SECOND FIVE-YEAR REVIEW
FOR THE
MID-SOUTH WOOD PRODUCTS SUPERFUND SITE
MENA, ARKANSAS

SEPTEMBER 2002

917452

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
DALLAS, TEXAS

SECOND FIVE-YEAR REVIEW FOR
MID-SOUTH WOOD PRODUCTS SUPERFUND SITE
MENA, ARKANSAS

Summary Of Five-Year Review

The selected remedy (1986 Record of Decision [ROD]) at the Mid-South Wood Products Superfund Site (Mid-South Wood Products) includes three components:

1. Excavation, consolidation, and solidification/stabilization of contaminated soil from the North and South Land Farms and Old Pond Area, followed by clay capping. Edward Hines Lumber Company (E.H. Lumber Co.) was responsible for the remedy and Operation and Maintenance (O&M) following the implementation of the remedy.

2. Ground water recovery treatment and monitoring and operation of the water treatment plant, which was the responsibility of Mid-South Wood Products.

3. Mitigation of contaminant runoff from the active chromated copper arsenate (CCA) wood-treating facility currently operated by Mid-South Wood Products.

The remedy was completed in September 1989. Since 1989, O&M activities have been performed by the E. H. Lumber Co. Trust. The first Five-Year Review was completed in June 1997. The site has had a National Pollutant Discharge Elimination System (NPDES) monitoring system since 1989. In 1999, the U.S. Environmental Protection Agency (EPA) determined that an NPDES permit was not required at a Superfund Site. The NPDES monitoring data collected during the past 9 years at four off-site stream monitoring stations indicate that any exceedances for arsenic, chromium, and pentachlorophenol (PCP)–the primary contaminants of concern (COC) at the site–are very rare. This demonstrates that the hazardous chemicals associated with the Superfund site are not likely to be migrating off site, and thus there are no adverse ecological impacts on the surrounding areas. However off-site migration of sediments should be evaluated.

Findings

During the Second Five-Year Review (1997 to 2002), EPA found that:

1. The ground water recovery and treatment system is not operating at designed capacity.

2. Padlocks are missing from three monitoring wells and one well is damaged and requires repair.

3. CCA-treated lumber is being stockpiled on the ground in an outdoor storage area, increasing the potential for off-site migration of CCA contaminants.

4. In a 1999 surface and subsurface soil investigation, the Arkansas Department of Environmental Quality (ADEQ) detected chromium at levels that exceeded the current soil cleanup standard (1986 ROD). Previous investigations from 1994 through 1997 also detected arsenic and chromium exceedances in the remediated part of the site. While these levels exceed the ROD cleanup standard, they do not appear to exceed a risk-based level of concern.

Actions Needed

1. Mid-South Wood Products must hire a trained licensed operator to maintain the ground water recovery and treatment system, install a storm water runoff system, and develop measures for preventing off-site migration.

2. The EPA contractor will conduct an investigation of the site in the near future to evaluate ADEQ concerns described in the November 1999 Remedial Action Investigation Report and subsequent discussions. These include evaluation of surface and subsurface contaminant levels at several locations and the adequacy of the cap and the French Drain system in the Old Pond area.

3. In accordance with Title 40 Code of Federal Regulations 300.430(e)(2)(i)(A)(2), EPA intends to propose a ROD Amendment to:

    a. Revise the soil remediation goals consistent with the anticipated land use for the site based on the 2001 risk evaluation.
    b. Partially shut down the existing ground water recovery and treatment system under a Technical Impracticability waiver, as suggested by ADEQ in its November 1999 report.

Determinations

I have determined that the remedy for the Mid-South Wood Products Superfund site has been protective of human health and the environment in the short-term, and will be protective in the long run provided the action items identified in this report are addressed as described above.

Myron O. Knudson

9-27-02

Myron O. Knudson, P.E.
Director
Superfund Division
U.S. Environmental Protection Agency, Region 6

Date

CONTENTS

Section			Page
ACRONYMS AND ABBREVIATIONS			iv
EXECUTIVE SUMMARY			ES-1
1.0	INTRODUCTION		1
2.0	SITE CHRONOLOGY		2
3.0	BACKGROUND		2
	3.1	PHYSICAL CHARACTERISTICS	2
	3.2	LAND AND RESOURCE USE	5
	3.3	HISTORY OF CONTAMINATION	6
	3.4	INITIAL RESPONSE	7
	3.5	BASIS FOR TAKING RESPONSE	8
	3.6	CONTAMINANTS OF CONCERN	8
4.0	REMEDIAL ACTIONS		10
	4.1	REMEDY SELECTION	10
	4.2	REMEDY IMPLEMENTATION	11
	4.3	SYSTEM OPERATIONS	13
		4.3.1 Long-term Ground Water Monitoring	13
		4.3.2 Ground Water Recovery and Treatment System	14
		4.3.3 Treated Ground Water Discharge	16
	4.4	PROGRESS SINCE THE LAST FIVE-YEAR REVIEW	17
5.0	FIVE-YEAR REVIEW PROCESS		17
6.0	FIVE-YEAR REVIEW FINDINGS		17
	6.1	INTERVIEWS	17
	6.2	FIVE-YEAR REVIEW SITE INSPECTION	18
	6.3	ARAR REVIEW	19
	6.4	DATA REVIEW	22
7.0	TECHNICAL ASSESSMENT		23
8.0	ISSUES AND DEFICIENCIES		25
9.0	RECOMMENDATIONS AND FOLLOW-UP ACTIONS		26

FIVE-YEAR REVIEW REPORT
FOR THE
MID-SOUTH PRODUCTS SUPERFUND SITE
MENA,
POLK COUNTY, ARKANSAS

Prepared by:

REGION 6
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SECOND FIVE-YEAR REVIEW FOR

MID-SOUTH WOOD PRODUCTS SUPERFUND SITE

EPA ID# ARD092916188

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CONTENTS (Continued)

10.0 PROTECTIVENESS STATEMENTS 26

11.0 NEXT REVIEW 26

Appendices

A LIST OF DOCUMENTS REVIEWED
B SITE VISIT REPORT

Attachments

A-1 SITE LAYOUT AND WELL SUMMARY
A-2 WATERSHED MAP
B 1989/1990 O&M MANUAL WELL CLOSURE PROCEDURE
C WELL SHUTOFF CRITERIA AND GROUND WATER ANALYTICAL DATA, 1989-2002
D-1 EFFLUENT LIMITATIONS, MONITORING REQUIREMENTS, EXCEEDANCES, AND FLOW VOLUMES, 1997-2001
D-2 HISTORICAL SUMMARY OF NPDES ANALYTICAL DATA, 1989-2002
D-3 GROUND WATER RECOVERY SYSTEM CUMULATIVE FLOW DIAGRAMS, 1990-2001
E ANALYTICAL DATA TRENDS FOR GROUND WATER, 1989-2002

TABLES

Table		Page
1	CHRONOLOGY OF SITE EVENTS	3
2	CONTAMINANTS OF CONCERN	9
3	1986 ROD CLEANUP ACTION LEVELS AND PROPOSED SOIL PRGS	21
4	ISSUES/DEFICIENCIES IDENTIFIED	27
5	RECOMMENDATIONS AND FOLLOW-UP ACTIONS	28

ACRONYMS AND ABBREVIATIONS

ADEQ	Arkansas Department of Environmental Quality
ADPCE	Arkansas Department of Pollution Control and Ecology
ARAR	Applicable or relevant and appropriate requirement
B&F	B & F Engineering, Inc.
bgs	Below ground surface
CCA	Chromated copper arsenate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	Contaminant of concern
cPAH	Carcinogenic polycyclic aromatic hydrocarbon
DOJ	U.S. Department of Justice
EPA	U.S. Environmental Protection Agency, Region 6
FS	Feasibility study
Hines	Edward Hines Lumber Company
HRS	Hazard Ranking System
mg/kg	Milligram per kilogram
mg/L	Milligram per liter
Mid-South	Mid-South Wood Products
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
O&M	Operation and Maintenance
O&M Manual	Mid-South Superfund Site Remediation O&M Manual
PAH	Polycyclic aromatic hydrocarbon
PCP	Pentachlorophenol
ppm	Part per million
PRG	Preliminary remediation goal
PRP	Potentially responsible party
RA	Remedial action
RAO	Remedial Action Objective
RD	Remedial design
RI	Remedial investigation
RI/FS	Remedial investigation/feasibility study
ROD	Record of Decision
SMS	Stream monitoring station
TCLP	Toxicity characteristic leaching procedure
Tetra Tech	Tetra Tech EM Inc.
WWTP	Wastewater treatment plant

EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency, Region 6 (EPA), conducted a five-year review of the remedial actions (RA) implemented at the Mid-South Wood Products (Mid-South) Superfund site in Mena, Arkansas. The purpose of the five-year review is to determine if the remedy at the site is protective of human health and the environment. This review was conducted from July through September 2002, and the findings and conclusions are documented in this report.

EPA placed the Mid-South site on the National Priorities List on September 8, 1983. From 1983 to 1986, EPA conducted various investigations at the site. From January through April 1984, EPA conducted a remedial investigation (RI) and feasibility study (FS), which included on- and off-site investigations. In November 1985, EPA conducted a supplemental RI of the operational chromated copper arsenate (CCA) wood-treating plant; the FS was completed in April 1986. The potential health risks for the Mid-South site were based on possible contact with, or ingestion of, contaminated soils or ground water. On September 9,
1986, EPA received an RA work plan from the potentially responsible parties, and after some discussion, a revised work plan was received on October 7, 1986. On November 14, 1986, EPA approved the Record of Decision (ROD). The ROD and subsequent remedial design called for excavation, consolidation, residuals solidification/stabilization, on-site disposal, clay capping, and ground water recovery, treatment, and monitoring. Mid-South was also required to take any necessary measures to reduce contaminant runoff from the active CCA wood-treating facility. In EPA's FS Report, cleanup action levels were derived to limit exposure to arsenic, chromium, and carcinogenic polycyclic aromatic hydrocarbons (including benzo[a]pyrene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, and chrysene) in contaminated soils.

Remedial activities at the site began in May 1988, and by March 25, 1989, approximately 100,000 cubic yards of contaminated soil and wastes had been excavated, stabilized, and placed in specified on-site capped areas. On July 7, 1988, excavation of contaminated soil began in the South Land Farm. The soil was taken to the North Land Farm for eventual capping. The oils, liquids, and sludges from the Small Old Pond and Old Plant areas were excavated, stabilized, and then consolidated with soils in the North Land Farm. Oils, liquids, and sludges from the Old Pond were excavated, stabilized, and then returned to the Old Pond where it was capped in place. The remaining contaminated soils were placed in the North Land Farm.

The materials placed in both the Old Pond and the North Land Farm were compacted and covered with a drainage layer of sand, 3 feet of compacted clay, and 2 feet of topsoil. The topsoil layer was then seeded and mulched. The excavated areas on site were backfilled with clean fill material, compacted, regraded to achieve proper drainage, and seeded to prevent soil erosion. A water treatment facility was constructed on site, which utilizes a carbon filtration system, settling tanks, and an oil-water separator to remove contaminants from the ground water. A series of French drains and recovery wells were installed around the site to intercept the contaminated ground water and pump it to the water treatment facility. One of the recovery wells exhibited high concentrations of inorganic constituents, and is pumping directly to the CCA plant for use as make-up water in the wood treatment operations.

The North Land Farm and Old Pond Areas were fenced in 1989. A restrictive covenant was filed by Mid-South with the Polk County Clerk on September 25, 1989, to ensure that residential use, destroying the integrity of the cap, drilling into the contaminated aquifer, and use of ground water from the site is prohibited.

Remedial activities performed at the active CCA wood-treating facility included constructing a roof over the drip pad, which is used to store freshly treated lumber and collect drippings of CCA solution. Other activities included cleaning out the old sump area beneath the treatment vessel; backfilling the sump area and replacing it with a steel-lined sump and gravity flow return line; cleaning out the treatment building sump; and installing a float-actuated pump in the CCA treatment building.

