ADEQ
ARKANSAS
Department of Environmental Quality

FIVE (5) YEAR REVIEW

OLD MIDLAND PRODUCTS SITE
EPA ID# ARD980745665

DATE: June 1999

942423

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Section 1.0
INTRODUCTION

1.1 Authority

The Arkansas Department of Environmental Quality (ADEQ) and the Environmental Protection Agency (EPA) conducted this review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, section 122(c), the National Contingency Plan (NCP) section 300.400 (f)(4)(ii), and the Office of Solid Waste and Emergency Response (OSWER) Directives 9355.7-02 and 9355.7-02A. This is a statutory review with the purpose of ensuring that the remedial action conducted at the Old Midland site remains protective of the public health and the environment. This review is also the confirmation that the remedy is functioning as it was intended and designed. This document will become part of the site file. This review (Type Ia as defined in OSWER 9355.7-02A) is applicable to a site at which some remedial response is on-going. Is this particular case, groundwater extraction and treatment has been conducted over the past five (5) years and has just recently been discontinued for an undetermined length of time. However, additional groundwater monitoring will be conducted over the next one year period.

1.2 Site Characterization and Background

The Old Midland Products site is located approximately one mile east of the City of Ola, in Yell County, Arkansas (see Figure 1). A sawmill facility and wood preserving chemical plant were operated on the site from 1969 to 1979. The wood treating process included the use of creosote and pentachlorophenol (PCP) to preserve the wood from bacterial and insect degradation. The Old Midland Products Company ceased operations on the property, abandoning several buildings used to house two sawmills, a wood preserving treatment plant, waste/product storage lagoons, and water treatment settling lagoons.

Due to the past waste handling and product storage practices at the site and the nature of the wastes present, extensive contamination was found to be present in the immediate vicinity of the storage lagoons and treatment area. Pentachlorophenol (PCP) was the most widespread contaminant at the site followed by polynuclear aromatics (PNAs), both non-carcinogenic and carcinogenic compounds. A series of inspections and investigations at the site were performed by the Arkansas Department of Pollution Control and Ecology (ADPC&E), now ADEQ, and the EPA between 1981 and 1986. The site was first evaluated using the hazard ranking system on October 23, 1981. On December 10, 1983 the site was ranked by the EPA for consideration as a Superfund site. The hazard ranking was revised to incorporate additional site data and the site was added

to the second update of the National Priority List on July 16, 1984 with a Hazard Score of 30.77.

IT Corporation (IT), in association with The Mehlburger Firm completed the Remedial Investigation (RI) and Feasibility Study (FS) under a contract with ADPC&E through a cooperative agreement with the EPA in 1986. Soil contamination was verified to exist around the lagoon areas and the treatment buildings based on the RI sampling and analysis. The area under the lagoons was not sampled so as to preclude any further vertical migration of the contaminants due to the RI investigation activities. The areal extent of the contamination was determined to be approximately 190,000 square feet. The groundwater investigation was confined to the upper 40 feet as specified by the RI/FS Work Plan. Although, the shallow groundwater was contaminated, the RI sampling and analysis showed no detectable contaminants at a depth of 40 feet. A conclusion of the Feasibility Study was that all the chemicals of concern were considered relatively immobile in surface soils, but subject to transport by soil/wind erosion, storm water run-off and leaching, lagoon leakage through fractures into the upper most aquifer, and movement by construction and earth moving activities.

Section 2.0
REMEDIAL OBJECTIVES

2.1 Record of Decision (ROD)

On March 24, 1988, the EPA executed a declaration selecting the remedial alternative which included on-site thermal destruction (i.e. incineration) of contaminated soils, sludges and sediments (Alternative 5) as well as accelerated pumping and carbon absorptive treatment of the groundwater (Alternative 3B). A copy of the ROD is included in Appendix A.

The rationale for the selection of the on-site incineration consisted of the alternative being protective and cost-effective, and also the alternative being able to attain applicable or relevant and appropriate Federal and State standards. The source control alternative utilized a permanent solution and a treatment technology that reduced contaminant mobility, toxicity, and volume to the maximum extent practicable.

2.2 Clean-up Level

The soils, sludges, and sediments were addressed to a level of 1 part-per-million (ppm) pentachlorophenol (PCP). This level was derived from the Arkansas Water Quality Regulation #2, which had been determined the most stringent existing regulation. That

level was expected to remediate the site to a $1x10^{-6}$ incremental cancer risk. At least 13,000 cubic yards of soils, sludges, and sediments were estimated for the excavation and treatment. This clean-up level was verified through sampling and analysis during the remedial action excavation activities.

The total PCP soil clean-up level of 1 ppm was deemed sufficiently stringent so that coexisting polynuclear aromatics (PNA) contaminants would be removed to concentrations well below those that would present any significant threat to the public health or the environment.

The groundwater extraction and treatment remedy was outlined in the ROD as requiring two clean-up level criterions: the maximum contaminate level goal of 0.2 micrograms-per-liter (mg/L) for PCP, and the $1x10^{-5}$ increased cancer risk concentration of 28 nanograms-per-liter (ng/L) for PNAs, from EPA's Ambient Water Quality Criteria. The clean-up level monitoring was conducted through regularly scheduled groundwater sampling and analysis activities.

2.3 Site Remediation Activities

The Remedial Design (RD) was accomplished by IT Corporation and The Mehlburger Firm during 1988 and 1989 under a contract with ADPC&E. The design included detailed remedial action specifications for the selected remedy of on-site incineration and groundwater extraction and treatment. The RD was funded by ADPC&E and EPA under a cooperative agreement.

The procurement of the remedial action contractor was conducted in 1990. By the competitive bidding method of procurement, Chemical Waste Management, Inc. won the incineration and groundwater treatment project. The RA award and Notice to Proceed were issued in early 1991.

The site remediation activities were broken down into three phases designated as Phase A, Phase B, and Phase C.

Phase A consisted of mobilization to the site, preparation of site plans, installation of the incineration facilities and ancillary equipment including the feed preparation building, design and installation of the wastewater treatment plant, excavation of some site contaminated materials, and the execution and successful demonstration of the contamination destruction capabilities of the incineration unit via a trial burn process.

Mobilization was initiated upon the execution of the Notice to Proceed by ADPC&E on May 15, 1991. Site activities began on May 17, 1991. Clearing and grubbing the site inside the area to be excavated followed initial mobilization. The existing man-made plant facility structures, including the treatment building, pump houses, yard offices,

maintenance shops, wood maintenance sheds, process equipment, tanks, vessels, furnaces, boilers, pumps, compressors, fans, controls, foundations, above and below ground piping, valving, conduits, fences, rails, posts, and various wood debris on-site, were disassembled, decontaminated and/or demolished by cutting them into manageable pieces for handling. The incinerator and its ancillary facilities were constructed immediately adjacent to the excavation area. Two mini-burns and two trial burns were conducted during Phase A to determine the appropriate operating parameters based on air emission limits and ash criteria.

Phase B included the excavation and incineration of contaminated soils, sludges, and sediments, ash backfilling, removal of the incineration facilities and ancillary equipment, final grading and seeding, the installation of recovery and additional monitoring wells, and the connection of the groundwater recovery and treatment equipment systems.

After the excavation activities were initiated, the incinerator production burn commenced on June 8, 1992. The production burn ended on May 27, 1993 with a total of 102,571 payable tons processed during the Phase B operations. The excavation area was comprised of 98 grid cells, each approximately 50' x 50' in dimension. Dismantling of the incineration facility continued through early August 1993 concurrently with the backfill and final grading operations. The monitoring and recovery wells, and the recovery well system were installed by September 1993. Site clean-up, including site seeding, was conducted in October and November 1993. Substantial completion was determined to be achieved November 6, 1993 with the gates locked on November 19, 1993. Figure 2 shows the current general site conditions.

Phase C was scheduled as a five (5) year groundwater recovery and treatment program which was initiated in January 1994. The groundwater recovery system consists of a network of eight recovery wells encompassing the area of highest groundwater contamination. The recovery system extracted contaminated groundwater and pumped it to the wastewater treatment plant, which was utilized during the earlier phases of the remedial effort. The actual extraction and treatment operation has recently been completed, but an additional one year monitoring period has been added to the work in order to document any contaminant rebound after the recovery system has been shut-down.

