Second Five-Year Review Report

for

Sherwood Medical Company Superfund Site

at

Norfolk, Madison County, Nebraska

July 2008

PREPARED BY:

United States Environmental Protection Agency
Region VII
Superfund Division
Kansas City, Kansas

Approved by:

Cecilia Tapia, Director
Superfund Division

Date:

7/3/08

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List of Abbreviations

ARAR	Applicable or Relevant and Appropriate Requirement
AST	Air Stripping Tower
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CD	Consent Decree
COC(s)	Contaminant(s) of Concern
CS/CN	Designation of a specific area of the site covering approximately five thousand (5,000 ft^2) square feet in a rectangular shape with the northern boundary being the property line between SMC and PMHC and located about two-thirds of the way, west to east, along that boundary
DCA	Dichloroethane
DCE	Dichloroethylene
EPA	Environmental Protection Agency
ESD	Explanation of Significant Differences
GETS	Groundwater Extraction and Treatment System
GWEX(s)	Groundwater Extraction Well(s)
IC	Institutional Control
MCL(s)	Maximum Contaminant Level(s) allowed for drinking water by regulation
NCP	National Contingency Plan
NDEQ	Nebraska Department of Environmental Quality
NPDES	National Pollution Discharge Elimination System
NPL	National Priorities List
OU	Operable Unit
O&M	Operation and Maintenance
PCOR	Preliminary Close Out Report
PMHC	Park Mobile Home Court
PCE	Perchloroethylene or Tetrachloroethene
RAO(s)	Remedial Action Objective(s)
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
RPM(s)	Remedial Project Manager(s)
SMC	Sherwood Medical Company
SVE	Soil Vapor Extraction
TBC	To Be Considered
TCA	Trichloroethane
TCE	Trichloroethylene
UST	Underground Storage Tank
VOC(s)	Volatile Organic Compound(s)

Executive Summary

The remedy for the Sherwood Medical Company site (SMC) in Norfolk, Madison County, Nebraska, included soil source removal, active groundwater extraction and treatment, provision of a potable water source to off-site users, and institutional controls (ICs) to prevent the use of contaminated groundwater. Construction completion for SMC was achieved with the signing of the Preliminary Close Out Report on September 24, 1999.

This is the second five-year review for SMC and was conducted as a policy review. The triggering action for this review is the date of the first five-year review which was September 25, 2003. Groundwater remediation was addressed first in the remedial action. The United States Environmental Protection Agency (EPA) Region VII Superfund Division decided to conduct the first five-year review early due to the extended time period, without significant site review, since the 1993 Record of Decision (ROD).

The assessment of the first five-year review found that the remedy was constructed in accordance with the requirements of the ROD. One Explanation of Significant Differences was issued changing the method type of soil treatment. The remedy was functioning as designed:

- Two soil sources consisting of 2,500 cubic yards of contaminated soil.
- Over 1.7 billion gallons of contaminated groundwater were extracted, thereby removing over 1,000 pounds of volatile organic compounds (VOCs) from the aquifer.

The immediate threats to human health and the environment have been addressed, and the remedy is expected to be protective when groundwater goals are achieved through active groundwater extraction and treatment.

This second five-year review reinforces the assessment, findings, and the conclusion of the first.

SECOND FIVE-YEAR REVIEW REPORT SUMMARY FORM

SITE IDENTIFICATION		
Site name (from WasteLAN): *Sherwood Medical Company Site*		
EPA ID (from WasteLAN): *NED084626100*		
Region: VII	**State:** NE	**City/County:** *Norfolk / Madison*

SITE STATUS	
NPL status: ☒ Final ☐ Deleted ☐ Other (specify)	
Remediation status (choose all that apply): ☐ Under Construction ☒ Operating ☐ Complete	
Multiple OUs?* ☒ YES ☐ NO	**Construction completion date:** *_09 / _24 / _1999_*
Has site been put into reuse? ☒ YES ☐ NO (Site has always been in use)	

REVIEW STATUS	
Lead agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency	
Author's name: *John T. Cook*	
Author title: *Remedial Project Manager*	**Author affiliation:** *U.S. EPA, Region VII, Superfund Division, Missouri-Kansas Branch*
Review period:** *_10_/_31_/_2007_ to _ 06_/_30_/_2008_*	
Date(s) of site inspection: *_10 / _31_ / _2007_*	
Type of review: ☒ Post-SARA ☐ Pre-SARA ☐ Non-NPL Remedial Action Site ☐ Regional Discretion ☐ NPL-Removal only ☐ NPL State/Tribe-lead	
Review number: ☐ 1 (first) ☒ 2 (second) ☐ 3 (third) ☐ Other (specify)	
Triggering action: ☐ Actual RA Onsite Construction at OU #____ ☐ Actual RA Start at OU# 01 ☐ Construction Completion ☒ Previous Five-Year Review Report ☐ Other (specify)	
Triggering action date *(from WasteLAN)*: *_09 / _31 / _2003_*	
Due date *(five years after triggering action date)*: *_09 / _25 / _2008_*	

* [*OU* refers to operable unit]

Second Five-Year Review Report Summary Form (continued)

Issues:

Achieving safe drinking water standards in the contaminated aquifer has not been accomplished. The goal could be met within the next five years with continuation of the groundwater extraction and treatment efforts plus additional measures discussed below. Although groundwater contaminant levels have decreased dramatically, the attainment of drinking water Maximum Contaminant Levels (MCLs) is proving to be difficult. The influent concentrations have reached an asymptotic level for the past five years but perchloroethylene or tetrachloroethene (PCE) concentrations continue to exceed the performance standard in multiple locations during the sampling events. In addition, 1,1-dichloroethylene (1,1-DCE) and trichloroethylene (TCE) concentrations have exceeded performance standards in another well as recently as September 2006.

The capacity of the extraction system had fallen to approximately one-third of the remedial design capacity. More aggressive maintenance efforts have raised this capacity to almost one-half the remedial design capacity. This is the major factor which caused the remediation to exceed the remedial design modeling estimate of project closure within five years of remedy start.

Sampling results from the Off-site area (monitoring wells 11C and 14C) fail to assure EPA that VOC contamination has not migrated below the current maximum monitoring depth. Additional and deeper sampling locations are proposed to address this.

Recommendations and Follow-up Actions:

The groundwater extraction and treatment should continue.

A pilot study using biostimulation and bacteria injections will be conducted. The work plan for this pilot study is being revised to address comments by EPA and the Nebraska Department of Environmental Quality. The pilot study will last approximately 6 to 12 months.

Northern sampling locations including private water wells will be included in the groundwater monitoring efforts.

Protectiveness Statement(s):

All immediate threats at SMC have been addressed, and the remedy is expected to be protective of human health and the environment after the groundwater cleanup goals are achieved through groundwater extraction and treatment.

Long-term Protectiveness:

Long-term protectiveness of the remedial action will be verified by monitoring both the groundwater extraction and treatment system (GETS), maintenance of SMC's IC, and the potable water provided to off-site users. Current data indicate that the SMC plume is controlled even if migrating deeper and being extracted by GETS, but new additional effort(s) may be required to accomplish MCL standards. Current monitoring data also indicate that the remedy is functioning effectively and producing significant, at least 96 percent on average, reductions in total contaminant levels in the aquifer. The potable water being supplied by SMC has met safe drinking water standards.

Other Comments:

None.

Second Five-Year Review Report

I. Introduction

The purpose of five-year reviews is to determine whether the remedy at any site is protective of human health and the environment. The methods, findings, and conclusions of these reviews are documented in five-year review reports. In addition, five-year review reports identify issues found during the review, if any, and recommendations to address them.

The Environmental Protection Agency (EPA) is preparing this five-year review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) § 121 and the National Contingency Plan (NCP). CERCLA § 121 states:

> *If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section (104) or (106), the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.*

EPA interpreted this requirement further in the NCP, 40 CFR § 300.430(f)(4)(ii) states:

> *If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.*

EPA conducted the first five-year review of the remedial actions implemented at the Sherwood Medical Company site (SMC) in Norfolk, Madison County, Nebraska. That review was conducted from February 2003 through September 2003. This second five-year review report conducted from October 2007 to June 2008 documents the results of the second review.

The first five-year review was conducted as a policy review. The triggering action was the date of the Preliminary Close Out Report (PCOR) for Operable Unit 2 (OU 2), the groundwater remediation on September 24, 1999. EPA decided to conduct that review early due to the long period of time since the 1993 Record of Decision (ROD).

Five-year reviews are required due to the fact that hazardous substances, pollutants, or contaminants remain at the site in the groundwater above levels that allow for unlimited use and unrestricted exposure.

II. Site Chronology

Table 1: Chronology of Site Events

EVENT	DATE
Initial Discovery of Problem: Drinking Water Contamination at Park Mobile Home Court	10-1987
EPA Provided Potable Water Supply to Park Mobile Home Court	1988
SMC Decommissioned Septic System Pursuant to EPA Order	09-06-1989 to 12-1990
SMC Provides Potable Water Supply to Park Mobile Home Court Pursuant to EPA Order (Later Expanded to Businesses North of Site)	09-1989 to Present
Site Proposed and Placed on National Priorities List	Proposed: 7-29-1991 Placed: 10-14-1992
SMC Conducted Remedial Investigation/Feasibility Study Pursuant to EPA Order	03-21-1991 to 09-28-1993
EPA Record of Decision	09-28-1993
EPA Record of Decision Explanation of Significant Differences	09-05-1995
Consent Decree Entered by Court, Requiring SMC to Conduct Cleanup	11-07-1996
Remedial Designs - Operable Unit 1 Addressing Soils and Operable Unit 2 Addressing Groundwater	11-1996 and 07-1998 Respectively
Actual Remedial Action Starts – Operable Unit 1 and Operable Unit 2	07-10-1998
Preliminary Close Out Report	09-24-1999
Operation and Maintenance for Operable Unit 2	Since 10-01-1999
Final Remedial Action Report for Operable Unit 1 – Soils	09-25-2000

Interim Remedial Action Report for Operable Unit 2 – Groundwater	09-26-2000
First Five-Year Review Completed	09-25-2003
Second Quarter 2003 Status Report	11-17-2003
Third Quarter 2003 Status Report	11-25-2003
Fourth Quarter 2003 Status Report	02-19-2004
Operation & Maintenance Report, 04-01-03 Through 09-30-03	02-25-2004
First Quarter 2004 Status Report	04-27-2004
Fact Sheet for the First Five-Year Review Completed	05-01-2004
Field Sampling Plan And Quality Assurance Project Plan (Final)	05-01-2004
Submission of Work Plan for Limited Study of Soils in the Former Septic System Leach Field (located in the Underground Storage Tank Area) as a Continuing Contamination Source to that Area	05-04-2004
Operation & Maintenance Report, 10-01-03 Through 03-31-04	07-30-2004
Drinking Water Treatment System, Second Quarter 2004 Status Report	08-20-2004
Second Quarter 2004 Status Report	08-20-2004
Submission/Acceptance of the Limited Leach Field Investigation Report	11-16-2004
Final: Operation & Maintenance Report, 04-01-04 Through 09-30-04	12-22-04
Third Quarter 2004 Status Report	01-25-2005

Drinking Water Treatment System, Fourth Quarter 2004 Status Report	01-25-2005
Fourth Quarter 2004 Status Report	01-25-2005
Operation & Maintenance Report, 04-01-04 Through 09-2004	02-18-2005
First Quarter 2005 Status Report	05-04-2005
Operation & Maintenance Report, 10-01-04 Through 03-31-05	08-01-2005
Final Leach Field Comprehensive Study and Soil Remediation Work Plan	08-15-2005
Drinking Water Treatment System, Second Quarter 2005 Status Report	09-14-2005
Drinking Water Treatment System, Third Quarter 2005 Status Report	10-21-2005
Submission and Acceptance by EPA of the Comprehensive Leach Field Study Report	01-01-2006
Fourth Quarter 2005 Status Report	02-27-2006
Operation & Maintenance Report, 04-01-05 Through 10-31-05	04-15-2006
First Quarter 2006 Status Report	05-24-2006
Second Quarter 2006 Status Report	08-31-2006
Submission of Revised Cyclic Pumping Proposal	10-5-2006
Fourth Quarter 2006 Status Report	04-11-2007
Operation & Maintenance Report, 04-01-06 Through 10-31-06	04-19-2007

First Quarter 2007 Status Report	06-13-2007
Comments Referencing the Revised Cyclic Pumping Proposal Submitted 10-05-06 and Acceptance of the Switch to In Situ Bio-injections	06-26-2007
Second Five-Year Review Report Site Inspection Completed	11-01-2007
Operation & Maintenance Report for 04-01-07 to 10-31-07	01-10-2008
Submission of New Cyclic Pumping Proposal for Off-site Area Only	01-25-2008
Submission of New Cyclic Pumping for Off-site Area Only and the In Situ Bioinjections Work Plans	02-06-2008
Comments of New Cyclic Pumping in Offsite Area Work Plan and In Situ Bioinjections Work Plans	03-11-2008
Announcement of Second Five-Year Review Published in the *Norfolk Daily News* and Notices Mailed to All Listed Recipients, etc.	5-10-2008
Second Five-Year Review Completed	6-30-2008

III. Background

Physical Characteristics

SMC covers approximately 106 acres and is located in Madison County, Nebraska, approximately one and one-half miles south of the city of Norfolk and adjacent to U.S. Highway 81 (see Attachments M-1 for a site location map). The southern part of SMC, about 40 acres, consists of the property which includes the manufacturing building and adjoining lake. The northern/northeastern part of SMC consists of the Park Mobile Home Court (PMHC) property. Industrial, commercial, and residential properties are located on all sides of SMC. Medelman's Lake and the Elkhorn River, which is the major hydraulic component and influencer of both the surface and groundwater in the SMC area, are north of SMC and within one mile.

Land and Resource Use

The historic and present land use of the immediate area consists of mixed industrial, commercial, and residential. In addition to the SMC plant, a sand and gravel operation is to the northeast; commercial operations are active to the north; and the Karl Stefan Airport is just west, across U.S. Highway 81. In addition to the PMHC, additional private residences exist immediately south, northwest, and east of the SMC property. It is expected that future land use for the area will be the same as the historic uses. For cleanup purposes, the requirements for soil and groundwater are based upon residential protection standards. These consist of the Maximum Contaminant Level (MCL) standards for groundwater and the site-specific soil action levels developed in the Remedial Design Phase I via the EPA *Soil Screening Level Guidance* (12-94) as presented below and accepted by EPA and the Nebraska Department of Environmental Quality (NDEQ).

SOIL STANDARDS (ACTION LEVELS) DETERMINED BY SITE-SPECIFIC STUDY AND INSTITUTED IN THE ROD

Chemical Contaminant	Standard in Milligrams per Kilogram
Trichloroethylene (TCE)	0.076
Perchloroethylene (PCE)	0.227
Trichloroethane (111TCA)	2.000
Dichloroethene (11DCE)	0.084
Dichloroethane (12DCA)	0.025

The groundwater aquifer underlying SMC is currently used as the only source of commercial and residential water south of the Elkhorn River. The dominant groundwater flow direction is north by northeast toward the Elkhorn River.

History of Contamination and Initial Responses

SMC started its operations at the site in 1961. SMC and all its successors have manufactured medical syringes and other medical products using injection molding processes at this plant. Chlorinated solvents were used in associated activities of the manufacturing and were allowed to drain into the on-site septic system. It is also believed that liquid chlorinated solvent wastes or materials were released in the CS/CN area.

In 1987, a sample collected by the Nebraska Health Department from the PMHC water system was found to contain volatile organic compounds (VOCs). In 1988, EPA supplied the PMHC residents with potable water by first providing bottled water and then by installing an activated carbon water treatment system on the water supply well.

Investigations identified the SMC plant as the source for the VOCs which resulted in SMC decommissioning their septic system and installing a permanent potable water supply for the PMHC by 1989.

SMC was proposed for the National Priorities List (NPL) on July 29, 1991, and placed on the NPL on October 14, 1992.

Following the early actions described above, SMC conducted a Remedial Investigation/Feasibility Study (RI/FS) which resulted in EPA's 1993 ROD. That RI/FS identified: (1) Two soil sources contaminated with VOCs on the property – the former underground storage tank (UST) and septic system area and a specific area of SMC approximately 5,000 square feet located completely on SMC property immediately southeast of the groundwater extraction well number 3 (GWEX3) and the northern property boundary designated as CS/CN; and (2) Two corresponding groundwater plumes, respectively, contaminated with VOCs, with both extending north by northeast with the UST plume proceeding under the plant building and the CS/CN plume proceeding beyond the property onto the PMHC.

Basis for Taking Action

Contaminants

Hazardous substances that have been released at SMC in soils and groundwater include:

- Chlorinated VOCs including primarily PCE, TCA, DCE, and TCE
- Toluene and gasoline compounds were detected at low levels, below health-based standards, in subsurface soils

Potentially, unacceptable risks were calculated based on ingestion, inhalation, and dermal contact to contaminants through exposure from the contaminated groundwater.

IV. Remedial Actions

Remedy Selection

The ROD for SMC was signed on September 28, 1993. The principal threats at SMC and the Remedial Action Objectives (RAOs) were developed from data collected during the RI to aid in the development and screening of remedial alternatives that were considered for the ROD. The three principal threats at SMC were identified, both current and potential, as:

- The contaminated groundwater originating on the SMC property and extending toward Medelman's Lake

- The contaminated subsurface clay unit located in the designated CS/CN area

- The subsurface residual contamination in the UST area

The RAOs for SMC are to eliminate the current and to prevent future unacceptable exposures due to the three principal threats.

The major components of the remedy selected in the ROD include:

- A deed restriction, on the SMC property only, prohibiting land disturbance in the two soil source areas and the use of groundwater supply wells in the contaminated portion of the aquifer. This is an Institutional Control (IC) which may be removed when the SMC groundwater meets all MCL standards. The IC is to prevent the consumption of contaminated groundwater and to prevent the withdrawal of water through any groundwater well that might affect the performance of the groundwater extraction and treatment system (GETS).

- A permanent supply of potable water to the PMHC and other affected properties.

- A groundwater monitoring well system to monitor the status and evaluate changes in the groundwater quality.

- The removal of the septic system.

- The excavation and low-temperature thermal treatment of contaminated soils which exceed soil action standards from the two source areas. The treated soils would be placed back into the on-site excavated area after achieving the performance standards.

- The extraction and treatment of the contaminated groundwater. The treatment would involve air stripping the groundwater, and the treated water would be discharged to the Elkhorn River via a pipeline and be pursuant to a state National Pollutant Discharge Elimination System (NPDES) permit regulated by NDEQ. Also, the extraction system would be designed to achieve potable standards within five years from start up.

An Explanation of Significant Differences (ESD) was issued on September 5, 1995. Following a preliminary design effort of a soil contamination treatment system

noted in the **Land and Resource Use** above, SMC proposed changing the soil treatment method to ex-situ soil vapor extraction (SVE) and developed the actual soils VOC performance standards. EPA and NDEQ approved the change.

