THIRD SUPERFUND FIVE-YEAR REVIEW REPORT

for the

E. I. du Pont de Nemours & Co., Inc.
County Road X-23 Site

Lee County, Iowa

August 2007

Prepared By:

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Region VII
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Approved by:

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Date:

8/15/07

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List of Abbreviations

ARARs	Applicable or relevant and appropriate requirements
ASTM	American Society for Testing and Materials
bgs	Below ground surface
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
EPA	Unites States Environmental Protection Agency
ESD	Explanation of Significant Differences
MCL	Maximum Contaminant Level
mg/kg	Milligram per kilogram
mg/l	Milligram per liter
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and maintenance
PRGs	Preliminary remediation goals
psi	Pounds per square inch
RA	Remedial Action
RD	Remedial Design
RD/RA	Remedial Design/Remedial Action
RAOs	Remedial Action Objectives
ROD	Record of Decision
QAPP	Quality Assurance Project Plan
SAP	Sampling and Analysis Plan
TCLP	Toxicity Characteristic Leaching Procedure
UCS	Unconfined compressed strength
UECA	Uniform Environmental Covenants Act
VOC	Volatile organic compounds
μg/l	Microgram per liter

Executive Summary

The E. I. du Pont de Nemours & Co., Inc., County Road X-23 Superfund site in Lee County, Iowa, consists of two subsites known as the Baier and McCarl subsites. The remedy for the site included stabilization and solidification of contaminated soil from both subsites into a solid monolith which was covered with a soil cap at the Baier subsite. The remedy also included groundwater monitoring and the implementation of covenants and deed notices restricting the future use of the subsites. The site achieved construction completion with the signing of the Preliminary Close-out Report on September 29, 1993. The site was deleted from the National Priorities List on September 25, 1995. The trigger for this five-year review was the signing of the second Five-Year Review Report on August 16, 2002.

The determination that has been made during this five-year review is that the remedy continues to function as designed. The immediate threats have been addressed and the remedy continues to be protective.

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name *(from WasteLAN)*: E. I. du Pont de Nemours & Co., Inc. County Road X-23 Site

EPA ID *(from WasteLAN)*: IAD980685804

Region: VII | **State:** IA | **City/County:** West Point/Lee County

SITE STATUS

NPL status: □ Final X Deleted □ Other (specify)

Remediation status (choose all that apply): □ Under Construction □ Operating X Complete

Multiple OUs?* □ YES X NO | **Construction completion date:** 9 /29/1993

Has site been put into reuse? □ YES X NO

REVIEW STATUS

Lead agency: X EPA □State □ Tribe □ Other Federal Agency

Author name: Diana Engeman

Author title: Remedial Project Manager | **Author affiliation:** U.S. EPA – Region VII

Review period:** 11/21/2006 to 08/15/2007

Date(s) of site inspection: 7/05/2007

Type of review:
X Post-SARA □ Pre-SARA □ NPL-Removal only
□ Non-NPL Remedial Action Site □ NPL State/Tribe-lead
□ Regional Discretion)

Review number: □ 1 (first) □ 2 (second) X 3 (third) □ Other (specify)

Triggering action:
□ Actual RA On-site Construction at OU #___ □ Actual RA Start at OU# 01
□ Construction Completion X Previous Five-Year Review Report
□Other (specify) Remedial action start

Triggering action date *(from WasteLAN)*: 8/16/2002

Due date *(five years after triggering action date)*: 8/16/2007

* OU refers to operable unit.
** Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.

Five-Year Review Summary Form, cont'd.

Issues:

Failure to perform analysis of soil cover in 2005.

Schedule for future groundwater monitoring needs to be determined.

Schedule for future inspection and maintenance activities at the Baier subsite needs to be determined.

Recommendations and Follow-up Actions:

Soil cover at the Baier subsite to be sampled in 2008 and nutrients applied if needed.

At the Baier subsite, groundwater monitoring for total metals will continue biennially (2008 and 2010) for the next five years in accordance with the Groundwater Monitoring Plan.

Discontinue future inspection and maintenance activities at the McCarl subsite.

Routine inspection at the Baier subsite to occur twice per year for next five years.

Protectiveness Statement:

The remedy at the DuPont County Road X-23 site is protective of human health and the environment.

Third Five-Year Review Report

1.0 Introduction

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

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

The Agency 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.*

The United States Environmental Protection Agency (EPA) Region VII has conducted a five-year review of the remedial actions implemented at the E. I. du Pont de Nemours & Co., Inc., County Road X-23 (DuPont County Road X-23) site in Lee County, Iowa. This review was conducted from November 2006 through August 2007. This report documents the results of the review.

This is the third five-year review for the DuPont County Road X-23 site. The triggering action for this review is the date of completion of the second five-year review, as shown in EPA's WasteLAN database: August 16, 2002. The five-year review is required due to the fact that hazardous substances, pollutants, or contaminants remain on the site above levels that allow for unlimited use and unrestricted exposure.

2.0 Site Chronology

Table 2-1
Chronology of Site Events

EVENT	Date
Initial discovery of contamination	11/1979
Removal actions conducted	1990-1992
Final listing on National Priorities List (NPL)	8/30/1990
Remedial Investigation/Feasibility Study completed	1/1991
Proposed Plan available for public comment	4/1991
Record of Decision (ROD) signed	5/28/1991
Consent Decree (CD) for Remedial Design/Remedial Action (RD/RA) finalized	4/23/1992
ROD Explanation of Significant Differences (ESD) signed	5/11/1992
Remedial design (RD) completed and remedial action (RA) construction began	6/5/1992
Preliminary Close Out Report signed	9/29/1993
Final Close-out Report completed	8/1/1994
Deleted from the NPL	9/25/1995
First five-year review signed	6/19/1997
Second five-year review signed	8/16/2002

3.0 Background

3.1 Physical Characteristics

The DuPont County Road X-23 site, consisting of the Baier and McCarl subsites, is located in rural Lee County, Iowa, approximately 3.5 miles south of the town of West Point. The two subsites are located 0.75 miles apart, in Township 68 North and Range 5 West. The Baier subsite is located in the southwest quarter of Section 28, and the McCarl subsite is located in the southwest quarter of Section 22 (see Attachment A). The Baier subsite encompasses approximately 13 acres of which 3.5 acres is where the treated soil is located and is accessible by County Road X-23. The McCarl subsite encompasses approximately 1.25 acres located in a largely undeveloped, wooded area.

3.2 Land and Resource Use

Land use in the vicinity of the subsites was in the past and continues to be agricultural with some scattered residences. The Baier subsite is surrounded by pastures and forests. There is a residence on the property adjacent to the McCarl subsite. Land use in the vicinity of the subsites is not anticipated to change substantially in the future.

Groundwater at the McCarl and Baier subsites is encountered in perched, shallow water-bearing zones at approximately 20 feet below ground surface (bgs). A deeper groundwater zone is found at approximately 60 feet bgs. The upper and lower water-bearing zones are separated by a confining unit. The shallow water-bearing unit does not provide enough yield to serve as a source of drinking water.

3.3 History of Contamination

Between April 1949 and November 1953, wastes generated at DuPont's paint manufacturing facility located in Fort Madison, Iowa, were deposited at waste disposal areas at the Baier and McCarl subsites. It is estimated that between 48,000 and 72,000 55-gallon drums of waste were disposed at the two subsites. In addition to drummed wastes, paint waste was placed in trenches and burned. An estimate of the volume of material burned indicated that between 4,500 and 7,000 tons of ash was present at the subsites. The Baier subsite was the primary disposal area; however, in inclement weather, when the Baier subsite was not accessible, wastes were disposed at the McCarl subsite.

Contamination in soil consisted primarily of metals including lead, cadmium, chromium, and selenium, and organic compounds including toluene, methylbenzene, total xylene, and naphthalene. Remedial investigation data from both subsites indicated that the areal extent of lead contamination in soil defined the surface area of contamination and that lead contamination rapidly attenuated with depth, decreasing to the background level of 350 milligrams/kilogram (mg/kg) at four feet bgs.

Total xylenes, ethylbenzene, and selenium were the primary contaminants in the shallow groundwater at the Baier subsite. Selenium, lead, arsenic, barium, cadmium, and chromium were the contaminants found in groundwater at the McCarl subsite. Deep monitoring wells at both of the subsites were not found to be impacted by site-related contaminants.

3.4 Initial Response

The subsites were identified as sources of volatile organic compounds (VOCs) and metals contamination during initial EPA investigations conducted between 1983 and 1986. As a result of site contamination identified in soil and groundwater, the DuPont County Road X-23 site was proposed for inclusion on the National Priorities List (NPL) in June 1988 and the listing became final in August 1990.

In January 1991, DuPont completed Remedial Investigation and Feasibility Study Reports for the site. In April 1991, a Proposed Plan identifying the EPA's preferred remedy was presented to the public, starting the period for public comment.