2.4 Compliance with the National Contingency Plan (NCP) and the Provisions of the Superfund Amendments and Preauthorization Act of 1986 (SARA)

The source control remedy provided adequate protection and continues to provide adequate protection of public health, welfare, and the environment. The remedy is consistent with the National Contingency Plan (NCP), 40 CFR Part 300. The NCP requires a remedy to effectively mitigate and minimize threats to, and provide adequate protection of public health, welfare and the environment.

In addition, the long-term effectiveness factors outlined in SARA Section 121 (b)(1) remain protected under the current status of the source control remedy. These factors include:

- the long-term uncertainty of land disposal,
- the objectives of the Solid Waste Disposal Act,
- the persistence, toxicity, mobility, and propensity for bioaccumulation of site hazardous substances,
- short and long-term potential for adverse health effects from human exposure,
- the long-term maintenance costs,
- the potential for future remedial action costs, and
- the potential threat to human health and the environment associated with excavation, transportation, and redisposal, or containment.

No future source control remedial actions are required or anticipated at this time. The completed source control remedial action is considered permanent.

The groundwater pump and treat remedy implementation has established and maintained adequate protection of public health, welfare, and the environment. The groundwater movement was controlled during the pump and treat operation and some contamination has been extracted. General groundwater movement and thus groundwater contamination is slow, and has not reached the property boundaries.

The groundwater remedy is consistent with the NCP, 40 CFR Part 300, and during the implementation it has effectively mitigated and minimized threats to the public welfare, and the environment.

Additional groundwater sampling is scheduled to be conducted during the year following the shutdown of the pump and treat system. An evaluation of the site conditions, upon rebound of any groundwater contaminate concentrations, will be conducted during that period. It has yet to be determined whether the pump and treat remedy will continue.

2.5 Consistency with Other Environmental Laws

During the selection of the remedial alternative and throughout the implementation of the remedial action, consideration was given to the requirements of the various Federal and State environmental laws, in addition to CERCLA as amended by SARA. Primary consideration was given to attaining applicable or relevant and appropriate Federal and State public health and environmental regulations and standards (ARARs - Applicable or Relevant and Appropriate Requirements). While some Federal and State laws were not legally applicable to the remedy, these rules were evaluated to determine if the whole, or a portion, were relevant and appropriate. The Record of Decision, attached herein, documents the specific ARARs for the remedial action.

Section 3.0
RECOMMENDATIONS

3.1 Summary of the Five Year Review

The source control remedy achieved cleanup levels for unrestricted land use as outlined in the ROD. In addition, the source control remedy remains functional and protective of human health and the environment. The cap placed upon the backfilled incinerator ash initially had some minimal erosion concerns. However, these areas were repaired, and since the vegetative cover has become established, the areas remain stable and secure.

The source control remedy was anticipated to be a "walk-away" remedy as stated in the ROD. On the other hand, the ultimate outcome of the groundwater remediation effort could not be determined at the time the ROD was written. However, after the scheduled five years of the groundwater pump and treat remedial effort, some evaluations can be determined. The future of the groundwater remedial effort will be determined after the one year of groundwater monitoring with no pump and treat operations. In the interim, the site fence remains intact and is maintained to prevent access of unauthorized personnel.

Reviewing the groundwater analytical results over the past 5 years reveals that the pump and treat system has been effective in removing some of the contamination. The data shows that the average PCP concentration in the recovery wells has trended slightly downward from approximately 1.2 mg/L to approximately 0.9 mg/L. Using the more recent recovery well data it appears that about five (5) of the eight (8) recovery wells could meet the ROD goal of 0.2 mg/L for PCP during the pump and treat operation. At the beginning of the pump and treat remedial effort only two (2) of the recovery wells met the ROD goals.

The PNA concentrations do not reveal a positive remedial impact. From the Phase C data it can be illustrated that the average PNA concentration has trended upward from approximately 5 mg/L at the beginning of Phase C to approximately 20 mg/L at the end of 1998. Only one (1) well has illustrated a general downward trend of PNA concentration.

During the operation of the pump and treat system the groundwater movement was controlled, and the contamination around the recovery wells did not expand. At the end of the pump and treat operation (i.e. Phase C) the contamination was still about 150 feet from the property boundary. During the Remedial Investigation (RI) it was calculated that the groundwater movement was toward the north, northwest at about 20 to 30 feet per year. Local groundwater use is domestic and agricultural. An off-site residential well (the Barnes well) is located approximately 1200 feet northwest of the site, and has available

city water supply but as of late1998 it was not hooked up. Another off-site residential well (the Nieley well) is located approximately 450 feet west, northwest of the groundwater contamination. Although this off-site well did not test positive for contamination, ADEQ installed the connection to city water supply for the residence prior to the remedial action. At the end of the groundwater extraction and treatment (Phase C) the Nieley and Barnes wells showed no analytical results of contamination.

3.2 Recommendations

The remedy is functioning and remains adequate to protect the public health and the environment. The future of the groundwater remedial work remains somewhat questionable at this time. During the schedule year of groundwater monitoring, the groundwater clean-up levels will be reviewed to determine the current day appropriate applicability of the remediation standards. In any outcome of the groundwater future actions, it is recommended that the site be continually monitored and maintained until the groundwater remedial effort is complete and a final resolution of the site future has been decided.

The continual maintenance and monitoring will provide additional opportunities for reviews and observations in order to safeguard against possible disturbance of destruction of the remedy. It will also allow for a more appealing site and promote the redevelopment and future land use.

Section 4.0
STATEMENT OF PROTECTIVENESS

4.1 Declaration

The implemented remedy is protective of human health and the environment, it has attained and maintained Federal and State requirements that are applicable or relevant, and it was cost effective. The remedy satisfied the statutory preference for remedies that employ treatment which permanently and significantly reduces toxicity, mobility, or volume of hazardous substances. Finally, it was determined that the source control remedy utilized permanent solutions and alternative treatment technologies to the maximum extent practicable.

4.2 Certification

" I certify that the remedy selected for and implemented at the Old Midland Products site remains protective of human health and the environment."

Section 5.0
NEXT FIVE-YEAR REVIEW

Since the groundwater remedial action effort continues at this time, the next five-year review for the pump and treatment remedy will be conducted by March 2004. If the groundwater remedial effort is completed before that time and the site affords unlimited use and unrestricted exposure, an additional five-year review may not be required. In that case, site completion activities will be documented in the site Close Out Report.

