FIRST FIVE-YEAR REVIEW REPORT

FOR

ARLINGTON BLENDING AND PACKAGING SITE

Prepared For:

United States Environmental Protection Agency
Region IV
Atlanta, Georgia

Prepared By:

Memphis Environmental Center, Inc.
Memphis, Tennessee

September 2002

FIRST FIVE-YEAR REVIEW REPORT

FOR

ARLINGTON BLENDING AND PACKAGING SITE

Prepared For:

United States Environmental Protection Agency
Region IV
Atlanta, Georgia

Prepared By:

Memphis Environmental Center, Inc.
Memphis. Tennessee

September 2002

Approved by: _____ **Date:** 9/27/02

United States Environmental Protection Agency, Region IV

TABLE OF CONTENTS

LIST OF FIGURES, TABLES, AND APPENDICES ii

LIST OF ACRONYMS iii

FIVE-YEAR REVIEW SUMMARY FORM 1

1.0 INTRODUCTION 3

2.0 SITE CHRONOLOGY 4

3.0 BACKGROUND 4

4.0 REMEDIAL ACTIONS 5
- 4.1 Remedy Selection 5
- 4.2 Remedy Implementation 6
  - 4.2.1 Soil Remedial Action 6
  - 4.2.2 Groundwater Remedial Action 7
- 4.3 Operation and Maintenance 9

5.0 PROGRESS SINCE THE LAST FIVE YEAR REVIEW 10

6.0 FIVE-YEAR REVIEW FINDINGS 10
- 6.1 Five Year Review Process 10
- 6.2 Interviews 10
- 6.3 Site Inspections 11
- 6.4 Standards Review 11
- 6.5 Data Review 13
  - 6.5.1 Evaluation of Trends in Contaminant Concentrations 13
  - 6.5.2 Evaluation of Monitored Natural Attenuation Data 15
  - 6.5.3 PCP Attenuation Compared to Modeling Results 17
  - 6.5.4 Surface Water Monitoring Overview 18

7.0 ASSESSMENT 20

8.0 ISSUES 22

9.0 RECOMMENDATIONS 22

10.0 PROTECTIVENESS STATEMENT 23

11.0 NEXT REVIEW 23

K:\Word\SITE014\5yearreview\Report.doc

LIST OF FIGURES, TABLES, AND APPENDICES

FIGURES

Figure 1: Site Location Map
Figure 2: General Site Cross Section
Figure 3: Groundwater Contour Map (6-5-01)
Figure 4: Monitoring Locations
Figure 5: Time Series of PCP Concentration in Groundwater
Figure 6: Time Series of Benzene Concentration in Groundwater
Figure 7: Time Series of 1,1-DCE Concentration in Groundwater
Figure 8: Time Series of Endrin Concentration in Groundwater
Figure 9: Plume Average Concentration Evaluation
Figure 10: Plume Mass Evaluation
Figure 11: PCP Cleanup Time Evaluation

TABLES

Table 1: Site Chronology of Events
Table 2: Groundwater Contaminants of Concern and Remediation Levels
Table 3: Excavation and Treatment Standards
Table 4: Summary of Estimated Contaminant Removals

APPENDICES

Appendix A: List of Documents Reviewed
Appendix B: Photographs of Site Inspection
Appendix C: Historical Groundwater Analytical Data Summary
Appendix D: Historical Natural Attenuation Data Summary
Appendix E: Historical Surface Water Analytical Data Summary
Appendix F: Irrigation Well Operation Logs for 2001 and 2002

LIST OF ACRONYMS

ARARs	Applicable or Relevant and Appropriate Requirements
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRF	Code of Federal Regulations
COCs	Contaminants of Concern
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
LTMM	Long-Term Monitoring and Maintenance Plan
MEC	Memphis Environmental Center, Inc.
O&M	Operation and Maintenance
PRPs	Potentially Responsible Parties
RD/RA	Remedial Design/Remedial Action
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
TDEC	Tennessee Department of Environment and Conservation
UAO	Unilateral Administrative Order

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name (from WasteLAN): Arlington Blending and Packaging Site		
EPA ID (from WasteLAN): TND 980468557		
Region: IV	**State: TN**	**City/County: Town of Arlington, Shelby County**
SITE STATUS		
NPL status: Final		
Remediation status: Complete, Long-Term Monitoring and Maintenance Ongoing		
Multiple OUs? No		**Construction completion date: 7/24/97**
Has site been put into reuse? No		
REVIEW STATUS		
Lead agency: USEPA		
Author name: Joe Ricker		
Author title: Environmental Project Coordinator		**Author affiliation: Memphis Environmental Center, Inc**
Review period: July 1997 - July 2002		
Date(s) of site inspection: 10/26/01		
Type of review: Policy		
Review number: 1(first)		
Triggering action: Construction Completion		
Triggering action date (from WasteLAN): 7/24/97		
Due date (five years after triggering action date): 7/24/2002		

*["OU" refers to operable unit.]

**[Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

FIVE-YEAR REVIEW SUMMARY FORM, cont'd

Issues:

Two issues were identified potentially relating to the effectiveness of the remedy. The first issue is the presence of PCP in wells near the discharge point at the Loosahatchie River (i.e., AB-9D, AB-17D) and the presence of PCP in the drainage ditch (SST1). However, no statistically significant increase in contaminant concentration was detected in either surface water body, and no exceedance of the surface water standard for PCP was observed. The second issue is the observed increasing trend in the Site average concentration of endrin. It is noted, however, that no significant contaminant migration from the source area has occurred. Both of these issues will be addressed using the current monitoring schedule and should be reevaluated at the next five-year review.

Recommendations and Follow-up Actions:

Based on the findings of this five-year review, the following recommendations are made:

1. Continue with the monitoring program as outlined in the approved Long-Term Monitoring and Maintenance Plan;
2. Add the drainage channel surface water sampling location (SST1) to the surface water monitoring program. A sample should be collected from this location semiannually in conjunction with the semi-annual surface water monitoring events; and
3. Copy all future reports to the Town of Arlington.

Protectiveness Statement(s):

Although the surficial aquifer remains impacted by Site-specific contaminants, the current remedy remains protective of human health and the environment. The remedy is expected to be protective of human health and the environment upon attainment of the groundwater cleanup goals via natural attenuation, which is expected to require 25 years to achieve. Previous remedial actions at the Site have removed the majority of the source through excavation and treatment using low-temperature thermal desorption. The surficial aquifer has been determined to be hydraulically isolated from the Memphis Sand Aquifer located below it. No measurable impact to the Loosahatchie River has been observed. Contaminant concentrations demonstrate a decreasing trend over time and PCP attenuation rates are progressing at a greater rate than model-predicted rates. Institutional controls preclude human exposure to the contaminated groundwater (for drinking purposes) at any point between the Site and the Loosahatchie River. All threats at the Site have been addressed through source control and implementation of institutional controls.

Long-term protectiveness of the remedial action will be verified by obtaining additional groundwater and surface water samples in accordance with the LTMM Plan. Future five-year review reports will evaluate migration of the contaminant plume downgradient from the former source area and towards the Loosahatchie River. Current monitoring data indicate the remedy is functioning as required to achieve groundwater cleanup goals.

Other Comments:

None

1.0 INTRODUCTION

Memphis Environmental Center, Inc. (MEC), on behalf of the U.S. Environmental Protection Agency, Region IV (EPA), has conducted a five-year review of the remedial actions undertaken at the Arlington Blending and Packaging Site (Site) in Arlington, Shelby County, Tennessee. The purpose of the five-year review is to determine whether a remedy at a site continues to be protective of human health and the environment. Additionally, five-year review reports identify deficiencies, if any, and identify recommendations to address them.

This report documents the results of the review for this site, conducted in accordance with the EPA guidance document, Comprehensive Five-Year Review Guidance, June 2001, OSWER Directive 9355.7-03B-P.

This five-year review is required to meet the statutory mandate of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) §121. Five-year reviews are conducted as a matter of EPA policy for a remedial action that, upon completion, will not leave hazardous substances, pollutants, or contaminants on site above levels that allow for unrestricted use or unrestricted exposure, but requires five or more years to complete. CERCLA §121 (c), as amended by the Superfund Amendments and Reauthorization Act (SARA), 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 implemented.*

Under the National Contingency Plan (NCP), the Code of Federal Regulations (CFR) states, in 40 CFR §300.430(f)(4)(ii):

> *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.*

This is the first five-year review for the Arlington Blending and Packaging Site. The triggering action for this policy review is the date of the Amended Record of Decision (ROD) on July 24, 1997, which also served as the Preliminary Closeout Report.

2.0 SITE CHRONOLOGY

A chronology of significant site events and dates is included in ***Table 1***. Sources of this information are listed in ***Appendix A***.

3.0 BACKGROUND

The Site is located approximately 25 miles northeast of Memphis in Arlington, Tennessee (***Figure 1).*** The Site is the former location of the Arlington Blending and Packaging (ABAP) Company. ABAP was engaged in the blending and packaging of various pesticide, herbicide, and other chemical formulations at the Site from 1971 to 1978. The company custom formulated these compounds with solvents and emulsifiers in accordance with their client companies' specifications. The formulated products were then packaged or bottled in a form suitable for retail distribution.

Spills and leaks from previous Site operations resulted in the contamination of soil and groundwater with contaminants handled at the Site. The ROD identified several contaminants of concern (COCs) at the Site for both soil and groundwater. The groundwater COCs and their respective cleanup levels are listed in ***Table 2***. The soil COCs and their respective cleanup standards are listed in ***Table 3***.

The Site is bounded to the east by a residential housing subdivision, to the west by a Tennessee Department of Transportation (TDOT) maintenance facility, to the south by a CSX Transportation railroad, and to the north by U.S. Highway 70. The Loosahatchie River flows in a southwesterly direction approximately 3,000 feet due north of the Site. A turf farm is located between the Loosahatchie River and Highway 70. Cropland lies south of the CSX Railroad. The Site encompasses approximately 2.5 acres and the terrain across the Site is relatively flat. Topography in the area varies from relatively flat, in the vicinity of Arlington, to gently rolling to rather steep.

The land surface is topped mainly by Pleistocene loess, except in flood plain locations where alluvial deposits are prevalent. Previous investigations of the Site have identified four hydrogeologic units: (1) Unit I, a 20-foot thick silt semi-confining layer, (2) Unit II, a 30-foot thick confined/semi-confined sand aquifer (surficial aquifer), (3) Unit III, a 70-foot thick clay confining unit, and (4) Unit IV, the upper portion of the Memphis Sand confined aquifer. A cross-section of the site showing the units described above is illustrated in ***Figure 2***. The

groundwater flow direction in the surficial aquifer is north-northwest towards the Loosahatchie River, as shown in ***Figure 3***.

In October 1983 EPA conducted a removal action in which 1,920 cubic yards of contaminated soil were excavated from three locations: (1) south of Buildings E and G (both buildings since demolished) along the area of a former rail road spur located along the southern portion of the Site to a depth of four feet, (2) along the fence line separating the TDOT and the Site to a depth of 18 inches, and (3) the southern third of the garden area (an off-site area due east of the Site) to a depth of one foot. Additionally, 112 drums of stored chemical wastes and approximately six inches of soil were removed from the entire Site.

In 1990, EPA conducted further removal activities in which approximately 70 cubic yards of soil were removed from the residential property located east of the Site. The soil removed was stockpiled in building H and treated along with other contaminated Site soils during the remedial action. In 1993, all Site buildings were demolished and removed except Building H, which was later removed as part of the Site Remedial Action in 1996.

4.0 REMEDIAL ACTIONS

4.1 Remedy Selection

EPA completed a Remedial Investigation and Feasibility Study (RI/FS) in January 1991. Based on the findings in the RI/FS, a Record of Decision (ROD) was completed by EPA in June 1991. The ROD specified objectives for the Site remedial action. The objectives for the remedial action were as follows:

1. Reduce the risks associated with long-term exposure to contaminated on-site and off-site soils;
2. Prevent future ingestion of potentially contaminated groundwater;
3. Reduce migration of contaminants between site soils and groundwater;
4. Restore groundwater in the Unit 2 aquifer to drinking water quality; and
5. Reduce off-site contaminant migration through the groundwater pathway.

The selected remedy outlined in the ROD was developed to clean up both contaminated soil and groundwater. Soil remediation was to be addressed by the excavation and subsequent treatment of the soils by low-temperature thermal desorption (LTTD) processes. The treated soils were then to be backfilled into excavated areas. Groundwater cleanup was addressed through extraction of contaminated groundwater,

treatment using granular activated carbon, and discharge of the treated effluent to the Loosahatchie River or the nearby publicly owned treatment works (POTW).

4.2 Remedy Implementation

On January 31, 1992, EPA issued a Unilateral Administrative Order (UAO) for Remedial Design/Remedial Action (RD/RA) for the ABAP Site to the potentially responsible parties (PRPs). The PRPs formed the Arlington Blending Site Group (ABSG) to complete the requirements of the UAO. The ABSG initiated the remedial design for both the soil and groundwater remedies in 1992. The soil remedial design was completed with the completion of the soil Remedial Design Report (RDR) in November 1994. Due to the acquisition of new data during the remedial design, an Explanation of Significant Differences (ESD) was issued by EPA in November 1994. The ESD addressed the soil remedy only and specifically clarified issues relating to excavation and treatment standards.

4.2.1 Soil Remedial Action

The ABSG initiated remedial actions relating to the soil remedy in July 1995. The soil remedial action consisted of excavation, stockpiling, treatment, and backfilling of over 41,000 tons of contaminated soil. Contaminated soils were treated using an on-site low temperature thermal desorption system. The soil remedial action was completed with the approval of the Remedial Action Report (RAR) on September 29, 1997.

Due to the difficulties associated with excavation below the water table, an exception was granted in the ESD. If groundwater was encountered during excavation, the excavation ceased and a final soil sample was taken to document contamination left in place. Likewise, soil excavation could not be conducted in the area near the CSX railroad defined as a 1 to 1 slope starting eight feet from the CSX railroad. There were a total of 15 grids (25’ x 25’) near the south of the site where groundwater was encountered with analytical results still in excess of excavation standards. Additionally, there were four grids near the CSX railroad remaining in excess of excavation standards due to the slope limitations.

As summarized in the RAR, a total of 88 pounds of contaminants were left in place near the south side of the site and 172 pounds of contaminants were left in place

near the railroad. An estimated 2,757 pounds of contaminants were treated; therefore the soil remedial action resulted in the removal of an estimated 91.4% of the contaminants at the site. A summary of contaminant removals and mass left in place is included in ***Table 4***.

After the completion of the soil remedial action, the ABSG dissolved. Through various settlement agreements, Velsicol Chemical Corporation (Velsicol) assumed management responsibilities for the Site.

4.2.2 Groundwater Remedial Action

In light of new data obtained since the issuance of the ROD, Velsicol initiated a groundwater modeling effort to evaluate the efficacy of natural attenuation as an alternative to the ROD-selected remedy of pump and treat for contaminated groundwater. The decision to evaluate natural attenuation was primarily based on observed decreasing contaminant trends and the recent removal of over 90% of the source contamination.

The modeling effort was conducted during 1996 in which several remedial options were considered, including natural attenuation and several active (i.e., pump and treat) remediation scenarios. In addition to evaluating various remedial scenarios, an evaluation was made of the potential for surficial aquifer contaminants to migrate vertically downward to the Memphis Sand aquifer. Vertical migration was a concern because the Memphis Sand aquifer supplies municipal water for all of Shelby County and also because an irrigation well (screened in the Memphis Sand aquifer) is situated just west of the contaminant plume.

The model results demonstrated that site-wide aquifer restoration would be achieved by natural attenuation in generally the same time frame as active (i.e., pump and treat) remediation. An independent modeling analysis conducted by USEPA concurred with the conclusions of the Velsicol modeling effort. The modeling conducted by USEPA is summarized in Appendix F of the Amended ROD dated July 24, 1997.

To address the concern about the lateral extent and thickness of the clay confining layer separating the surficial aquifer from the Memphis Sand aquifer, a drilling program was conducted in the sod farm in April 1996. Three boreholes were advanced in the sod farm to determine the physical characteristics of the confining layer in the downgradient portions of the contaminant plume. The study results indicated that the clay confining

layer is horizontally continuous with a minimum encountered thickness of 42 feet. The material has a maximum vertical permeability that is equivalent to an aquitard (i.e., 2.6 x 10^{-8} cm/sec). Additionally, a pumping test was conducted in July 1996 on the irrigation well in the sod farm (location on ***Figure 4***). Pumping of the irrigation well failed to induce drawdown in the surficial aquifer after 24 hours of sustained stress at 1,200 gallons per minute.

Computer-simulated pumping of the Memphis Sand aquifer from the sod farm irrigation well showed no vertical migration of site contaminants downward through the clay confining unit. The model evaluated the worst-case potential leakage through the confining unit based on the results of the drilling program. The results indicated that the clay confining unit will prevent vertical migration of contaminants from the surficial aquifer if a downward hydraulic gradient across the aquitard is induced by local pumping of the Memphis Sand aquifer. This conclusion was also supported by the independent modeling conducted by USEPA.

As determined in the modeling effort, the hydraulic gradient at the Site is vertically upward from the Memphis Sand to the surficial aquifer. Hydraulic monitoring conducted during the modeling effort demonstrated that the piezometric surface of the upper portion of the Memphis Sand aquifer (Unit IV) is approximately four feet higher than the piezometric surface in the surficial aquifer (Unit II).

Based on the modeling effort and other Site-specific data that had been obtained or developed since the original ROD was finalized, EPA modified the groundwater remedy from pump and treat technology to monitored natural attenuation. The modification was formalized in an Amended ROD completed in July 1997. The rationale for changing the remedy to natural attenuation, as listed in the Amended ROD, is as follows:

- The confining layer beneath the contaminated shallow aquifer has been confirmed to be intact beneath the area of groundwater contamination. The presence of this confining layer makes the possibility of vertical migration of contaminants into the Memphis Sand aquifer unlikely.
- The Loosahatchie River Canal (LRC) serves as a point of entry for the site groundwater plume.

- Groundwater contaminant levels are not substantial enough to adversely impact LRC water quality.
- 41,431 tons of source (contaminated) soils were excavated and treated during early 1996 (more than ninety percent of the total source soils).
- Existing Shelby County regulations (Appendix D of the Amended ROD) prohibit construction of groundwater wells for domestic uses where a public water system is available and within a half-mile of a listed Superfund site. These regulations would, therefore, preclude human exposure to the contaminated groundwater (for drinking purposes) at any point between the Site and the LRC.
- The shallow aquifer has not been used as a drinking water source in the past and will not likely be used for this purpose in the foreseeable future.
- Groundwater natural attenuation achieves cleanup standards within a time frame comparable to that of active aquifer restoration methods.

A Long-Term Monitoring and Maintenance (LTTM) Plan developed in support of natural attenuation was completed in February 1998 and approved by USEPA on June 19, 1998. Monitoring in support of the natural attenuation remedy commenced in June 1998.

4.3 Operation and Maintenance

Four years of Site operation and maintenance (O&M) activities are now complete (i.e., 1998, 1999, 2000, and 2001). The O&M activities at the Site are being conducted in accordance with the approved LTMM Plan. The activities being conducted are summarized as follows:

- General maintenance of the Site (vegetative cover, monitoring wells, fence, etc.)
- Mowing as needed – generally 4 to 6 times per year
- Fertilize annually
- Annual sampling of 11 groundwater monitoring wells screened within the surficial aquifer
- Semi-annual sampling of three surface water sampling locations in the Loosahatchie River
- Quarterly Site inspections
- Initial annual sampling of municipal supply well, discontinued in 2000 when wells no longer used by City of Arlington
- Annual survey of new wells constructed in the vicinity of the Site
- Annual reporting to EPA submitted in March of each year.

5.0 PROGRESS SINCE THE LAST FIVE YEAR REVIEW

This is the first five-year review for this Site.

6.0 FIVE-YEAR REVIEW FINDINGS

6.1 Five Year Review Process

The five-year review of the Arlington Blending and Packaging Site was conducted by MEC in cooperation with U.S. EPA and Tennessee Department of Environment and Conservation (TDEC). The purpose of the review was to determine if the implemented remedy for the Site (i.e., monitored natural attenuation) continued to be protective of human health and the environment. The components of the five-year review include document review, personnel interviews, Site inspection, standards review, and data review. The documents reviewed as part of the five-year review are listed in ***Appendix A***.

6.2 Interviews

Interviews were conducted with the Town of Arlington Recorder, an adjacent property owner, and the sod farm owner. The Town Recorder indicated that the Town was satisfied with the activities conducted at the Site, and that no complaints concerning the Site have been made. She mentioned, however, that the Town has not received any reports describing the progress of remediation at the Site. She was told during the interview that annual progress reports are prepared, and that the Town would be copied on subsequent reports.

The adjacent property owner indicated that he was satisfied with the overall performance of the Site remedy. He stated that he has had concerns associated with the Site in the past, however, his concerns were readily addressed. His overall impression was that he was pleased with the ongoing operation and maintenance activities conducted at the Site since the completion of the Remedial Action in 1997.

