest annual levels and, allowing for late summer declines, the wells will satisfy the intent of the DNR criteria throughout the year. That is, the wells will allow a floating layer on the water table to enter the well screen.

Suggestion/Request No. 2

This item was changed by mutual agreement with DNR on May 21, 1985, during a telephone conversation between Bill Warren and Ed Kreul (DNR hydrogeologist), which was later approved by Gary Kullibert (DNR). It was agreed that the one-week waiting period between well development and sampling would be shortened to one or two days in order to expedite project completion.

A second set of samples will be collected two weeks after the first round of water samples collected on May 25, 1985.

The DNR was informed that the first set of samples would be analyzed for PCP and mineral spirits. Bill Warren has asked Kent Foster (Sentry Labs, Stevens Point) to look for possible decomposition products of these compounds and to research the theoretical decomposition of PCP and mineral spirits in the groundwater environment. The DNR also agreed that VOC analyses would be carried out on the second set of water samples and not on the first set.

Another change in this suggestion/request was made during the water sampling round of May 25, 1985. The DNR requested that all wells (10) be sampled and analyzed for PCP and mineral spirits. Monitor wells 1-3 and 8-14 were sampled on May 25, but monitor wells 4-7 were not sampled. Pat Wierzba and I agreed that these wells (in the plant area) obviously contained the product and should be allowed to "rest" pending measurements for a product layer. The purpose of these wells

(4-7) is the definition of the area of a floating layer on the water table and water sampling is not an immediate concern, since the product was obviously present in these wells. Should the DNR disagree with this decision, monitor wells 4-7 could be sampled during the second sampling round.

Suggestion/Request No. 3

A round of water level measurements was carried out on May 25, 1985, for all monitor wells (1-14) by Bill Warren in the presence of Pat Wierzba.

A second round of water levels was carried out on May 30, 1985, by Pat Wierzba. A third round of water level measurements will be made by Pat Wierzba at the time of the second round of water sample collection.

Water level measurements will be made by the wetted tape method which Bill Warren has demonstrated to Pat Wierzba. By this method, a weighted measuring tape is lowered into the well to a point where the zero point of the tape is below the water level and the tape measurement is recorded as a depth below a reference point on the well casing (designated as "held", on the whole foot number). The tape is removed from the well and the "wetted cut" is recorded as "wet". Subtraction of "held" and "wet" equals the depth to water below the reference point on the well casing. Chalk applied to the tape aids in reading the water mark. Once instructed, anyone can make this measurement with accuracy and eliminates the "one person" requirement of the DNR.

Eder Associates will prepare water table maps based on each round of water level measurements.

Suggestion/Request No. 4

A recovery well expert visited the SNE plant on May 23, 1985, and discussed the problem. Mr. Gary Johnson of Groundwater Technology, Minneapolis, Minnesota, was informed of the problem and the presently available data. Once additional data on the extent of free product on the water table has been developed, Mr. Johnson will be asked to submit a proposal for the installation of a product recovery system.

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5/14/85

eder associates
consulting engineers, p.c.

May 14, 1985
File #509-1

Mr. Seymour Kroll
President
SNE Corporation
910 Cleveland Avenue
Wausau, Wisconsin 54401

Dear Mr. Kroll:

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Continued . . .

85 FOREST AVENUE • LOCUST VALLEY, NEW YORK 11560 • (516) 671-8440

LEONARD J. EDER, P.E. • FREDERICK H. INYARD, P.E. • STEPHEN J. OSMUNDSEN, P.E. • GARY A. ROZMUS, P.E.
JOHN McGUIRE, P.E. • JORGE MOLINA, ING. • WILLIAM J. CUNNINGHAM, P.E. • VINCENT J. FRISINA, P.E.

The strategy for the phased groundwater investigation is to first define the possible flow paths along which PCP may be migrating toward the discharge area at the Wisconsin River and to bracket this zone for future monitoring. Once the flow path has been determined, additional downgradient monitoring wells may be required to determine if PCP dissolved in groundwater discharges to the River.

As recommended in our report of March 8, 1985, six monitoring wells would be installed at locations shown on the enclosed map to determine whether PCP and/or mineral spirits are present in groundwater downgradient of the SNE plant site. Each monitoring well would be drilled to a maximum depth of approximately 10 feet below the water table and screened from 5 feet above the water table to 10 feet below the water table. All monitoring wells will be constructed according to the suggested guideline promulgated unofficially by the Wisconsin Department of Natural Resources (DNR) (diagram enclosed, "Observation Well").

EA would provide an on-site consulting hydrogeologist during all drilling operations and sample collection. The hydrogeologist would maintain logs of geologic conditions revealed by test drilling and all other observations significant to the definition of the site hydrogeology. The hydrogeologist would also maintain a quality control and assurance program to insure the use of proper protocols during the drilling, installation, and water sampling of each monitoring well.

Upon completion, each well (including existing W-1 through W-4) will be sampled according to Environmental Protection Agency (EPA) protocol for the collection of representative groundwater samples. Each well will be developed properly and sampled one week later. A second round of samples will be collected two weeks later. The DNR will be informed of the analytical method and the compounds to be detected. Koppers Company will be asked for help in identifying the chemical composition of mineral spirits and whether it is virgin or recycled product. A scan for volatile organic compounds will also be performed by the laboratory. All water samples would be analyzed for PCP and mineral spirits by Sentry Labs including replicate samples and blanks for quality assurance.

Upon completion of all monitoring wells, a professional land surveyor would determine the elevation of the top of each well casing cap to an accuracy of 0.01 foot using standard surveying methods. EA's hydrogeologist would measure water levels in monitoring wells during

Continued . . .

the drilling program and synoptically when static water levels have stabilized. Water level readings will be made one week after well development, additional readings will be made three days later, followed by another reading after three more days. Water level measurements will be made prior to water sampling. These water levels would be used for the preparation of a water table map which will be revised for water level charges.

Phase II

The immediate concern of the DNR is the removal of any floating layer of PCP and mineral spirits from the water table surface. We propose that the extent of the floating layer be defined by a test drilling and monitoring well installation program, to be followed, if necessary, by a product removal program based on the results of the monitor wells. A minimum of three, 2-inch diameter monitor wells are required to approximately define the extent of the floating PCP. These wells would be located as shown on the enclosed map, and constructed as shown on the enclosed diagram.

After installation, these wells would be monitored for the formation of a floating layer of PCP which may require at least a month to form. Monitor wells containing a floating layer would be used as recovery wells (MW-4 is known to contain PCP and would be a recovery well).

To expedite the flow of PCP liquid into the wells, it would be necessary to create a gradient on the water table surface toward the recovery wells. This is usually accomplished by pumping a well screened in a slightly deeper zone to create a cone of depression in its vicinity. The optimum location for the pumping well is near the center of the floating layer, which is usually near the point where the product entered the ground. Pending the results of the monitor wells, it may be assumed that the center of the floating layer is at or near the dip line area. In that case, a pumping well would be installed adjacent to the proposed monitoring well in the open area near the dip line, as shown on the enclosed map. After a cone of depression has been created by the pumping well, the monitor wells containing a floating layer of PCP may be used as recovery wells.

Since the quantity of PCP on the water table may not be very large and the PCP would enter the wells slowly, mechanical pumping systems would not be advisable. Instead, the PCP could be removed by bailing the small amounts flowing into the recovery wells. An automated recovery

Continued . . .

system of this type is marketed by Wright Associates of Harrisburg, Pennsylvania. This unit may be moved from well to well because it is mounted on a self contained trailer.

The pumping well and recovery systems would be operated until PCP liquid ceased forming a layer in the wells. An additional period of recovery may be required to remove any residual PCP from the water table which may be in an emulsified state. The PCP liquid removed from recovery wells could probably be stored on-site in 55-gallon drums, pending proper disposal. The main problem with any system of this type is the discharge of groundwater pumped from the drawdown well because it will contain PCP in low concentrations. It may be possible to discharge this flow into the sanitary sewer system, but permission must first be obtained from the City of Wausau.