Mike Bates

Mike Bates, Chief
Hazardous Waste Division, ADEQ

6/14/99
Date

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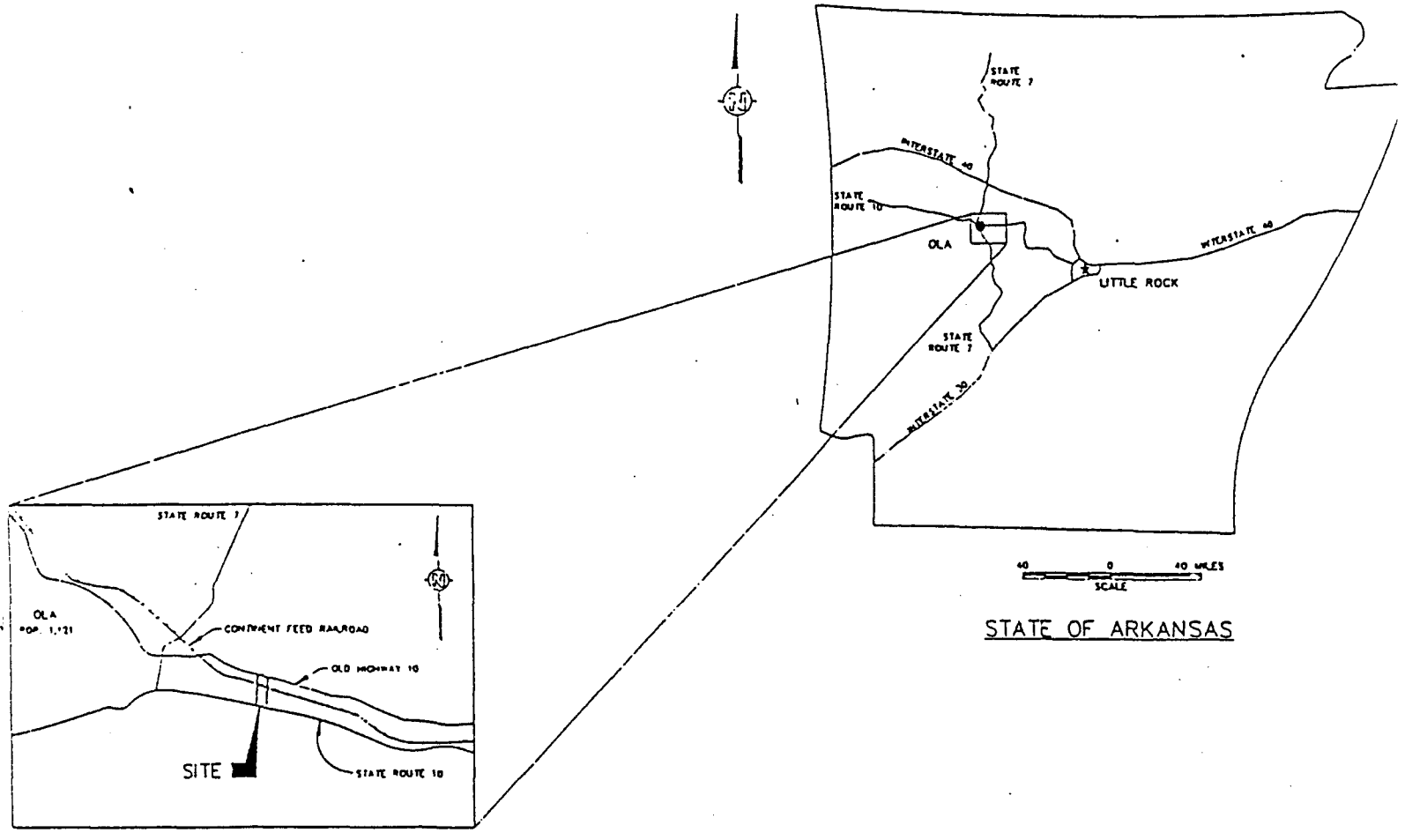
OLD MIDLAND PRODUCTS SITE
YELL COUNTY ; OLA, ARKANSAS



SITE VICINITY MAP OLD MIDLAND PRODUCTS SITE OLA, ARKANSAS	
STATE OF ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY LITTLE ROCK, ARKANSAS	
Drawn By: IT Corporation Houston, Texas	Checked By: CMC
Project No: 1595	Scale: As Shown
	Figure No: 1

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APPENDIX A

RECORD OF DECISION

RECORD OF DECISION

EPA
REGION 6

OLD MIDLAND PRODUCTS

REMEDIAL ALTERNATIVE SELECTION

The abandoned Old Midland Products site is located near the city of Ola, Arkansas in Yell County. From 1969 to 1979, a creosote and pentachlorophenol wood preserving plant and sawmill were operated at the site.

Investigations show contamination present in surface soils, lagoon sludges, and on-site drainageway sediments. The lagoon area, used to store spent treatment fluid, broached an underlying clay formation into the weathered shale. This facilitated localized ground water contamination with a lighter-than-water oil phase.

Several potential remedies were evaluated against the requirements of the Superfund Amendments and Reauthorization Act of 1986. After presenting proposed remedies for public review, EPA has selected the options entailing on-site incineration of contaminated soils, sediments, and sludges; and an accelerated pumping and treating of the contaminated ground water.

DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Old Midland Products, Yell County, Arkansas

STATEMENT OF PURPOSE

This decision document presents the selected remedial action for this site developed in accordance with Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and the National Contingency Plan (40 CFR Part 300).

The State of Arkansas has concurred on the selected remedy. (Letter attached)

STATEMENT OF BASIS

This decision is based upon the administrative record for the Old Midland Superfund Site [index attached]. The attached index identifies the items which comprise the administrative record upon which the selection of a remedial action is based.

DESCRIPTION OF THE SELECTED REMEDY

The major components of the selected remedy include:

- On-site thermal destruction of the contaminated surface soils, lagoon sludges, and drainageway sediments. The soils, sludges, and sediments will be cleaned to a level of 1 ppm total pentachlorophenol (PCP).

- Placement of the clean ash on the site. Covering the ash with a vegetated soil layer.

- Collection and onsite treatment, using carbon adsorption, of the contaminated lagoon water and groundwater.

DECLARATION

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate and is cost-effective. The remedy satisfies the statutory preference for remedies that employ treatment which permanently and significantly reduces the toxicity, mobility, or volume of hazardous substances as their principle element. Finally it is determined that this remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

March 24, 1988
Date

Robert E. Layton Jr.
Robert E. Layton Jr., P.E.
Regional Administrator

Summary of Remedial Alternative Selection
Old Midland Products Site
Yell County, Arkansas
February, 1988

I. SITE LOCATION AND DESCRIPTION

The Old Midland Products site is an abandoned creosote and pentachlorophenol wood preserving plant and sawmill located near Ola, Arkansas in Yell County (Figure 1). The site borders the north right-of-way of Highway 10 and extends north to the southern right-of-way of Old Highway 10. The site is flat (2-3% slope) with a total area of about 37 acres. Areas of concern include 7 process lagoons and a treatment building. The process lagoons range in area from 125 to 7200 square feet with depths from 3.5 feet to 6 feet (See Figure 1). Most surface runoff is to an on-site intermittent stream. The stream flows into the Petit Jean Wildlife Management Area about three-fourths of a mile downstream. Repeated tests show that the wildlife management area is not significantly affected, if at all, by the site.