3.5 Basis for Taking Action

Contaminants of concern in soil at the Baier and McCarl subsites, except as noted:

Inorganic Contaminants	VOCs	Semi-volatile Contaminants
Arsenic	Ethylbenzene	Bis(2-ethylhexyl)phthalate
Barium*	4-methyl-2-pentanone	2-methyl naphthalene
Cadmium	Toluene	Naphthalene
Chromium	1,1,1-trichloroethane**	
Copper*	Xylenes	
Lead		
Manganese*		
Selenium		
Zinc		

* Contaminant found at the McCarl subsite only.
** Contaminant found at the Baier subsite only.

In the Baseline Risk Assessment it was determined that exposure to soil at both subsites presented significant human health risks associated with a future land use scenario involving residential exposures. Increased health risks were found to be due to the noncarcinogenic effects of exposure to cadmium, chromium, selenium, and lead. It was also determined in the Baseline Risk Assessment that no exposure to contaminated groundwater would occur due to the low groundwater yield from the contaminated zone.

4.0 Remedial Actions

4.1 Remedy Selection

The Record of Decision (ROD) for the DuPont County Road X-23 site was signed by the Regional Administrator of EPA Region VII on May 28, 1991. Remedial action objectives (RAOs) were developed as a result of data collected during the remedial investigation to aid in the development and screening of remedial alternatives that were considered for the ROD. The RAOs for the site were:

- To prevent or minimize the potential for human exposure to contaminated soil and groundwater so that health-based allowable exposure limits are not exceeded; and

- To prevent or minimize the potential for future off-site migration of contaminants.

The selected remedy for soil was stabilization and solidification of all soil contaminated above risk-based levels into a solid monolith such that contaminants of concern would be unable to leach into the groundwater. All surface waste materials not amenable to the selected technology such as scrap metal, grinding balls, filters, or drums, were removed and disposed at an off-site hazardous waste landfill prior to treatment of the soil. Following treatment, the treated soil was covered with a soil cap to protect the treated material and prevent direct contact with human or ecological receptors. The protective cover was required to be graded and planted with vegetation to reduce erosion. Covenants restricting the future use of the site were included to ensure the integrity of the protective cover and the underlying solidified soil mass and to prevent contact with the treated soil.

The selected remedy for groundwater was no action. Groundwater monitoring was required for a minimum of five years.

An Explanation of Significant Differences (ESD) was issued by EPA Region VII on May 11, 1992. It modified the treatment technology as described in the ROD so that stabilization/solidification of contaminated soil could be conducted on site and above ground instead of in situ. Contaminated soil from the McCarl and Baier subsites was consolidated at the Baier subsite, mixed with stabilizing/solidifying reagents, then placed within a monolith and covered with impermeable clay, clean topsoil, and a vegetative cover.

4.2 Remedy Implementation

In a CD entered into with the United States on April 23, 1992, DuPont agreed to perform the remedial design/remedial action (RD/RA) and pay past costs associated with the cleanup of the site. The RD was conducted in conformance with the ROD as modified by the ESD. The RD was approved by the EPA on June 5, 1992.

The major components of the RA, as stated in the ROD and modified by the ESD, include the following:

- Removal of surface debris not amenable to solidification, and subsequent disposal at an EPA-approved landfill;
- Excavation of contaminated subsurface material from both subsites exceeding 150 milligrams/kilogram (mg/kg) of chromium, 350 mg/kg of lead, 10 mg/kg of selenium, and 20 mg/kg of cadmium and placement in a stockpile for subsequent treatment and disposal at the Baier subsite;
- Stabilization/solidification of contaminated soil from both subsites;
- Construction of soil covers at each subsite to prevent human or ecological contact with the treated soil;
- Introduction of vegetation to prevent erosion of the soil covers;

- Implementation of land use restrictions to limit land and groundwater utilization;
- Inspection and evaluation of the site every five years; and
- Groundwater monitoring to ensure that no unacceptable contaminant concentrations occur in groundwater in the future.

Further requirements for the Remedial Action (RA) were included in the Statement of Work, Appendix B of the CD, as follows:

- Soil contaminated above the cleanup levels was required to undergo stabilization/solidification to a depth of two feet below the waste/soil interface or to the known depth of metals contamination, whichever is deeper;
- Following treatment, the treated soil was required to be covered with a minimum of one foot of topsoil prior to grading and planting with suitable vegetation; and
- Erosion controls were required to be included in the Remedial Design (RD) and/or Inspection and Maintenance Plans, if necessary.

The performance criteria for the soil that was stabilized/solidified were as follows:

- Hydraulic conductivity less than or equal to 1×10^{-7} centimeters/second;
- Leachability test results demonstrating compliance with Toxicity Characteristic Leachability Procedure metals standards (lead and chromium less than five milligrams per liter (mg/l); cadmium and selenium less than one mg/l);
- Unconfined compressive strength (UCS) of 250 pounds per square inch (psi) with a minimum USC of 50 psi after seven days;
- Freeze/thaw resistance in accordance with American Society for Testing and Materials (ASTM) D4842; and
- Wet/dry testing in accordance with ASTM D4843, with samples for both tests demonstrating a weight loss of eight to ten percent or less at the conclusion of each of the durability testing procedures.

Prior to the start of RA construction activities, surface debris from both subsites was accumulated, characterized, and disposed at a hazardous waste landfill. Construction activities at the McCarl subsite began in August 1992 and were completed in September 1992. At the Baier subsite, construction activities began in March 1992 and were completed in October 1993. Delays were encountered in the work schedule at the Baier subsite due to wet ground conditions. The subsites were surveyed, cleared of trees and dense vegetation, and temporary surface water controls and access roads were constructed prior to the beginning of excavation activities.

A total of 2,408 cubic yards of contaminated soil was excavated from the McCarl subsite and transported to the Baier subsite, where it was stockpiled within the area of contamination awaiting treatment. The McCarl subsite was then backfilled with clean soil and covered with six inches of topsoil. The site was graded, fertilized, and seeded. A prefinal site inspection was conducted by the EPA at the McCarl subsite on September 29, 1992.

Excavation at the Baier subsite began with construction of a disposal trench. Once completed, contaminated soil from the trench location and the McCarl subsite was placed in the trench. A total volume of 6,795 cubic yards of contaminated soil was excavated from the Baier subsite and also placed in the trench.

Stabilization of the excavated soil was achieved by mixing the contaminated soil with water and approximately 20 percent Type 1 Portland cement. The stabilization process was completed directly in the disposal trench.

After chemical and physical performance testing of the stabilized material, a three-foot-thick layer of compacted clay followed by a one foot thick layer of topsoil was placed over the treated material. After placement of the topsoil, the disposal trench area was graded, fertilized, and seeded. A prefinal inspection was conducted by the EPA at the Baier subsite on September 10, 1993.

One year of quarterly groundwater sampling at the McCarl subsite began in September 1992 and was conducted annually through September 1996. One year of quarterly groundwater sampling at the Baier subsite began in September 1993 and was conducted annually through September 1996. Following the first five-year review in 1997, the groundwater monitoring was conducted biennially, in 1998 and 2000. Based upon the recommendations made during the second five-year review, groundwater monitoring at the Baier subsite continued biennially, in 2003, 2004, and 2006 to continue to evaluate the stability of the treated soil left in place at the subsite. During the second five-year review, it was determined that it was no longer necessary to continue groundwater monitoring at the McCarl subsite since contaminated soil was removed from the subsite and the monitoring wells were properly abandoned in July 2003.

The site achieved construction completion status when the Preliminary Close-out Report was signed on September 29, 1993. The EPA and the State determined that all RA construction activities, including the implementation of institutional controls, were performed according to the specifications. The Final Close-out Report for the site was signed on August 1, 1994, and the site was deleted from the NPL on September 25, 1995.

4.3 System Operations/Operation and Maintenance

DuPont continues to conduct long-term monitoring, inspection, and maintenance activities according to the Remedial Action Inspection and Maintenance Plan and the Groundwater Monitoring Plan, which were approved by the EPA. The primary activities associated with the operation and maintenance (O&M) of the remedy includes the following:

- Groundwater monitoring of the shallow and deeper water-bearing zones at the Baier subsite which has been conducted biennially since the first five-year review;
- Inspection of the condition of groundwater monitoring wells;
- Abandonment of the groundwater monitoring wells at the McCarl subsite since the conclusion of the second five-year review;
- Inspection of the condition of the ground cover including the cap at the Baier subsite and the vegetation; and
- Inspection of the condition of site fencing.