The sod farm owner indicated that he was satisfied with the overall performance of the Site remedy. Although he was not affected directly by Site cleanup operations, there are several monitoring wells on his property. He is paid an annual access fee for the

use of the wells on his property. He is aware of the Site issues and he is periodically updated on remedial progress.

6.3 Site Inspections

A Site inspection was conducted on October 26, 2001. The inspection team consisted of Joe Ricker and A. Enrique Huerta from MEC, Derek Matory from U.S. EPA, and Maylynne Pynkala and Jordan English from TDEC. Photographs taken prior to the Site inspection are included in ***Appendix B***.

The appearance of the Site was that it was well maintained and no vandalism was evident (Photographs 4-14). There is one locking gate at the front of the Site, which was properly secured (Photograph 2). The vegetative cover was in good condition and no evidence of erosion was observed (Photograph 3). The entire fenceline was observed to be free from shrubs and tall weeds.

All of the groundwater monitoring wells were inspected for proper identification, accessibility, and general integrity. All 11 wells were properly identified, locked, and appeared to be in good condition (Photographs 4-14). In addition to identifying monitoring well locations, three surface water sampling locations were observed, as well. The surface water and groundwater monitoring locations are shown on ***Figure 4***. During the inspection the EPA Remedial Project Manager requested that a fourth surface water sample be collected from the drainage ditch flowing into the Loosahatchie River. As part of the routine semi-annual surface water sampling event on November 16, a fourth sample was collected from the drainage ditch (SST1 location). The location of the sample is shown on ***Figure 4***.

6.4 Standards Review

Applicable or Relevant and Appropriate Requirements (ARARs) for the Site were identified in a ROD dated June 28, 1991. An Amended ROD was signed on July 24, 1997; however, no new ARARs were addressed in this amendment. This five-year review includes identification of and evaluation of changes in the ROD-specified ARARs to determine whether such changes may affect the protectiveness of the selected remedy.

The Arlington Blending and Packaging Site ROD identified the following ARARs as having an impact on the proposed remedy.

Contaminant Specific ARARs

1. The Safe Drinking Water Act (40 CFR Part 141);
2. National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50);
3. National Emission Standards for Hazardous Air Pollutants (NESHAPS) (40 CFR Part 61); and
4. New Source Performance Standards (NSPS) (40 CFR Part 60).

Location Specific ARARs

1. RCRA Subtitle C regulations pertaining to the treatment, storage, and disposal of hazardous waste;
2. Land Disposal Restrictions (40 CFR Part 268);
3. Delisting RCRA Wastes (40 CFR 260.20 and 260.22);
4. Standards Applicable to Transporters of Hazardous Waste (40 CFR Part 263);
5. Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (40 CFR Part 264);
6. DOT Rules for Hazardous Materials Transport;
7. The Clean Water Act; and
8. The Tennessee Water Quality Control Act (TN Code 69-3-104).

The ARARs listed above pertain to the soil remedy and the original groundwater remedy (i.e., pump and treat). Because the soil remedy is complete and the original groundwater remedy was changed to monitored natural attenuation, the only ARARs applicable to the current remedy are maximum contaminant levels (MCLs) established under the Safe Drinking Water Act. The site-specific COCs and their respective cleanup levels, which were based on current MCLs at the time the ROD was drafted, are listed in ***Table 2***.

A review of current MCLs for all COCs identified changes in the MCL for two compounds: endrin and toluene. As shown in ***Table 2***, the ROD-specified cleanup levels for endrin and toluene were 0.2 μg/l and 2,000 μg/l, respectively. These were the current MCLs at the time the ROD was developed. The current MCLs for endrin and toluene are 2 μg/l and 1,000 μg/l, respectively. In the case of endrin the MCL has increased by an order of magnitude. Based on the June 2002 monitoring data only one well exceeds the current MCL for endrin (AB-20D, 5.49 μg/l). The current maximum Site concentration for toluene is 22.8 μg/l (AB-20D); therefore the lowering of the MCL for toluene does not impact the effectiveness of the natural attenuation remedy.

As stated in the Amended ROD, the current remedy complies with the ARARs since contaminant concentrations will be reduced below MCLs over time. No new laws or regulations have been promulgated or enacted that would impact the effectiveness of the remedy at the Arlington Blending and Packaging Site.

6.5 Data Review

As discussed previously, the soil remedial action was completed in September 1997. Although some contamination was left onsite, it was envisioned that the remaining contamination would be addressed by the groundwater remedial action, which is currently underway.

Prior to the start of the LTMM period, groundwater and surface water samples were collected periodically during various Site investigations. Since the start of the LTMM period in 1998, groundwater samples have been collected annually and surface water samples have been collected semi-annually. This section is a review of all historical groundwater data through the June 2002 sampling event. Analytical data summaries for all existing monitoring wells are provided in ***Appendix C***. Starting in 1998, natural attenuation parameters were added to the annual monitoring program. A summary of results for natural attenuation parameters is provided in ***Appendix D***. Analytical data summaries for all surface water samples are provided in ***Appendix E***.

Natural attenuation was selected as the preferred remedial action for groundwater due in part to observed decreasing trends in contaminant concentrations. Natural attenuation of Site contaminants is evidenced by the evaluation of trends in chemical and geochemical data, including decreasing concentrations of COCs over time and along the flow path, increasing daughter (i.e., degradation) compound concentrations, depletion of electron donors and acceptors, and increasing metabolic byproduct concentrations. As part of the data review, it is also important to compare the modeled or predicted cleanup time with the actual progress of natural attenuation

6.5.1 Evaluation of Trends in Contaminant Concentrations

In order to evaluate changes in the contaminant plume, isoconcentration maps were prepared for PCP, benzene, 1,1-DCE, and endrin. Due to non-detect

values and results below cleanup levels, there were not sufficient data to prepare maps for the remaining COCs. The isoconcentration maps were prepared for each of the years 1993, 1995, and 1998-2002 and are included in ***Figures 5***, ***6***, ***7***, and ***8***, respectively. In each isoconcentration map, the plume is defined by the MCL for each respective contaminant. Each map also shows the calculated plume area and average concentration.

By observation of ***Figures 5***, ***6***, ***7***, and ***8***, there are many spatial and temporal changes in each of the plumes. For example, although the plume area for PCP has remained relatively unchanged, the average concentration has reduced from 101 μg/l in 1993 to 36.8 μg/l in 2002. In order to evaluate the temporal trends in plume concentration, the plume concentrations were plotted for each year. A linear regression trend line is shown on each plot in order to evaluate the temporal trends. A summary of plume average concentrations is shown in ***Figure 9***.

Review of ***Figure 9*** shows that there are observed decreasing trends in average concentration for PCP, benzene, and 1,1-DCE. An increasing trend in average concentration for endrin is observed. For this reason, it is important to evaluate the magnitude of the contaminant plume and the potential for a continued increasing concentration. This was accomplished by calculating the plume mass and comparing to the mass of contamination removed and the mass of contamination remaining onsite at the completion of the soil remedy. The plume mass was determined using the plume area, average concentration, an assumed aquifer thickness of 25 feet, and a porosity of 0.39. A summary of the temporal trends in plume mass is shown in ***Figure 10***.

Based on the 2002 data, the current plume mass for PCP, benzene, 1,1-DCE, and endrin is 34.7 lbs., 1.5 lbs., 0.3 lbs., and 0.15 lbs., respectively. As shown on ***Table 4***, the amount of mass removed for PCP and endrin was 63 lbs. and 355 lbs., respectively. There were no soil remediation levels for benzene and 1,1-DCE; therefore no samples were taken to estimate mass removed for these compounds. The estimated mass left in place for PCP and endrin is 5 lbs. and 13 lbs., respectively. It is apparent from these figures that most of the mass of PCP at the Site is currently dissolved in groundwater (e.g., 34.7 pounds in the plume and 5 pounds in the soil), while the predominant mass of endrin is bound in the

soil(e.g. 0.15 pounds in the plume and 13 pounds in the soil). Based on historical data and the literature values for retardation of endrin, it is not likely that endrin concentrations will continue to rise significantly. Currently, the average concentration of endrin in the plume is 0.62 µg/l. Although this is higher than the ROD-specified cleanup level of 0.2 µg/l, it is well below the current MCL of 2 µg/l for endrin. The general decreasing trends in concentration for PCP, benzene, and 1,1-DCE are expected to continue in a likewise manner, although fluctuations from year to year are likely. The trend for endrin should be closely monitored and reevaluated in the next five-year review.

6.5.2 Evaluation of Monitored Natural Attenuation Data

Starting with the 1998 sampling event, natural attenuation parameters were added to the sampling program. The parameters allow for the evaluation of biological processes that may be occurring at the Site. Although it is difficult to quantify any biodegradation that may be occurring, the natural attenuation parameters provide qualitative evidence that biodegradation is occurring. For this data review the June 2002 data set is used. The data used in this review are located in ***Appendix D***. The data review in this section is evaluated in accordance with the "Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Groundwater", by USEPA Office of Research and Development, dated September 1998 (Technical Protocol).

Some of the COCs at the Site are known to break down into other daughter products under certain geochemical conditions. In order to monitor parent/daughter compound reactions the following compounds are monitored: vinyl chloride (daughter compound of 1,1-DCE), heptachlor (parent/impurity compound of heptachlor epoxide), and total chlorophenols (daughter compounds of PCP). Vinyl chloride was not detected in any samples. Heptachlor was detected once in AB-20D at a concentration of 0.14 µg/l; however, heptachlor epoxide was not detected in any samples. Although lower chlorinated phenols may exist as impurities in technical grade PCP, they may also exist as breakdown products of PCP. Total tetrachlorophenol was detected once in AB-21D (16.9 µg/l) and total trichlorophenol was detected once in AB-19D (33.4 µg/l).

Dissolved oxygen (DO) is the most thermodynamically favored electron acceptor in the biodegradation of organic contaminants. Thus, areas of the contaminant plume with lowered DO concentrations (compared to background) would indicate that aerobic biodegradation is occurring in those areas. Dissolved oxygen data collected in June 2002 indicate that the interior of the plume is anaerobic. All samples from wells within the plume are well below the anaerobic threshold of 0.5 mg/l. The background well AB-1S had a DO concentration of 3.54 mg/l. These data indicate DO is an important electron acceptor at the Site.

After DO has been depleted, nitrate may be used as an electron acceptor for biodegradation through the process of denitrification. Current monitoring data indicate that nitrate concentrations are reduced in all on-site and downgradient monitoring wells. Nitrate is non-detect at the plume source area (i.e., AB-20D), compared to a background concentration of 8.11 mg/l (AB-1S). This is a strong indication that anoxic biodegradation of Site contaminants is occurring at the Site through the process of denitrification.

After nitrate has been depleted, ferric iron (Fe^{+3}) may be used as an electron acceptor during anaerobic biodegradation. During this process ferric iron (Fe^{+3}) is reduced to ferrous iron (Fe^{+2}) which is soluble in water. Increased ferrous iron concentrations can thus be used as an indication of anaerobic biodegradation of contaminants. Ferrous iron concentrations are elevated in source area wells, with the highest concentration (4.4 mg/l) in AB-20D, which is the source area of the plume. This is an indication that ferric iron (Fe^{+3}) is being reduced to ferrous iron during anaerobic biodegradation of contaminants at the Site.

After DO and nitrate have been depleted, sulfate may be used as an electron acceptor for anaerobic biodegradation. During the process of sulfate reduction, sulfide is produced. By observation of data in ***Appendix D***, sulfate is not being reduced in the source area. Sulfide is detected in many wells, however the concentrations are not significantly above the background concentration. Although sulfate reduction is an indicator of anaerobic biodegradation of many organic compounds, it is not currently occurring at the Site.

The presence of methane in groundwater is indicative of strongly reducing conditions. Background levels of methane at the Site are at a non-detect level (<0.5 µg/l in AB-1S). Elevated levels of methane above background (up to 134 µg/l) only occur in monitoring wells located in the contaminant source area (AB-19D, AB-20D, and AB-21D). This is an indication that anaerobic biodegradation of Site contaminants is likely occurring at the Site through the process of methanogenesis.

As each electron acceptor is utilized, the groundwater becomes more reducing and the oxidation-reduction potential (ORP) of the water decreases. The ORP influences rates of biodegradation and is important because some biological processes only operate within a certain range of ORP conditions. The Technical Protocol states that reductive dechlorination is possible with ORP values less than 50 mv and that it is likely with ORP values less than -100 mv. Monitoring wells AB-19D and AB-20D resulted in ORP values of -60 mv and -75 mv, respectively. This indicates that strongly reducing conditions are present in the contaminant source area, and that biodegradation is likely occurring in this area. Current data indicate the ORP is lowered for all wells within the plume, when compared to the background well AB-1S.

Overall, the geochemical data indicate that, in addition to non-destructive processes such as dilution and dispersion, biodegradation is occurring at the Site and is contributing to the overall mass reduction of contaminants.

6.5.3 PCP Attenuation Compared to Modeling Results

Because PCP is the predominant contaminant in the plume, it is used as an indicator compound to monitor the progress of the natural attenuation remedy. As part of the five-year review, an evaluation was conducted to determine if actual PCP attenuation rates were greater or less than predicted rates presented in the report entitled "Groundwater Modeling Effort to Evaluate Remedial Alternatives for Contaminated Groundwater," dated August 1996 by Smith Environmental Technologies Corporation.

Charts were created for four monitoring wells with data prior to the soil remedial action. Three on-Site wells (i.e., source area wells) were evaluated

including OW-1A (replaced by AB-19D in 1998), AB-3D, and OW-2A. One off-Site well was also evaluated (AB-13D) which is located down-gradient from the three on-Site wells evaluated. The charts showing the predicted attenuation rates compared to actual data are shown in ***Figure 11***. The predicted attenuation curves on each chart were generated using equations and constants presented in Section 3.3.1 of the modeling report referenced above.

The charts for the on-Site wells show that actual PCP concentrations are lower than those predicted by groundwater modeling results for both adsorption only and adsorption and degradation. Likewise, the graph for AB-13 shows that actual PCP concentrations are lower than those predicted by groundwater modeling results, with the exception of the result for 2001. This evaluation shows that the monitored natural attenuation remedy is performing at a higher rate than what was anticipated at the time the groundwater remedy was changed to natural attenuation.

6.5.4 Surface Water Monitoring Overview

Historically, surface water samples have been collected from three locations in the Loosahatchie River and from two locations in the drainage ditch near the Site. A summary of all historical surface water sample results is included in ***Appendix E***. The sampling locations are shown in ***Figure 4***. Historical samples collected from the Loosahatchie River have demonstrated no adverse impact from Site contaminants. The only historical detection of Site contaminants was in 1995. Heptachlor epoxide was detected in all three sampling locations, including upgradient from the Site. This indicates that either heptachlor epoxide resulted in the river from another source or that the results were anomalous.

Samples were collected from the drainage ditch east of the turf farm (location SST2 on ***Figure 4***) in 1995, 1996, and 1997. All samples resulted in non-detect concentrations for Site contaminants. A sample was collected from the drainage ditch near the confluence with the Loosahatchie River (location SST1) during the Remedial Investigation in 1988. Due to positive results for 1,1-DCE and toluene in that sample, EPA requested that an additional sample be collected prior to the five-year review. The drainage ditch sample was collected on November 16, 2001. There was no flow in the ditch and the sample was collected

in stagnant water approximately 30 feet upstream from the confluence with the Loosahatchie River. The drainage ditch was dry upstream from the sampling point. A second sample was collected from the SST1 location during the June 2002 sampling event.

PCP was detected in the SST1 sample for both sampling dates at levels of 1.55 µg/l and 1.13 µg/l, respectively. All other results for both samples were non-detect. As discussed in section 5.2.1 of the Final Remedial Investigation Report, dated November 1990 (RI Report), the lower reach of the channel is likely a groundwater discharge point and thus low level concentrations of COCs in the channel could be expected. The results of PCP in the drainage ditch were compared to surface water standards for Tennessee using the following guidance: Tennessee Department of Environment and Conservation – Division of Water Pollution Control Regulations for Surface Water Use, Chapter 1200-4-4 "Use Classifications for Surface Waters" and Chapter 1200-4-3 "General Water Quality Criteria". The drainage ditch is not listed in the guidance; therefore, criteria that apply to the Loosahatchie River were used. The regulations classify all of the Loosahatchie River from mile 0.0 to its origin as suitable for both "fish and aquatic life" and "recreation" uses. The regulations state that for a given parameter, the more restrictive standard applies if it appears in more than one set of standards. The "fish and aquatic life" water quality standard for PCP is 20 µg/l (max) and 13 µg/l (continuous). The "recreation" standard for PCP is 2.8 µg/l (water & organisms) and 82 µg/l (organisms only). The water & organisms classification applies only to surface waters that are classified as both "recreation" and "domestic water supply". Because the Loosahatchie River is not classified as "domestic water supply", the three remaining standards may be used to compare to results in the drainage ditch. Therefore, the most restrictive standard that applies to the Loosahatchie River for PCP is 13 µg/l. The results of PCP in the drainage ditch are well below the standard that applies to the Loosahatchie River.

The RI Report further states that the effects of dilution by mixing with the Loosahatchie River water is expected to reduce the concentrations of any contaminants in the ditch to very low levels within a short distance from the discharge area. This is confirmed by the non-detect result for PCP (i.e., <0.5 µg/l) in the sample collected from the Loosahatchie River approximately 100 feet downstream of the confluence with the drainage ditch. In order to address this

issue, surface water dilution was evaluated and provided in Appendix E of the Amended ROD. The dilution calculations show that discharges of PCP as high as 1,106 μg/l would be diluted to below non-detect concentrations. The calculations further assumed that the flow in the Loosahatchie River would be a continuous flow of 73.6 ft^3/sec (3 day minimum, 20 year recurrence interval). For reference, the 2001 minimum flow was 81 ft^3/sec and the annual average flow was 423 ft^3/sec.

7.0 ASSESSMENT

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

The review of documents, ARARS, risk assumptions, and the results of the Site inspection indicates that the remedy is functioning as intended by the ROD, as amended by the ESD and the Amended ROD. The soil remedy of low temperature thermal desorption successfully treated 41,431 tons of contaminated soil removing over 2,757 pounds of contaminants. Through this process, an estimated 91% of the total source of contamination was removed from the Site. The effective use of institutional controls has prevented the exposure to contaminated groundwater.

Maintenance of the final vegetative cover over the Site has been effective. The Site is mowed several times a year and is maintained to have the appearance of a well maintained field (e.g., shrubs and trees are periodically removed from the fenceline and around wells). Operation and maintenance costs are consistent with forecasted costs, and no increase in forecasted spending is anticipated.

The wells closest to the Loosahatchie River, AB-9D and AB-17D, continue to exhibit detectable levels of PCP (37.8 μg/l and 180 μg/l, respectively in June 2002). Additionally, the surface water sampling location SST1, located in the drainage ditch near AB-17D continues to exhibit detectable levels of PCP (1.13 μg/l in June 2002). Although it is a concern that PCP is discharging to the drainage ditch and is likely discharging to the Loosahatchie River, no statistical increase in contaminant level has been detected. The PCP concentration in the drainage ditch (currently 1.13 μg/l) is well below the applicable PCP surface water standard of 13 μg/l. It is also noted that this standard applies to the Loosahatchie River, as no standard exists for the drainage ditch. Surface water dilution calculations provided in Appendix E of the

Amended ROD show that discharges of PCP as high as 1,106 μg/l would be diluted to below non-detect concentrations.

Another concern raised during the five-year review is the potential vertical migration of contaminants downward through the confining layer to the Memphis Sand aquifer due to the operation of an irrigation well (screened in the Memphis Sand) in the sod farm downgradient from the Site. Numerous studies have shown that the confining layer is laterally contiguous acrosss the entire plume area with a minimum thickness of 42 feet. In many areas the thickness is greater than 60 feet. Groundwater modeling studies conducted by the PRP and by USEPA have shown that vertical migration of contaminants due to pumping of the irrigation well is unlikely. It is noted that in both studies, it was assumed that the well operated continuously. However, due to a special permit issued by the Memphis and Shelby County Health Department, the well can only operate a maximum of 32 continuous hours or three days in a ten day time period. Actual operation of the well is much less than the requirements of the permit. For example, review of the operation log for the well showed that it operated for a total of 146 hours (6 days) in 2001 and only 18 hours thus far in 2002 (through August). It is noted that the well is typically used only during the growing season of May through September. Copies of the 2001 and 2002 irrigation well operation logs are included in ***Appendix F***.

The institutional controls that are in place include a prohibition on the use of water from the contaminated surficial aquifer underlying the Site. Existing Shelby County regulations prohibit construction of groundwater wells for domestic uses where a public water system is available and within a half-mile of a listed Superfund site. These regulations would, therefore, preclude human exposure to the contaminated groundwater (for drinking purposes) at any point between the Site and the Loosahatchie River.