Due to the disposal of stabilized soils and wood treating wastes in on-site disposal units, maintenance to the disposal cell, disposal cell cap, and associated drainage ditches is one of Mid-South's on-going responsibilities. Additionally, Mid-South is required to inspect the condition of the roads and the site fencing and repair as necessary.

The remedial action objectives listed in the ROD for the Mid-South site are to: (1) minimize the threat to the public health from the ingestion of or contact with on-site contaminated soil; (2) minimize the threat to the public health from direct ingestion of shallow ground water, both on site and downgradient of the site; (3) minimize erosion of contaminated soil and off-site migration to protect public health and environmental quality; (4) minimize leaching of contaminants into surface water and ground water; and (5) identify cost-effective alternatives for remediation of the site. The RA meets the protectiveness criteria in the short term, but the evaluation is continuing.

The ADEQ conducted a Remedial Action Investigation Report and published it in November 1999. As a result of the November 1999 report, ADEQ's concerns could be summarized as follows:

1. Is the ground water surfacing in the drainage ditch and affecting off-site receptors (Rivers, etc.)?

2. Near wells RW-6 and RW-17 and around the CCA Plant area, delineate the extent of subsurface soil contamination and establish if ground water at the top of rock is in contact with the contaminated subsurface soils, and if contaminated ground water is surfacing in the drainage ditch. During May 1994, EPA collected four samples from the drainage ditches in the general vicinity, which exceeded the 1986 chromium standards; however, EPA found no physical indication that contaminants are being released from either capped areas. Upon closer examination, EPA noted all four sample points were located in drainage ditches with headwaters originating at the present CCA Plant. Additional samples collected in August 1994 provided similar results; however, the four points where samples were collected could not be tied to the CCA Plant.

3. For the French drains in the Old Pond Area and CCA Plant, establish if ground water is (1) moving horizontally along the top of the rock surface, (2) bypassing the French drains, (3) contacting the waste in the landfill or waste remaining in place near RW-6, RW-17, and RW-15, and (4) becoming contaminated and surfacing in the drainage ditch.

4. Around Old Pond Area, establish if water is infiltrating through the cap, contacting the waste, contaminating the ground water at the top of the rock, and surfacing in the drainage ditch.

During the First Five-Year Review the four samples mentioned in the above item 2 had no exceedance of chromium. Thus EPA had a risk evaluation performed for arsenic using 1 in 100,000 excess cancer risk under an industrial land use scenario. The protective arsenic concentration for this scenario was 38 parts per million (ppm) and the highest concentration from the four sample points (May 1994, from Item 2 above) was 31 ppm. Subsequently, in 2001, an EPA risk assessor conducted a risk evaluation for all of the contaminants of concern at the site, i.e., arsenic, chromium, and polycyclic aromatic hydrocarbons.

In accordance with Title 40 Code of Federal Regulations 300.430(e)(2)(i)(A)(2), EPA intends to use the 2001 evaluation to propose a ROD amendment to: (1) revise the soil preliminary remediation goals (PRG) to levels consistent with the anticipated land use of the site, based on a 1 in 100,000 excess cancer risk under an industrial scenario; and (2) issue a Technical Impracticability Waiver to partially shut down the ground water treatment system in the vicinity of the Old Pond Area, based upon the Arkansas Department of Environmental Quality's recommendation that the current system is not effective given the fractured hydrogeologic conditions that exist at the site.

Recommendations and follow-up actions include: (1) hire a trained licensed operator to maintain the ground water treatment facility and complete ground water remediation; (2) a secondary containment or storm water runoff collection system should be installed at the active plant; and (3) secure monitoring well MW-11 and observation wells M-4A and M-4B and repair the hinged protective casing for monitoring well MW-11; (4) an EPA contractor should conduct an investigation of the site in the near future to evaluate ADEQ concerns described in the November 1999 Remedial Action Investigation Report, some of which relate to sediments in the ditch near the CCA Plant.

National Pollutant Discharge Elimination System discharge data since 1989 indicate that no exceedances have been reported for arsenic, chromium, or pentachlorophenol at any of the four off-site stream monitoring stations, which demonstrates that these hazardous constituents are not likely to be impacting the area surrounding the Superfund site; thus, the ecological impact of the site on the surrounding area is negligible. The EPA intends to propose a ROD Amendment to revise the soil remediation goals consistent with the anticipated land use for the site (industrial/commercial) based on the 2001 risk evaluation.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name (from WasteLAN): Mid-South Wood Products Superfund Site		
EPA ID (from WasteLAN): ARD092916188		
Region: 6	**State:** AR	**City/County:** Polk
SITE STATUS		
NPL Status: 9 Final 9 Deleted : Other (specify) Second Five-Year Review		
Remediation Status (choose all that apply): 9 Under Construction 9 Operating : Complete		
Multiple OUs?* 9 YES : NO	**Construction Completion Date:** 09/28/89	
Has site been put into reuse? 9 YES : NO		
REVIEW STATUS		
Reviewing Agency: : EPA 9 State 9 Tribe 9 Other Federal Agency		
Author Name: Shawn Ghose, M.S., P.E.		
Author Title: Remedial Project Manager	**Author Affiliation:** U.S. EPA, Region 6	
Review Period:** 06/05/1997 to 06/05/2002		
Date(s) of Site Inspection: 08/08/2002		
Type of review: : Statutory 9 Policy 9 Post-SARA 9 Pre-SARA 9 NPL-Removal only 9 Non-NPL Remedial Action Site 9 NPL State/Tribe-lead 9 Regional Discretion		
Review Number: 9 1 (first) : 2 (second) 9 3 (third) 9 Other (specify)		
Triggering Action: 9 Actual RA On-site Construction at OU1 9 Construction Completion 9 Other (specify)	9 Actual RA Start at OU # : Previous Five-Year Review Report	
Triggering Action Date (from WasteLAN): June 5, 1997		
Due Date (Five Years After Triggering Action Date): September 13, 2002		

* "OU" refers to operable unit

** The review period refers to the period during which the five-year review was conducted.

Five-Year Review Summary Form

Issues/Deficiencies:

- Ground water is not being treated at a flow rate that approaches the design flow rate.
- Ground water treatment system is not undergoing proper operation and maintenance.
- Deficiencies were noted in the treated ground water discharge monitoring requirements.
- Monitoring well MW-11 and observation wells M-4A and M-4B are not properly secured. Additionally, the casing for monitoring well MW-11 is damaged.
- ADEQ has evaluated the existing ground water recovery and treatment system and found it to be ineffective under the existing fractured hydrogeologic conditions.
- 1999 ADEQ surface and subsurface soil sampling RA investigation revealed concentrations of chromium in exceedance of the current cleanup standard (1986 ROD).

Recommendations and Follow-up Actions:

- EPA intends to propose a ROD amendment to: (1) revise the soil preliminary remediation goals (PRGs) to levels consistent with anticipated land use for the site and (2) partially shut down the existing ground water recovery and treatment system in the vicinity of the Old Pond Area under a Technical Impracticability waiver, based upon the ADEQ's recommendation.
- A trained licensed operator is needed at the site in order to maintain the treatment facility and complete ground water remediation.
- A secondary containment or storm water runoff collection system should be installed at the active plant.
- Monitoring well MW-11 and observation wells M-4A and M-4B should be properly secured. The hinged protective casing for monitoring well MW-11 should be repaired.
- EPA contractor will conduct an investigation of the site in near future to evaluate ADEQ concerns described in the November 1999 Remedial Action Investigation Report.

Protectiveness Statement(s):

Pending EPA issuance of the upcoming ROD Amendment, protective short-term objectives of the remedy have been met ant the evaluation is continuing.

Long-term Protectiveness:

A restrictive covenant was filed by Mid-South with the Polk County Clerk on September 25, 1989, to ensure that residential use, destroying the integrity of the cap, drilling into the contaminated aquifer, and use of ground water from the site are prohibited. Long-term protectiveness will have to be re-evaluated upon issuance of the upcoming ROD Amendment.

1.0 INTRODUCTION

The U.S. Environmental Protection Agency, Region 6 (EPA), with assistance from Tetra Tech EM Inc. (Tetra Tech), and in coordination with the Arkansas Department of Environmental Quality (ADEQ), conducted a five-year review of the remedial action (RA) implemented at the Mid-South Wood Products (Mid-South) Superfund site in Mena, Arkansas. The purpose of the five-year review is to determine if the remedy at the site is protective of human health and the environment. The Mid-South site comprises just one operable unit for soil and ground water. This is EPA's second five-year review for the Mid-South Superfund site, and it addresses the entire site. The triggering action for this review was the completion of the first five-year review (report dated June 5, 1997). This review, for the 1997-2002 five-year period, was conducted from July through September 2002, and the methods, findings, conclusions, and recommendations from the review are documented in this report.

This review is required by statute. The EPA must implement five-year reviews consistent with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA §121(c), as amended, 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.

NCP Part 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.

Due to the fact that hazardous substances, pollutants, or contaminants remain at the Mid-South site above levels that allow for unrestricted use and unlimited exposure, a five-year review is required.

2.0 SITE CHRONOLOGY

Table 1 lists the chronology of events for the Mid-South site. (Internet address: http://www.epa.gov/superfund/sites/cursites/c3ar/s0600136.htm)

3.0 BACKGROUND

The following site background information presents the: (1) physical characteristics of the Mid-South site, including the location, history, geology/hydrogeology, and site hydrogeologic conditions; (2) initial response; (3) basis for taking response; and (4) contaminants of concern (COC) listed in the 1986 Record of Decision (ROD) for the site.

3.1 PHYSICAL CHARACTERISTICS

The Mid-South site covers approximately 57 acres in Polk County, Arkansas, in the western portion of the state. It is located between U.S. Highway 71 and State Highway 375 immediately southwest of the town of Mena (population 6,000). The site consists of an abandoned wood-treatment operation covering 20 acres on the southwest side and an active wood treatment operation covering 37 acres on the northeast side of the site. Wastes from three separate wood-preservative processes have been disposed of on the inactive portion of the site, including creosote compounds, pentachlorophenol (PCP), and chromated copper arsenate (CCA).

The Mid-South site and surrounding area have a rolling topography with a general surface elevation approximately 1,100 feet above mean sea level (surface relief of about 25 feet). The site and surrounding area are located in the Caddo Basin within the Ouachita Mountains physiographic sub-province, and are bounded by the Fourche Mountains to the north and the Caddo and Cossatot Mountains to the south. The site is located on the northern flank of a broad syncline. The bedrock consists of multiple steeply dipping fractured beds, in a sequence of sandstones, shales, and sandstone and shale.

TABLE 1

CHRONOLOGY OF SITE EVENTS

Date	Event
December 1, 1980	Site discovery
January 1, 1981	Preliminary assessment
January 1, 1981 to February 1, 1981	Site inspection
December 30, 1982	Proposed to the NPL
September 1, 1983	HRS package
September 8, 1983	Final listing on the NPL
September 30, 1983	NPL PRP search
September 23, 1983 to November 14, 1986	Combined RI/FS
November 14, 1986	Record of Decision
May 15, 1986 to December 31, 1987	RD/RA negotiations
June 30, 1986 to March 17, 1988	Consent decree negotiations
March 17, 1988	Lodged by DOJ
March 17, 1987 to March 24, 1988	PRP RD
March 24, 1988 to September 28, 1989	PRP RA
May 17, 1990 to June 29, 1990	Removal assessment
December 21, 1992	Removal assessment
August 1, 1993 to June 16, 1997	First Five-Year Review Remedy Assessment
October 1998 to April 1999	ADEQ Remedial Action Investigation
January 1, 1995 to December 31, 1999	Mid-South Annual Report and Five-Year Evaluation (prepared by B&F)

TABLE 1 (Continued)

CHRONOLOGY OF SITE EVENTS

Date	Event
January 1, 2001 to December 31, 2001	Mid-South Annual Report (prepared by B&F)

Notes:

ADEQ	Arkansas Department of Environmental Quality
B&F	B & F Engineering, Inc. (Mid-South consultant)
DOJ	U.S. Department of Justice
HRS	Hazard Ranking System
Mid-South	Mid-South Wood Products, Inc.
NPL	National Priorities List
PRP	Potentially responsible party
RA	Remedial action
RD	Remedial design
RI/FS	Remedial investigation and feasibility study

Ground water at the site occurs primarily in weathered bedrock and in fractured sandstone and shales. A major fracture zone on site is associated with a fault that trends through the site from west to east along the trace of the East Fork of Moon Creek. This fault is characterized by highly fractured shales and strikes northwest through the site, underneath the Old Pond Area. Ground water beneath the site is encountered at approximately 10 to 30 feet below ground surface (bgs) from Paleozoic Age bedrock; this bedrock contains no major aquifer, and ground water is derived principally from the secondary porosity of the rock (joints, fractures, and bedding planes). Ground water flow under the site is controlled primarily by topography—ground water flow is to the east and southeast on the eastern half of the site and to the west, south, and southwest on the western half of the site (gradient of 0.0002 foot per foot). Ground water flow is through a fractured rock regime with a downward flow gradient towards the thrusted fault zone. A ground water high is observed in the monitoring well M-7 area with flow to the NE and to the SW.