It is recommended that SNE take immediate steps to determine whether an extensive layer of PCP is floating on the water table at the site prior to the initiation of a product recovery program which would involve groundwater pumpage for water table depression. An expert on product recovery will be brought to the site during the field investigation to begin the planning of a product recovery system. It is also recommended that soil samples be collected from the dip line room and near the 8,000 gallon tank, and analyzed for PCP as described in Mr. Kulibert's letters. These would be shallow borings (10-20 feet in depth) and not wells. The three small diameter wells should be installed and monitored for floating PCP which may take one month to form. At that time, additional recommendations for PCP removal, if required, would be presented by EA. It would be advantageous to install these three wells at the same time as the downgradient monitor wells to minimize contractor mobilization costs.

Project Objectives

The program that EA has set forth for SNE should provide an adequate data base for the implementation of a monitoring program or a remediation program, if required. The Wisconsin DNR has indicated that their immediate concern is the removal of any undissolved PCP which may be floating on the water table below the SNE site. Since there is a floating layer at monitor well W-4, it is assumed that SNE will be required to initiate a PCP removal program. The level of effort required will be determined by the results of the test wells in the plant area. The level of effort, at a minimum, would involve the continuation of the present daily bailing of W-4. The maximum level would involve pumping a water well to create a gradient toward recovery wells and skimming the recovery wells for PCP.

Continued . . .

As for the downgradient fate of PCP, the presently available data indicates that the floating layer is relatively immobile and PCP only moves downgradient in a dissolved form at low concentrations. There do not appear to be any water wells between SNE and the Wisconsin River. Therefore, there is no immediate health hazard associated with low levels of PCP in groundwater (due to non-use).

If low levels are discharging to the Wisconsin River, dilution may reduce the concentration to an acceptable level as defined by the Wisconsin DNR regulations. If these two criteria (groundwater non-use and acceptable dilution in the Wisconsin River) are met, it may be possible for SNE to maintain a program of water quality monitoring to assure that the existing conditions do not change.

SNE should be aware that while the DNR is authorized to require the removal of hazardous materials from soil and groundwater, the DNR also considers alternatives which include plume management where there is no imminent danger to human health. While plume management is less costly than cleanup, the DNR must necessarily emphasize the human health aspects rather than cost to industry when deciding whether cleanup is required.

Please advise if further clarification is required.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

William M. Warren

William M. Warren
Senior Hydrogeologist

WMW/mw

cc: J. Derouin
J. Noonan

5/9/85

eder associates
consulting engineers, p.c.

May 9, 1985
File #509-1

Mr. Seymour Kroll
President
SNE Corporation
910 Cleveland Avenue
Wausau, Wisconsin 54401

Dear Mr. Kroll:

Pursuant to your request, this letter provides an overview of the proposed PCP investigation and possible future actions that may be required at the SNE facility in Wausau, Wisconsin. Eder Associates (EA) proposes that the investigation be divided into two studies to be performed consecutively. The first phase would be the determination and fate of dissolved PCP in groundwater downgradient of the SNE facility. The second phase would be the investigation of undissolved PCP floating on the water table directly below the SNE facility.

Phase I

Since PCP has been detected in groundwater at the SNE site, the downgradient fate of that PCP must be determined. A test drilling and monitor well installation program would be required in order to define the vertical and horizontal extents of PCP in groundwater. This program would be limited to the saturated portion of the unconsolidated materials (shallow groundwater) at the present time. Depending on the findings of the recommended program, groundwater in the bedrock may or may not require investigation. At present, it will be assumed that there is an upward groundwater gradient in the bedrock zone and that downward movement of shallow groundwater into the bedrock is not an immediate concern. This assumption is based on conditions reported during water-well drilling in the general area.

The recommended test drilling program is designed to define groundwater flow directions at, and downgradient of, the SNE site by the preparation of a water-table map. The water-table map would be used with the results of groundwater sample analyses to map the lateral extent of PCP occurrence in groundwater. In the event that PCP is detected in shallow groundwater downgradient of the site, it will be necessary to install a second well at these locations to define the vertical extent of PCP.

Continued . . .

Based on the available data, it is assumed that groundwater at the site flows toward the Wisconsin River where it discharges; PCP occurrence is limited to the saturated unconsolidated zone; and PCP and mineral spirits (in a dissolved form or a discrete phase on the water table) are the primary compounds in groundwater at SNE.

The strategy for the phased groundwater investigation is to first define the possible flow paths along which PCP may be migrating toward the discharge area at the Wisconsin River and to bracket this zone for future monitoring. Once the flow path has been determined, additional downgradient monitoring wells may be required to determine if PCP dissolved in groundwater discharges to the river.

As recommended in our report of March 8, 1985, six monitoring wells would be installed at locations shown on the enclosed map to determine whether PCP and/or mineral spirits are present in groundwater downgradient of the SNE plant site. Each monitoring well would be drilled to a maximum depth of approximately 40 feet and screened from 30 to 40 feet to sample groundwater at and near the water table surface. All monitoring wells will be constructed according to the suggested guideline promulgated unofficially by the Wisconsin Department of Natural Resources (DNR) (diagram enclosed, "observation well").

EA would provide an on-site consulting hydrogeologist during all drilling operations and sample collection. The hydrogeologist would maintain logs of geologic conditions revealed by test drilling and all other observations significant to the definition of the site hydrogeology. The hydrogeologist would also maintain a quality control and assurance program to insure the use of proper protocols during the drilling, installation, and water sampling of each monitoring well.

Upon completion, each well would be sampled according to EPA protocol for the collection of representative groundwater samples. All water samples would be analyzed for PCP by Sentry Labs including replicate samples and blanks for quality assurance. Five additional samples would be collected from the new monitoring wells after the results of all PCP analyses have been received. These samples would be analyzed for mineral spirits. These samples would be collected from monitoring wells to be determined as soon as groundwater flow patterns have been defined.

Continued . . .

Upon completion of all monitoring wells, a professional land surveyor would determine the elevation of the top of each well casing cap to an accuracy of 0.01 foot using standard surveying methods. EA's hydrogeologist would measure water levels in monitoring wells during the drilling program and synoptically when static water levels have stabilized. These water levels would be used for the preparation of a water table map and groundwater flow depiction maps.

Phase II

The immediate concern of the DNR is the removal of any floating layer of PCP and mineral spirits from the water table surface. We propose that the extent of the floating layer be defined by a test drilling and monitoring well installation program, to be followed, if necessary, by a product removal program based on the results of the monitor wells. A minimum of three, 2-inch diameter monitor wells are required to approximately define the extent of the floating PCP. These wells would be located as shown on the enclosed map, and constructed as shown on the enclosed diagram.

After installation, these wells would be monitored for the formation of a floating layer of PCP which may require at least a month to form. Monitor wells containing a floating layer would be used as recovery wells (MW-4 is known to contain PCP and would be a recovery well).

To expedite the flow of PCP liquid into the wells, it would be necessary to create a gradient on the water table surface toward the recovery wells. This is usually accomplished by pumping a well screened in a slightly deeper zone to create a cone of depression in its vicinity. The optimum location for the pumping well is near the center of the floating layer, which is usually near the point where the product entered the ground. Pending the results of the monitor wells, it may be assumed that the center of the floating layer is at or near the dip line area. In that case, a pumping well would be installed adjacent to the proposed monitoring well in the open area near the dip line as shown on the enclosed map. After a cone of depression has been created by the pumping well, the monitor wells containing a floating layer of PCP may be used as recovery wells.

Continued . . .

Since the quantity of PCP on the water table may not be very large and the PCP would enter the wells slowly, mechanical pumping systems would not be advisable. Instead, the PCP could be removed by bailing the small amounts flowing into the recovery wells. An automated recovery system of this type is marketed by Wright Associates of Harrisburg, Pennsylvania. This unit may be moved from well to well because it is mounted on a self contained trailer.

The pumping well and recovery systems would be operated until PCP liquid ceased forming a layer in the wells. An additional period of recovery may be required to remove any residual PCP from the water table which may be in an emulsified state. The PCP liquid removed from recovery wells could probably be stored on-site in 55-gallon drums, pending proper disposal. The main problem with any system of this type is the discharge of groundwater pumped from the drawdown well because it will contain PCP in low concentrations. It may be possible to discharge this flow into the sanitary sewer system, but permission must first be obtained from the City of Wausau.