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

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

The ARARs for the soil remedy have been met. ARARs that still must be met include the MCLs established under the Safe Drinking Water Act. A review of current MCLs for all COCs identified changes in the MCLs for two compounds: endrin and toluene. The ROD-specified cleanup levels for endrin and toluene were 0.2 μg/l and 2,000 μg/l, respectively. These

were the current MCLs at the time the ROD was developed. The current MCLs for endrin and toluene are 2 µg/l and 1,000 µg/l, respectively. In the case of endrin the MCL has increased by an order of magnitude. Based on the June 2002 monitoring data only one well exceeds the current MCL for endrin (AB-20D, 5.49 µg/l). The current maximum Site concentration for toluene is 22.8 µg/l (AB-20D); therefore the lowering of the MCL for toluene does not impact the effectiveness of the natural attenuation remedy.

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

There is no other information that calls into question the protectiveness of the remedy.

Assessment Summary

Based on the Site interviews, the Site inspection, and the data review, it appears that the remedy is functioning as intended by the ROD, as amended. The assumptions used at the time of the remedy selection are still valid, and no additional information has been identified that would call into question the protectiveness of the remedy.

8.0 ISSUES

Two issues were identified potentially relating to the effectiveness of the remedy. The first issue is the presence of PCP in wells near the discharge point at the Loosahatchie River (i.e., AB-9D, AB-17D) and the presence of PCP in the drainage ditch (SST1). However, no statistically significant increase in contaminant concentration was detected in either surface water body, and no exceedance of the surface water standard for PCP was observed. The second issue is the observed increasing trend in the Site average concentration of endrin. It is noted, however, that no significant contaminant migration from the source area has occurred. Both of these issues will be addressed using the current monitoring schedule and should be reevaluated at the next five-year review.

9.0 RECOMMENDATIONS

Based on the findings of this five-year review, the following recommendations are made:

- Continue with the monitoring program as outlined in the approved Long-Term Monitoring and Maintenance Plan;

- Add the drainage ditch surface water sampling location (SST1) to the surface water monitoring program. A sample should be collected from this location semiannually in conjunction with the semi-annual surface water monitoring events; and
- Copy all future reports to the Town of Arlington.

10.0 PROTECTIVENESS STATEMENT

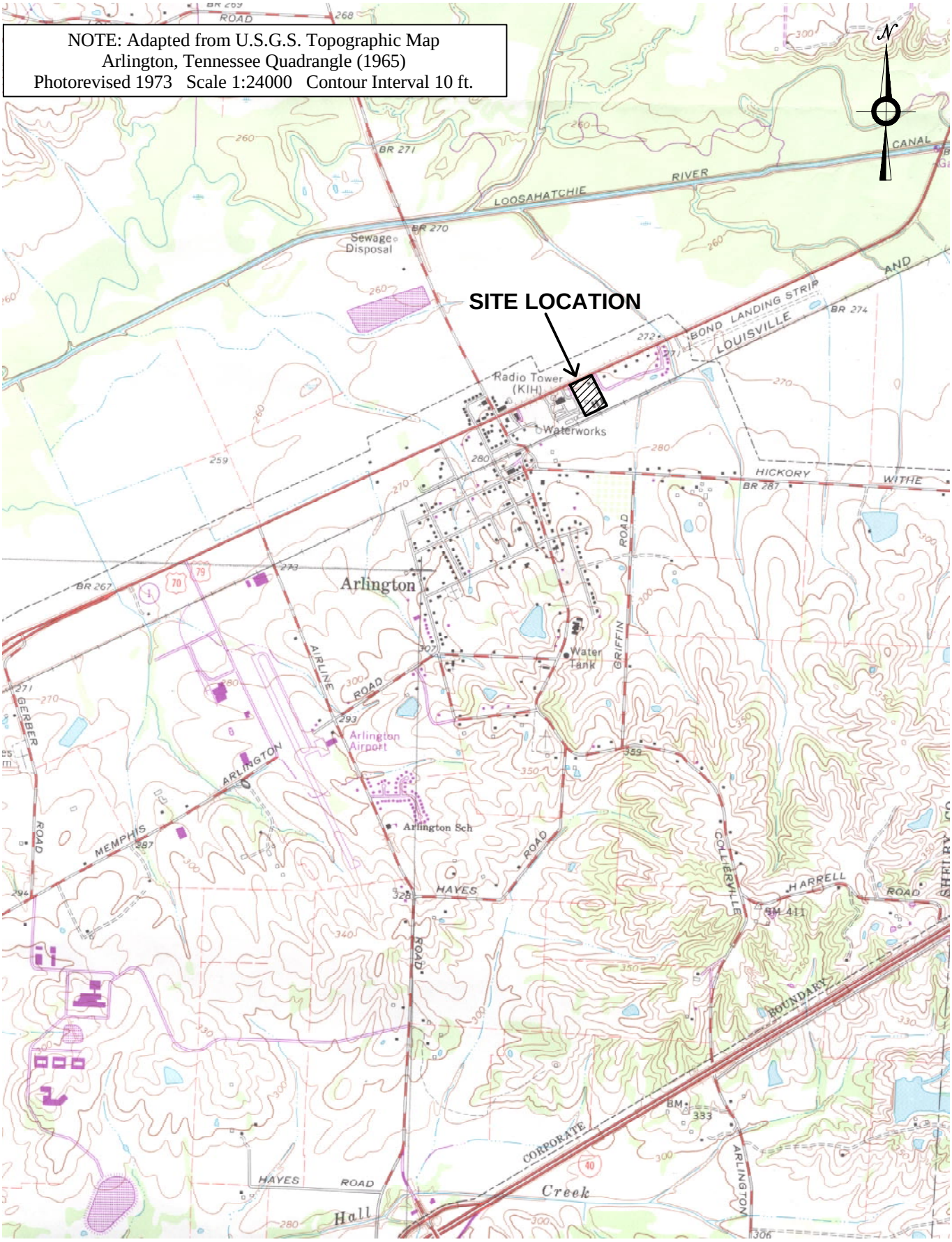
Although the surficial aquifer remains impacted by Site-specific contaminants, the current remedy remains protective of human health and the environment. The remedy is expected to be protective of human health and the environment upon attainment of the groundwater cleanup goals via natural attenuation, which is expected to require 25 years to achieve. Previous remedial actions at the Site have removed the majority of the source through excavation and treatment using low-temperature thermal desorption. The surficial aquifer has been determined to be hydraulically isolated from the Memphis Sand Aquifer located below it. No measurable impact to the Loosahatchie River has been observed. Contaminant concentrations demonstrate a decreasing trend over time and PCP attenuation rates are progressing at a greater rate than model-predicted rates. Institutional controls preclude human exposure to the contaminated groundwater (for drinking purposes) at any point between the Site and the Loosahatchie River. All threats at the Site have been addressed through source control and implementation of institutional controls.

Long-term protectiveness of the remedial action will be verified by obtaining additional groundwater and surface water samples in accordance with the LTMM Plan. Future five-year review reports will evaluate migration of the contaminant plume downgradient from the former source area and towards the Loosahatchie River. Current monitoring data indicate the remedy is functioning as required to achieve groundwater cleanup goals.

11.0 NEXT REVIEW

Five-year reviews are to be conducted at this Site until contaminant levels are below the standards set in the ROD (i.e., drinking water standards). Because Site contaminant levels remain above cleanup levels, the next five-year review will be completed within five years of the date of this report. The due date for the next five-year review is July 2007.

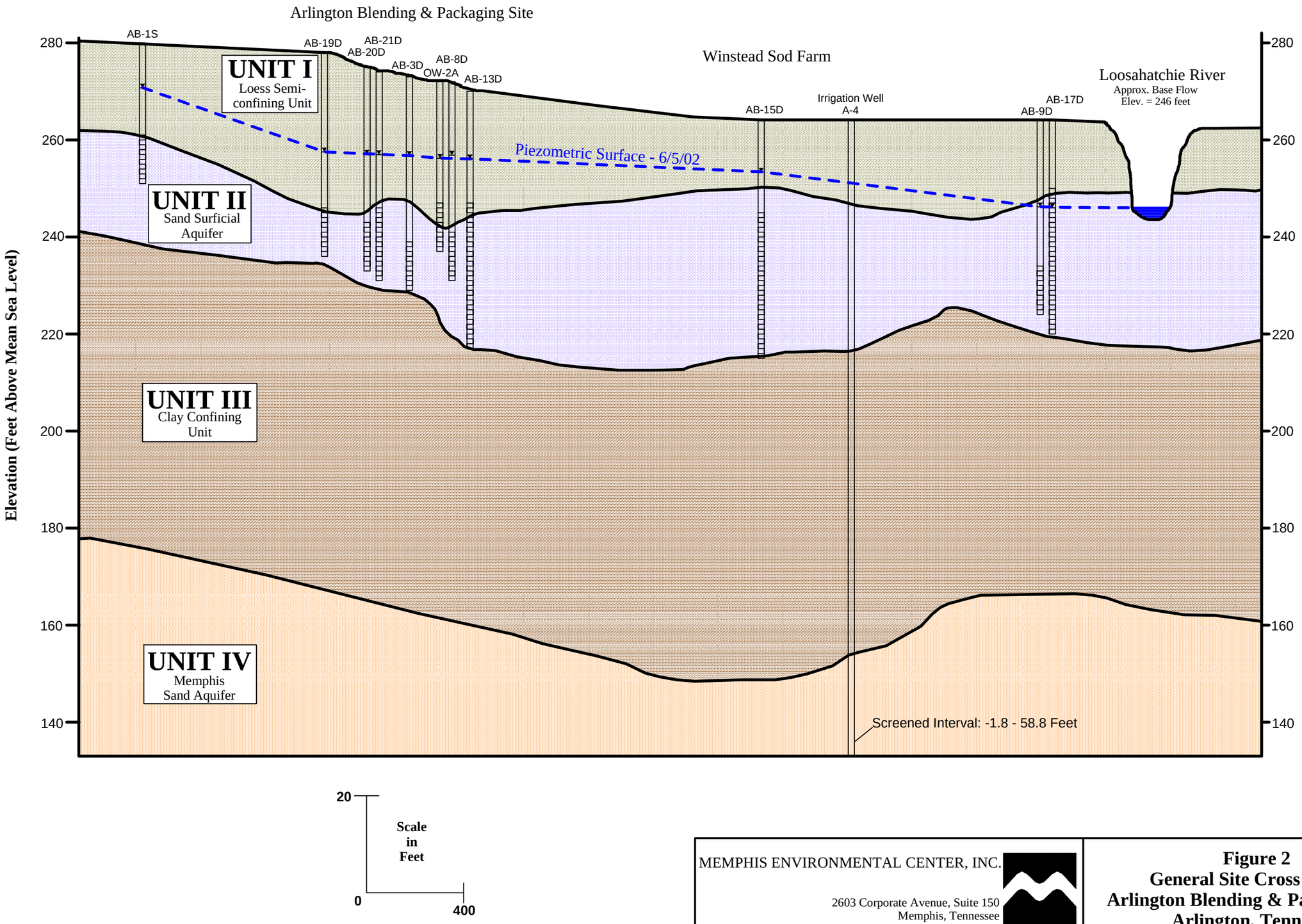
FIGURES



MEMPHIS ENVIRONMENTAL CENTER, INC.

2603 Corporate Avenue, Suite 150
Memphis, Tennessee

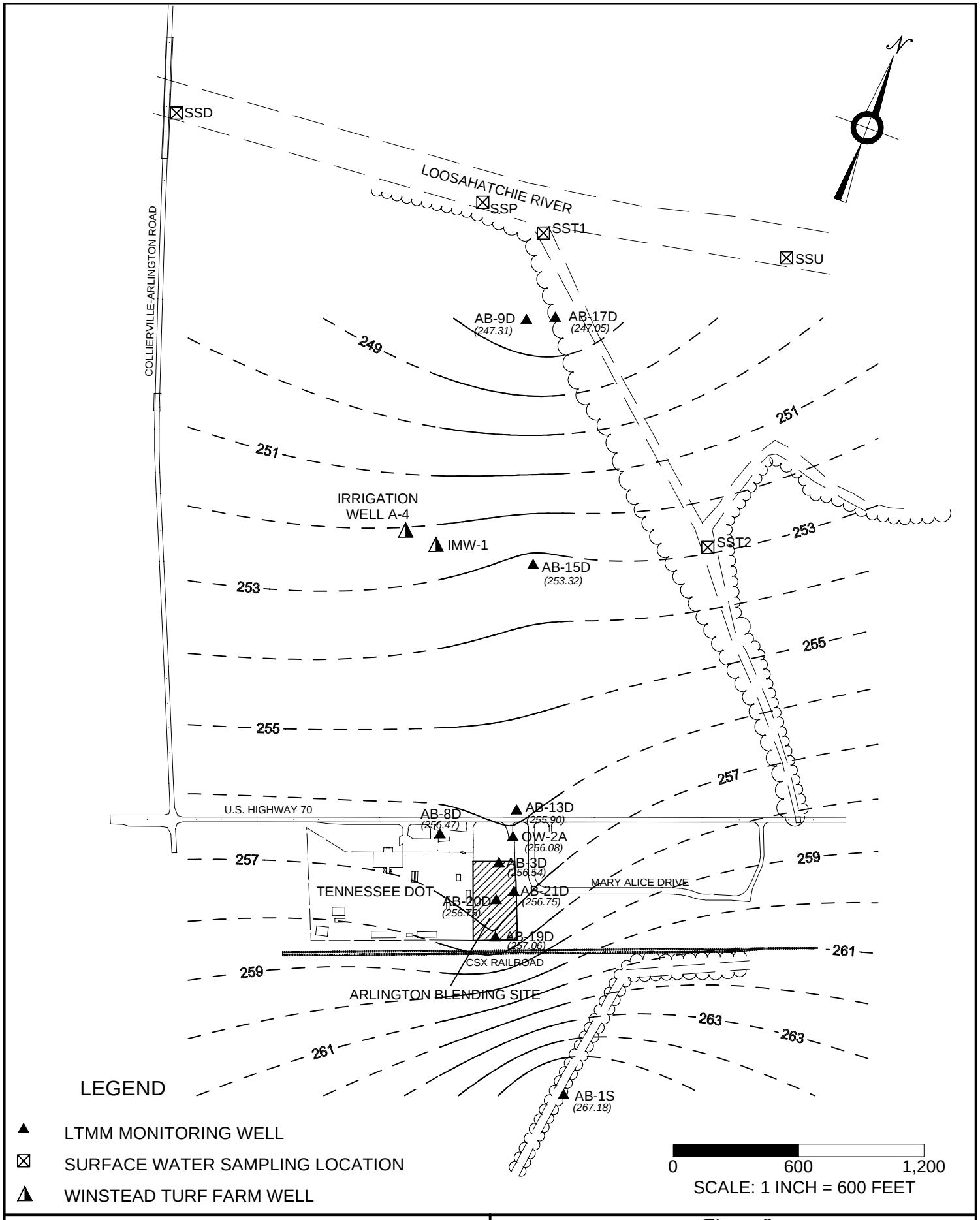
Figure 1
Site Location Map
Arlington Blending & Packaging Site
Arlington, Tennessee



MEMPHIS ENVIRONMENTAL CENTER, INC.

2603 Corporate Avenue, Suite 150
Memphis, Tennessee

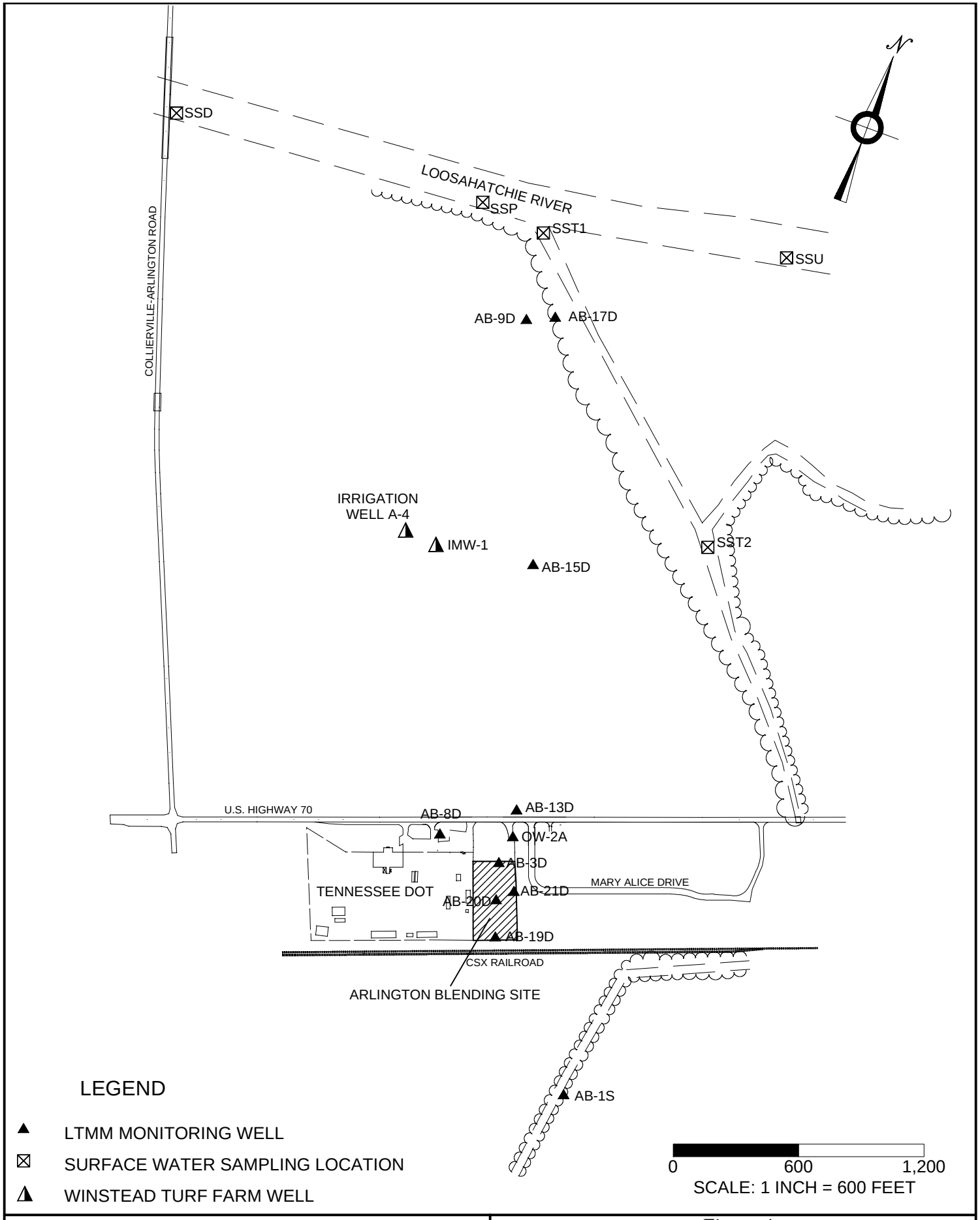
Figure 2
General Site Cross Section
Arlington Blending & Packaging Site
Arlington, Tennessee



MEMPHIS ENVIRONMENTAL CENTER, INC.