3.2 LAND AND RESOURCE USE

The northeastern half of the site contains an active wood treating operation that uses the CCA process. The primary land use near the site is agricultural and residential. Along both sides of State Highway 375 immediately north of the site are several residences on large lots, several small farms, two cemeteries, and a church. To the west of the site are several larger farms, including open pastures and wooded areas. The southern boundary of the site is formed by railroad tracks and U.S. Highway 71; there are several businesses and residences along both sides of U.S. Highway 71, as well as to the east of the site. About 40 to 50 people reside on the 18 properties that are adjacent to the site. There is no significant change in future land use projected.

The town of Mena and surrounding smaller towns obtain their drinking water from Ward Lake and Iron Forks Reservoir, which are located 2.5 miles north and 6 miles northeast of the site, respectively. The two surface water bodies provide Mena with a projected yield of 8.6 million gallons per day. The remainder of the rural water supply comes primarily from ground water, which occurs in Paleozoic Age bedrock. Approximately 5,700 people are served by drinking water wells within 1 mile of the site; however, rural residents located downgradient (north and northwest) of the site between the on-site source areas and the ground water discharge area along the East Fork of Moon Creek have been placed on the city water supply.

3.3 HISTORY OF CONTAMINATION

The site was originally developed by Nebraska Bridge Supply and Lumber Company as a wooden post and pole production facility in the late 1930s. In 1955, Nebraska Bridge Supply and Lumber Company, operating under the name of Three States Lumber Company, installed a pressure-treating system that preserved wood with creosote. In 1967, Edward Hines Lumber Company (Hines) purchased the plant and introduced PCP into the wood-treating operation. The pressure cylinders associated with the PCP and creosote wood treating activities were located in what is now referred to as the Old Plant site. Waste PCP and creosote were stored in an unlined impoundment (referred to as the Small Old Pond) adjacent to the Old Plant site; both the Old Plant site and Small Old Pond occupied approximately 10,000 square feet. The Old Pond–a larger unlined impoundment about 112,500 square feet in size that was located west of the Old Plant site–was later excavated to increase waste storage capacity. As the Old Pond filled with PCP and creosote waste, some of the liquid and sludge waste were deposited onto nearby land surfaces and mixed with the surface soil; these areas are now referred to as the North Land Farm (approximately 150,000 square feet) and South Land Farm (approximately 84,000 square feet). Sawdust, wood chips, and other wood wastes were deposited into a swale area (now called the Landfill Area) located west of the Old Plant and north of the Old Pond (Attachment A).

In 1977, Hines converted the Old Plant site into a CCA treatment facility. In September 1978, Hines sold the facility, and soon afterwards, the new owner formed the Mid-South Wood Products of Mena, Inc. At some point, Mid-South abandoned the original wood-treating facility and constructed a new CCA facility, where they currently continue CCA wood-treating operations. Mid-South's currently active CCA facility is located adjacent to the Old Plant site, and consists of a pressure-treating cylinder and several aboveground storage tanks for storage of the CCA preservative solution. Treated wood is allowed to drip dry on a concrete pad prior to storage on the property. Releases of arsenic and chromium have been detected adjacent to the active plant and are attributed to uncontrolled surface water runoff.

Because the CCA wood treatment process is a closed-loop recycling system, and Mid-South had no intentions of using PCP or creosote in its operation, use of the Old Pond was discontinued in 1978. In 1980, Mid-South constructed a dike across the lower end of the Landfill Area to control runoff, which in turn, resulted in the formation of Clear Lake.

During closure activities, the contents of the Old Pond were reportedly pumped from the pond and sprayed and tilled into the soil in the area now referred to as the North Land Farm. Some of the soil and waste sludge mixture was placed back into the Old Pond, with the remainder of the soil-waste mixture remaining on the North Land Farm Area. The Old Pond area was then graded and covered with soil.

3.4 INITIAL RESPONSE

From 1980 through 1982, investigations triggered by a 1976 fish kill that occurred in Rock Creek and Mountain Fork River downstream of the Mid-South site determined that ground water (including nearby drinking water wells), surface water, and sediment near the site were contaminated with PCP, arsenic, and chromium. In December 1981, the Arkansas Department of Pollution Control and Ecology (ADPCE; predecessor to ADEQ) conducted a sampling investigation at the site and concluded that the contamination was attributable to Mid-South site operations. In 1982, the Mid-South site was added to the proposed NPL. The final listing date on the NPL was September 8, 1983.

The EPA identified Hines and Mid-South as potentially responsible parties (PRP) at the site, and on March 18, 1982, sent notice letters to the PRPs offering them an opportunity to conduct a remedial investigation (RI). On March 31, 1983, ADPCE issued an Administrative Order requiring that Hines and Mid-South, as PRPs, perform certain short-term RAs and submit a work plan for a full investigation of the site on a specified schedule. Since this schedule was not met, on December 17, 1983, ADPCE requested that EPA implement a remedial investigation/feasibility study (RI/FS) to develop alternative RAs for the site.

From 1983 to 1986, EPA conducted various investigations at the site. From January through April 1984, EPA conducted an RI/FS, which included on- and off-site investigations. In November 1985, EPA conducted a supplemental RI of the operational CCA plant; the FS was completed in April 1986. The potential health risks for the Mid-South site were based on possible contact with, or ingestion of, contaminated soils or ground water.

On April 17, 1986, EPA sent notice letters to Hines and Mid-South informing them of the completion of all RI/FS activities and of EPA's intent to begin the RA process. On September 9, 1986, EPA received a RA work plan from the PRPs and after some discussion, a revised work plan was received on October 7, 1986.

On November 14, 1986, EPA issued the ROD. Throughout much of 1987, a Consent Decree was negotiated between the parties and on May 16, 1988, the Consent Decree was entered in U.S. District Court, Western District of Arkansas. The ROD and subsequent remedial design (RD) called for excavation, consolidation, residuals solidification/stabilization, on-site disposal, clay capping, and ground water recovery, treatment, and monitoring. Mid-South was also required to take any necessary measures to reduce contaminant run-off from the active CCA facility. The estimated capital cost of the remedy was approximately $3.5 million, with Operation and Maintenance (O&M) costs estimated at $153,500 annually.

3.5 BASIS FOR TAKING RESPONSE

Based on the data collected during the RI/FS activities, EPA determined that actual or threatened releases of hazardous substances from the Mid-South site, if not addressed by implementing the response action selected in the ROD, could present an imminent and substantial endangerment to public health, welfare, or the environment.

3.6 CONTAMINANTS OF CONCERN

The COCs are presented in Table 2. Only soil cleanup standards for arsenic, chromium, and carcinogenic polycyclic aromatic hydrocarbons (cPAH, including benzo[a]pyrene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, and chrysene) are specifically addressed in the 1986 ROD. Treated effluent discharge standards and ground water treatment standards for arsenic, chromium, polycyclic aromatic hydrocarbons (PAH), and PCP were specifically addressed in the National Pollutant Discharge Elimination System (NPDES) permit for Outfall 001 and the EPA-approved 1989 O&M Manual, respectively.

TABLE 2

CONTAMINANTS OF CONCERN

Contaminant of Concern	NPDES Discharge Limitation for Treated Effluent (mg/L)	1986 ROD Soil Cleanup Action Level (ppm)	1989/1990 O&M Manual Ground Water Treatment Standard[a] (mg/L)
Arsenic	0.05	5.6	0.05[c]
Chromium	0.05	19.4	0.05[c]
Carcinogenic PAHs	- -	3	- -
Acenaphthene [b]	1.7	- -	- -
Benzo(a)anthracene	- -	- -	0.01[d]
Benzo(b+k)fluoranthene	- -	- -	0.01[d]
Benzo(a)pyrene	- -	- -	0.01[d]
Chrysene	- -	- -	0.01[d]
Fluoranthene [b]	3.98	- -	- -
Naphthalene [b]	2.30	- -	- -
Pentachlorophenol	2.02	- -	0.2[e]

Notes:

EPA	U.S. Environmental Protection Agency
mg/L	Milligram per liter
NPDES	National Pollutant Discharge Elimination System
O&M	Operation and Maintenance
PAH	Polycyclic aromatic hydrocarbon
ppm	Part per million
ROD	Record of Decision

a "Mid-South Superfund Site Remediation O&M Manual" well closure procedure (Attachment B)
b PAH identified in the NPDES permit but not in the 1986 ROD
c EPA maximum contaminant level established under the Safe Drinking Water Act (Attachment B)
d Analytical detection limit (Attachment B)
e EPA reference dose (Attachment B)

4.0 REMEDIAL ACTIONS

The following sections discuss the remedy selected, remedy implementation, systems operations, and progress made since the last five-year review.

4.1 REMEDY SELECTION

The EPA signed the ROD for the Mid-South site on November 14, 1986. Remedial Action Objectives (RAO) were developed in order to aid in the development and screening of RA alternatives for the site. The RAOs for the Mid-South site are listed below:

- Minimize the threat to the public health from the ingestion of or contact with on-site contaminated soil.
- Minimize the threat to the public health from direct ingestion of shallow ground water, both on site and downgradient of the site.
- Minimize erosion of contaminated soil and off-site migration to protect public health and environmental quality.
- Minimize leaching of contaminants into surface water and ground water.
- Identify cost-effective alternatives for remediation of the site.

The selected remedy called for excavation, consolidation, residuals solidification/stabilization, on-site disposal, clay capping, and ground water recovery, treatment, and monitoring. The site PRPs were also required to take any necessary measures to reduce contaminant runoff from the active CCA facility.

In EPA's FS report, cleanup action levels were derived to limit exposure to arsenic, chromium, and cPAHs in contaminated soils. The cleanup criteria called for action levels for arsenic and chromium to be set at any concentration that exceeds the range of background concentrations (specifically, greater than 5.6 parts per million [ppm] for arsenic and greater than 19.4 ppm for chromium). The cleanup requirements for cPAHs would be set at a lifetime cancer risk of $1x10^{-5}$ (3 ppm).

The components of the remedy documented in the ROD were:

- Excavation of all on-site and off-site contaminated soils containing concentrations of cPAHs, arsenic, and chromium above the RAO levels of 3 ppm, 5.6 ppm, and 19.4 ppm, respectively, followed by consolidation of the soils in the North Land Farm
- Contaminated soils consolidated in the North Land Farm Area would be graded and covered with a Resource Conservation and Recovery Act top-soil clay cap.
- Excavation of any free oil, liquid, or sludge found in the heavily contaminated areas of the Small Old Pond and Old Plant site, followed by solidification/stabilization (mixed with clay to immobilize wastes and improve compressive strength) and consolidation with soils in the North Land Farm.
- Any contaminated soil and free oil, liquid, or sludge found in the Old Pond Area were to undergo *in situ* stabilization followed by toxicity characteristic leaching procedure (TCLP) testing prior to capping the stabilized material in place.
- Installation of a ground water recovery and treatment system to include a series of French drains and a water treatment plant; no ground water cleanup levels were specified
- Installation of a ground water monitoring system
- PRPs were required to take any necessary measures to reduce the amount of contaminant runoff from the active CCA plant.
- Fencing and deed restrictions

4.2 REMEDY IMPLEMENTATION

After EPA approval of the PRP's RA work plan, remedial activities at the site began in May 1988.