Site History

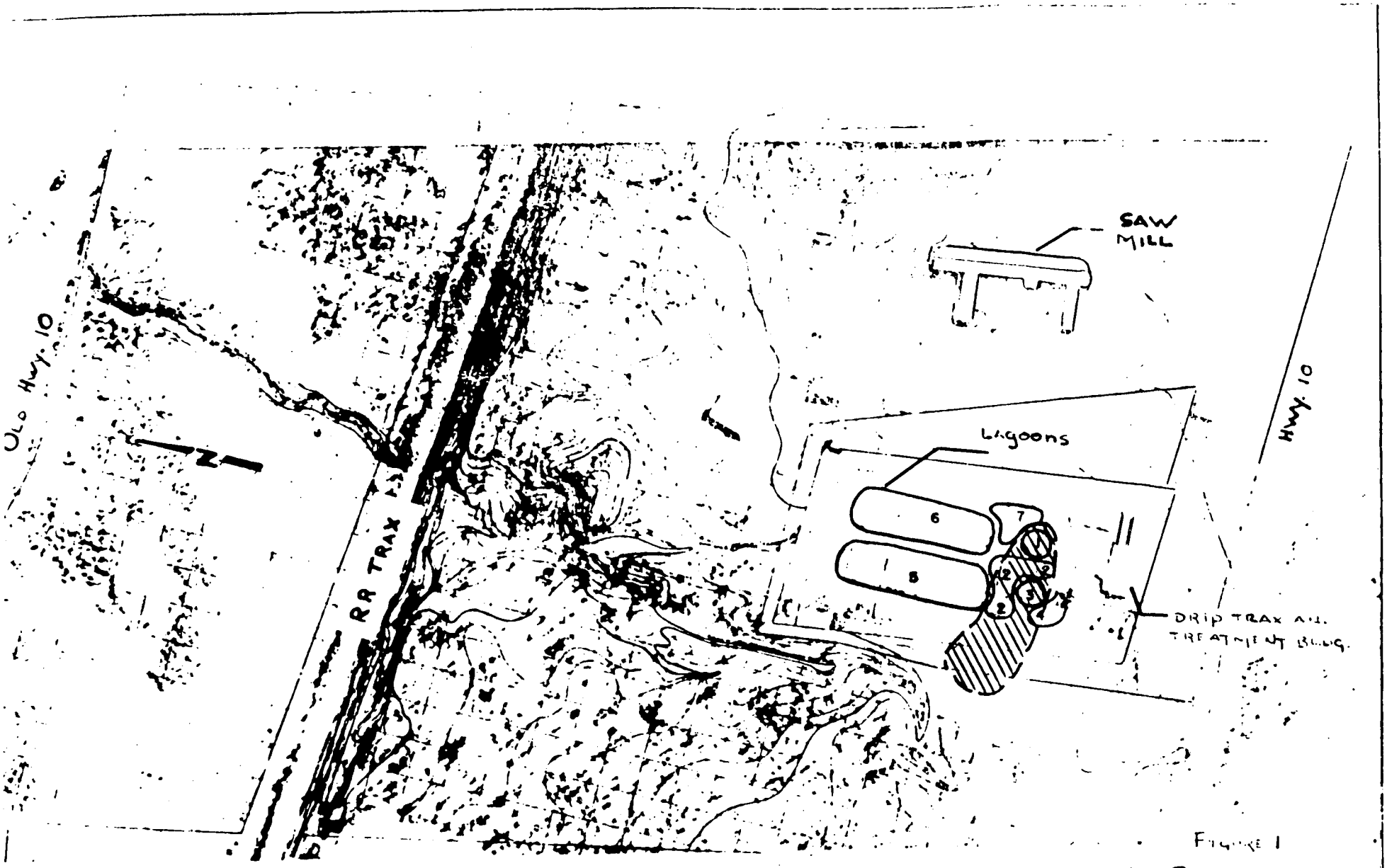
Old Midland Products is known to have been in operation from 1969 to 1979 as a wood preserving plant. However, the Environmental Protection Agency (EPA) aerial photos indicate that the sawmill might have been in operation as early as 1960. Operations included treating wood with creosote and pentachlorophenol (PCP) to preserve the wood from bacterial and insect degradation. The chemicals were generally forced into the wood under pressure resulting in the release of lignin and tannin based chemicals from the wood. The treated wood was probably allowed to dry in open areas to the east and west of the lagoons and treatment building. Effluent from the treatment process containing PCP and polynuclear aromatic compounds (PNAs) were discharged into Lagoons 1 or 3 (see figure 1) and other lagoons via a moveable discharge pipe. Pond overflows have occurred with drainage to the intermittent stream west of the lagoons.

The land, originally owned by the Old Midland Products Company, was sold in 1979 to the Plainview-Ola Economic Trust Inc. The First State Bank of Plainview is the lien holder for the Old Midland Products Co.

On December 10, 1983, the site was ranked by EPA and the Arkansas Department of Pollution Control and Ecology (ADPCE) for consideration as a Superfund site. Based on hazards posed by the lagoons and contaminated soils the site was included on the second update of the National Priorities List on July 16, 1984 with a Hazard Ranking Score of 30.77.

Geology/Hydrogeology

The site is in the center of the Arkansas Valley and the Ouachita Mountains regions. Geology of Yell County is dominated by outcrops of the lower and middle Atoka Formation of the Pennsylvanian Age. The Atoka



LEGEND

PROPERTY LINE
CHAIN LINK FENCE
BARBED WIRE FENCE
CONTOUR LINE
CHAIN LINK FENCE NEW
DISCOLORED SOIL AREA

OLD MIDLANDS PRODUCTS SITE

OLA, ARKANSAS

GROUNDWATER PLUME

FIGURE 1

OLD MIDLAND PRODUCTS

MARCH, 1983

004279

Formation consists primarily of interbedded gray/black shale and brownish gray sandstone and siltstone. In the site vicinity the Atoka Formation may be several thousand feet thick, with the shale constituting about three-fourths of the thickness. The upper forty feet of soil/rock at the site contain (in order of descending depth) silty clay down to about 15 feet, a layer of iron nodules less than 6" thick and a layer of weathered shale about 20 feet thick. Below these layers an unweathered or slightly weathered (but fractured) shale goes down thousands of feet.

The weathered and unweathered shale layers represent a single water bearing zone. Groundwater in the area occurs under Artesian conditions and flows through fractures, faults, bedding planes and weatered zones. The shallowest water producing intervals occur in the weathered shale at depths of 15 to 20 feet in a zone 3 to 5 feet thick.

The weathered shale, as well as the surface topography, slope to the north-northwest. The hydraulic gradient slopes to the northwest with a magnitude of 0.02 to 0.34 feet/foot. In general, groundwater movement follows the general slope of the area water table. However, the contaminant plume initially flows against this slope (see figure 1), apparently following a fold, fault or channel, then is redirected to follow the general water table of the area.

Five local water supply wells have been identified within 1500 feet of the site. Well depths range from 80 to almost 300 feet. These five wells, and the city of Ola water well, were sampled. The results showed those wells were free from site related contaminants. The closest well is located approximately 450 feet west-northwest of the lagoons at a reported depth of 80 feet. The water bearing zone is then classified as being a potential source of water for beneficial use (Class II B). Remediation levels will reflect such.

Remedial Investigation Results

A remedial investigation (RI) was conducted at the Old Midland Products site from April 1985 to November 1987. During the RI, samples were collected from soil, sediments, sludges, air, surface water and ground water to characterize the contamination, define the extent of contamination and estimate the volume of contamination present at the site. In addition, data were collected to characterize the hydrogeology, hydrology, demography, and ecology of the site and area to allow assessment of potential contaminant migration and risk to public health and the environment.

During the RI, four deep (40 feet) and eight shallow (20 feet) groundwater monitoring wells were installed. Six deep (40 feet) and eight shallow (20 feet) piezometers were installed to monitor groundwater elevations and hydraulic gradients. Soil boring samples were collected during the installation of the monitoring wells and piezometers and at 2 additional 40 feet deep holes and 9 additional 18 foot deep holes.

Three exploratory trenches approximately 20 feet deep were dug a total of 540 linear feet to further characterize the site's shallow geology. Permeability was measured with 23 in-situ falling head tests

and 15 laboratory falling head tests. Twenty-one soil particle size analyses were performed. Sludge and water samples from each of the seven lagoons, 22 sediment samples from the intermittent stream, 37 groundwater samples, 72 soil boring samples, and 138 surface/subsurface soil samples were all chemically analyzed. An air analysis station was placed onsite and was used to monitor site meteorological conditions for one year. A pumping and recovery test was completed on the shallow groundwater bearing zone.

A lagoon sludge stabilization test was completed and carbon treatability tests were performed on lagoon water and groundwater.

Findings of the Remedial Investigation

Pentachlorophenol (PCP) is the most widespread contaminant at the site followed by polynuclear aromatics (PNAs). Chlorinated dibenzo dioxins and furans are present in the more concentrated wastes (such as lagoon sludges and nonaqueous phase liquid). However, the established clean up levels would treat them sufficiently. Trace levels of aromatic hydrocarbons were also detected, although of limited spatial extent and at concentrations that present no significant health or environmental threats.

PCP was present in surface (0"-6") soil, subsurface (6-12") soil, deeper soil (down to water bearing zone), drainageway sediments, surface water, groundwater; lagoon sediments, and lagoon fluids. PNAs were detected in surface soil, subsurface soil, deeper soil, drainageway sediments, ground water, lagoon sediments, and lagoon fluids.

Table 1 presents the maximum PCP concentrations observed and the maximum concentration of a specific PNA observed per media.

Soil contamination is limited to the area around the lagoons and treatment building and the soil beneath the lagoons. Drainageway sediments were contaminated at concentrations from 1 to 10 ppm PCP from near the northwest perimeter of the lagoon area downstream to south of Old Highway 10, an estimated distance of 1,680 feet. No significant contamination was observed in offsite drainageway sediments.

Groundwater contamination is limited to the shallow ground water. Contamination appears to be made up of a lighter-than-water nonaqueous phase liquid, that covers an estimated area of 24,000 square feet. Under static, nonpumping conditions most of the groundwater contamination is within the upper 20 feet of soil/rock. No indications of deeper contamination were observed. Figure 2 illustrates the estimated areal extent of groundwater contamination.