It is recommended that SNE take immediate steps to determine whether an extensive layer of PCP is floating on the water table at the site prior to the initiation of a product recovery program which would involve groundwater pumpage for water table depression. It is also recommended that soil samples be collected from the dip line room and near the 8,000 gallon tank, and analyzed for PCP as described in Mr. Kulibert's letters. These would be shallow borings (10-20 feet in depth) and not wells. The three small diameter wells should be installed and monitored for floating PCP which may take one month to form. At that time, additional recommendations for PCP removal, if required, would be presented by EA. It would be advantageous to install these three wells at the same time as the downgradient monitor wells to minimize contractor mobilization costs.

Project Objectives

The program that EA has set forth for SNE should provide an adequate data base for the implementation of a monitoring program or a remediation program, if required. The Wisconsin DNR has indicated that their immediate concern is the removal of any undissolved PCP which may be floating on the water table below the SNE site. Since there is a floating layer at monitor well W-4, it is assumed that SNE will be required to initiate a PCP removal program. The level of effort required will be determined by the results of the test wells in the plant area. The level of effort, at a minimum, would involve the continuation of the present daily bailing of W-4. The maximum level would involve pumping a water well to create a gradient toward recovery wells and skimming the recovery wells for PCP.

Continued . . .

As for the downgradient fate of PCP, the presently available data indicates that the floating layer is relatively immobile and PCP only moves downgradient in a dissolved form at low concentrations. There do not appear to be any water wells between SNE and the Wisconsin River. Therefore, there is no immediate health hazard associated with low levels of PCP in groundwater (due to non-use).

If low levels are discharging to the Wisconsin River, dilution may reduce the concentration to an acceptable level as defined by the Wisconsin DNR regulations. If these two criteria (groundwater non-use and acceptable dilution in the Wisconsin River) are met, it may be possible for SNE to maintain a program of water quality monitoring to assure that the existing conditions do not change.

SNE should be aware that while the DNR is authorized to require the removal of hazardous materials from soil and groundwater, the DNR also considers alternatives which include plume management where there is no imminent danger to human health. While plume management is less costly than cleanup, the DNR must necessarily emphasize the human health aspects rather than cost to industry when deciding whether cleanup is required.

Please advise if further clarification is required.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

William M. Warren
Senior Hydrogeologist

WMW/mw

cc: J. Derouin
J. Noonan

COST ESTIMATE
PCP INVESTIGATION

Phase I	
Monitor Well Investigation	
Subcontractor - Exploration Technology Inc., Madison, Wisconsin	
Six monitoring wells	$10,000
Consulting Services - Eder Associates	
Field hydrogeologic investigation (Includes field expenses)	12,500
Date analysis and report preparation	11,000
Water Sample Analysis	
Subcontractor - Zimpro Lab, Wausau, Wisconsin	
Mineral Spirits	1,500
Sentry Lab	
Water Analysis for PCP*	--
Surveying Monitoring Well Elevations*	500
TOTAL	$35,500
Phase II	
Well Installation[1]	$ 5,000
Consultative Services of EA's	
Senior Hydrogeologist, (includes field expenses[2])	5,000
Laboratory Analyses[1]	
Four water samples for PCP	
Five soil samples for PCP	
Surveying of well head elevations[1]	250
TOTAL	$10,250
TOTAL, Phase I	$35,500
GRAND TOTAL	$45,750

*Assumed direct billing to SNE Corporation

1) Direct billing to SNE Corporation.
2) Assuming one-time mobilization for installation of all monitor wells proposed by EA.

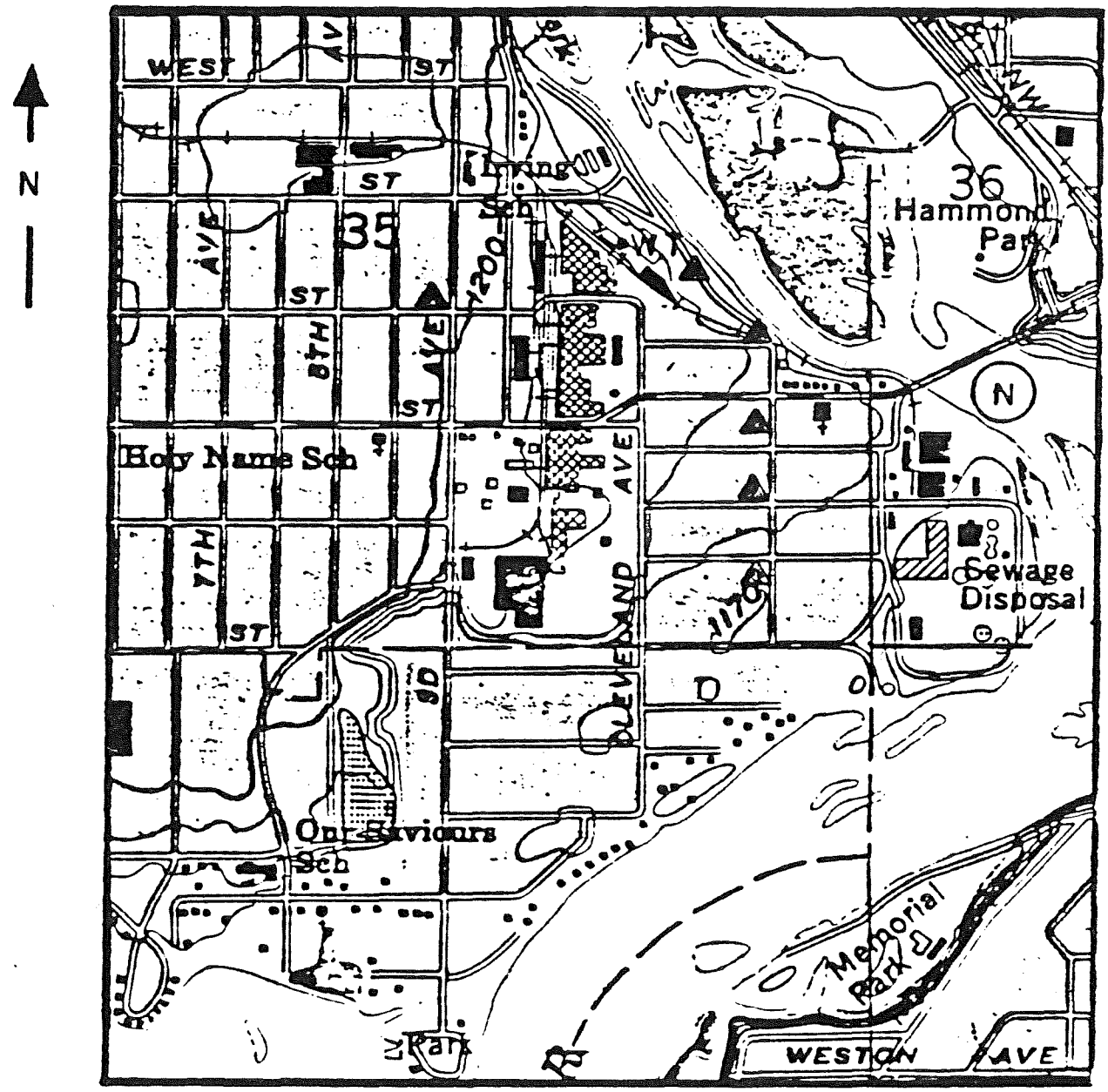
FIGURE 6

SNE CORPORATION

WAUSAU, WISCONSIN

LOCATION OF RECOMMENDED

MONITORING WELLS



Legend:

▲ Proposed Monitoring Well Location

Scale: 1" = 1000 feet

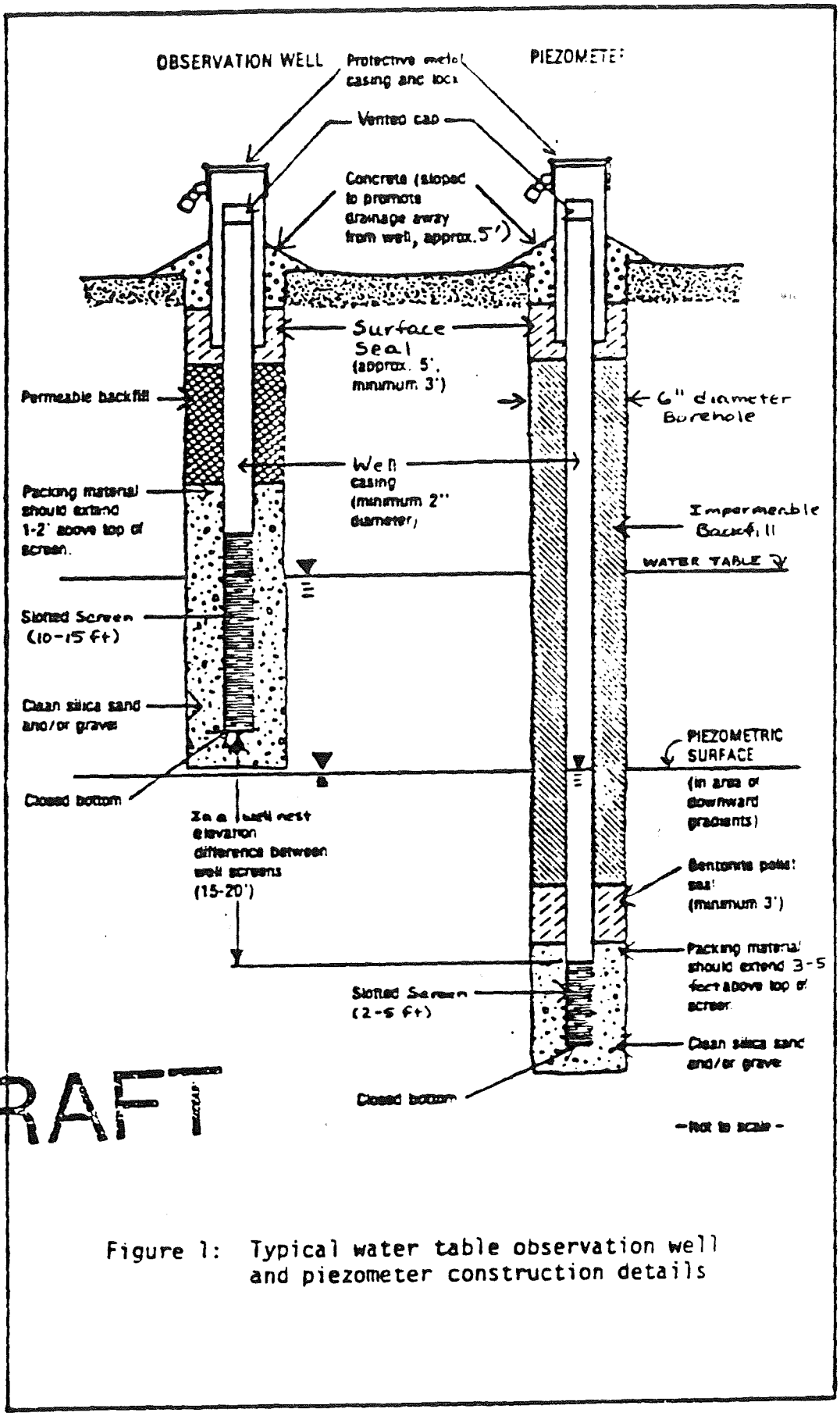
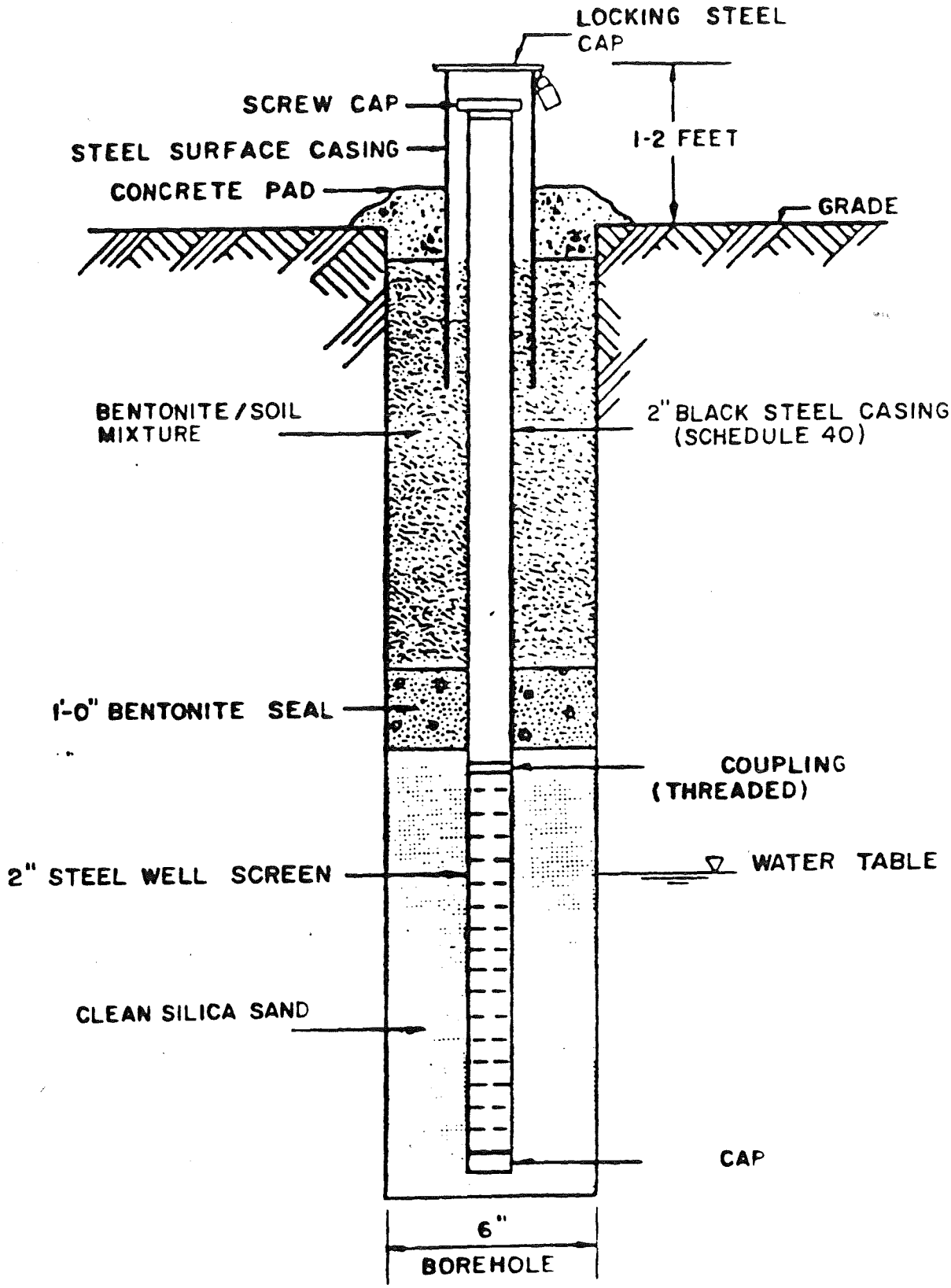
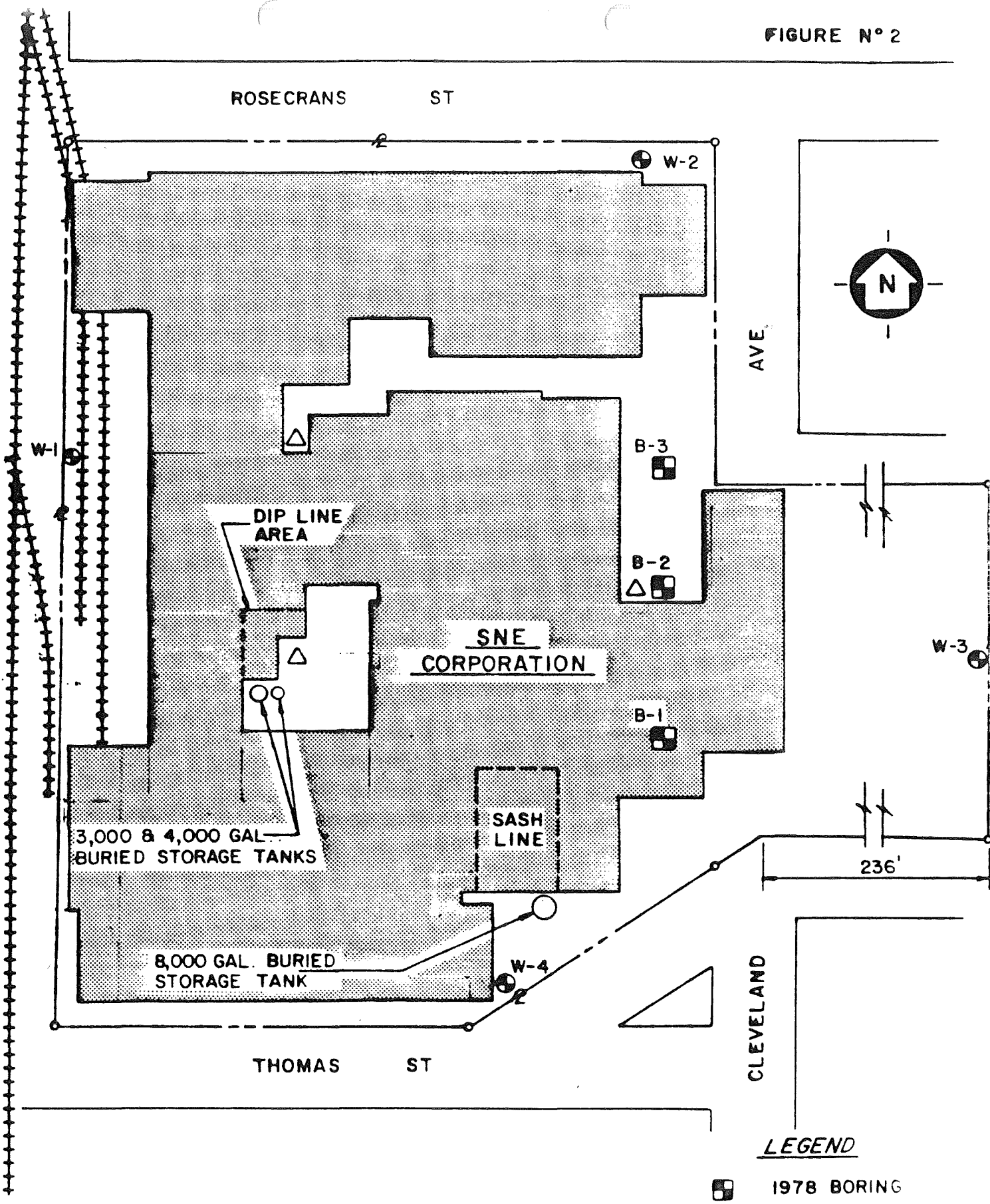