The estimate for O&M costs in the ROD was approximately $12,000 per year. The actual O&M costs for the past five years, shown in Table 4-1, were provided by DuPont. In the past five years the costs have been very near that estimate except for 2003, when the Sampling and Analysis Plan, including the Quality Assurance Project Plan (QAPP), were modified, the McCarl monitoring wells were properly abandoned, and the Baier monitoring wells were sampled. It is anticipated that the average annual O&M costs will be near or less than the estimate in the ROD during the next five years.

Table 4-1
Annual Operation and Maintenance Costs
Since Second Five-Year Review

Year	Total Cost
2002	$11,958
2003	37,384
2004	12,447
2005	8,526
2006	13,977

5.0 Progress Since the Last Review

The protectiveness statement in the Second Five-Year Review Report was as follows: "The remedy at the DuPont County Road X-23 site is protective of human health and the environment."

There were three recommendations made in the Second Five-Year Review Report. The first recommendation was that the soil cover at the Baier subsite was to be sampled in 2002 and lime and fertilizer applied as needed to promote vegetation growth. The soil was analyzed and fertilizer was applied based upon the recommendations of the Iowa State University's soil testing results in August 2002.

The second recommendation was that biennial groundwater monitoring at the Baier subsite should continue for the next five years but would be discontinued at the McCarl subsite and the monitoring wells abandoned consistent with the Groundwater Monitoring Plan. It was necessary to modify the Sampling and Analysis Plan (SAP), including the QAPP to accommodate the changes to the groundwater monitoring activities that were to occur. The revised SAP/QAPP was not approved by the EPA until March 2003. Therefore, the groundwater sampling planned for 2002 did not occur until July 2003. Subsequent groundwater monitoring at the Baier subsite occurred in September 2004 and September 2006. The McCarl subsite wells were abandoned during the week of July 14, 2003.

The final recommendation was that routine inspection of both subsites occur twice per year for the next five years and that the soil cover at the Baier subsite be sampled in 2005 with lime and fertilized added as needed. Both subsites continued to be inspected three times a year, as they had been prior to the second five-year review. There is no evidence that the soil was sampled to determine the need for fertilizer in 2005, but the conditions of the ground cover at both subsites is reported to be thick and in good condition. Several conditions requiring attention were noted during the inspections at the subsites including repairs needed to fencing, erosion in one portion of the McCarl subsite needing additional rip rap, and mowing to prevent trees from growing on the soil cap at the Baier subsite. All of the conditions requiring attention were addressed and the improvements reported on subsequent inspections reports.

6.0 Five-Year Review Process

6.1 Administrative Components

DuPont was notified of the initiation of the five-year review on December 4, 2006. The five-year review was conducted by Diana Engeman, EPA Remedial Project Manager for the DuPont County Road X-23 site, with assistance by other members of the regional technical staff. Robert Drustrup of the Iowa Department of Natural Resources and Stuart Schmitz of the Iowa Department of Public Health assisted in the review as representatives of support agencies.

6.2 Community Involvement

On March 5, 2007, a notice was placed in the Fort Madison Daily Democrat, the Bonny Buyer, and the West Point Bee that a five-year review was to be conducted and provided information on how to contact the EPA to provide input. A letter stating the same, as well as a history of the site, was sent to elected officials, members of the media, and community members. The letter invited the recipients to submit any comments they might have to the EPA. No comments have been received.

Soon after approval of this Third Five-Year Review Report, a notice will be placed in the same local newspapers announcing that the Report is complete, and that it is available to the public at the Cattermole Memorial Library in Fort Madison, Iowa, and the EPA Region VII office.

6.3 Document Review

This five-year review consisted of a review of relevant documents including Inspection and Maintenance Plan Reports and Groundwater Sampling Reports (Attachment B).

6.4 Data Review and Evaluation

Site Inspection and Maintenance

The plan for site inspection and maintenance is included in the Remedial Action Inspection and Maintenance Plan, which is Attachment 4 to the Remedial Design Report. According to this report, inspection and maintenance of the soil cover, vegetative cover, drainage channels, and the site in general were scheduled for three times per year for the first three years following completion of the RA to ensure continued integrity of the RA (1994, 1995 and 1996) and twice per year for the next seven years (1997 through 2003). Additionally, shallow soil sampling of the soil cover was to occur on the third, sixth, and ninth years following completion of the RA (1996, 1999, and 2002) to evaluate the need to apply lime or fertilizer to promote vegetation growth.

For this Five-Year Review Report, Site Inspection and Maintenance Reports submitted by Ray Krogmeier, DuPont Environmental Resource, were reviewed for site visits conducted in July and October 2002; April, July, and October 2003; March, July, and November 2004; April, July, and October 2005; March, July, and October 2006; and March 2007. In the Site Inspection and Maintenance Reports, both the Baier and McCarl subsites were visually inspected regarding the condition of the soil and vegetative covers, development of erosion areas, development of natural drainage channels, and condition of the site fences.

Throughout the period of time since the second five-year review, the vegetation has continued to be well established at both subsites. Shallow soil samples were analyzed to determine if sufficient nutrients were in the soil for vegetation growth. Fertilizer was applied at the Baier subsite in August 2002 based upon the recommendations of the Iowa State University's Soil Testing Laboratory. Maintenance issue related to fencing during the past five years

occurred at the McCarl subsite in 2003 and the Baier subsite in 2005 and 2007. Minor repairs were completed shortly after they were discovered.

The monitoring wells at the McCarl subsite were properly abandoned in July 2003. No other significant issues were identified related to the monitoring wells in the past five years. During July 2003 it was noted that an area of erosion was forming near former monitoring well 4S on the McCarl subsite. This area was monitored until rip rap was placed in the drainage prior to the inspection in March 2004. No problems have been reported since that time. Since there is no waste remaining at the McCarl subsite and all of the monitoring wells have been properly abandoned, there is no longer a need to continue inspecting this subsite. For soil conservation purposes, it would be advisable to continue to manage drainage to minimize erosion of the property.

Groundwater Monitoring

Groundwater monitoring of the shallow and deeper water-bearing zones of the Baier subsite has been conducted since the second five-year review in July 2003, September 2004, and September 2006. Groundwater monitoring is conducted according to the Groundwater Monitoring Plan, which is Attachment 5 to the Remedial Design Report. Attachment C to this report shows monitoring well locations for the Baier subsite.

During each of the sampling events, water level measurements were taken in the monitoring wells to determine the direction of groundwater flow in both water-bearing zones. Groundwater in the shallow water-bearing zone flowed to the west and southwest and in the deep water-bearing zone, groundwater flowed to the southwest. This data is consistent with historical data.

Although there are no cleanup levels for groundwater in the ROD for either subsite since there was no exposure pathway for groundwater, groundwater monitoring results have been compared against the EPA Maximum Contaminant Levels (MCLs) for drinking water. MCLs, which are set forth at 40 Code of Federal Regulations (CFR) Part 141, are the permissible level of a contaminant in which water is delivered to any user of a public water system. Summaries of the groundwater monitoring results for the Baier subsite may be found in Attachments D and E. The contaminants that have been found to exceed MCLs since the second five-year review are selenium, which has an MCL of 50 μg/l; and thallium, which has an MCL of 2 μg/l. Of these contaminants, only selenium was identified as a contaminant of concern during the baseline risk assessment.

In the shallow water-bearing zone at the Baier subsite, selenium was found at levels exceeding the MCL at monitoring wells BRA-1S (163 μg/l in 2003, 156 μg/l in 2004, and 149 μg/l in 2006) and BRA-2S (51.8 μg/l in 2006). This is consistent with what had been detected in these wells in the past. Based on the direction of groundwater flow in this zone at the Baier subsite, both of these monitoring wells are upgradient of the area of contamination. There were no contaminants detected in the deep water-bearing zone at the Baier subsite during the past five years. During the remedial investigation no connection between the two water-bearing zones was found.

Institutional Controls

A thorough review of the Declaration of Covenants and Restrictions filed on July 22, 1992, revealed a discrepancy between the legal description of the property known at the Baier subsite in the covenant and other descriptions of that property contained in other site documents. Also, it was determined that restrictions were no longer necessary for the McCarl subsite since no site contamination remains at that location and no further actions are necessary at that subsite. Also, it is significant to note that the state of Iowa has enacted a Uniform Environmental Covenants Act (UECA) since the second five-year review was conducted for this site.

DuPont has implemented an Environmental Covenant for the Baier subsite which is consistent with the Iowa UECA, accurately describes the Baier subsite property, and vacates the prior Declaration of Covenants and Restrictions. The Environmental Covenant includes a requirement that annually DuPont verify that the activity and use limitations were in place and complied with during the preceding year. This Environmental Covenant was signed by the Region VII Superfund Division Director on August 6, 2007, and was subsequently filed with the Lee County, Iowa Recorder's Office by DuPont.