There is estimated to be approximately 9,000 to 21,000 cubic yards of contaminated soil. The range is due to the uncertainty in depth of contamination beneath the lagoons. There are approximately 850 cubic yards of contaminated drainage sediments. Approximately 450,000 gallons of groundwater are contaminated, as are about 620,000 gallons of lagoon fluids. The contaminated lagoon sludges measure approximately 2,770 cubic yards.

Table 1. Maximum Detected Concentrations (in parts per million)

MEDIA	MAXIMUM PCP	MAXIMUM PNAs
Surface soil (0-6 in)	790	14,000
Subsurface soil (6-12 in)	690	220
Deeper soil (1-20 ft)	0.32	270
Drainageway sediment	9.5	6.6
Surface water	0.012	not found
Groundwater, oil phase	12,000	5,100
Lagoon sludges	5,900	38,000
Lagoon fluids	0.6	2.2

NOTE: PNAs refers to a wide variety of compounds. Some, such as phenanthene, are not harmful. Some, such as benzo(a)anthracene, are carinogenic.

Potential Impact of Site Contaminants on Human Health and the Environment

The environmental fate and transport of PNAs and PCP was assessed based on the physical and chemical characteristics of these contaminants and the geological and topographical characteristics of the site.

PNAs, due to their low water solubility (thus non-leachable), high octanol/water partition coefficient, high soil adsorption coefficients, and resistance to oxidation or hydrolysis make them highly immobile in soils. Their low vapor pressure indicates they will not volatilize. Therefore, migration of PNAs is expected to be extremely limited.

There is little information on the transport of PCP through the environment. The compound has a low vapor pressure and therefore is not likely to volatilize readily. It is slightly soluble in water and adsorbs to sediments and soil, and therefore may be transported by soil and drainageway sediments.

The site presents potential current and future risks to public health and the environment if no actions are implemented. The lighter-than-water nonaqueous phase liquid plume in the shallow groundwater, direct contact with surface contaminants and the leaching of contaminants from lagoon sediments into the groundwater represent the primary risks. These risks can be mitigated through treatment of contaminated soils, lagoon liquids, sludges, and contaminated groundwater.

II. ENFORCEMENT

The enforcement goal for the EPA is to have those parties responsible for the site contamination pay for the cleanup of the site. At least one Potential Responsible Party (PRP) has been identified and the Agency presently is searching for additional parties. Any PRPs would be notified that they may undertake or participate in the chosen remedy. If they decline involvement in the remedial action, EPA will fund the design and implementation of the selected remedy. A cost recovery enforcement action will be pursued at a later date.

III. COMMUNITY RELATIONS HISTORY

Initial community interest in the Old Midland Products site was high, due in part to the cost of the remedial investigation/feasibility study and the length of time before actual cleanup could begin. Approximately 35 people attended a public meeting in May 1986. Both EPA and the Arkansas Department of Pollution Control and Ecology explained the Superfund process, outlined the activities planned for the remedial investigation, and responded to the citizen's concerns.

Upon completion of the feasibility study a public notice was released on November 16, 1987. This notice summarized the various alternatives, highlighted the proposed plan, announced the public comment period of November 27 through December 31, 1987, and invited the public to a meeting on December 9. Media coverage of this notice appeared in the

Dardanell Post-Dispatch, Arkansas Gazette, and Arkansas Democrat. A fact sheet was mailed to 85 area residents, local officials, and interested citizens. Extra copies of all relevant documents are available in the Yell County Courthouse, and Ola Community Center. Posters announcing the public meeting were sent to all area businesses, churches, and the Community Center.

Approximately 20 people attended the public meeting on December 9th. There was no opposition expressed at the meeting or during the comment period to EPA's proposed plan for onsite incineration and accelerated recovery wells. Responses to the questions/comments received during the comment period are outlined in Appendix A entitled Responsiveness Summary.

IV. ALTERNATIVES EVALUATION

A. Evaluation Criteria

Section 121(a) through (f) of the Superfund Amendments and Reauthorization Act (SARA) contains factors which EPA must consider in selecting a remedy for a Superfund site. Section 121(b)1 of SARA states a preference for certain items: EPA is directed to look at alternative treatment technologies, the final selection is a remedial activity which is protective of human health and the environment. "Remedial actions in which treatment which permanently and significantly reduces the volume, toxicity, or mobility of the hazardous substance as a principal element, are to be preferred over remedial actions not involving such treatment. The offsite transport and disposal of hazardous substances or contaminated materials without such treatment should be the least favored alternative remedial action where practicable treatment technologies are available."

These factors, as well as other criteria used during the evaluation of alternatives, are discussed below:

1. Consistency with Other Environmental Laws - Compliance with ARARs

   In determining appropriate remedial actions at Superfund sites, consideration must be given to the requirements of the various Federal and state environmental laws, in addition to CERCLA as amended by SARA. Primary consideration is given to attaining applicable or relevant and appropriate Federal and State public health and environmental regulations and standards, commonly referred to as ARARs (Applicable or Relevant and Appropriate Regulations). While many State and Federal laws may not be legally applicable to the proposed remedy, they must be evaluated to determine if the whole, or a portion, are relevant and appropriate.

2. Reduction of Toxicity, Mobility or Volume

   The degree to which alternatives employ treatment that reduces toxicity, mobility, or volume must also be assessed. Relevant factors are:

- o The treatment processes the remedies employ and materials they will treat;
- o The amount of hazardous materials that will be destroyed or treated;
- o The degree of expected reduction in toxicity, mobility, or volume;
- o The residuals that will remain following treatment, considering the persistence, toxicity, mobility, and propensity for bioaccumulation of such hazardous substances and their constituents.

3. Short-term Effectiveness

The short-term effectiveness of alternatives must be assessed considering appropriate factors among the following:

- o Magnitude of reduction of existing risks;
- o Short-term risks that might be posed to the community, workers, or the environment during implementation of an alternative including potential threats to human health and the environment associated with excavation, transportation, and redisposal or containment;
- o Time until full protection is achieved.

4. Long-term Effectiveness and Permanence

Alternatives are assessed for the long-term effectiveness and permanence they afford along with the degree of certainty that the remedy will prove successful. Factors considered are:

- o Magnitude of residual risks in terms of amounts and concentrations of waste remaining following implementation of a remedial action, considering the persistence, toxicity, mobility, and propensity for bioaccumulation of such hazardous substances and their constituents;
- o The degree to which the treatment is irreversible;
- o Type and degree of long-term management required, including monitoring and operation and maintenance;
- o Potential for exposure of human and environmental receptors to remaining waste considering the potential threat to human health and the environment associated with excavation, transportation, redisposal, or containment;

- o Long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated wastes and residuals;

- o Potential need for replacement of the remedy.

5. Implementability

The ease or difficulty of implementing the alternatives are assessed by considering the following types of factors:

- o Degree of difficulty associated with constructing the technology;

- o Expected operational reliability of the technologies;

- o Need to coordinate with and obtain necessary approvals and permits (e.g., NPDES, dredge and fill permits for off-site actions) from other offices and agencies;

- o Availability of necessary equipment and specialists;

- o Available capacity and location of needed treatment, storage, and disposal services.

6. Cost

The types of costs that should be assessed include the following:

- o Capital cost;

- o Operation and maintenance costs;

- o Net present value of capital and O & M costs;

- o Potential future remedial action costs.

7. Community Acceptance

This assessment examines:

- o Components of the alternatives that the community supports;

- o Features of the alternatives about which the community has reservations;

- o Elements of the alternatives which the community strongly opposes.

8. State Acceptance

Evaluation factors include assessments of:

- o Components of the alternatives the State supports;
- o Features of the alternatives about which the State has reservations;
- o Elements of the alternatives under consideration that the State strongly opposes.

9. Overall Protection of Human Health and the Environment

Following the analysis of the remedial options against individual evaluation criteria, the alternatives are assessed from the standpoint of whether they provide adequate protection of human health and the environment considering the multiple criteria.

B. Description of Alternatives

Based on appearance and past site operations, the following structures will be treated as contaminated with PCP and/or PNAs: yard offices A and B, storage trailer, maintenance shop, wood storage shed, treatment building, tanks A through E, and portions of the interior of the sawmill.