On July 7, 1988, excavation of contaminated soil began in the South Land Farm. The soil was taken to the North Land Farm for eventual capping. The oils, liquids, and sludges from the Small Old Pond and Old Plant areas were excavated, stabilized, and then consolidated with soils in the North Land Farm. Oils, liquids, and sludges from the Old Pond were excavated, stabilized, and then returned to the Old Pond where it was capped in place. The remaining contaminated soils were placed in the North Land Farm. The stabilized waste would undergo the following tests prior to consolidation in the North Land Farm:

- Paint filter testing to determine the liquid composition of the stabilized waste materials.

- Compressive strength testing to ensure the stabilized waste materials could support the cap.

- Results of TCLP testing were compared to regulatory levels for arsenic (5.0 milligrams per liter [mg/L]), chromium (5.0 mg/L), and PCP (3.6 mg/L) and used as a pass/fail criteria for the stabilized waste materials.

The materials placed in both the Old Pond and the North Land Farm were compacted and covered with a drainage layer of sand, 3 feet of compacted clay, and 2 feet of topsoil. The topsoil layer was then seeded and mulched. The excavated areas on site were backfilled with clean fill material, compacted, regraded to achieve proper drainage, and seeded to prevent soil erosion. By March 25, 1989, approximately 100,000 cubic yards of contaminated soil and wastes had been excavated, stabilized, and placed in the on-site capped areas.

A water treatment facility was constructed on site, which utilizes a carbon filtration system, settling tanks, and an oil-water separator to remove contaminants from the ground water. A series of French drains and recovery wells was installed around the site to intercept the contaminated ground water and pump it to the water treatment facility. One of the recovery wells exhibited high concentrations of inorganic constituents, and is pumping directly to the CCA plant for use as make-up water in the wood treatment operations.

The North Land Farm and Old Pond Areas were fenced in 1989. A restrictive covenant was filed by Mid-South with the Polk County Clerk on September 25, 1989, to ensure that residential use, destroying the integrity of the cap, drilling into the contaminated aquifer, and use of ground water from the site are prohibited.

Remedial activities were also performed at the active CCA wood treatment facility, including constructing a roof over the drip pad, which is used to store freshly treated lumber and collect drippings of CCA solution. Other activities included cleaning out the old sump area beneath the treatment vessel; backfilling the sump area and replacing it with a steel-lined sump and gravity flow return line; cleaning out the treatment building sump; and installing a float-actuated pump in the treatment building.

An additional ground water investigation was conducted along the geologic fault structure that exists along the drainage area between the Landfill and the North Land Farm. A series of wells was installed and the lateral and vertical extent of contamination was identified throughout the length of the fault. All

recovery wells that indicated the presence of contamination were connected to the ground water treatment system.

4.3 SYSTEM OPERATIONS

The 1986 ROD required that the PRPs complete the following activities:

- Disposal of stabilized soils and wood treating wastes in on-site disposal units (North Land Farm Area and Old Pond Area)
- Installation and maintenance of a ground water recovery and treatment system to include a wastewater treatment plant (WWTP)

Due to the disposal of stabilized soils and wood treating wastes in on-site disposal units, maintenance to the disposal cell, disposal cell cap, and associated drainage ditches is one of Mid-South's on-going responsibilities. Maintenance and monitoring activities that sustain the design properties of the cell and monitor migration of contaminants include (1) regrading erosion scars (with or without addition of material), rills, or minor surface slumps in the cover and on the berm slopes; (2) cleaning out accumulated sediment and debris in drainage ditches; (3) reseeding the cover, as necessary; (4) inspecting the cover for settlement and regrade, as necessary; (5) inspecting the cover for damage and repair, as necessary; (6) surveying the cap settlement monuments; and (7) long-term ground water monitoring. Additionally, Mid-South is required to inspect the condition of the roads and the site fencing and repair as necessary.

4.3.1 Long-term Ground Water Monitoring

Monitoring activities were conducted for monitoring wells within the three distinct systems at the site: capped areas, the ground water recovery system, and the geologic fault zone. Monitoring activities were scheduled quarterly for the first year after completion (November 1989 to September 1990), semiannually for year 2 (1991), and annually for years 3 to 5 (1992 - 1995). In 1996, monitoring wells with no history of contamination were converted from annual sampling status to 5-year sampling status with EPA approval, as outlined in the "Mid-South Superfund Site Remediation O&M Manual" (O&M Manual; see Attachment B). Monitoring wells relegated to 5-year sampling status in 1996 included MW-10, MW-11, MW-12, MW-14, MW-15, MW-16, MW-18, MW-21, MW-22, M-8A, M-4B, and M-8B. Monitoring wells MW-17, MW-19, M-17, IWB-170, and IWD remain on an annual sampling schedule. MW-20 was over-drilled and replaced by recovery well RW-16 in 1998. RW-19 was to be replaced, but MW-20 was

removed by mistake. A replacement well for MW-20 is needed. Monitoring wells MW-17 and IWD remain on an annual sampling schedule only for the purpose of monitoring for any possible migration of contaminants to the east and north of the site, respectively. The well closure procedure and shutoff criteria, and historical ground water data (1989-2002) are presented in Attachments B and C.

4.3.2 Ground Water Recovery and Treatment System

The ground water recovery and treatment system consists essentially of drilled (vertical) and French drain (horizontal) recovery wells, the force main collection system, and the WWTP. The drilled wells provide the greatest volume of flow to the treatment system. Ground water is pumped from the recovery wells through an oil-water separator and drained to a storage tank. The water is then pumped through fabric filters and the carbon treatment system. Treated effluent from the carbon canisters is collected in a single gravity pipe and is discharged to Outfall 001. The volume and quality of treated ground water discharged is monitored to verify compliance and to evaluate the effectiveness of the ground water treatment system.

Each of the ground water recovery wells is equipped with a discharge meter. After completion of the 1993 ground water monitoring event, recovery wells that did not show parameter concentrations above the minimum risk to human health were eligible to be evaluated for closure. In 1996, recovery wells that showed no contamination greater than minimum risk to human health (as specified in Table 3.1 in Attachment B) for at least 5 years became eligible for closure without further testing with EPA approval. Recovery wells that have no contamination greater than minimum risk to human health for a period of 4 years are eligible for the following on/off schedule with EPA approval:

> Pumping should discontinue at the closure candidate well(s) for a period of 3 months. The recovery well(s) should then be pumped for 3 months, then off for 3 months, and then pumped for 3 months. The well(s) shall be sampled and analyzed for the parameters listed in Table 3.1 (Attachment B) at the end of each of the on/off periods (four sampling events). If no contamination is detected greater than minimum risk to human health (specified in Table 3.1) during the on/off period, pumping of the well(s) may be discontinued with EPA approval. If contamination is detected, pumping shall resume until the well shows no contamination for four consecutive sampling events. At this time, the well becomes eligible for the above on/off schedule with EPA approval.

Seven recovery wells (RW-1, RW-7, RW-8, RW-11, RW-15, RW-16, and RW-17) are currently still active. On February 1, 1997, recovery wells RW-2, RW-4, RW-6, RW-12, and RW-13 were closed with EPA approval, and RW-3, RW-5, RW-9, RW-10, and RW-14 initiated the on/off period as described in

the O&M Manual Well Closure Procedure (Attachment B). Recovery wells RW-5, RW-10, and RW-14 completed the on/off period in April 1998 and were closed upon EPA approval. Recovery wells RW-3 and RW-9 completed the on/off period during July 1999, and are pending closure upon EPA approval. Recovery wells RW-16 and 17 were installed in 1998. Annual flow volumes from 1997-2001, cumulative flow volumes from 1997-2001, and cumulative flow volumes from 1990-2001 for recovery wells are presented in Table 2.5 of Attachment D-1. Graphs of annual cumulative flow for active recovery wells RW-1, RW-7, RW-8, RW-11, and RW-15 are presented in Attachment D-2.

From 1997 through 2001, Mid-South manifested the following hazardous wastes for disposal, which were generated by the ground water recovery system:

- Approximately 23,200 pounds of oily sludge from the oil-water separator, storage tank, and sediment tank, that were manifested as listed hazardous wastes D004 (arsenic), D007 (chromium), and K001 (wood preservative)
- Thirteen 55-gallon drums containing oil absorbent materials and spent fabric filters that were manifested as listed hazardous wastes D004 (arsenic) and D007 (chromium).
- Twenty-six 55-gallon drums of well cuttings from recovery wells RW-16 and RW-17; only one of the drums was manifested as listed hazardous waste K001 (wood preservative); the other 25 drums were nonhazardous.

According to the annual site inspection reports prepared by the PRPs' consultant (B&F Engineering, Inc. [B&F]), the major operational problem associated with the ground water recovery and treatment system has been in securing a trained operator for the facility; five different operators were employed at the facility during 1997 and two in 1998. None of these operators, including the current operator, meet the licensing requirements of ADEQ for Class I Wastewater Treatment Operators, nor has the current operator completed the training required by the Occupational Safety and Health Administration Title 29, Code of Federal Regulations Part 1910.120. The amount of ground water being treated since 1999 is substantially less than in previous years, as indicated in Table 2.7 of Attachment D-1. This decreased flow is primarily due to the problems with the operators and the inadequate cleaning of the treatment facilities.

4.3.3 Treated Ground Water Discharge

Since 1990, Mid-South has been required to conduct routine NPDES water quality criteria monitoring of discharge waters from Outfall 001, Outfall 002, and off-site stream monitoring stations (SMS) 1, 2, 3, and 4 (see Attachment A-2). Outfall 001 is equipped with its own discharge meter; treated ground water discharged from Outfall 001 travels west along an unnamed tributary of Rock Creek to Outfall 002. Outfall 002 was originally intended to monitor surface runoff from the Superfund site for potential contaminants; however, contaminants from the sawmill area and old landfill also flowed into Outfall 002. In its 1993 NPDES permit renewal application, Mid-South requested that flow from the sawmill and old landfill areas be routed around Outfall 002. In 1998, Mid-South requested that some of its SMS monitoring requirements be suspended because they were located upgradient of the site, or they monitored storm water runoff from the active wood-treating facility. In the review of the NPDES draft permit (January 1999), it was proposed that storm water from the active CCA wood-treating facility be separated from that being generated at the Superfund site under a separate storm water permit. In February 1999, EPA determined that, under CERCLA 121(e), no federal, state, or local permit is required for the Superfund site while an RA is being conducted. Pursuant to this finding, the NPDES permit requirement was discontinued in August 1999.

Since water quality monitoring was initiated in 1990, concentrations of site COCs in discharge waters have exceeded permitted effluent limitations on very few occasions:

- Out of more than 500 samples collected from Outfall 001, only eight exceedances were reported for arsenic, one exceedance for chromium, and no exceedances for PCP.
- Out of nearly 500 samples collected from Outfall 002, only four exceedances were reported for arsenic, two exceedances for chromium, and no exceedances for PCP.
- Out of more than 100 samples collected from each SMS (1, 2, 3, and 4), no exceedances were reported for arsenic, chromium, or PCP.

The current effluent limitations, monitoring requirements, and exceedances and biomonitoring results since 1997 for Outfall 001 and Outfall 002 are presented in Attachment D-1. Historical monitoring data for Outfall 001, Outfall 002, and SMSs 1, 2, 3, and 4 are presented in Attachment D-2.

4.4 PROGRESS SINCE THE LAST FIVE-YEAR REVIEW

This is the second five-year review to be conducted for the Mid-South site. The third five-year review is scheduled to occur in 2007.