2603 Corporate Avenue, Suite 150
Memphis, Tennessee

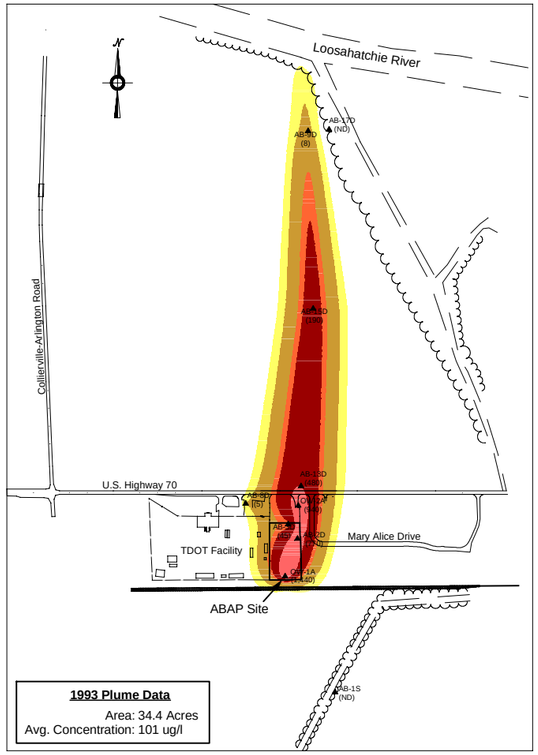
Figure 3
Groundwater Contour Map (6/5/01)
Arlington Blending & Packaging Site
Arlington, Tennessee

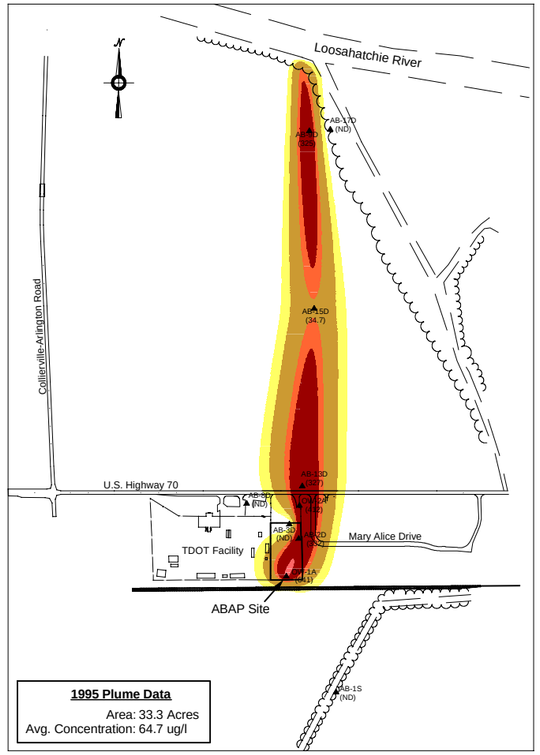


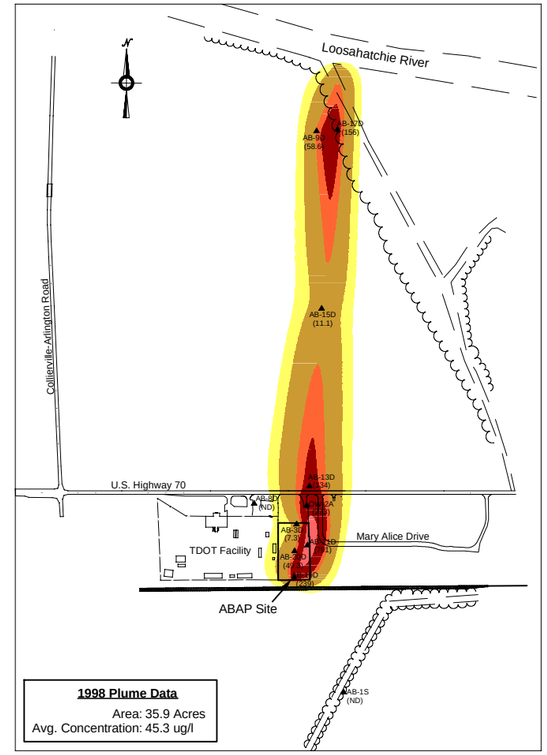
MEMPHIS ENVIRONMENTAL CENTER, INC.

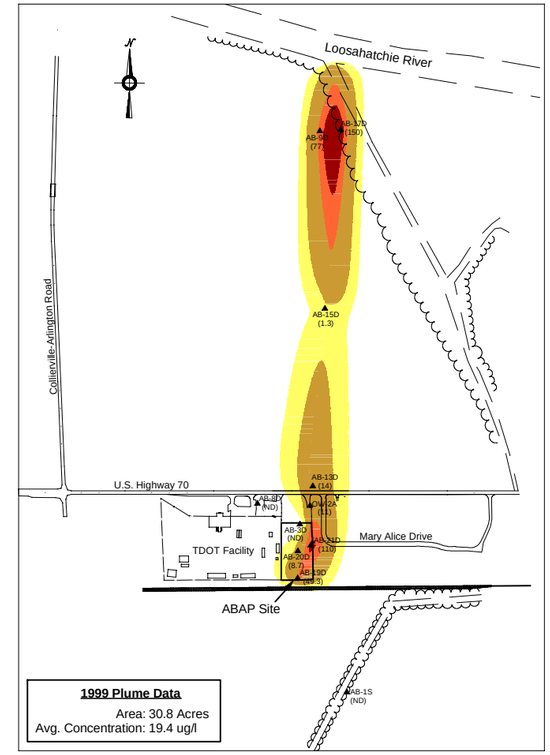
2603 Corporate Avenue, Suite 150
Memphis, Tennessee

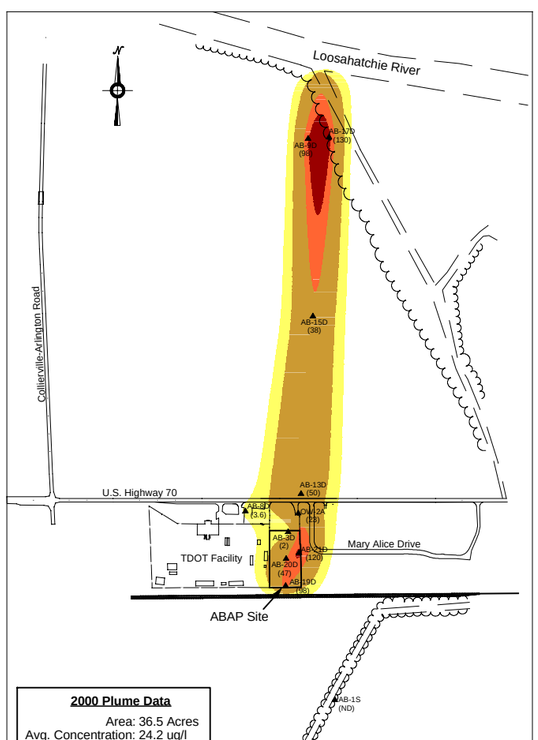
Figure 4
Monitoring Locations
Arlington Blending & Packaging Site
Arlington, Tennessee

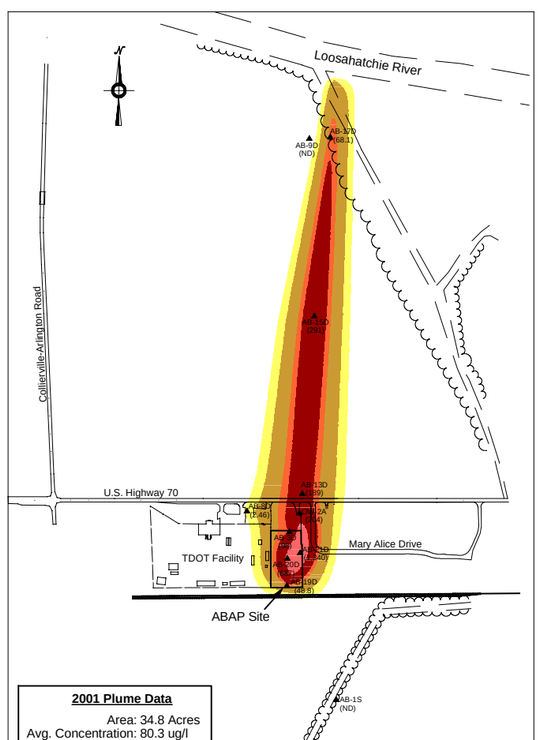












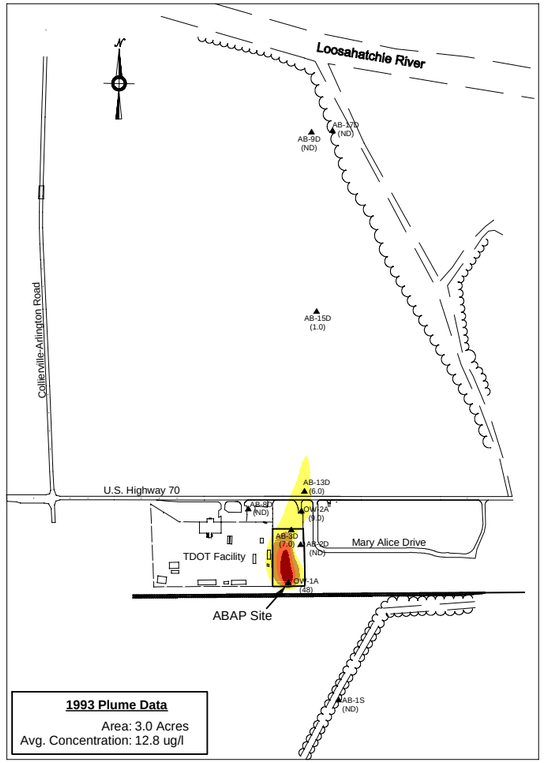
LEGEND

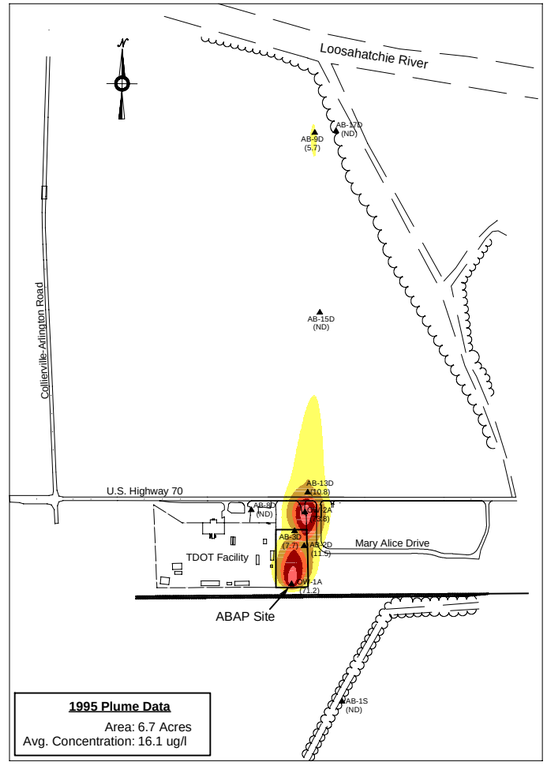
- 1 TO 5 UG/L CONTOUR INTERVAL
- 5 TO 50 UG/L CONTOUR INTERVAL
- 50 TO 100 UG/L CONTOUR INTERVAL
- 100 TO 500 UG/L CONTOUR INTERVAL
- > 500 UG/L CONTOUR INTERVAL

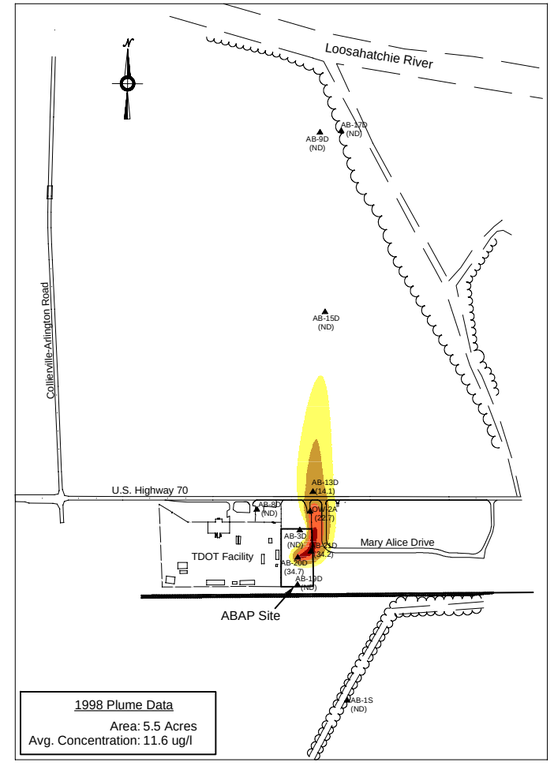
Figure 5
Time Series of PCP Concentration in Groundwater

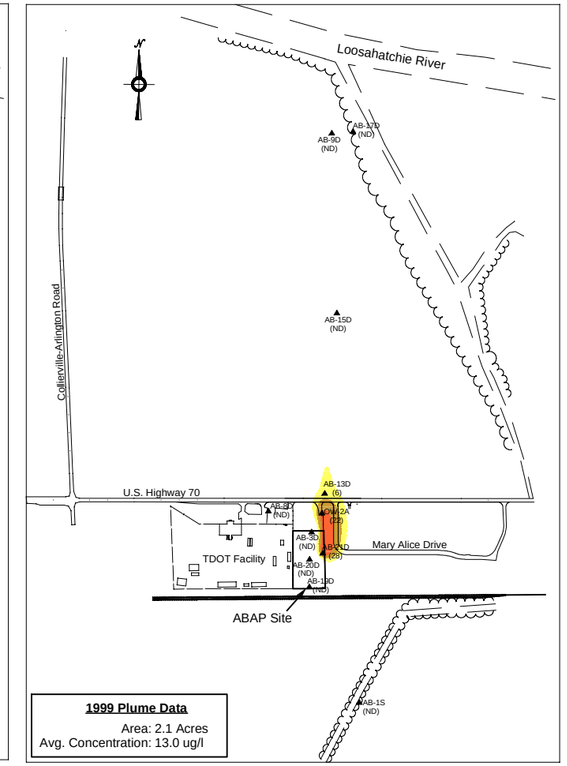
ARLINGTON BLENDING &PACKAGING SITE
ARLINGTON, TENNESSEE

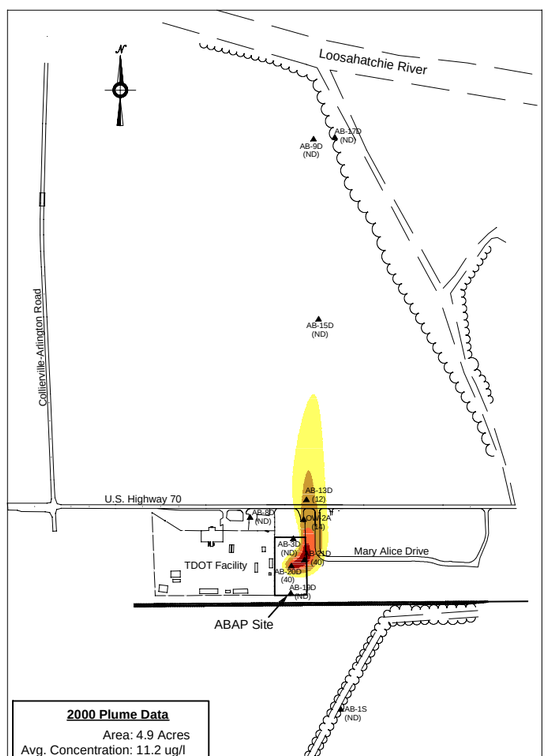
MEMPHIS ENVIRONMENTAL CENTER, INC.
2603 Corporate Avenue, Suite 150
Memphis, Tennessee 38132

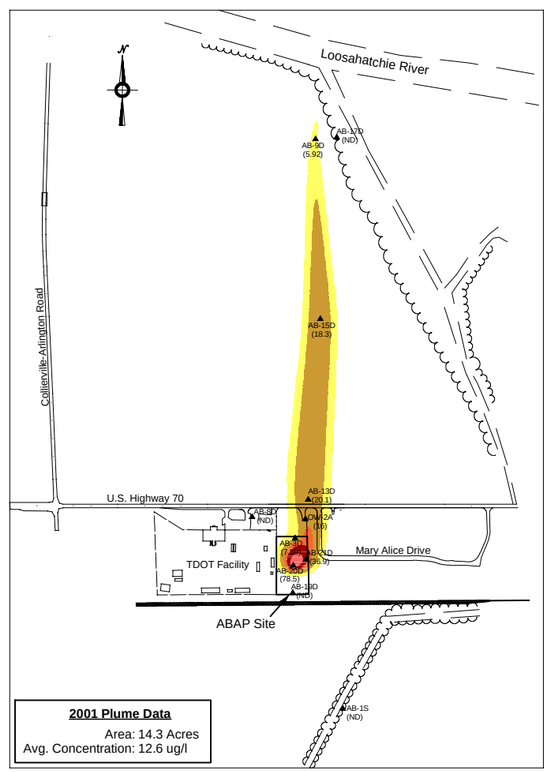


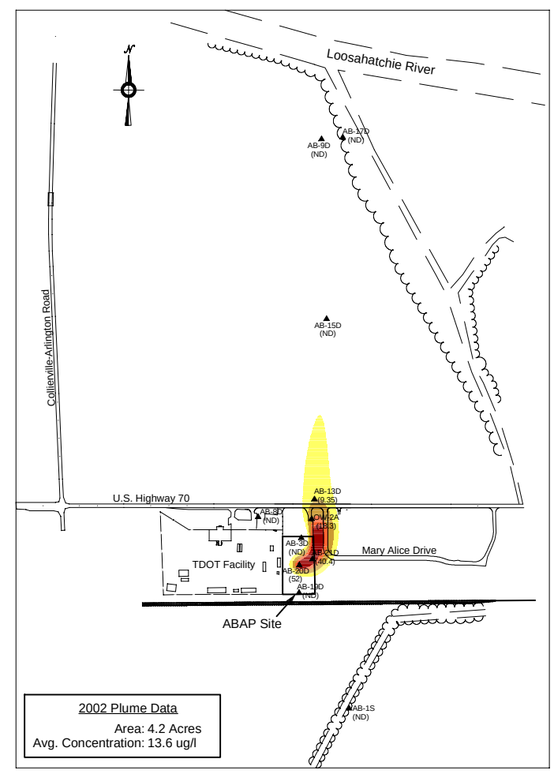












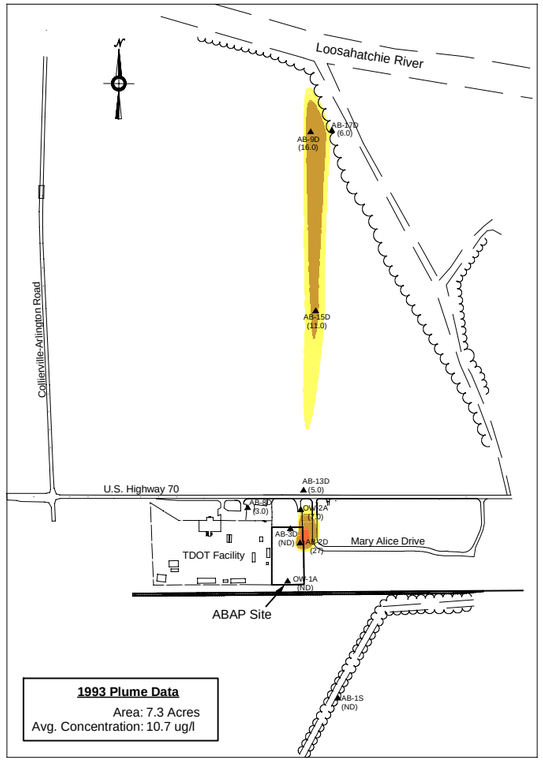
LEGEND

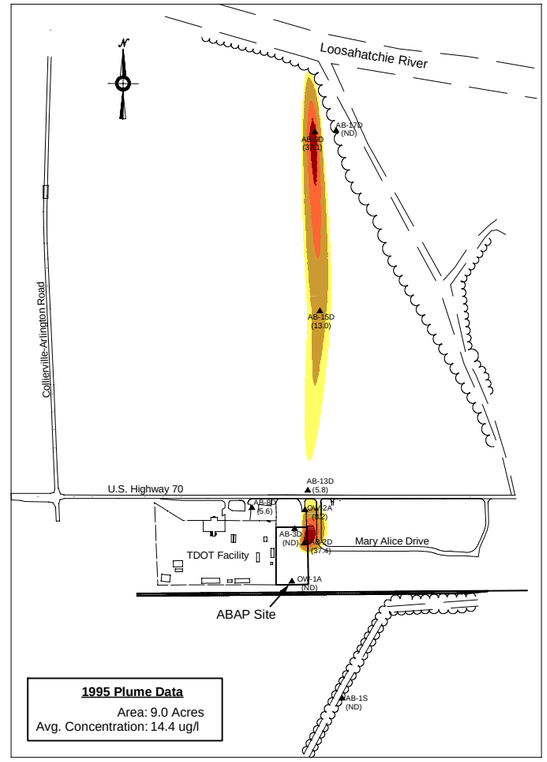
- 5 TO 10 UG/L CONTOUR INTERVAL
- 10 TO 20 UG/L CONTOUR INTERVAL
- 20 TO 30 UG/L CONTOUR INTERVAL
- 30 TO 50 UG/L CONTOUR INTERVAL
- > 50 UG/L CONTOUR INTERVAL

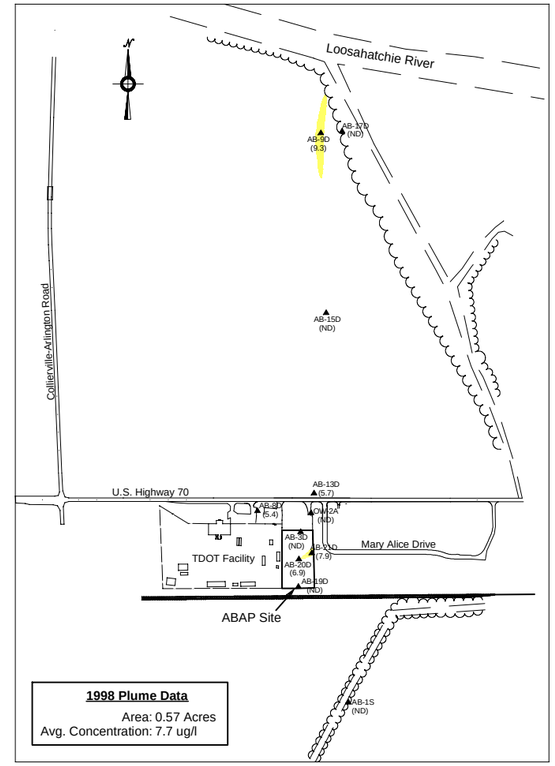
Figure 6
Time Series of Benzene Concentration in Groundwater