Figure 1: Typical water table observation well and piezometer construction details



MONITORING WELL CONSTRUCTION DETAILS

FIGURE N° 2



SITE PLAN

SCALE: 1" = 100'

Department of Natural Resources

SNE file

FACILITY CONTACT FORM

Form 3400-51 Rev. 2-84

→ Kulibert

ATT'N. _____

☐ PRETREATMENT WW/2

☐ ENV. ENF. EE/5

☐ MUNIC. WASTEWATER SECTION WW/2

☐ PRIV. WATER SECTION WS/2

☐ IND. WASTEWATER SECTION WW/2

☐ PUBL. WATER SECTION WS/2

☒ Kulibert, NC DISTRICT

Date: 04 29 85 (M M D D Y Y)

Time (24-Hour Clock): 10:30

Contact Method: ☐ In Person ☒ Telephone

Facility Name	Location (Address or ¼¼)	County
SNE Corp.	Wausau	Marathon

Facility I.D.	WPDES Permit Number	District No.	DNR Person Making Contact
- - - - - - - - - - - -	- - - - - - - - - . -	7	Kreul

Facility Representative Contacted: Pat Wierzba

Title or Position of Representative:

Activity Codes: - - - - - - - - - - - - - - -

I called Pat to see what if any further tank testing they had done or intend to do. The 8000 gallon tank is being checked w/ a dip stick monthly or so. Pat is contacting local contractors for abandonment of the other buried tanks which were emptied last week. They intend to triple rinse the tanks w/ mineral spirits before abandonment. As the tanks are not to be removed but filled in place, we will not know if those tanks leaked while in service.

cc: T. Evanson, SW/3

ACTIVITY CODES

Wastewater

Assistance

AL	Laboratory Assistance
AO	O & M Assistance
SA	Sludge Assistance
PT	Pretreatment Assistance
PA	Planning Assistance
PR	Confer with Officials on Permit Req.

Evaluation

CC	Compliance Contact
LE	Laboratory Evaluation
AG	Agricultural Waste Investigation
SD	Sludge Disposal Site Inspection
OE	Operator Evaluation
CI	Facility Complaint Investigation
SP	Spills/Plant Upsets

Enforcement

VI	Violation Identified by Inspector
VM	Minor Violation Follow-up
VS	Significant Violation Follow-up
CP	Compliance Schedule Progress Check

Compliance Monitoring

CE	Compliance Evaluation Inspection
CS	Compliance Sampling Inspection
PA	Performance Audit Inspection
GW	Groundwater Monitoring System Inspection
PC	Pretreatment Compliance Monitoring
LD	Land Disposal System Inspection

Water Supply

GC	G.W. Contamination Investigation Follow-up
WO	Waterworks Operator Evaluation
WC	WD/PI Contact
CT	Compliance Contact including Noncompliance/ Violation Follow-up
RC	Plan Review Contact
CI	Complaint Investigation
SS	Sanitary Survey
AI	Annual Inspection — Municipal
PP	Public Presentation
OT	O & M Technical Assistance
EC	Enforcement Conferences/Contact
EE	Environmental Emergencies/Spill
OR	Other

4/16/85

CORRESPONDENCE / MEMORANDUM

STATE OF WISCONSIN

DATE: April 12, 1985 FILE REF: 4430

TO: Gary Kulibert - NCD

FROM: Terry Evanson - SW/3 TAE

SUBJECT: March 1985 "Engineering Report Summarizing Site Investigation for Pentachlorophenol", for the SNE Corporation, Prepared by Eder Associates

I have quickly reviewed the above named report and have the following comments:

A. Proposed Phase II Investigation

1. Inspection of tanks and pipes containing PCP. SNE should also closely inspect the area around the 8,000 gallon tank and the methods for loading the PCP into the tank. The report seems to assume this area is not a source of contamination because it is paved. More investigation, including monitoring wells, is needed in this area.

2. Locating and testing private wells. All private wells between the plant and the river should be identified (this includes the north, east, and south directions) and tested. Any wells within one-quarter of a mile upgradient should also be identified and tested.

3. Location of monitoring wells. Eder proposes additional wells based on the assumption of upward gradients and the strategy of identifying "flow paths". Groundwater flow direction and the location of a possible contaminant plume need to be defined. This is best carried out with a phased approach to well installation starting near the contaminant source and moving outward. The proposed well placement is approximately 600 to 1,300 feet away from the plant site. I suggest:

   a. Additional wells near the 8,000 gallon tank to define the extent of the PCP floating on the groundwater surface.

   b. An additional well(s) near the dip line area.

   c. Wells south, southeast, east, northeast, and north of the plant grounds. These could be placed 200 to 500 feet beyond the plant and be constructed as watertable wells. Exact location must be governed by public right-of-ways, etc. If contaminants are detected in the new wells, then additional wells farther out, (perhaps 1,000 feet) should be considered.

d. At least one well nest should be installed. A piezometer should be installed next to one of the new observation wells. The piezometer should be screened approximately 15 feet below the bottom of the watertable well. If bedrock is encountered, the piezometer should be sealed into the bedrock. I hesitate to turn W-4 into a well nest because of the extent of the contamination at this point. You don't want to introduce contaminants where none exist now (if, in fact, that is the case).