5.0 FIVE-YEAR REVIEW PROCESS

Mid-South's second five-year review was led by Mr. Ruben Moya and Mr. Shawn Ghose, EPA Remedial Project Managers. Mr. Masoud Arjmandi of ADEQ assisted with the site inspection and review of the Mid-South Five-Year Review Report. The EPA notified Mid-South of the start of the five-year review process. This five-year review consisted of a review of relevant documents, a review of standards, ground water monitoring data, interviews, and a site inspection conducted on August 8, 2002. The documents reviewed included: (1) 1986 ROD; (2) 1989 Interim Close-out Report; (3) RI/FS reports; (4) Endangerment Assessment; (5) 1997 Five-Year Review Report; (6) O&M Manual; and (7) Inspection and Monitoring Reports. Upon completion, the 2002 Five-Year Review Report will be made available at the information repository and a notice will be placed in the local newspaper.

6.0 FIVE-YEAR REVIEW FINDINGS

The following sections present the findings of this five-year review.

6.1 INTERVIEWS

In accordance with the requirements of the five-year review guidance, Tetra Tech interviewed or contacted several key individuals by mail in order to obtain their opinions with regard to issues associated with the site. Key individuals were identified from the site file in consultation with EPA. During the site visit conducted on August 8, 2002, Tetra Tech (1) interviewed Mr. Jim Huff of Mid-South and (2) provided questionnaires to several neighboring residences and businesses in the vicinity of Mid-South. Only one Superfund Site Survey Form was returned, which did not list the name and address of the interviewee and included no complaints or concerns about the site.

6.2 FIVE-YEAR REVIEW SITE INSPECTION

A site inspection was conducted on August 8, 2002, to assess the condition of the site and the protective measures employed to protect human health and the environment from the contaminants still present at the sites. Attendees included (1) Mr. Jim Huff of Mid-South, (2) Mr. Tim Startz of Tetra Tech; and (3) Mr. Luis Vega of Tetra Tech. Mr. Ruben Moya and Mr. Shawn Ghose of EPA, Mr. Masoud Arjmandi of ADEQ, and Ms. Linda McCormick of B&F were invited but were unable to attend. The site visit report is provided in Appendix B of this document.

Visually, there were no signs or evidence of contamination at the site. Tetra Tech inspected the WWTP associated with the selected remedy for ground water contamination at the site. Tetra Tech based its evaluation of WWTP operations on B&F's recent December 2001 annual site visit. Most of the observation and monitoring wells that were visually inspected were in good condition, clearly labeled, protected from impact, and securely encased (lock and cover). The exceptions were: (1) monitoring well MW-11 and observation wells M-4A and M-4B were missing padlocks and not properly secured; and (2) the hinged protective casing for monitoring well MW-11 was damaged and could not be opened. The vegetative cover at the site, including that on both clay caps (North Land Farm Area and Old Pond Area), appeared similar in type, plant health, and density to typical areas outside the site.

During the site visit, Tetra Tech observed several piles of CCA-treated lumber that were stockpiled on the ground surface in an outdoor storage area, which was located east of the CCA Treatment Building. The potential exists for storm water runoff generated during a rain event to transport CCA components that may have leached from the treated lumber. The active CCA plant does not have any secondary containment or a storm water runoff collection system in place to mitigate the potential off-site migration of CCA components.

As discussed in the January 2002 Annual Report for the site, B&F's site visit on December 4, 2001, revealed the following areas of concern:

- Storage tanks were full and ground water was not being treated.
- Fabric filters were clogged.

- Recovery well meter readings and their respective force main meter readings at Discharge 001 could not be compared due to meter discrepancies; the meters require calibration.

- pH and oxygen meters were not being properly maintained resulting in unreliable readings.

- WWTP plant operator does not meet ADEQ licensing requirements for Class I Wastewater Treatment Operators.

Based on these findings, B&F recommended that the WWTP be shut down until a trained licensed operator is hired for the site in order to maintain the system properly and operate it as closely as possible to the designed flow rate.

6.3 ARAR REVIEW

The 1986 ROD did not identify any specific applicable or relevant and appropriate requirements (ARAR) for the Mid-South site RA. However, cleanup criteria called for the action levels for arsenic and chromium to be set at any concentration that exceeds the range of background concentrations (specifically, greater than 5.6 ppm for arsenic and greater than 19.4 ppm for chromium). The cleanup requirements for cPAHs were set at a lifetime cancer risk of $1x10^{-5}$ (3 ppm). The PRP's approved O&M Manual outlined the following cleanup requirements for ground water:

- 0.5 ppm for arsenic and chromium, based on EPA maximum contaminant levels established under the Safe Drinking Water Act.

- 0.20 ppm for PCP, based on the EPA reference dose.

- 0.01 ppm for benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, and chrysene, based on analytical detection limits.

Since 1997, arsenic and chromium exceedances of the 1986 ROD cleanup standards have been an issue at the Mid-South site, most likely due to releases from post-RA wood-treating activities. In an attempt to resolve the situation, EPA funded an ADEQ investigation to: (1) review and evaluate RA documentation and all annual reports pursuant to the O&M Manual; and (2) collect samples. During 1999, ADEQ collected 14 environmental samples using a hand auger (0 to 2 feet bgs) and a drilling subcontractor (greater than 2 feet bgs). The ADEQ's RA Investigation Report found several exceedances of the ROD cleanup standards for arsenic and chromium in soil and sediment samples; mean values for arsenic and chromium were 15.39 ppm and 25.08 ppm, respectively.

Based on a review of naturally-occurring background levels for arsenic and chromium by EPA Region 6 in its Human Health Medium-specific Screening Levels Guidance (EPA 2001a) and by D. Kirk Nordstrom on the occurrence of high values of arsenic in sediments worldwide (Nordstrom 2002), EPA's analysis of the existing data indicates that the background values for arsenic and chromium may be naturally high near the Mid-South site, and may actually exceed the 1986 ROD cleanup action levels. Per Title 40 Code of Federal Regulations 300.430(e)(2)(i)(A)(2), EPA has the authority to choose the concentration level for a specific COC that represents an excess cancer lifetime risk to an individual between 1 in 10,000 and 1 in 1,000,000. In December 2001, the EPA Region 6 Superfund risk assessment group calculated a level consistent with future land use of the site i.e. industrial (or preliminary remediation goals [PRG]) for the Mid-South site based on an excess cancer risk of 1 in 100,000 under an industrial scenario (EPA 2001b). The EPA intends to propose a ROD amendment to revise the soil PRGs, based on a 1 in 100,000 excess cancer risk under an industrial scenario. Table 3 compares the 1986 ROD cleanup action levels and the newly proposed PRGs.

Utilizing the proposed PRGs, all but one of the soil and sediment concentrations of arsenic and chromium reported in the November 1999 ADEQ report comply with the new proposed standards (PRGs). Also, NPDES discharge data since 1989 indicates that no exceedances have been reported for arsenic, chromium, or PCP at any of the four off-site SMSs, which demonstrates that these hazardous constituents are not impacting the area surrounding the Superfund site; thus, the ecological impact of the site on the surrounding area is negligible. However, EPA has planned for a contractor to collect samples in the near future to determine if contaminated sediments are discharging to off-site areas.

The EPA intends to propose a Technical Impracticability Waiver under the upcoming ROD amendment to partially shut down the ground water treatment system in the vicinity of the Old Pond Area, based upon ADEQ's recommendation that the current system is not effective given the fractured hydrogeologic conditions that exist at the site. In its November 1999 RA Investigation report, ADEQ recommended that the ROD amendment include a Technical Impracticability ARAR Waiver with a natural attenuation determination for the ground water. According to ADEQ, the current ground water recovery and treatment system for the fractured bedrock aquifer in the vicinity of the Old Pond Area within the thrusted fault zone should be discontinued.

TABLE 3

1986 ROD CLEANUP ACTION LEVELS AND PROPOSED SOIL PRGS

Contaminant of Concern	1986 ROD Soil Cleanup Action Level (ppm)	Proposed Soil PRG[a] (mg/kg)
Arsenic	5.6	38
Chromium	19.4	1,210
Carcinogenic PAHs	3 [b]	- -
Benzo(a)pyrene equivalents	- -	2.6 [c]

Notes:

- -	Not applicable
EPA	U.S. Environmental Protection Agency
mg/kg	Milligram per kilogram
PAH	Polycyclic aromatic hydrocarbon
ppm	Part per million
PRG	Preliminary remediation goal
ROD	Record of Decision

a Soil PRGs (1 in 100,000 excess cancer risk for a commercial/industrial scenario) proposed by EPA for the upcoming ROD Amendment (EPA 2001).

b As defined in the 1986 ROD, carcinogenic PAHs include benzo(a)anthracene, benzo(b+k)fluoranthene, benzo(a)pyrene, and chrysene.

c Benzo(a)pyrene equivalents

6.4 DATA REVIEW

A review of the inspection reports completed through fourth quarter 2001 indicates that most of the procedures outlined in the O&M Manual have insured to date that the RA for the Mid-South site is being maintained as designed and constructed with a few exceptions.

The RAO to protect human health and the environment by preventing direct contact, ingestion, and migration of the wood-treating wastes and associated soils continues to be met by the intact caps (North Land Farm and Old Pond Areas), which were most recently inspected on August 8, 2001. The caps were noted to be in good condition, with no evidence of cracking, settlement, erosion, side-slope instability, ponding, damage from burrowing animals, seepage, or barren areas in the vegetative cover. Thus, contaminant migration is prevented by the intact caps. In addition, the fence, gates, locks, and signs are in place and verified sound as of August 8, 2002, which will further limit access to the site and preclude direct contact or ingestion of waste and soils.

The RAO to prevent the potential for human exposure to contaminated ground water continues to be met. Ground water data indicated no radical change in COC concentrations. Attachment B summarizes the COC concentrations in ground water over the entire O&M period. Attachment E provides graphical displays of analytical data trends for ground water.

From 1989 through 2002, analytical data for untreated ground water indicate decreasing long-term trends in constituent concentrations in most of the active recovery wells (RW-1, RW-7, RW-15, and RW-16). Data for recovery wells RW-8 and RW-11 indicate an increasing long-term trend for PCP, benzo(a)anthracene, benzo(a)pyrene, benzo(b+k)fluoranthene, and chrysene due to elevated values for these constituents during 2001; however, review of data from 1989 through 2002 indicates a decreasing long-term trend. Data for recovery well RW-17 indicates an increasing long-term trend for PCP. Analysis of ground water samples collected during the recent May 2002 sampling event detected elevated concentrations of (1) cPAHs (ranging from 0.26-0.71 mg/L) in recovery well RW-11; (2) arsenic (3.8 mg/L), chromium (2.1 mg/L), and PCP (12 mg/L) in RW-15; and (3) PCP (0.37 mg/L) in recovery well RW-17, which may indicate an increasing short-term trend for these constituents and their respective recovery wells.

From 1989 through 2002, analytical data from ground water monitoring wells indicate decreasing long-term trends in constituent concentrations for most of the active monitoring wells. However, analytical data indicates; (1) an increasing long-term trend for PCP (2.0 mg/L in May 2002) in M-17, (2) a slight increasing long-term trend for cPAHS (ranging from 0.015-0.044 mg/L in May 2002) in IWB-170, and (3) an increasing long-term trend for chrysene in MW-19. Analysis of ground water samples collected during the recent May 2002 sampling event detected elevated concentrations of PCP (1.5 mg/L), chromium (0.02 mg/L), and cPAHs (0.02 – 0.055 mg/L) in MW-19, which may indicate an increasing short-term trend for these constituents.

For Outfall 001, arsenic concentrations consistently exceeded the treated ground water discharge permit limit of 0.05 mg/L from April 1998 through July 1999. There were no constituent discharge permit exceedances for 2001for Outfall 001; however, deficiencies in discharge-monitoring requirements occurred in February, March, April, May, June, August, October, November, and December 2001. As of June 2002, there have been no constituent discharge permit exceedances for 2002 for Outfall 001; however, deficiencies in discharge-monitoring requirements occurred in January, March, April, May, and June 2002. Table 2.1 (Attachment D-1) presents the effluent limitations and monitoring requirements for Outfall 001, and Table 2.2 (Attachment D-1) presents the summary of constituents exceeding permit limits for Outfall 001 from 1997 through June 2002.