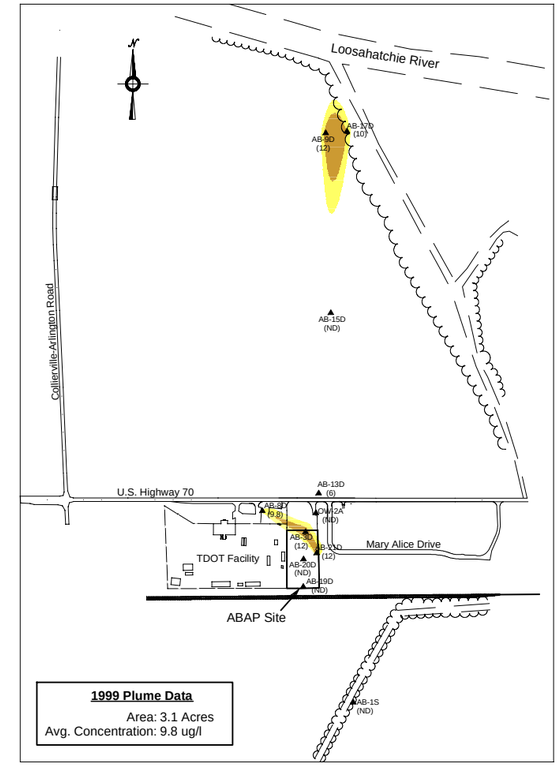
ARLINGTON BLENDING &PACKAGING SITE
ARLINGTON, TENNESSEE

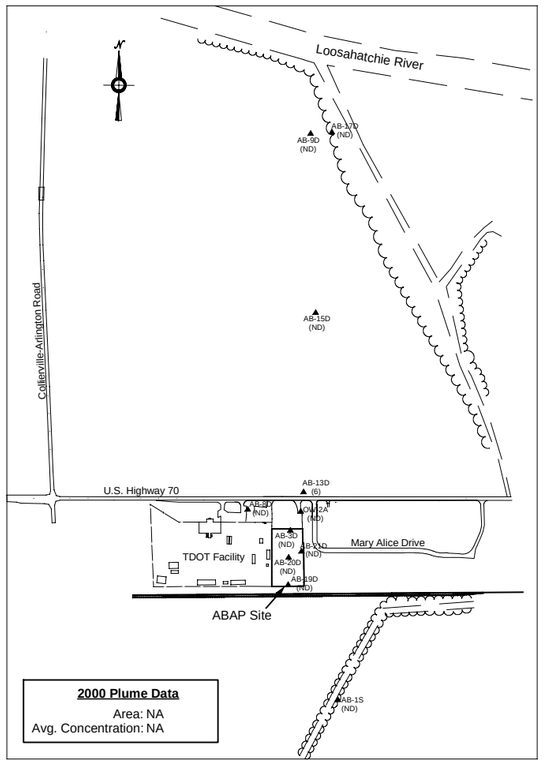
MEMPHIS ENVIRONMENTAL CENTER, INC.
2603 Corporate Avenue, Suite 150
Memphis, Tennessee 38132

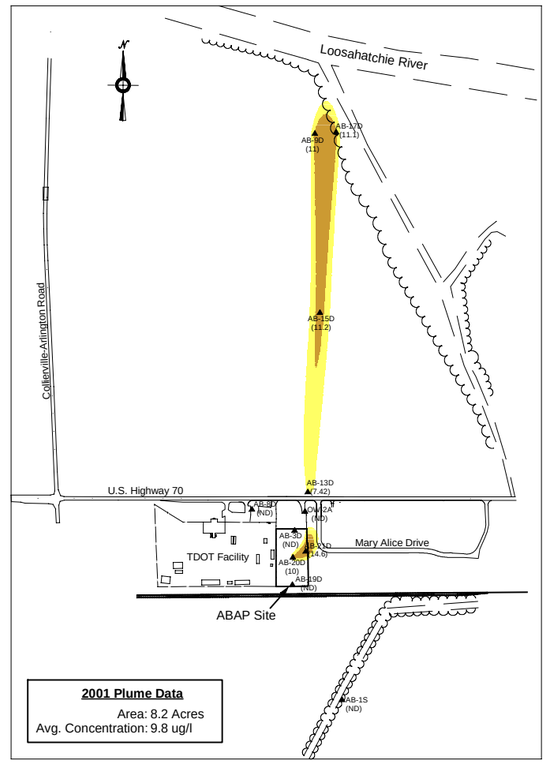


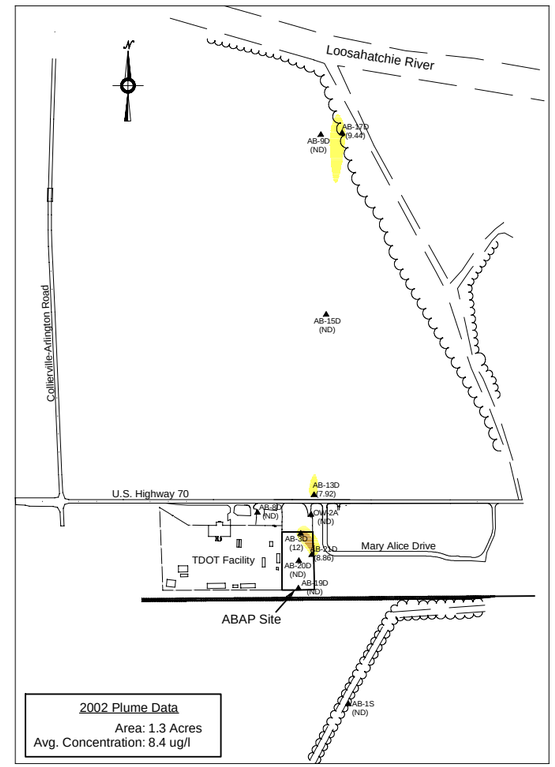












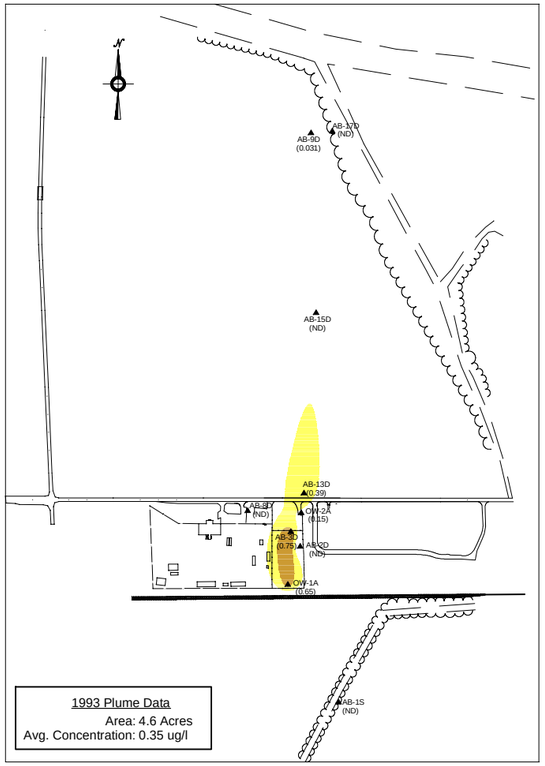
LEGEND

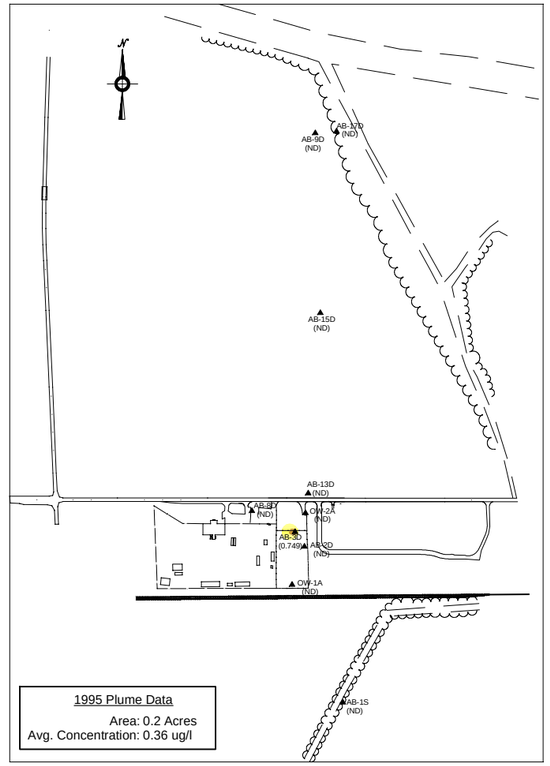
- 7 TO 10 UG/L CONTOUR INTERVAL
- 10 TO 20 UG/L CONTOUR INTERVAL
- 20 TO 30 UG/L CONTOUR INTERVAL
- > 30 UG/L CONTOUR INTERVAL

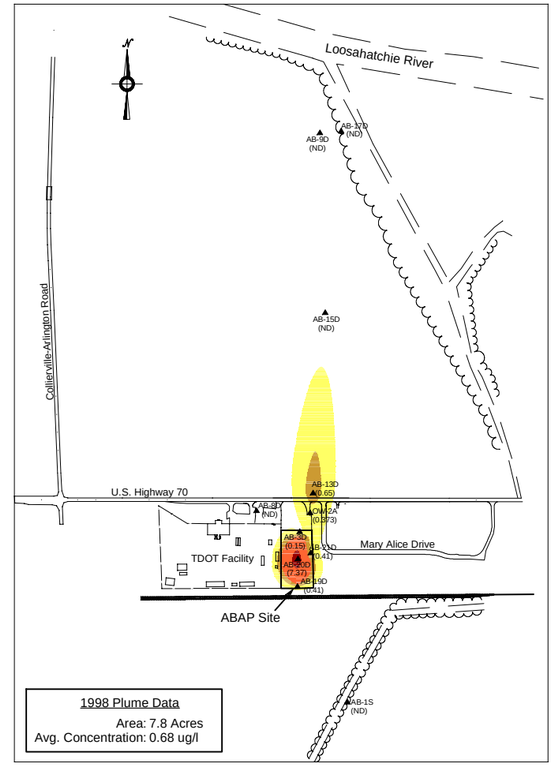
Figure 7
Time Series of 1,1-DCE Concentration in Groundwater

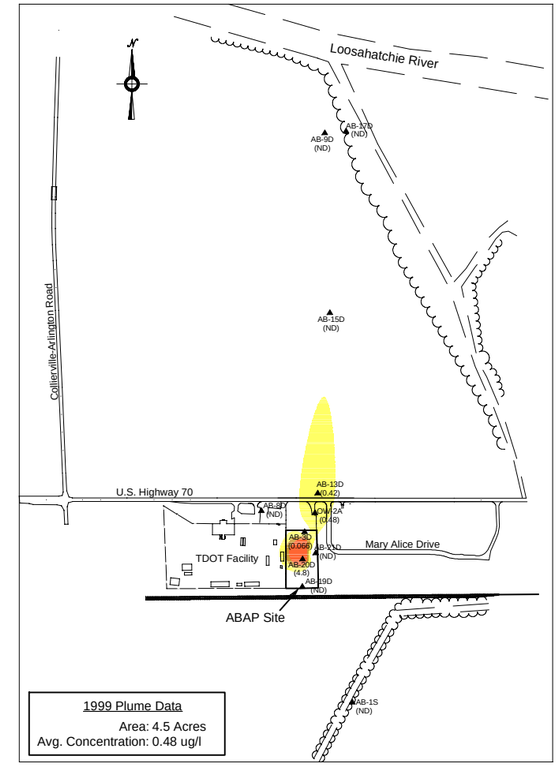
ARLINGTON BLENDING &PACKAGING SITE
ARLINGTON, TENNESSEE

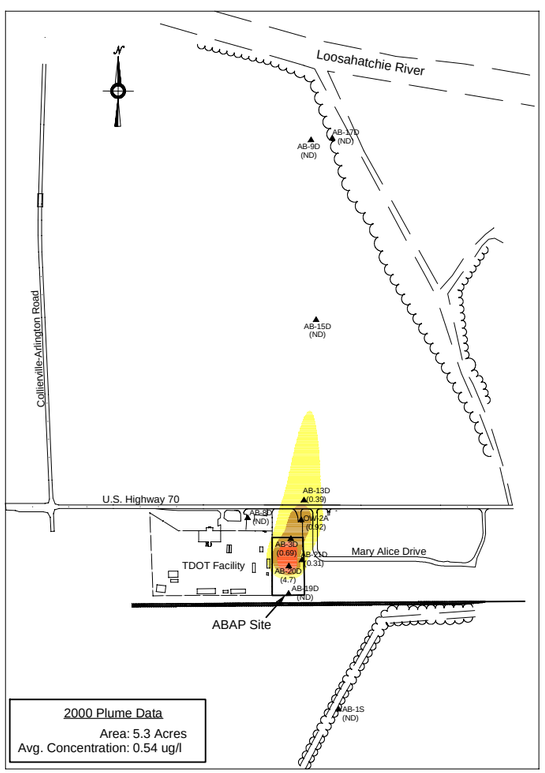
MEMPHIS ENVIRONMENTAL CENTER, INC.
2603 Corporate Avenue, Suite 150
Memphis, Tennessee 38132

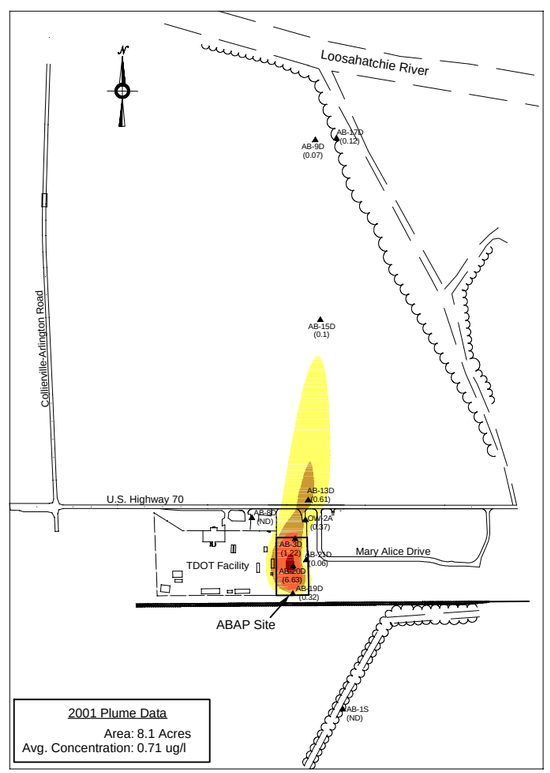


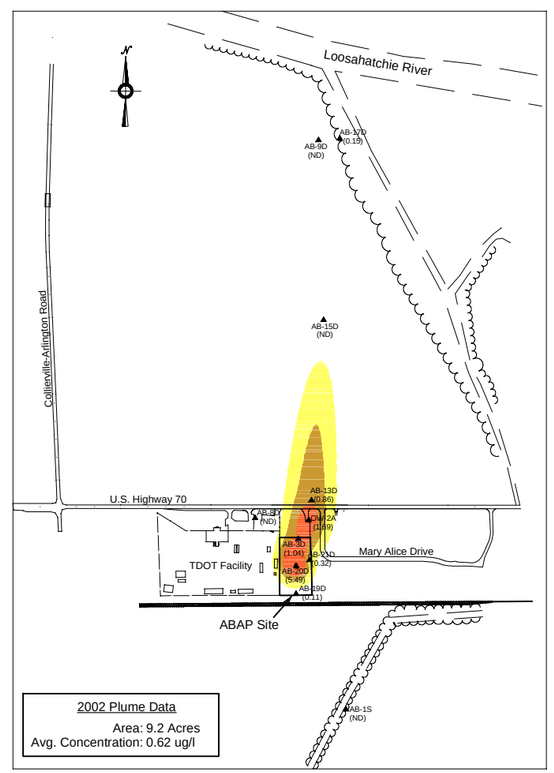












LEGEND

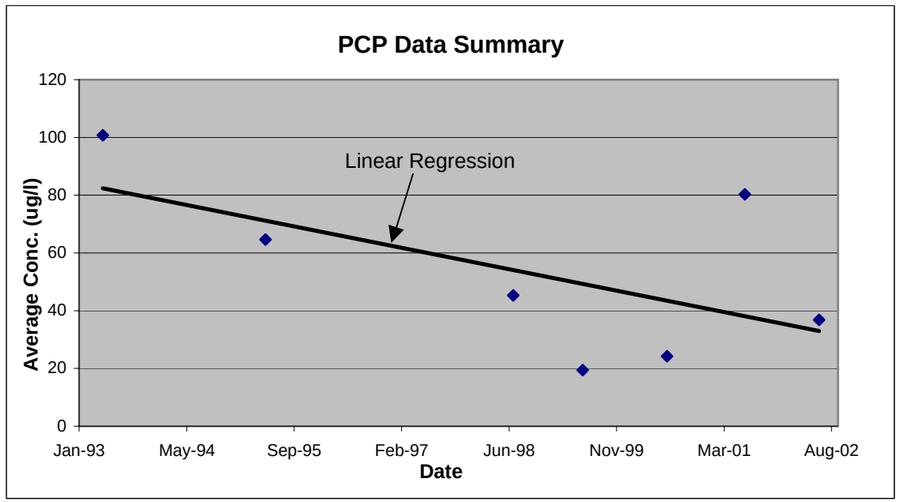
- 0.2 TO 0.5 UG/L CONTOUR INTERVAL
- 0.5 TO 1 UG/L CONTOUR INTERVAL
- 1 TO 5 UG/L CONTOUR INTERVAL
- > 5 UG/L CONTOUR INTERVAL

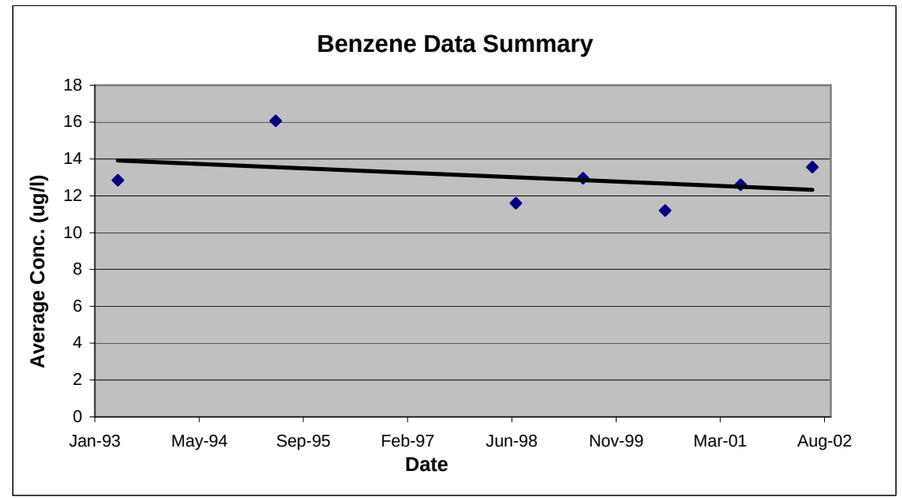
Figure 8
Time Series of Endrin Concentration in Groundwater

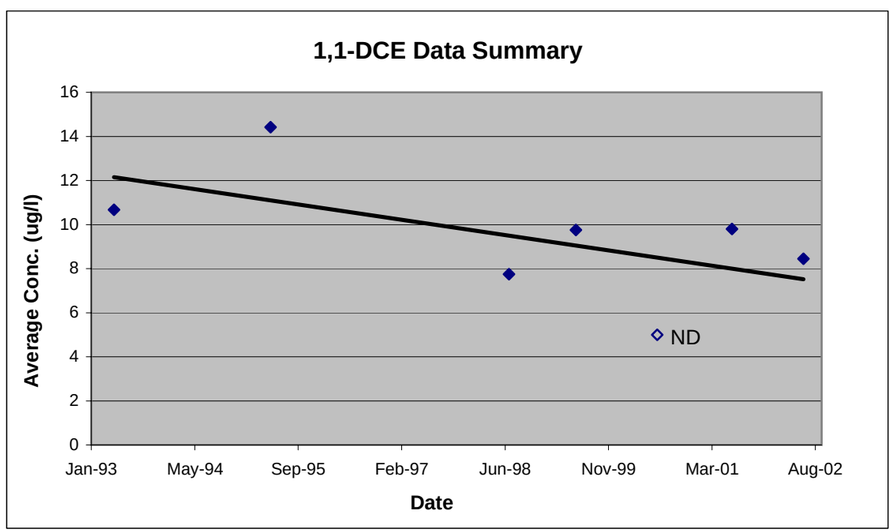
ARLINGTON BLENDING &PACKAGING SITE
ARLINGTON, TENNESSEE

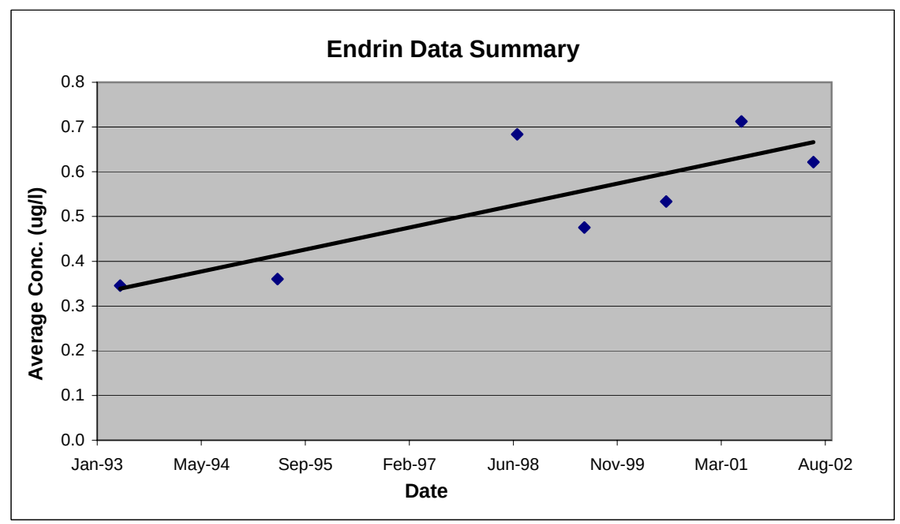
MEMPHIS ENVIRONMENTAL CENTER, INC.
2603 Corporate Avenue, Suite 150
Memphis, Tennessee 38132

Plume Average Concentration (ug/l)				
Date	PCP	Benzene	1,1-DCE	Endrin
4/21/1993	100.8	12.8	10.7	0.35
5/18/1995	64.7	16.1	14.4	0.36
7/13/1998	45.3	11.6	7.7	0.68
6/1/1999	19.4	13.0	9.8	0.48
6/28/2000	24.2	11.2	< 5.0	0.53
6/25/2001	80.3	12.6	9.8	0.71
6/5/2002	36.8	13.6	8.4	0.62







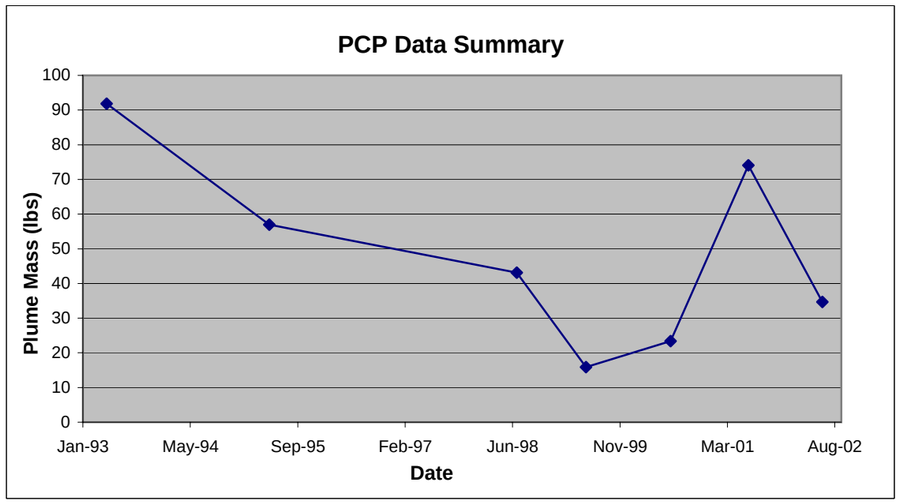


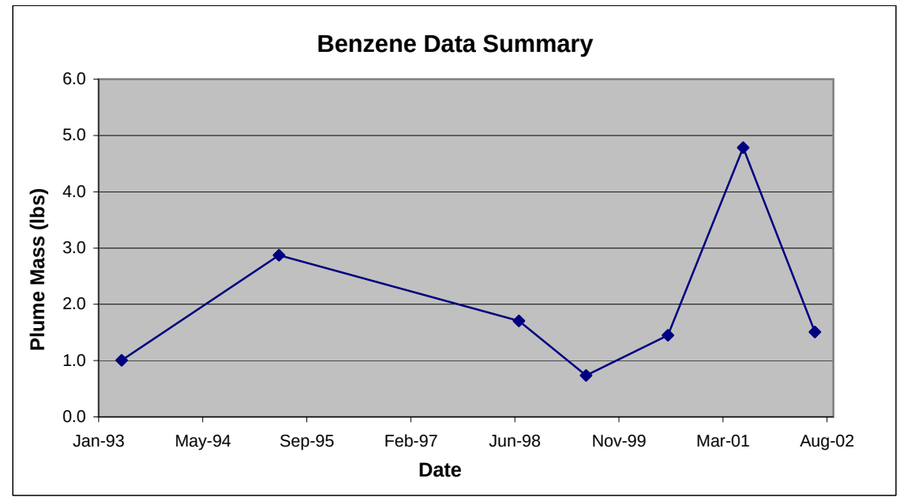
MEMPHIS ENVIRONMENTAL CENTER, INC.
2603 Corporate Avenue, Suite 150
Memphis, Tennessee 38132

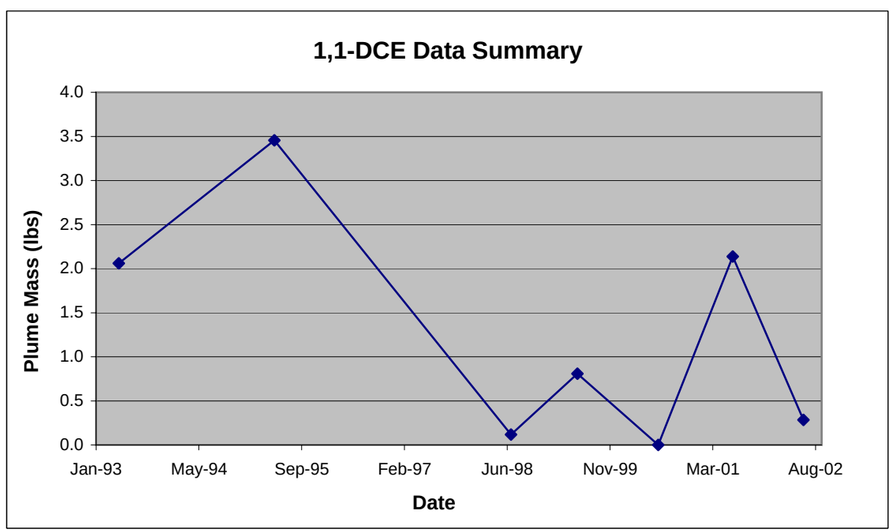
Arlington Blending & Packaging Site
Arlington, Tennessee

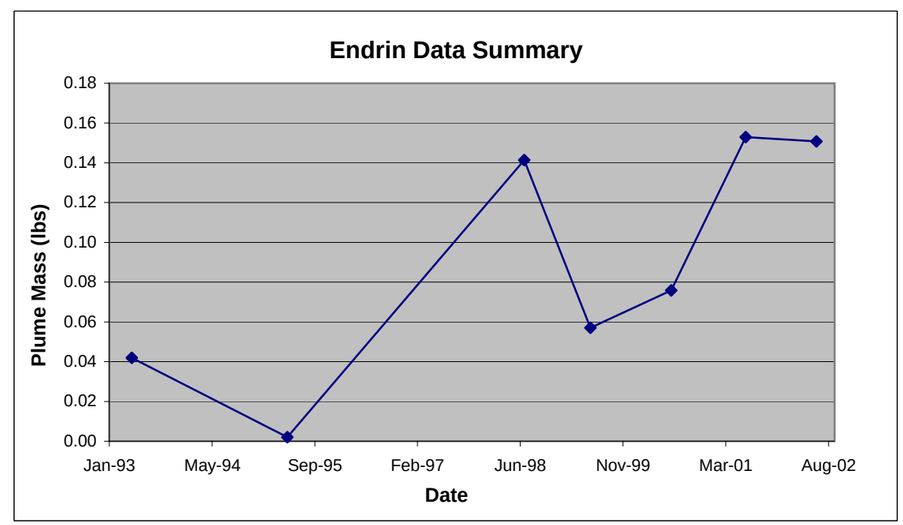
Figure 9
Plume Average Concentration Evaluation

Plume Mass (lbs)				
Date	PCP	Benzene	1,1-DCE	Endrin
4/21/1993	91.9	1.0	2.1	0.04
5/18/1995	57.0	2.9	3.5	0.002
7/13/1998	43.1	1.7	0.1	0.14
6/1/1999	15.8	0.7	0.8	0.06
6/28/2000	23.4	1.5	0.0	0.08
6/25/2001	74.1	4.8	2.1	0.15
6/5/2002	34.7	1.5	0.3	0.15





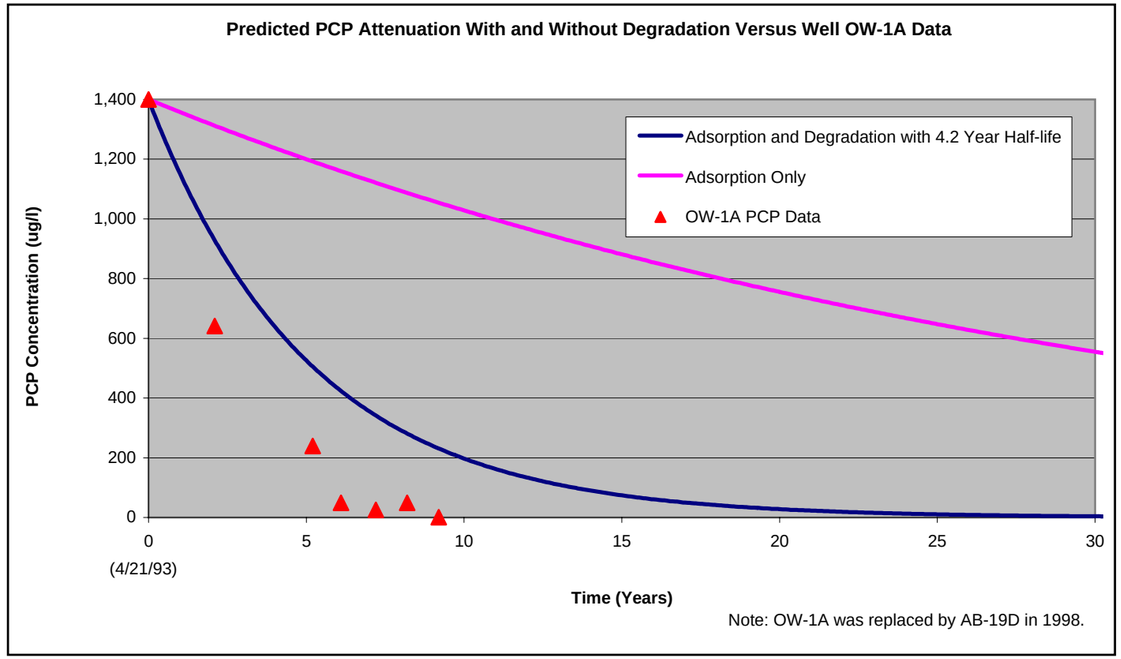


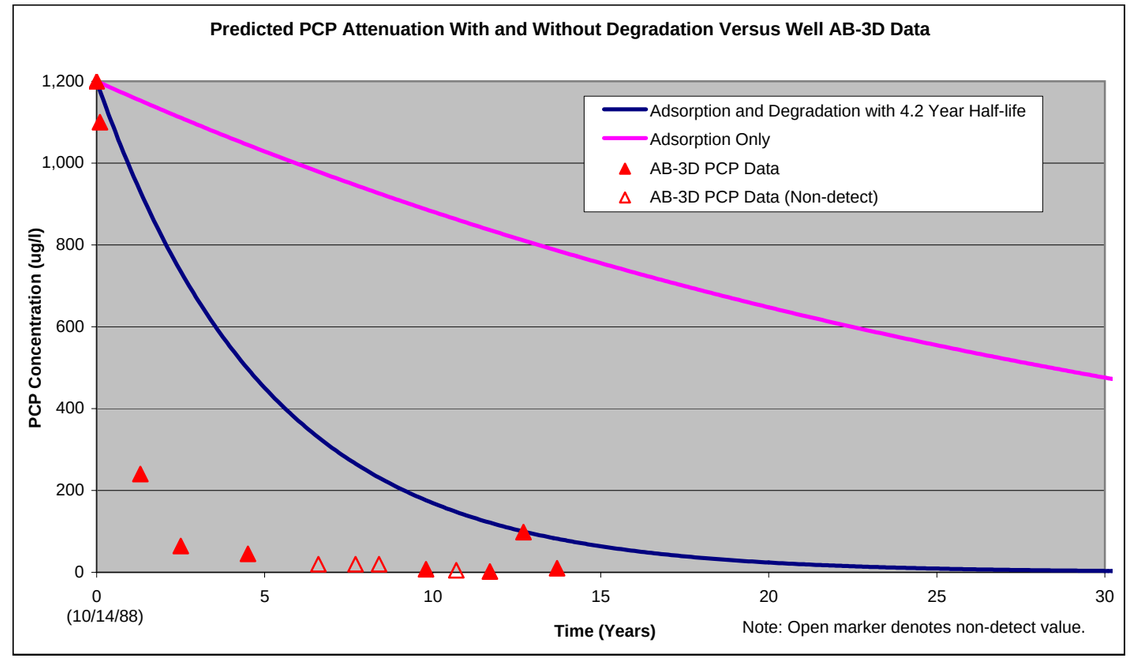


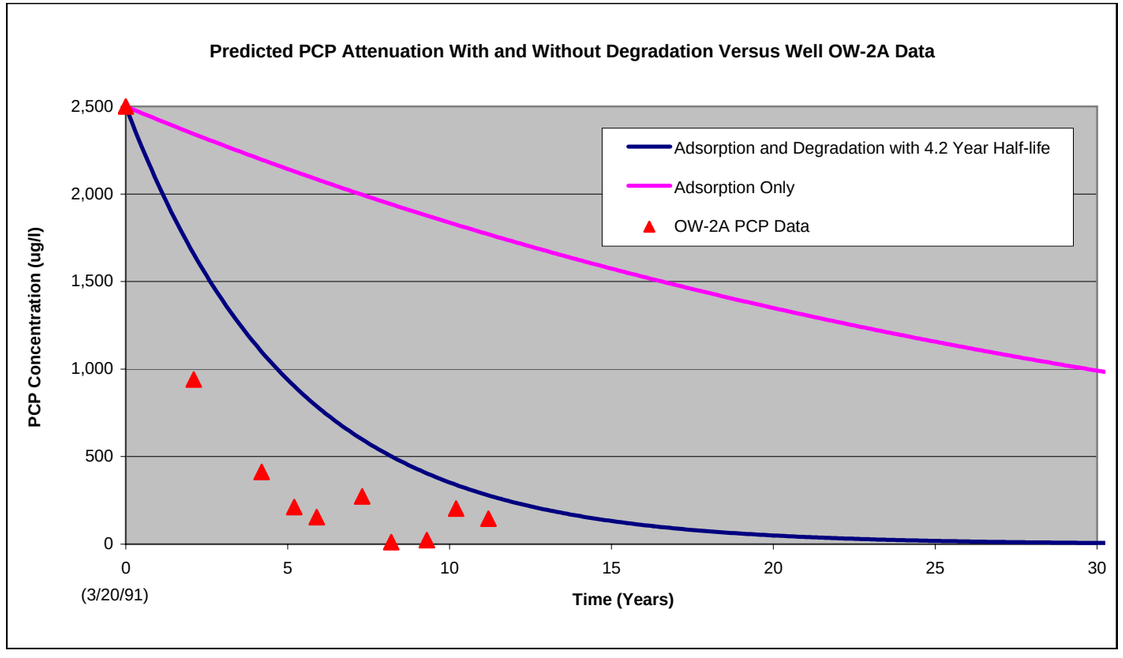
MEMPHIS ENVIRONMENTAL CENTER, INC.
2603 Corporate Avenue, Suite 150
Memphis, Tennessee 38132

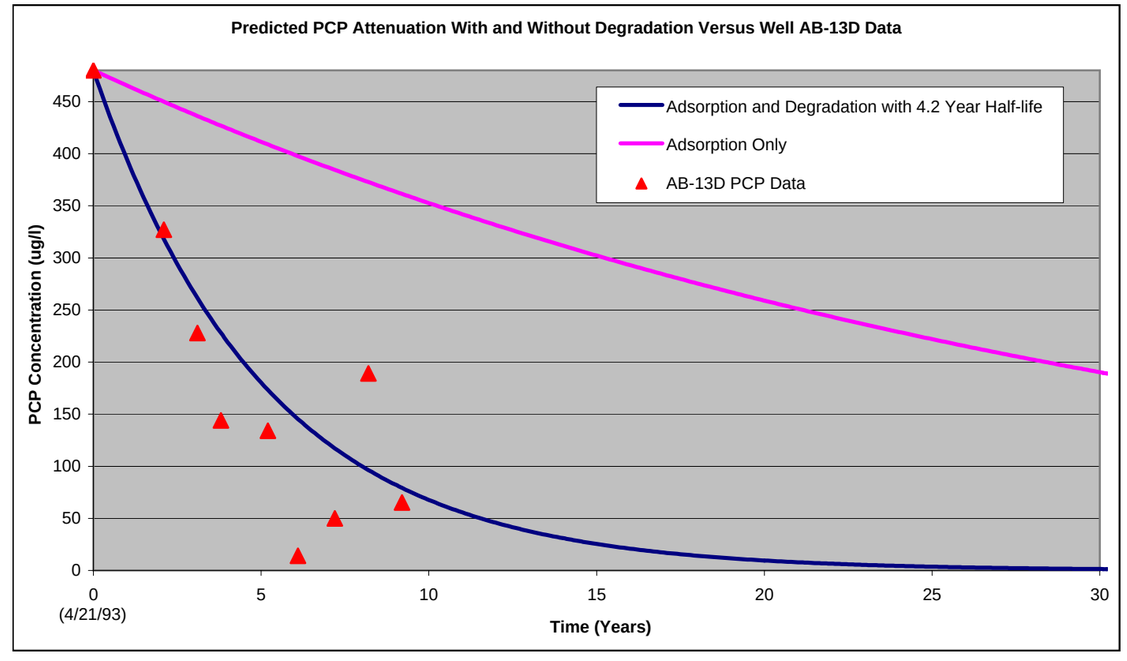
Arlington Blending & Packaging Site
Arlington, Tennessee

Figure 10
Plume Mass Evaluation









MEMPHIS ENVIRONMENTAL CENTER, INC.
2603 Corporate Avenue, Suite 150
Memphis, Tennessee 38132

Arlington Blending & Packaging Site
Arlington, Tennessee

Figure 11
PCP Cleanup Time Evaluation

TABLES

Table 1
Chronology of Events
Arlington Blending & Packaging Site

Date	Event
1971-1978	Arlington Blending and Packaging (ABAP) Site operated as a pesticide formulation facility
5/79	EPA and TDPH sampled soil from adjacent property to east of plant to find high levels of DDT and Chlordane
7/79	TDPH sampled soil from adjacent property to east of plant to confirm previous pesticide results
1980	A fence was built along the east side of the site between building B3 and residential area.
9/19/80	Site owner, William Bell, agreed in letter to TDPH to clean up site
9/82	Wire fence placed around site except on western boundary where a chain link fence already existed
4/83	TDPH and MSCHD sampled soil and water from adjacent property to east of plant to find Pesticides detected but discrepancies existed between split samples
6/83	EPA sampled soil and water from adjacent property to east of plant to confirm detected Pesticides
8/83	TDPH conducted the following activities: • Lot adjacent to Site on east was completely re-sodded • A vegetable garden located between Site and Mary Alice Drive was plowed under, the garden and surrounding areas were re-sodded • Drainage ditches were rerouted away from residential area • New fence with lockable gate installed to secure site
10/83	EPA conducted an immediate removal activity by completely removing and disposing of all equipment, waste and chemicals on site and much of the contaminated soil that remained. Excavation of soil was conducted to the point where only reasonably safe levels of pesticides remained. The area was backfilled with clean soil. The railroad spur leading onto the property was removed, the containment basins were drained and cleaned out and the site buildings were decontaminated.
9/5/85	PRPs received section 107 CERCLA notification from USEPA, Region IV
7/22/87	EPA put Arlington Blending on NPL at NO. 40
10/23/87	USEPA sent a letter to Responsible Parties including Velsicol, Terminix, Monsanto, Helena Chemical and Bill Bell, asking them to volunteer to do the RI/FS under USEPA's requirements.
4/14/88	EPA started Remedial Investigation and Feasibility Study (RI/FS)
11/13/90	RI was completed by EPA
1/18/91	FS was completed by EPA
6/28/91	ROD was executed
1/31/92	EPA issued a Unilateral Administrative Order (Section 106a) to the

	following companies: Velsicol, Terminix, Chemwood, Ciba-Geigy and Wormald, (Bill Bell - owner/operator).
12/93	Aquifer Characterization Report submitted to USEPA
11/23/94	ESD approved and issued by USEPA
1/4/95	Soil Remedial Design Report (RDR) submitted to USEPA by Focus Environmental
4/24/95	Sprint commences relocation of fiber optic cable located near back of Site. Relocation completed on 4/30/95
9/5/95	Final approval of RAWP by USEPA
10/95	Excavation of soil commenced
1/5/96	Natural Attenuation Modeling Scope of Work submitted to USEPA
3/96	Drilling of 3 deep bore holes started in sod farm for subsurface geological investigation (as part of natural attenuation modeling effort)
6/4/96	Thermal treatment of soil completed. Total quantity = 41, 431 tons
6/25/96	Off-site disposal of 237 tons of arsenic contaminated soil to Laidlaw subtitle C landfill in Pinewood, SC
7/96	Off-site disposal of 323 yd^3 construction & misc. debris to Excel TSD, Inc. & BFI, Inc. Subtitle D landfills
8/14/96	Submitted Groundwater Modeling Report to EPA
7/24/97	Modified ROD signed by EPA. Groundwater remedy modified from pump and treat to monitored natural attenuation.
9/29/97	Remedial Action Report approved by EPA
6/19/98	Long Term Monitoring and Maintenance Plan approved by EPA
3/99	1998 Annual Report Submitted to EPA
3/00	1999 Annual Report Submitted to EPA
3/01	2000 Annual Report Submitted to EPA
3/02	2001 Annual Report Submitted to EPA

Table 2
Groundwater Contaminants of Concern
Arlington Blending & Packaging Site

Contaminant of Concern	Cleanup Level Specified in ROD (µg/l)	Current MCL (µg/l)
Benzene	5.0	5.0
Technical Chlorodane	2.0	2.0
1,1 – Dichloroethene (1,1-DCE)	7.0	7.0
Endrin	0.2	2.0
Heptachlor Epoxide	0.2	0.2
Pentachlorophenol (PCP)	1.0	1.0
Toluene	2,000	1,000
Total Xylenes	10,000	10,000

Table 3
Excavation and Treatment Standards
Arlington Blending & Packaging Site

Contaminant of Concern	Excavation Standards				Treatment Standards (µg/kg)
	Onsite		Offsite		
	Surface (µg/kg)	Subsurface (µg/kg)	Surface (µg/kg)	Subsurface (µg/kg)	
Chlordane	10,000	3,300	1,000	3,300	1,000
Heptachlor	3,000	(a)	300	(a)	300
Endrin	2,700	608	2,700	608	608
Heptachlor Epoxide	2,000	(a)	200	(a)	200
Pentachlorophenol	635	635	635	635	635
Arsenic	25,000 (b)	(b)	25,000 (b)	(b)	100,000

(a) These contaminants are not contaminants of concern for groundwater protection. See Section 4.1 of the Remedial Action Report for an explanation.

(b) Surface soils outside of excavation areas determined to be contaminated with arsenic in excess of 25,000 Φg/kg must be covered with one foot of clean soil. There is no subsurface excavation standard for arsenic, however, the Explanation of Significant Differences (ESD) established a treatment standard of 100,000 Φg/kg total arsenic on treated soils to minimize the potential for contamination of groundwater. Treated soils with total arsenic concentrations in excess of 100,000 Φg/kg had to be disposed of offsite.

Table 4
Summary of Estimated Contaminant Removals
Arlington Blending & Packaging Site

Contaminant	Mass Processed (lb)	Mass left in Place (a)		Removal (wt %)
		Excavations (lbs)	At Railroad (lb)	
Chlordane	1,772	62	85	92.3
Heptachlor	394	16	77	80.9
Endrin	355	4	9	96.5
Heptachlor Epoxide	173	0.7	1.0	99.0
Pentachlorophenol	63	5	(b)	92.7
Total COC's	2,757	88	172	91.4

(a) Estimated mass of contaminant remaining in soil not excavated. Values assume that remaining soils are contaminated at the final measured concentration for an additional 2 feet. See Appendix I of the Remedial Action Report for a list of assumptions and an example calculation

(b) Mass left in place includes pentachlorophenol left at railroad tracks.

Appendix A

List of Documents Reviewed

Appendix A
Documents Reviewed

Record of Decision, USEPA, June 28, 1991

Explanation of Significant Differences, USEPA, November 1994

Remedial Design Report-Soil Remedy, Focus Environmental, Inc., November 1994

Remedial Action Report-Soil Remedy, Focus Environmental, Inc., April 1997

Groundwater Modeling Effort to Evaluate Remedial Alternatives for Contaminated Groundwater, Smith Environmental Technologies Corp., August 1996

Amended Record of Decision, USEPA, July l 997

Long-Term Monitoring and Maintenance Plan, Memphis Environmental Center, Inc., February 1998

1998 Annual Report for Arlington Blending and Packaging Site, Memphis Environmental Center, Inc., March 1999

1999 Annual Report for Arlington Blending and Packaging Site, NWI Land Management Corporation, March 2000

2000 Annual Report for Arlington Blending and Packaging Site, Memphis Environmental Center, Inc., March 2001

2001 Annual Report for Arlington Blending and Packaging Site, Memphis Environmental Center, Inc., January 2002

Appendix B

Photographs of Site Inspection

Arlington Blending and Packaging
Site Inspection - October 26, 2001

1) View of site looking south from U.S. 70

2) View of site looking south from front gate

Arlington Blending and Packaging
Site Inspection - October 26, 2001

3) View of site looking north from south property line

4) Monitoring Well AB-1S

Arlington Blending and Packaging
Site Inspection - October 26, 2001

5) Monitoring Well OW-2A

6) Monitoring Well AB-3D

Arlington Blending and Packaging
Site Inspection - October 26, 2001

7) Monitoring Well AB-8D

8) Monitoring Well AB-9D

Arlington Blending and Packaging
Site Inspection - October 26, 2001

9) Monitoring Well AB-13D

10) Monitoring Well AB-15D

Arlington Blending and Packaging
Site Inspection - October 26, 2001

11) Monitoring Well AB-17D

12) Monitoring Well AB-19D

Arlington Blending and Packaging
Site Inspection - October 26, 2001

13) Monitoring Well AB-20D

14) Monitoring Well AB-21D

Appendix C

Historical Groundwater Analytical Data Summary

Appendix C
Analytical Results-Groundwater Samples
Arlington Blending Packaging Site

Well ID	Parameter	Date Sampled												
		10/4/1988	11/1/1988	1/11/1990	3/20/1991	4/21/1993	5/18/1995	6/12/1996	2/18/1997	7/13/1998	6/1/1999	6/28/2000	6/6/2001	6/5/2002
AB-1S	1,1-DCE	< 5	< 5	< 5	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Benzene	< 5	< 5	< 5	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Toluene	< 5	< 5	< 5	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	m,p-Xylene	< 5	< 5	< 5	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	o-Xylene	< 5	< 5	< 5	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Endrin	< 0.025	< 0.18	< 0.25	NA	NA	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Heptachlor Epoxide	< 0.015	< 0.088	< 0.25	NA	NA	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
	Technical Chlordane	< 0.13	< 0.78	< 1	NA	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
	Pentachlorophenol	< 20	< 20	< 20	NA	NA	< 20	< 20	< 20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
OW-2A	1,1-DCE	NA	NA	NA	8.9	7	8.2	7.4	6.3	< 5	< 5	< 5	< 5	< 5
	Benzene	NA	NA	NA	22	19	73.8	86.7	58.2	22.7	22	14	16	18.3
	Toluene	NA	NA	NA	< 7.5	< 10	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	m,p-Xylene	NA	NA	NA	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	o-Xylene	NA	NA	NA	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Total Xylenes	NA	NA	NA	9.5	< 10	NA	NA	NA	NA	NA	NA	NA	NA
	Endrin	NA	NA	NA	< 1	0.15	< 0.05	0.458	1.44	0.373	0.48	0.92	0.37	1.69
	Heptachlor Epoxide	NA	NA	NA	< 1.3	< 0.5	< 0.05	< 0.05	< 0.05	< 0.05	0.65	0.64	< 0.05	< 0.05
	Technical Chlordane	NA	NA	NA	< 5	< 10	< 1	< 1	< 1	1.26	< 1	< 8.3	< 5	< 5
	Pentachlorophenol	NA	NA	NA	2500	940	412	212	155	273	11	23	204	146
AB-3D	1,1-DCE	14	14	1.2	1.2	< 10	< 5	< 5	< 5	< 5	12	< 5	< 5	12
	Benzene	21	59	9.7	6.9	7	7.7	19	5.4	< 5	< 5	< 5	7.59	< 5
	Toluene	< 100	< 100	< 5	< 1.5	6	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	m,p-Xylene	14	81	< 5	NA	NA	< 5	< 5	< 5	11.1	< 5	< 5	< 5	< 5
	o-Xylene	40	220	2.4	NA	NA	< 5	< 5	19.8	7	< 5	< 5	< 5	< 5
	Total Xylenes	NA	NA	NA	29	13	NA	NA	NA	NA	NA	NA	NA	NA
	Endrin	0.13	< 0.34	< 0.34	< 2.5	0.75	0.749	1.27	1.96	0.15	0.066	0.69	1.22	1.04
	Heptachlor Epoxide	< 0.4	< 0.3	< 0.3	< 1	< 0.51	< 0.5	< 0.05	< 0.05	< 0.05	0.059	0.32	< 0.05	0.1
	Technical Chlordane	14.4	23.81	12	79	< 10	< 10	< 1	< 1	2.8	2.2	< 7.2	< 20	< 5
	Pentachlorophenol	1200	1100	240	64	45	< 20	< 20	< 20	7.34	< 5	2	98	9.68
AB-8D	1,1-DCE	NA	NA	< 5	NA	3	5.6	< 5	< 5	5.4	9.8	< 5	< 5	< 5
	Benzene	NA	NA	< 5	NA	< 10	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Toluene	NA	NA	< 5	NA	< 10	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	m,p-Xylene	NA	NA	< 5	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	o-Xylene	NA	NA	< 5	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Total Xylenes	NA	NA	NA	NA	< 10	NA	NA	NA	NA	NA	NA	NA	NA
	Endrin	NA	NA	< 0.25	NA	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.15	< 0.05	< 0.05
	Heptachlor Epoxide	NA	NA	< 0.25	NA	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.15	< 0.05	< 0.05
	Technical Chlordane	NA	NA	0.16	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 3	< 1	< 1
	Pentachlorophenol	NA	NA	< 20	NA	5	< 20	41.7	< 20	< 0.5	< 0.5	3.6	2.46	< 0.5
AB-9D	1,1-DCE	NA	NA	< 5	NA	16	37.1	28.7	< 5	9.3	12	< 5	11	< 5
	Benzene	NA	NA	< 5	NA	< 10	5.7	8.7	5.9	< 5	< 5	< 5	5.92	< 5
	Toluene	NA	NA	< 5	NA	< 10	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	m,p-Xylene	NA	NA	< 5	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	o-Xylene	NA	NA	< 5	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Total Xylenes	NA	NA	NA	NA	< 10	NA	NA	NA	NA	NA	NA	NA	NA
	Endrin	NA	NA	< 0.25	NA	0.031	< 5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.15	0.07	< 0.05
	Heptachlor Epoxide	NA	NA	< 0.25	NA	< 0.051	< 5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.15	< 0.05	< 0.05
	Technical Chlordane	NA	NA	0.11	NA	< 1	< 100	< 1	< 1	< 1	< 1	< 3	< 1	< 1
	Pentachlorophenol	NA	NA	< 20	NA	8	325	287	191	58.6	77	98	< 5	37.8

NA - No Analysis

Appendix C
Analytical Results-Groundwater Samples
Arlington Blending Packaging Site

Well ID	Parameter	Date Sampled												
		10/4/1988	11/1/1988	1/11/1990	3/20/1991	4/21/1993	5/18/1995	6/12/1996	2/18/1997	7/13/1998	6/1/1999	6/28/2000	6/6/2001	6/5/2002
AB-13D	1,1-DCE	NA	NA	NA	NA	5	5.8	< 5	< 5	5.7	6	6	7.42	7.92
	Benzene	NA	NA	NA	NA	6	10.8	21.4	< 5	14.1	5.9	12	20.1	9.35
	Toluene	NA	NA	NA	NA	< 10	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	m,p-Xylene	NA	NA	NA	NA	NA	< 5	< 5	< 5	5	< 5	< 5	< 5	< 5
	o-Xylene	NA	NA	NA	NA	NA	< 5	< 5	< 5	5	< 5	< 5	< 5	< 5
	Total Xylenes	NA	NA	NA	NA	< 10	NA	NA	NA	NA	NA	NA	NA	NA
	Endrin	NA	NA	NA	NA	0.39	< 50	0.395	1.99	0.65	0.42	0.39	0.61	0.86
	Heptachlor Epoxide	NA	NA	NA	NA	< 0.5	< 50	< 0.05	0.39	< 0.05	0.61	0.47	< 0.05	< 0.05
	Technical Chlordane	NA	NA	NA	NA	< 10	< 100	< 1	< 1	7.93	6.2	< 5	< 10	< 10
	Pentachlorophenol	NA	NA	NA	NA	480	327	228	144	134	14	50	189	65.2
AB-15D	1,1-DCE	NA	NA	NA	NA	11	13	18.9	< 5	< 5	< 5	< 5	11.2	< 5
	Benzene	NA	NA	NA	NA	1	< 5	11.4	< 5	< 5	< 5	< 5	18.3	< 5
	Toluene	NA	NA	NA	NA	< 10	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	m,p-Xylene	NA	NA	NA	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	o-Xylene	NA	NA	NA	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Total Xylenes	NA	NA	NA	NA	< 10	NA	NA	NA	NA	NA	NA	NA	NA
	Endrin	NA	NA	NA	NA	< 0.2	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.15	0.1	< 0.05
	Heptachlor Epoxide	NA	NA	NA	NA	< 0.098	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.15	< 0.05	< 0.05
	Technical Chlordane	NA	NA	NA	NA	< 2	< 1	< 1	< 1	< 1	< 1	< 3	< 1	< 1
	Pentachlorophenol	NA	NA	NA	NA	190	34.7	138	49.5	11.1	1.3	38	291	51.3
AB-17D	1,1-DCE	NA	NA	NA	NA	6	< 5	< 5	< 5	< 5	10	< 5	11.1	9.44
	Benzene	NA	NA	NA	NA	< 10	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Toluene	NA	NA	NA	NA	< 10	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	m,p-Xylene	NA	NA	NA	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	o-Xylene	NA	NA	NA	NA	NA	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
	Total Xylenes	NA	NA	NA	NA	< 10	NA	NA	NA	NA	NA	NA	NA	NA
	Endrin	NA	NA	NA	NA	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.15	0.12	0.15
	Heptachlor Epoxide	NA	NA	NA	NA	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.15	0.70	< 0.05
	Technical Chlordane	NA	NA	NA	NA	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
	Pentachlorophenol	NA	NA	NA	NA	< 20	< 20	< 20	66.7	156	150	38	68.1	180
AB-19D	1,1-DCE	NA	NA	NA	NA	NA	NA	NA	NA	< 5	< 5	< 5	< 5	< 5
	Benzene	NA	NA	NA	NA	NA	NA	NA	NA	< 5	< 5	< 5	< 5	< 5
	Toluene	NA	NA	NA	NA	NA	NA	NA	NA	< 5	< 5	< 5	< 5	< 5
	m,p-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	< 5	< 5	NA	< 5	< 5
	o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	< 5	< 5	NA	< 5	< 5
	Total Xylenes	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	20	NA	NA
	Endrin	NA	NA	NA	NA	NA	NA	NA	NA	0.41	7.37	< 0.25	0.32	0.11
	Heptachlor Epoxide	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	< 0.05	0.31	< 0.05	< 0.05
	Technical Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	1.75	1.65	< 5	< 5	< 5
	Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	239	49.3	25	48.8	1.07
AB-20D	1,1-DCE	NA	NA	NA	NA	NA	NA	NA	NA	6.9	< 5	< 5	10	< 10
	Benzene	NA	NA	NA	NA	NA	NA	NA	NA	34.7	< 5	40	78.5	52
	Toluene	NA	NA	NA	NA	NA	NA	NA	NA	51.5	< 5	24	23.9	22.8
	m,p-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	1850	3800	NA	1310	1240
	o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	4090	< 5	NA	1110	1150
	Total Xylenes	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2800	NA	NA
	Endrin	NA	NA	NA	NA	NA	NA	NA	NA	7.37	4.8	4.7	6.63	5.49
	Heptachlor Epoxide	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	5.7	4.1	0.75	< 0.05
	Technical Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	1.65	43	< 48	< 50	< 50
	Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	49.3	8.7	47	687	283

NA - No Analysis

Appendix C
Analytical Results-Groundwater Samples
Arlington Blending Packaging Site

Well ID	Parameter	Date Sampled												
		10/4/1988	11/1/1988	1/11/1990	3/20/1991	4/21/1993	5/18/1995	6/12/1996	2/18/1997	7/13/1998	6/1/1999	6/28/2000	6/6/2001	6/5/2002
AB-21D	1,1-DCE	NA	NA	NA	NA	NA	NA	NA	NA	7.9	12	< 5	14.6	8.86
	Benzene	NA	NA	NA	NA	NA	NA	NA	NA	34.2	28	40	36.9	40.4
	Toluene	NA	NA	NA	NA	NA	NA	NA	NA	8.9	7.3	< 5	< 5	5.98
	m,p-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	13.6	100	NA	10.2	28.4
	o-Xylene	NA	NA	NA	NA	NA	NA	NA	NA	54.5	< 5	NA	21.4	58.3
	Total Xylenes	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	57	NA	NA
	Endrin	NA	NA	NA	NA	NA	NA	NA	NA	0.41	< 0.05	0.31	0.06	0.32
	Heptachlor Epoxide	NA	NA	NA	NA	NA	NA	NA	NA	< 0.05	< 0.05	0.4	< 0.05	< 0.05
	Technical Chlordane	NA	NA	NA	NA	NA	NA	NA	NA	11.7	< 1	< 5	< 5	< 5
	Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA	NA	791	110	120	1340	758

NA - No Analysis

Appendix D

Historical Natural Attenuation Data Summary

Appendix D
Analytical Results-Natural Attenuation Parameters
Arlington Blending and Packaging Site

Sample Date: 7/13/98

Natural Attenuation Paramet	Units	AB-1S	OW-2A	AB-3D	AB-8D	AB-9D	AB-13D	AB-15D	AB-17D	AB-19D	AB-20D	AB-21D
Vinyl Chloride	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Heptachlor	ug/l	< 0.05	0.63	< 0.05	< 0.05	< 0.05	1.44	< 0.05	< 0.05	0.11	< 0.05	< 0.05
Total Chlorophenol	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Dichlorophenol	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Trichlorophenol	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Tetrachlorophenol	ug/l	< 10	11.2	< 10	< 10	< 10	< 10	< 10	< 10	< 10	14.2	25.5
Nitrate	mg/l	10.2	2.26	6.44	7.46	1.01	2.04	2.2	0.52	7.24	< 0.20	0.95
Sulfate	mg/l	18.5	28.7	20.4	59.2	47.5	26.4	21.2	66.1	29.2	81.6 J	34.4
Sulfide	mg/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloride	mg/l	45.8	25.9	55.2	283	48.4	56.8	99.3	52.8	31.1	35.2 J	26.6
Alkalinity	mg/l	141	113	88.3	83.5	102	94.2	85.6	128	71.7	140	113
Iron	mg/l	16.7	6.42	0.808	1.42	1.43	3.18	2.3	101	14.3	9.41	4.5
Manganese	mg/l	0.434	5.15	2.75	0.061	0.038	0.682	0.068	1.51	1.05	3.38	4.44
Total Organic Carbon	mg/l	3.04	5.19	7.45	5.81	3.93	4.14	5.48	3.7	4.45	10.7 J	7.94
Methane	ug/l	3.3	30	< 0.50	1.7	1.1	34	3.5	13	2.1	140	74
Ethane	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ethene	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dissolved Oxygen	mg/l	9	1.1	0.8	0.6	0.8	0.9	0.8	0.9	3.6	0	0
Ferrous Iron	mg/l	0	0.28	0.05	0.12	0	0	0	0.15	0.49	6.4	4
Redox Potential	mv	65	81	88	97	84	89	88	84	81	78	78

Sample Date: 6/15/99

Natural Attenuation Paramet	Units	AB-1S	OW-2A	AB-3D	AB-8D	AB-9D	AB-13D	AB-15D	AB-17D	AB-19D	AB-20D	AB-21D
Vinyl Chloride	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Heptachlor	ug/l	< 0.05	< 0.25	< 0.067	< 0.05	< 0.25	< 0.25	< 0.05	< 0.25	< 0.25	< 1.6	< 0.5
Total Chlorophenol	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Dichlorophenol	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Trichlorophenol	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	28 J	< 10	< 10
Total Tetrachlorophenol	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	14 J
Nitrate	mg/l	9.9	0.95	6	6.6	0.84	2.9	2.3	0.75	7.7	< 0.20	1.4
Sulfate	mg/l	23.7	26.9	23.5	53.9	52.4	32	47.3	57.5	21.4	40.5	38.8
Sulfide	mg/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chloride	mg/l	52.1	30.9	44.9	205	38.4	56.9	135	44.5	38.3	39.5 J	28.6
Alkalinity	mg/l	152	112	80.8	64.6	94.9	90.9	77.8	113	87.9	133	135
Iron	mg/l	3.4	2.2	< 0.1	< 0.1	< 0.1	0.59	< 0.1	1.3	2.4	11.3	4.2
Manganese	mg/l	0.053	11.9	1.6	0.058	0.015	0.95	0.1	0.028	1.1	4	5.4
Total Organic Carbon	mg/l	1.1	3.1	1.3	1.1	1.6	2.1	1.1	1.5	1.5	7.3 J	5.1
Methane	ug/l	< 0.50	na	6.8	0.82	na	28	1.5	16	150	na	170
Ethane	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Ethene	ug/l	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Dissolved Oxygen	mg/l	na	na	na	na	na	na	na	na	na	na	na
Ferrous Iron	mg/l	nd	0.18	0.05	0.1	0.09	0.07	0.04	0.17	1.3	8.6	3.1
Redox Potential	mv	na	na	na	na	na	na	na	na	na	na	na

Appendix D
Analytical Results-Natural Attenuation Parameters
Arlington Blending and Packaging Site

Sample Date: 6/28/00

Natural Attenuation Paramet	Units	AB-1S	OW-2A	AB-3D	AB-8D	AB-9D	AB-13D	AB-15D	AB-17D	AB-19D	AB-20D	AB-21D
Nitrate	mg/l	8.46	1.5	5.2	3.5	1.2	3.1	1.8	0.67	6.9	<0.1	1.5
Sulfate	mg/l	28.5	35.2	28.3	55.8	53.5	33.7	42.1	50.5	42.9	54.3	39.1
Sulfide	mg/l	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloride	mg/l	103	32	41.7	104	57.5	50.1	82.9	43.2	37.3	34.7	32.1
Alkalinity	mg/l	138	107	94.9	77.8	109	93.9	102	105	90.9	127	112
Total Organic Carbon	mg/l	<1	1.8	1	<1	<1	1.6	<1	1.1	1.2	6.7	2.8
Vinyl Chloride	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Heptachlor	ug/l	<0.05	0.45 J	0.3 J	<0.15	<0.15	0.35 J	<0.15	<0.15	<0.25	2 J	<0.25
Iron	mg/l	8.59	0.17	<0.1	0.2	0.14	0.4	0.16	4.1	0.6	9.4	2
Manganese	mg/l	0.081	12.4	4.9	0.068	0.019	1.6	0.13	0.023	0.88	5.4	4.7
Ferrous Iron	mg/l	<0.01	0.12	0.02	<0.01	<0.01	0.07	<0.01	<0.01	0.1	6.24	0.5
Dissolved Oxygen	mg/l	8.2	3.3	3.6	3.8	4.2	2.7	5.7	3.5	2.5	1.5	3.3
Redox Potential	mv	322	190	270	290	320	227	235	195	94	-150	54
Methane	ug/l	<0.5	49	10.7	1.15	3.68	34.2	29.2	12	35.9	200	126
Ethane	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethene	ug/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Chlorophenol	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total Dichlorophenol	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Total Trichlorophenol	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	15	<10	<10
Total Tetrachlorophenol	ug/l	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	17

Sample Date: 6/5/01

Natural Attenuation Paramet	Units	AB-1S	OW-2A	AB-3D	AB-8D	AB-9D	AB-13D	AB-15D	AB-17D	AB-19D	AB-20D	AB-21D
Nitrate (as Nitrogen)	mg/l	3.05	< 1	< 1	< 1	< 1	2.47	< 1	< 1	< 1	< 1	1.71
Sulfate	mg/l	37.1	33.5	36.2	62.7	36.8	38.5	45.9	75.6	46	71.5	48
Sulfide	mg/l	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Chlorides	mg/l	67.5	17.5	38.5	72	45.5	47.5	94.5	42.5	23.5	35	18
Alkalinity (as Calcium Carbo	mg/l	135	83.1	73.6	71	95	71.3	85.5	97.4	119	102	118
Total Organic Carbon	mg/l	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	7.4	< 5
Vinyl Chloride	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Heptachlor	ug/l	< 0.05	0.16	0.26 UC	< 0.05	< 0.05	0.21	< 0.05	0.16	< 0.05	< 0.05	< 0.05
Iron	mg/l	1.21	0.916	0.093	0.256	< 0.02	0.178	0.367	4.16	1.29	12.6	3.03
Manganese	mg/l	< 0.015	4.25	3.9	< 0.015	< 0.015	1.43	0.02	< 0.015	1.48	2.58	2.53
Dissolved Oxygen	mg/l	3.7	1.7	4.6	2.7	2.8	1.9	4	3.2	3	3	2.7
Redox Potential	mv	334	170	227	279	271	231	241	203	45	-90	48
Ferrous Iron	mg/l	< 0.01	0.21	< 0.01	0.04	0.03	0.04	< 0.01	0.04	0.07	5.8	1.27
Methane	ug/l	< 0.5	38	7.2	0.6	4.88	11.6	38.6	3.91	281	199	187
Ethane	ug/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethene	ug/l	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Dioxide	ug/l	61,700	75,200	44,100	60,400	59,300	53,500	58,300	62,200	39,700	79,600	52,200
Total Chlorophenol	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Dichlorophenol	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Trichlorophenol	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Tetrachlorophenol	ug/l	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	40.9	10.5

Appendix D
Analytical Results-Natural Attenuation Parameters
Arlington Blending and Packaging Site

Sample Date: 6/5/02

Natural Attenuation Paramet	Units	AB-1S	OW-2A	AB-3D	AB-8D	AB-9D	AB-13D	AB-15D	AB-17D	AB-19D	AB-20D	AB-21D
Nitrate (as Nitrogen)	mg/L	8.11	0.99	6.24	5.75	1.26	2.99	1.68	0.98	8.03	<0.20	2.11
Sulfate	mg/L	28.6	32.5	18.9	52.1	48.8	32	42.6	53.2	20.7	66.9	37.3
Sulfide	mg/L	1.2	3.36	2.8	1.4	2.8	1.2	1.6	1.68	<1.00	1.76	1.6
Chlorides	mg/L	66	32.7	46.4	160	108	44.8	106	53.6	34	48.9	31.2
Alkalinity (as Calcium Carbo	mg/L	137	92.7	73.8	51.3	108	80.1	81	121	68.9	120	104
Total Organic Carbon	mg/L	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	5.22	< 5
Vinyl Chloride	ug/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 20	< 10
Heptachlor	ug/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.14 UC	< 0.05
Iron	mg/L	1.41	0.206	< 0.02	1.63	< 0.02	0.137	0.142	1.18	0.584	13.4	1.35
Manganese	mg/L	0.44	9.5	0.928	0.61	0.17	1.46	0.74	0.31	0.619	3.38	3.6
Dissolved Oxygen	ppm	3.54	< 0.01	< 0.01	0.11	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.1	0.19
Redox Potential	mv	280	145	237	95	107	206	225	125	-60	-75	40
Ferrous Iron	mg/l	< 0.01	0.15	0.05	1.96	0.02	0.11	0.08	0.1	0.71	4.4	0.92
Methane	ug/L	< 0.5	41.4	4.78	0.757	3.64	8.02	3.32	8.25	110	134	114
Ethane	ug/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethene	ug/L	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Chlorophenol	ug/L	< 10	< 10	< 10	56.8	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Dichlorophenol	ug/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10
Total Trichlorophenol	ug/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	33.4	< 10	< 10
Total Tetrachlorophenol	ug/L	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	< 10	16.9

Appendix E

Historical Surface Water Analytical Data Summary

Appendix E
Analytical Results-Surface Water Samples
Arlington Blending Packaging Site

Sampling Date	Parameter	Sampling Location				
		SSD	SSP	SSU	SST1	SST2
8/23/1988	1,1-DCE	< 5	NA	< 5	0.71	NA
	Benzene	< 5	NA	< 5	< 5	NA
	Toluene	< 5	NA	< 5	0.87	NA
	m,p-Xylene	< 5	NA	< 5	< 5	NA
	o-Xylene	< 5	NA	< 5	< 5	NA
	Endrin	< 0.0056	NA	< 0.0039	< 0.0039	NA
	Heptachlor Epoxide	< 0.0043	NA	< 0.0054	< 0.0054	NA
	Technical Chlordane	< 0.02	NA	< 0.019	< 0.019	NA
	Pentachlorophenol	< 20	NA	< 20	< 20	NA
5/3/1994	1,1-DCE	NA	NA	NA	NA	NA
	Benzene	NA	NA	NA	NA	NA
	Toluene	NA	NA	NA	NA	NA
	m,p-Xylene	NA	NA	NA	NA	NA
	o-Xylene	NA	NA	NA	NA	NA
	Endrin	< 0.05	NA	NA	NA	NA
	Heptachlor Epoxide	< 0.05	NA	NA	NA	NA
	Technical Chlordane	< 1.0	NA	NA	NA	NA
	Pentachlorophenol	NA	NA	NA	NA	NA
5/18/1994	1,1-DCE	NA	NA	NA	NA	NA
	Benzene	NA	NA	NA	NA	NA
	Toluene	NA	NA	NA	NA	NA
	m,p-Xylene	NA	NA	NA	NA	NA
	o-Xylene	NA	NA	NA	NA	NA
	Endrin	< 0.05	NA	NA	NA	NA
	Heptachlor Epoxide	< 0.05	NA	NA	NA	NA
	Technical Chlordane	< 1.0	NA	NA	NA	NA
	Pentachlorophenol	NA	NA	NA	NA	NA
5/31/1994	1,1-DCE	NA	NA	NA	NA	NA
	Benzene	NA	NA	NA	NA	NA
	Toluene	NA	NA	NA	NA	NA
	m,p-Xylene	NA	NA	NA	NA	NA
	o-Xylene	NA	NA	NA	NA	NA
	Endrin	< 0.05	NA	NA	NA	NA
	Heptachlor Epoxide	< 0.05	NA	NA	NA	NA
	Technical Chlordane	< 1.0	NA	NA	NA	NA
	Pentachlorophenol	NA	NA	NA	NA	NA
6/17/1994	1,1-DCE	NA	NA	NA	NA	NA
	Benzene	NA	NA	NA	NA	NA
	Toluene	NA	NA	NA	NA	NA
	m,p-Xylene	NA	NA	NA	NA	NA
	o-Xylene	NA	NA	NA	NA	NA
	Endrin	< 0.05	NA	NA	NA	NA
	Heptachlor Epoxide	< 0.05	NA	NA	NA	NA
	Technical Chlordane	< 1.0	NA	NA	NA	NA
	Pentachlorophenol	NA	NA	NA	NA	NA
6/27/1994	1,1-DCE	NA	NA	NA	NA	NA
	Benzene	NA	NA	NA	NA	NA
	Toluene	NA	NA	NA	NA	NA
	m,p-Xylene	NA	NA	NA	NA	NA
	o-Xylene	NA	NA	NA	NA	NA
	Endrin	< 0.05	NA	NA	NA	NA
	Heptachlor Epoxide	< 0.05	NA	NA	NA	NA
	Technical Chlordane	< 1.0	NA	NA	NA	NA
	Pentachlorophenol	NA	NA	NA	NA	NA
5/18/1995	1,1-DCE	< 5	< 5	< 5	NA	< 5
	Benzene	< 5	< 5	< 5	NA	< 5
	Toluene	< 5	< 5	< 5	NA	< 5
	m,p-Xylene	< 5	< 5	< 5	NA	< 5
	o-Xylene	< 5	< 5	< 5	NA	< 5
	Endrin	< 0.05	< 0.05	< 0.05	NA	< 0.05
	Heptachlor Epoxide	0.079	0.09	0.066	NA	< 0.05
	Technical Chlordane	< 1.0	< 1.0	< 1.0	NA	< 1.0
	Pentachlorophenol	< 20	< 20	< 20	NA	< 20

NA - No Analysis

Appendix E
Analytical Results-Surface Water Samples
Arlington Blending Packaging Site

Sampling Date	Parameter	Sampling Location				
		SSD	SSP	SSU	SST1	SST2
6/13/1996	1,1-DCE	< 5	< 5	< 5	NA	< 5
	Benzene	< 5	< 5	< 5	NA	< 5
	Toluene	< 5	< 5	< 5	NA	< 5
	m,p-Xylene	< 5	< 5	< 5	NA	< 5
	o-Xylene	< 5	< 5	< 5	NA	< 5
	Endrin	< 0.05	< 0.05	< 0.05	NA	< 0.05
	Heptachlor Epoxide	< 0.05	< 0.05	< 0.05	NA	< 0.05
	Technical Chlordane	< 1.0	< 1.0	< 1.0	NA	< 1.0
	Pentachlorophenol	< 20	< 20	< 20	NA	< 20
2/18/1997	1,1-DCE	< 5	< 5	< 5	NA	< 5
	Benzene	< 5	< 5	< 5	NA	< 5
	Toluene	< 5	< 5	< 5	NA	< 5
	m,p-Xylene	< 5	< 5	< 5	NA	< 5
	o-Xylene	< 5	< 5	< 5	NA	< 5
	Endrin	< 0.05	< 0.05	< 0.05	NA	< 0.05
	Heptachlor Epoxide	< 0.05	< 0.05	< 0.05	NA	< 0.05
	Technical Chlordane	< 1.0	< 1.0	< 1.0	NA	< 1.0
	Pentachlorophenol	< 20	< 20	< 20	NA	< 20
7/10/1998	1,1-DCE	< 5	< 5	< 5	NA	NA
	Benzene	< 5	< 5	< 5	NA	NA
	Toluene	< 5	< 5	< 5	NA	NA
	m,p-Xylene	< 5	< 5	< 5	NA	NA
	o-Xylene	< 5	< 5	< 5	NA	NA
	Endrin	< 0.05	< 0.05	< 0.05	NA	NA
	Heptachlor Epoxide	< 0.05	< 0.05	< 0.05	NA	NA
	Technical Chlordane	< 1.0	< 1.0	< 1.0	NA	NA
	Pentachlorophenol	< 0.5	< 0.5	< 0.5	NA	NA
12/23/1998	1,1-DCE	< 5	< 5	< 5	NA	NA
	Benzene	< 5	< 5	< 5	NA	NA
	Toluene	< 5	< 5	< 5	NA	NA
	m,p-Xylene	< 5	< 5	< 5	NA	NA
	o-Xylene	< 5	< 5	< 5	NA	NA
	Endrin	< 0.05	< 0.05	< 0.05	NA	NA
	Heptachlor Epoxide	< 0.05	< 0.05	< 0.05	NA	NA
	Technical Chlordane	< 1.0	< 1.0	< 1.0	NA	NA
	Pentachlorophenol	< 0.5	< 0.5	< 5	NA	NA
6/15/1999	1,1-DCE	< 5	< 5	< 5	NA	NA
	Benzene	< 5	< 5	< 5	NA	NA
	Toluene	< 5	< 5	< 5	NA	NA
	m,p-Xylene	< 5	< 5	< 5	NA	NA
	o-Xylene	< 5	< 5	< 5	NA	NA
	Endrin	< 0.05	< 0.05	< 0.05	NA	NA
	Heptachlor Epoxide	< 0.05	< 0.05	< 0.05	NA	NA
	Technical Chlordane	< 1.0	< 1.0	< 1.0	NA	NA
	Pentachlorophenol	< 0.5	< 0.5	< 0.5	NA	NA
12/17/1999	1,1-DCE	< 5	< 5	< 5	NA	NA
	Benzene	< 5	< 5	< 5	NA	NA
	Toluene	< 5	< 5	< 5	NA	NA
	m,p-Xylene	< 5	< 5	< 5	NA	NA
	o-Xylene	< 5	< 5	< 5	NA	NA
	Endrin	< 0.05	< 0.05	< 0.05	NA	NA
	Heptachlor Epoxide	< 0.05	< 0.05	< 0.05	NA	NA
	Technical Chlordane	< 1.0	< 1.0	< 1.0	NA	NA
	Pentachlorophenol	< 0.5	< 0.5	< 0.5	NA	NA
7/6/2000	1,1-DCE	< 5	< 5	< 5	NA	NA
	Benzene	< 5	< 5	< 5	NA	NA
	Toluene	< 5	< 5	< 5	NA	NA
	m,p-Xylene	< 5	< 5	< 5	NA	NA
	o-Xylene	< 5	< 5	< 5	NA	NA
	Endrin	< 0.05	< 0.05	< 0.05	NA	NA
	Heptachlor Epoxide	< 0.05	< 0.05	< 0.05	NA	NA
	Technical Chlordane	< 1.0	< 1.0	< 1.0	NA	NA
	Pentachlorophenol	< 0.5	< 0.5	< 0.5	NA	NA

NA - No Analysis

Appendix E
Analytical Results-Surface Water Samples
Arlington Blending Packaging Site

Sampling Date	Parameter	Sampling Location				
		SSD	SSP	SSU	SST1	SST2
12/27/2000	1,1-DCE	< 5	< 5	< 5	NA	NA
	Benzene	< 5	< 5	< 5	NA	NA
	Toluene	< 5	< 5	< 5	NA	NA
	m,p-Xylene	< 5	< 5	< 5	NA	NA
	o-Xylene	< 5	< 5	< 5	NA	NA
	Endrin	< 0.05	< 0.05	< 0.05	NA	NA
	Heptachlor Epoxide	< 0.05	< 0.05	< 0.05	NA	NA
	Technical Chlordane	< 1.0	< 1.0	< 1.0	NA	NA
	Pentachlorophenol	< 0.5	< 0.5	< 0.5	NA	NA
7/9/2001	1,1-DCE	< 5	< 5	< 5	NA	NA
	Benzene	< 5	< 5	< 5	NA	NA
	Toluene	< 5	< 5	< 5	NA	NA
	m,p-Xylene	< 5	< 5	< 5	NA	NA
	o-Xylene	< 5	< 5	< 5	NA	NA
	Endrin	< 0.05	< 0.05	< 0.05	NA	NA
	Heptachlor Epoxide	< 0.05	< 0.05	< 0.05	NA	NA
	Technical Chlordane	< 1.0	< 1.0	< 1.0	NA	NA
	Pentachlorophenol	< 0.5	< 0.5	< 0.5	NA	NA
11/16/2001	1,1-DCE	< 5	< 5	< 5	< 5	NA
	Benzene	< 5	< 5	< 5	< 5	NA
	Toluene	< 5	< 5	< 5	< 5	NA
	m,p-Xylene	< 5	< 5	< 5	< 5	NA
	o-Xylene	< 5	< 5	< 5	< 5	NA
	Endrin	< 0.05	< 0.05	< 0.05	< 0.05	NA
	Heptachlor Epoxide	< 0.05	< 0.05	< 0.05	< 0.05	NA
	Technical Chlordane	< 1.0	< 1.0	< 1.0	< 1.0	NA
	Pentachlorophenol	< 0.5	< 0.5	< 0.5	1.55	NA
6/4/2002	1,1-DCE	< 5	< 5	< 5	< 5	NA
	Benzene	< 5	< 5	< 5	< 5	NA
	Toluene	< 5	< 5	< 5	< 5	NA
	m,p-Xylene	< 5	< 5	< 5	< 5	NA
	o-Xylene	< 5	< 5	< 5	< 5	NA
	Endrin	< 0.05	< 0.05	< 0.05	< 0.05	NA
	Heptachlor Epoxide	< 0.05	< 0.05	< 0.05	< 0.05	NA
	Technical Chlordane	< 1.0	< 1.0	< 1.0	< 1.0	NA
	Pentachlorophenol	< 0.5	< 0.5	< 0.5	1.13	NA

NA - No Analysis

Appendix F

Irrigation Well Operation Logs for 2001 and 2002

2001

			STOPPED		
5-1-01	STARTED	7:20 AM		8:30 pm	EAST PIVOT
5-2-01	STARTED	1:20 AM		5:50 pm	EAST PIVOT
5-3-01	STARTED	9:40 AM		~~NOON~~	
5-4-01			STOPPED	12:00 pm (noon) 5/11/01	
5-11-01	STARTED	8:45 AM	STOPPED	2:00 PM	WET PIVOT
5-15-01	STARTED	7:40 AM	STOPPED	9:05 PM	
5-16-01	STARTED	4:40 pm	—		
5-					
5-17-01	—		STOPPED	8:30 am	
6-20-01	STARTED	2:10 pm	STOPPED	9:00 pm	6/20/01
6-22-01	DIARY STARTED				
6-25-01	STARTED	12:35 pm	STOPPED	8:40	
6-26-01	"	10:45 AM	STOPPED	9:10 AM	
8-28	STARTED	5:50 pm	STOPPED	8/29	7:40 AM
8-26	STARTED	8:05 AM	"		7:35 pm

2002

5/17/02 STARTED 9:40AM STOPPED 3:20PM ENVO GEN NOT WORKING
8/7/02 STARTED 8:10AM STOPPED 8:50PM.