Remedy Implementation

In a Consent Decree (CD) entered by the court on November 7, 1996, SMC agreed to perform the remedial design/remedial action and pay the government's future costs incurred in connection with SMC; all past costs had already been paid by SMC. The remedial design/remedial action were conducted in conformance with the ROD as modified by the ESD.

SMC managed the design and construction of the remedy as two OUs—soils (OU 1) and groundwater (OU 2). Both designs were approved by EPA on July 10, 1998. SMC had entered into a design and build contract with its selected consultant. Thus, approval of the designs automatically initiated work on the remedy construction activities.

The construction of the GETS was completed first so it would be available to process any contaminated water encountered during the soil excavation activities. No contaminated groundwater was encountered during the contaminated soil excavation. On April 21, 1999, EPA notified SMC that the construction of the groundwater system was completed in accordance with the approved design. The major components of the OU 2 remedial action were the following:

- Installation of three new GWEXs (GWEX1 through GWEX3) as part of an extraction system utilizing a total of four GWEXs

- Installation of two new monitoring well locations (14A-C and 15) as part of a monitoring system utilizing a total of over 40 monitoring wells

- Construction of a groundwater treatment system based upon air stripping as the primary removal process

- Construction of a pipeline designed to carry the treatment system discharge from the property to the Elkhorn River pursuant to an NPDES permit

- A deed restriction (IC) was filed with the Madison County, Nebraska, Register of Deeds (in Deed Book M97-3, pages 118–123, on March 4, 1997, at 9:00 a.m.) only on the SMC property prohibiting both land disturbance in the two soil source areas and the use of groundwater supply wells in the contaminated portion of the aquifer.

OU 1 involved the remediation of the two soil source areas—CS/CN and UST. In September 1999, EPA notified SMC that the construction activities were completed in accordance with the approved design and ESD. The major components of the OU 1 remedial action were the following:

- The removal of the septic system.

- The excavation and ex-situ treatment of contaminated soils which exceeded soil performance standards from the two source areas. The treated soils were returned to the on-site excavation once the cleanup standards were met.

There were no soils found contaminated above the cleanup standards in the UST source area. The former septic system was removed and the UST area which included the system's leach field closed according to the remedial design.

Approximately 2,500 cubic yards of contaminated soils were excavated from the CS/CN source area. Wastes from SMC's manufacturing processes were found disposed in the subsurface soils. During the excavation, these wastes were segregated and disposed of in an appropriate off-site municipal solid waste landfill. The contaminated soils were processed through a shredding device which mixed sand with the clay soils in order to enhance the effectiveness of the ex-situ SVE process. Following the soil preparation process, SMC collected samples of the soils for chemical analysis to develop a baseline prior to treatment. Analytical results indicated that the soil preparation process removed the VOCs to a concentration level sufficient to achieve the soil cleanup standards. As a result, this phase was completed by August 1999, approximately one year ahead of schedule.

SMC achieved construction completion status when the PCOR was signed on September 24, 1999.

EPA and NDEQ determined that all remedial action construction activities, including the implementation of ICs, were performed according the specifications of the remedial design and CD. The goal for the GETS was to achieve cleanup levels (MCLs) for all groundwater contaminants within five years from start up. Once groundwater cleanup levels have been met, EPA will issue a Final Close Out Report

System Operation/Operation and Maintenance

SMC is conducting the long-term operation and maintenance (O&M) activities according to the O&M Plan that was approved by EPA on December 15, 1999. The primary activities associated with O&M include:

- O&M of the GETS components: wells, air strippers, etc.
- Chemical monitoring and reporting of the progress of the groundwater remediation to EPA and NDEQ Superfund programs
- Chemical monitoring and reporting of the GETS discharge to the Nebraska NPDES program, EPA Superfund, and the Nebraska Remediation/Groundwater Standards Program
- Operation of the drinking water supply to PMHC and providing potable water to several businesses near SMC
- Chemical monitoring of the potable water supplied to the residents and reporting the results to both EPA and NDEQ Superfund programs
- Maintenance of the IC for SMC which includes the deed restriction noted in the **Remedy Implementation** above and the PMHC access agreement

The cleanup of the CS/CN and UST soil sources achieved cleanup standards which are protective of groundwater as noted in **Land and Resource Use** above by establishing action levels for PCE-contaminated soils which removed and/or treated the soil sources which were causing PCE contamination in the groundwater. All the remaining contamination present is in the groundwater; therefore, the remaining O&M activities involve operating the GETS, monitoring the results, and maintaining the site IC.

Table 2: Annual System Operations/O&M Costs

Dates		Cost rounded to nearest $1,000
From	To	
12-99	12-02	$240 (estimated)
01-03	12-07	$792 (estimated)

Since the first five-year review, an additional 800 million gallons of groundwater have been extracted and treated with the removal of an additional 250 pounds of total contaminants of concern (COCs) from the aquifer.

The GETS has run at an average rate over 90 percent of the time since 1999. SMC has pumped over 1.7 billion gallons of groundwater and removed over 1,000 pounds of COCs from the aquifer in total. The GETS is functioning as designed but far below the design volume capacities.

V. Progress Since the Last Review

Protectiveness Statements from the First Five-Year Review

All immediate threats at SMC have been addressed. The remedy is expected to be protective of human health and the environment after the groundwater cleanup goals are achieved through groundwater extraction and treatment.

Table 4: Recommendations and Follow-up Actions

Issue	Recommend-ations and Follow-up Actions	Party Respon-sible	Oversight Agency	Milestone Date	Effects Protectiveness (Y/N)	
					Current	Future
Meet Groundwater Cleanup Standards	Review operational data to determine if additional actions are required to accelerate cleanup	SMC	EPA and NDEQ	9/2004	N	N

The only recommendation and follow-up action shown above has been accomplished. Actions have been taken and additional actions to accelerate the groundwater cleanup are proposed and shall be taken.

Results of Implemented Actions, Including Whether They Achieved the Intended Effect

Since the first five-year review, SMC suspected that the soils in the leach field of the former septic system in the UST area were a continuing source of contamination to the UST area plume. They requested permission to do a limited study which was approved and completed. SMC requested permission to perform a comprehensive investigation of these soils and also if found to be a source, permission to remove and treat these soils. EPA reviewed and approved the investigation and the study was completed. During the study, ceramic pipe mains and discharge lines were discovered and removed but it was determined that the soils of the former leach field were not a source of contamination to the groundwater and did not require removal.

An ozone injection system was added to the GETS in 2004 to improve the air stripping tower (AST) by reducing the biofouling of organics within the packing materials

in the tower. This system is still in place, however, it has been only moderately successful in controlling the iron buildup which does clog the voids within the filter packing materials.

In 2005, all wells were rehabilitated by cleaning and scrubbing to remove the rust accumulation and the attached bacteria growth. This work effort was done in 2006 and 2007 and will become part of the annual O&M.

Also, major maintenance, repairs, and replacements have been done as needed. GETX3 and GETX4 required pump motor replacements. Other valves, fittings, seals, etc., routinely fail or fall to a performance level which requires repair or replacement. An example would be the transducer on the AST which failed in May 2005 and caused the shut down of the GETX for about 20 days. Lastly, mechanical expendables (oil, lubricants, packings, etc.) require repair and/or replacement on a weekly basis.

On November 3, 2003, just after the first five-year review report, SMC requested permission to revise the continuous groundwater pumping plan to a cyclic pumping plan. This was not approved because of the success of the existing plan and the high COC concentrations. On October 5, 2006, SMC proposed a revised cyclic pumping plan; EPA determined that the pumping plan would not be changed but would include an in situ reductive treatment (discussed in full below). On January 10, 2008, SMC proposed a new cyclic pumping plan for the Off-site area to which EPA and NDEQ proposed an alternate plan on March 3, 2008, and to which SMC has not replied.

Status of Any Other Prior Issues

A pilot study in the UST/septic system area will be implemented. This pilot is for an in situ reductive treatment via biostimulation and bacteria injections. The pilot study work plan includes the injection of organic substrate into the contaminated groundwater plus the injection of bacteria cultures which are affective in remediating PCE. These new actions require modifications of the Quality Assurance Project Plan, Field Sampling Plan, and Health and Safety Plan. It is estimated that the pilot study will last a year. Any changes to the remedy will require either a ROD Amendment or an ESD. The public will be notified of any proposed remedy changes. Progress reports will be submitted to EPA and NDEQ on a monthly basis during the pilot study.

Table 3: Actions Taken Addressing the First Five-Year Stated Recommendations and Follow Ups Since that Review

Issues from Previous Review	Recommendations/ Follow-Up Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Meeting the Groundwater Cleanup Standards	Review of O&M procedures and improvements including data to determine what additional actions might accelerate the cleanup	SMC	March 1, 2004	Data provided were checked and analyzed; O&M, repairs, and replacements to the system were completed; and proposals for acceleration are underway	September 9, 2005
Meeting the Groundwater Cleanup Standards	Creation of a site hydrograph potentiometric surface map	SMC	November 2005	Water level measurements were taken, calculations made, and a site hydrograph potentiometric surface map was produced which showed the existing GWEX system was adequate for creating the hydraulic capture zone necessary.	November 2005

Table 3A: Actions Taken Since the First Five-Year Review that are Not Stated Recommendations or Follow Ups

Goal	Actions	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
Meeting the Groundwater Cleanup Standards	Placement of an ozone injection system into the packings of the AST	SMC	July 2004	With the ozone injections, production through the AST has increased to a little less than ½ the remedial design rate of the system and thus has increased the rate of contaminant removals from the aquifer	July 2004
Meeting the Groundwater Cleanup Standards	Increased and more aggressive cleaning maintenance of the GWET system, both the AST and GWEXs	SMC	July 2005	The AST and GWEXs were rehabilitated by cleaning and scrubbing to remove the rust accumulation and the bacteria growth which resulted in higher flow rates that increased pumping volumes to about ⅓ the remedial design rate of the system resulting in an increase in the rate of contaminant removal	July 2005 July 2006 July 2007

VI. Five-Year Review Process

Administrative Components

The public was notified of this second five-year review on May 10, 2008, through a public notice placed in the *Norfolk Daily News*. In addition, representatives of SMC and NDEQ were notified through electronic mail. This five-year review was conducted by Clint Sperry, Steve Auchterlonie, and John T. Cook, all of whom serve as Remedial Project Managers (RPMs) in the Superfund Division of EPA. Wade Gregson, NDEQ

Remediation Section, assisted in this review as the representative for the supporting state agency.

This review included the following components:

- Community involvement
- Document review
- Data review
- Site inspection
- Local interviews
- Five-Year Review Report development, evaluation, and approval

The schedule extended from October 2007 through August 2008.

Community Involvement

On May 10, 2008, a notice was placed in the *Norfolk Daily News* announcing that the second five-year review was to be conducted and inviting public participation. To date, no comments have been received. Upon completion of the second five-year review report, a second notice will be placed announcing the completion of the review and the availability of the report. A copy of the report will be made available in SMC's Administrative Record located in the Norfolk Public Library and EPA Region VII office in Kansas City, Kansas.

Document Review

This second five-year review consisted of an examination of relevant documents including O&M records, quarterly reports, correspondence, monitoring data, etc. Applicable groundwater cleanup standards as listed in the 1993 ROD were reviewed also.

Data Review

Groundwater monitoring has been conducted since the start up of the GETS in 1999, and the GETS has operated over 90 percent of the total time since. In general, all COCs were detected at their highest levels during the first two years of operation. These high levels have significantly decreased during the subsequent years. On average, the reductions in total contaminant concentration levels have been

approximately 96 percent with all but PCE meeting the RAOs. Attachments G-1 through G-5 graph the influent COC concentrations for each of the four GWEXs and the treatment plant. These graphs document the reduction in COC concentrations in the groundwater. To date, 1.7 billion gallons of groundwater have been extracted and treated removing over 1,000 pounds of COCs from the aquifer as shown in Attachments G-6 and G-7.

Even with these significant reductions, the contaminant level for PCE is still greater than drinking water standards in five monitoring wells (6A, 6B, 4A, 3A, and 13A1) and three extraction wells (GWEX1, GWEX3, and GWEX4). Refer to Appendix A: Figure F-1 for an illustration showing the locations and most recent sampling results.

EPA and NDEQ have approved an in situ pilot study scheduled in the area adjacent to monitoring wells 4 and 13. The study will evaluate the effectiveness of using biostimulation and bacteria injections to treat PCE in this source area and will be completed in 2009.

During the RI/FS and as reflected in the ROD, two groundwater plumes were identified with two source areas—UST/septic system area and the CS/CN area. In addition, during the remedial design process a third plume was identified—the Off-site area groundwater contamination north by northeast of the SMC property. Groundwater results for each of these three areas are summarized below.

Off-site Area

The Off-site area, which is within SMC's boundaries but outside SMC's property borders, is identified as contamination which migrated into the groundwater from SMC's CS/CN contaminated area which is completely within SMC's boundaries and north by northeast of the plant building.

As shown in Attachment Map M-1, the GETS utilizes two extraction wells—GWEX1 and GWEX2—which are hydraulically controlling the Off-site area groundwater. Monitoring well locations 10, 11, 14, and 15 as well as GWEX1 and GWEX2 influents verify a more than 97 percent reduction in total COCs concentrations in the Off-site area. Concentration levels are below MCL standards for every COC except PCE in the GWEX1 influent and accomplish all the RAOs for SMC except the PCE RAO. These accomplishments are most notably apparent in monitoring wells 10B, 10C, 11A, 11B, 14B, and 15 plus influents to GWEX1 and GWEX2.

The influent contaminant levels for PCE in GWEX1 have exceeded the PCE MCL standard during the past five years; the levels of PCE range from 4.3 micrograms per liter (µg/L) to a high of 15 µg/L in March 2003. The influent into GWEX2 has been less than 5 µg/L (the MCL for PCE) for the last five years. The deep segments of two of the monitoring wells (11C and 14C) whose sampling analyses are shown in Appendix A (C-

10 and C-11, respectively) show intermittent levels in total COC concentrations but PCE is below the MCL. It is possible that VOC contamination may be present deeper in the groundwater than currently being monitored. The sampling of additional existing private wells which were previously monitored or new monitoring wells which are proposed herein will provide necessary information regarding depth, location, and concentration of the contamination.

Combining the monitoring well and extraction well results over the life of the GWEX operations demonstrates the GETS is very effectively controlling and removing the COCs plume from the groundwater. Bottled water is supplied by SMC to several businesses north of the SMC property which eliminates the use of private wells for drinking water. SMC provides the potable water to PMHC. SMC submits quarterly reports to EPA and NDEQ documenting the volume and quality of the supplied water. To date, the supplied water meets drinking water standards. An IC in the form of deed restrictions on SMC property and an access agreement with PMHC assure that no new or redeveloped well shall affect and/or restrict the existing GWEX1 and GWEX2 control of the groundwater in the Off-site area.

To provide additional, needed groundwater data necessary to understand and make effective decisions in the Off-site area, it is recommended that private residence wells which have been sampled in the past and new ones if there are any near the Off-site area be identified and sampled.

CS/CN Area

The CS/CN area is approximately 5,000 square feet and is located immediately southeast of GWEX-3, on the northern boundary of the SMC property as shown on Appendix A (M-1).

The GETS utilizes GWEX3 to hydraulically control the groundwater in the CS/CN area. The total influent COCs concentration levels have decreased by over 96 percent, and those levels are below MCL standards for every COC except PCE. Those levels accomplish all the RAOs for SMC except the MCL standard for PCE. In addition, downgradient monitoring wells, most notably wells 14B and 15, document significant reductions in COCs concentrations as shown in Appendix A (C-4 and C-5). Thus, the CS/CN soil removal effort appears to have effectively eliminated the contamination source for this area and the GETS appears to effectively remove the groundwater COCs.

The influent contaminant concentration levels for PCE in GWEX3 and GWEX1 show that since October 2006 the groundwater has exceeded and most probably will continue to exceed the PCE MCL standard.

UST Area

The UST/septic system area is located next to the plant building at the southwest corner and includes monitoring well locations 4 and 13. The area is also monitored by monitoring wells 2C, 4A, 5C, 6A, 6B, 6C, 7B, 7C, 7R, 9C, 12C, 13A, and 13A1.

The GETS utilizes GWEX4 to hydraulically control the groundwater contamination migrating from the UST source area. Influent COCs concentration levels for the area have decreased by 95 percent from start up. Levels are below MCL standards except for PCE as shown by the influent to GWEX4 and the monitoring wells noted above. Thus, the removal of the tanks, entire septic system, and the contaminated soil appears to have effectively eliminated the contamination source for this area and the GETS appears to have effectively removed and treated the groundwater contamination.

Sampling data from the GWEX4 influent (Appendix A [C-9]) and monitoring wells 4A, 5C, 6A, 6B, 13A, and 13A1 indicate COC concentration levels have and are continuing to exceed the MCL standard for PCE. These exceedances require the following actions: continued extraction and treatment; continued close attention by SMC, NDEQ, and EPA to the data produced and evaluations/decisions made from it; more aggressive O&M activities; and implementation of the pilot study to reduce the residual PCE.

Site Inspection

An inspection of SMC was conducted on November 1, 2007, by Clint Sperry and Steve Auchterlonie, RPMs at EPA Region VII. The purpose of the inspection was to assess the protectiveness of the remedy including the operation of the GETS. No significant issues have been identified at any time regarding the supply of potable water to off-site parties and the operation of the GETS. SMC identified an ongoing maintenance problem with bacterial growth in the wells and treatment system. SMC managed the problem through implementing maintenance procedures which include periodic cleaning of the air stripper and extraction wells and continuously adding a biocide to the extracted water prior to air stripping.

SMC completed the IC requiring a deed restriction prohibiting land disturbance in the two soil source areas and the use of groundwater supply wells in the contaminated portion of the aquifer. SMC supplies potable water to off-site users which eliminates the use of contaminated groundwater for drinking water needs.

Local Interviews

Interviews were conducted during the SMC visit with two key employees of SMC: (1) Larry Belz, SMC plant manager; and (2) Rick Tomjack, SMC Environmental Health

and Safety Engineer and GETS Technical Manager. These personnel discussed the maintenance problems related to the iron buildup and the cost and resources required for maintenance of the GETS. They suggested the in situ treatment pilot study that is in process.

VII. Technical Assessment

Question A: Is the remedy functioning as intended by the decision document?

The review of documents, applicable or relevant and appropriate regulations (ARARs), risk assumptions, and the results of the SMC inspection indicate that the remedy continues to function as intended by the ROD as modified by the ESD:

- The source removal actions conducted in the UST and CS/CN areas achieved the specified cleanup standards.

- Groundwater extraction and treatment monitoring data indicate that the contaminants' migration continues to be controlled by the GETS but additional monitoring data from deeper locations in the Off-site area are required to validate this assessment.

- The water supply provided to PMHC and other off-site users effectively eliminates the use of the contaminated groundwater as a drinking water source.

O&M of the GETS has been effective with only minor outage incidents. O&M annual costs have increased above original estimates due to the ozone injection and expanded cleaning and maintenance. There were no opportunities for system optimization determined during this review. The first eight and two-thirds years of operation created a database upon which to make future decisions. The groundwater and operational database plus the pilot study will be instrumental in determining if any changes are required to meet the objective of achieving safe drinking water standards.

