DECISION DOCUMENT FOR THE REMEDIATION OF

Ashland Chemical Company

Ashland County, Ohio

Prepared By:

THE OHIO ENVIRONMENTAL PROTECTION AGENCY

April 2005

DECLARATION

SITE NAME AND LOCATION

Ashland Chemical Company
City of Ashland, Ashland County, Ohio

STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the selected remedial action for the Ashland Chemical Company facility in the City of Ashland, Ashland County, Ohio, chosen in accordance with the policies of the Ohio Environmental Protection Agency (Ohio EPA), statutes and regulations of the State of Ohio, and the National Contingency Plan, 40 CFR Part 300.

ASSESSMENT OF THE SITE

The major health and environmental risks of this Site result from on-site historical spills from normal Site operations, two soil piles generated during upgrade of the tank farm in 1987, soil in the vicinity of the former leach beds and the tank farm. Contaminants (volatile organic compounds (VOCs)) in ground water are migrating onto the Site from off-site sources.

DESCRIPTION OF THE SELECTED REMEDY

The preferred remedial alternative in this Decision Document includes:

Alternative 4 consists of a combination of institutional controls and engineering controls to prevent exposure to soil and ground water. The institutional controls are comprised of a use restriction to prohibit potable uses of ground water, restrict the property to commercial/industrial use, and requiring any excavation be done pursuant to an approved Soil Management Plan (SMP). The use restriction requirement has been modified by Ohio EPA as a means to comply with the recently passed House Bill 516, which requires any activity and use limitations be filed in the form of an environmental covenant, and to ensure the protection of public safety and the environment. Under this modification of Alternative 4, an environmental covenant would prohibit the installation of new water supply wells and the withdrawal of ground water for potable uses at the Site, restrict the property to commercial/industrial use, and prohibit the excavation of soils beneath a depth of five feet in the tank farm area without prior authorization from Ohio EPA and implementation of an approved SMP. The engineering control consists of well abandonment as described above and physical control, such as restrictive fencing and security measures, to minimize access to the Site.

By recording the aforementioned environmental covenant, exposure to contaminated soil at the Site would be prevented. Additionally, the existing pathway for exposure to ground water would be eliminated by properly abandoning the existing monitoring wells and the potential future use of ground water would be prohibited by recording the use restriction.

This alternative also eliminates the need for costly, on-going well maintenance.

The Ohio EPA finds that these measures will protect public health and the environment by reducing risk to acceptable levels once the remedial action objectives have been achieved.

STATUTORY DETERMINATIONS

The selected remedial action is protective of human health and the environment, complies with legally applicable state and federal requirements, is responsive to public participation and input and is cost-effective. The remedy utilizes permanent solutions to the maximum extent practicable to reduce toxicity, mobility and volume of hazardous substances at the Site. The effectiveness of the remedy will be reviewed regularly.

Joseph P. Koncelik, Director

5/5/05
Date

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DECISION SUMMARY
for *Ashland Chemical Company*
Ashland County, Ohio

1.0 SITE BACKGROUND

1.1 Site History

The Ashland Chemical Facility (the Site) is located at 1745 Cottage Street in the City of Ashland, Ashland County, Ohio.

The facility is bounded by farmland and the Atlas Bolt and Screw Company to the north, farmland and residential property to the east, and residential property to the south and west.

The facility was originally built by the Goodyear Tire and Rubber Company in 1969 on farmland for the manufacture of specialty adhesives and sealants for automotive, roofing and construction industries. In January 1984, Ashland Chemical purchased the facility from the Goodyear Tire and Rubber Company and has continued to manufacture similar adhesives and sealant products. The facility occupies an area of approximately 21.5 acres. The western area of the property contains the main plant consisting of one building with manufacturing and warehousing operations, an aboveground raw materials tank farm, a tanker loading area, an enclosed drum storage area, an outdoor drum storage area, and a 12,000-gallon aboveground fuel oil storage tank. The eastern area of the property consists of two buildings containing adhesive products and warehousing operations (see Figures 1 and 2). The property is secured by a 6-foot-high perimeter chain-link fence topped with three strands of barbed wire and is only accessible through two gates, one near the main plant entrance off of Cottage Street (U.S. Route 250) and the second near the warehousing operations off of Troy Street (U.S. Route 511).

1.2 Summary of the Remedial Investigation

The Remedial Investigation (RI) was conducted by Ashland Chemical Facility with oversight by Ohio EPA. The RI included a number of tasks to identify the nature and extent of site-related chemical contaminants. The RI was approved by Ohio EPA on September 19, 2002. The tasks included sampling of soil, surface water sediments and ground water.

The data obtained from the investigation were used to conduct a baseline risk assessment and to determine the need to evaluate remedial alternatives. The Preferred Plan contains only a brief summary of the findings of the Remedial Investigation and Feasibility Study. Please refer to the Remedial Investigation Report and Feasibility Study Report for additional information on contaminant concentrations.

The nature and extent of contamination at the Ashland Chemical Facility in each environmental medium and the contaminants of concern attributable to the Site are described in the following sections: 1.2.1 through 1.2.3.

1.2.1 Soil Contamination

Sources of VOCs and semi-volatile organic compounds (SVOCs) detected in soil and ground water beneath the facility include upgradient, off-site properties, onsite historical spills from normal Site operations, two soil piles generated during the upgrade of the tank farm in 1987, and soil in the vicinity of the former leach beds and tank farm. No other continued leaching sources of VOCs or SVOCs were identified at the Site.

On February 19, 1986, approximately 240 gallons of dimethyl formamide (DMF) vented through a mixer to the building rooftop and flowed through the roof drains and onto the drainage channel located on the northern side of the building. Ashland Chemical instituted response actions that contained the DMF. The roof was cleaned and the DMF was collected and properly disposed of at a licensed and permitted landfill.

The facility previously used leach beds numbers 1, 2 and 3. Leach bed number 1 is located north of the tank farm. If any of the products stored inside the tank farm were released or spilled, such products could potentially have been discharged to the environment. Ashland Chemical has made several improvements to the facility since acquiring the Site in 1984. The tank farm has been upgraded from an earthen structure to an impervious concrete structure, the leach beds that were potential pathways have been inactivated, and the floor drains inside the building have been sealed.

The potential source areas at the Site include the approximately 350 to 400 cubic yards of soil located in two piles generated from the upgrade of the tank farm and the soils in the vicinity of the tank farm and leach beds. The types of contaminants typically found in association with the operation of the facility in surface and subsurface soils included toluene, ethylbenzene, xylenes, chloroform, trichlorofluoromethane, methylene chloride, trans-1,2-dichloroethene, 1,1,1-trichloroethane (1,1,1-TCA) and trichloroethene (TCE). The ground water contaminants at this Site consist of benzene, toluene, perchloroethylene (PCE), TCE, 1,2-dichloroethene, 1,2-dichloroethane and vinyl chloride.