All these contaminated areas are addressed by this Record of Decision. The conditions at the site dictated looking at alternatives to address the site as two problems: (1) source control-cleaning the surface soils, drainageway sediments, and lagoon water and sludges; (2) ground water.

In conformance with EPA regulation, 40 CFR Part 300, also known as the National Contingency Plan, the universe of possible applicable technologies was screened to determine whether they might be appropriate for this site. (See the Feasibility Study for details of this evaluation). This set of possible technologies was then screened based on existing site wastes and conditions, and their ability to minimize long term threat to human health and the environment. The protection of workers working onsite was also considered. This process highlighted 23 available technologies. Then, from these 23 possible technologies, six source control and five groundwater alternatives were chosen for more detailed evaluation and comparison with respect to the nine remedy selection criteria outlined above. The source control and groundwater remedies were evaluated separately but they will be implemented concurrently.

Certain actions are common to all alternatives. For example, all existing monitor wells, peizometers and water wells on the site were assumed to be plugged and abandoned for cost estimating purposes except for monitor well MW-1s. This well will be retained to provide an upgradient well for post-remediation monitoring. The remedial action and any possible future use of the site would present a risk of damaging the wells. Plugging and abandonment of the wells will eliminate the risk of damage to the integrity of the well seal and casing with the consequent risk of contamination of the aquifer through the damaged well.

C. SOURCE CONTROL ALTERNATIVES

As part of the source control alternatives, a carbon adsorption treatment system will be used for decontaminating the liquid wastes for all alternatives except alternative I, which does not include any treatment, and alternative VI, which recommends using UV/ Ozonation.

The recovered oil from the oil-water separator will be sent to a hazardous waste incinerator. The carbon will either be regenerated or disposed of as residue from hazardous waste treatment unit.

ALTERNATIVE I, NO ACTION - This alternative consists primarily of restricting public access to the contaminated areas and monitoring the site. The existing fence would be maintained and warning signs would be installed. The site monitoring will involve periodic air and groundwater sampling and analysis. This action would continue for at least 30 years.

ALTERNATIVE II, CONTAINMENT - This alternative involves in-situ solidification of lagoon wastes; excavation of drainageway sediments, solidification of drainage sediments if necessary, and placement of drainage sediments in lagoons; then construction of a surface cap designed to meet all pertinent regulations and statutes. Approximately 998,000 gallons of contaminated stormwater runoff during construction and 620,000 gallons of lagoon liquids, would be collected, treated, and discharged. Any liquid discharges would be sent to the onsite stream. The discharged water would conform to applicable or relevant and appropriate standards.

ALTERNATIVE III, ONSITE LANDFILL - Since there is adequate space available, a landfill could be located on site. The landfill would have protective top and bottom liners which satisfy all requirements and are protective of human health and the environment. The site wastes (surface soils, sediments, and sludges) would be stabilized then placed in the landfill. The lagoon liquids would be collected, treated, and discharged. The discharged water would conform to applicable or relevant and appropriate standards.

ALTERNATIVE IV, ONSITE BIOLOGICAL TREATMENT - Alternative IV involves onsite biotreatment of wastes using a combination of a liquid/solids contact reactor and land treatment technologies. The reactor would be used for the concentrated wastes (lagoon sediments) and landfarming would be applied to the less contaminated soils and drainageway sediments. An integral part of this remedial action would be securing a waiver to the RCRA Land Ban as it impacts the proposed landfarming operation. The lagoon liquids would be collected, treated and discharged. The discharged water would conform to applicable or relevant and appropriate standards. This action could require monitoring for up to 30 years.

ALTERNATIVE V, ONSITE INCINERATION - Alternative V is composed of bringing to the site a transportable incinerator to destroy the wastes. All soils, sediments and sludges contaminated with greater than 1 ppm PCP, would be treated and returned to the site, as an ash. The ash will be tested to insure it meets the clean-up standards described on

page 6. As with all source control remedies, except no action, the lagoon liquids will be collected, treated and discharged. The discharged water would conform to applicable or relevant and appropriate standards. This action would take two years to implement.

ALTERNATIVE VI, ONSITE INCINERATION WITH ULTRAVIOLET/OZONATION - Same remedy as alternative V but using UV/Ozonation as the water treatment system instead of carbon adsorption. It was initially felt UV/Ozonation could be a more cost-effective water treatment alternative. Now it is projected to be similar in effectiveness to Alternative V. This action could take for up to seven years to implement.

D. GROUNDWATER ALTERNATIVES

ALTERNATIVE 1, NO ACTION - Includes only groundwater monitoring. No remedial actions would be implemented to address groundwater contamination. This action would be continued for at least 30 years.

ALTERNATIVE 2, CONTAINMENT - This alternative consists of constructing a soil-bentonite slurry wall barrier to such depth that the wall surrounds the plume. A surface cap would also be constructed to cover the contaminated surface area.

ALTERNATIVE 3, RECOVERY WELLS - MINIMAL PROGRAM - This alternative includes installation of two recovery wells, completed to depths of just below the oil phase. The groundwater treatment system would include an oil-water separator and a carbon adsorption system which would treat the water. The cleanup is estimated to take between 5-10 years.

ALTERNATIVE 4, RECOVERY WELLS - ACCELERATED PROGRAM - This remedy is the same as Alternative 3 but proposes four wells instead of two. The accelerated program reduces cleanup time from 5-10 years to 1-5 years.

ALTERNATIVE 5, FRENCH DRAIN - The french drain and sump would be constructed on the downgradient edge of the plume. At the sump discharge there would be an oil-water separator with a carbon adsorption unit. This method could take up to 30 years. This is expected to be less effective than alternatives 3 and 4 in recovering the oil phase because of the reduced ability to draw down contaminants to the french drain.

E. EVALUATION OF ALTERNATIVES

The degree that the remedial alternatives meet the nine selection criteria described earlier is contained in Table 2. The following symbols were assigned to compare remedial selection criteria:

+ Alternative would exceed a criterion in comparison to other alternatives.

0 Alternative achieves selection criteria.

- Special efforts will be necessary in the design of the remedy to meet the selection criterion.

( ) Blank indicates no discernable opinion.

1. COMPLIES WITH ARARs (i.e., meets or exceeds applicable or relevant and appropriate Federal and state requirements)

SOURCE CONTROL

The no action remedy was rated "-" because it does not meet the intent of the RCRA and Superfund requirements for remediation of a hazardous waste site. Containment can meet requirements, but it would likely be ineffective due to the fractured site geology. Containment was given "0". The National Contingency Plan provisions to respond to a threat of release are not satisfied by this remedy. The onsite landfill was rated "-" because the existing levels of dioxins and furans possibly exceed the allowable land disposal concentrations for this waste. According to contemporary laboratory and literature data, biological treatment is uncertain for these particular wastes. Thus, the rating is ( ).

Incineration was rated the highest for this criterion (+) because in addition to exceeding all relevant or applicable and appropriate environmental regulations, this alternative most effectively meets the intent of SARA for permanently addressing the site contaminants.

GROUNDWATER

No action would not attain ARARs and would not reduce existing contamination and thus received a "-". Containment was given a "-" because the subsurface geology would prevent it from achieving the ARARs. The two pumping alternatives were given "+" due to their ability to achieve the specified clean up levels. The french drain was given a "-" because it is not expected to be able to attain clean up levels within the plume.

2. REDUCES MOB., TOX., VOL. (i.e., Reduces the Mobility, Toxicity, or Volume of Waste)

SOURCE CONTROL

No action was rated "-" for mobility, toxicity, and volume reduction because it does nothing to address any of the stated criteria. Containment was rated "-" for mobility reduction due to the fractured subsurface geology. Percolation would be reduced but with negligable impact on the subsurface flow. Containment would not reduce the toxicity of the waste, thus it received a "-" for toxicity reduction. The contaminated volume would not decrease, therefore containment receives a "-" for volume reduction.