B. Other Comments on the Report

1. A topographic map is needed at a scale of one inch to 100 feet or 1 inch to 200 feet. This could be done by enlarging the USGS 7.5' quad map. The map should include the area to the Wisconsin River and be plan sheet size.

2. An effort should be made to redevelop W-3. I suggest using a surge block and bailing. It does not seem reasonable that the well should recharge so slowly.

3. The well construction logs for W-1 and W-4 need to be corrected. Length of screen and solid pipe do not equal well depth.

C. Comments on Ed Kreul's March 19, 1985 Memo to Gary Kulibert

1. Installation of another upgradient well. It's not surprising that W-1 has some PCP since the railroad line was a unloading point for the PCP at one time. If another upgradient well is necessary for defining groundwater flow, then it should be installed. From a groundwater quality standpoint, it would be important to put additional wells to the west if there were other sources of PCP (other than SNE) or if there were private water supplies in close proximity. I would concentrate on the downgradient wells.

2. Soil samples should be collected and visually identified every five feet. Grain size analysis (GSA) is necessary only where changes occur in the unconsolidated deposits (changes from coarse to fine sediments, etc.). GSA is not necessary at every boring as long as the soil description is complete. Soils should be classified according to USCS.

3. Analysis of soils for PCP, phenols, dioxin, furan, and mineral spirits (petroleum naptha):

a. Dioxins and furans are trace contaminants of PCP but testing for them is extremely expensive and is probably not warranted. The PCP levels would be much higher than any trace contaminant and any actions taken to deal with PCP will almost certainly effect the trace contaminants too.

b. I don't think testing soil for organic contaminants is necessary unless soil removal/capping/etc., is being considered. Soil testing may be in order at the site of a spill, directly under tanks, areas of surface water runoff, etc., but is probably not needed away from immediately effected areas. Groundwater monitoring should tell if the contaminants have migrated away from the immediate spill area.

c. If unconsolidated deposits below the watertable show horizontal layering of permeable/less permeable material, then consideration should be given to screening a well above the less permeable layer. A deeper well should also be installed to check for vertical migration of contaminants.

On the whole I agree with Ed Kreul's comments and think he has done a good job of reviewing this report. I would be happy to discuss my comments in more detail with you, if you would like. My telephone number is (608) 266-0941. A conference call could also be arranged.

cc: Mark Giesfeldt - HW/3

5689R

4/12/85

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES
North Central District Headquarters
Box 818
Rhinelander, Wisconsin 54501
(715)362-7616

Carroll D. Besadny
Secretary

April 12, 1985

File Ref: 4400

Mr. Seymour Kroll, President
SNE Corporation
P. O. Box 1007
Wausau, Wisconsin 54401

Dear Mr. Kroll:

The Department has completed its review of Eder Associates' report, "Engineering Summarizing Site Investigation for Pentachlorophenol" at the SNE site on Cleveland Avenue in Wausau. Based on the review of the report, The Department has the following comments and recommendations:

There are a number of areas dealing with well installation and associated data that need to be clarified or corrected.

1. When the monitoring wells were installed, it appears the concrete used to hold the protective casing in place also filled the annular space between the protective casing and the well itself. There are concerns about the effects of frost heaving on the well. These effects have been documented at other sites. I have enclosed a copy of our proposed groundwater well construction guidelines for your reference.

2. The well elevations were taken on the top of the protective casing and not the top of the well. Because the protective casings' elevation may change due to frost heaves or other effects, all elevations need to be taken at a specific point on the top of the well.

3. In reviewing the data, there appears to be a discrepancy of .8 feet in the ground elevation for Well No. 1. In Figure 3, it indicates an elevation of 1,192.11 feet, while in Figure 5, it indicates an elevation of 1,192.91 feet. This discrepancy needs to be resolved.

4. It was indicated in the report that contaminated water bailed from the wells was being placed in a barrel for disposal. Where is this material being disposed? In all cases where there is contaminated water being removed from the wells, it should not be placed on the ground but instead, properly disposed.

5. Groundwater elevations were taken in inches. Standard practice is to use tenths of a foot.

6. In reviewing the groundwater analysis, it appears that the laboratories did not always indicate the detection limits for various compounds. It is important that detection limits are recorded for all compounds. Because SNE is using a number of labs for analysis, this is extremely important. One suggestion is to limit the number of laboratories doing the work to minimize discrepancies between any of the data.

Based on a review of the report, the Department has the following recommendations concerning the addition of work to be done:

1. The report states the area around the 8,000-gallon PCP tank is not a concern as a possible source of contamination. This may not be the case, depending on loading practices. There should be at least one soil boring done in the immediate vicinity of the tank to determine if there was any leakage or spillage of PCP.

2. It is important to continue to locate and test any private wells in the area. I realize most people are on public water supply. However, if anyone in the vicinity is still on a private water supply, including the area upgrading from the plant, these should be located, identified and tested.

3. The location of monitoring wells in the report. Your consultant proposes additional monitoring wells to determine groundwater flow and the location of the contaminant plume. The Department concurs with this approach; however, this should be done in a multi-phase approach. The first wells should be installed south, southeast, east, northeast and north of the plant. The wells should be located 200 to 500 feet beyond the plant and constructed as water table wells. The exact locations will be dictated by public right-of-way accesses, etc. If contamination is detected in the new well then additional wells further out, perhaps 1,000 feet, should be considered. It is thought that by placing wells 600 to 1,300 feet away from the plant at this time will not be as useful in determining groundwater flow pattern and contamination plume.

4. At least one well nest should be installed. This piezometer should be installed next to one of the new observation wells and screened approximately 15 feet below the bottom of the groundwater table well. If bedrock is encountered the piezometer should be seated into the bedrock. At this time, the Department would not recommend Well #4 be turned into a nested well because of the contamination in the area. The deeper well may permit the channeling of contamination deeper into the aquifer.

5. When wells are installed, soil samples should be collected every five feet and visually classified in accordance with Uniform Soil Classification System. Grain size analysis is necessary only when a change occurs in the consolidated deposits. For example, change from a coarse to a fine sediment. Grain size analysis is not necessary in every boring as long as the soil description is complete.

6. Again, the Department recommends all existing wells and new wells be monitored for a number of components including PCP, petroleum naptha, field pH, and specific conductance, COD and at least one round of volatile organic compounds screening analysis on all wells. Groundwater elevations should also be taken on more than one occurrence. It is suggested water elevation be taken once a week for four weeks to take into account any local fluctuations.

7. Finally, a larger site map is needed of the area. Presently, the map in the report has a scale of one-inch equals 1,000 feet. This is far too small to properly display and analyze information concerning this situation. The City of Wausau has two-foot contour maps available of this area. It is suggested these be used.

The Department is pleased to see the work that SNE has done toward resolving this problem. We encourage you to continue this great effort. We will be happy to offer any technical assistance that we can to insure that this project is brought to a quick and successful completion.

If there are any questions concerning this matter, please do not hesitate to contact me at the District Office (715)362-7616.

Sincerely,

Gary F. Kulibert
Solid Waste Coordinator

GFK:dim
cc: P. Weirzba, SNE Corporation, P. O. Box 1007, Wausau, WI 54401
Eder and Associates, 85 Forest Avenue, Locust Valley, NY 11560
R. O'Hara, SW/3
T. Evanson, SW/3
D. Erlandson, Antigo
E. Kreul, Rhinelander

(AD-75)

4/10/85

CORRESPONDENCE/MEMORANDUM

STATE OF WISCONSIN

Date: April 10, 1985 *File Ref:* 3400

To: Gary F. Kulibert

From: Ed Kreul

Subject: SNE Corporation

4/8/85

As I mentioned in our discussion ~~today~~, I feel it is important that further wells installed in close proximity to the source of pentachlorophenol (PCP) contamination at SNE Corporation be constructed with inert materials in accordance with proposed guidelines for monitoring well installation prepared by the Bureau of Solid Waste Management in August 1984.