VOCs were detected in 16 of 19 soil samples collected at the Site in July 1994. Toluene was the most prevalent VOC detected in soil and was present in eight samples collected from five soil borings. Toluene concentrations ranged from 3 micrograms per kilogram (µg/kg) to 3,000 µg/kg. Chloroform was detected in five soil samples at a maximum concentration of 4 µg/kg. 1,2-DCE (total) was detected in three samples at a maximum concentration of 250 µg/kg. The remaining VOCs (vinyl chloride, carbon disulfide, 1,1-dichloroethane, 2-butanone, trichloroethene, benzene, PCE, ethylbenzene and xylenes) were present above detection limits either once or twice in soil samples.

A total of eight soil samples collected from four soil borings were analyzed for SVOCs. Nineteen SVOCs were detected in seven of the eight soil samples.

A total of eight soil samples collected from four borings were analyzed for alcohol and acetate. No alcohol or acetates were detected in the soil samples.

Two soil samples were analyzed for target analyte list (TAL) metals. Because there is no history of metal catalysts being used at the facility, metal concentrations detected in these two samples are believed to represent local soil-background concentrations for metals.

To summarize constituents in soil: aromatic hydrocarbons (predominantly toluene) are present at concentrations that pose an unacceptable risk in soil near the tank farm.

1.2.2 Ground Water Contamination

Fifteen ground water samples were collected from Site wells in 1994 and analyzed for VOCs. Two of the ground water samples were also analyzed for SVOCs, alcohol and acetates, and TAL metals. SVOCs, alcohol and acetates, and TAL metals were not detected in these two samples. Ground water samples collected during subsequent sampling events were analyzed for VOCs only.

PCE was the most prevalent VOC detected and was present in 10 of the samples collected in 1994 at concentrations ranging from 0.1 micrograms per liter (µg/L) to 50 µg/L. The highest concentration of PCE was in upgradient well MW-13.

To summarize constituents in ground water: steady state concentrations of chlorinated VOCs are present in wells (MW-13 and MW-1) located upgradient of the Site. Decreasing concentrations of chlorinated VOCs are present in well MW-6. Vinyl chloride and other degradation products of chlorinated VOCs are present at relatively steady concentrations in wells (MW-18 and MW-19) located downgradient of the Site.

1.2.3 Surface Water Contamination

One surface water sample and two sediment samples were collected in July 1994 and analyzed for VOCs, SVOCs and alcohol and acetates. Alcohol and acetates were not detected in any of the surface water or sediment samples. SVOCs were also not detected in the surface water sample. Trace concentrations of VOCs were detected in the surface water sample. VOCs detected in sediment samples were attributed to probable blank contamination.

2.0 SUMMARY OF SITE RISKS

A baseline risk assessment was conducted to evaluate current and potential future risks to human health and to ecological receptors associated with contaminants present at the Site. The results demonstrated that the existing concentration of contaminants in environmental media poses no risks to human and ecological receptors at the existing level of contamination.

2.1 Risks to Human Health

The purpose of a baseline risk assessment is to assess the magnitude of potential risk to human health and the environment from detected constituents in environmental media. The results provide the basis for determining whether or not remedial action is necessary.

A baseline risk assessment was conducted to assess constituents detected in soil as part of the RI. The baseline risk assessment concluded that there were very limited potential pathways of exposure to constituents detected in Site soil. Shallow soil constituents had been excavated, while deeper soil constituents were at depths that would not be encountered under normal facility operations. As part of the risk assessment, an exposure assessment was conducted to evaluate the type and magnitude of potential pathways by which humans may be exposed to constituents detected in environmental media at the Site. Pathways that are considered complete represent a potential for exposure. Incomplete pathways represent situations in which exposure is not expected. Without exposure, there is no risk of adverse health effects associated with the constituents.

Potential risks associated with direct contact with soil were evaluated for the Site. There is minimal potential exposure to site-related chemicals of concern (COCs) under current site-use conditions. Estimates of carcinogenic (cancer causing) and non-carcinogenic risks from exposure to COCs in the soils were calculated.

Cancer risk is defined as the probability of an individual developing cancer over a lifetime as a result of exposure to a potential carcinogen as compared with a person not exposed to the Site.

These risks refer only to the incremental risks created by exposures from the Site. They do not include the risks of cancer from other non-site related factors to which people may be exposed. As a benchmark in developing cleanup goals at contaminated sites, an acceptable range of excess lifetime cancer risk from one in one million (1×10^{-6}) to one in ten thousand (1×10^{-4}) has been established. Vinyl chloride was the only COC detected in one sample that exceeded its soil action level at the 1×10^{-6} target excess cancer risk level. Vinyl chloride was detected in sample SB23-3 at a depth of 5 to 7 feet at a concentration of 44 µg/kg; its health-based soil action levels are 0.3 to 30 µg/kg (10^{-6} to 10^{-4} target cancer risk).

No other COCs were detected in soil that would present a risk to workers from inadvertent ingestion or inhalation exposure pathways. Under current and foreseeable future Site conditions, there is minimal potential for facility workers to be exposed to residual constituents in Site soil. The exposure pathway for direct contact with constituents in soil would only be complete if excavation of greater than 5 feet below land surface (bls) was conducted at the Site. As such, an environmental covenant prohibiting excavation below 5 ft. in the tank farm area without prior authorization and without implementation of the approved SMP would be required to prevent exposure to soil contaminants at the Site.

2.2 Risks to Ecological Receptors

Exposure of ecological receptors to site-related contaminants is unlikely, as there are few complete exposure pathways. There is a small marshy area near the middle of the facility connected to an unnamed drainage channel. The drainage channel, which is often dry, conveys storm water northeastward into Sprinkle Lake and Emmons Lake. Onsite surface water monitoring detected three VOCs (methylene chloride; 1,1,1-TCA and toluene) at concentrations less than 1 µg/L. Trace concentrations of VOCs detected were attributed to probable blank contamination. Also, the surface water and sediment samples were analyzed for SVOCs, alcohol and acetates. Alcohol, acetates and VOCs were not detected in the surface water or sediment samples. In addition, the facility is secured by a perimeter chain-link fence topped with three strands of barbed wire that inhibits wildlife migration onto the property. As a result, the surface water and sediment exposure pathways are considered incomplete.

3.0 FEASIBILITY STUDY

A Feasibility Study was conducted by Ashland, Inc. (Ashland) to define and analyze appropriate remedial alternatives. That study was conducted with oversight by Ohio EPA and was approved on October 30, 2002. The Remedial Investigation and Feasibility Study are the basis for the selection of the Ohio EPA's preferred remedial alternative.

4.0 REMEDIAL ACTION OBJECTIVES

As part of the remedial investigation/feasibility study (RI/FS) process, remedial action objectives (RAOs) were developed in accordance with the National Contingency Plan (NCP), 40 CFR Part 300, which was promulgated under the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended, and U.S. EPA guidance. The RAOs are goals that a remedy should achieve in order to ensure the protection of human health and the environment.