Onsite landfill was rated "0" for mobility reduction because this alternative could reduce percolation and thus the mobility of contaminants; for reduction of toxicity and volume the landfill alternative was rated "-" because neither of these are reduced. Onsite biological treatment, due to the relative uncertainity associated with this

remedy for reducing the toxicity of these wastes, was given a "-". (Mobility might be reduced with the biotreatment alternative, and so) received a "+". Volume would not reduced since there would be soil addition, thus it received a "-". The thermal destruction alternatives (with carbon adsorption and UV/ Ozonation) were given ratings of "+" due to the complete destruction achieved by these remedies. For both remedies, mobility, toxicity, and volume would be reduced. Thus, all three categories for both alternatives were rated positively.

GROUNDWATER

No action was given a "-" because there would be no reduction of mobility, toxicity, or volume. Containment was given "-" ratings since the fractured subsurface geology would render the slurry walls ineffective for reducing mobility, toxicity, or volume.

The two pump and treat methods were given "+" ratings because they reduce the mobility, toxicity and volume of the plume. The french drain would not be as effective due to the reduced ability to draw the contaminants down to the french drain, thus it was given "0" for all three categories.

3. SHORT TERM EFFECTIVENESS

SOURCE CONTROL

No action leaves contaminated seeps and waste exposed to the public, thus the no action rated "-". The simple containment remedy (Alt. 2) was judged capable of being designed to present essentially no risk to workers or residents. It would reduce direct contact threats but would not address groundwater problems. It received a neutral rating "0". Onsite landfilling was also assigned a "0" because although the handling would require additional attention, standard safety precautions would adequately protect the site workers. Onsite biotreatment was assigned a "-" because of the uncertainty of the ability of this technology to be effective. The on-site thermal treatment options were assigned a single "0" because potential risks can be prevented through careful design and standard safety precautions.

GROUNDWATER

No action and containment received negative ratings ("-"). No action would do nothing to address site risks. Based on the subsurface geology, containment would not be effective. The minimal pump and treat was given a "0" because, although better than the first two alternatives, it is not as effective in the short term as the accelerated program. The accelerated program would be most effective in the short term, thus it received a "+". The french drain alternative received a "0" rating. This alternative would be marginally effective in the short term.

4. LONG TERM EFFECTIVENESS

SOURCE CONTROL

No action will do nothing to reduce long term risks to human health and the environment thus received a rating of "-". Containment is rendered ineffective due to the subsurface geology thus it receives a "-". Onsite landfilling leave the waste in place, the toxicity is not reduced, and the volume is increased, these alternatives therefore each merited a "-". Uncertainties with the ability of biotreatment to treat the site specific wastes lead to a "-". Because of the added assurance of complete destruction of the waste with thermal destruction technology, those remedies were rated "+".

GROUNDWATER

No action would have no long term effectiveness, therefore it received a "-". Containment would be ineffective in the long term due to the fractured subsurface geology, thus it also received a "-". Minimal pumping and treatment will be effective in the long term, thus it received a "+". The accelerated pump and treat program would be the most effective and received a "+". The effectiveness of the french drain system is seriously questionable, thus received a "-".

5. IMPLEMENTABILITY

SOURCE CONTROL

No action alternative is easy to implement, it receives a "+". Containment is implementable, as is the landfill. They both received "0". Biotreatment would require more attention during design than other remedies to ensure implementability (acquiring a waiver to the Land Ban) and was therefore given "-". The thermal destruction alternatives are both implementable, they both received a "0".

GROUNDWATER

No action is easy to implement and received a "+". Containment is implementable and receives a "0". The two pump and treat methods are implementable and received "0". The french drain is not practical to implement because the depth required broaches the current water bearing zone, it received a "-".

6. COST

Estimated costs for each alternative are summarized in Table 2.

7. COMMUNITY ACCEPTANCE

From prior meetings and correspondence, it is evident that local residents want something done about the problem (i.e. not the "no action" remedy). Thermal destruction, without UV/Ozonation, was the

only source control remedy that the community discussed and accelerated pumping and treatment was the only ground water remedy discussed. These were both accepted by the community, therefore they merited a "0". Ratings for all other remedies are left blank.

8. STATE ACCEPTANCE

The State (Arkansas Department of Pollution Control and Ecology) has concurred with the onsite incineration and accelerated pump and treatment for groundwater. These, therefore, received a "+". The other remedies were judged to be less desirable, they receive "0".

9. Overall Protection of Human Health and the Environment

SOURCE CONTROL

Due to the health threat posed by untreated waste remaining on-site, the no action, containment, and landfill alternatives received a rating of "-". The uncertainities associated with biotreatment lead to a rating of "-". The thermal destruction remedies received the highest rating of "+", because they result in elimination of the organic contaminants. The thermal treatment unit would be designed to meet RCRA standards. Destruction of the organic contamination will reduce the potential for human exposure.

GROUNDWATER

No action is not protective and receives a "-". The subsurface geology is fractured such that containment would be rendered ineffective; thus, containment received a "-". The two recovery well programs receive "+" because these are the most effective in addressing the contamination. Since the effectiveness of the french drain is questioned, its protection is questioned. It receives a "-".

V. PROPOSED REMEDY: V. ONSITE THERMAL DESTRUCTION OF CONTAMINATED SOILS, SLUDGES, AND SEDIMENTS and 4. ACCELERATED PUMP AND TREATMENT OF THE GROUNDWATER.

Considering the current and potential site hazards, and also taking into account the unique hydrogeology of the site, EPA selects and ADPCE concurs with the above remedy. This remedy consists of: excavating the contaminated drainageway sediments and surface soils, dewatering the lagoons and removing the sludges, then thermally treating and destroying these wastes. The air emissions of the thermal destruction unit will be monitored to ensure safe operation. The systems will be designed to meet all ARARs. Soils with greater than 1 ppm PCP will be excavated and incinerated. A sampling strategy will be developed during the Remedial Design phase of the project to ensure attainment of this soil cleanup level. Treated water will achieve two cleanup levels: the maximum contaminant level goal of 0.2 mg/l for PCP; the 1×10^{-5} increased cancer risk concentration of 28 ng/l for PNAs. The contaminated groundwater will be pumped and the

oil will be separated from the water. The water will be treated with carbon adsorption and the oil will be recycled if possible. If it is not possible to recycle the groundwater will be pumped and the oil will be separated from the oil it will be thermally destroyed. The "spent" carbon will be disposed of appropriately. The site air and groundwater will be monitored to ensure that an adequate cleanup has been completed.

Rationale

This alternative is protective and cost-effective, and attains applicable or relevant and appropriate Federal and state standards. It utilizes permanent solutions and treatment technologies that reduce contaminant mobility, toxicity, and volume to the maximum extent practicable.

The value of this remedy is three-fold: the acceptance and cooperation of all parties; relatively low cost for permanent treatment; finally thermal destruction would allow for a walk-away remedy.

Cleanup Level

The soils, sludges, and sediments will all be addressed to a level of 1 ppm PCP. This level is derived from the Arkansas Water Quality Regulation # 2, which has been determined to be the most stringent existing regulation. Attached is a letter from ADPCE stating that this regulation has been sufficiently promulgated and consistently enforced. This level is expected to clean the site to a $1x10^{-6}$ incremental cancer risk level. It is planned to excavate at least 13,000 cubic yards of soils, sludges, and sediments. This clean-up level will be verified with periodic sampling during excavation. This sampling scenario will be further delineated in the Remedial Design phase of the project.

The total PCP cleanup level of 1 ppm is sufficiently stringent so that coexisting PNA contaminants will be destroyed to concentrations well below those that present any significant threat to the public health or environment. The PNA clean-up level achieved is expected to exceed cleanup levels at Superfund sites where PNAs are the main contaminant of concern.

The lagoon water and the groundwater will be treated to two clean-up levels: For PCP, a health based goal of 0.2 mg/l, established by the Safe Drinking Water Act; for PNAs the 1×10^{-5} cancer risk level, from EPA's Ambient Water Quality Criteria. It is estimated that 1.07 million gallons of lagoon water and groundwater will have to the pumped and treated. This volume verification will also be outlined in the Remedial Design phase.

The reasons for elimination of the other remedies are as follows:

SOURCE CONTROL

ALTERNATIVE I, NO ACTION - This alternative is not protective of public health and the environment. It meets neither the intent of RCRA nor SARA.