Wells installed in the first phase of the study were constructed with PVC which is subject to aggression by the mineral spirits found on the water table. I suggest any further wells be constructed with teflon, steel or any other material which will not leach or adsorb organic contaminants.

EK:dim
cc: R. O'Hara, SW/3
D. Urso, Rhinelander

4/3/85

To: Gary Kulibert - NCD April 3, 1985

From: Terry Evanson - SW/3 TAE

Subject: March 1985 "Engineering Report Summarizing Site Investigation for Pentachlorophenol", for the SNE Corp., Prepared by Eder Assoc.

I have quickly reviewed the above named report and have the following comments:

A. Proposed Phase II Investigation

1. Inspection of tanks and pipes containing PCP. SNE should also closely inspect the area around the 8000 gal. tank and the methods for loading the PCP into the tank. The report seems to assume this area is not a source of contamination because it is paved. More investigation, including monitoring wells, is needed in this area.

2. Locating and testing private wells. All private wells between the plant and the river should be identified + tested (this includes the North, east & South directions). Any wells within 1/4 of a mile upgradient should also be identified and tested.

3. Location of monitoring wells. Eder proposes additional wells based on the assumption of upward gradients and the strategy of identifying "flow paths". Groundwater flow direction and the location of a possible contaminant plume need to be defined. This is best carried out with a phased approach to well installation starting near the contaminant source and moving outward. The proposed well placement is approximately 600 to 1300 feet away from the plant site. I suggest:

a. Additional wells near the 8000 gal. tank to define the extent of the floating PCP on the groundwater surface.

b. An additional well (s) near the dip line area

c. Wells south, southeast, east, northeast and north of the plant grounds. These could be placed 400 to 500 feet beyond the plant and be constructed as water table wells. Exact location must be governed by public right of ways, etc. If contaminants are detected in the new wells, then additional wells further out, (perhaps 1000 feet) should be considered.

d. At least one well nest should be installed. A piezometer should be installed next to one of the new observation wells. The piezometer should be screened approximately 15 feet below the bottom of the water table well. If bedrock is encountered, the piezometer should be sealed into the bedrock. I hesitate to turn W-4 into a well nest because of the extent of the contamination at this point. You don't want to introduce contaminants where none exist now. (If, in fact, that's the case).

B. Other comments on the report

1. A topographic map is needed at a scale of 1"=100' or 1"=200'. This could be done by enlarging the USGS 7.5' quad map. The map should include the area to the Wisconsin River and be plan sheet size.

2. An effort should be made to redevelop W-3. I suggest using a surge block + bailing. It does not seem reasonable that the well should recharge so slowly.

3. The well construction logs for W-1 + W-4 need to be corrected. Length of screen + solid pipe does not equal well depth.

C. Comments on Ed Kreul's March 19, 1985 memo to Gary Kulibert.

1. Installation of another upgradient well. It's not surprising that W-1 has some PCP since the railroad line was an unloading point for PCP at one time. If another upgradient well is necessary for defining groundwater flows, then it should be installed. From a groundwater quality stand point, it would be important to put additional wells to the west if there were other sources of PCP (other than SAE) or if there were private water supplies in close proximity. I would concentrate on the down gradient wells.
2. Soil samples should be collected and visually identified every 5 feet. Grain Size Analysis (GSA) is necessary only where changes occur in the unconsolidated deposits (changes from course to fine sediments, etc). GSA is not necessary at every boring as long as the soil description is complete. Soils should be classified according to USCS.
3. Analysis of soils for PCP, phenols, dioxin, furan + mineral spirits (petroleum naptha):
   a. Dioxins and furans are trace contaminants of PCP, but testing for them is extremely expensive and is probably not warranted. The PCP levels would be much higher than any trace contaminants and any actions taken to deal with PCP will almost certainly affect the trace contaminants too.

b. I don't think testing soil for organic contaminants is necessary unless soil removal / capping / etc. is being considered. Soil testing may be in order at the site of a spill, directly under tanks, areas of surface runoff, etc., but is probably not needed away from immediately affected areas. Groundwater monitoring should tell if the contaminants have migrated away from the immediate spill area.

c. If unconsolidated deposits below the water table show horizontal layering of permeable / less permeable material, then consideration should be given to screening a well above the less permeable layer. A deeper well should also be installed to check for vertical migration of contaminants.

I would be happy to discuss these comments in more detail with you, if you would like. My phone number is (608) 266-0941. A conference call could also be arranged.

cc. Mark Giesfeldt - HW/3

E. Kroll 4/1/85

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES
North Central District Headquarters
Box 818
Rhinelander, Wisconsin 54501
(715)362-7616

Carroll D. Besadny
Secretary

April 1, 1985

File Ref: 4430

Mr. Seymour Kroll, President
SNE Corporation
910 Cleveland Avenue
P. O. Box 1007
Wausau, Wisconsin 54401

Dear Mr. Kroll:

On March 26, 1985, I met with Pat Wierzba of SNE Corporation to discuss several issues.

First, it appears that there is a considerable amount of pentachlorophenol mixed with the mineral spirits still on the top of groundwater on SNE property. Monitoring Well #3 shows approximately four inches of product floating on the water surface. In accordance with State Statutes 144.76, we urge SNE to take immediate steps in beginning recovery of this product. It is easier and less costly to recover product in a pure state than dispersed throughout the environment. This work must commence within the next two weeks.

There will be a need for additional monitoring wells and borings around the property to delineate the extent of the recoverable product.

Please keep us informed of your progress.

Also during the March 26, 1985, meeting with Mr. Wierzba we discussed the dip tank area. SNE wants to convert the present system to a water-based system. This would require the concreting of an area where pentachlorophenol has been spilled. As I indicated to Mr. Wierzba, before this area can be backfilled and covered with concrete, the Department is asking for soil boring in the area and analysis of the soil profile to include pentachlorophenol, petroleum, naphtha, and phenols.

A monitoring well is needed immediately down gradient from the dip area. This well will help in determining groundwater flow and the extent of product on top of groundwater. Once this information is received and reviewed by the Department, we can then determine if additional work must be done in this area or if the area can be covered.

If you have any other questions concerning this matter or are in need of technical assistance, please do not hesitate to contact me at the Rhinelander District Office at (715)362-7616.

Sincerely,

Gary F. Kulibert
District Solid Waste Management
Coordinator

GFK:dim
cc: Pat Wierzba, SNE Corporation, 910 Cleveland Avenue, P. O. Box 1007, Wausau, Wisconsin 54401
Mr. W. Warren, Eder Associates, 85 Forest Ave., Locust Valley, NY 11560
D. Erlandson, Antigo
R. O'Hara, HW/3
E. Kreul, Rhinelander

3/28/85

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES
North Central District Headquarters
Box 818
Rhinelander, Wisconsin 54501
(715)362-7616

Carroll D. Besadny
Secretary

March 28, 1985

File Ref: 4430

Mr. Seymour Kroll, President
SNE Corporation
910 Cleveland Avenue
P. O. Box 1007
Wausau, Wisconsin 54401

Dear Mr. Kroll:

This letter is to acknowledge receipt of three copies of a report entitled "Engineering Report Summarizing Site Investigation for Pentachlorophenol" dated March 1985. This information was submitted on behalf of SNE Corporation located on 910 Cleveland Avenue, Wausau, Marathon County, by Eder Associates of Locust Valley, New York.

This report has been assigned to District staff for review. If you have any questions, please feel free to contact Gary Kulibert or Ed Kreul, District Hydrogeologist, at (715)362-7616.