Since water quality monitoring was initiated in 1989, concentrations of site COCs in discharge waters have exceeded permitted effluent limitations on very few occasions for Outfall 001 and Outfall 002, and there have not been any reported exceedances for any of the four SMSs (Attachment D-2). Of more than 100 samples collected from each SMS (1, 2, 3, and 4) since 1989, no exceedances have been reported for arsenic, chromium, or PCP. On the basis of effluent limitations not having been exceeded at the four off-site SMS monitoring points, it can be inferred that discharge waters from the Mid-South site have had no adverse impact on the ecology of the surrounding area. However, EPA plans to test for sediments in the near future to be sure that the site is not negatively impacting off-site areas by sediment discharge.

7.0 TECHNICAL ASSESSMENT

The following conclusions support the determination that the remedy at the Mid-South site is currently protective of human health and the environment.

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

- **Remedial Action Performance—**Capped areas appear to be functioning properly; ADEQ has evaluated the existing ground water recovery and treatment system and found it to be ineffective under the existing fractured hydrogeologic conditions, and EPA plans to partially shut down the system under a Technical Impracticability waiver in the upcoming ROD Amendment.

- **System Operations/O&M—**O&M ground water monitoring activities are being conducted according to plan. Ground water is not being treated at a flow rate that approaches the design flow rate. A trained licensed operator is needed at the site in order to maintain the treatment facility and complete ground water remediation. Deficiencies in treated ground water discharge monitoring requirements have increasingly occurred since early 2001.

- **Cost of System Operations/O&M—**No information was available.

- **Opportunities for Optimization—**The monitoring well network appears to provide sufficient data to assess the quality of site ground water, and maintenance of the cap is sufficient to maintain its integrity. However, ground water is not being treated at a flow rate that approaches the design flow rate. A trained licensed WWTP operator is needed at the site in order to maintain the treatment facility and complete ground water remediation. ADEQ has evaluated the existing ground water recovery and treatment system and found it to be ineffective under the existing fractured hydrogeologic conditions, and EPA plans to partially shut down the system under a Technical Impracticability waiver in the upcoming ROD Amendment.

- **Early Indicators of Potential Issues—**None.

- **Implementation of Institutional Controls—**A restrictive covenant was filed by Mid-South with the Polk County Clerk on September 25, 1989, to ensure that residential use, destroying the integrity of the cap, drilling into the contaminated aquifer, and use of ground water from the site are prohibited.

Question B: Are the assumptions used at the time of remedy selection still valid?

- **Changes in Standards and To Be Considered—**EPA intends to issue a ROD amendment to revise the soil PRGs to levels consistent with anticipated future land use (for arsenic and chromium). The soil PRGs will be based on a 1 in 100,000 excess cancer risk under an industrial scenario, which will revise the soil cleanup standards from 5.6 to 38 milligrams per kilogram (mg/kg) for arsenic; from 19.4 to 1,210 mg/kg for chromium; and from 3 to 2.6 mg/kg benzo(a)pyrene equivalent for cPAHs (in 1986 according to EPA risk assessor risk based calculations were not well developed thus carcicinogenic PAHs or cPAH is equivalent to current benzo(a) pyrene equivalent) .

- **Changes in Exposure Pathways—**There are no changes that bear on the protectiveness of the remedy.
- **Changes in Toxicity and Other Contaminant Characteristics—**There are no changes that bear on the protectiveness of the remedy.

- **Changes in Risk Assessment Methodologies—**There are no changes that bear on the protectiveness of the remedy.

- **Expected Progress Towards Meeting RAOs—**The RAOs relating to contaminated wood-treating wastes have been met; however, soils have exceeded current PRG values. The EPA intends to amend the ROD and revise the soil PRGs to levels consistent with anticipated future industrial land use. ADEQ has evaluated the existing ground water recovery and treatment system and found it to be ineffective under the existing fractured hydrogeologic conditions, and EPA plans to propose partially shutting down the system under a Technical Impracticability waiver in the upcoming ROD Amendment.

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

The EPA intends to further investigate surface and subsurface soils.

8.0 ISSUES AND DEFICIENCIES

Table 4 summarizes issues for the Mid-South site. The following issues were noted:

1. **Mean flow for Outfall 001 has decreased dramatically since 1998—**Ground water is not being treated at a flow rate that approaches the design flow rate.

2. **Deficiencies in treated ground water discharge monitoring requirements—**Deficiencies in treated ground water discharge monitoring requirements have increasingly occurred since early 2001.

3. **Poor O&M for ground water recovery and treatment system—**Maintenance of the wastewater treatment system is not being conducted to the extent necessary to maintain flows as in previous years (prior to 1999). Specific issues identified during the December 2001 site visit include (1) storage tanks that were full and ground water that was not being treated; (2) clogged fabric filters; (3) recovery well meter readings and their respective force main meter readings at Discharge 001 could not be compared due to meter discrepancies and require calibration; (4) pH and oxygen meters were not being properly maintained resulting in unreliable readings; and (5) WWTP plant operator does not meet ADEQ licensing requirements for Class I Wastewater Treatment Operators. In order to complete the ground water remediation, it is imperative to treat the ground water at a flow rate as close as possible to the design flow rate for the system.

4. **Potentially contaminated storm water runoff—**During the site visit, Tetra Tech observed several piles of CCA-treated lumber that were stockpiled on the ground surface in an outdoor storage area, which was located east of the CCA Treatment Building. The potential exists for storm water runoff generated during a rain event to transport CCA components that may have been leached from the treated lumber. The active CCA plant does not have any secondary containment or a storm water runoff collection system in place to mitigate the potential off-site migration of CCA components.

5. **Monitoring well security and maintenance**—As noted in the site visit report (Appendix B), the cover on monitoring well MW-11 and observation wells M-4A and M-4B were missing padlocks and not properly secured; and (2) the hinged protective casing for monitoring well MW-11 was damaged and needed repair.

6. **Effectiveness of the ground water recovery and treatment system**—ADEQ has evaluated the existing ground water recovery and treatment system and found it to be ineffective under the existing fractured hydrogeologic conditions.

7. **Chromium concentrations in soil that exceed current cleanup standards**—During the first quarter of 1999, ADEQ's Hazardous Waste Division conducted surface and subsurface soil sampling as part of an RA investigation. Chromium was detected in some samples in exceedance of the current cleanup standard (1986 ROD).

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Table 5 summarizes recommendations and follow-up actions for the Mid-South site.

10.0 PROTECTIVENESS STATEMENTS

Pending EPA issuance of the upcoming ROD Amendment, protective short-term objectives have been met and evaluation is continuing.

11.0 NEXT REVIEW

This is a site that requires ongoing five-year reviews. The next review will be conducted within the next 5 years, but no later than September 2007. The EPA intends to further investigate surface and subsurface sediments to corroborate the results of the 1999 ADEQ investigation during the next 5-year review period.

TABLE 4

ISSUES/DEFICIENCIES IDENTIFIED

Issue	Currently Affects Protectiveness? (Y/N)
Mean flow for Outfall 001 has decreased dramatically since 1998 because ground water is not being treated at a flow rate that approaches the design flow rate.	Y
Deficiencies in treated ground water discharge monitoring requirements have increasingly occurred since early 2001.	Y
Maintenance of the wastewater treatment system is not being conducted to the extent necessary to maintain flows as in previous years (prior to 1999). Specific issues identified during the December 2001 site visit include (1) storage tanks that were full and ground water that was not being treated; (2) clogged fabric filters; (3) recovery well meter readings and their respective force main meter readings at Discharge 001 could not be compared due to meter discrepancies, and the meters require calibration; (4) pH and oxygen meters were not being properly maintained resulting in unreliable readings; and (5) WWTP plant operator does not meet ADEQ licensing requirements for Class I Wastewater Treatment Operators. In order to effectively implement ground water remediation, it is imperative to operate the ground water treatment system at a flow rate as close as possible to the design flow rate for the system.	Y
No secondary containment or storm water runoff collection system exists to mitigate the potential off-site migration of CCA constituents from treated wood stockpiled on the ground surface in an outdoor storage area at the active CCA plant.	Y
Monitoring well MW-11 and observation wells M-4A and M-4B were missing padlocks and not properly secured, and the hinged protective casing for monitoring well MW-11 was damaged and needed repair.	N
ADEQ has evaluated the existing ground water recovery and treatment system and found it to be ineffective under the existing fractured hydrogeologic conditions.	Y
A 1999 ADEQ surface and subsurface soil sampling RA investigation revealed concentrations of chromium in exceedance of the current cleanup standard (1986 ROD).	Y

Notes:

ADEQ Arkansas Department of Environmental Quality
CCA Chromated copper arsenate
ROD Record of Decision

TABLE 5

RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendations/ Follow-up Actions	Responsible Party	Oversight Agency	Milestone Date	Follow-up Action Affects Protectiveness? (Y/N)
Mean flow for Outfall 001 has decreased dramatically since 1998 because ground water is not being treated at a flow rate that approaches the design flow rate.	A trained licensed operator is needed at the site in order to maintain the treatment facility and complete ground water remediation.	Mid-South	EPA	2002	Y
Deficiencies in treated ground water discharge monitoring requirements have increasingly occurred since early 2001.	A trained licensed operator is needed at the site in order to maintain the treatment facility and complete ground water remediation.	Mid-South	EPA	2002	Y
Maintenance of the wastewater treatment system is not being conducted to the extent necessary to maintain flows as close as possible to the design flow rate for the system.	A trained licensed operator is needed at the site in order to maintain the treatment facility and complete ground water remediation.	Mid-South	EPA	2002	Y
No secondary containment or storm water runoff collection system exists to mitigate the potential off-site migration of CCA constituents from treated wood stockpiled on the ground surface in an outdoor storage area at the active CCA plant.	Install secondary containment or storm water runoff collection system at active plant.	Mid-South	EPA	2003	Y
Monitoring well MW-11 and observation wells M-4A and M-4B were missing padlocks and not properly secured, and the hinged protective casing for monitoring well MW-11 was damaged and needed repair.	Secure and repair monitoring and observation wells as necessary.	Mid-South	EPA	2002	N

TABLE 5 (Continued)

RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Issue	Recommendations/ Follow-up Actions	Responsible Party	Oversight Agency	Milestone Date	Follow-up Action Affects Protectiveness? (Y/N)
ADEQ has evaluated the existing ground water recovery and treatment system and found it to be ineffective under the existing fractured hydrogeologic conditions.	EPA plans to partially shut down the ground water treatment system under a Technical Impracticability waiver as suggested by ADEQ, in the upcoming ROD Amendment.	EPA	EPA	2003	Y
A 1999 ADEQ surface and subsurface soil sampling RA investigation revealed concentrations of chromium in exceedance of the current cleanup standard (1986 ROD).	EPA intends to propose a ROD amendment to revise the soil PRGs to levels consistent with anticipated future land use. The new PRGs will be based on a 1 in 100,000 excess cancer risk, under an industrial scenario. Also EPA will use a contractor to evaluate ADEQ concerns e.g. sediments in ditches and possible migration to off-site areas in the near future.	EPA	EPA	2003	Y

Notes:

ADEQ	Arkansas Department of Environmental Quality
CCA	Chromated copper arsenate
EPA	U.S. Environmental Protection Agency
Mid-South	Mid-South Wood Products, Inc.
PRG	Preliminary remediation goal
ROD	Record of Decision

APPENDIX A

LIST OF DOCUMENTS REVIEWED

(Two Pages)

DOCUMENTS REVIEWED

Arkansas Department of Environmental Quality. 1999. Remedial Action Investigation Report, Mid-South Superfund Site, Mena, Arkansas. November 4.

B & F Engineering, Inc. (B&F). 1989. Mid-South Superfund Site Remediation O&M Manual.

B&F. 2000. Annual Report and Five-Year Evaluation, Mid-South Superfund Site, Mena, Arkansas, 1995 - 1999. February.