The goals are designed specifically to mitigate the potential adverse effects of Site contaminants present in environmental media. For environmental media, remediation levels were developed for a range of potential residual carcinogenic risk levels (i.e., 1 in 100,000; 1 in 1,000,000, etc.) and using a non-cancer hazard quotient (or index) of 1.0 and a range of potential exposed receptors.

For example, a 1 in 10,000 risk level means that if 10,000 people were chronically exposed to the carcinogens at the Site, there is a probability of one additional case of cancer. Note that these risks refer only to the incremental risks created by exposures from the Site. They do not include the risks of cancer from other non-site related factors to which people may be exposed.

Non-carcinogenic hazards are generally expressed in terms of a hazard quotient or index, which combines the concentration of chemical exposures with the toxicity of the chemicals (quotient refers to the effects of an individual chemical whereas index refers to the combined effects of all chemicals). A hazard index of 1 represents the maximum exposure at which no harmful effects are expected. These carcinogenic risk levels refer to the increased likelihood that someone exposed to the chemical releases from the Site would develop cancer during his lifetime as compared with a person not exposed to the Site. Currently, there is minimal potential for facility workers to be exposed to residual constituents in site soil. The exposure pathway for direct contact with constituents in soil would only be complete if excavation of greater than 5 feet bls was conducted at the Site.

The RAOs were developed to ensure that remedial actions reduce the projected risk to humans to acceptable levels. The U.S. EPA, through the NCP defines acceptable Site remediation goals for known or suspected carcinogens to be concentration levels that represent an upper bound excess lifetime cancer risk, above that of the background, to an individual between 1 in 10,000 and 1 in 1,000,000 using information on the relationship between dose and response with the 1 in 1,000,000 risk level as the point of departure (the level of risk at which further remedial action is considered unnecessary). Noncarcinogenic risks are also to be reduced to an acceptable level, which corresponds to a hazard index of 1.0, at which harmful effects are generally not observed in exposed persons. In a similar manner, important ecological resources (e.g., waters of the state or endangered species) will also be protected.

The RAOs developed for the Site are detailed below:

- An approved Soil Management Plan (SMP) restricting unauthorized digging below 5 feet in the tank farm area which will prevent direct subsurface contact with contaminants; and

- institutional controls, i.e., an environmental covenant that would prohibit installation of new water wells and the withdrawal of ground water for potable use at the Site, restrict the Site to commercial/industrial usage only, and prohibit excavation below 5 feet in the tank farm area without prior authorization from Ohio EPA and following an SMP approved by Ohio EPA; and

- engineering controls, i.e., restrictive fencing and security measures, to minimize access to the Site.

5.0 SUMMARY OF REMEDIAL ALTERNATIVES

A total of four (4) remedial alternatives were considered in the Feasibility Study. A brief description of the major features of each of the remedial alternatives follows. More detailed information about these alternatives can be found in the Feasibility Study.

5.1 Alternative 1: No Action

Alternative 1 consists of No Action and has been retained in accordance with the NCP.

The No Action alternative provides no measures to prevent exposure to constituents in soil or ground water beneath the Site. Under Alternative 1, the existing Site monitoring wells would remain in place.

5.2 Alternative 2: Institutional and Engineering Controls

Alternative 2 consists of an institutional control in the form of a soil management plan and an engineering control in the form of well abandonment. Under Alternative 2, a soil management plan would be required prior to any activity that would involve excavation at the Site. Additionally, the 19 Site monitoring wells would be abandoned in accordance with "State of Ohio Technical Guidance for Sealing Unused Wells" (ODNR, 1996). The soil management plan would make workers aware of soil conditions and establish guidelines for proper handling, storage and disposal of contaminated soil so as to prevent exposure to contaminants. Properly abandoning the monitoring wells would effectively eliminate the existing pathway for exposure to ground water and would also eliminate the need for costly on-going well maintenance.

Abandoning the wells would not necessarily prevent the future use of ground water because it would not prevent the installation of water supply wells in the future.

5.3 Alternative 3: Institutional and Engineering Controls

Alternative 3 consists of a combination of institutional controls and engineering controls to restrict access to contaminated soil and ground water at the Site. The institutional controls would be implemented as a use restriction to prevent the installation of water wells and prohibit the use of ground water. Implementation of the approved soil management plan would be required prior to any excavation below 5 feet in depth. The engineering controls would consist of physical barriers and well maintenance and security. The use restriction would be placed on the deed for the property and would transfer with the ownership of the property. Additionally, the use restriction would remain should the property land use change, thereby ensuring that no exposure to ground water occurs. Physical barriers already exist across much of the Site in the form of fencing, security and limited road access, which prevent unauthorized access to most of the Site. The physical barriers subsequently prevent access to ground water. However, a few of the existing monitoring wells are located in unsecured areas of the facility. Well maintenance and security are already in place at the Site. Under Alternative 3, protective casings and locking expansion well caps would continue to be maintained to prevent access to water in the monitoring wells.

5.4 Alternative 4: Institutional and Engineering Controls

Alternative 4 also consists of a combination of institutional controls and engineering controls to prevent exposure to contaminated soil and ground water at the Site. As with Alternative 3, the institutional controls consist of a use restriction and a SMP. The engineering controls consist of well abandonment as described in Alternative 2. Similarly to Alternative 3, the SMP would be required prior to excavation activities to prevent exposure to soil contaminants at the Site.

However, Ohio EPA has modified the use restriction requirements to comply with House Bill 516 by requiring the activity and use limitations be filed in the form of an environmental covenant, which will limit the Site to commercial/industrial use, prohibit ground water use, and prohibit excavation below 5 feet in the tank farm area without prior authorization from Ohio EPA and following an approved SMP. This modification will ensure the protection of public safety and the environment. Additionally, the existing pathway for exposure to ground water would be eliminated by properly abandoning the existing monitoring wells and the potential future use of ground water would be prohibited by recording the environmental covenant. This alternative also eliminates the need for costly, on-going well maintenance.

6.0 COMPARISON AND EVALUATION OF ALTERNATIVES

6.1 Evaluation Criteria

In selecting the remedy for this Site, Ohio EPA considered the following eight criteria as outlined in U.S. EPA's National Contingency Plan (NCP) promulgated under CERCLA (40 CFR 300.430):

1. Overall Protection of Human Health and the Environment – Remedial alternatives shall be evaluated to determine whether they can adequately protect human health and the environment, in both the short- and long-term, from unacceptable risks posed by hazardous substances, pollutants, or contaminants present at the Site.

2. Compliance with ARARs – Remedial alternatives shall be evaluated to determine whether a remedy will meet all of the applicable or relevant and appropriate requirements under State and Federal and Local environmental laws.

3. Long-Term Effectiveness and Permanence – Remedial alternatives shall be evaluated to determine the ability of a remedy to maintain reliable protection of human health and the environment over time, once pollution has been abated and RAOs have been met. This includes assessment of the residual risks remaining from untreated wastes, and the adequacy and reliability of controls such as containment systems and institutional controls.