ALTERNATIVE II, CONTAINMENT - Due to the site subsurface geology, a slurry wall, and thus this alternative, is rendered ineffective. The underlying formation is weathered and fractured shale. The cost associated with this alternative is high compared to its level of protection.

ALTERNATIVE III, ONSITE LANDFILL - This remedy is not permanent treatment and is not "walk away". It does not provide long term protection and would require perpetual operation and maintenance. The cost relative to alternative V is high considering the level of protection for the environment and public health offered by Alternative III. Since this is considered regulated waste, compliance with the RCRA Land Disposal Restrictions is required. Use of a landfill violates the Land Ban, therefore this remedy is rejected.

ALTERNATIVE IV, ONSITE BIOLOGICAL DEGRADATION - The effectiveness of this alternative is questioable. Because of the uncertainity associated with this alternative, and the high cost, which includes a contingency for process failure, this alternative was viewed as less attractive than the proposed action. The cost savings is not significant compared to the uncertainity in the technology.

ALTERNATIVE VI, ONSITE THERMAL DESTRUCTION WITH UV/OZONATION - This is the same remedy as Alternative V except the water would be treated with UV/Ozonation instead of carbon adsorption. It was initially thought that UV/Ozonation could be a more effective water treatment alternative; this was, however, found not to be the case. Since the UV/Ozonation costs were estimated to be higher than those for carbon adsorption, the selected alternative is preferred.

GROUNDWATER

ALTERNATIVE 1, NO ACTION - Same as no action above.

ALTERNATIVE 2, CONTAINMENT - Same as containment above.

ALTERNATIVE 3, PUMP AND TREAT, MINIMAL - This is the same as alternative 4, the selected alternative, but at a greater cost and more time since this remedy only utilizes two pumps.

ALTERNATIVE 5, FRENCH DRAIN - Installation may not be practical due to the depth required by the system. This depth is lower than the artesian head of the water bearing zone. This alternative is also less effective at reducing mobility, toxicity, and volume than alternative 4 and it is more expensive.

Consistency with the National Contingency Plan (NCP) and the Provisions of the Superfund Amendments and Reauthorization Act of 1986 (SARA)

The proposed remedy provides adequate protection of public health, welfare, and the environment. This alternative is also consistent with the National Contingency Plan (NCP), in 40 CFR 300.68(H)(2)(iv) and (vi), (Federal Register, 1985) which requires:

(iv) An assessment of each alternative in terms of the extent to which it is expected to effectively mitigate and minimize threats to and provide adequate protection of public health, welfare and the environment.
(vi) An analysis of any adverse environmental impacts, methods for mitigating these impacts, and costs of mitigation.

Additionally, the long-term effectiveness factors cited in SARA Section §121(b)(1) were addressed. These include:

A) The long-term uncertainties associated with land disposal;

B) The goals, objectives, and requirements of the Solid Waste Disposal Act;

C) The persistence, toxicity, mobility, and propensity to bioaccumulate of site hazardous substances and their constituents.

D) Short- and long-term potential for adverse health effects from human exposure;

E) Long-term maintenance cost;

F) The potential for future remedial action costs if the remedial action in question were to fail; and

G) The potential threat to human health and the environment associated with excavation, transportation, and redisposal, or containment.

Operation and Maintenance (O&M)

Site operation and maintenance will include a 1 year groundwater and air monitoring and analysis program.

Future Actions

No future remedial actions are anticipated after completion of the proposed remedy. The selected remedial action is considered permanent. If, however, significant unforeseen off-site contamination occurs as a result of the site, appropriate remedial measures will be taken. As stated under the O&M section, the site will be monitored for 1 year to ensure the reliability of the implemented remedial action.

Remedial Action Schedule

Approve Remedial Action (sign ROD)	March 1988
Complete Enforcement Negotiations	July 1988
Obligate Funds to Begin Remedial Design (assuming the PRPs do not take over)	July 1988
Complete Design	October 1989
Obligate Funds to Start Remedial Action	October 1989
Complete Remediation (Depending on ground water clean-up)	April 1991

TABLE 2

COMPARISON OF REMEDIAL ALTERNATIVES

OLD MIDLAND SUPERFUND SITE

SOURCE CONTROL

ALTERNATIVES	COMPLIES WITH ARARS	REDUCES			EFFECTIVENESS		IMPLEMENT-ABILITY	COST $(MIL)	ACCEPTANCE		OVERALL PROTECT'N
		MOB.	TOX.	VOL.	SHORT TERM	LONG TERM			COMMUNITY	STATE	
I. NO ACTION	-	-	-	-	-	-	+	$0.5	-	-	-
II. CONTAINMENT	0	-	-	-	0	-	0	$3.4		0	-
III. ONSITE LANDFILL	-	0	-	-	0	-	0	$6.0		0	-
IV. ON-SITE BIOLOGICAL TREATMENT	+	-	-	-	-	-	-	$9.5		0	-
V. ON-SITE INCINERATION	+	+	+	+	0	+	0	$10.3	+	+	+
VI. ON-SITE INCINERATION UV/OZONATION	+	+	+	+	0	+	0	$10.8		0	+

TABLE 2 (Continued)

COMPARISON OF REMEDIAL ALTERNATIVES

OLD MIDLAND SUPERFUND SITE

GROUNDWATER

ALTERNATIVES	COMPLIES WITH ARARS	REDUCES			EFFECTIVENESS		IMPLEMENT-ABILITY	COST $(MIL)	ACCEPTANCE		OVERALL PROTECT'N
		MOB.	TOX.	VOL.	SHORT TERM	LONG TERM			COMMUNITY	STATE	
I. NO ACTION	-	-	-	-	-	-	+	$0.5	-	-	-
II. CONTAINMENT	-	-	-	-	-	-	0	$0.5		0	-
III. PUMP & TREAT MINIMAL	+	+	+	+	0	+	0	$1.7		0	+
IV. PUMP & TREAT ACCELERATE	+	+	+	+	+	+	0	$1.4	+	+	+
V. FRENCH DRAIN	-	0	0	0	0	-	-	$2.9		0	-

TABLE 3

SUMMARY OF APPLICABLE OR RELEVANT AND APPROPRIATE ENVIRONMENTAL REQUIREMENTS

STATUTE	REGULATION	REMEDIAL ALTERNATIVES						
		No Action	Containment	Onsite Landfill	Bio-Treatment	Onsite Incineration	Recovery Wells	French Drain
Resource Conservation & Recovery Act (RCRA)	a) Operation of hazardous waste storage/treatment facilities (40 CFR 264)	R	R	R	R	R	R	R
	b) Hazardous waste land disposal ban (40 CFR 268)	NA	NA	R	R	R	NA	NA
	c) Incineration regulations (40 CFR 265)	NA	NA	NA	NA	NA	NA	NA
Clean Water Act	Water quality (40 CFR 19)	NA	R	R	R	R	R	R
Clean Air Act	Emissions to air (40 CFR 53,60,61)	NA	NA	NA	NA	R	NA	NA
Occupational Safety and Health Act (OSHA)	Protection standards for workers (29 CFR 1910)	A	A	A	A	A	A	A

KEY

A - Applicable requirement
R - Relevant and appropriate requirement
NA - Not an ARAR

TABLE 3 (continued)

SUMMARY OF APPLICABLE OR RELEVANT AND APPROPRIATE ENVIRONMENTAL REQUIREMENTS

STATUTE	REGULATION	REMEDIAL ALTERNATIVES						
		No Action	Containment	Onsite Landfill	Bio-Treatment	Onsite Incineration	Recovery Wells	French Drain
Arkansas Water Quality Regulation #2	Protection of Aquatic Life	NA	R	R	R	R	R	R
National Environmental Protection Act	Environmental Impact Survey	NA	R	R	R	R	R	R
Superfund Amendments and Reauthorization Act	National Contingency Plan	A	A	A	A	A	A	A
Hazardous and Solid Waste Act	Land Application of Waste (HSWA 3004M)	NA	NA	R	R	R	R	R

KEY

A - Applicable requirement
R - Relevant and appropriate requirement
NA - Not an ARAR