6.5 Site Inspection

An inspection of both of the subsites was conducted on July 5, 2007, by the EPA Remedial Project Manager. The purpose of the inspection was to assess the protectiveness of the remedy, including the condition of the fencing, the integrity of the cap at the Baier subsite, the condition of the monitoring wells, and compliance with the Environmental Covenant. Holly Ritter, Environmental Manager for the DuPont Fort Madison Plant, and Ray Krogmeier, DuPont Environmental Resource, were also present for the inspection.

The Baier subsite is fenced on all sides with a locked gate in the northeast corner. The fence was found to be in good condition. The vegetation at the subsite was found to be in good condition with no evidence of erosion on the cap or of any other area of the subsite outside of the cap. There were no trees growing anywhere near the cap. All groundwater monitoring wells at the subsite were found to be locked and in good condition.

The Environmental Covenant on the Baier subsite includes a requirement that the property is fenced and there not be any residential, recreational, or agricultural uses. Installation of water wells on the properties is also prohibited. No activities were observed that would violate the activity and use limitations of the Environmental Covenant.

7.0 Technical Assessment

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

The review of site documents, applicable or relevant and appropriate requirements (ARARs), risk assumptions, and the results of the site inspection indicate that the remedy is

continuing to function as intended by the ROD, as modified by the ESD. The excavation, stabilization/solidification, and capping of contaminated soil has achieved the remedial objectives of preventing or minimizing the potential for human exposure to contaminated soil and groundwater and to prevent or minimize the potential for future off-site migration of contaminants. The effective implementation of an Environmental Covenant also aids in preventing exposure to contaminated soil and groundwater as well as ingestion of contaminated groundwater.

Operation and maintenance of the cap has been effective. Maintenance has been performed and appears to be effective. During some of the past five years the costs exceed the estimate in the ROD of approximately $12,000, but they do not appear to be excessive and it is anticipated that they will continue to be fairly consistent in the future.

The relative stability of the groundwater monitoring results at the Baier subsite throughout the implementation of the remedy is indicative that the solidified soil with its clay cap is stable. All of the contaminated soil from the McCarl subsite was excavated, treated, and disposed at the Baier subsite.

The Environmental Covenant that is in place on the Baier subsite includes a requirement that the property is fenced and there not be any residential, recreational, or agricultural uses. Installation of water wells on the properties is also prohibited. No activities were observed that violate these restrictions. The capped area and the surrounding area were undisturbed with a thick cover of vegatation, and no new uses of groundwater were observed. The Baier subsite remains fenced as previously described. The Environmental Covenant includes a requirement that DuPont verify annually that the activity and use limitations were in place and complied with during the preceding year.

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

There have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. There have been no changes in the land use assumptions that would affect the protectiveness of the remedy.

Changes in Standards and To Be Considered

After issuance of the ROD in 1991, the EPA adopted a number of MCLs for drinking water. The previous MCL for cadmium was 10 µg/l and the current MCL is 5 µg/l. The previous MCL for arsenic was 50 µg/l and the current MCL is 10 µg/l. Because there is no exposure to the contaminated groundwater, and because the underlying aquifer has not been impacted, no action was taken at the site for the remediation of groundwater. There are no federal or state ARARs for the selected "no action" alternative because compliance with federal and state ARARs is not required as no remedial action is necessary to protect human health and the environment. The remedy continues to be protective.

Chemical-specific soil cleanup levels stated in the ROD were 350 mg/kg for lead, 150 mg/kg for chromium, 10 mg/kg for selenium, and 20 mg/kg for cadmium. Soil exceeding these levels at both subsites was excavated, treated, and then capped at the Baier subsite. For comparison purposes, EPA Region IX's preliminary remediation goals (PRGs) are used as soil screening levels in Region VII. Currently, the Region IX PRGs are higher for all of the contaminants than the cleanup values for this site, assuming residential use of the site. The Region IX PRGs are 400 mg/kg, 210 mg/kg, 390 mg/kg, and 37 mg/kg for lead, chromium, selenium, and cadmium respectively. Contaminated soil was removed from the McCarl subsite and transported to the Baier subsite. Residual soil at the McCarl subsite was sampled and does not exceed the soil cleanup levels. Solidified/stabilized soil with contaminant concentrations above specified cleanup levels remains at the Baier subsite beneath an engineered cap. The remedy continues to be protective.

Changes in Exposure Pathways, Toxicity, and Other Contaminant Characteristics

Groundwater continues to remain an incomplete exposure pathway. Risk posed by exposure to contaminated soil has been eliminated by: (1) the removal of contaminated soil at the McCarl subsite, and (2) the solidification of contaminated soils followed by the placement of a low permeability clay layer overlain by a vegetated soil cap at the Baier subsite.

Toxicity values for metals used for risk characterization have changed since the completion of the risk assessment and the second five-year review (Table 7-1). For some of these contaminants the toxicity value has increased. However, since completion of the soil remediation activities (soil removal, solidification, and the placement of vegetative soil caps), no exposure to contaminated soil is occurring.

Table 7-1
Comparison of Past and Current Toxicity Values

	Risk Assessment Toxicity Values		2002 Toxicity Values		Current Toxicity Values	
Chemical	**SFo**	**RfDo (mg/kg-day)**	**SFo**	**RfDo (mg/kg-day)**	**SFo**	**RfDo (mg/kg-day)**
Arsenic	1.75	1.00e-03	1.5	3.00e-04	1.5	3.00e-04
Barium	---	5.00e-02	---	7.00e-02	---	2.00e-01
Cadmium	---	1.00e-03	---	5.00e-04	---	5.00e-04
Chromium	---	5.00e-03	---	3.00e-03	---	3.00e-03
Copper	--	1.30e+00	--	3.71e-02	--	4.00e-02
Lead	NA	NA	NA	NA	NA	NA
Manganese	--	2.00e-01	--	2.00e-02	--	1.40e-01
Selenium	--	3.00e-03	--	5.00e-03	--	5.00e-03
Zinc	--	2.00e-01	--	3.00e-01	--	3.00e-01

SFo – Oral Slope Factor
RfDo – Oral Reference Dose
NA – Not Applicable

During the second five-year review it was determined that groundwater monitoring was no longer warranted at the McCarl subsite because the contaminated media has been removed and there is no complete exposure pathway from this media to humans or sensitive environmental receptors. Although groundwater monitoring at the Baier subsite has not indicated that the solidified waste is causing groundwater contamination, since contaminated media remains on site, groundwater monitoring should continue at this subsite as a means to verify the ongoing effectiveness of this remedy.

Evaluation of RAOs

The response actions taken address the principal threats posed by this site and continue to protect human health and the environment through (1) the prevention of human exposure to contaminants in soil and groundwater by contaminated soil removal, solidification, placement of a vegetated soil cap, and an Environmental Covenant, and (2) the minimization of off-site migration of contaminated groundwater by solidification of contaminated soil as well as the placement of a low permeability clay layer followed by top soil at the Baier subsite. Therefore, the RAOs are effectively being met.

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

No ecological targets were identified during the baseline risk assessment and none were identified during this five-year review, and therefore, monitoring of ecological targets is not necessary. No weather-related events have affected the protectiveness of the remedy. There is no other information that calls into question the protectiveness of the remedy.

Technical Assessment Summary

According to the data reviewed and the site inspection, the remedy is functioning as intended by the ROD, as modified by the ESD. There have been no changes to the physical conditions of the site that would affect the protectiveness of the remedy. During implementation of the remedy, DuPont has complied with all ARARs cited in the ROD. While there have been changes in some of the toxicity factors for the contaminants of concern that were used in the baseline risk assessment as shown in Table 7-1, due to the remediation activities, no exposure to contaminated media is occurring and, therefore, toxicity has no bearing. There has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy. There have been no changes in land usage that could affect the protectiveness of the remedy. The Environmental Covenant is durable and enforceable. There is no other information that calls into question the protectiveness of the remedy.

8.0 Issues

Table 8-1
Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Failure to perform analysis of soil cover in 2005	N	Y
Schedule for future groundwater monitoring needs to be determined	N	Y
Schedule for future inspection and maintenance activities at both subsites needs to be determined	N	Y

9.0 Recommendations and Follow-up Actions

For all of the recommendations and follow-up actions listed in Table 9-1, DuPont is the party responsible for implementing the actions and the EPA is the oversight agency. The Iowa Department of Natural Resources will be kept informed of activities at the site.