4. Reduction of Toxicity, Mobility or Volume Through Treatment – Remedial alternatives shall be evaluated to determine the degree to which recycling or treatment are employed to reduce toxicity, mobility or volume, including how treatment is used to address the principal threats posed by the Site.

5. Short-Term Effectiveness – Remedial alternatives shall be evaluated to determine the following: (1) Short-term risks that might be posed to the community during

implementation of an alternative; (2) Potential impacts on workers during remedial action and the effectiveness and reliability of protective measures; (3) Potential environmental impacts of the remedial action and the effectiveness and reliability of mitigative measures during implementation; and (4) Time until protection is achieved.

6. Implementability – Remedial alternatives shall be evaluated to determine the ease or difficulty of implementation and shall include the following as appropriate: (1) Technical difficulties and unknowns associated with the construction and operation of a technology, the reliability of the technology, ease of undertaking additional remedial actions, and the ability to monitor the effectiveness of the remedy; (2) Administrative feasibility, including activities needed to coordinate with other offices and agencies and the ability and time required to obtain any necessary approvals and permits from other agencies (for off-site actions); and (3) Availability of services and materials, including the availability of adequate off-site treatment, storage capacity, and disposal capacity and services; the availability of necessary equipment and specialists, and provisions to ensure any necessary additional resources; the availability of services and materials; and the availability of prospective technologies.

7. Cost – Remedial alternatives shall evaluate costs and shall include the following: (1) Capital costs, including both direct and indirect costs; (2) Annual operation and maintenance costs (O&M); and (3) Net present value of capital and O&M costs. The cost estimates include only the direct costs of implementing an alternative at the Site and do not include other costs, such as damage to human health or the environment associated with an alternative. The cost estimates are based on figures provided by the Feasibility Study.

8. Community Acceptance – Remedial alternatives shall be evaluated to determine which of their components interested persons in the community support, have reservations about, or oppose.

6.2 Analyses of Evaluation Criteria

This section looks at how each of the evaluation criteria is applied to each of the remedial alternatives found in Section 5.0 and compares how the alternatives achieve the criteria. Evaluation Criteria 1 and 2 are threshold criteria required for acceptance of an alternative that has accomplished the goal of protecting human health and the environment and complied with the law. Any acceptable remedy must comply with both of these criteria. Evaluation Criteria 3 through 7 are the balancing criteria for picking the best remedial alternatives. Evaluation Criteria 8, community acceptance, was determined, in part, by written responses received during the public comment period and statements offered at the public meeting.

6.2.1 Overall Protection of Human Health and the Environment

The assessment of cancer risks and non-cancer hazards to human receptors requires that exposure pathways be identified and the risks and hazards of each pathway be numerically estimated. Only one SVOC detected during site investigation exceeded its respective action level.

The maximum detected concentration of benzo(a)pyrene (1,800 µg/kg) exceeds the action level based on a target risk of 1×10^{-6}, but does not exceed the action level based on a 1×10^{-4} target cancer risk. The only potential for chemical exposure is for facility workers to be exposed to residual constituents in Site soil and ground water. The exposure pathway for direct contact with constituents in soil would only be complete if excavation of greater than 5 feet bls was conducted at the site. However, prior Ohio EPA authorization and implementation of the approved SMP would be required prior to any excavation in the tank farm area.

Adverse impacts to ecological receptors are identified as a hazard quotient and, when appropriate, a hazard index value greater than 1.0.

The exposure pathway for ground water exposure of ecological receptors to site-related contaminants is unlikely as there are few complete exposure pathways.

Alternative 1: No Action

The No Action alternative is not protective of human health or the environment in that it provides no means to prevent access to constituents in ground water beneath the Site.

Alternative 2: Institutional and Engineering Controls

Alternative 2 does not provide overall protection of human health and the environment. Although it eliminates current and potential future access to soil and current access to constituents in ground water beneath the Site, it does not prevent future potential exposure to ground water because it does not incorporate a use restriction to prohibit use of ground water.

Alternative 3: Institutional and Engineering Controls

Alternative 3 provides overall protection of human health and the environment because it would prevent exposure to Site soil via an approved SMP and prohibit the use of ground water by the implementation of a use restriction. However, Alternative 3 does not address all potential ground water and soil exposure pathways because it does not require abandonment of the existing monitoring wells at the Site and does not require a use restriction regarding excavation of contaminated soil below 5 feet in depth.

Alternative 4: Institutional and Engineering Controls

Alternative 4 provides overall protection of human health and the environment because it restricts the Site to commercial/industrial use, restricts access to soil via the environmental covenant prohibiting digging in the tank farm area without prior Ohio EPA authorization and without following an approved SMP, it eliminates current access to constituents in ground water beneath the Site by abandonment of the existing monitoring wells, it minimizes access to the Site via physical controls, such as restrictive fencing and security measures, and it prevents future potential ground water exposure via an environmental covenant.

6.2.2 Compliance with ARARs

Alternative 1: No Action

This alternative does not provide any measures to restrict access to soil or ground water and, therefore, does not comply with ARARs.

Alternative 2: Institutional and Engineering Controls

This alternative does not provide for use restrictions to restrict the use of ground water and, therefore, does not comply with ARARs establishing Maximum Contaminant Levels MCLs. An approved SMP would comply with ARARs regarding worker health and safety and fugitive dust control. Additionally, this alternative complies with the ARAR for well abandonment.

Alternative 3: Institutional and Engineering Controls

This alternative does not comply with the ARAR requiring well abandonment.

Alternative 4: Institutional and Engineering Controls

This alternative complies with all of the identified ARARs.

6.2.3 Long-Term Effectiveness and Permanence

Alternative 1: No Action

The No Action alternative does not have long-term effectiveness or permanence because it has no provisions to prevent access to soil contaminants or the future use of ground water.

Alternative 2: Institutional and Engineering Controls

Alternative 2 does not have long-term effectiveness or permanence because it has no provisions to prevent the future use of ground water.

Alternative 3: Institutional and Engineering Controls

Alternative 3 provides limited long-term effectiveness and permanence because an approved SMP prevents exposure to Site contaminated soil, and the ground water use restriction would prohibit the future use of ground water. This Alternative does not eliminate current access to constituents in ground water beneath the Site because the existing monitoring wells at the Site will be locked, but not abandoned. This Alternative does not eliminate access to Site contaminated soil because it does not require a use restriction to prohibit excavation below 5 feet in the tank farm area without prior authorization from Ohio EPA, in addition to implementing an approved SMP.

Alternative 4: Institutional and Engineering Controls

Alternative 4 provides for long-term effectiveness and permanence because the elimination of the existing wells prevents exposure to Site contaminated ground water. Furthermore, Alternative 4, as modified by the Ohio EPA with respect to the future use of the property, provides a way to measure long-term effectiveness and performance of the selected remedy for the Site. This is done by using an environmental covenant to restrict the Site to commercial/ industrial usage, prevent exposure to contaminated soil and prohibit the use of ground water. Additionally, access to the Site will be minimized via restrictive fencing.

6.2.4 Reduction of Toxicity, Mobility or Volume Through Treatment

Alternative 1: No Action

By way of the natural attenuation processes demonstrated in the RI report to be occurring in ground water beneath the Site, the toxicity and volume of chlorinated VOCs in ground water are being reduced. Historical Site ground water analytical results are consistent over time and demonstrate natural attenuation processes are degrading the PCE and TCE in ground water beneath the Site.

Alternative 2: Institutional and Engineering Controls

By way of the natural attenuation processes demonstrated in the RI report to be occurring in ground water beneath the Site, the toxicity and volume of chlorinated VOCs in ground water are being reduced.

Alternative 3: Institutional and Engineering Controls

By way of the natural attenuation processes demonstrated in the RI report to be occurring in ground water beneath the Site, the toxicity and volume of chlorinated VOCs in ground water are being reduced.

Alternative 4: Institutional and Engineering Controls

By way of the natural attenuation processes demonstrated in the RI report to be occurring in ground water beneath the Site, the toxicity and volume of chlorinated VOCs in ground water are being reduced.

6.2.5 Short-Term Effectiveness

Alternative 1: No Action

The No Action alternative has no short-term effectiveness because it makes no provisions to prevent exposure to constituents currently existing in ground water.

Alternative 2: Institutional and Engineering Controls

Alternative 2 provides short-term effectiveness in that the current pathway for access to ground water is eliminated by abandonment of the 19 monitoring wells. Additionally, an approved SMP restricts access to constituents in subsurface soil.

Alternative 3: Institutional and Engineering Controls

Alternative 3 provides short-term effectiveness because an approved SMP should prevent exposure to Site soil and prevents the future use of ground water. Additionally, this alternative provides for Site security and maintains the integrity of the existing wells to prevent unauthorized access to the wells. Also, an approved SMP prevents access to constituents in subsurface soil. However, it does not eliminate current access to contaminants in ground water beneath the Site because the existing monitoring wells at the Site will be locked, but not abandoned. This Alternative does not eliminate access to soil because it does not require a use restriction prohibiting excavation below 5 feet without prior authorization from Ohio EPA in addition to implementation of an approved SMP.

Alternative 4: Institutional and Engineering Controls

Alternative 4 has short-term effectiveness because it restricts the Site to commercial/industrial usage, eliminates the existing monitoring wells and prohibits the future use of ground water through an environmental covenant. Additionally, the environmental covenant would restrict access and protect construction workers from exposure to constituents in subsurface soil by prohibiting digging below 5 feet in depth in the tank farm area without prior Ohio EPA authorization and implementation of an approved SMP.

6.2.6 Implementability

Alternative 1: No Action

The No Action alternative is readily implementable because it requires no action other than to maintain the integrity of the existing monitoring wells at the Site.

Alternative 2: Institutional and Engineering Controls

Alternative 2 should be readily implementable because it requires only that an approved SMP be prepared prior to any intrusive activity and the existing monitoring wells at the Site be properly abandoned. The existing monitoring wells would be abandoned in accordance with "State of Ohio Technical Guidance for Sealing Unused Wells." Note that overdrilling of the monitoring wells for abandonment may require that an approved SMP address management of potentially contaminated materials that would be brought to the surface.

Alternative 3: Institutional and Engineering Controls

Alternative 3 should be readily implementable. A ground water use restriction can be applied to the property deed. Site security measures already in place at the site (fencing, restricted road access) can be extended to secure monitoring wells located in unsecured portions of the Site. Additionally, maintenance activities can be implemented to maintain the integrity and security of the existing monitoring wells.

Alternative 4: Institutional and Engineering Controls

Alternative 4 should be readily implementable because it requires that the existing monitoring wells at the Site be properly abandoned, it minimizes access to the Site via physical controls, such as restrictive fencing, and requires that an environmental covenant be filed with the property deed. This alternative requires the recording of an environmental covenant with the Ashland County Recorder that restricts the Site to commercial/industrial usage only, prohibits the use of ground water, and prohibits the excavation of soils below 5 feet in the tank farm area without prior authorization from Ohio EPA and implementation of an approved SMP.

6.2.7 Cost

Cost estimates to implement the four remedial alternatives are provided below.

Alternative	Capital Cost	Annual Short-term O&M (5 yrs)	Annual Long-term O&M (80 yrs)	Present Worth
Alternative 1 **No Action**	$ 0	$ 25,000	$ 18,318	**$ 43,318**
Alternative 2 **Institutional and Engineering Controls**	$ 47,795	$ 0	$ 0	**$ 47,795**
Alternative 3 **Institutional and Engineering Controls**	$ 21,500	$ 25,000	$ 22,833	**$ 69,333**
Alternative 4 **Institutional and Engineering Controls**	$ 31,200	$ 0	$ 19,620	**$ 50,820**

Alternative 1: No Action

There are no capital costs to implement the No Action alternative. O&M costs are necessary to maintain the integrity of the 19 monitoring wells currently located at the Site. The O&M costs are estimated to be $25,000 over a ten-year period. Periodic costs are associated with community relations and Agency review and comment for taking a No Action approach to the Site. The periodic costs are estimated to be $10,800 over the ten-year period. Management fees are estimated at 10% of the total capital, O&M and periodic costs. Contingency fees are estimated to be 10% of the total capital, O&M, periodic costs and the management fees. The total estimated cost to implement the No Action alternative is $43,318 over a ten-year period. The total present value, using a 7% discount factor, for Alternative 1 is $34,313. A cost evaluation for Alternative 1 is presented in Table 5 of the Feasibility Study. The calculation of present value costs is presented in Table 9 of the Feasibility Study.

Alternative 2: Institutional and Engineering Controls

Capital costs to implement Alternative 2 are associated with preparation of an approved SMP and abandoning the existing monitoring wells. The capital costs for preparation of an approved SMP and properly abandoning the 19 Site monitoring wells are estimated to be $28,700. There are no O&M costs associated with this alternative. Periodic costs are associated with community relations and agency review and comment.

The periodic costs are estimated to be $10,800. Management fees are estimated at 10%

of the total capital, O&M and periodic costs. Contingency fees are estimated to be 10% of the total capital, O&M, periodic costs and the management fees. The total estimated cost to implement Alternative 2 is $47,795. The total present value for Alternative 2 is still $47,795 because all of the costs are assumed to be incurred within the first year. A cost evaluation for Alternative 2 is presented in Table 6 of the Feasibility Study. The calculation of present value costs is presented in Table 9 of the Feasibility Study.

Alternative 3: Institutional and Engineering Controls

Capital costs to implement Alternative 3 are associated with implementing a use restriction to prohibit the use of ground water at the Site, preparation of an approved SMP, and the installation of physical barriers to restrict access to wells currently in unsecured areas of the property. The capital costs are estimated to be $21,500. O&M costs are associated with the annual inspection and maintenance of the 19 monitoring wells at the Site. The O&M costs are expected to be $25,000 over a ten-year period. Periodic costs are associated with community relations and agency review and comment. The periodic costs are estimated to be $10,800. Management fees are estimated at 10% of the total capital, O&M and periodic costs. Contingency fees are estimated to be 10% of the total capital, O&M, periodic costs and the management fees.

The total estimated cost to implement Alternative 3 is $69,333. The total present value for Alternative 3 is $60,328. A cost evaluation for Alternative 3 is presented in Table 7. The calculation of present value costs is presented in Table 9 of the Feasibility Study.

Alternative 4: Institutional and Engineering Controls

Capital costs to implement Alternative 4 are associated with: 1) implementing an environmental covenant that would prohibit use of ground water at the Site, prohibits excavation below 5 feet in the tank farm area without prior authorization from Ohio EPA and implementation of an approved SMP, and limits the Site to commercial/industrial uses; 2) preparation of an approved SMP; and 3) abandoning the existing monitoring wells in accordance with “State of Ohio Technical Guidance for Sealing Unused Wells” and implementing an environmental covenant. Although the use restriction requirement has been modified by Ohio EPA, there should be no changes to the capital cost estimates provided above in section 8.2.7.

The capital costs are estimated to be $31,200. There are no O&M costs associated with this alternative. Periodic costs are associated with community relations and agency review and comment. The periodic costs are estimated to be $10,800. Management fees are estimated at 10% of the total capital, O&M and periodic costs. Contingency fees are estimated to be 10% of the total capital, O&M, periodic costs and the management fees.

The total estimated cost to implement Alternative 4 is $50,820. The total present value for Alternative 4 is still $50,820 because all of the costs are assumed to be incurred within the first year. A cost evaluation for Alternative 4 is presented in Table 8 of the Feasibility

Study. The calculation of present value costs is presented in Table 9 of the Feasibility Study.

6.2.8 Community Acceptance

The Ohio EPA received comments from interested parties during the public comment period and at the public meeting held at Ashland City Council Chambers on December 1, 2004. Those comments and Ohio EPA's responses are included in the Responsiveness Summary.

7.0 SELECTED REMEDIAL ALTERNATIVE

Ohio EPA has selected Alternative 4 as its Preferred Alternative. Primarily, remedial actions are required to provide overall protection of public health and the environment and compliance with Federal and State ARARs. Additionally, a selected remedial action must be cost-effective and utilize innovative technologies to the maximum extent practicable.

Based on these factors, Alternative 4 is the alternative that satisfies the statutory requirements applicable to the Site. Alternative 4 consists of the following elements:

Institutional Controls
Engineering Controls

7.1 Institutional Controls

Access Restriction

Restricting access to a Site or contaminated media is an Institutional Control Technology Type. An environmental covenant would be proposed as a Process Option under the Access Restriction. The environmental covenant would be effective by prohibiting installation of new water wells at the Site as well as prohibiting future use of ground water at the Site. The environmental covenant would be transferable with the deed should the property ownership be transferred in the future and would remain in place until it could be demonstrated that constituents in ground water no longer posed a threat to human health and the environment. An environmental covenant is readily implementable and inexpensive to apply. The environmental covenant has been retained as a viable option. The environmental covenant would also limit the Site to commercial/industrial use and prohibit excavation at depths below 5 feet from the ground surface in the tank farm area without a prior authorization from Ohio EPA.

Excavations at depths greater than 5 feet would require implementation of an approved SMP to ensure workers are aware of soil conditions and describe how excavated soil would be handled, stored and disposed of in the event of future intrusive activities. Additionally, an approved SMP would describe measures (i.e., monitoring, personal protective equipment, etc.) to be taken to ensure that workers are not exposed to residual constituents in soil during excavation activities or during storage, transportation and disposal of excavated soil. In addition, a health and safety plan would be developed and implemented to ensure worker safety while excavation is completed. Therefore, an approved SMP would be required prior to excavation activities to prevent exposure to soil contaminants at the Site by restricting unauthorized digging below 5 feet in the tank farm area.

Performance Standards:

Ground Water

- Record an environmental covenant with the Ashland County Recorder prohibiting the installation of new water supply wells and the withdrawal of ground water for potable use at the Site. The performance standard shall be achieved upon the recording of the environmental covenant and its continued enforcement.

Soil

- Record an environmental covenant with the Ashland County Recorder to restrict the Site to commercial/industrial usage only, and prohibit excavation below 5 feet in the tank farm area without prior authorization from Ohio EPA and following an SMP approved by Ohio EPA. The performance standard shall be achieved upon recording the environmental covenant and its continued enforcement.

7.2 Engineering Controls

Physical Barriers

Physical barriers represent an effective Process Option under the Engineering Control Technology Type. Physical barriers, such as fences, would be effective by preventing unauthorized access to the Site. Fences are already in place at the Ashland Chemical Site. This Process Option is considered readily implementable and a low cost measure with respect to this Feasibility Study. Physical barriers were retained.

Performance Standard:

- Restrict unauthorized access to the Site and contaminated media through the maintenance of physical barriers. The performance standard shall be achieved upon the implementation of the O&M program approved by the Ohio EPA and its continued enforcement.

Well Abandonment

Abandonment of the 19 monitoring wells at the Site is another effective Technology Type because it would eliminate the conduit for exposure to ground water that currently exists at the Site. Once removed, there would be no existing means of accessing ground water at the Site.

Properly sealing the wells is readily implementable. The capital costs would be relatively high; however, there would be no operation and maintenance costs once the wells were removed. Well abandonment was retained as a Process Option.

Performance Standards:

- Restrict access to contaminated ground water through the maintenance of physical barriers to prevent exposure to contaminated ground water until these monitoring wells are properly abandoned. The performance standard shall be achieved upon the implementation of the O&M program and its continued enforcement.

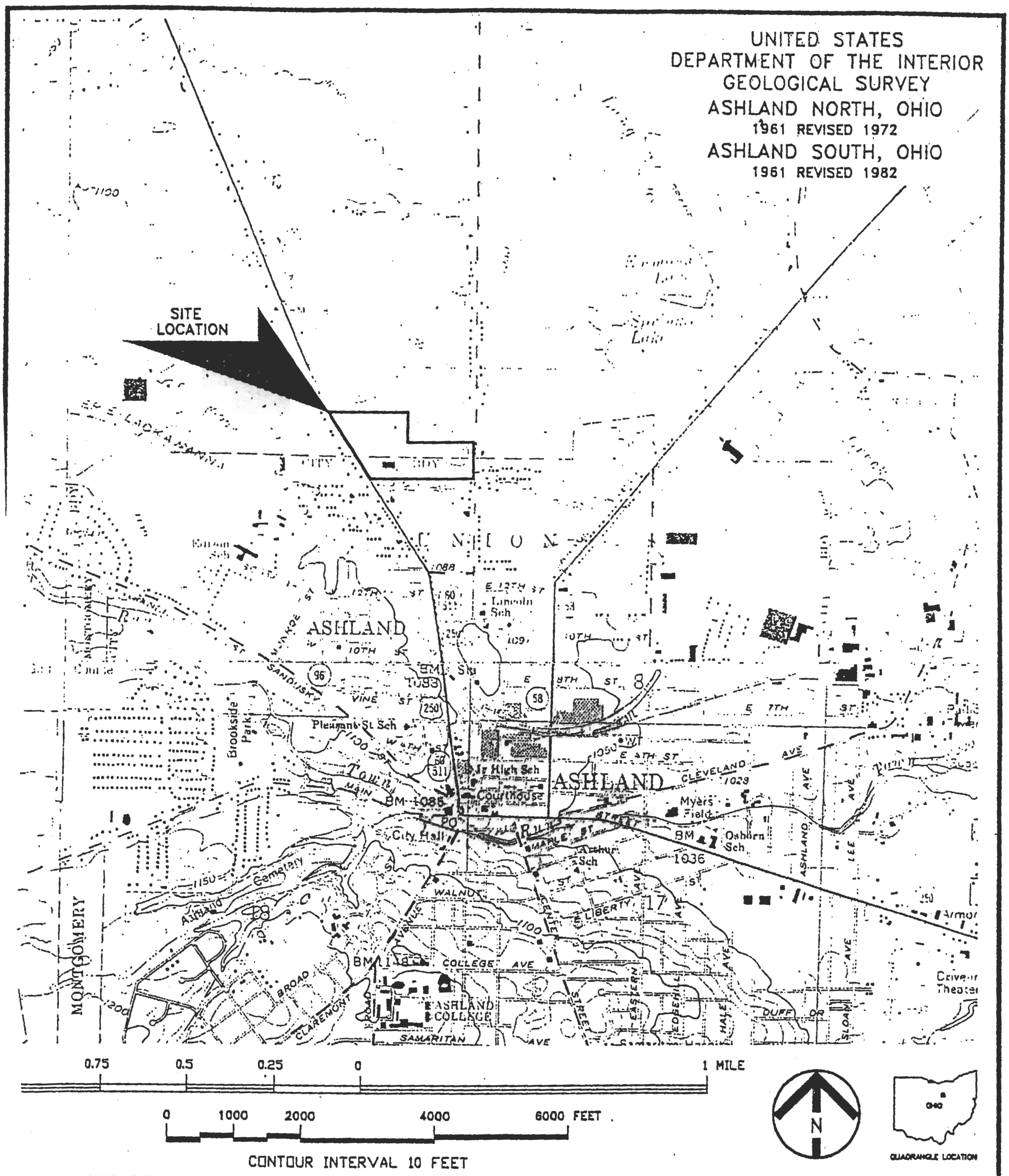
- Abandon monitoring wells in accordance with the *State of Ohio Technical Guidance for Sealing Unused Wells* (State Coordinating Committee on Ground Water, 1996). The performance standard shall be achieved upon the successful recording of the Water Well Sealing Reports with the Ohio Department of Natural Resources, Division of Waters, and the Ohio EPA.

8.0 GLOSSARY

Aquifer	An underground geological formation capable of holding and yielding water.
ARARs	Applicable or relevant and appropriate requirements. Those rules, including state and federal laws, which strictly apply to remedial activities at the site, or those rules whose requirements would help achieve the remedial goals for the site.
Baseline Risk Assessment	An evaluation of the risks to humans and the environment posed by a site.
Carcinogen	A chemical that causes cancer.
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act of 1980 as amended. A federal law that regulates cleanup of hazardous substances sites under the U.S. EPA Superfund Program.
Decision Document	A statement issued by the Ohio EPA giving the Director's selected remedy for a site and the reasons for its selection.
Ecological Receptor	Animals or plant life exposed to chemicals released from a site.
Exposure Pathway	Route by which a chemical is transported from the site to a human or ecological receptor.
Feasibility Study	A study conducted to ensure that appropriate remedial alternatives are developed and evaluated such that relevant information concerning the remedial action options can be presented to a decision-maker and an appropriate remedy selected.
Hazardous Substance	A chemical that may cause harm to humans or the environment.
Hazardous Waste	A waste product, listed or defined by the RCRA, which may cause harm to humans or the environment.
Human Receptor	A person exposed to chemicals released from a site.
MCL	Maximum Contaminant Level. The highest level of a contaminant that is allowed in drinking water. The level is established by U.S. EPA.

NCP	National Oil and Hazardous Substances Pollution Contingency Plan, codified at 40 CFR Part 300 (1990), as amended. A framework for remediation of hazardous substances sites specified in CERCLA.
O&M	Operation and Maintenance. Long-term measures taken at a site after the initial remedial actions to assure that a remedy remains protective of human health and the environment.
Preferred Plan	The plan that evaluates the preferred remedial alternative chosen by the Ohio EPA to remediate the site in a manner that best satisfies the evaluation criteria.
RCRA	Resource Conservation and Recovery Act of 1976, codified at 42 CFR Part 6901 et seq. (1988), as amended. A federal law that regulates the handling of hazardous wastes.
Remedial Action Objectives (RAOs)	Specific goals of the remedy for reducing risks posed by the site.
Remedial Investigation	Those activities undertaken by Respondent to determine the nature and extent of the contamination at the Site caused by disposal, discharge or release of waste materials.
Responsiveness Summary	A summary of all comments received concerning the Preferred Plan and Ohio EPA's response to all issues raised in those comments.
Soil Management Plan (SMP)	A Soil Management Plan that was conducted by Ashland Chemical and approved by Ohio EPA specific to this Site. The Plan considers the exposure of workers to chemical or hazardous substance during any future soil excavation at the Site.
Water Quality Criteria	Chemical and thermal standards that define whether a body of surface water is unacceptably contaminated. These standards are intended to ensure that a body of water is safe for fishing, swimming and as a drinking water source.
PCE	Tetrachloroethene or Perchloroethylene. A common industrial solvent and cleaner, often used for dry cleaning.
SVOCs	Semivolatile organic compounds, also known as "SVOCs," are also

	substances that contain carbon and various proportions of other elements found in VOCs. The main difference is that these compounds evaporate less readily.
TAL	Target Analyte List. The TAL was originally derived from the U.S. EPA Priority Pollutant List under CERCLA. A fact sheet on total metals, dissolved metals and cyanide can be obtained from the U.S. EPA Contract Laboratory Program.
VOCs	Volatile organic compounds, also known as "VOCs," are substances containing carbon and different proportions of other elements such as hydrogen, oxygen, fluorine, chlorine, bromine, sulfur or nitrogen. VOCs are most commonly used as solvents such as paint thinners, lacquer thinner, degreasers and dry cleaning fluids.

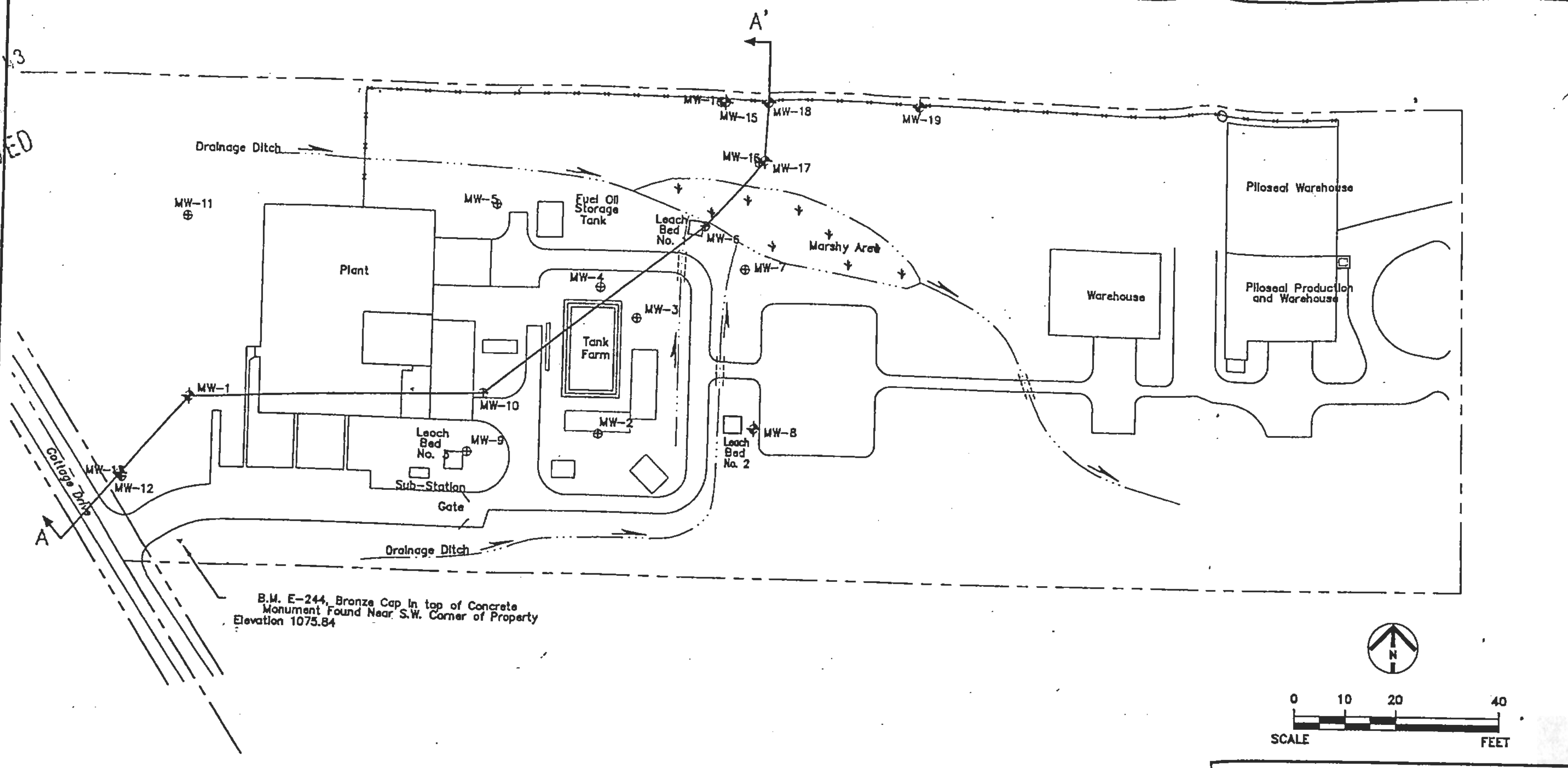


GENERAL LOCATION MAP

ASHLAND SP&A FACILITY - 1745 COTTAGE STREET - ASHLAND, OHIO

RAWN BY: ERB	CHECKED BY: SS	PROJECT NUMBER: 02300107.00	DATE: 4/23/02	FIGURE NO: 1

URS



LEGEND

⊕ Shallow Monitoring Well Location (<16 Feet)

Deep Monitoring Well Location (>16 Feet)

A' Line of Corss Section

URS
5200 BLAZER PARKWAY
DUBLIN, OHIO 43017

CLIENT: ASHLAND SP&A FACILTY

LOCATION: ASHLAND, OHIO

GENERAL SITE LAYOUT

DRAWN BY:	CHECKED BY:	PROJECT NO:	DATE:	FIGURE NO:
ERB	GG	23000107	4/16/02	2

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RESPONSIVENESS SUMMARY
for Ashland Chemical Site
Ashland County, Ohio

This Responsiveness Summary has been prepared to address each of the comments submitted in written form on the Preferred Plan for remedial action at the Ashland Chemical Site. On December 8, 2004, Ohio Environmental Protection Agency (Ohio EPA) received written comments from Ashland, Inc. on the October 2004 Preferred Plan. Ashland, Inc. raised two comments associated with the Preferred Plan. No oral comments were made during the December 1, 2004, hearing on the Preferred Plan.

1. ***"Ashland is concerned that the Preferred Plan does not state that groundwater impacts originate from off-site and that Ashland is not contributing to the groundwater impacts. This was a significant finding of the Remedial Investigation and the basis for Ashland not having to conduct remediation of groundwater at the site. The Preferred Plan should state that groundwater impacts originate from off-site sources and that Ashland is not contributing to these groundwater impacts."***
<u>Ohio EPA Response</u>: Ohio EPA concurs with the assessment that the concentration of total VOCs at the downgradient monitoring wells MW-18 and 19 are less than the concentration of total volatile organic compounds (VOCs) flowing on-site at the upgradient monitoring well MW-13. The Preferred Plan and approved Feasibility Study document echoed this conclusion. However, based on information collected from previous ground water investigations performed by Ashland, Inc., at the facility, we cannot be one hundred percent certain that previous activities at the facility did not contribute to the VOC's concentration in the ground water underneath the facility.

2. ***"The Ohio EPA included in the Preferred Plan a modification requiring that excavation of soil beneath the depth of 5 feet would require prior approval of the Ohio EPA. The requirement for Ohio EPA approval prior to excavation of soil beneath a depth of 5 feet was not part of Ashland's proposed remedy, Alternative 4 of the Feasibility Study that was approved by the Ohio EPA on October 30, 2002. The Soil Management Plan prepared for the facility was approved by Ohio EPA on July 25, 2003, and was prepared as part of the approved remedy. The Soil Management Plan is sufficient to protect public safety and the environment from exposure to residual constituents in soil at the site. Therefore, the modification should be removed from the Preferred Plan."***
<u>Ohio EPA Response</u>: It was not the intention of Ohio EPA to restrict all the property at Ashland's facility by modifying the Preferred Alternative in the Preferred Plan. The modification to the Preferred Alternative, which prohibits excavation below 5 feet (ft) without prior authorization from Ohio EPA, is limited to the tank farm area only of Ashland's property. Therefore, Ohio EPA has reflected this clarification in the Decision Document by indicating that the prohibition of excavation below 5 ft is limited to the tank farm area only.