Sincerely,

Dale T. Urso
Assistant District Director -
Environmental Protection

cc: D. Erlandson, Antigo
R. O'Hara, SW/3
Systems Management Section, SW/3
G. Kulibert, Rhinelander

(AD-75)

3/26/85

CORRESPONDENCE/MEMORANDUM

STATE OF WISCONSIN

Date: March 26, 1985 *File Ref:* 3300

To: Gary Kulibert

From: Ed Kreul

Subject: SNE Corporation

On March 21, 1985, I spoke to Bill Warren of Eder Associates regarding the groundwater contamination investigation ongoing at SNE Corporation. It appears that SNE is anxious to get the currently inoperative dip line back into service, using a water base preservative rather than the solvent-carried PCP, which they have used in the past. Part of the necessary revamping would include covering the portion of the dip line where soil was exposed to and contaminated with PCP. I told Bill Warren I did not feel it was wise to cover that area with concrete at the present time, as we have not obtained soil samples and do not know how that area fits into the groundwater contamiantion observed at the SNE site. Nonetheless, Pat Wierzba is anxious to resolve this situation and get their dip line back in operation. As I mentioned to you in our conversation last Friday (March 22, 1985), I told Bill Warren that you would be contacting Pat to discuss their options and our concerns.

Another issue which came up was the time frame in which they can expect to proceed on further groundwater investigation and remedial action at the site. I told Bill that my comments were complete and they had been submitted to you and that you would be transmitting our response to their report sometime the week of March 25. I hereby urge you to prepare and transmit that response as soon as possible. I also urge you to contact Pat Wierzba, as he is apparently very concerned about their progress toward resuming operation of their dip line.

If you have any questions or would like to discuss the conversation I had with Mr. Warren, please let me know.

EK:ck
cc: Richard O'Hara, SW/3
Dale Urso, Rhinelander

(AD-75)

3/19/85

CORRESPONDENCE/MEMORANDUM

STATE OF WISCONSIN

Date: March 19, 1985 *File Ref:* 3200

To: Gary Kulibert

From: Ed Kreul

Subject: SNE Corporation, March 1985 Site Investigation Summary by Eder Associates

I have reviewed the March 1985 "Engineering Report Summarizing Site Investigation For Pentachlorophenol" prepared by Eder Associates for SNE Corporation of Wausau. The comments rendered herein are broken into two groups - those on work performed thus far and those on recommendations included in the report. I hope you find them useful in preparing your response to SNE Corporation.

Comments On Investigation Activities To Date

1. Drilling and sampling equipment was reportedly cleaned with SNE plant steam prior to use. Plant steam contains the corrosion inhibitor N-n diethyl ethanolamine (trade name LP-2). If plant steam is to be used for cleaning in the future, micro components of LP-2 and potential daughter products should be identified.

2. According to the narrative on Page 11 and diagrams on Pages 12 and 13, the four groundwater table observation wells installed at the site include a protective casing embedded in the concrete cap at grade. The concrete thereby fills the annular space between the protective casing and the PVC inner casing. Any disruption of the protective casing will be transmitted to the inner casing displacing or damaging the well. Well top sealing and protective casing installation on all additional wells should take the configuration depicted in Appendix A of the report wherein the concrete cap does not contact the PVC inner casing.

3. The diagrams on Pages 12 and 13 give elevations of the tops of the protective casings at each well. Elevations of the tops of the inner casings are generally required for water table elevation determinations as protective casings are more prone to shifting. Reference points for depth to water measurements are further identified in Table 5 as "top of cap", a particularly poor reference point. If these wells are to be used for further water table determinations, a specified point on the top of the uncapped inner casing must be vertically located and used for all future water level measurements. The necessary surveying should be conducted after all danger of freezing temperatures has past.

4. Grade elevation at Well 1 given in Figure 3 disagrees with that given in Table 5 by 0.8 feet.

5. The report writer states in paragraph two of Page 15 that water bailed from Well 4 was placed in a 55-gallon drum and disposed of in an "approved disposal facility". The disposal facility should be specified. Additionally, water bailed from the other wells should not be disposed of to the ground surface as this may affect future contaminant source investigation.

6. Because of the slow water level recovery in Well 3, this well was not properly bailed prior to sampling. In the future, slow recovering wells should be bailed dry and allowed to recover prior to sampling unless being sampled for free product on the water table.

7. Depths to water in Table 5 are given in feet and inches resulting in water level elevations reported to the nearest tenth of a foot. Precision of the nearest 1/8 inch or 1/100 foot may be reasonably obtained in depth to water measurements. Resultant accuracy may be somewhat less but certainly better than the nearest inch or 1/10 foot.

8. The CBC Aqua Search Laboratory Report in Appendix B does not state detection limits for PCP in soil or water samples. Detection limits should always be stated, even if the analysis method is stated on the laboratory report.

9. A sample collected from Well 4 January 11, 1985, was analyzed for purgeable, base neutral and acid extractable organics. Results of these analyses were not supplied to this Department. As the solution found on the water table is better than 95% mineral spirits, organics other than PCP will be most useful in plume definition and for regulatory purposes. Volatile organic compound (VOC) screening should be conducted at all sampling points as soon as possible.

10. The water column in Well 4 has been examined for free floating mineral spirits but the other wells have not. Such an examination should be routine on all contaminated wells.

11. On Page 28 of the narrative report, the reader is referred to Appendix B for Parker Services report of analyses performed on samples from two private wells. Detection limits on these samples are given as 10 ppb for PCP and unstated for "mineral spirits". Detection of PCP to as low as 1 ppb is reasonably achieveable in samples free of significant interference. Components of mineral spirits can be detected at similar levels. The Andreas and Ganterer wells must be resampled and adequately analyzed. All other wells in use as potable water sources in the area should also be sampled and analyzed. Quality assurance/quality control procedures and results should accompany all analysis reports.

12. It is stated as fact on Page 31 that "groundwater at the plant site ultimately discharges to the Wisconsin River". It has been shown in other locations that groundwater can flow beneath the Wisconsin River making this assumption unreasonable.

Comments On Recommendations

1. Recommendation 3 on Page 33 includes installation of several shallow wells followed by installation of deeper wells where contaminants are identified near the water table. I suggest a minimum of three deep wells be installed immediately to provide a more complete geologic profile and some indication of vertical head distribution. All additional wells should be installed according to "Proposed Guidelines for Monitoring Well Installation" prepared by the Bureau of Solid Waste Management, August 1984.

2. The existing monitoring Well 1, considered to be up gradient, contains significant concentrations of PCP (1 ppm). Another up gradient well must be installed in an attempt to establish background water quality.

3. During drilling of additional wells, soil samples should be collected every five feet and at every significant change in soil type. Each soil sample should be analyzed for particle size distribution and classified according to ASTM Method D 2487-83. Soil samples should be collected in such a way as to allow later detailed analysis for PCP, other phenolic compounds, dioxins, furans and mineral spirit components. I recommend that any soil layers with significantly lower permeability than the overlaying soils be analyzed for the above-mentioned organic contaminants.

4. Quality assurance/quality control procedures used in all soil and water analyses should be provided to the Department. Those procedures should generally include analysis of spiked samples, duplicate samples, and trip blanks. Detection limits and analysis methods must be provided.

Overall, the proposed investigation strategy appears sound but should be broadened somewhat and contain more detail as discussed above. I hope you find my comments useful. I will be soliciting comments from Bureau of Solid Waste Management staff to help insure the best guided study possible from this point on. Let me know if I can be of further service.

EK:da
cc: D. Urso, Rhinelander
W. Dobbins, Rhinelander
R. O'Hara, SW/3

3/8/85

eder associates
consulting engineers, p.c.

March 8, 1985
File #509-1

Mr. Gary Kulibert
Solid Waste Coordinator
North Central District
Wisconsin Department of
Natural Resources
Box 818
Rhinelander, Wisconsin 54501

Dear Mr. Kulibert:

Enclosed are three copies of "Engineering Report Summarizing Site Investigation for Pentachlorophenol." SNE Corporation would like to proceed with the report recommendations as soon as possible.

Please advise if you have any questions or comments on the report or recommendations.

Very truly yours,

EDER ASSOCIATES CONSULTING ENGINEERS, P.C.

William M. Warren

William M. Warren
Senior Hydrogeologist

WMW/mw
Enc.

cc: S. Kroll
J. Derouin
J. Noonan

85 FOREST AVENUE • LOCUST VALLEY, NEW YORK 11560 • (516) 671-8440