B&F. 2002. Annual Report, Mid-South Superfund Site, Mena, Arkansas, January 1, 2001 to December 31, 2001. January.

CH2M Hill Southeast, Inc. (CH2M Hill). 1984. Remedial Investigation Report, Mid-South Wood Products, Mena, Arkansas. October 24.

CH2M Hill. 1985. Endangerment Assessment, Mid-South Wood Products, Mena, Arkansas. May 9.

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CH2M Hill. 1986b. Feasibility Study, Mid-South Wood Products, Mena, Arkansas. April.

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Nordstrom, D. Kirk. 2002. Worldwide Occurrences of Arsenic in Groundwater. *Science.* Volume 296, pp. 2143-2145. June 21.

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EPA. 1988. Consent Decree, United States of America v. Edward Hines Lumber Co. and Mid-South Wood Products of Mena, Inc. May 16.

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EPA. 1997. First Five-Year Review Report, Mid-South Superfund Site, Mena, Arkansas. June 5.

EPA. 2001a. EPA Region 6 Risk-based Human Health Medium-Specific Screening Levels. Dallas, TX. November. Internet address: http://www.epa.gov/earth1r6/6pd/rcra c/pd-n/screen.htm.

DOCUMENTS REVIEWED (Continued)

EPA. 2001b. Memorandum from Ghassan A. Koury, EPA, to Shawn Ghose, EPA, concerning response to risk assessment request for chromium, PNAs and arsenic for Mid-South Superfund Site. December 18.

EPA. 2002. Mid-South Wood Products Superfund Site Update. August 6.

APPENDIX B

SITE VISIT REPORT

(22 Pages)

FIVE-YEAR REVIEW SITE VISIT REPORT
FOR
MID-SOUTH WOOD PRODUCTS SUPERFUND SITE
MENA, ARKANSAS

AUGUST 30, 2002

PREPARED BY:

U.S. Environmental Protection Agency Region 6
Dallas, TX 75202-2733

Work Assignment No.	:	934-FRFE-06ZZ
EPA Region	:	6
Date Prepared	:	August 30, 2002
Contract No.	:	68-W6-0037
Prepared by	:	Tetra Tech EM Inc.
Telephone No.	:	214-754-8765
EPA Project Officer	:	Mr. Henry Thompson
EPA Work Assignment Manager	:	Mr. Shawn Ghose
Telephone No.	:	(214) 665-6782

CONTENTS

Section **Page**

ACRONYMS AND ABBREVIATIONS ii

1.0 INTRODUCTION 1
2.0 BACKGROUND 1
3.0 SITE VISIT ACTIVITIES 2
4.0 FINDINGS 3
5.0 REFERENCES 5

Exhibit

A PHOTOGRAPH LOG
B FIVE-YEAR REVIEW SITE VISIT CHECKLIST

ACRONYMS AND ABBREVIATIONS

ADEQ	Arkansas Department of Environmental Quality
B&F	B & F Engineering, Inc.
CCA	Chromated copper arsenate
EPA	U.S. Environmental Protection Agency
FS	Feasibility study
Mid-South	Mid-South Wood Products
RA	Remedial action
RI	Remedial investigation
ROD	Record of Decision
Tetra Tech	Tetra Tech EM Inc.
WWTP	Wastewater treatment plant

1.0 INTRODUCTION

Tetra Tech EM Inc. (Tetra Tech) received Work Assignment No. 934-FRFE-06ZZ from the U.S. Environmental Protection Agency (EPA) under Response Action Contract No. 68-W6-0037. Under this work assignment, Tetra Tech is authorized to conduct a five-year review of the remedial action (RA) implemented at the Mid-South Wood Products (Mid-South) Superfund site.

On August 8, 2002, Tetra Tech visited the site to verify that all components of the remedies are operating in accordance with criteria established in the respective Record of Decision (ROD) and the approved operation and maintenance manual. This report summarizes the results of that visit.

2.0 BACKGROUND

Background information presented herein includes a brief discussion of the physical characteristics overview, location, and history of the site. A complete description, which includes a discussion on the geology/hydrogeology and contaminants of concern listed in the ROD, can be found in the *Five-Year Review Report for Mid-South Wood Products Site.*

The site covers approximately 57 acres in Polk County, Arkansas, in the western portion of the state. It is located on the west side of U.S. Highway 71 immediately southwest of the town of Mena (population 6,000). The site consists of an abandoned wood-treatment operation covering 20 acres on the southwest side and an active wood treatment operation covering 37 acres on the northeast side of the site. Wastes from three separate wood-preservative processes have been disposed of on the inactive portion of the site, including creosote compounds, pentachlorophenol, and chromated copper arsenate (CCA). The primary land use near the site is agricultural and residential. The town of Mena and the surrounding smaller towns obtain their drinking water from Ward Lake and Iron Forks Reservoir, which are located 2.5 miles north and 6 miles northeast of the site, respectively. The remainder of the rural water supply comes primarily from ground water, which occurs in Paleozoic Age bedrock. Several private wells are located near the site; however, rural residents located downgradient (north and northwest) of the site, between the on-site source areas and the ground water discharge area along the East Fork of Moon Creek, have been placed on the town's water supply.

Mid-South's currently active CCA facility is located adjacent to the Old Plant Site, and consists of a pressure-treating cylinder and several aboveground storage tanks for storage of the CCA preservative solution. Treated wood is allowed to drip dry on a concrete pad prior to storage on the property. Releases of arsenic and chromium have been detected adjacent to the active plant and are attributed to uncontrolled surface water runoff.

From 1983 to 1986, EPA conducted several site investigations. From January through April 1984, EPA conducted a remedial investigation (RI) and feasibility study (FS), which included on- and off-site investigations. In November 1985, EPA conducted a supplemental RI of the operating CCA plant; the FS was completed in April 1986. The potential health risks for the site were based on possible contact with, or ingestion of, contaminated soils or ground water. On September 9, 1986, EPA received an RA work plan from the potentially responsible parties, and after some discussion, a revised work plan was received on October 7, 1986. On November 14, 1986, EPA approved the ROD that was prepared for the site. The ROD and subsequent remedial design called for excavation, consolidation, residuals solidification/stabilization, on-site disposal, clay capping, and ground water recovery, treatment, and monitoring. Mid-South was also required to take any necessary measures to reduce contaminant runoff from the active CCA facility. In EPA's FS Report, cleanup action levels were derived to limit exposure to arsenic, chromium, and carcinogenic polycyclic aromatic hydrocarbons (including benzo[a]pyrene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, and chrysene) in contaminated soils.

Remedial activities were also performed at the active CCA wood treatment facility, including constructing a roof over the drip pad, which is used to store freshly treated lumber and collect drippings of CCA solution. Other activities included cleaning out the old sump area beneath the treatment vessel; backfilling the sump area and replacing it with a steel-lined sump and gravity flow return line; cleaning out the treatment building sump; and installing a float-actuated pump in the treatment building.

3.0 SITE VISIT ACTIVITIES

A site visit was conducted on August 8, 2002, to assess the condition of the site and the protective measures employed to protect human health and the environment from the contaminants still present at the site.

The following individuals participated in the site inspection:

- Jim L. Huff, Mid-South (President)
- Tim Startz, Tetra Tech
- Luis Vega, Tetra Tech

Mr. Ruben Moya and Mr. Shawn Ghose of EPA, Mr. Masoud Arjmandi of ADEQ, and Ms. Linda McCormick of B&F were invited but were unable to attend.

The inspection evaluated the condition of most of the monitoring and observation wells; the condition of the site drainage, vegetation, and roads; the condition of the clay caps; and the site fencing. The log for photographs taken during the site visit is presented as Exhibit A, and the completed five-year review site visit checklist is presented as Exhibit B.

The weather conditions during the inspections were clear, dry, and warm (light breeze and temperature in the low 90s). Evidence, such as ponding, of recent precipitation was not detected, and not forecasted. A summary of the findings from the site visit follows.

4.0 FINDINGS

There were no visual signs or evidence of contamination at the Mid-South Superfund site. The selected remedy for waste and contaminated soils at the site—solidification, stabilization, on-site disposal, and capping—did not require any operating engineered systems to be evaluated. Tetra Tech inspected the wastewater treatment plant (WWTP) associated with the selected remedy for ground water contamination at the site, but did not conduct a thorough evaluation due to the absence of ADEQ and B&F. Tetra Tech will base its evaluation of WWTP operations on B&F's recent December 2001 annual site visit.

With exceptions, most of the monitoring and observation wells that were visually inspected were in good condition, clearly labeled, protected from impact, and securely encased (lock and cover). The exceptions were: (1) monitoring well MW-11 and observation wells M-4A and M-4B were missing padlocks and not properly secured; and (2) the hinged protective casing for monitoring well MW-11 was damaged and could not be opened.

The cover at the site, including that on both clay caps (North Land Farm Area and Old Pond Area), appeared similar (in vegetative type, plant health, and density) to typical areas adjacent to but not associated with the Comprehensive Environmental Response, Compensation, and Liability Act site.

During the site visit, Tetra Tech observed several piles of CCA-treated lumber that were stockpiled on the ground surface in an outdoor storage area, east of the CCA Treatment Building. The potential exists for storm water runoff generated during a rain event to transport CCA components that may have been leached from the treated lumber. The active CCA plant does not have any secondary containment or a storm water runoff collection system in place to mitigate the potential off-site migration of CCA components.

As discussed in the January 2002 Annual Report for the site, B&F's site visit on December 4, 2001, revealed the following areas of concern:

- Storage tanks were full and ground water was not being treated.
- Fabric filters were clogged.
- Recovery well meter readings and their respective force main meter readings at Discharge 001 could not be compared due to meter discrepancies and require calibration.
- pH and oxygen meters were not being properly maintained resulting in unreliable readings.
- WWTP plant operator does not meet ADEQ licensing requirements for Class I Wastewater Treatment Operators.

Based on these findings, B&F recommended that the WWTP be shut down until a trained licensed operator is hired for the site in order to maintain the system properly and operate it as closely as possible to the designed flow rate.

5.0 REFERENCES

Arkansas Department of Environmental Quality. 1999. Remedial Action Investigation Report, Mid-South Superfund Site, Mena, Arkansas. November 4.

B & F Engineering, Inc. (B&F). 2000. Annual Report and Five-Year Evaluation, Mid-South Superfund Site, Mena, Arkansas, 1995 - 1999. February.

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CH2M Hill. 1986a. Supplemental Remedial Investigation, Mid-South Wood Products, Mena, Arkansas. March 13.

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EPA. 2002. Mid-South Wood Products Superfund Site Update. August 6.

EXHIBIT B

FIVE-YEAR REVIEW SITE VISIT CHECKLIST

(11 Sheets)

FIVE-YEAR REVIEW SITE VISIT CHECKLIST

Information may be completed by hand and attached to the five-year review report as supporting documentation of site status. "N/A" refers to "not applicable."

I. SITE INFORMATION

Site Name: Mid-South Wood Products Superfund Site	**Date of Inspection:** August 8, 2002
Location and Region: Mena, Arkansas, Region 6	**EPA ID:** ARD092916188
Agency, office, or company leading the five-year review: Tetra Tech EM Inc.	**Weather/temperature:** Clear, dry, and warm/low 90s

Remedy Includes: (Check all that apply)

- : Landfill cover/containment
- : Access controls
- : Institutional controls
- : Ground water pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (Check all that apply)

1. O&M Site Manager Jim L. Huff (Name) President (Title) 8/8/02 (Date)
Interviewed: ☐ by mail : at office ☐ by phone Phone no. (479) 394-1272
Problems, suggestions: ☐ Report attached

2. **O&M Staff** N/A (Name) _____ (Title) _____ (Date)
Interviewed: ☐ by mail ☐ at office ☐ by phone Phone no. _____
Problems, suggestions: ☐ Report attached

3. Local regulatory authorities and response agencies (i.e.; State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.). Fill in all that apply.

Agency N/A
Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone no.)

Problems, suggestions: ☐ Report attached

Agency N/A
Contact _____ (Name) _____ (Title) _____ (Date) _____ (Phone no.)