The IC (deed restriction on SMC property) and an access agreement with PMHC assure that no new or redeveloped well shall be allowed on those properties until all the MCL goals are accomplished and no groundwater extraction is affecting the ability of the GETS to accomplish all that it can to reach MCL standards.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?

There have been no changes in the physical conditions of SMC that would affect the protectiveness of the remedy.

Changes in Standards and To Be Considereds (TBCs)

When the remedial work for soils was completed, the ARARs for soil contamination cited in the ROD were met.

The ARARs that still must be met at this time pertain to groundwater cleanup standards and treatment standards. As specified in the ROD and ESD, there have been no changes in those ARARs and no new standards or TBCs affecting the protectiveness of the remedy. The main ARARs are listed below:

- Safe Drinking Water Act nonzero MCLs, 40 CFR 141.50-62, 40 CFR 141.11-16, and Nebraska Title 118

- Federal Clean Water Act, 33 United States Code 1251 et seq., criteria for surface water discharges including but not limited to sections 301, 303, 402, and 502, and Nebraska Title 117

- Nebraska Title 129 establishes air quality standards

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

The exposure assumptions used to develop the Human Health Risk Assessment included both current exposures and potential future exposures. There have been no changes in the toxicity factors for the COCs that were used in the Human Health Risk Assessment. These assumptions are considered to be conservative and reasonable in developing risk-based cleanup levels. No change to these assumptions or the cleanup levels developed from them is warranted. No changes were identified pertaining to the exposure pathway assumptions made during the risk analysis. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. The remedy is progressing but at a slower rate than was expected. The groundwater cleanup levels were not met in the projected five-year timetable, but progress toward them is still practicable and will be continued.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

The only other information that calls into question the possible protectiveness of the remedy is the lack of data in the deeper aquifer downgradient of the Off-site area. There is nothing to prove any lack of protectiveness and no one is being affected by this possibility at this time, but there is a possibility that requires investigation. This matter shall be addressed via revisions to the sampling procedures which are proposed herein and resumption of the sampling of existing wells or development of new wells. This will be undertaken by SMC.

VIII. Issues

Table 4: Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Groundwater contaminant levels still have not met the safe drinking water standards within the five-year period projected at start up of the GETS and still have not met those standards	N	Y
Determination of the contamination levels of the deep aquifer in the Off-site area	N	Possible

IX. Recommendations and Follow-up Actions

Table 5: Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party(s) Respon-sible	Oversight Agency(s)	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Data Gaps	Sampling every monitoring well and as many private off-site wells as possible at each sampling event	SMC	EPA and NDEQ	August 2008 Sampling Event	N	Y
More Aggressive O&M Activities	Increase the AST and extraction well rehabilitation maintenance to twice a year	SMC	EPA and NDEQ	ASAP	N	Y
Determine if COCs Plume is Migrating Deeper in Off-site Area	Study the lower level data of the Off-site plume in existing monitoring wells to determine the reasons for consistent and increasing total COCs and determine if new and/or deeper monitoring wells are required to provide additional necessary data	SMC	EPA and NDEQ	ASAP	N	Possibly
Perform the Pilot Study	In Situ Reductive Treatment consisting of biostimulation and bacteria injection	SMC	EPA and NDEQ	ASAP	N	Possibly

X. Protectiveness Statement(s)

The remedy is expected to be protective of human health and the environment upon attainment of groundwater cleanup goals through operation of the GETS, which is expected to require some more time to achieve the PCE MCL standard. Exposure pathways that could result in unacceptable risks are being controlled by preventing exposure to or ingestion of the contaminated groundwater via the maintenance of SMC's IC and the provision of potable water to PMHC.

Long-term protectiveness of the remedial action will be verified by monitoring both the GETS and the potable drinking water provided to off-site users. Current data indicate that the plumes, with the possible exception of the deeper levels of the Off-site area plume, are being controlled and the contaminations being extracted from the aquifer by the GETS. Current monitoring data indicate that the remedy is functioning effectively and has produced on average approximately 96 percent reductions in total COC concentration levels in the aquifer.

XI. Next Review

The next five-year review for SMC is required by June 2013 or five years from the date of this review.

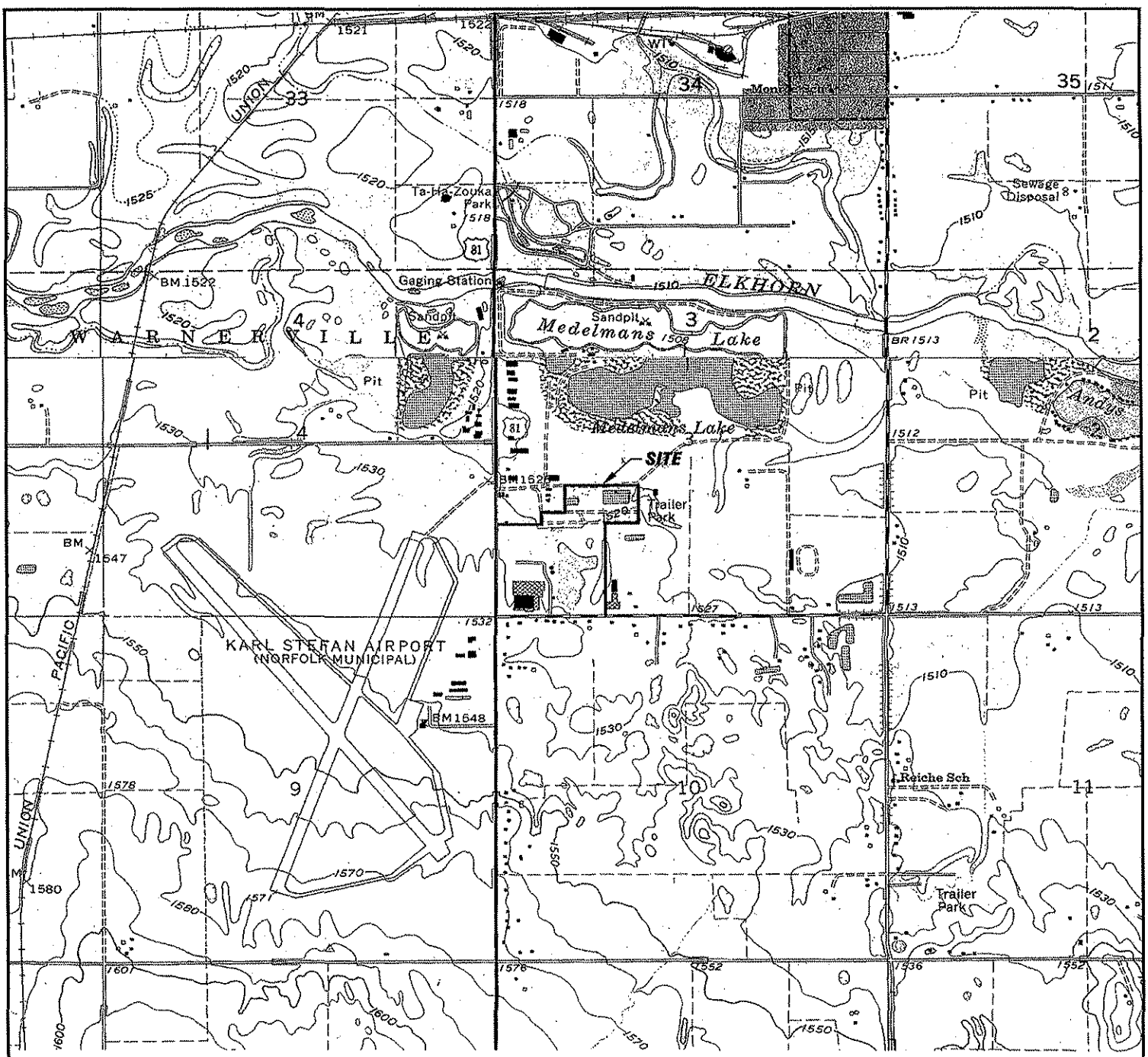
ATTACHMENTS

The Tables, Map, Figure, and Charts in this report were developed by the SMC

APPENDIX

The Second Five-Year Review Site Inspection Meeting Minutes were prepared by SMC and approved by EPA with Photos Taken by EPA RPMs Clint Sperry and Steve Auchterlonie during that site visit.

Site Map



January 15, 2008 2:28:19 p.m.
Drawing: T:\SHERWOOD\16170230\200\fig1-1.dwg

URS

SITE LOCATION PLAN
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NE

DRN. BY: DRB	DATE: 10/18/07	PROJECT NO.	FIG. NO.
CHK'D. BY: BKW	DATE: 10/22/07	16170230	1-1

FIGURE 2-4
GROUNDWATER COC DETECTED IN GWEX-1
SHERWOOD MEDICAL COMPANY - SUPERFUND SITE
NORFOLK, NEBRASKA

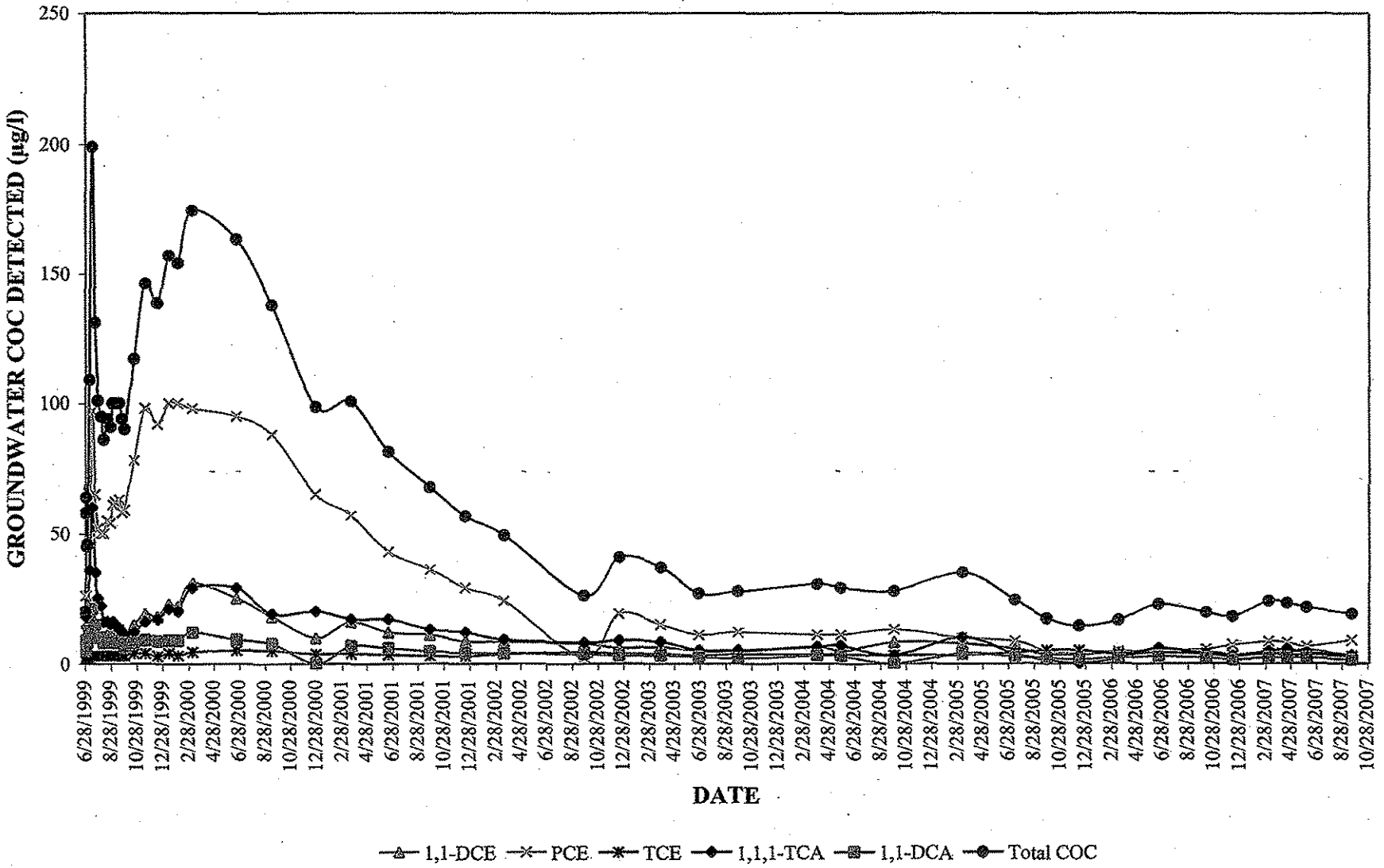


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FIGURE 2-5
GROUNDWATER COC DETECTED IN GWEX-2
SHERWOOD MEDICAL COMPANY - SUPERFUND SITE
NORFOLK, NEBRASKA

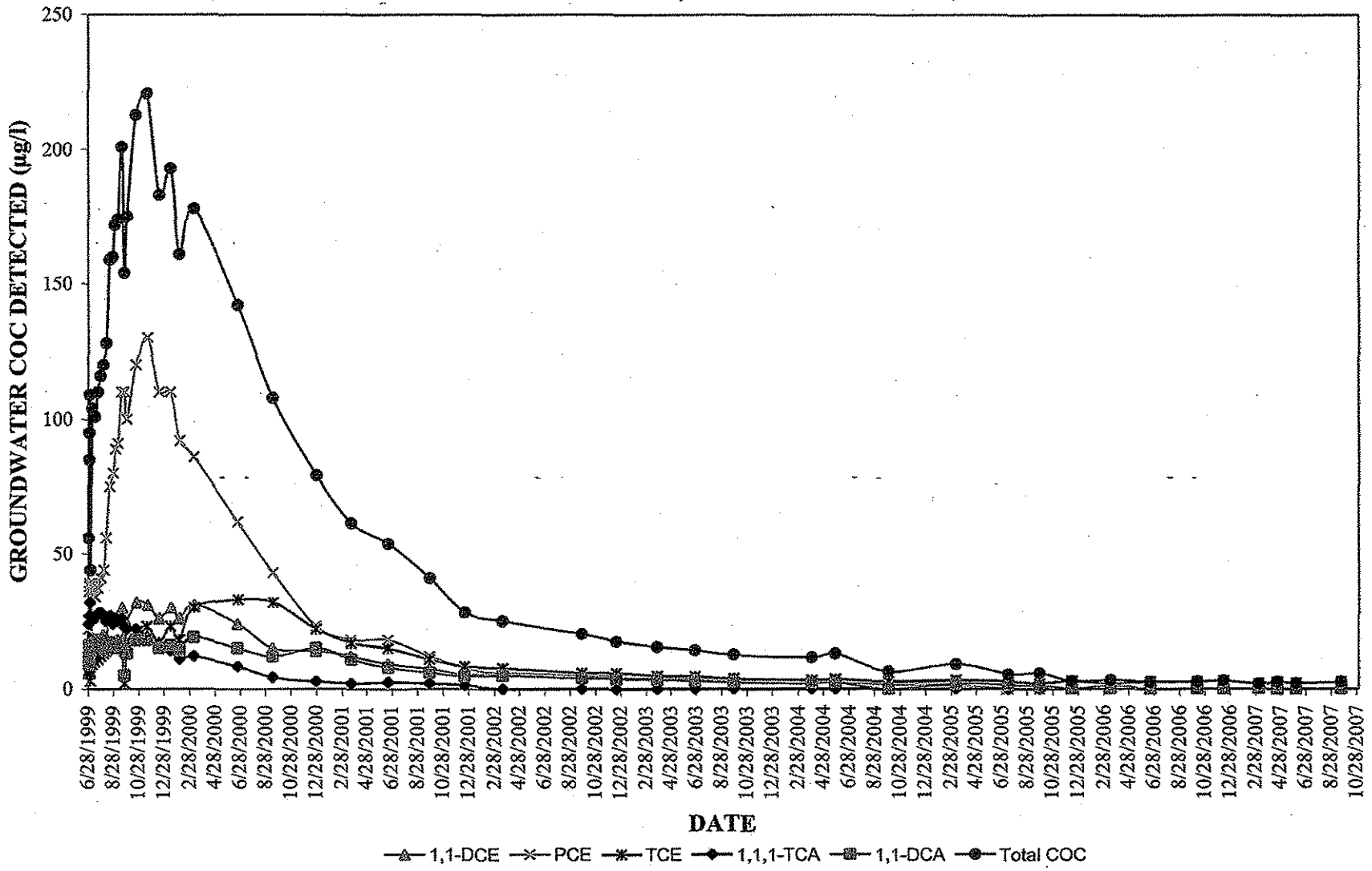

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FIGURE 2-6
GROUNDWATER COC DETECTED IN GWEX-3
SHERWOOD MEDICAL COMPANY - SUPERFUND SITE
NORFOLK, NEBRASKA

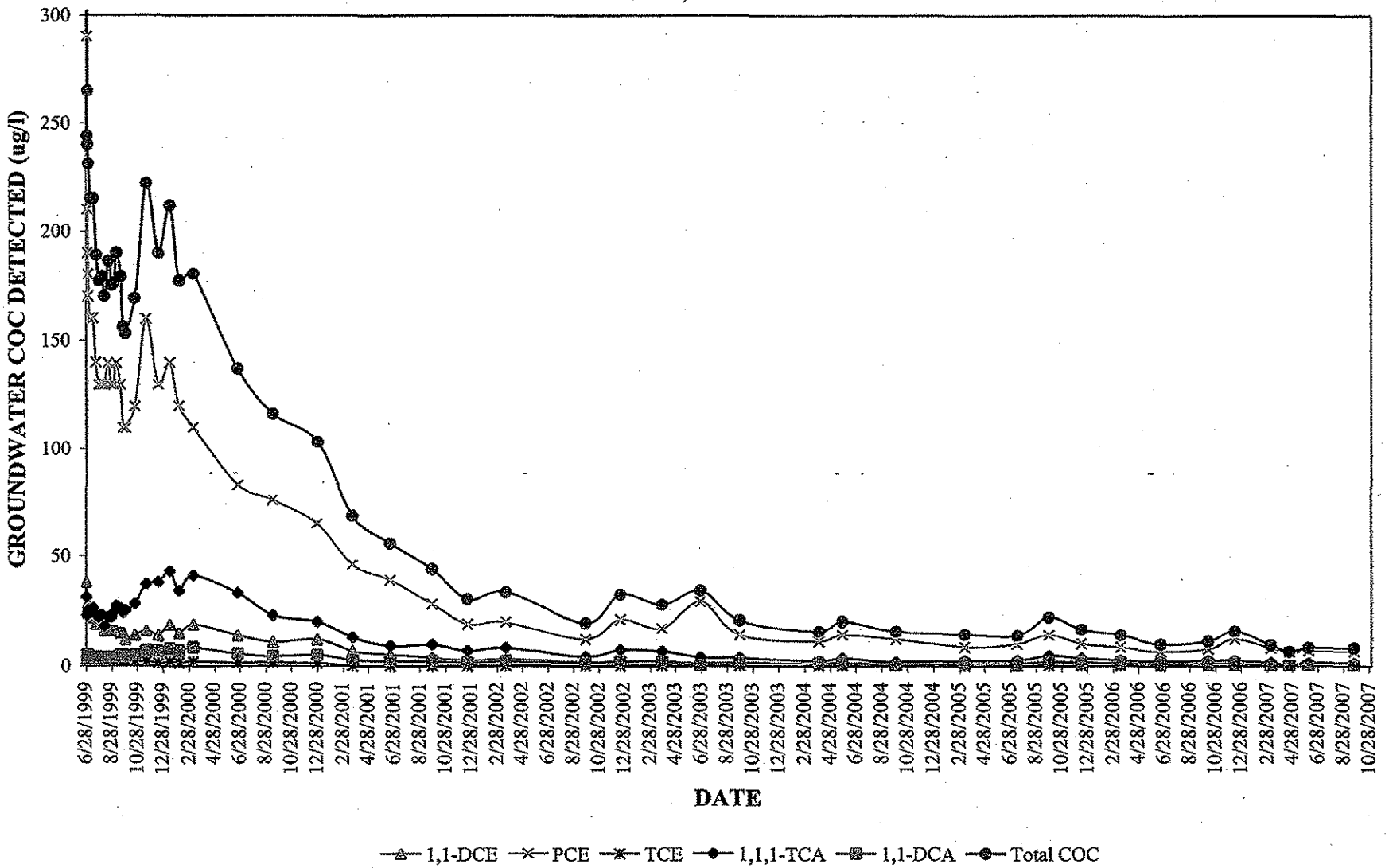

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FIGURE 2-7
GROUNDWATER COC DETECTED IN GWEX-4
SHERWOOD MEDICAL COMPANY - SUPERFUND SITE
NORFOLK, NEBRASKA

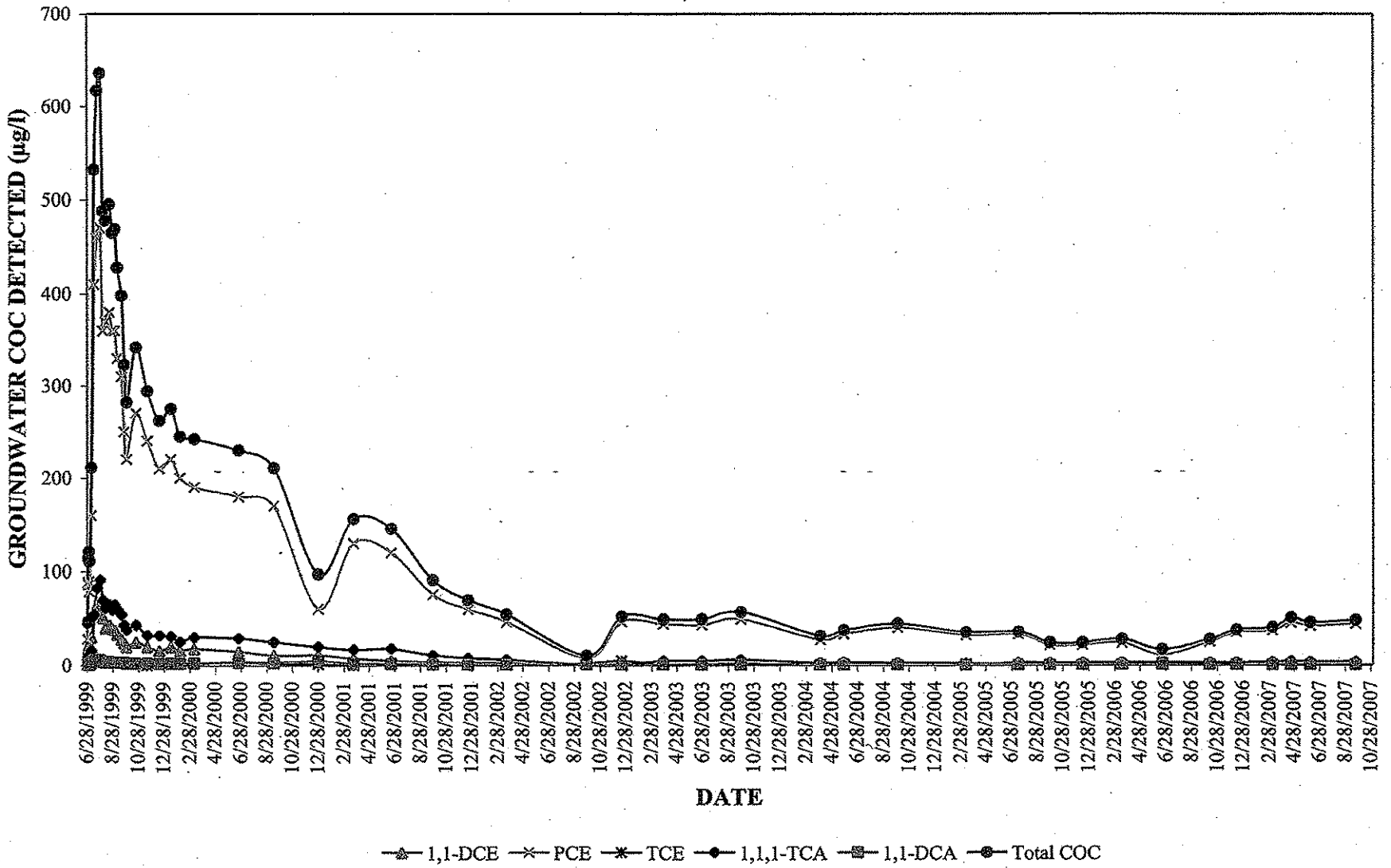

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FIGURE 2-8
GROUNDWATER COC DETECTED IN THE COMBINED INFLUENT
SHERWOOD MEDICAL COMPANY - SUPERFUND SITE
NORFOLK, NEBRASKA

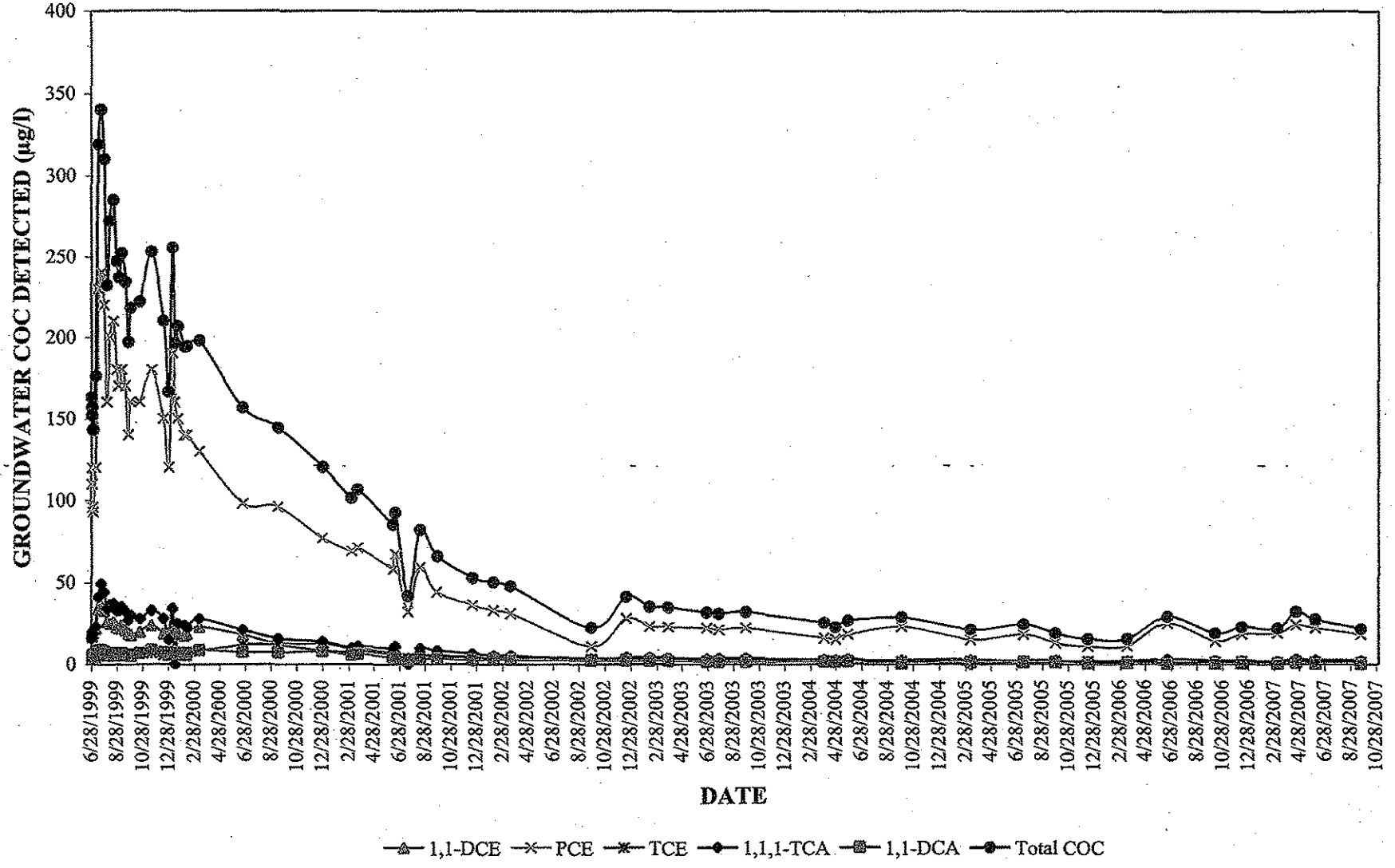

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FIGURE 2-3
GROUNDWATER EXTRACTED
SHERWOOD MEDICAL COMPANY - SUPERFUND SITE
NORFOLK, NEBRASKA

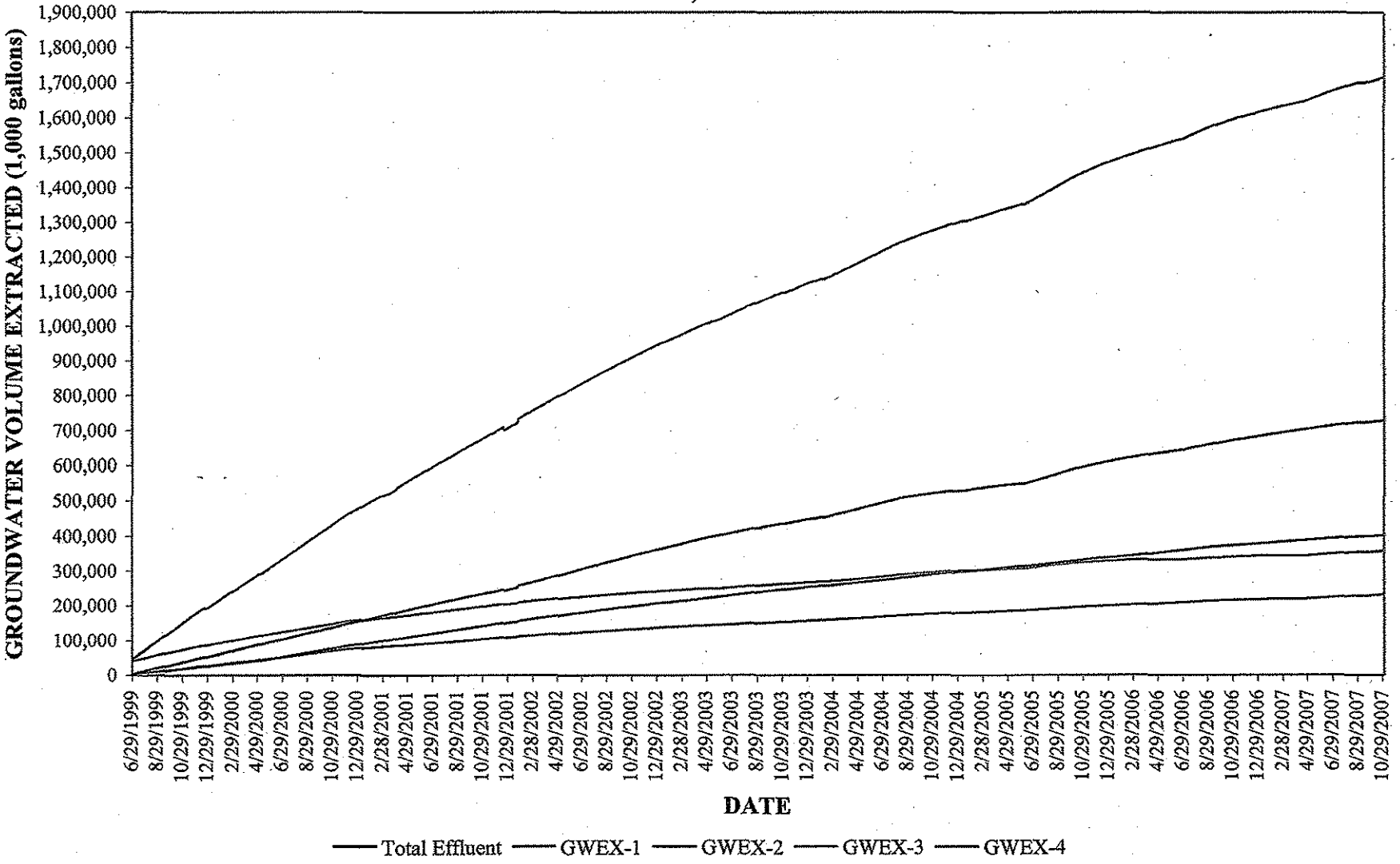

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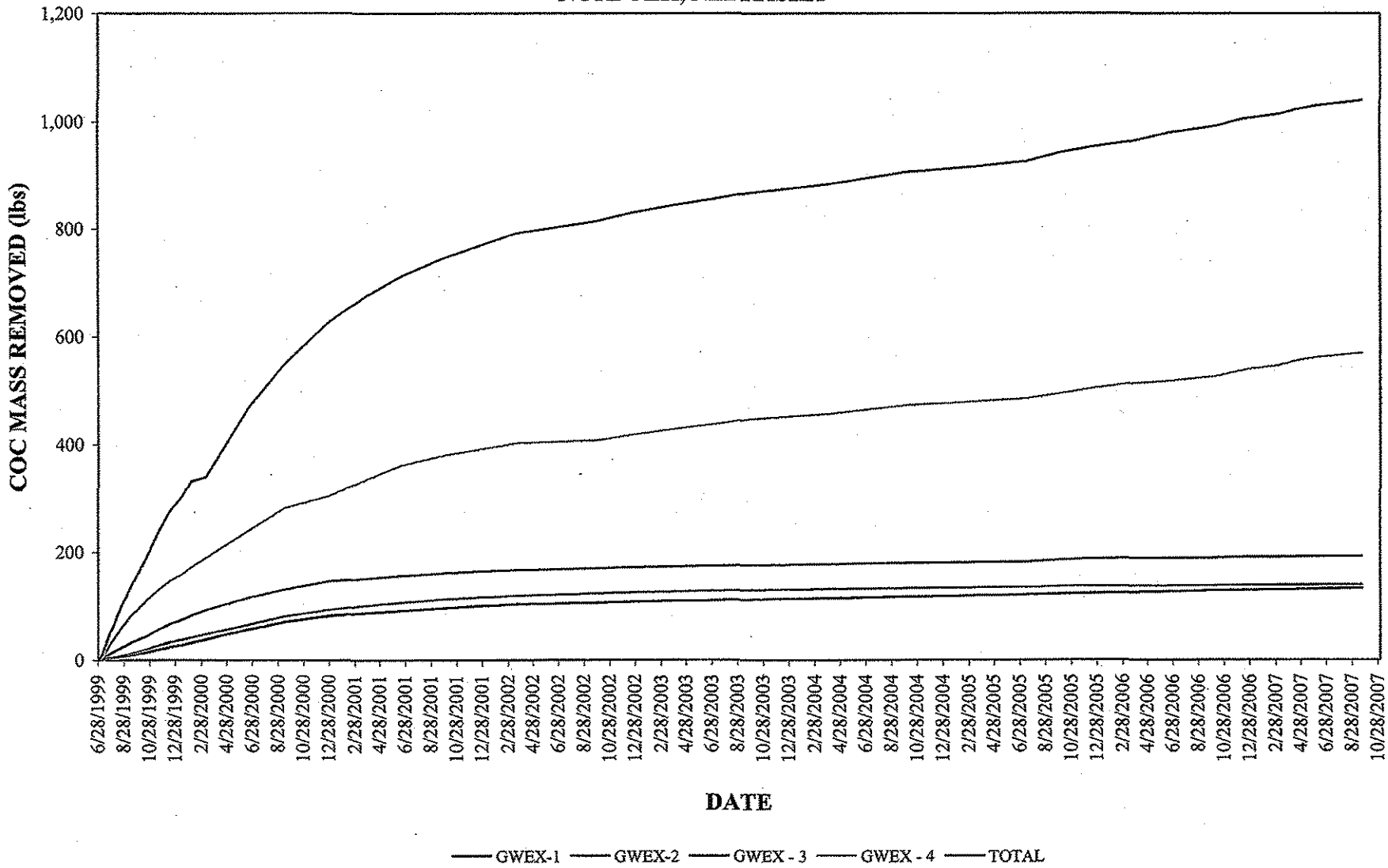
FIGURE 2-9
GROUNDWATER COC REMOVED
SHERWOOD MEDICAL COMPANY - SUPERFUND SITE
NORFOLK, NEBRASKA



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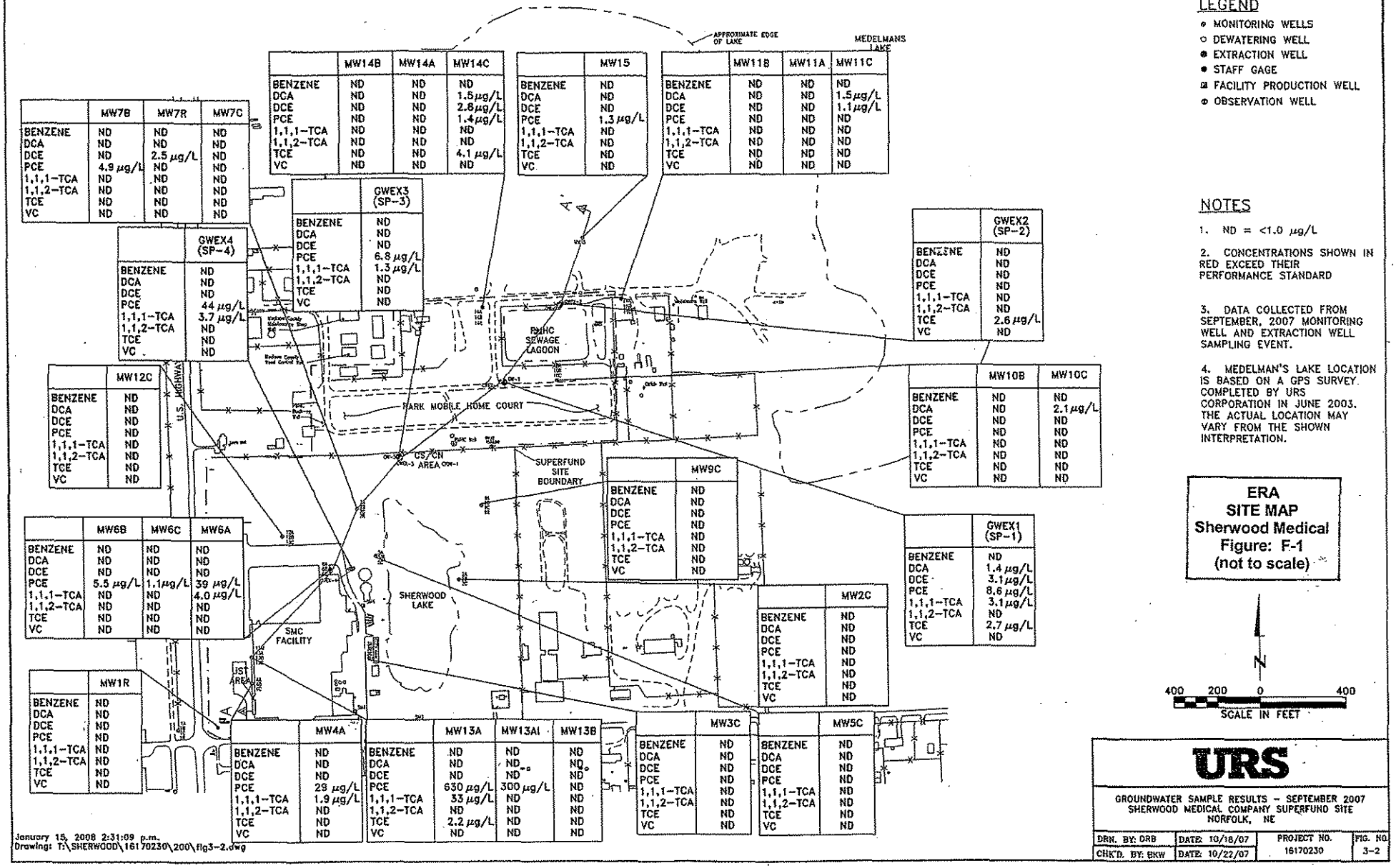

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LEGEND

- ⊙ MONITORING WELLS
- ○ DEWATERING WELL
- ⊛ EXTRACTION WELL
- ● STAFF GAGE
- ⊠ FACILITY PRODUCTION WELL
- ⊕ OBSERVATION WELL

NOTES

1. ND = <1.0 µg/L
2. CONCENTRATIONS SHOWN IN RED EXCEED THEIR PERFORMANCE STANDARD
3. DATA COLLECTED FROM SEPTEMBER, 2007 MONITORING WELL AND EXTRACTION WELL SAMPLING EVENT.
4. MEDELMAN'S LAKE LOCATION IS BASED ON A GPS SURVEY COMPLETED BY URS CORPORATION IN JUNE 2003. THE ACTUAL LOCATION MAY VARY FROM THE SHOWN INTERPRETATION.

ERA SITE MAP
Sherwood Medical
Figure: F-1
(not to scale)

N

400 200 0 400
SCALE IN FEET

URS

GROUNDWATER SAMPLE RESULTS – SEPTEMBER 2007
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NE

DRN. BY: DRB	DATE: 10/18/07	PROJECT NO. 16170230	FIG. NO. 3-2
CHK'D. BY: BKW	DATE: 10/22/07		

TABLE E-32
SUMMARY OF COCs DETECTED IN MW10B
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<1	<1	<1	31	1	0.9	1	0.6	34.5
9/16/1991	<1	<1	<1	31	1	1	1	<1	34.0
12/16/1991	<1	<1	<1	28	2	1	2	2	35.0
10/04/1994	<0.35	6.3	<0.25	7.3	2.6	<0.65	1.1	<0.55	17.3
4/04/1995	<0.97	6.8	<0.25	6.3	2.3	<0.42	<0.3	<0.55	15.4
10/03/1995	0.5	8		10	5	1	2	0.5	27.0
4/02/1996	1	29	<2	8	11	0.5	1	0.3	50.8
4/15/1997	0.4	40	<2	8	10	<2	0.6	<2	59.0
4/09/1999	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/13/1999	<1	6	<1	5	3	<1	<1	<1	14.0
12/07/1999	<1	<1	1.8	9.2	1.3	<1	<1	<1	12.3
3/08/2000	<1	<1	<1	9.2	<1	<1	<1	<1	9.2
6/20/2000	<1	<1	<1	8.7	<1	<1	<1	<1	8.7
9/12/2000	<1	<1	<1	4.2	<1	<1	<1	<1	4.2
3/20/2001	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/18/2002	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/24/2002	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/26/2003	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/24/2003	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/31/2004	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/29/2004	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/15/2005	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/26/2005	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/15/2006	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/18/2006	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/20/2007	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/21/2007	<1	<1	<1	<1	<1	<1	<1	<1	0.0

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-33
SUMMARY OF COCs DETECTED IN MW10C
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<1	<1	<1	13	1	0.6	2	1	17.6
9/16/1991	<1	<1	<1	19	2	0.7	2	2	25.7
12/16/1991	<1	<1	<1	18	2	0.9	2	2	24.9
10/03/1995	<0.35	<0.35	<0.25	7.4	1.1	0.34	0.63	<0.55	9.5
4/04/1995	<0.35	<0.35	<0.25	6.3	0.77	<0.3	0.5	<0.55	7.6
4/10/1999	<1	<1	<1	3	<1	<1	<1	<1	3.0
9/15/1999	<1	<1	<1	6	1	<1	<1	<1	7.0
12/07/1999	<1	<1	<1	6.3	<1	<1	<1	<1	6.3
3/09/2000	<1	<1	<1	8	1	<1	<1	<1	9.0
6/21/2000	<1	<1	<1	6.8	1.1	<1	<1	<1	7.9
9/12/2000	<1	<1	<1	6.8	<1	<1	<1	<1	6.8
3/20/2001	<1	<1	<1	7.1	<1	<1	<1	<1	7.1
9/25/2002	<1	<1	<1	4.7	<1	<1	<1	1	5.7
9/24/2003	<1	<1	<1	2.9	<1	<1	<1	<1	2.9
9/29/2004	<1	<1	<1	<1	<1	<1	<1	<1	0.0
10/19/2005	<1	<1	<1	4.2	<1	<1	<1	<1	4.2
9/18/2006	<1	<1	<1	4.3	<1	<1	<1	<1	4.3
9/21/2007	<1	<1	<1	2.1	<1	<1	<1	<1	2.1

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-34
SUMMARY OF COCs DETECTED IN MW11A
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<1	<1	<1	0.5	<1	<1	<1	<1	0.5
9/16/1991	<1	<1	<1	<1	<1	<1	<1	<1	0.0
12/16/1991	<1	0.5	<1	2	<1	<1	<1	<1	2.5
10/03/1995	0.3	3		4	3		0.2		10.5
4/02/1996	0.2	0.2	<1	1	0.6	<1	<1	<1	2.0
4/15/1997	0.3	7	<1	7	5	<1	0.2	<1	19.5
4/10/1999	<1	34	<1	6	12	<1	<1	<1	52.0
9/13/1999	<1	<1	<1	4	3	<1	<1	<1	7.0
12/07/1999	<1	5.8	<1	10	6	<1	<1	<1	21.8
3/09/2000	<1	<1	<1	4.8	2.8	<1	<1	<1	7.6
6/21/2000	<1	<1	<1	1.8	<1	<1	<1	<1	1.8
9/12/2000	<1	<1	<1	2.7	<1	<1	<1	<1	2.7
3/20/2001	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/25/2002	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/25/2003	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/29/2004	<1	<1	<1	<1	<1	<1	<1	<1	0.0
10/18/2005	<1	<1	<1	<1	<1	<1	<1	<1	0.0
11/16/2005	<1	<1	<1	5.5	6.4	<1	<1	4.4	16.3
3/15/2006	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/19/2006	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/21/2007	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/19/2007	<1	<1	<1	<1	<1	<1	<1	<1	0.0

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-44
SUMMARY OF COCs DETECTED IN MW14B
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
9/16/1991	<1	2	<1	3	3	26	<1	<1	34
12/16/1991	<3	3	<3	3	4	3	<3	<3	13
10/04/1994	<0.35	78	0.85	16	140	300	4.9	<0.55	539.75
5/12/1995	<0.35	53	<2.5	9.6	64	140	2.8	<5.5	269.4
10/03/1995	<10	70	<10	11	89	200	4	<20	374
4/02/1996	<5	33	<5	6	45	120	3	<10	207
4/15/1997	<5	43	<5	6	57	140	2	<10	248
4/08/1999	<1	380	3	37	320	1600	19	<1	2359
9/13/1999	<1	360	<1	37	240	1600	20	<1	2257
12/06/1999	<1	150	<1	22	150	1100	6.6	<1	1428.6
3/07/2000	<1	48	<1	9	44	380	3.9	<1	484.9
6/20/2000	<1	4.8	<1	1.2	9	110	1.5	<1	126.5
9/12/2000	<1	<1	<1	<1	1.9	41	1	<1	43.9
3/20/2001	<1	<1	<1	<1	<1	14	<1	<1	14
3/18/2002	<1	<1	<1	<1	<1	2	<1	<1	2
3/26/2003	<1	<1	<1	<1	<1	<1	<1	<1	0
9/24/2003	<1	<1	<1	<1	<1	1.7	<1	<1	1.7
3/31/2004	<1	<1	<1	<1	<1	1.1	<1	<1	1.1
9/28/2004	<1	<1	<1	<1	<1	<1	<1	<1	0
3/10/2005	<1	<1	<1	2.9	5	1.1	3.6	<1	12.6
9/26/2005	<1	<1	<1	<1	<1	1.5	<1	<1	1.5
3/15/2006	<1	<1	<1	<1	<1	<1	<1	<1	0
9/18/2006	<1	<1	<1	<1	<1	<1	<1	<1	0
3/20/2007	<1	<1	<1	<1	<1	1.6	<1	<1	1.6
9/21/2007	<1	<1	<1	<1	<1	<1	<1	<1	0

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-46
SUMMARY OF COCs DETECTED IN MW15
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
4/10/1999	<1	12	<1	38	29	39	77	1	196
9/15/1999	<1	10	<1	68	36	22	77	15	228
12/07/1999	<1	4.6	<1	97	36	33	110	25	305.6
3/09/2000	<1	1.4	<1	120	46	18	74	33	292.4
6/22/2000	<1	<1	<1	26	9.2	<1	8.4	6	49.6
9/12/2000	<1	<1	<1	18	6.4	<1	1.6	8.5	34.5
3/21/2001	<1	<1	<1	6.1	2.5	<1	2.4	3.5	14.5
3/18/2002	<1	<1	<1	4.7	<1	<1	<1	7	11.7
9/25/2002	<1	<1	<1	3.3	1.6	<1	<1	3.5	8.4
3/26/2003	<1	<1	<1	5.3	<1	<1	<1	7.3	12.6
9/24/2003	<1	<1	<1	3.1	<1	<1	<1	3.1	6.2
3/31/2004	<1	<1	<1	1.7	<1	<1	<1	3.5	5.2
9/29/2004	<1	<1	<1	<1	<1	<1	<1	3.6	3.6
3/10/2005	<1	<1	<1	1.6	<1	<1	<1	2.5	4.1
9/29/2005	<1	<1	<1	<1	<1	<1	<1	1	1
3/15/2006	<1	<1	<1	<1	<1	<1	<1	<1	0
9/19/2006	<1	<1	<1	<1	<1	<1	<1	<1	0
3/21/2007	<1	<1	<1	1.6	<1	<1	<1	1.1	2.7
9/19/2007	<1	<1	<1	<1	<1	1.3	<1	<1	1.3

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE A-2
SUMMARY OF GROUNDWATER CONTAMINANTS OF CONCERN
DETECTED AT THE GWEX SAMPLE PORTS AND INFLUENT SAMPLE PORT
SHERWOOD MEDICAL COMPANY - SUPERFUND SITE
NORFOLK, NEBRASKA

			Contaminant of Concern								
Sample Port	Sample Identification	Sample Date	Benzene	1,1,1-TCA	1,1,2-TCA	1,1-DCA	1,1-DCE	PCE	TCE	VC	Total COCs
			µg / L	µg / L	µg / L	µg / L	µg / L	µg / L	µg / L	µg / L	µg / L
SP-O1 (GWEX1)	SMC-INOO1-002	06/28/99	<1	3	<1	5	2	8	2	<1	20
	SMC-INOOI-003	06/29/99	<1	18	<1	7	5	26	2	<1	58
	SMC-INOO1-004	06/30/99	<1	20	<1	9	7	26	2	<1	64
	SMC-INOOI-005	07/01/99	<1	14	<1	8	5	16	2	<1	45
	SMC-INOO1-006	07/02/99	<1	14	<1	8	6	16	2	<1	46
	SMC-INOOI-007	07/07/99	<1	36	<1	13	11	47	2	<1	109
	SMC-INOOI-008	07/14/99	<1	60	<1	21	18	97	3	<1	199
	SMC-INOO1-009	07/21/99	<1	35	<1	15	13	65	3	<1	131
	SMC-INOOI-0I0	07/28/99	<1	25	<1	10	11	52	3	<1	101
	SMC-INOOI-O11	08/04/99	<1	22	<1	10	10	50	3	<1	95
	SMC-INOO1-012	08/10/99	<1	16	<1	8	9	50	3	<1	86
	SMC-INOOI-013	08/19/99	<1	16	<1	9	11	55	3	<1	94
	SMC-INOOI-014	08/26/99	<1	15	<1	8	11	54	3	<1	91
	SMC-INOOI-015	09/01/99	<1	16	<1	8	12	61	3	<1	100
	SMC-INOOI-OI6	09/07/99	<1	15	<1	8	12	62	3	<1	100
	SMC-INOOI-017	09/17/99	<1	13	<1	8	13	63	3	<1	100
	SMC-INOOI-018	09/23/99	<1	12	<1	8	13	58	3	<1	94
	SMC-INOO1-019	09/29/99	<1	11	<1	6	11	59	3	<1	90
	SMC-INOO1-020	10/21/99	<1	12	<1	8	15	78	4	<1	117
	SMC-INOO1-021	11/17/99	<1	16	<I	9	19	98	4	<1	146
	SMC-INOO1-034	12/16/99	<1	17	<1	8.6	18	92	2.9	<1	138.5
	SMC-INOO1-035	01/12/00	<1	21	<1	8.9	23	100	4.2	<1	157.1
	SMC-INOO1-036	02/03/00	<1	20	<1	8.9	22	100	3.2	<1	154.1
	SMC-INOOI-038	03/08/00	<1	29	<1	12	31	98	4.6	<1	174.6
	SMC-INOOI-041	06/21/00	<1	29	<1	9.2	25	95	5.1	<1	163.3
	SMC-INOO1-042	09/13/00	<1	19	<1	7.7	18	88	5	<1	137.7
	SMC-INOOI-043	12/27/00	<1	20	<1	<1	9.9	65	3.7	<1	98.6
	SMC-INOOI-044	03/21/01	<1	17	<1	6.8	16	57	3.9	<1	100.7
	SMC-INOOI-045	06/18/01	<1	17	<1	6	12	43	3.4	<1	81.4
	SMC-INOOI-046	09/25/01	<2	13	<2	4.7	11	36	3	<2	67.7
	SMC-INOO1-047	12/18/01	<1	12	<1	4.2	8.6	29	2.9	<1	56.7
	SMC-INOO1-048	03/19/02	<1	9.2	<1	4	8.5	24	3.7	<1	49.4
	SMC-INOOI-051	09/25/02	<1	8	<1	3.8	7.6	2.2	4.5	<1	26.1
	SMC-INOO1-052	12/17/02	<1	8.9	<1	3.2	6	19	3.8	<1	40.9
	SMC-INOO1-053	03/26/03	<1	8.4	<1	3.3	6.4	15	3.9	<1	37
	SMC-INOOI-054	06/25/03	<1	5.2	<1	2.7	5	11	3.1	<1	27
	SMC-INOOI-055	09/26/03	<1	5.2	<1	2.1	4.7	12	3.7	<1	27.7
	SMC-INOO1-058	03/31/04	<1	6.4	<1	3.2	6.5	11	3.4	<1	30.5
	SMC-INOOI-059	O5/26/04	<1	6.9	<1	3	4.7	11	3.5	<1	29.1
	SMC-INOO1-060	09/30/04	<1	3.3	<1	<1	8.2	13	3.3	<1	27.8
	SMC-INOOI-061	03/11/05	<1	10	<1	4	7.7	9.9	3.4	<1	35
	SMC-INOO1-062	07/14/05	<1	3.5	<1	2.6	5.6	8.5	4.1	<1	24.3
	SMC-INOO1-063	09/27/05	<1	1.5	<1	2.1	3.6	4.8	5.2	<1	17.2
	SMC-INOO1-064	12/13/05	<1	<1	<1	1.6	3.5	4.3	5	<1	14.4
	SMC-INOO1-065	03/16/06	<1	2	<1	2.2	4.2	4.6	3.6	<1	16.6
	SMC-INOO1-066	06/19/06	<1	5.9	<1	2.9	4.6	5	4.3	<1	22.7
	SMC-INOO1-067	*10/10/06*	<I	3.6	<I	2.2	4.5	5.4	3.7	<1	19.4
	SMC-INOO1-068	*12112/06*	<1	2.8	<1	1.6	3.3	7.1	3.2	<1	18
	SMC-INOO1-069	*03/07/07*	<1	4.8	<1	2.4	4.5	8.4	3.8	<1	23.9
	SMC-INOO1-070	*04/20/07*	<1	5.4	<1	2.3	4.2	8	3.2	<I	23.1
	SMC-INOOI-071	*06/05/07*	<I	4.1	<1	2.3	5.1	6.5	3.4	<1	21.4
	SMC-INOOI-072	*09/21/07*	<1	3.1	<1	1.4	3.1	8.6	2.7	<1	18.9

TABLE A-2
SUMMARY OF GROUNDWATER CONTAMINANTS OF CONCERN
DETECTED AT THE GWEX SAMPLE PORTS AND INFLUENT SAMPLE PORT
SHERWOOD MEDICAL COMPANY - SUPERFUND SITE
NORFOLK, NEBRASKA

Sample Port	Sample Identification	Sample Date	Contaminant of Concern								
			Benzene µg / L	1,1,l-TCA µg / L	1,1,2-TCA µg / L	1,l-DCA µg / L	1,l-DCE µg / L	PCE µg / L	TCE µg / L	VC µg / L	Total COCs µg / L
(GWEX2)	SMC-1N002-002	06/28/99	<1	12	<1	10	6	22	6	<1	56
	SMC-1N002-003	06/29/99	<1	24	<1	10	9	36	6	<1	85
	SMC-1N002-004	06/3019	<1	27	<1	12	11	38	7	<1	95
	SMC-1N002-005	07/01/99	<1	32	<1	16	14	39	8	<1	109
	SMC-1N002-006	07/02/99	<1	14	<1	9	6	12	3	<1	44
	SMC-1N002-007	07/07/99	<1	26	<1	16	14	39	9	<1	104
	SMC-1N002-008	07/14/99	<1	26	<1	17	14	34	10	<1	101
	SMC-1N002-009	07/21/99	<1	28	<1	18	16	37	11	<1	110
	SMC-1N002-010	07/28/99	<1	28	<1	18	17	41	12	<1	116
	SMC-1N002-011	08/04/99	<1	27	<1	16	20	44	13	<1	120
	SMC-1N002-012	08/10/99	<1	25	<1	14	19	56	14	<1	128
	SMC-1N002-013	08/19/99	<1	27	<1	17	25	75	15	<1	159
	SMC-1N002-014	08/26/99	<1	24	<1	16	25	80	15	<1	160
	SMC-1N002-015	09/10/99	<1	26	<1	15	26	89	16	<1	172
	SMC-1N002-016	09/07/99	<1	25	<1	16	26	91	16	<1	174
	SMC-1N002-017	09/17/99	<1	26	<1	17	30	110	18	<1	201
	SMC-1N002-018	09/23/99	<1	23	<1	5	14	110	2	<1	154
	SMC-1N002-019	09/29/99	<1	22	<1	13	24	100	16	<1	175
	SMC-1N002-020	10/21/99	<1	22	<1	18	32	120	21	<1	213
	SMC-1N002-021	11/17/99	<1	19	<1	18	31	130	23	<1	221
	SMC-1N002-034	12/16/99	<1	15	<1	15	26	10	17	<1	183
	SMC-1N002-035	01/12/00	<1	14	<1	16	30	110	23	<1	193
	SMC-1N002-036	02/03/00	<1	11	<1	14	26	92	18	<1	161
	SMC-1N002-038	03/08/00	<1	12	<1	19	31	86	30	<1	178
	SMC-1N002-041	06/21/00	<1	8.2	<1	15	24	62	33	<1	142.2
	SMC-1N002-042	09/13/00	<1	4.3	<1	12	15	43	32	1.5	107.8
	SMC-1N002-043	12/27/00	<1	2.7	<1	15	14	23	22	2.5	79.2
	SMC-1N002-044	03/21/01	<1	2.1	<1	11	12	18	17	1.5	61.6
	SMC-1N002-045	06/18/01	<1	2.4	<1	7.9	9.1	18	15	1.4	53.8
	SMC-1N002-046	09/25/01	<2	2.1	<2	6.1	7.4	12	11	2.4	41
	SMC-1N002-047	12/18/01	<1	1.4	<1	4.6	5	7.8	8.3	1.1	28.2
	SMC-1N002-048	03/19/02	<1	<1	<1	5	5.6	5.6	7.7	1.2	25.1
	SMC-1N002-051	09/25/02	<1	<1	<1	4	5	5.4	5.9	<1	20.3
	SMC-1N002-052	12/17/02	<1	<1	<1	3.7	3.8	4.2	5.9	<1	17.6
	SMC-1N002-053	03/26/03	<1	<1	<1	3.4	3.9	3.5	4.8	<1	15.6
	SMC-1N002-054	06/25/03	<1	<1	<1	3	3.5	3.2	4.6	<1	14.3
	SMC-1N002-055	09/26/03	<1	<1	<1	2.4	3.9	2.7	3.7	<1	12.7
	SMC-1N002-058	03/31/04	<1	<1	<1	2.2	3.0	2.2	3.3	1.0	11.7
	SMC-1N002-059	05/26/04	<1	<1	<1	2.4	2.2	3.7	3.4	1.3	13
	SMC-1N002-060	09/30/04	<1	<1	<1	<1	1.9	1.8	2.8	<1	6.5
	SMC-1N002-061	03/11/05	<1	<1	<1	1.8	2.9	1.2	3.2	<1	9.1
	SMC-1N002-062	07/14/05	<1	<1	<1	1.5	1.3	<1	2.6	<1	5.4
	SMC-1N002-063	09/27/05	<1	<1	<1	1	1.5	<1	2	1.3	5.8
	SMC-1N002-064	12/13/05	<1	<1	<1	<1	<1	<1	2.9	<1	2.9
	SMC-1N002-065	03/16/06	<1	<1	<1	<1	1.3	<1	1.9	<1	3.2
	SMC-1N002-066	06/19/06	<1	<1	<1	<1	<1	<1	2.7	<1	2.7
	SMC-1N002-067	10/10/06	<1	<1	<1	<1	<1	<1	2.7	<1	2.7
	SMC-1N002-068	12/12/06	<1	<1	<1	<1	<1	<1	3.1	<1	3.1
	SMC-1N002-069	03/07/07	<1	<1	<1	<1	<1	<1	1.9	<1	1.9
	SMC-1N002-070	04/20/07	<1	<1	<1	<1	<1	<1	2.7	<1	2.7
	SMC-1N002-071	06/05/07	<1	<1	<1	<1	<1	<1	2.2	<1	2.2
	SMC-1N002-072	09/21/07	<1	<1	<1	<1	<1	<1	2.6	<1	2.6

TABLE A-2
SUMMARY OF GROUNDWATER CONTAMINANTS OF CONCERN
DETECTED AT THE GWEX SAMPLE PORTS AND INFLUENT SAMPLE PORT
SHERWOOD MEDICAL COMPANY - SUPERFUND SITE
NORFOLK, NEBRASKA

			Contaminant of Concern								
Sample Port	Sample Number	Sample Date	Benzene	1,1,1-TCA	1,1,2-TCA	1,IDCA	1,1-DCE	PCE	TCE	VC	Total COCs
			µg / L	µg / L	µg / L	µg / L	µg / L	µg / L	µg / L	µg / L	µg / L
SP-03 (GWEX-3)	SMC-IN003-002	06/28/99	<1	31	<1	5	38	290	5	<1	369
	SMC-IN003-003	06/29/99	<1	23	<1	3	25	210	4	<1	265
	SMC-IN003-004	06/30/99	<1	23	<l	3	24	190	4	<1	244
	SMC-IN003-005	07/01/99	<1	24	<1	4	28	180	4	<1	240
	SMC-IN003-006	07/02/99	<1	25	<1	5	27	170	4	<1	231
	SMC-IN003-007	07/07/99	<1	24	<1	4	24	160	3	<1	215
	SMC-IN003-008	07/14/99	<1	26	<l	4	22	160	3	<1	215
	SMC-IN003-009	07/21/99	<l	23	<1	4	19	140	3	<l	189
	SMC-IN003-010	07/28/99	<1	22	<1	3	19	130	3	<1	177
	SMC-IN003-011	08/04/99	<1	23	<1	4	19	130	3	<1	179
	SMC-IN003-012	08/10/99	<1	18	<1	3	16	130	3	<1	170
	SMC-IN003-013	08/19/99	<1	22	<1	4	17	140	3	<1	186
	SMC-IN003-014	08/26/99	<1	22	<1	4	16	130	3	<1	175
	SMC-IN003-015	09/01/99	<l	24	<l	4	16	130	2	<l	176
	SMC-IN003-016	09/07/99	<1	27	<l	4	16	140	3	<l	190
	SMC-IN003-017	09/17/99	<1	26	<1	5	15	130	3	<1	179
	SMC-IN003-018	09/23/99	<1	24	<1	5	15	110	2	<1	156
	SMC-IN003-019	09/29/99	<1	25	<1	4	12	110	2	<1	153
	SMC-IN003-020	10/21/99	<1	28	<1	5	14	120	2	<1	169
	SMC-IN003-021	11/17/99	<1	37	<1	7	16	160	2	<1	222
	SMC-IN003-034	12/16/99	<1	38	<1	6.8	14	130	1.2	<1	190
	SMC-IN003-035	01/12/00	<1	43	<1	7.8	19	140	2	<1	211.8
	SMC-IN003-036	02/03/00	<1	34	<1	6.8	15	120	1.4	<1	177.2
	SMC-IN003-038	03/08/00	<l	41	<l	8.4	19	110	1.9	<l	180.3
	SMC-IN003-041	06/21/00	<1	33	<1	5.7	14	83	1.6	<1	137.3
	SMC-IN003-042	09/13/00	<1	23	<1	4.6	11	76	1.7	<1	116.3
	SMC-IN003-043	12/27/00	<l	20	<1	5	12	65	1.2	<1	103.2
	SMC-IN003-044	03/21/01	<1	13	<1	2.8	6.8	46	<1	<1	68.6
	SMC-IN003-045	06/18/01	<1	9.3	<1	2.3	5.3	39	<1	<1	55.9
	SMC-IN004-046	09/25/01	<2	9.8	<2	2.3	3.9	28	<1	<1	44
	SMC-IN004-047	12/18/01	<1	7	<1	1.7	2.5	19	<1	<1	30.2
	SMC-IN004-048	03/19/02	<1	8.3	<1	2.2	3	20	<1	<1	33.5
	SMC-IN004-051	*09125/02*	<1	4.4	<1	1.4	1.7	12	<1	<l	19.5
	SMC-IN004-052	12/17/02	<1	7.4	<1	2	2	21	<1	<l	32.4
	SMC-IN003-053	*03126/03*	<1	6.7	<1	2	2	17	<l	<1	27.7
	SMC-IN003-054	*06125/03*	<l	4	<1	<l	1.2	29	<l	<l	34.2
	SMC-IN003-055	09/26/03	<1	3.8	<l	1.4	1.4	14	<l	<1	20.6
	SMC-IN003-058	03/31/04	<1	2.2	<1	1.3	1.1	11	<l	<1	15.6
	SMC-IN003-059	S/26/04	<1	3.6	<1	1.4	1.1	14	<l	<1	
	SMC-IN003-060	09/30/04	<1	1.7	<1	<1	1.9	12	<1	<1	15.6
	SMC-IN003-061	03/11/05	<1	2.5	<1	1.2	2	8.6	<1	<1	14.3
	SMC-IN003-062	07/14/05	<1	2.6	<1	1.2	<1	10	<1	<1	13.8
	SMC-IN003-063	*09127/05*	<1	4.7	<1	1.9	1.4	14	<1	<1	22
	SMC-IN003-064	12/13/05	<1	3.6	<1	1.6	1.3	10	<1	<1	16.5
	SMC-IN003-065	03/16/06	<l	2.6	<1	1.6	1.2	8.5	<1	<l	13.9
	SMC-IN003-066	06/19/06	<1	2.1	<1	1.1	<1	6.6	<1	<l	9.8
	SMC-IN003-067	10/10/06	<1	2.4	<1	1.2	<1	7.7	<l	<1	11.3
	SMC-IN003-068	12/12/06	<1	2.5	<1	1.2	<1	12	<1	<1	15.7
	SMC-IN003-069	03/07/07	<1	1.4	<1	<1	<1	8	<1	<1	9.4
	SMC-IN003-070	04/20/07	<1	<1	<1	<1	<1	6.4	<1	<1	6.4
	SMC-IN003-07I	06/05/07	<1	1.2	<1	<1	<1	6.9	<1	<1	8.1
	SMC-IN003-072	09/21/07	<1	1.3	<1	<1	<1	6.8	<1	<1	8.1

TABLE A-2
SUMMARY OF GROUNDWATER CONTAMINANTS OF CONCERN
DETECTED AT THE GWEX SAMPLE PORTS AND INFLUENT SAMPLE PORT
SHERWOOD MEDICAL COMPANY - SUPERFUND SITE
NORFOLK, NEBRASKA

			Contaminant of Concern								
Sample Port	Sample Identification	Sample Date	Benzene µg / L	1,1,1-TCA µg / L	1,1,2-TCA µg / L	1,1-DCA µg / L	1,1-DCE µg / L	PCE µg / L	TCE µg / L	VC µg / L	Total COCs µg / L
SP-04	SMC-IN004-002	06/28/99	<1	6	<1	<1	12	28	<1	<1	46
(GWEX4))	SMC-IN004-003	06/29/99	<1	9	<1	<1	17	88	<1	<1	114
	SMC-IN004-004	06/30/99	<1	9	<1	<1	19	86	<1	<1	114
	SMC-IN004-005	07/0//99	<I	9	<1	1	22	89	<1	<I	121
	SMC-IN004-006	07/02/99	<1	9	<1	1	23	78	<1	<1	111
	SMC-IN004-007	07/07/99	<1	16	<1	3	30	160	2	<1	211
	SMC-IN004-008	07/14/99	<1	54	<1	6	56	410	6	<1	532
	SMC-IN004-009	07/21/99	<1	82	<1	6	64	460	5	<I	617
	SMC-IN004-010	07/28/99	<1	91	<1	6	64	470	5	<1	636
	SMC-IN004-011	08/04/99	<1	69	<1	4	51	360	4	<1	488
	SMC-IN004-012	08/10/99	<1	61	<1	3	40	370	4	<1	478
	SMC-IN004-013	08/19/99	<1	64	<1	4	43	380	4	<1	495
	SMC-IN004-014	08/26/99	<1	59	<1	3	39	360	4	<I	465
	SMC-IN004-015	09/01/99	<1	64	<1	3	38	360	4	<1	469
	SMC-IN004-016	09/07/99	<1	59	<1	3	33	330	3	<1	428
	SMC-IN004-017	09/17/99	<1	54	<1	3	28	310	3	<1	398
	SMCIN004-018	09/23/99	<1	43	<1	3	24	250	3	<1	323
	SMC-IN004-019	09/29/99	<1	38	<1	2	20	220	2	<1	282
	SMC-IN004-020	10/21/99	<1	43	<1	2	25	270	2	<1	342
	SMC-IN004-02I	11/17/99	<1	32	<1	2	20	240	<1	<1	294
	SMC-IN004-034	12/16/99	<1	32	<1	2.2	16	210	1.7	<1	261.9
	SMC-IN004-035	12/16/99	<1	32	<1	2.2	16	210	1.7	<1	261.9
	SMC-IN004-036	01/12/00	<1	25	<1	2.1	16	200	1.6	<1	244.7
	SMC-IN004-038	03/08/00	1	30	<1	2.4	18	190	1.9	<1	242.3
	SMC-IN004-041	06/21/00	<1	29	<1	2.8	15	180	3.1	<I	229.9
	SMC-IN004-042	09/13/00	<I	25	<1	2.8	II	170	1.9	<I	210.7
	SMC-IN004-043	12/27/00	< I	20	<1	4.6	II	60	1.2	<I	96.8
	SMC-IN004-044	03/21/01	<1	17	<1	1.6	7.6	130	<I	<1	156.2
	SMC-IN004-045	06/18/01	<1	18	<1	1.5	5.2	120	1.1	<1	145.8
	SMC-IN004-046	09/25/01	<2	11	<2	1.1	3.5	75	<I	<1	90.6
	SMC-IN004-047	12/18/01	<I	7.8	<1	<I	2.4	59	<I	<I	69.2
	SMC-IN004-048	03/19/02	<1	6.1	<1	<1	2.1	46	<1	<1	54.2
	SMC-IN004-051	09/25/02	<1	<I	<1	1.3	<1	7.8	1.7	<I	10.8
	SMC-IN004-052	12/17/02	<1	<1	<1	<1	1.1	46	4.6	<1	51.7
	SMC-IN004-053	03/26/03	<I	4.6	<I	<I	<1	44	<I	<1	48.6
	SMC-IN004-054	06/25/03	<1	4.8	<1	<1	1.1	43	<I	<1	48.9
	SMC-IN004-055	09/26/03	<1	6.1	<1	,1	1.4	49	<1	<1	56.6
	SMC-IN004-058	03/31/04	<1	2.4	<1	<1	1.1	27	1.1	<1	31.6
	SMC-IN004-059	05/26/04	<1	3.1	<1	<1	<I	33	1.3	<1	37.4
	SMC-IN004-060	09/30/04	<1	2.3	<1	<1	2.1	40	<I	<I	44.4
	SMC-IN004-061	03/11/05	<1	<1	<1	<1	2	32	1.2	<1	35.2
	SMC-IN004-062	07/14/05	<1	2.7	<1	<1	<1	33	<1	<1	35.7
	SMC-IN004-063	09/27/05	<I	2.1	<1	<1	<1	22	<I	<1	24.1
	SMC-IN004-064	12/13/05	<1	2.3	<1	<1	<1	22	<1	<1	24.3
	SMCIN004-065	03/16/06	<1	2.8	<I	<1	1.1	24	<1	<I	27.9
	SMC-IN004-066	06/19/06	<I	2.5	<1	<1	1.5	11	2	<1	17
	SMC-IN004-067	10/10/06	<1	2.6	<I	<1	<1	25	<1	<1	27.6
	SMC-IN004-068	12/12/06	<1	2.6	<I	<1	<1	35	<1	<1	37.6
	SMC-IN004-069	03/07/07	<1	3	<1	<1	<1	37	<1	<1	40
	SMCIN004-070	04/20/07	<1	4.1	<1	<1	1.2	45	<1	<1	50.3
	SMC-IN004-071	06/05/07	<1	3.4	<1	<1	<1	42	<1	<I	45.4
	SMC-IN004-072	09/21/07	<1	3.7	<1	<1	<1	44	<1	<1	47.7

TABLE E-36
SUMMARY OF COCs DETECTED IN MW11C
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<1	<1	<1	3	<1	<1	<1	<1	3.0
9/16/1991	<1	<1	<1	3	<1	<1	<1	<1	3.0
12/16/1991	<1	<1	<1	3	<1	<1	<1	<1	3.0
10/04/1994	<0.42	<0.35	<0.25	2.8	0.28	<0.3	<0.3	<0.55	3.1
4/04/1995	<0.35	<0.35	<0.25	1.4	<0.35	<0.3	<0.3	<0.55	1.4
4/10/1999	<1	<1	<1	2	<1	<1	<1	<1	2.0
9/15/1999	<1	<1	<1	4	<1	<1	1	<1	5.0
12/07/1999	<1	<1	<1	5.3	1.1	<1	<1	<1	6.4
3/09/2000	<1	<1	<1	11	1.2	<1	<1	<1	12.2
6/21/2000	<1	<1	<1	8.6	<1	<1	<1	<1	8.6
9/12/2000	<1	<1	<1	7.8	<1	<1	<1	<1	7.8
3/21/2001	<1	<1	<1	7.3	<1	<1	<1	<1	7.3
9/25/2002	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/25/2003	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/29/2004	<1	<1	<1	<1	<1	<1	<1	<1	0.0
10/18/2005	<1	<1	<1	7.9	10	<1	<1	8.9	26.8
11/16/2005	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/15/2006	<1	<1	<1	4.4	6.3	<1	<1	4.4	15.1
9/19/2006	<1	<1	<1	5.6	7.3	<1	<1	6.1	19.0
3/21/2007	<1	<1	<1	2.7	2.9	<1	<1	1.3	6.9
9/19/2007	<1	<1	<1	1.5	1.1	<1	<1	<1	2.6

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-45
SUMMARY OF COCs DETECTED IN MW14C
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
9/16/1991	<1	<1	<1	3	0.6	<1	<1	<1	3.6
12/16/1991	<1	<1	<1	3	<1	<1	<1	<1	3
10/04/1994	<0.35	<0.35	<0.25	3.9	0.83	<0.3	<0.3	0.35	5.08
4/04/1995	<0.35	<0.35	<0.25	0.88	<0.35	<0.3	<0.3	<0.55	0.88
10/03/1995				5	1			1	7
4/02/1996	<1	<1	<1	6	1	<1	<1	1	8
4/15/1997	<1	0.2	<1	5	1	<1	<1	1	7.2
4/08/1999	<1	<1	<1	4	2	<1	<1	<1	6
9/13/1999	<1	<1	<1	7	7	10	2	<1	26
12/06/1999	<1	<1	<1	5	3.5	2.4	<1	<1	10.9
3/07/2000	<1	<1	<1	4.4	3.2	1.1	<1	<1	8.7
6/20/2000	<1	<1	<1	4.8	4.2	1.1	<1	<1	10.1
9/12/2000	<1	<1	<1	4.8	4.3	<1	<1	<1	9.1
3/20/2001	<1	<1	<1	4.5	4.5	1.2	<1	<1	10.2
9/24/2002	<1	<1	<1	3.5	3.2	1.6	2.1	<1	10.4
9/24/2003	<1	<1	<1	2.6	4.1	1.2	2.5	<1	10.4
9/28/2004	<1	<1	<1	1	3.8	1.3	3.2	<1	9.3
10/18/2005	<1	<1	<1	<1	1.8	3.1	11	<1	15.9
9/19/2006	<1	<1	<1	1.7	2.6	<1	3.7	<1	8
9/21/2007	<1	<1	<1	1.5	2.8	1.4	4.1	<1	9.8

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-7
SUMMARY OF COCs DETECTED IN MW02C
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<1	1	<1	23	4	<1	2	<1	30.0
9/16/1991	<1	3	<1	21	5	2	2	<1	33.0
12/16/1991	<1	2	<1	22	5		2	<1	31.0
4/09/1999	<1	<1	<1	4	1	<1	<1	<1	5.0
9/14/1999	<1	2	<1	7	<1	<1	<1	<1	9.0
12/06/1999	<1	<1	<1	3	<1	<1	<1	<1	3.0
3/08/2000	<1	<1	<1	1.8	<1	<1	<1	<1	1.8
6/21/2000	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/13/2000	<1	<1	<1	1.3	<1	<1	<1	<1	1.3
3/19/2001	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/25/2002	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/25/2003	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/30/2004	<1	<1	<1	<1	<1	<1	<1	<1	0.0
10/18/2005	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/19/2006	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/20/2007	<1	<1	<1	<1	<1	<1	<1	<1	0.0

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-11
SUMMARY OF COCs DETECTED IN MW04A
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<8	<8	<8	<8	<8	150	<8	<8	150.0
9/16/1991	<1	44	<1	3	0.7	14000	5	<1	14052.7
12/16/1991	<83	<83	<83	<83	<83	1700	<83	<83	1700.0
4/06/1999	<1	<1	<1	<1	<1	5	<1	<1	5.0
9/16/1999	<1	2	<1	7	<1	12	<1	<1	21.0
12/08/1999	<1	<1	<1	<1	<1	1	<1	<1	1.0
3/09/2000	<1	<1	<1	<1	<1	1.7	<1	<1	1.7
6/22/2000	<1	<1	<1	<1		4.3	<1	<1	4.3
9/13/2000	1	1	1	1	1	31	<1	<1	36.0
3/20/2001	1	1	1	1	1	12	<1	<1	17.0
3/18/2002	1	1	1	1	1	45	1	1	52.0
9/25/2002	1	1	1	1	1	60	1	1	67.0
3/26/2003	1	1	1	1	1	12	1	1	19.0
9/24/2003	<1	<1	<1	<1	<1	75	<1	<1	75.0
3/31/2004	<1	<1	<1	<1	<1	39	<1	<1	39.0
9/30/2004	<1	<1	<1	<1	<1	49	<1	<1	49.0
3/10/2005	<1	<1	<1	<1	<1	17	<1	<1	17.0
9/27/2005	<1	<1	<1	<1	<1	50	<1	<1	50.0
3/15/2006	<1	<1	<1	<1	<1	18	<1	<1	18.0
9/19/2006	<1	<1	<1	<1	<1	31	<1	<1	31.0
3/21/2007	<1	<1	<1	<1	<1	61	<1	<1	61.0
9/20/2007	<1	1.9	<1	<1	<1	29	<1	<1	30.9

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-36
SUMMARY OF COCs DETECTED IN MW11C
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<1	<1	<1	3	<1	<1	<1	<1	3.0
9/16/1991	<1	<1	<1	3	<1	<1	<1	<1	3.0
12/16/1991	<1	<1	<1	3	<1	<1	<1	<1	3.0
10/04/1994	<0.42	<0.35	<0.25	2.8	0.28	<0.3	<0.3	<0.55	3.1
4/04/1995	<0.35	<0.35	<0.25	1.4	<0.35	<0.3	<0.3	<0.55	1.4
4/10/1999	<1	<1	<1	2	<1	<1	<1	<1	2.0
9/15/1999	<1	<1	<1	4	<1	<1	1	<1	5.0
12/07/1999	<1	<1	<1	5.3	1.1	<1	<1	<1	6.4
3/09/2000	<1	<1	<1	11	1.2	<1	<1	<1	12.2
6/21/2000	<1	<1	<1	8.6	<1	<1	<1	<1	8.6
9/12/2000	<1	<1	<1	7.8	<1	<1	<1	<1	7.8
3/21/2001	<1	<1	<1	7.3	<1	<1	<1	<1	7.3
9/25/2002	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/25/2003	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/29/2004	<1	<1	<1	<1	<1	<1	<1	<1	0.0
10/18/2005	<1	<1	<1	7.9	10	<1	<1	8.9	26.8
11/16/2005	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/15/2006	<1	<1	<1	4.4	6.3	<1	<1	4.4	15.1
9/19/2006	<1	<1	<1	5.6	7.3	<1	<1	6.1	19.0
3/21/2007	<1	<1	<1	2.7	2.9	<1	<1	1.3	6.9
9/19/2007	<1	<1	<1	1.5	1.1	<1	<1	<1	2.6

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-17
SUMMARY OF COCs DETECTED IN MW06A
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<33	530	<33	<33	210	570	18	<33	1328.0
9/16/1991	<1	1	<1	<1	<1	3	<1	<1	4.0
12/16/1991	<1	0.8	<1	<1	<1	1	<1	<1	1.8
4/06/1999	<1	54	1	1	45	320	3	<1	424.0
9/15/1999	<1	770	<1	14	400	4400	130	<1	5714.0
12/08/1999	<1	400	5.5	27	170	2900	41	<1	3543.5
3/08/2000	<1	290	2.2	12	54	1000	19	<1	1377.2
9/13/2000	<1	27	<1	1.1	11	210	2.1	<1	251.2
9/29/2004	<1	5.7	<1	<1	6.7	110	<1	<1	122.4
9/18/2006	<1	1.2	<1	<1	<1	12	<1	<1	13.2
3/21/2007	<1	4.3	<1	<1	1.3	58	<1	<1	63.6
9/20/2007	<1	4	<1	<1	<1	39	<1	<1	43.0

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-18
SUMMARY OF COCs DETECTED IN MW06B
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<40	260	<40	<40	54	630	<40	<33	944.0
9/16/1991	<100	870	<100	<100	200	1900	100	<100	3070.0
12/16/1991	<120	1600	<120	<120	280	3000	120	<120	5000.0
10/03/1995	<500	3000	<500	<500	790	12000	<500	<1000	15790.0
4/02/1996	<500	1800	<500	<500	1100	12000	<500	<1000	14900.0
4/15/1997	<120	260	<120	<120	180	2600	<120	<250	3040.0
4/08/1999	<1	470	<1	7	140	4200	21	<1	4838.0
9/14/1999	<1	<1	<1	<1	<1	240	4	<1	244.0
12/07/1999	<1	<1	<1	<1	<1	290	<1	<1	290.0
3/07/2000	<1	<1	<1	<1	<1	79	<1	<1	79.0
6/20/2000	<1	<1	<1	<1	<1	33	<1	<1	33.0
9/12/2000	<1	<1	<1	<1	<1	44	<1	<1	44.0
3/20/2001	<1	<1	<1	<1	<1	18	<1	<1	18.0
3/18/2002	<1	<1	<1	<1	<1	21	<1	<1	21.0
9/25/2002	<1	<1	<1	<1	<1	15	<1	<1	15.0
3/26/2003	<1	<1	<1	<1	<1	7.6	<1	<1	7.6
9/24/2003	<1	<1	<1	<1	<1	12	<1	<1	12.0
3/31/2004	<1	<1	<1	<1	<1	10	<1	<1	10.0
9/29/2004	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/10/2005	<1	<1	<1	<1	<1	7.6	<1	<1	7.6
9/26/2005	<1	<1	<1	<1	<1	8.3	<1	<1	8.3
3/15/2006	<1	<1	<1	<1	<1	3.9	<1	<1	3.9
9/18/2006	<1	<1	<1	<1	<1	4.3	<1	<1	4.3
3/20/2007	<1	<1	<1	<1	<1	7	<1	<1	7.0
9/20/2007	<1	<1	<1	<1	<1	5.5	<1	<1	5.5

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-19
SUMMARY OF COCs DETECTED IN MW06C
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<2	<2	<2	<2	<2	26	<2	<2	26.0
9/16/1991	<1	<1	<1	<1	<1	30	<1	<1	30.0
12/16/1991	<1	<1	<1	<1	<1	9	<1	<1	9.0
4/07/1999	<1	<1	<1	<1	<1	2	<1	<1	2.0
9/15/1999	<1	<1	<1	<1	<1	2	<1	<1	2.0
12/08/1999	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/08/2000	<1	<1	<1	<1	<1	1	<1	<1	1.0
6/21/2000	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/13/2000	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/19/2001	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/25/2002	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/25/2003	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/29/2004	<1	<1	<1	<1	<1	<1	<1	<1	0.0
10/19/2005	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/18/2006	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/20/2007	<1	<1	<1	<1	<1	1.1	<1	<1	1.1

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-21
SUMMARY OF COCs DETECTED IN MW07B
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<110	630	<110	<110	170	1800	<110	<110	2600.0
9/16/1991	<1	1500	2	23	650	3700	25	<1	5900.0
12/16/1991	<250	1600	<250	<250	540	3700	<250	<250	5840.0
10/04/1994	<0.5	4200	9.1	130	2000	11000	94	<0.55	17433.1
5/12/1995	<0.35	3500	<250	<350	1300	12000	<300	<550	16800.0
10/03/1995	<500	4200	<500	190	2300	15000	<500	<1000	21690.0
5/03/1996	<250	1800	<250	210	2200	8400	79	<500	12689.0
4/15/1997	<250	870	<250	82	560	4800	<250	<500	6312.0
4/08/1999	<1	640	<1	29	340	5400	33	<1	6442.0
9/14/1999	<1	250	<1	19	100	1400	21	<1	1790.0
12/06/1999	<1	22	<1	<1	6	340	2	<1	370.0
3/06/2000	<1	2.5	<1	<1	1.4	47	<1	<1	50.9
6/19/2000	<1	<1	<1	<1	<1	27	<1	<1	27.0
9/12/2000	<1	1.3	<1	<1	<1	38	<1	<1	39.3
3/20/2001	<1	<1	<1	<1	<1	17	<1	<1	17.0
3/18/2002	<1	<1	<1	<1	<1	24	<1	<1	24.0
9/25/2002	<1	<1	<1	<1	<1	17	<1	<1	17.0
3/26/2003	<1	<1	<1	<1	<1	10	<1	<1	10.0
9/24/2003	<1	<1	<1	<1	<1	11	<1	<1	11.0
9/28/2004	<1	<1	<1	<1	<1	15	<1	<1	15.0
3/10/2005	<1	<1	<1	<1	<1	7.8	<1	<1	7.8
9/26/2005	<1	<1	<1	<1	<1	7.3	<1	<1	7.3
3/15/2006	<1	<1	<1	<1	<1	10	<1	<1	10.0
9/18/2006	<1	<1	<1	<1	<1	14	<1	<1	14.0
3/21/2007	<1	<1	<1	<1	<1	18	<1	<1	18.0
9/21/2007	<1	<1	<1	<1	<1	4.9	<1	<1	4.9

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-22
SUMMARY OF COCs DETECTED IN MW07C
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<4	40	<4	19	47	71	<4	<4	177.0
9/16/1991	<1	23	<1	13	21	76	1	<1	134.0
12/16/1991	<2	9	<2	8	8	44	2	<2	71.0
10/04/1994	<0.35	<2.7	<0.25	7.9	5.6	32	0.49	<0.55	46.0
4/04/1995	<0.35	1.6	<0.5	5.4	2.7	30	0.77	<1.1	40.5
10/03/1995	<5	<5	<5	5	3	28	<5	<10	36.0
4/02/1996	<5	<5	<5	6	5	35	<5	<10	46.0
4/15/1997	<5	1	<5	5	3	28	2	<10	39.0
4/08/1999	<1	<1	<1	4	2	25	<1	<1	31.0
9/13/1999	<1	<1	<1	<1	<1	2	<1	<1	2.0
12/06/1999	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/06/2000	<1	<1	<1	<1	<1	<1	<1	<1	0.0
6/19/2000	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/12/2000	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/20/2001	<1	<1	<1	<1	<1	2.4	<1	<1	2.4
9/24/2002	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/24/2003	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/28/2004	<1	<1	<1	<1	<1	<1	<1	<1	0.0
10/19/2005	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/18/2006	<1	<1	<1	1.1	<1	1.2	<1	<1	2.3
9/21/2007	<1	<1	<1	<1	<1	<1	<1	<1	0.0

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-23
SUMMARY OF COCs DETECTED IN MW07R
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
9/16/1991	<1	0.7	<1	4	4	1	<1	<1	9.7
12/16/1991	<1	<1	<1	4	3	1	<1	<1	8.0
10/04/1994	<0.35	<.35	<0.25	3	3.6	<5	0.7	<0.55	7.3
5/12/1995	<0.35	0.058	<0.25	<0.35	1.4	3.3	1.1	<0.55	5.9
10/03/1995	<1	<1	<1	3	3	2	0.8	<1	8.8
4/02/1996	<1	<1	<1	3	4	3	1	<1	11.0
4/15/1997	<1	<1	<1	0.8	1	<1	0.3	<1	2.1
4/08/1999	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/13/1999	<1	<1	<1	1	2	<1	5	<1	8.0
12/06/1999	<1	<1	<1	1	2.3	<1	3.6	<1	6.9
3/06/2000	<1	<1	<1	1.4	2.6	<1	4.9	<1	8.9
6/19/2000	<1	<1	<1	1.6	4.3	<1	6.3	<1	12.2
9/12/2000	<1	<1	<1	1.6	4.1	<1	4.7	<1	10.4
3/20/2001	<1	<1	<1	1.6	5.4	<1	4.7	<1	11.7
3/18/2002	<1	<1	<1	1.4	4.8	<1	3	<1	9.2
9/24/2002	<1	<1	<1	1.5	4.9	<1	1.7	<1	8.1
3/26/2003	<1	<1	<1	<1	4.1	<1	<1	<1	4.1
9/23/2003	<1	<1	<1	<1	3.5	<1	<1	<1	3.5
3/31/2004	<1	<1	<1	<1	2.9	<1	<1	<1	2.9
9/28/2004	<1	<1	<1	<1	3.7	<1	<1	<1	3.7
3/10/2005	<1	<1	<1	<1	4.8	<1	<1	<1	4.8
9/26/2005	<1	<1	<1	<1	3.3	<1	<1	<1	3.3
3/15/2006	<1	<1	<1	<1	4.2	<1	<1	<1	4.2
9/18/2006	<1	<1	<1	<1	2.4	<1	<1	<1	2.4
3/21/2007	<1	<1	<1	<1	3.4	<1	<1	<1	3.4
9/21/2007	<1	<1	<1	<1	2.5	<1	<1	<1	2.5

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-29
SUMMARY OF COCs DETECTED IN MW09C
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
6/10/1991	<1	<1	<1	33	1	<1	1	<1	35.0
9/16/1991	<1	<1	<1	22	1	<1	1	<1	24.0
12/16/1991	<1	<1	<1	48	2	<1	2	1	53.0
10/04/1994	2	<0.35	<0.25	8.6	1.1	<0.3	1.1	0.33	13.13
4/04/1995	<1.2	1.2	<0.25	8.4	0.7	<1.1	1.3	<0.55	11.6
10/03/1995	<0.9	<1	<1	10	1	<1	1	0.5	12.5
4/02/1996	1	<1	<1	6	0.5	<1	2	0.3	9.8
4/15/1997	0.6	<1	<1	5	0.4	<1	1	0.2	7.2
4/08/1999	<1	<1	<1	6	<1	<1	1	<1	7.0
9/13/1999	<1	<1	<1	<1	<1	<1	<1	<1	0.0
12/06/1999	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/07/2000	<1	<1	<1	<1	<1	<1	<1	<1	0.0
6/20/2000	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/12/2000	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/20/2001	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/25/2002	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/24/2003	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/28/2004	<1	<1	<1	<1	<1	<1	<1	<1	0.0
10/18/2005	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/18/2006	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/20/2007	<1	<1	<1	<1	<1	<1	<1	<1	0.0

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-39
SUMMARY OF COCs DETECTED IN MW12C
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
9/16/1991	<1	<1	<1	<1	<1	<1	<1	<1	0.0
12/16/1991	<1	<1	<1	<1	<1	<1	<1	<1	0.0
4/09/1999	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/16/1999	<1	<1	<1	<1	<1	2	<1	<1	2.0
12/07/1999	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/09/2000	<1	<1	<1	<1	<1	<1	<1	<1	0.0
6/21/2000	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/13/2000	<1	<1	<1	<1	<1	<1	<1	<1	0.0
3/19/2001	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/25/2002	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/25/2003	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/30/2004	<1	<1	<1	<1	<1	<1	<1	<1	0.0
10/18/2005	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/19/2006	<1	<1	<1	<1	<1	<1	<1	<1	0.0
9/20/2007	<1	<1	<1	<1	<1	<1	<1	<1	0.0

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

TABLE E-40
SUMMARY OF COCs DETECTED IN MW13A/MW13AI
SHERWOOD MEDICAL COMPANY SUPERFUND SITE
NORFOLK, NEBRASKA

	Contaminant of Concern								
Sample Date	Benzene µg/L	1,1,1-TCA µg/L	1,1,2-TCA µg/L	1,1-DCA µg/L	1,1-DCE µg/L	PCE µg/L	TCE µg/L	VC µg/L	Total COC µg/L
9/16/1991	<100	86	<100	<100	<100	1600	<100	<100	1686.0
12/16/1991	<120	88	<120	<120	<120	2300	<120	<120	2388.0
10/03/1995	<12	26	<12	<12	<12	370	<12	<25	396.0
4/02/1996	<25	71	<25	<25	<25	900	<25	<50	971.0
4/15/1997	<50	59	<50	<50	<50	1100	<50	<100	1159.0
4/08/1999	<1	16	<1	<1	<1	1200	8	<1	1224.0
9/14/1999	<1	15	<1	<1	<1	1300	6	<1	1321.0
12/07/1999	<1	6.1	<1	<1	<1	2100	4.3	<1	2110.4
3/09/2000	<1	16	<1	<1	<1	1000	5.3	<1	1021.3
9/12/2000	<1	8.8	<1	<1	<1	370	1	<1	379.8
3/18/2002	<1	9.2	<1	<1	<1	340	6.2	<1	355.4
9/25/2003	<1	<1	<1	<1	<1	81	<1	<1	81.0
9/30/2004	<1	<1	<1	<1	<1	350	1.2	<1	351.2
3/10/2005	<1	<1	<1	<1	<1	140	<1	<1	140.0
9/27/2005	<1	<1	<1	<1	<1	110	<1	<1	110.0
3/15/2006	<1	<1	<1	<1	<1	76	<1	<1	76.0
9/19/2006	<1	1.3	<1	<1	<1	180	<1	<1	181.3
3/21/2007	<1	1.3	<1	<1	<1	150	<1	<1	151.3
9/21/2007	<1	<1	<1	<1	<1	300	<1	<1	300.0

Abbreviations:

COC = Contaminants of Concern
J = Estimated value
UJ = Reporting limit is estimated. Analyte was not detected above the reporting limit.
µg/L = Micrograms per liter
1,1,1-TCA = 1,1,1-Trichloroethane
1,1,2-TCA = 1,1,2-Trichloroethane
1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
PCE = Tetrachloroethene
TCE = Trichloroethene
VC = Vinyl Chloride

Note:

1) After Septembeer 2003, water sample was collected from MW13AI because the groundwater elevation at MW13A has been historically below the bottom of MW13A's well screen. MW-13AI was installed to allow sampling of the shallow groundwater in the vicinity of well cluster MW13. All analytical results shown after this date are for water samples collected from MW13AI.

Meeting Minutes

Participants: Steve Auchterlonie (United States Environmental Protection Agency [USEPA])
Clint Sperry (USEPA)
Wade Gregson (Nebraska Department of Environmental Quality [NDEQ])
Larry Belz (Covidien)
Rick Tomjack (Covidien)
John Heinicke (URS Corporation [URS])
Brian Wight (URS)

Meeting Date: October 31, 2007

Distribution Date: November 13, 2007

Meeting Minutes By: Brian Wight

These minutes summarize the items discussed during the Second Five-Year Review meeting for the Sherwood Medical Company (SMC) Superfund Site. The meeting was held at the SMC Superfund Site on October 31, 2007. A summary of the discussions is presented below.

1. Steve Auchterlonie introduced Clint Sperry and described his role in assisting Steve with this project. All documents and communications will continue to be sent to Steve Auchterlonie. USEPA plans to complete an inspection of the SMC Superfund Site for the 5-year review tomorrow, and plans to publish the 5-year-review report in March of 2008.

2. Larry Belz summarized the SMC Superfund Site history.

3. A brief tour of the on-site portion of the site was done.

4. The majority of the contaminant plume is located on Covidien property. The highest concentrations of groundwater contaminants of concern are located in the shallow groundwater at monitoring well MW-13A/AI located east of the former central leach field and west of the Covidien plant. Lower concentrations of GCOC are being detected in the monitoring wells located northeast of the plant on Covidien property. GCOC were not detected at in the off-site monitoring wells above the performance standards during the September 2007 groundwater sampling event and have not been detected in the majority of the monitoring wells at concentrations above the performance standard for several groundwater monitoring events.

5. Low concentrations (i.e., below the performance standards) of GCOC are being detected at GWEX-2 (furthest upgradient extraction well). Concentrations of tetracholoroethene (PCE) were detected at concentrations of 8.6 micrograms per liter (ug/L) and 6.8 ug/L in GWEX-1 and GWEX-3 in September 2007, slightly higher than the performance standard of 5 ug/L. PCE was detected at a concentration of 44 ug/L at GWEX-4 in September 2007.

URS

LETTER OF TRANSMITTAL

DATE	November 13, 2007	
PROJECT NO.	16170230.00100	
PROJECT NAME	Sherwood Medical Company Superfund Site	
TO	Larry Belz	Covidien 1222 Sherwood Road Norfolk, Nebraska 68701
	Rick Tomjack	Covidien 1222 Sherwood Road Norfolk, Nebraska 68701
	Steve Auchterlonie	United States Environmental Protection Agency Region VII Project Manager - Missouri/Kansas Remedial Branch Superfund Division 901 N. 5th Street Kansas City, Kansas 66101
	Clint Sperry	United States Environmental Protection Agency Environmental Scientist 901 N. 5th Street Kansas City, Kansas 66101
	John Hieinicke	URS Corporation 12120 Shamrock Plaza, Suite 300 Omaha, Nebraska 68154
FROM	Brian Wight	URS Corporation 12120 Shamrock Plaza, Suite 300 Omaha, Nebraska 68154
CC	Perry Howard	Wyeth Environmental Affairs Manager Five Giralda Farms Madison, New Jersey 07940

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ENCLOSURES

Item	Description
1	October 31, 2007 Meeting Minutes

SUBMITTED FOR YOUR

- ☐ Review
- ☐ Approval
- ☒ Information
- ☐ Signature

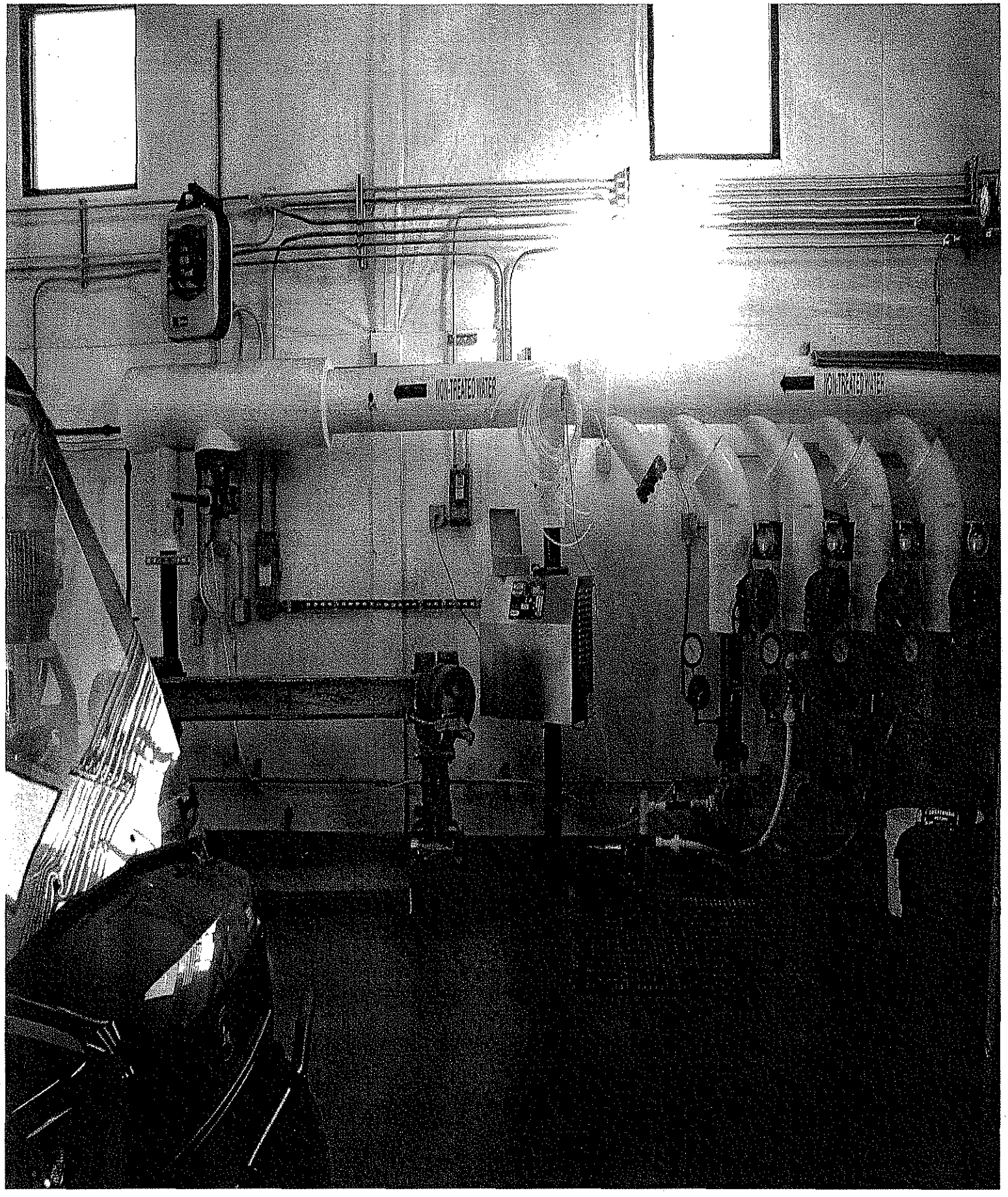
REMARKS

6. Since the majority of the contaminant plume is located on site, Larry Belz asked if the off-site extraction wells could be turned off to evaluate the contaminant plumes response and hydraulic containment of the contaminant plume using the on-site extraction wells. The USEPA indicated that they would be interested in seeing how the contaminant plume and hydraulic containment of the plume responded to the off-site extraction wells being turned off. It was always the USEPA's expectation that the off-site wells would be turned off before the on-site extraction well. Steve Auchterlonie suggested that a proposal be sent to the USEPA requesting to shut the off-site extraction wells. The proposal should indicate the monitoring that would be done to monitor the response of the plume.

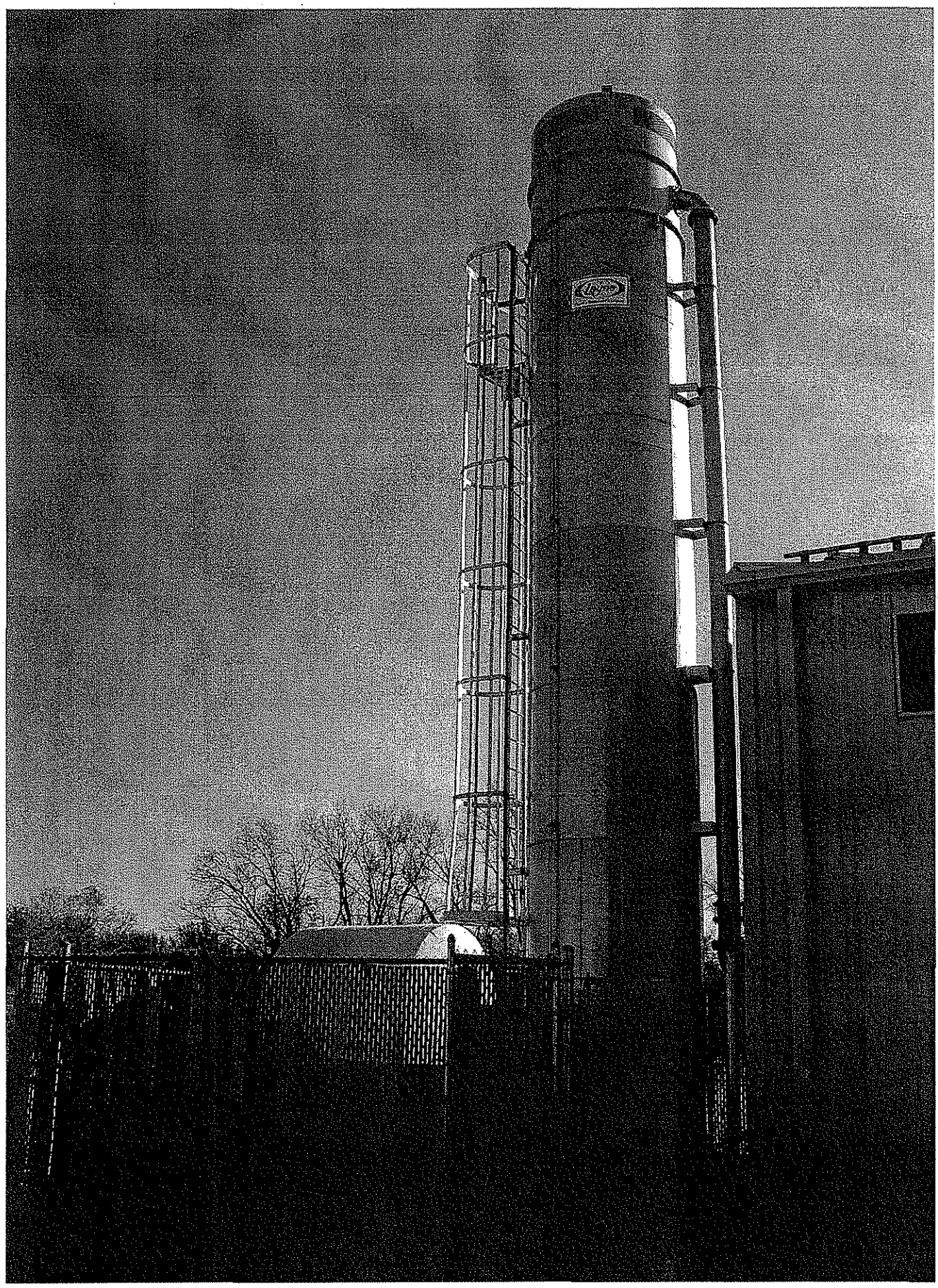
7. The extraction well's efficiencies have decreased since they became operational in 1999, mostly because of bacterial growth. Larry Belz asked if the two on-site extraction wells could be replaced and moved to the center of the plume to improve the contaminant mass removal rate. The USEPA indicated that the remedial goal stated in the Record of Decision is to achieve cleanup in 5 years, even though they understood that the 5-year-goal is unrealistic. USEPA stated that wells could be replaced as long as the intent of the 5-year-goal was maintained. For example, design pumping rates should not be significantly reduced. The USEPA considers the replacement of the extraction wells a maintenance issue that does not require their pre-approval. However, they requested that plans showing the new locations and design of the new extraction wells be transmitted to them.

8. John Heinicke presented a discussion on using in-situ reductive treatment (ITR) to accelerate the removal of GCOC from the shallow containment plume near MW-13. The USEPA suggested that a Pilot Study Work Plan be submitted to the USEPA for their review and approval. Wade Gregson asked if groundwater flushing would be considered to flush the contaminant plume from beneath the plant to the downgradient extraction well. URS noted that injection of the large quantities of water that flushing requires would require considerable maintenance to deal with fouling and plugging. The flushing option may be considered in the future if other available options are found to be ineffective.

9. Larry indicated that Wyeth (represented by Perry Howard) is financially responsible party for the SMC Superfund Site and that any discussions held today that involved modifications to the current remediation system required Wyeth's approval. USEPA noted that if Wyeth wanted the 5-year review report to include a discussion of any of these possible modifications, then written correspondence explaining the proposed modifications should be submitted to USEPA by early January 2008.

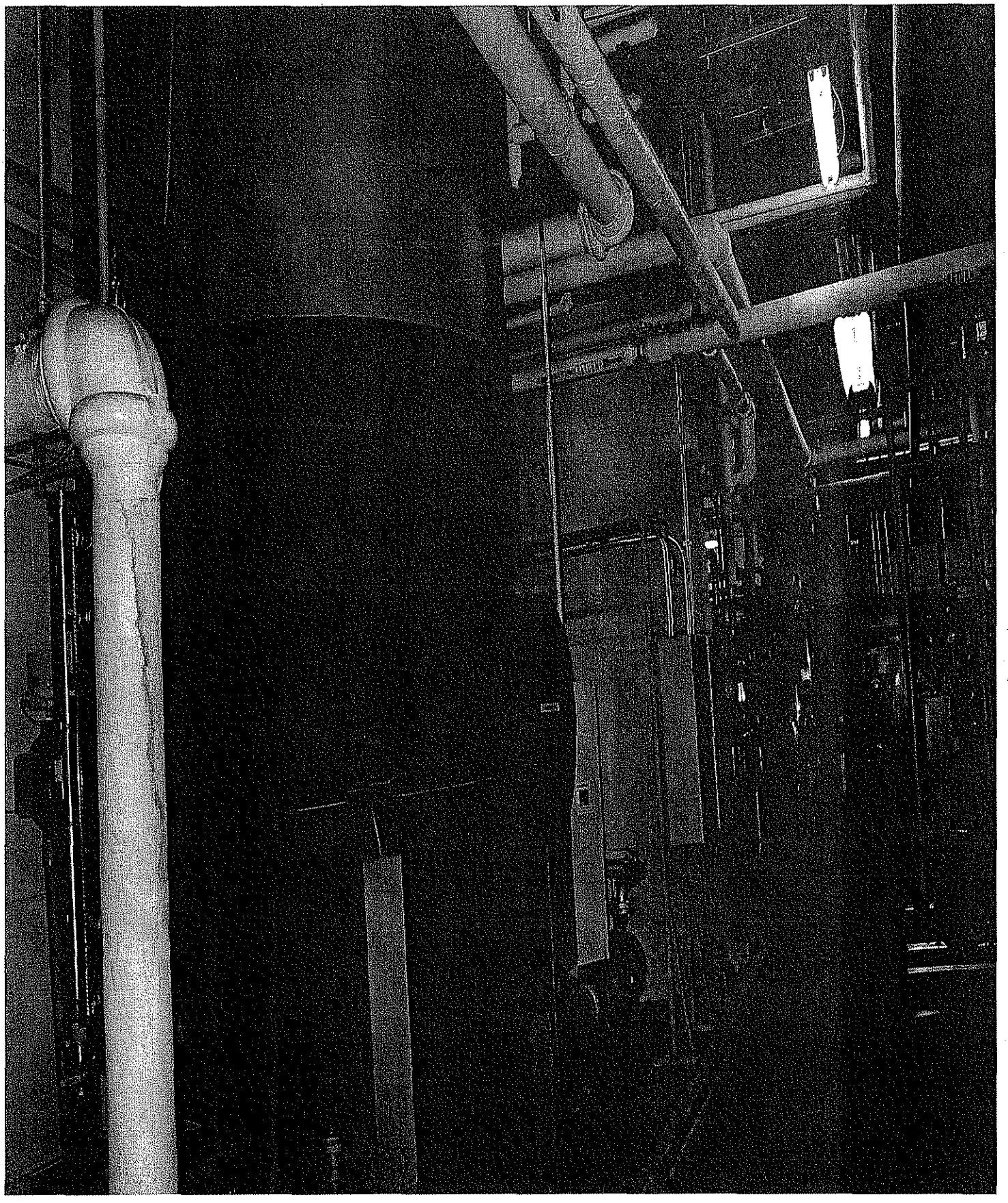


Ground Water Treatment System



Air Stripper Tower

Ground Water Treatment Outflow



Drinking Water Treatment System