Table 9-1
Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Milestone Date	Affects Protectiveness (Y/N)	
			Current	Future
Failure to perform analysis of Baier soil cover in 2005	Soil cover at the Baier subsite to be sampled in 2008 and nutrients applied as needed to promote vegetation growth.	12/31/08	N	Y
Schedule for future groundwater monitoring needs to be determined	At the Baier subsite, groundwater monitoring for total metals will continue biennially for the next five years in accordance with the Groundwater Monitoring Plan.	Monitoring 2008 and 2010.	N	Y
Schedule for future inspection and maintenance activities needs to be determined	Discontinue inspection and maintenance at the McCarl subsite. Routine inspection at the Baier subsite to occur twice per year for next five years. Soil cover at the Baier subsite to be sampled in 2011 and nutrients applied as needed.	Inspect Mar. and Oct. Sample and treat by 12/31/11.	N	Y

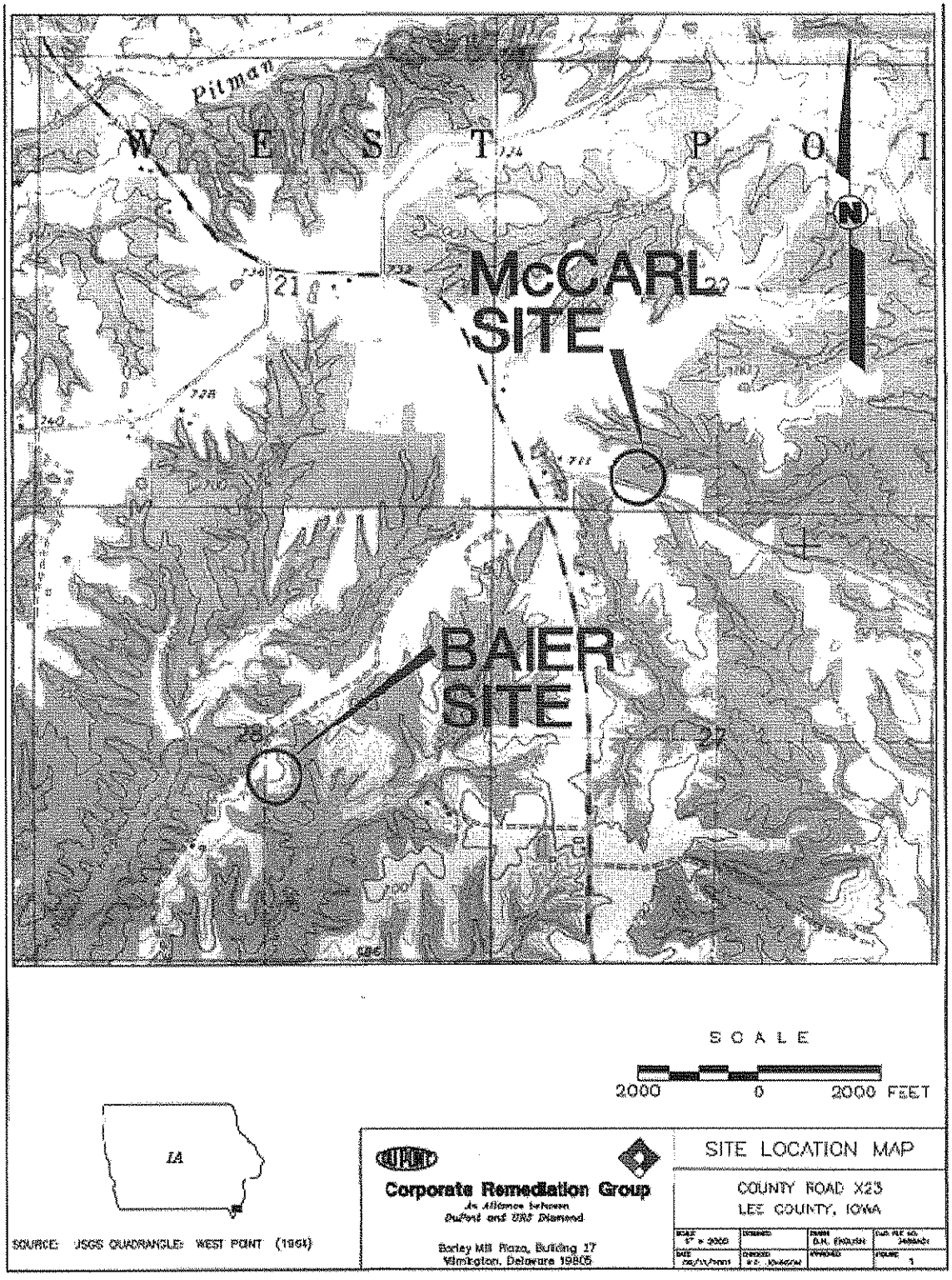
10.0 Protectiveness Statement

The remedy at the DuPont County Road X-23 site is protective of human health and the environment.

11.0 Next Review

The next five-year review for the DuPont County Road X-23 Superfund site is required by August 15, 2012, five years from the date of this review.

Attachment A
Site Map



Attachment B
List of Documents Reviewed

2003 Groundwater Sampling Report, County Road X23 Superfund Site, Lee County, Iowa, September 2003

2004 Groundwater Sampling Report, Baier Site, County Road X23 Superfund Site, Lee County, Iowa, December 2004

2006 Groundwater Sampling Report, Baier Site, County Road X23 Superfund Site, Lee County, Iowa, December 2006

Baier Site Mowing and Fertilizer Application Report, E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier Site. Lee County Iowa, August 27, 2002

Consent Decree, United States of America v. E. I. DuPont De Nemours & Company, May 21, 1992

Email from Amanda A. DeSantis, Subject: Baier McCarl Site – O&M Costs, April 11, 2007

Environmental Covenant, August 6, 2007

Explanation of Significant Differences for the DuPont County Road X23 Superfund Site, Lee County, Iowa, May 11, 1992

Five-Year Review DuPont County Road X23 Site, Lee County, Iowa, June 19, 1997

Five-Year Review DuPont County Road X23 Site, Lee County, Iowa, August 16, 2002

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, July 23, 2002

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, October 11, 2002

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, March 31, 2003

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, July 14, 2003

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, October 23, 2003

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, March 19, 2004

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, July 15, 2004

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, October 25, 2004

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, April 11, 2005

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, July 8, 2005

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, October 31, 2005

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, March 15, 2006

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, July 7, 2006

Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, October 30, 2006

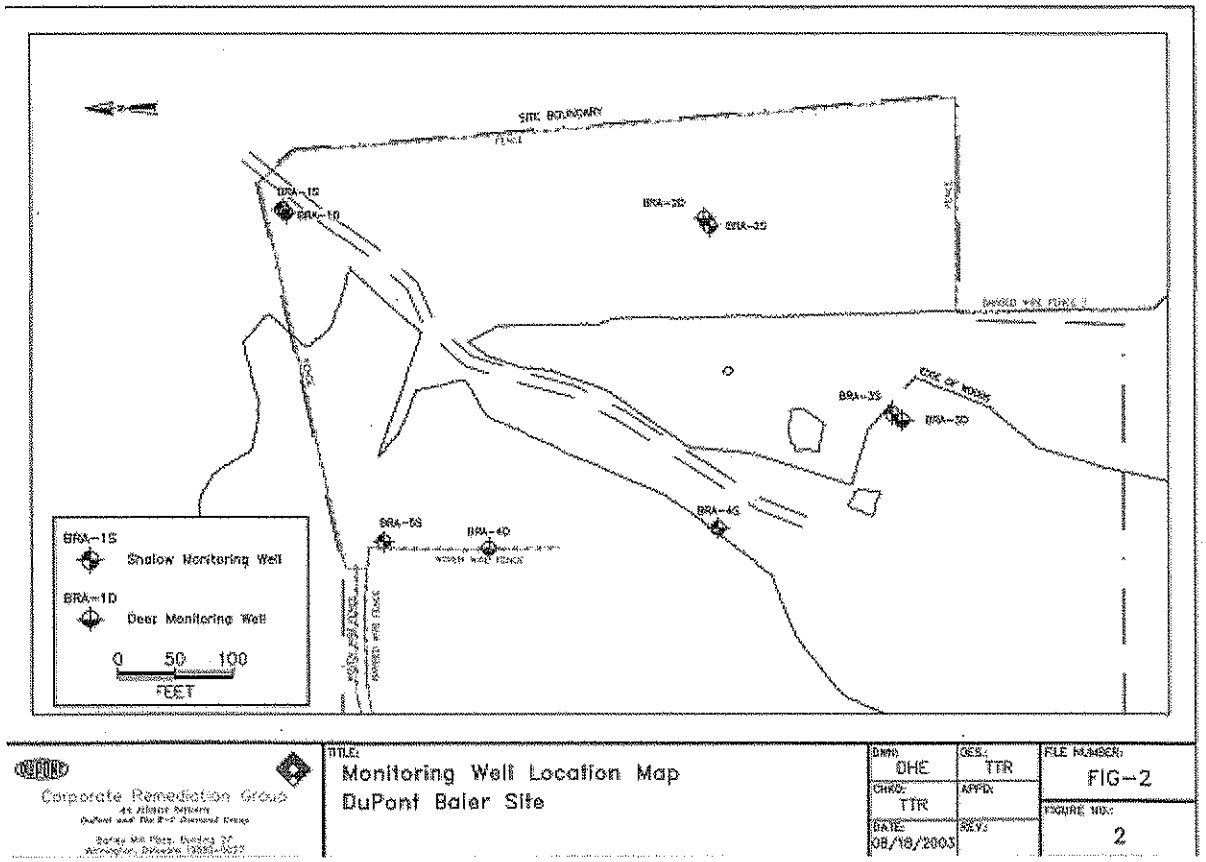
Inspection and Maintenance Plan Report for E. I. du Pont de Nemours and Company, (DuPont Lee County X-23) Baier and McCarl Site, Lee County, Iowa, March 29, 2007

Remedial Design Report, Final Design Submittal Baier Site and McCarl Site, Lee County, Iowa, May 1992

Revised Sampling and Analysis Plan, County Road X23 Superfund Site, Lee County, Iowa, February 2003

Superfund Record of Decision: E. I. du Pont de Nemours (County Rd X23), Iowa, May 1991

Attachment C
Baier Subsite Groundwater Monitoring Well Location Map



Attachment D
Baier Subsite 1993 through 2006 Shallow Groundwater Monitoring Data

Table 4
GW Concentrations: 1993 thru 2006
Shallow Wells

Well	BRA-1S												Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	09/98	09/00	07/03	09/04	09/06	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.724	0.224	2.13 P	<0.0268	0.0502 J	0.0795 J	0.104 J	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	<0.0047	0.0056 B	<0.0029	<0.0029	<0.0035	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0018	<0.0013	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.109 B	0.0766 B	0.107 B	0.0611 B	0.0488 J	0.0476 J	0.0562 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	0.00027 B	<0.00021	<0.00036	<0.00012	<0.000062	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	<0.00031	<0.00041	<0.00043	<0.00088	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	152	156	150	160	158	157	162	—
CHROMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	0.00096 B	0.0054 B	<0.0013	<0.0018	<0.0014	<0.00091	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0036	<0.00076	0.0023 B	0.00088 B	<0.0013	<0.0011	<0.001	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	0.0038 B	<0.00079	0.0027 J	0.0013 J	0.0027 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	1.84	0.408	3.45	<0.0149	0.13 J	0.234	0.201	0.3[1]
LEAD	<CRDL	0.0051	0.004	<CRDL	<CRDL	<0.00043	0.00086 B	<0.0023	<0.0024	<0.0042	<0.006	<0.004	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	55.7	55.6	56.3	59	57.4	56.9	57	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0644	0.0235	0.112	<0.00022	0.0109 J	0.0149 J	0.0345 J	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.000097 B	<0.000009	0.000093	<0.000026	<0.000071	<0.000046	<0.00013	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0046	0.0018 B	0.0056 B	0.0029 B	<0.0018	0.0019 J	0.0018 J	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	1.96 B	1.61 B	2.13 B	1.64 B	2.34 J	2.15 J	1.97 J	—
SELENIUM	0.0935	0.173	0.141	0.137	0.179	0.179	0.124	0.152	0.148	0.163 J	0.156	0.149	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00067	<0.00072	<0.0004	<0.00062	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	382	408	40.2	42	39.5	40.7	39.9	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0027 B	<0.0011	<0.0065	<0.0035	<0.0059	<0.0066	<0.0079	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0052	0.0013 B	0.0074 B	0.0018 B	<0.0013	0.0015 J	0.0016 J	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.007 B	0.0127 B	0.0177 B	0.0022 B	0.0085 J	0.0034 J	0.0047 J	5[1]

All units are mg/L. B: Blank Contamination J: Estimated Concentration (1): Secondary Drinking Water Standard
Shade: Result > MCL CRDL: Contract Required Detection Limit (2): Action Level
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) as of 11/06 unless specified

Attachment D
Baier Subsite 1993 through 2006 Shallow Groundwater Monitoring Data

Table 4
GW Concentrations: 1993 thru 2006
Shallow Wells

Well	BRA-2S												Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	09/98	09/00	07/03	09/04	09/06	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.764	0.276	0.358	0.307	0.0767 J	<0.0061	1.30	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	<0.0047	<0.0023	0.0039 J	<0.0029	<0.0036	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0023 B	0.0019 B	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.111 B	0.078 B	0.0668 B	0.0927 B	0.0771 J	0.0537 J	0.167 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	0.00017 B	<0.00021	<0.00036	0.00037 J	0.00012 J	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	0.00049 B	<0.00049	0.00039 B	<0.00041	<0.00043	<0.00088	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	155	197	166	147	138	149	213	---
CHROMIUM	0.021	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	0.00096 B	0.0018 B	0.0047 B	<0.0018	<0.0014	0.0037 J	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0036	0.0013 B	0.0016 B	<0.00078	<0.0013	0.0011 J	0.0032 J	---
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	<0.0014	0.0022 B	0.0016 J	<0.00074	0.0043 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	2.65	0.463	0.522	0.709	0.117 J	0.0721 J	2.15	0.3[1]
LEAD	0.003	0.0054	<CRDL	<CRDL	<CRDL	<0.00043	0.00096 B	<0.0023	<0.0024	<0.0042	<0.006	<0.004	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	56.7	60.3	72.6	59.2	58.6	64	85.3	---
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0672	0.67	0.523	0.189	0.149	0.23	0.231 J	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.000083 B	<0.000009	0.000084	<0.000026	<0.000071	0.000057 J	<0.00013	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0048	0.0077 B	0.0086 B	0.0045 B	0.0018 J	0.0047 J	0.0076 J	---
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	2.06 B	4.54 B	3.76 B	12.4	18.6 J	8.85	3.34 J	---
SELENIUM	0.0514	0.024	0.0244	<CRDL	0.0275	0.0158	0.0047	0.0273	0.0579	0.047 J	0.0341 J	0.0518	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00057	<0.00072	<0.0004	<0.00062	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	38.8	60.1	54.2	50.4	47.7	43.6	38.3	---
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0029 B	<0.0011	0.0082 B	<0.0035	<0.0059	<0.0086	<0.0079	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0056 B	0.0017 B	0.0026 B	0.0023 B	<0.0013	0.0013 J	0.0047 J	---
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0098 B	0.0092 B	0.0092 B	0.0013 B	<0.0046	<0.0016	0.0054 J	5[1]

All units are mg/L. B: Blank Contamination J: Estimated Concentration (1): Secondary Drinking Water Standard
Shade: Result > MCL CRDL: Contract Required Detection Limit (2): Action Level
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

Attachment D
Baier Subsite 1993 through 2006 Shallow Groundwater Monitoring Data

Table 4
GW Concentrations: 1993 thru 2006
Shallow Wells

Well	BRA-3S												Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	09/98	09/00	07/03	09/04	09/06	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	3.09	2.64	3.32	3.62	3.17 J	6.87	3.9	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	<0.0047	<0.0023	0.006 J	<0.0029	<0.0035	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0023 B	0.0049 B	<0.0074	<0.0029	0.0057 J	0.0054 J	<0.0037	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0982 B	0.08 B	0.0985 B	0.113 B	0.113 J	0.137 J	0.0876 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	0.0003 B	0.00032 B	<0.00036	0.00072 J	0.00032 J	0.004
CADMIUM	<CRDL	0.0084	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	0.00035 B	<0.00041	<0.00043	<0.00088	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	249	245	186	211	201	217	239	—
CHROMIUM	0.0142	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	0.0018 B	0.0036 B	0.0039 B	0.0037 J	0.0051 J	0.0037 J	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0044 B	0.0036 B	0.0078 B	0.0131 B	0.0211 J	0.0295 J	0.0155 J	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	0.0014 B	0.0045 B	0.0068 B	0.0073 J	0.0102 J	0.0065 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	3.59	2.01	2.75	5.1	4.97 J	3.49	4.32	0.3[1]
LEAD	<CRDL	0.0046	<CRDL	<CRDL	<CRDL	<0.00043	0.002 B	<0.0023	0.0036	<0.0042	0.0061 J	<0.004	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	102	98.5	78.1	86.2	80.1	88.8	96.8	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.821	0.41	1.29	1.41	1.74	1.75	1.18 J	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.000096 B	0.000017 B	0.00012	0.000034	<0.000071	<0.000048	<0.00013	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0096 B	0.0088 B	0.0198 B	0.0214 B	0.0257 J	0.026 J	0.017 J	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	3.08 B	2.89 B	3.2 B	3.16 B	2.53 J	3.94 J	2.63 J	—
SELENIUM	<CRDL	0.0279	0.0453	<CRDL	0.0264	0.03	0.0139	0.0215	0.02	0.0235 J	0.0168 J	0.0082 J	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0026	<0.00072	<0.00091	<0.00067	<0.00072	<0.0004	<0.00062	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	49.5	47.8	63.8	54.7	57.3	54.6	49.3	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.0011	<0.0065	<0.0035	<0.0059	<0.0086	<0.0079	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0074 B	0.004 B	0.0076 B	0.0074 B	0.0076 J	0.0121 J	0.0081 J	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0236	0.015 B	0.0205	0.02 B	0.0158 J	0.0239 J	0.0141 J	5[1]

All units are mg/L. B: Blank Contamination J: Estimated Concentration (1): Secondary Drinking Water Standard
Shade: Result > MCL CRDL: Contract Required Detection Limit (2): Action Level
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

Attachment D
Baier Subsite 1993 through 2006 Shallow Groundwater Monitoring Data

Table 4
GW Concentrations: 1993 thru 2006
Shallow Wells

Well	BRA-4S												Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	10/98	09/00	07/03	09/04	09/06	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0441 B	0.049 B	0.0654 B	0.129 B	1.01 J	1.85	6.41	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	<0.0047	<0.0023	0.0057 J	<0.0029	<0.0035	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0018	<0.0013	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.102 B	0.101 B	0.145 B	0.0965 B	0.0929 J	0.124 J	0.187 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	<0.00015	<0.00021	<0.00035	0.00019 J	0.00026 J	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	0.00032 B	<0.00041	<0.00043	<0.00088	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	151	138	107	88.8	53.3	66.4	76.5	—
CHROMIUM	0.0136	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	<0.00058	<0.00068	0.0037 B	0.002 J	0.0047 J	0.0125	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0045 B	0.0043 B	0.0014 B	<0.00078	0.0018 J	0.0045 J	0.0059 J	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	<0.0014	0.0031 B	0.0076 J	0.0036 J	0.0120 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.147	0.116	0.176	0.196	1.02 J	2.02	6.42	0.3[1]
LEAD	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00043	0.0011 B	<0.0023	<0.0024	<0.0042	<0.006	0.0104	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	63.3	55.9	40.7	32.8	12.7	15.3	26.3	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	1.51	0.946	0.497	0.111	0.503	1.35	1.62 J	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.000089 B	<0.000009	0.00003	<0.000026	<0.000071	0.000085 J	<0.00013	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0076 B	0.0093 B	0.007 B	0.0042 B	0.0101 J	0.0099 J	0.017 J	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	2.56 B	2.24 B	1.8 B	1.74 B	2.9 J	3.01 J	2.42 J	—
SELENIUM	0.0063	<CRDL	<CRDL	<CRDL	<CRDL	0.0016 B	<0.0007	<0.004	<0.0038	0.0021 J	<0.0034	<0.0052	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00067	<0.00072	0.00040 J	<0.00052	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	35.1	35.9	37.1	27	16.2	15.3	19.8	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.0011	<0.0065	<0.0035	<0.0059	<0.0088	<0.0079	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0052	0.0011 B	0.0014 B	0.0018 B	0.0035 J	0.0051 J	0.017 J	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0054 B	0.0116 B	0.0093 B	0.003 B	0.0151 J	0.0181 J	0.0576 J	5[1]

All units are mg/L. B: Blank Contamination J: Estimated Concentration (1): Secondary Drinking Water Standard
Shade: Result > MCL CRDL: Contract Required Detection Limit (2): Action Level
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

Attachment D
Baier Subsite 1993 through 2006 Shallow Groundwater Monitoring Data

Table 4
GW Concentrations: 1993 thru 2006
Shallow Wells

Well	BRA-5S												Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	10/98	09/00	07/03	09/04	09/06	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.284	0.0495 B	1.29	<0.0268	0.513 J	<0.0061	<0.0152	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	<0.0047	<0.0023	0.0038 J	<0.0029	<0.0035	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0016	<0.0013	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0649 B	0.0292 B	0.175 B	0.04 B	0.095 J	0.0336 J	0.0319 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	<0.00015	<0.00021	<0.00036	0.00019 J	0.00018 J	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	0.00049 B	<0.00041	<0.00043	<0.00068	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	309	280	265	282	268	263	269	---
CHROMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	<0.00056	0.0043 B	<0.0013	<0.0018	<0.0014	<0.00091	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0036	0.0011 B	0.003 B	0.0026 B	0.0059 J	0.0011 J	0.0049 J	---
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	0.0035 B	0.0012 B	0.0056 J	<0.00074	0.0016 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.773	0.125	2.28	0.0833 B	1.01 J	<0.0111	0.0591 J	0.3[1]
LEAD	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00043	0.001 B	<0.0023	<0.0024	<0.0042	<0.008	<0.004	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	110	94.9	99.6	101	98.7	97.4	99.9	---
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.363	0.33	0.313	2.18	1.84	0.31	1.22 J	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.000093 B	<0.000009	0.000053 B	0.000049 B	<0.000071	0.000074 J	<0.00013	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0046	0.0086 B	0.0114 B	0.0401	0.0228 J	0.0097 J	0.022 J	---
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	3.52 B	3.45 B	3.23 B	3.4 B	3.39 J	3.36 J	3.04 J	---
SELENIUM	0.0093	<CRDL	0.0274	<CRDL	0.0172	<0.00068	0.017	<0.004	<0.0038	<0.002	<0.0034	<0.0052	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00087	<0.00072	<0.0004	<0.00052	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	49.1	45.4	51.4	49.8	58	53.2	48.5	---
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.0011	<0.0065	<0.0035	<0.0059	<0.0086	<0.0079	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0064 B	<0.0005	0.0055 B	0.0012 B	0.003 J	0.00079 J	<0.00085	---
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0046 B	0.0148 B	0.0145 B	0.0056 B	0.0073 J	<0.0016	0.003 J	5[1]

All units are mg/L. B: Blank Contamination J: Estimated Concentration (1): Secondary Drinking Water Standard
Shade: Result > MCL CRDL: Contract Required Detection Limit (2): Action Level
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

Attachment E
Baier Subsite 1993 through 2006 Deep Groundwater Monitoring Data

Table 5
GW Concentrations: 1993 thru 2006
Deep Wells

Well	BRA-1D												Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	09/98	09/00	07/03	09/04	09/06	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0223	<0.0412	0.0813 B	0.0332 B	0.066 J	0.0523 J	<0.0152	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	<0.0047	<0.0023	0.0038 J	<0.0029	<0.0036	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0018	0.0016 B	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.12 B	0.121 B	0.122 B	0.121 B	0.121 J	0.119 J	0.0884 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	0.00016 B	<0.00021	<0.00036	<0.00012	<0.000062	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	0.00055 B	<0.00049	<0.00031	<0.00041	<0.00043	<0.00068	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	96.6	96.6	93.5	98.9	102	99	80.2	—
CHROMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	<0.00058	<0.00068	<0.0013	<0.0018	<0.0014	<0.00091	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0038	0.001 B	0.0017 B	0.0014 B	0.0019 J	0.0027 J	<0.001	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	<0.0014	<0.00079	<0.00092	<0.00074	0.00091 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.247	0.365	0.328	0.394	0.293 J	0.325	0.0122 J	0.3[1]
LEAD	<CRDL	0.0035	<CRDL	<CRDL	<CRDL	<0.00043	0.00085 B	<0.0023	<0.0024	<0.0042	<0.006	<0.004	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	30.1	29.4	29.8	30.5	30.9	29.5	29	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.781	0.726	0.735	0.581	0.552	0.566	0.0406 J	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.00008 B	<0.000009	0.000032 B	<0.000026	<0.000071	<0.000048	<0.00013	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0131 B	0.0029 B	0.0034 B	0.0039 B	0.0042 J	0.0047 J	<0.0017	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	2.93 B	2.95 B	2.93 B	2.97 B	3.26 J	3.24 J	2.84 J	—
SELENIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00068	<0.0007	0.0047 B	<0.0038	<0.002	<0.0034	<0.0062	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00067	<0.00072	<0.0004	<0.00062	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	49.2	48.9	48.7	46.5	47.4	46.9	46.1	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.0011	0.0071 B	<0.0035	<0.0059	<0.0088	<0.0079	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0052	<0.0005	0.0012 B	0.0012 B	<0.0013	0.0015 J	<0.00085	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.004 B	0.0222	0.0097 B	<0.0011	<0.0048	<0.0016	0.0025 J	5[1]

All units are mg/L.
Shade: Result > MCL
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

B: Blank Contamination
CRDL: Contract Required Detection Limit

J: Estimated Concentration

(1): Secondary Drinking Water Standard
(2): Action Level

Attachment E
Baier Subsite 1993 through 2006 Deep Groundwater Monitoring Data

Table 5
GW Concentrations: 1993 thru 2006
Deep Wells

Well	BRA-2D												Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	09/98	09/00	07/03	09/04	09/06	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0223	<0.0412	<0.043	<0.0268	<0.0418	<0.0061	<0.0152	0.05(1)
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	<0.0047	<0.0023	<0.0029	<0.0029	<0.0033	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0018	<0.0013	<0.0074	<0.0028	<0.0027	<0.0044	<0.0037	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.121 B	0.119 B	0.108 B	0.123 B	0.12 J	0.124 J	0.115 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	<0.00015	<0.00021	<0.00038	<0.00012	<0.000062	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	<0.00031	<0.00041	<0.00043	<0.00088	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	84.9	72.7	58.4	85.5	88.6	87.1	86.4	---
CHROMIUM	0.017	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	<0.00058	0.0011 B	<0.0013	<0.0018	<0.0014	<0.00091	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0036	<0.00076	<0.00088	0.00079 B	<0.0013	0.0016 J	0.0012 J	---
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	<0.0014	<0.00079	<0.00092	<0.00074	0.00065 J	1.3(2)
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.599	0.358	0.359	0.416	0.538 J	0.477	0.593	0.3(1)
LEAD	0.0074	<CRDL	<CRDL	<CRDL	<CRDL	0.00043 B	0.001 B	0.0036	<0.0024	<0.0042	<0.006	<0.004	0.015(2)
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	33.6	30.2	22.2	33.9	34.3	33.6	33.9	---
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.251	0.25	0.157	0.291	0.27	0.284	0.248 J	0.05(1)
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.000089 B	0.000009 B	0.000064 B	<0.000026	<0.000071	<0.000046	<0.00013	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0046	0.0016 B	<0.0019	0.0019 B	<0.0018	0.0028 J	0.002 J	---
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	3.38 B	5.55	9.55	3.19 B	3.26 J	3.44 J	3 J	---
SELENIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00088	<0.0007	<0.004	<0.0038	<0.002	<0.0034	<0.0062	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00057	<0.00072	0.00051 J	<0.00062	0.1(1)
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	52.7	48.3	48.7	49.9	51.3	52.9	48.9	---
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0018 B	<0.0011	<0.0065	<0.0035	<0.0059	<0.0086	<0.0079	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0052	0.00058 B	0.0012 B	0.0011 B	<0.0013	0.00051 J	<0.00085	---
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.002	0.0097 B	0.0076 B	<0.0011	<0.0046	<0.0016	<0.0019	5(1)

All units are mg/L.
Shade: Result > MCL
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

B: Blank Contamination
CRDL: Contract Required Detection Limit

J: Estimated Concentration

(1): Secondary Drinking Water Standard
(2): Action Level

Attachment E
Baier Subsite 1993 through 2006 Deep Groundwater Monitoring Data

Table 5
GW Concentrations: 1993 thru 2006
Deep Wells

Well	BRA-3D												Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	09/98	09/00	07/03	09/04	09/06	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0223	<0.0412	<0.043	<0.0268	<0.0418	<0.0061	<0.0152	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	0.0069 B	<0.0023	<0.0029	<0.0029	<0.0035	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0018	0.0015 B	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.163 B	0.153 B	0.143 B	0.134 B	0.144 J	0.144 J	0.129 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	<0.00016	<0.00021	<0.00036	0.00015 J	<0.000062	0.004
CADMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	<0.00031	<0.00041	<0.00043	<0.00088	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	69.8	67.4	64.3	70.9	66.8	67.3	68.2	—
CHROMIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0029	<0.00058	<0.00068	0.004 B	<0.0018	<0.0014	<0.00091	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0036	0.0026 B	0.0024 B	0.0012 B	0.0023 J	0.0027 J	0.0035 J	—
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0042	<0.00048	<0.0014	0.0016 B	<0.00092	<0.00074	0.00074 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.202	0.198	0.0699 B	0.0609 B	0.186 J	0.0543 J	0.131	0.3[1]
LEAD	<CRDL	0.0059	<CRDL	0.0044	<CRDL	<0.00043	0.00036 B	0.0025 B	<0.0024	<0.0042	<0.006	<0.004	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	29.4	27.9	27.5	30.1	28.7	28.3	29.4	—
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.919	0.772	0.784	0.589	0.949	0.814	0.499 J	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.000083 B	<0.000039	0.00015 B	0.000044 B	<0.000071	<0.000048	<0.00013	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0045	0.0056 B	0.0059 B	0.0103 BP	0.0033 J	0.0054 J	0.0046 J	—
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	2.95 B	2.75 B	4.51 B	3.95 B	3.2 J	4.59 J	2.75 J	—
SELENIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00068	<0.0007	<0.004	<0.0038	<0.002	<0.0034	<0.0052	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00067	<0.00072	0.00054 J	<0.00052	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	54.2	51.4	50.9	52.9	50.7	52.3	46.2	—
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.0011	<0.0085	<0.0035	<0.0059	<0.0068	<0.0079	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0052	0.001 B	0.0011 B	0.001 B	<0.0013	0.00056 J	<0.00085	—
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.002	0.0128 B	0.0095 B	0.0028 B	<0.0046	<0.0016	0.0031 J	5[1]

All units are mg/L.
Shade: Result > MCL
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified

B: Blank Contamination
CRDL: Contract Required Detection Limit

J: Estimated Concentration

(1): Secondary Drinking Water Standard
(2): Action Level

Attachment E
Baier Subsite 1993 through 2006 Deep Groundwater Monitoring Data

Table 5
GW Concentrations: 1993 thru 2006
Deep Wells

Well	BRA-4D												Screening
Date	09/93	12/93	03/94	06/94	09/94	09/95	09/96	10/98	09/00	07/03	09/04	09/06	Criteria
ALUMINUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	5.68	0.344	<0.043	<0.0268	<0.0418	0.0412 J	0.334	0.05[1]
ANTIMONY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0116	<0.0019	<0.0047	<0.0023	<0.0029	<0.0029	<0.0035	0.006
ARSENIC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0033 B	<0.0013	<0.0074	<0.0029	<0.0027	<0.0044	<0.0037	0.01
BARIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.148 B	0.0557 B	0.0504 B	0.0499 B	0.0474 J	0.0488 J	0.0726 J	2
BERYLLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00041	<0.00056	<0.00015	<0.00021	<0.00036	0.00016 J	0.0001 J	0.004
CADMIUM	0.0084	<CRDL	<CRDL	<CRDL	<CRDL	<0.0014	<0.00038	<0.00049	0.00031 B	<0.00041	<0.00043	<0.00088	0.005
CALCIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	211	206	175	169	191	173	167	---
CHROMIUM	0.0182	<CRDL	<CRDL	<CRDL	<CRDL	0.009 B	0.0006 B	0.0011 B	0.0034 B	<0.0018	<0.0014	0.0016 J	0.1
COBALT	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0144 B	0.0051 B	0.0031 B	0.0034 B	0.0033 J	0.0034 J	0.0066 J	---
COPPER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0191 B	0.0017 B	<0.0014	<0.00079	<0.00092	<0.00074	0.0018 J	1.3[2]
IRON	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	13.2	1.03	0.599	0.104	0.0288 J	0.431	1.55	0.3[1]
LEAD	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0062	0.00092 B	<0.0023	<0.0024	<0.0042	<0.006	<0.004	0.015[2]
MAGNESIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	83	82.1	73.5	77.5	76.3	71.4	78.2	---
MANGANESE	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	1.33	0.663	0.698	1.33	1.55	1.18	1.74 J	0.05[1]
MERCURY	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.00011 B	<0.000009	0.00012 B	0.000032 B	<0.000071	0.000072 J	<0.00013	0.002
NICKEL	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0224 B	0.0055 B	0.0061 B	0.0072 B	0.0067 J	0.0062 J	0.007 J	---
POTASSIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	5.24	3.98	3.86 B	4. B	4.29 J	4.30 J	3.93 J	---
SELENIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.00068	<0.0007	<0.004	<0.0038	<0.002	<0.0034	<0.0062	0.05
SILVER	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	<0.0028	<0.00072	<0.00091	<0.00067	<0.00072	0.00051 J	<0.00062	0.1[1]
SODIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	71.6	61.8	75.5	66.5	71.3	68.2	60	---
THALLIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0023 B	<0.0011	<0.0065	<0.0035	<0.0059	<0.0086	<0.0079	0.002
VANADIUM	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0204 B	0.0012 B	0.0016 B	0.001 B	<0.0013	0.0013 J	0.0016 J	---
ZINC	<CRDL	<CRDL	<CRDL	<CRDL	<CRDL	0.0549	0.0096 B	0.0079 B	<0.0011	<0.0046	<0.0016	<0.0019	5[1]

All units are mg/L. B: Blank Contamination J: Estimated Concentration (1): Secondary Drinking Water Standard
Shade: Result > MCL CRDL: Contract Required Detection Limit (2): Action Level
Screening Criteria: Federal Maximum Contaminant Levels (MCLs) unless specified