Problems, suggestions: ☐ Report attached _____

4. Other interviews (optional): ☐ Report attached to Five-Year Review Report

N/A

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)

1. O&M Documents

☐ O&M manual	☐ Readily available	☐ Up to date	☐ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☐ N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☐ N/A

Remarks: _____

2. Site-Specific Health and Safety Plan ☐ Readily available ☐ Up to date ☐ N/A

☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☐ N/A

Remarks: _____

3. O&M and OSHA Training Records ☐ Readily available ☐ Up to date ☐ N/A

Remarks: _____

4. Permits and Service Agreements

☐ Air discharge permit	☐ Readily available	☐ Up to date	☐ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☐ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☐ N/A
☐ Other permits _____	☐ Readily available	☐ Up to date	☐ N/A

Remarks: _____

5. Gas Generation Records ☐ Readily available ☐ Up to date ☐ N/A

6. Settlement Monument Records ☐ Readily available ☐ Up to date ☐ N/A

7. Ground Water Monitoring Records ☐ Readily available ☐ Up to date ☐ N/A

8. Leachate Extraction Records ☐ Readily available ☐ Up to date ☐ N/A

9. Discharge Compliance Records

☐ Air	☐ Readily available	☐ Up to date	☐ N/A
☐ Water (effluent)	☐ Readily available	☐ Up to date	☐ N/A

Remarks: _____

10. Daily Access/Security Logs ☐ Readily available ☐ Up to date ☐ N/A

Remarks: _____

IV. O&M COSTS

1. O&M Organization

☐ State in-house ☐ Contractor for State
☐ PRP in-house ☐ Contractor for PRP
☐ Other _____

2. O&M Cost Records

☐ Readily available ☐ Up to date
☐ Funding mechanism/agreement in place
Original O&M cost estimate ☐ Breakdown attached

Total annual cost by year for review period, if available

Date	Date	Total Cost	
From _____	to _____	_____	- ☐ Breakdown attached
From _____	to _____	_____	- ☐ Breakdown attached
From _____	to _____	_____	- ☐ Breakdown attached
From _____	to _____	_____	- ☐ Breakdown attached
From _____	to _____	_____	- ☐ Breakdown attached
From _____	to _____	_____	- ☐ Breakdown attached
From _____	to _____	_____	- ☐ Breakdown attached
From _____	to _____	_____	- ☐ Breakdown attached

3. Unanticipated or Unusually High O&M Costs During Review Period

_____

V. ACCESS AND INSTITUTIONAL CONTROLS : Applicable ☐ N/A

A. Fencing

1. Fencing damaged ☐ Location shown on site map : Gates secured ☐ N/A
Remarks: _____

B. Other Access Restrictions

1. Signs and other security measures ☐ Location shown on site map ☐ N/A
Remarks: _____

C. Institutional Controls

1. Implementation and enforcement

Site conditions imply ICs not properly implemented ☐ Yes ☐ No ☐ N/A
Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by) _____
Frequency _____
Responsible party/agency _____

Contact _____ _____ _____ _____
Name Title Date Phone no.

Reporting is up-to-date ☐ Yes ☐ No ☐ N/A
Reports are verified by the lead agency ☐ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☐ N/A
Violations have been reported ☐ Yes ☐ No ☐ N/A
Other problems or suggestions: ☐ Report attached

_____
_____

2. Adequacy : ICs are adequate ☐ ICs are inadequate ☐ N/A
Remarks: _____

D. General

1. Vandalism/trespassing ☐ Location shown on site map : No vandalism evident
Remarks: _____

2. Land use changes onsite : N/A
Remarks: _____

3. Land use changes offsite : N/A
Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads : Applicable ☐ N/A

1. Roads damaged ☐ Location shown on site map : Roads adequate ☐ N/A
Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS : Applicable ☐ N/A

A. Landfill Surface

1. Settlement (Low spots) ☐ Location shown on site map : Settlement not evident
Areal extent _____ Depth _____
Remarks: _____

2. Cracks ☐ Location shown on site map : Cracking not evident
Lengths _____ Widths_____ Depths_____
Remarks: _____

3. Erosion ☐ Location shown on site map : Erosion not evident
Areal extent _____ Depth _____
Remarks:: _____

4. Holes ☐ Location shown on site map : Holes not evident
Areal extent _____ Depth _____
Remarks: _____

5. Vegetative Cover : Grass : Cover properly established : No signs of stress
☐ Trees/Shrubs (indicate size and locations on a diagram)
Remarks: _____

6. Alternative Cover (armored rock, concrete, etc.) : N/A
Remarks: _____

7. Bulges ☐ Location shown on site map : Bulges not evident
Areal extent _____ Depth _____
Remarks: _____

8. Wet Areas/Water Damage : Wet areas/water damage not evident
☐ Wet areas ☐ Location shown on site map ☐ Areal extent _____
☐ Ponding ☐ Location shown on site map ☐ Areal extent _____
☐ Seeps ☐ Location shown on site map ☐ Areal extent _____
☐ Soft subgrade ☐ Location shown on site map ☐ Areal extent _____
Remarks: _____

9. Slope Instability ☐ Slides ☐ Location shown on site map : No evidence of slope instability
Areal extent _____
Remarks:_____

B. Benches ☐ Applicable : N/A
(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)

1. Flows Bypass Bench ☐ Location shown on site map : N/A or okay
Remarks: _____

2. Bench Breached ☐ Location shown on site map : N/A or okay
Remarks: _____

3. Bench Overtopped ☐ Location shown on site map : N/A or okay
Remarks: _____

C. Letdown Channels ☐ Applicable : N/A
(Channel lined with erosion control mats, rip rap, grout bags, or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. Settlement ☐ Location shown on site map ☐ No evidence of settlement
Areal extent _____ Depth _____
Remarks: _____

2. Material Degradation ☐ Location shown on site map ☐ No evidence of degradation
Material type _____ Areal extent _____
Remarks: _____

3. Erosion ☐ Location shown on site map ☐ No evidence of erosion
Areal extent _____ Depth _____
Remarks: _____

4. Undercutting ☐ Location shown on site map ☐ No evidence of undercutting
Areal extent _____ Depth _____
Remarks: _____

5. Obstructions Type _____ ☐ No obstructions
☐ Location shown on site map Areal extent _____ Size _____
Remarks: _____

6. Excessive Vegetative Growth Type _____
☐ No evidence of excessive growth
☐ Vegetation in channels does not obstruct flow
☐ Location shown on site map Areal extent _____
Remarks: _____

D. Cover Penetrations ☐ Applicable : N/A

1. Gas Vents ☐ Active ☐ Passive
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M ☐ N/A
Remarks: _____

2. Gas Monitoring Probes
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M ☐ N/A
Remarks: _____

3. Monitoring Wells (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M ☐ N/A
Remarks: _____

4. Leachate Extraction Wells
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs O&M ☐ N/A
Remarks: _____

5. Settlement Monuments ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks: _____

E. Gas Collection and Treatment ☐ Applicable : N/A

1. Gas Treatment Facilities
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs O&M
Remarks: _____

2. Gas Collection Wells, Manifolds, and Piping
☐ Good condition ☐ Needs O&M
Remarks: _____

3. Gas Monitoring Facilities (e.g., gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs O&M ☐ N/A
Remarks: _____

F. Cover Drainage Layer ☐ Applicable : N/A

1. Outlet Pipes Inspected ☐ Functioning ☐ N/A
Remarks: _____

2. Outlet Rock Inspected ☐ Functioning ☐ N/A
Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable : N/A

1. Siltation Areal extent _____ Depth _____ ☐ N/A
☐ Siltation not evident
Remarks: _____

2. Erosion Areal extent _____ Depth _____
☐ Erosion not evident
Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A
Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A
Remarks: _____

H. Retaining Walls ☐ Applicable : N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident
Horizontal displacement _____ Vertical displacement _____
Rotational displacement _____
Remarks: _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident
Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable : N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident
Areal extent _____ Depth _____
Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A
☐ Vegetation does not impede flow
Areal extent _____ Type _____
Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident
Areal extent _____ Depth _____
Remarks: _____

4. **Discharge Structure** ☐ Functioning ☐ N/A
Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable : N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident
Areal extent _____ Depth _____
Remarks: _____

2. **Performance Monitoring** Type of monitoring _____
☐ Performance not monitored
Frequency _____ ☐ Evidence of breaching

Head differential _____
Remarks: _____

IX. GROUND WATER/SURFACE WATER REMEDIES : Applicable ☐ N/A

A. Ground Water Extraction Wells, Pumps, and Pipelines : Applicable ☐ N/A

1. Pumps, Wellhead Plumbing, and Electrical
☐ Good condition ☐ All required wells located ☐ Needs O&M ☐ N/A
Remarks: _____

2. Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances
☐ Good condition ☐ Needs O&M
Remarks: _____

3. Spare Parts and Equipment
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks: _____

B. Surface Water Collection Structures, Pumps, and Pipelines ☐ Applicable : N/A

1. Collection Structures, Pumps, and Electrical
☐ Good condition ☐ Needs O&M
Remarks: _____

2. Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances
☐ Good condition ☐ Needs O&M
Remarks: _____

3. Spare Parts and Equipment
☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided
Remarks: _____

C. Treatment System : Applicable ☐ N/A

1. Treatment Train (Check components that apply)
: Metals removal : Oil/water separation ☐ Bioremediation
☐ Air stripping : Carbon absorbers
: Filters fabric
☐ Additive (e.g., chelation agent, flocculent) _____
☐ Others _____
☐ Good condition ☐ Needs O&M

☐ Sampling ports properly marked and functional
☐ Sampling/maintenance log displayed and up to date
☐ Equipment properly identified
: Quantity of ground water treated annually annual average = 9.5 Mgal
☐ Quantity of surface water treated annually _____
Remarks: 12/4/01 Annual inspection by PRP consultant (B&F Engineering, Inc.) identified several O&M issues, including the need for a licensed wastewater treatment plant operator (please see 01/2002 Annual Report)

2. Electrical Enclosures and Panels (Properly rated and functional)
☐ N/A ☐ Good condition ☐ Needs O&M
Remarks: _____

3. Tanks, Vaults, Storage Vessels
☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs O&M
Remarks: _____

4. Discharge Structure and Appurtenances
☐ N/A ☐ Good condition ☐ Needs O&M
Remarks: _____

5. Treatment Building(s)
☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair
☐ Chemicals and equipment properly stored
Remarks: _____

6. Monitoring Wells (Pump and treatment remedy)
: Properly secured/locked : Functioning : Routinely sampled : Good condition
☐ All required wells located : Needs O&M ☐ N/A
Remarks: Monitoring well MW-11 and observation wells M-4A and M-4B were missing locks (not properly secured), and protective outer casing for monitoring well MW-11 was damaged.

D. Monitored Natural Attenuation

1. Monitoring Wells (Natural attenuation remedy)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ All required wells located ☐ Needs O&M : N/A
Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site that are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.).

The remedial objective determined to be necessary at the Mid-South site and the effectiveness of the chosen remedies are as follows:

- Minimize the threat to the public health from the ingestion of or contact with on-site contaminated soil; appears effective in design and functionality.

- Minimize the threat to the public health from direct ingestion of shallow ground water, both on site and downgradient of the site; will be evaluated in detail in the Five-Year Review Report.

- Minimize erosion of contaminated soil and off-site migration to protect public health and environmental quality; appears effective in design and functionality.

- Minimize leaching of contaminants into surface water and ground water; will be evaluated in detail in the Five-Year Review Report.

- Identify cost-effective alternatives for remediation of the site.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

Based on the January 2002 Annual Report and a December 2001 site visit, O&M of the ground water treatment system is not being conducted to the extent necessary to maintain flows as close as possible to the design flow rate for the system.

C. Early Indicators of Potential Remedy Failure

Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs, that suggest that the protectiveness of the remedy may be compromised in the future.

At the time of the site inspection, no unexpected changes in the cost or scope of O&M activities or high frequency of unscheduled repairs were noted that would compromise the protectiveness of the remedy in the future.

D. Opportunities for Optimization

Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy.