

Ohio Environmental Protection Agency

**Decision Document
for the
Remediation of the Imoundment Area**

**Ramp Creek Site
Heath, Ohio**

October, 1999

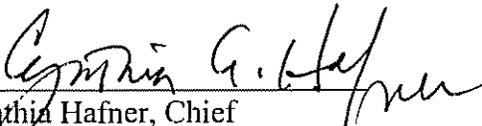
DECISION DOCUMENT

RAMP CREEK-IMPOUNDMENT AREA
MSL# 145-0654
LICKING COUNTY
SEPTEMBER 7, 1999

DECLARATION

This document presents the Ohio Environmental Protection Agency's (Ohio EPA's) selected remedial action for the Impoundment Area at the Ramp Creek Site, located on Ashland, Inc. property in the city of Heath, Licking County, Ohio (see Figure 1). The major component of the selected remedial action is on-site containment. The Impoundment Area's bottom material and soil will be solidified, stabilized, consolidated, and capped. Institutional controls will be put in place to further protect human health and the environment and to protect the integrity of the containment system.

The selected remedial action is protective of human health and the environment, attains applicable state requirements, and is cost effective. The remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable. Ohio EPA will monitor the status of the remedial action to ensure that the remedy continues to adequately protect human health and the environment. The remedial action will be required to meet the performance standards contained in this document.


Cynthia Hafner, Chief
Division of Emergency and Remedial Response
Ohio Environmental Protection Agency

10/25/99
Date

DECISION SUMMARY

The Impoundment Area is located on Ashland, Inc. property in western Heath (see Figure 1). The property is the former Pure Oil Refinery. Ashland acquired the property in 1970 from Union Oil Company of California (Unocal), who acquired it from Pure Oil Company in 1965. Ashland currently uses the property as a bulk storage facility for petroleum products and as a natural gas transfer station.

The Impoundment Area consists of five impoundments and two ditches named the North Pond, North Center Pond, South Center Pond, Clear Water Pond, Triangular Pond, Lime Ditch, and Caustic Ditch (see Figure 2). The impoundments were constructed between 1920 and the mid-1960's and were used for wastewater treatment, oil-water separation, oil recovery, storm water management, and as a disposal area for tank bottom waste, caustic waste, waste lime, and debris. As a result of these practices, approximately 27,500 cubic yards of soft, black cohesive hydrocarbon-based material accumulated at the base of five of the impoundments. This material and the adjacent soil is the subject of this remedial action.

In October 1989, the Ohio Department of Natural Resources (ODNR) informed Ohio EPA of an oil covered Canada Goose found near the Ashland Facility. ODNR alleged that the goose had landed on "sludge lagoons," located on Ashland property. Ohio EPA inspected the property and found two large impoundments containing black oily sludge and debris, one clear water pond, a smaller ponded area that contained sludge and debris, and areas of dry black sludge on the ground. Ohio EPA sampled the impoundments and the dry sludge in 1990 and found that the material in them consisted of typical refinery waste constituents.

In 1990, the State of Ohio filed a complaint with the Licking County Court of Common Pleas against Ashland and Unocal to investigate the magnitude and extent of ground water contamination in the area. The Impoundment Area was included in the suit as a possible source of the ground water contamination and a threat to wildlife. In 1991, Ashland and Unocal entered into a Consent Order for Preliminary Injunction (COPI) with the State of Ohio. Two addenda to the COPI, which specified additional investigations, were eventually filed with the court.

From 1991-1998 Ashland/Unocal, with Ohio EPA oversight, conducted three phases of environmental investigations. The Phase II Investigation, completed in 1995, focused on the Impoundment Area. This investigation defined the nature and extent of contamination and calculated the human health and ecological risks in the area. The investigations revealed that the impoundments contained a floating sludge layer and a bottom layer separated by a few feet of water. Ashland/Unocal removed the floating sludge in the two largest impoundments and the dried sludge on the ground (tank bottom area). Therefore, only the bottom layer and surrounding soil remains to be addressed.

The principle chemical constituents detected in the Impoundment Area are benzene, toluene, ethylbenzene, and xylenes (BTEX); dibenzofuran; polynuclear aromatic hydrocarbons (PAHs); and elevated concentrations of lead, antimony, chromium, arsenic, and mercury. Chemical concentrations were found to be within or below regulatory human health risk criteria of 1 in 10,000 to 1 in 1,000,000 for carcinogenic risks and a Hazard Quotient (HQ) score of less than 1 for non-cancer risks, assuming the property use remains industrial/commercial and on-site workers wear protective clothing. Without personal protective clothing and equipment, the carcinogenic risk is within the acceptable range, but the HQ score is 1.3, which slightly exceeds the acceptable range of 1.0. The Ecological Risk Assessment did not identify any sensitive ecosystems nearby that potentially could be adversely affected from the Impoundment Area constituents of concern. Ohio EPA concluded, however, that individual members of a species could be adversely affected if they were to come into contact with the impoundment material.

Remedial action objectives (RAOs) were developed to establish goals that will ensure the risk to human health and the environment does not exceed established risk criteria and to protect environmental receptors. The RAOs are listed below.

- Ensure that migratory waterfowl populations are not adversely affected from contact with petroleum hydrocarbons in the Impoundment Area.
- Ensure that current and future on-site worker ingestion, dermal contact and inhalation exposures to 95% of the upper confidence limit (UCL) on the mean concentration of constituents of concern in Impoundment Area bottom layers and soils are within a target risk range of 1E-06 to 1E-04 for individual carcinogens and an HQ range of 0.1 to 1.0 for individual non-carcinogens.
- Ensure that current and future off-site residents and off-site worker inhalation exposures to 95% UCL on the mean concentrations of constituents of concern in Impoundment Area bottom layers and soils are within a target risk range of 1E-06 to 1E-04 for individual carcinogens and an HQ range of 0.1 to 1.0 for individual non-carcinogens.
- Address constituents identified in the Impoundment Area soils and bottom layers and to be protective of human health and the environment.

Potential remedial alternatives were developed for the Impoundment Area that would address the RAOs (see *Volume III, Phase II Investigation Report*). This initial list of alternatives was further refined in the *Phase III Feasibility Study Report*. Ohio EPA evaluated the remedial alternatives and summarized the results in the *Preferred Plan for Impoundment Area at the Ramp Creek Site-Heath, Ohio*. The alternatives that were evaluated are listed below.

1. No Action
2. Monitoring and Institutional Controls
3. In-situ Solidification/Stabilization and Soil or RCRA Cap

4. In-Situ Soil Mixing, Phytoremediation, and Soil Cap
5. Ex-Situ Solidification/Stabilization and Soil Cap
6. Landfarming and Soil Cap

Ohio EPA selects the preferred alternative by comparing each alternative against evaluation criteria. A summary of the comparative analysis is provided in Table 1. Ohio EPA selected Alternative 3 as the preferred alternative because it is the most effective alternative that achieves the RAOs.

Ohio EPA public noticed the Preferred Plan on April 23, 1999 and held a public meeting and hearing at the Heath Municipal Building on May 26, 1999. The public comment period ended on June 2, 1999. A summary of the community response is provided in the Responsiveness Summary (see Appendix A). Based on the community response, the Ohio EPA determined that the Preferred Plan is generally acceptable to the local community. However, one property owner, the Van Voorhis Trust, objected to the preferred alternative for the Impoundment Area. Ohio EPA evaluated the Van Voorhis' comments and determined that they do not require a change in the Preferred Plan.

The remedial action consists of containment within the impoundment area through in situ stabilization, solidification, and capping. Specific components of the remedial action are listed below.

- Surface water on the impoundments will be pumped out as necessary to complete the project. The discharge water will meet applicable requirements and all necessary permits for this activity will be obtained from Ohio EPA's Division of Surface Water.
- The bottom layer materials will be recovered, reused, and/or recycled, if feasible. Feasibility for recycling is dependent on market demand, handling costs, and suitability of material.
- The bottom layer materials and contaminated soil that are not recovered will be solidified and stabilized in situ. This will be accomplished by physically and chemically binding the remaining bottom material and soil with binding agents. The solidified/stabilized mass will then be consolidated within the impoundment area unit.
- A two-foot soil cap will be placed over the solidified/stabilized material. The construction and maintenance of the soil cap will comply with the performance standards set forth in this document.
- Institutional and engineering controls will be implemented to restrict access and to protect the integrity of the remedy. The Impoundment Area will be monitored to ensure the cap is maintained and there are no unauthorized disturbances.

The majority of the bottom material that will be stabilized/solidified and consolidated is in the North Center Pond, South Center Pond, and Clear Water Pond. The North Pond contains bottom material mixed with considerable construction/demolition debris, soil, sand, and silt; therefore, it is not feasible to stabilize/solidify the entire North Pond. The Triangular Pond contains a thin bottom layer that will be stabilized/solidified and consolidated with the bottom material from the other impoundments. The Caustic Ditch and the Lime Ditch do not contain bottom material, so they do not have to be solidified/stabilized and capped; however, they may be included because of their proximity to the impoundments, depending on the final design.

Performance Standards

Performance standards are applicable standards and criteria for the remedial design/remedial action and operation and maintenance of the remedial alternatives. Ohio EPA identified the applicable standards that specifically address the remedial actions or circumstances for each component of the chosen remedy. The chosen remedy is expected to achieve these standards; if it does not, then additional work, remedy modifications, or contingent remedies will be considered. A performance monitoring and evaluation program will be developed and implemented. The specific performance standards are as follows:

- The soil cap will be constructed in accordance with the requirements found in DSIWM Guidance 0111, issued March 25, 1995;
- The solidified/stabilized bottom material will have sufficient bearing strength to support the soil cap specified above; and,
- The binding material(s) selected to be mixed with the bottom layer material will yield a solidified/stabilized mixture that, when subject to treatability testing, results in a reduction in the mobility of the constituent of concern (benzene) substantially equivalent to the mixture designated “flue dust” (“FD”) used in the follow-up treatability tests as reported in Appendix A of the Feasibility Study Report.

Additional work, remedy modifications, or contingent remedies will be considered if the chosen remedy does not achieve performance standards or meet RAOs.

Contingent Remedy Process

Contingent remedies may be employed if the selected remedy cannot be implemented as designed, fails to perform as anticipated, or, there is a change in the conditions at the site. A contingent remedy may specify a different technology or may be a modification of the preferred remedy. The general process by which the remedial program may be modified or changed is as

follows:

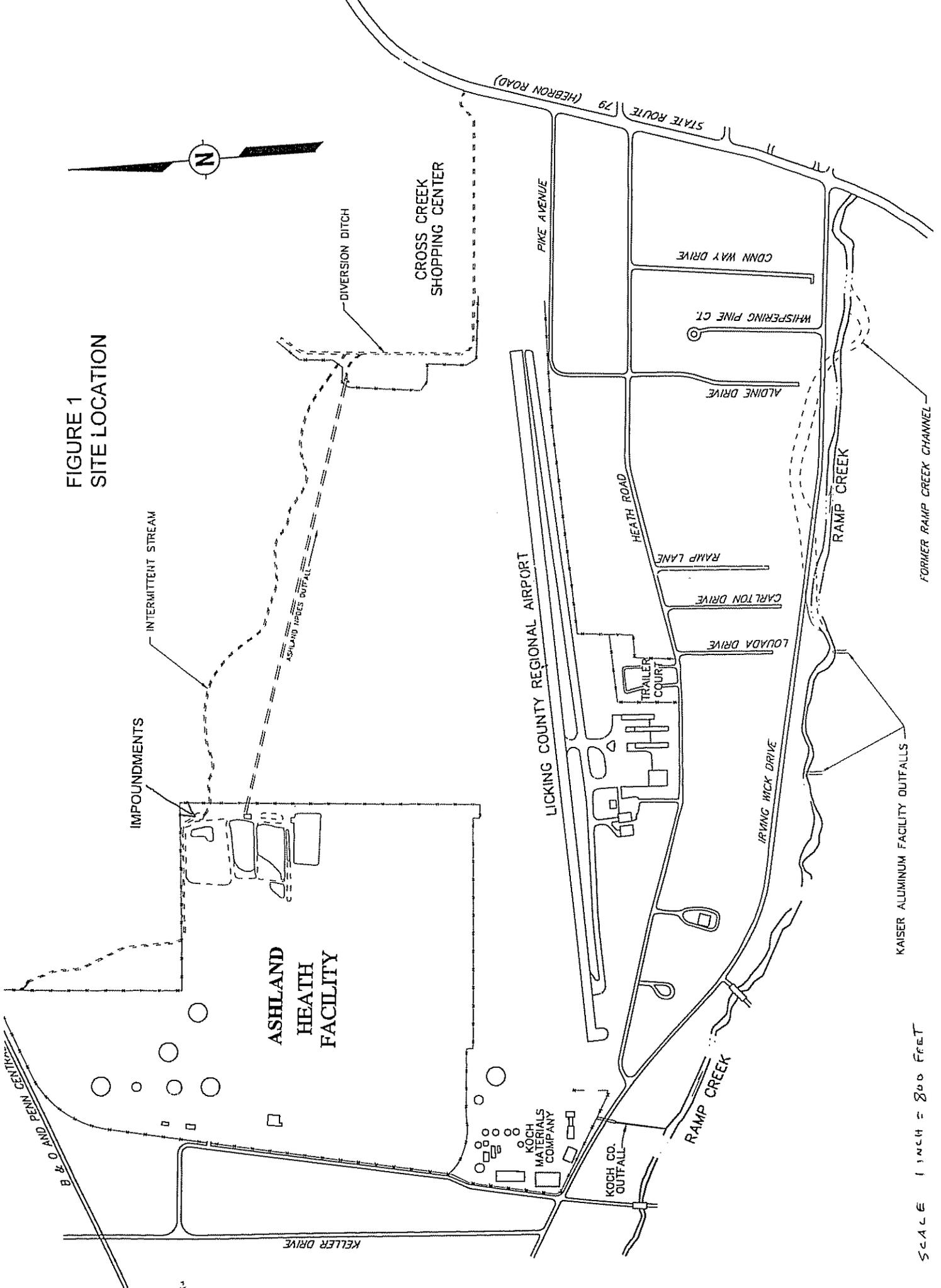
- evaluate which condition triggered the performance standard;
- evaluate the need for and/or extent to which the existing remedial program may be modified or changed to address the triggering condition, and the time frame for an appropriate response action;
- implement the selected remedial program modification or change; and
- document the modifications or changes that were made to the remedial program.

Potential contingent technologies will be identified and screened according to implementability, effectiveness, and cost. Ohio EPA will compare the technologies and select the most cost effective technology that will achieve the performance standards. Ohio EPA may review and change the performance standards if it is determined that the standards are not technically feasible.

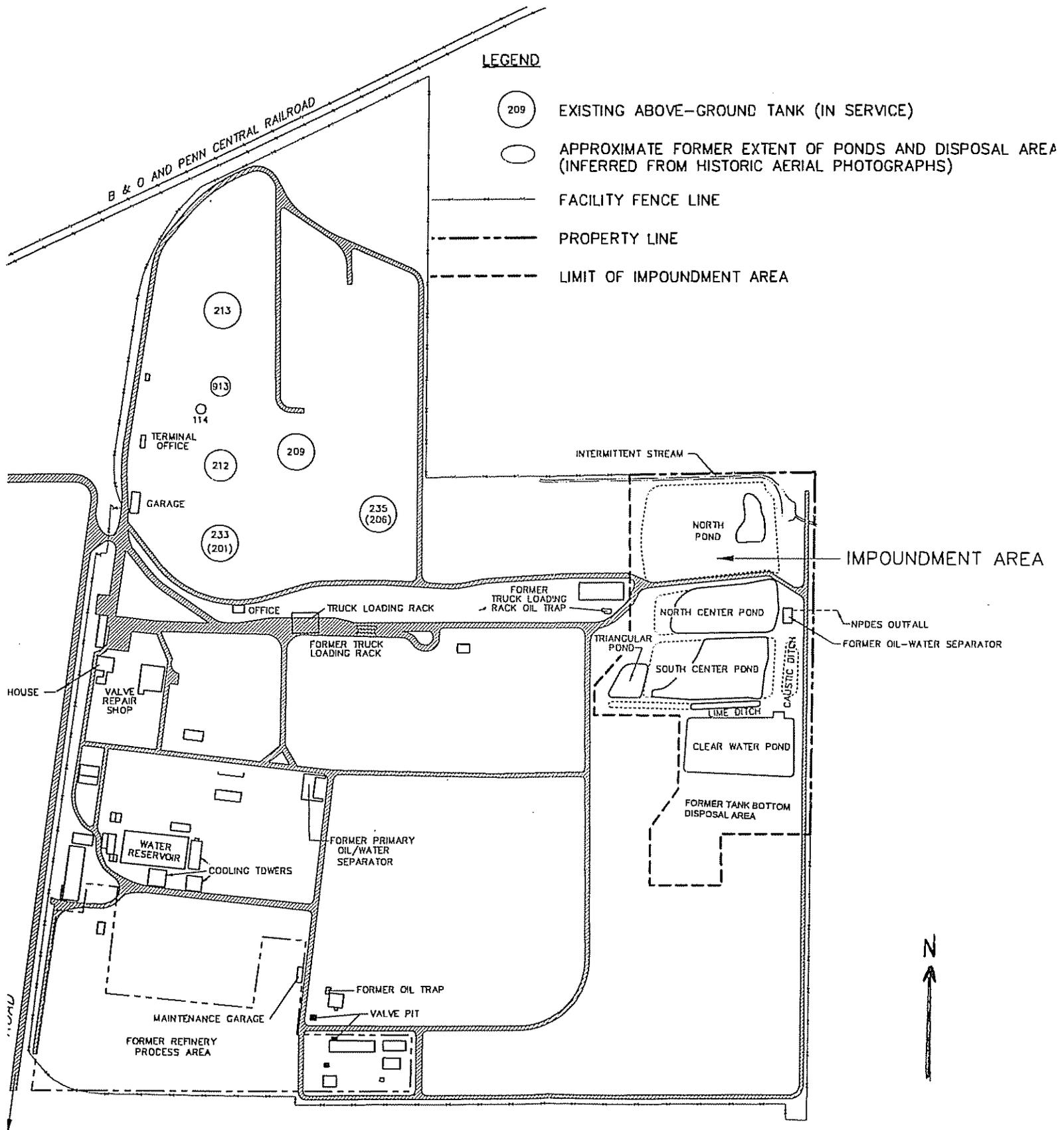
Table 1
Evaluation of Final Alternatives
Impoundment Area

Alternative Criteria	Alternative 1 No Further Action	Alternative 2 Monitoring, Institutional Con- trols, Skimming	Alternative 3 In-Situ Stabilization; RCRA or Soil Cap	Alternative 4 Soil Mixing, Phyto- remediation and Soil Cap	Alternative 5 Ex-Situ Stabil- ization; Soil Cap	Alternative 6 Landfarm, Stabilization, Consol- idation, Soil Cap
Overall Protection of Human Health and the Environment	Remains the same; does not meet RAOs	Risk to human health reduced; minor environmental benefit; does not meet RAOs	Dermal, ingestion, inhalation threat eliminated; leaching curtailed; RAOs met	Potential elimination of risk; direct contact threat eliminated; RAOs potentially met	Dermal, ingestion, inhalation threat eliminated; leaching curtailed; RAOs met	Dermal, ingestion, inhalation threat eliminated; risk eliminated; leaching eliminated; RAOs met
Compliance with Regulatory Requirements	Does not comply	May not comply	Complies	Complies	Complies	Complies
Long-Term Effectiveness and Permanence	Not effective or permanent	Effective if controls are enforced; effect- iveness of skimming is uncertain	Dependent on cap maintenance; stabilization of organics uncertain; RCRA cap is superior	Potentially effective and permanent, but technology is unproven	Dependent on cap maintenance; stab- ilization of organics uncertain	Effective and permanent; organic COCs degraded
Reduction in Toxicity, Mobility, Volume through Treatment	No reduction	Minor reduction in volume	Reduces mobility; volume increases	Reduces toxicity	Reduces mobility; volume increases	Reduces toxicity and mobility
Short-term Effectiveness	No added risk	Minor added risk	Worker protection required; dust, odor, traffic may increase; complete in 6-12 months	Worker protection required; dust, odor, traffic may increase; construction complete in 6-12 months	Worker protection required; dust, odor, traffic may increase; complete in 18 months	Worker protection required; dust, odor, traffic may increase; complete in 6-8 years
Implementability	Easily implemented	Easily implemented	May need permits; in- situ mixing may be difficult; expertise and materials available	May be difficult to implement; extensive testing required	Permits may be required; could be difficult; expertise and materials available	Permits may be required; could be difficult; expertise and materials available
Cost	\$0.00	\$338,000	\$3,473,000 (RCRA) \$3,049,000 (Soil)	\$2,720,000	\$3,520,000	\$4,370,000

**FIGURE 1
SITE LOCATION**



SCALE 1 INCH = 200 FEET



SCALE 1 INCH = 400 FEET

FIGURE 2
ASHLAND FACILITY LAYOUT

Appendix A

Responsiveness Summary and Public Comments

Responsiveness Summary on Comments Received on the Preferred Plans for the Ground water and Impoundment Area at the Ramp Creek Site, Heath, Ohio.

The Van Voorhis Trust Comments*

Comment 1: The principal flaw of the ground water plan is its imposition upon innocent down-gradient landowners of the burden of enduring contamination on their property for a very long period of time. Response: The burden of contamination on down gradient property owners was not imposed by the Preferred Plan; rather, it already exists. The Preferred Plan simply identifies Ohio EPA's preferred method of addressing the ground water at this site. See Ohio EPA's response to Comment 3 below for the remediation time-frame on Van Voorhis Property.

Comment 2: Natural attenuation is unsuitable where the ground water will be disturbed due to construction during the period prior to achievement of remedial action objectives.

Response: According to the *Human Health and Ecological Risk Assessment*, the risk to construction workers from contact with contaminated ground water and sediments is within acceptable standards. However, since there are uncertainties associated with risk assessments, workers will need to take precautions if they excavate in the affected area.

Comment 3: Ohio EPA's remedy selection criteria favor active remediation of ground water contamination on the Van Voorhis property. Response: According to Ohio EPA's remedy selection criteria, the principal difference between monitored natural attenuation (MNA) and active remedial technologies are that active measures have the potential to reduce the remediation time-frame. Whether or not active measures will actually reduce the remediation time-frame on Van Voorhis property is not known at this time.

There is, apparently, some misunderstanding of the predicted MNA remediation time-frame in the northern area of the contamination. The forty-two year time-frame is predicted for the center of the plume, not for the entire site. The affected part of the Van Voorhis property is on the northern and eastern fringe of the plume. According to the Natural Attenuation Time Frame Model, the remediation time-frame is predicted to be achieved in 13-17 years (based on study area data for the northern portion of Ashland, Inc. property). Considering the current and anticipated future land use, and the fact that the Van Voorhis property currently meets risk-based remedial action objectives (RAOs), this is considered a reasonable time-frame.

Comment 4: The selection of monitored natural attenuation for the Van Voorhis property does not conform to US EPA's recent directive on the appropriate use of that remedy.

Response: Ohio EPA uses the US EPA's Directive 9200.4-17P as guidance in evaluating the appropriateness of MNA in nonresidential areas. Ohio EPA concluded that the nonresidential area of this site meets the criteria set forth in the guidance. Ohio EPA considered the current and

potential use of ground water and the reliability of institutional controls when evaluating MNA. This is consistent with US EPA's directive. Ground water is not currently being used on Site, and it is not likely that it will be used in the near future because the city of Heath supplies water in the area, and Heath Ordinance 100-93 prohibits its use. While the estimated remediation time-frame of 13-17 years for the Van Voorhis property is considered reasonable, there is some uncertainty. However, this is only one factor that is considered when balancing many factors. The uncertainty factors at this site are not a sufficient reason to eliminate MNA as a remedial alternative.

Some residual petroleum hydrocarbons may remain in the smear zone below Van Voorhis property after the BTEX biodegrades, but the concentrations will not likely exceed human health risk criteria. Should an appreciable volume and concentration of heavier constituents remain in the subsurface on Van Voorhis property and pose an unacceptable risk, then additional actions will be considered and implemented through the contingent remedy process.

Comment 5: The contingent remedy of shifting to active remediation is not sufficient to justify the selection of natural attenuation. Response: The contingent remedy process is not a justification for any remedial alternative. The contingent remedy process is inherent in all remedial actions in the event that the remedial alternative does not perform as anticipated or the situation at the site changes. At this site the contingent remedy process is identified now, as opposed to when it might be needed.

Comment 6: The impoundments are a current source of ground water contamination beneath the Van Voorhis property and should be removed for the following reasons: (1) the bases of the impoundments are in contact with ground water and leach contaminants; (2) highly contaminated soils surround the impoundments and are a continuing source of hydrocarbons to the ground water; and (3) free-product occurs in lenses in the soil around the impoundments and is a source of hydrocarbons to the ground water. Alternative 3 will not prevent contaminant migration to ground water, and the impoundment area will continue to pollute Van Voorhis property, if this alternative is implemented. Response: The bases of the impoundments are occasionally in contact with the ground water, so it is possible that the impoundments leach contaminants to the ground water. The data obtained during the site investigations indicate that the impoundment area is not a significant source of ground water contamination relative to the smear zone. The data indicates the ground water quality is not any worse downgradient from the impoundments when compared to the upgradient ground water quality. Also, the extent of the ground water plume has remained stable over the past several years in the downgradient (east) from the impoundments, which indicates the impoundments are not contributing a significant amount of BTEX. Based on this information, Ohio EPA concludes that the volume of contaminants that leach out has minimal effect on the overall ground water quality in the area.

Ohio EPA has no evidence of highly contaminated soil in the impoundment area. Petroleum-related constituents are found in the soil around the impoundments, but the distribution and

concentration of soil contamination are less than in the smear zone. Therefore, Ohio EPA considers the smear zone as the principal source of ground water contamination in the area. In addition, free product (LNAPL) was not detected in lenses in the soil around the impoundments based on the results of the site investigations. While undetected pockets of free product in the soil may be present, these would be a minor source of ground water contamination relative to the smear zone and the impoundment bottom material. Therefore, there is no evidence to support the allegation that “highly” contaminated soils surround the impoundments and act as a continuing source of contamination. The preferred alternative will address the soil that forms the narrow dikes in between each of the impoundments through consolidation, solidification, stabilization, and a soil cap. Ohio EPA expects that this remedy will further reduce any leaching of contaminants from the soil. Finally, the removal of the impoundment soil and bottom material is not necessary to achieve RAOs and would be an unjustifiable expense.

Comment 7: Free-product occurs around the impoundments. Free-product acts as a continuing source to the ground water, so the estimated remediation time frame is not accurate. MNA is not appropriate where free-product is present, so it needs to be removed.

Response: Free product was detected around the north-center pond in monitoring wells MW-21, MW-22, and TW-5. The thicknesses of free product in these wells range from 0.1-1.8 feet. However, the upper aquifer is confined in the impoundment area, so the thicknesses in the well casings are not the true thicknesses in the aquifer. This is because free product enters the well screen and displaces the water above the confining unit. Because the bottom of the free product is above the base of the confining unit in these wells, the true thickness is a thin film and is not measurable.

MW-21, MW-22, and TW-5 were hydrocarbon-recharge tested during June 1994. The free product in MW-21 and TW-5 did not recover and MW-22 recovered slowly during the test, which indicates that the recoverable volume of free-product is small. Based on these results, it does not appear that there is a sufficient volume of recoverable free product in the impoundment area to justify the construction of a free-product recovery system. Ohio EPA agrees that free product removal is an important component of MNA, but it must be feasible to remove it.

Comment 8: The land surface (on Van Voorhis Property) will be greatly altered through pavement, buildings, and other structures when it is developed. This will reduce infiltration and increase the time for natural attenuation to achieve RAOs. Response: Since the affected area on Van Voorhis property is at the northern and eastern fringe of the plume and occupies a relatively small portion of the total plume area, development will not significantly alter infiltration rates and remediation time frames for the site as a whole. Ohio EPA agrees that structures and paving have the potential to alter surface water infiltration locally and may have an effect on the local attenuation rate. However, the smear zone is nearly submerged beneath the water table at the northeastern edge of the plume where most of the affected portions of the Van Voorhis property are located; a vertical dissolution of BTEX by percolating surface water is not as an important attenuation mechanism in that area compared to the southern portion. Based on these area-specific factors, Ohio EPA does not believe that development will significantly

decrease the rate of natural attenuation on the affected portion of the Van Voorhis property.

Comment 9: Methane gas from anaerobic biodegradation creates an unacceptable explosive risk, and this factor was not evaluated or considered in the Preferred Plan. Response: Since the types and locations of structures that may be built on the Van Voorhis property are unknown at this time, the impact of methane cannot be reliably evaluated. Data on the production and movement of methane will be collected during monitoring of natural attenuation processes at the site. Based on previous studies, aerobic processes are expected to be predominant along the fringe of the ground water plume; therefore, production of methane is expected to be relatively low on the Van Voorhis property compared to the axis of the plume. If monitoring shows that methane poses a hazard, then it will be addressed through the contingent remedy process.

Soil-gas profiles indicate that methane degrades within a few feet above the smear zone, so for methane to be a risk, the foundations of buildings would have to be set in or near the smear zone. Finally, there are several structures, including residential housing with basements, currently built over the ground water plume. Explosive gas monitoring has indicated that there is no explosive hazard in these structures. Therefore, Ohio EPA does not anticipate methane to be a problem at this site.

Comment 10: Natural aerobic biodegradation of the hydrocarbons needs to be enhanced by the use of air sparging, introduction of oxygen release compounds and nutrient addition in order to reduce the methane risk. Response: Air sparging was considered in the FS and was eliminated because of implementability issues. Some of the problems with air sparging at this site include the following: high ground water table, local confining conditions, iron precipitation and bacterial clogging, obtaining permits, and overall effectiveness. Artificial nutrient addition may be implementable at a small site, but it is not feasible for a site this large.

Comment 11: The affected portions of the Van Voorhis property could be zoned residential in the future. Response: If land-use changes or the affected portion of the Van Voorhis property is zoned residential, then active remediation methods will be evaluated under the contingent remedy process.

Comment 12: MNA is an economical approach that relies on the Van Voorhis property as a "treatment system" by allowing waste hydrocarbons to migrate and degrade on Van Voorhis property. Response: The Preferred Plan does not allow hydrocarbons to migrate to the Van Voorhis property and degrade; the petroleum hydrocarbons have been beneath the Van Voorhis property for several years. The hydrocarbons are entrained in the smear zone and are the residual left over from releases during refinery operations. The hydrocarbons are, therefore, degrading in place and the BTEX plume will shrink toward its center, which is west of the Van Voorhis property.

Comment 13: Ohio EPA considered the economic cost to the PRPs but did not consider the cost impact to the Van Voorhis. Response: The evaluation criteria are not permitted to take into

consideration the economic impacts to individual land owners when choosing the preferred alternative at remedial response sites. Ohio EPA must choose the most effective remedial alternative that will achieve RAOs for the entire site. See the Preferred Plan for a description of how remedies are weighed and selected.

Comment 14: Van Voorhis recommend free product recovery from the water table using interception trenches and sumps. Response: Ohio EPA agrees that free-product recovery is necessary if a sufficient volume of mobile free product is present, but this is not the case in the impoundment area (See Comment 7). During the 1970's US EPA and the US Coast Guard installed interception trenches and sumps near Ramp Creek in an effort to recover free product from the shallow aquifer. These efforts were generally unsuccessful. In 1991, Ashland/Unocal installed a passive trench system adjacent to Ramp Creek at an active seep area. To date no recoverable free product has ever accumulated in the system. Based on these experiences and the current subsurface conditions at this site, interception trenches and sumps would not be effective in recovering free-product.

Comment 15: Van Voorhis recommend the excavation and on-site treatment of hydrocarbon saturated soils in the impoundment area. Response: Excavation and on-site treatment were considered in the preferred plan, but it was not chosen because it is not the most effective alternative to achieve RAOs. See the Preferred Plan for an explanation of how this alternative compared to the other alternatives.

Comment 16: After free product and soil removal, the natural aerobic biodegradation process should be augmented. Response: If free product removal is feasible, augmenting the biodegradation process may be considered. Enhancement of aerobic biodegradation on Van Voorhis property is not likely to substantially decrease the remediation time-frame because of the high water table and relatively thin smear zone beneath Van Voorhis property.

*Ohio EPA summarized Comment Numbers 6 through 17.

Comment 1: Ashland/Unocal stated that all of the Alternatives, except for Alternative 1 for the Impoundment Area are protective of human health and the environment. Solidification/stabilization remediation provides additional protection, but is not required to be protective. Response: Ohio EPA agrees that solidification/stabilization may not be required to be protective. However, solidification/stabilization is recommended to improve support of a soil cap and help to reduce possible contaminant leaching to ground water from the impoundment bottom material.

Comment 2: Ashland/Unocal stated that a specific chemical composition for the binding agent should not have been included in the Preferred Plan to maintain flexibility. Response: Ohio EPA referenced the specific chemical composition because that was the most effective mixture based on the results of the pilot-scale studies. Ohio EPA will not reference a specific chemical composition in the Decision Document to maintain flexibility; although the effectiveness of the binding agent that is used must meet the performance standard.

Comment 3: Ashland/Unocal believe that Section 4.0 of the Preferred Plan contains statements that could be misinterpreted to suggest existing conditions present unacceptable risks to human health. Response: Ohio EPA has not identified any such statements in the Preferred Plan.

Comment 4: Ashland/Unocal believe that Section 7.2 of the Preferred Plan can be misinterpreted to imply that there is a potential for expansion of the hydrocarbon affected area. Ashland/Unocal states that studies indicate that the hydrocarbons are not spreading into unaffected areas and that conditions will improve overtime. Response: Ohio EPA agrees that the plume has not been actively spreading and conditions should improve over time for the site as a whole. We do not agree, however, that there is absolutely no potential for the contamination to spread to unaffected areas. There is a potential for unforeseen circumstances where the ground water contamination could spread in an area. That is one of the reasons for continued monitoring until RAOs are met.

Comment 5: Ashland/Unocal state that Section 7.6 of the Preferred Plan is in error concerning propane as a fuel source. The thermal oxidizer will use propane as a temporary fuel, but over the long term natural gas will be the fuel source for the thermal oxidizer. Also, carbon or other technologies may be used for air treatment. Response: Ohio EPA was evaluating the short-term risks when discussing propane. If propane is used as a temporary fuel, then there is some short-term risk associated with its use. This short-term risk was identified in the Preferred Plan.

Comment 6: Ashland/Unocal state that affected properties not currently covered under the city of Heath Ordinance 100-93 do not pose a risk to human health and environment based on current and reasonably expected future land use. Response: The only area of the site that is not covered is the northwest corner of the Van Voorhis property, where no analytical data are

available. Without data, any conclusions regarding this part of the site are conjecture. Field studies will be required to characterize the magnitude and extent of contamination in order to determine the human health and environmental risks.

At the public hearing one resident commented that he recently noticed oil on Ramp Creek on three occasions. On two of these occasions he noticed oil on his dog's fur, and on one occasion he noticed a distinctive rainbow pattern in the creek. Because of this he believes, Ramp Creek should continue to be studied and monitored. Response: Ohio EPA will continue to monitor Ramp Creek for visible oil. It is possible that some LNAPL could seep out into Ramp Creek occasionally, but we have not received any complaints on visible oil in Ramp Creek for several years. Also, water quality investigations of Ramp Creek conducted by Ohio EPA in 1995 did not identify adverse effects to aquatic life from this site. Overall, Ramp Creek meets Ohio Water Quality standards and is described as a very good habitat to an exceptional warm water habitat. One very localized area in the creek sediment did not have as many bottom dwelling species as expected, but Ohio EPA could not determine a specific cause.



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June 2, 1999

Mr. Fred Myers
Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Central District Office
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Columbus, Ohio 43207-3417

Re: Submittal of Comments on Ohio EPA's
Preferred Plans for the Ramp Creek Site

Dear Mr. Myers:

Ashland Inc. and Union Oil Company of California (Companies) have reviewed Ohio Environmental Protection Agency's (Ohio EPA's) April 1999 Preferred Plans for the Impoundment Area and Remediation of Groundwater for the Ramp Creek Site located in Heath, Ohio. Based on this review, the Companies have prepared comments for each of the Preferred Plans. Our comments are provided below.

Preferred Plan for the Impoundment Area

1. Section 6.1 of the Phase III Feasibility Study Report summarized the approved Risk Assessment and stated that materials in the Impoundment Area, under the current and reasonably foreseeable future use of the Facility, do not pose a risk to human health and environment with the possible exception of periodic exposure of individual waterfowl to floating hydrocarbon material. Therefore, all alternatives except Alternative No. 1 are protective of human health and the environment and any remediation conducted provides additional protection to human health and the environment. Thus, while solidification/stabilization of Impoundment Area bottom layer materials is proposed to be undertaken, it is not required to protect human health and the environment at the Ramp Creek Site.



Ashland Chemical's
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Quality and Productivity

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2. Section 9.0 of the Preferred Plan specifies the chemical composition of the binding agent to be used for solidifying/stabilizing bottom layer materials. The Companies believe that the performance standard for the binding material provided in Section 10.0 of the Preferred Plan should be referenced rather than a specific chemical composition. This approach will provide both consistency and flexibility so that the most cost-effective material meeting the performance standards can be used during the solidification/stabilization process.

Preferred Plan for the Remediation of Groundwater

1. The Companies are in general agreement that the Ohio EPA's preferred alternative for remediation of groundwater at the Ramp Creek Site will be cost-effective and protective of human health and the environment.

2. Section 4.0, Results of the Risk Assessment, contains statements that could be misinterpreted to suggest that existing conditions present unacceptable risks under applicable law. However, the approved Risk Assessment did not identify unacceptable risks associated with subsurface hydrocarbons at the site, provided that shallow groundwater is not used as a potable water source. Potable use of shallow groundwater does not currently occur, and is not reasonably expected to occur in the future.

3. In the discussions in Section 7.0 which describe the remedial alternatives, statements were made which could be misinterpreted to imply that there is some potential for expansion of the hydrocarbon-affected area (see, for example, Section 7.2, Overall Protection of Human Health and the Environment, and Short-Term Effectiveness). Although in Section 3.0 (Environmental Conditions), the Ohio EPA stated, "The contamination is not currently spreading or entering Ramp Creek", the Companies also wish to emphasize that studies conducted at the site have demonstrated consistently that subsurface hydrocarbons are not migrating or spreading into unaffected areas and available information indicates that conditions are expected to improve, rather than worsen, over time.

4. The description under Short-Term Effectiveness in Section 7.6 states that "propane is used as a fuel source for the thermal oxidizer, so there will be a propane tank and lines on-site". Although propane may be used on a temporary basis during pilot testing of a vacuum system, natural gas will be used as the permanent fuel source for the thermal oxidizer. Additionally, the Companies wish to clarify that vapor-phase carbon or other technologies may also be used for air treatment, if appropriate.

5. Groundwater underlying properties not currently addressed by the City of Heath Ordinance does not pose a risk to human health and the environment based on current and reasonably expected future land use.

Should you have any questions regarding these comments, please call me at 614/790-4651 or Bob Hopkins of Unocal at 614/882-7670.

Sincerely,

A handwritten signature in black ink that reads "Mark W Metcalf" followed by a stylized flourish or initial.

Mark W. Metcalf
Ashland Inc.

MWM:AER:hms

cc: R. Hopkins, Unocal
J. Rego, Jones, Day, Reavis & Pogue
R. Fahey, Arter & Hadden
B. Chapman, Chapman & Lewis

Ashland\Metcal\464349\fredlet10

SAMUELS AND NORTHROP CO., LPA
ATTORNEYS AT LAW

180 EAST BROAD STREET, SUITE 816
COLUMBUS, OHIO 43215

TELEPHONE: 614 464-3232
TELECOPIER: 614 464-0709

EMAIL: INFO@SN-LAW.COM

HAND DELIVERY

June 2, 1999

RECEIVED

JUN 02 1999

OHIO EPA/CDO

Fred Myers
Central District Office
Ohio EPA
3232 Alum Creek Drive
Columbus, Ohio 43207

Re: Ramp Creek Site---Preferred Plan

Dear Fred:

I have enclosed comments in opposition to the preferred plans for ground water and for the impoundment area at the Ramp Creek Site (Heath Refinery) submitted on behalf of the owners of the Van Voorhis Property located to the north and east of the refinery.

Thank you for your consideration of the enclosed.

Yours truly,



David E. Northrop

cc: Jessica Ditullio (w/encl.)
Margaret A. Malone (w/encl.)
John A. Rego (w/encl.)
Richard P. Fahey (w/encl.)

RECEIVED
JUN 02 1999
OHIO EPA/CDO

RAMP CREEK SITE
HEATH, OHIO

COMMENTS OF THE OWNERS OF THE VAN VOORHIS PROPERTY
IN OPPOSITION TO THE PREFERRED PLANS FOR THE REMEDIATION
OF THE IMPOUNDMENT AREA AND THE GROUND WATER

I. INTRODUCTION

These comments are offered in accordance with Ohio EPA's public notice of April 23, 1999, by the owners of the Van Voorhis Trust property that abuts the Heath Refinery property to the north and east. The joint owners of the property are Bank One Trust Company, N.A., as trustee of the Van Voorhis Trust, and two individuals, Susan Christiansen and Sally Rogers (referred to below collectively as "the Van Voorhis owners"). The Van Voorhis owners oppose both remedies, and request Ohio EPA to reconsider both as insufficient to achieve remedial action goals on the Van Voorhis property at the earliest practicable time.

This document, authored by legal counsel for the Van Voorhis owners, sets forth a general discussion of the flaws in the preferred plan for ground water. These comments are amplified in the attached comments prepared by the Van Voorhis owners' technical consultant, Michael E. Renz of Renz and Associates. Mr. Renz' comments also address the flaws in the preferred plan for the impoundment area.

For the reasons set forth below and in the attached, the Van Voorhis owners urgently request Ohio EPA to reconsider both preferred plans, and to substitute for them plans better suited to a prompt and effective remediation of both areas.

II. THE PRINCIPAL FLAW OF THE GROUND WATER PLAN
IS ITS IMPOSITION UPON INNOCENT DOWNGRADIENT LANDOWNERS
OF THE BURDEN OF ENDURING CONTAMINATION ON THEIR
PROPERTY FOR A VERY LONG PERIOD OF TIME.

The petroleum hydrocarbon contamination that has flowed in the ground water from the refinery onto neighboring properties is the result of the refinery's faulty design and maintenance of the impoundments in the "impoundment area". Had the refinery owners properly managed the impoundments, and spent sufficient funds to prevent the loss of petroleum into the ground water, the neighboring property owners would not have the accute problem of carcinogenic compounds in the soil and ground water on their property. The refinery owners' failure to expend sufficient funds to prevent this problem is the sole cause of the problem. They are solely at fault. And yet the preferred plan for ground water---solely to save the refinery owners money---proposes to allow the refinery owners to dispense with active remedial measures on the Van Voorhis property. The

lack of such measures will allow hazardous conditions to remain on the Van Voorhis property for an estimated period of forty-two years. By contrast, according to the agency's ground water preferred plan document, the active remedial measure of vacuum enhancement will achieve remedial action objectives elsewhere in the impacted area in less than thirteen years. Other active remediation methodologies may work even faster.

Why then must the Van Voorhis owners endure these conditions for so long? According to the discussion on pages 11 through 13 in the ground water preferred plan document, there appears to be no technical infeasibility of wider use of vacuum enhanced remediation. Property access is noted as a potential problem, but it is not an impediment for areas where the owners are willing to grant access. That leaves only cost. But why should the refinery owners---who have no financial difficulty in paying more to clean up their mess---be allowed to save money, when they are the sole cause of this problem? And why should the Van Voorhis property owners bear the burden of this contamination for decades merely to save the refinery owners money? There are no satisfactory answers to these questions. To adopt a passive remediation plan for this area simply to save money is enormously unjust to the downgradient landowners. Moreover, the preferred plan sets a very dangerous precedent in Ohio EPA's property remediation program that will be relied upon by future soil and ground water polluters in an effort to minimize remediation costs. If the preferred plan is not altered, Ohio EPA will most likely regret setting such a precedent.

III. NATURAL ATTENUATION IS UNSUITABLE WHERE THE GROUNDWATER WILL BE DISTURBED DUE TO CONSTRUCTION DURING THE PERIOD PRIOR TO ACHIEVEMENT OF REMEDIAL ACTION OBJECTIVES.

Natural attenuation is unsuitable on the Van Voorhis property due to plans to develop the property. The property is agricultural now, but it will not be so for very long. The Van Voorhis owners and the City of Heath are working on a comprehensive development plan for the property that will result in substantial construction on the property within the next five to twenty years. Thus, the contaminated ground water will not remain undisturbed. Construction and utility workers will come into contact with it in the process of dewatering for, and performance of, foundation construction and utility line installation. The presence of the benzene and other dangerous compounds in the ground water will present a hazard when that occurs. Thus, where natural attenuation may make sense if the ground water will not be disturbed during the period prior to achieving remedial action objectives, it certainly does not make sense on the Van Voorhis property where substantial subsurface disturbance will occur in the near term.

IV. OHIO EPA'S REMEDY SELECTION CRITERIA FAVOR ACTIVE REMEDIATION OF GROUND WATER CONTAMINATION ON THE VAN VOORHIS PROPERTY.

Ohio EPA's eight criteria for selecting a remedy, taken as a whole, favor active remediation of ground water on the Van Voorhis property. Of the eight, only one, cost, favors natural attenuation. Another, community acceptance, is difficult to judge at this time, although it is reasonable to assume that the community would prefer quicker achievement of remedial action objectives through active remediation, especially since that would likely result in quicker economic development of the property and the resultant creation of jobs. Two, long term effectiveness and implementability, are essentially satisfied by both remedial approaches. Once remedial action goals are achieved by either method, and if the source of the contaminant "plume" is removed, both approaches will be effective in the long term. And, both are implementable.

The remaining four criteria---overall protection of human health and the environment; compliance with regulatory requirements; reduction in toxicity, mobility, and/or volume through treatment; and short-term effectiveness---all strongly favor active remediation.

Overall protection of human health and the environment. Natural attenuation, under the current estimate, will attain remedial action objectives (i.e., concentrations of contaminants that are considered non-hazardous to human health under non-residential exposure assumptions) in forty-two years. Vacuum enhanced remediation or another active remediation method will work much quicker in achieving objectives. The preferred plan document estimates a compliance period of eight to thirteen years in residential areas with lower concentration objectives using VER. Thus, that time frame may be even shorter in areas that are currently non-residential. Clearly, human health and the environment are better protected the sooner the hazard is removed, thus strongly favoring active remediation. In addition, as noted above, ground water on the Van Voorhis property will be disturbed through construction well before forty-two years elapse. That construction will present a potential hazard. Thus, to avoid such a hazard, non-hazardous concentrations should be achieved, if possible, prior to such human exposure to the ground water. Thus, this criterion strongly favors achieving remedial action objectives as soon as possible through employment of active remediation of ground water.

Compliance with regulatory requirements. This is, again, a question of how to attain clean water goals the quickest, and thus restore the quality of ground water to that required by law. Compliance in forty-two years should be unacceptable to Ohio EPA, when compliance can be achieved much sooner.

Reduction of toxicity, mobility, or volume through treatment. Natural attenuation involves no treatment. Active remediation does. This criterion thus favors active remediation.

Short-term effectiveness. This criterion favors a method that abates hazardous conditions quickly, and achieves remedial objectives as soon as practicable. Active remediation is clearly preferred on this criterion.

Given this clear preference of the selection criteria for active remediation, it is very difficult to understand why Ohio EPA has proposed to select passive natural attenuation in the non-residential properties, including the Van Voorhis property. There can be but one explanation. Ohio EPA has elevated the cost criterion to a position that is more important than the others combined, including the protection of human health during the forty-two year passive remediation period. This might be understandable if the refinery owners had limited funds available for remediation, or if the likelihood of human intrusion into the ground water during the forty-two year period was remote. But neither is true. The refinery owners are surely financially capable of funding active remediation throughout the impacted area. And, the protection of human health requires as prompt achievement of health-protective standards as possible.

Ohio EPA should discard its result-oriented evaluation of the remedy selection criteria, and apply them rationally and objectively to require active remediation on all properties containing ground water that is not compliant with remedial action objectives.

V. THE SELECTION OF MONITORED NATURAL ATTENUATION FOR THE VAN VOORHIS PROPERTY DOES NOT CONFORM TO USEPA'S RECENT DIRECTIVE ON THE APPROPRIATE USE OF THAT REMEDY.

On April 21, 1999, USEPA issued a directive authored by its Office of Solid Waste and Emergency Response entitled, "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites", (Directive Number 9200.4-17P). The purpose of the directive is to describe those circumstances in which selection of natural attenuation as a remedy for soil and ground water contamination is appropriate. The directive, as applied to the Van Voorhis property, dictates against use of natural attenuation.

The directive recognizes that monitored natural attenuation (referred to in the directive as "MNA") can be an appropriate remedy, but only "under a limited set of site circumstances" (Directive, at 25). The directive notes that MNA has important disadvantages, including the length of time needed to attain remedial action objectives, and the need for "institutional controls" to prevent exposure to the contamination during the remediation period (Directive at 10). Thus, the directive provides that those sites where MNA is appropriate are those at which

the timeframe to complete remediation "is reasonable . . . compared to timeframes required for other more active methods", and is inappropriate at sites where "human health . . . may be adversely impacted as a consequence of selecting MNA as the remediation option." (Directive, at 17). As to the Van Voorhis property, both points dictate against natural attenuation. The remediation time frame of forty-two years is clearly unreasonable when compared to vacuum enhanced remediation of less than one-third of that time. And, as noted above, construction on the property will involve human exposure to the contaminants during the remediation period. Indeed, at page 12, the directive reasserts USEPA's continuing commitment to a remedy selection criterion of "prevent[ing] exposure to the contaminated groundwater". Both factors render natural attenuation unsuitable for this site.

Other provisions of the directive illustrate the impropriety of natural attenuation in this circumstance. As to the assessment of whether the remediation time for MNA is reasonable, the directive indicates that uncertainty in estimating that time frame is a negative factor that dictates against selection of MNA (Directive at 20). Ohio EPA's preferred plan document indicates the agency's lack of confidence in the accuracy of the forty-two year estimate by providing for implementation of a "contingent remedy" if the pace of the remediation is too slow. Thus, the time needed for MNA to achieve nonhazardous levels of contamination may prove to be longer than forty-two years, and thus even more unreasonable.

As to human exposure to contaminants, the directive addresses petroleum contamination as uniquely inappropriate for MNA if there is any likelihood of human contact with the contamination. The directive, at page 7, describes a residue of "heavier petroleum hydrocarbons", often left after remediation of the BTEX compounds, that pose a hazard if contacted by humans, and may continue to leach to ground water. The directive states, "For these reasons, MNA alone is generally not sufficient to remediate petroleum release sites. Implementation of source control measures in conjunction with MNA is almost always necessary. Other controls (e.g., institutional controls), in accordance with applicable state and federal requirements, may also be necessary to ensure protection of human health and the environment." This reference to "institutional controls" means the prevention of human access to the contamination through restrictions on use of the site or by other means. The Van Voorhis property, however, has no such restrictions, and, indeed, development plans will make human exposure to the ground water likely. In these circumstances, as indicated by the directive, MNA is inappropriate.

The directive also emphasizes that MNA is appropriate only if the source of the contamination is eliminated so as to prevent further migration of contaminants into the area undergoing MNA (Directive, at 21, 22). The attached comments of Mr. Renz raise serious questions regarding the sufficiency of

source control at this site, due to inadequacies in the lagoon remediation plan. Those inadequacies are another reason to reject MNA at this location.

Ohio EPA should carefully review the directive prior to choosing a remedy at this site, and should conclude that natural attenuation is inconsistent with the directive and thus inappropriate for this site.

VI. THE CONTINGENT REMEDY OF SHIFTING TO ACTIVE REMEDIATION IS NOT SUFFICIENT TO JUSTIFY THE SELECTION OF NATURAL ATTENUATION.

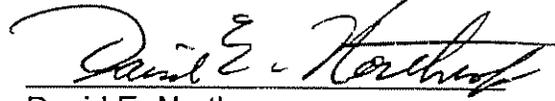
The preferred plan, at 15 and 16, discusses contingent remedies to be employed if the remedies chosen in the preferred plan do not perform as expected. This implies that if natural attenuation is not reducing contaminant concentrations at the predicted rate, Ohio EPA will require the refinery owners to shift to an active remediation method such as vacuum enhancement. This, however, is insufficient to justify natural attenuation, for, as a practical matter, it may not significantly accelerate achievement of remedial action objectives. The preferred plan states that vacuum enhanced remediation will achieve objectives in less than thirteen years, as compare to forty-two years for natural attenuation. But several years---perhaps ten or more---may pass before Ohio EPA concludes that attenuation is proceeding too slowly. Then, additional years will be devoted to negotiations, dispute resolution and contingent remedy design prior to implementing the active remedy. Thereafter, the active remedy will be implemented for up to thirteen additional years. The result of all this is that it may be well over twenty years---even as long as thirty---before the contingent remedy achieves objectives. This compares poorly to the lesser time frame involved in employing active remediation in the first instance. Thus, the presence of such a contingent remedy as a "backup" to natural attenuation is of little value to the Van Voorhis owners, and is insubstantial support for the choice of natural attenuation as the preferred remedy.

VII. CONCLUSION

Natural attenuation has considerable cost advantages to the refinery owners, but nearly nothing else positive to support its choice. Cost savings to the companies that caused this problem is insufficient to support a remedy that forces the property owners to endure the presence of the companies' contaminants for over forty years. More importantly, construction and utility installation on the Van Voorhis property will disturb the ground water and cause human exposure to it, thus rendering natural attenuation unsuitable.

These reasons, and those discussed in the attached comments of Mr. Renz, should cause Ohio EPA to require active remediation of the Van Voorhis property.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "David E. Northrop". The signature is written in a cursive style with a horizontal line underneath it.

David E. Northrop

DATED: June 2, 1999

Samuels & Northrop Co., LPA
180 E. Broad St., Suite 816
Columbus, Ohio 43215
(614) 464-3232

Attorney for the Van Voorhis Owners

Renz & Associates, Inc.

Environmental Geologists and Engineers

Ph. 614-538-0451
Fax 614-538-0310

David E. Northrop, Esq.
Samuels & Northrop Co., LPA
180 East Broad Street, Suite 816
Columbus, Ohio 43215

RE: Ramp Creek Site, Heath, Licking County, Ohio
Comments Regarding Ohio EPA Preferred Plans
for the Remediation of Impoundment Area and Ground
Water at the Ramp Creek Site, Heath, Ohio, April 1999.

Dear Mr. Northrop:

In accordance with your request I have reviewed the Preferred Plans for the Impoundment Area and for the Remediation of Ground Water for the Ramp Creek Site in Heath, Ohio. The purpose of this effort was to determine how the preferred plans would impact the Van Voorhis family's land which adjoins the refinery and is considered part of the Site. The presence of petroleum impacted soil and ground water on the Van Voorhis family property presents a number of practical problems and impediments to the planned development of the land. The depth to ground water and the "Smear Zone" of the soil in which petroleum contamination are present is very shallow. Measurements on-site indicate that the ground water is as little as two feet below grade in the area directly down-gradient from the impoundments. As a result, petroleum contaminated materials will be encountered during site development activities such as excavation or cut and fill operations. Soil generated in the impacted areas will require chemical characterization, special transportation, staging and storage procedures and treatment and/or disposal. The presence of petroleum contaminants at such shallow depths limit the land use options. These impacts of the release are not considered by the Ohio EPA Preferred Plans.

Impoundment Area

The Van Voorhis property is situated immediately down-gradient from the refinery property. As a result the property has been impacted by the release of contaminants from the refinery. The specific sources of contamination were never identified; however, two known sources remain: the impoundments containing liquids and sludge and the fugitive petroleum in the soils and ground water. Abatement of these known sources is vital to the restoration of the Van Voorhis family's property as contamination will continue to cross the property line and impact the site. Therefore removal of these continuing sources of contamination is needed to restore the Van Voorhis land within a reasonable period of time. The depth to ground water in the area of the impoundments is approximately two to three feet below grade. As a result, the impoundments and their contents are in contact with the ground water. Effective hydraulic communication between the contents of the impoundments and the shallow ground water is apparent by the fact that the fuel wastes have been migrating out of the impoundments and into the ground water. Free product has been previously detected around the impoundments and is likely to still be present in lenses around the impoundments.



The Ohio EPA Preferred Plan for the Impoundment Area (Alternative 3), consists of de-watering, stabilizing the contents with binding agents, skimming off the floating hydrocarbons and installing a cap. Institutional controls, including deed restrictions, are planned to be used as well. This option does not remove the highly contaminated soils around the impoundments. These soils are likely to be saturated with fuel wastes and will be a continuing source of contamination. Based on the fact that free product was detected in down-gradient wells on the Van Voorhis property, it is probable that free-product is present around the impoundments. The presence of free-product around the impoundments has not been ruled out and is not addressed by the preferred plan.

If the cap extends beyond the limits of each impoundment, the flux of water infiltrating through the surrounding soils will be reduced. However, these residual materials will still be exposed to ground water and contaminants will be advected down-gradient onto the Van Voorhis property. This option will also not achieve the Remedial Action Objectives in this area as it does not treat the surrounding soils.

Ground Water

The Ohio EPA Preferred Plan for the Remediation of Ground Water for the Van Voorhis Property is Monitored Natural Attenuation.

The Ohio EPA preferred remedy should be reconsidered for a number of reasons. The estimated time frame for natural attenuation is 42 years. This is an extremely long time frame for remediation and the estimate does not take into account the presence of free-product around the impoundments. The mass of petroleum present as free-product has not been determined and therefore the prediction of the remedial time frame is likely to be underestimated. Furthermore, the estimated time frame for natural attenuation is based upon the assumption that precipitation will be free to penetrate the soils and leach fuel compounds from the smear zone into the ground water where they will be biologically degraded. The off-site area will be developed in the near future and the land surface will be greatly altered through pavement, building foundations and other structures which will dramatically reduce infiltration. Therefore the time for natural attenuation to achieve the ultimate Remedial Action Objectives is likely to be significantly greater than predicted.

The evaluation of the remedial options does not take into account the fact that free-product has been detected around the impoundments and may be present on the Van Voorhis property. Natural Attenuation is not appropriate when free-product is present and acting as a source for continuing dissolution of hydrocarbons into ground water. Recovery of hydrocarbons in the form of free-product yields the greatest environmental benefit per unit cost of all remedial methods and therefore should be employed. The removal of free-product and highly contaminated soils from the source area will greatly reduce the remedial time frame at a relatively reasonable cost.

The studies performed on the site have shown that natural degradation has been taking place under anaerobic conditions. Anaerobic degradation produces methane gas and is much slower than aerobic degradation. When the Van Voorhis land is developed, methane will accumulate under the paved



surfaces and building foundations and may intrude into the structures. Although methane is not toxic or carcinogenic, it is a flammable gas and a simple asphyxiant. The impacts and risks associated with this degradation product once the adjoining Van Voorhis property is developed have not been considered. Enhancing the natural degradation process and facilitating aerobic break down of the hydrocarbon contamination would reduce the amount of methane generated and significantly reduce the remedial time frame. The only method of enhancement considered by the Preferred Plan is the induction of air into the subsurface by Vacuum Enhanced Recovery (VER). Induction of air or "BioVenting" is an associated benefit of VER, and not its primary function. The natural degradation process could be augmented with simpler and less costly methods such as air sparging or the injection of oxygen releasing compounds and nutrients. The extremely shallow depth to ground water and geology of the site in the up-gradient area makes the use of such methods practical. Augmented natural attenuation would also be less susceptible to disruption by the effects of development of the Van Voorhis property.

As indicated on Figure 2 of the Ohio EPA Preferred Plan for the Remediation of Ground Water, the Van Voorhis property constitutes a large portion of the impacted, off-site area. As such, the remediation of this area should be given greater consideration. Although the use of the airport will not likely be residential, the use of the Van Voorhis property as residential land cannot be ruled out. Given the apparent rate of population growth in Licking County, a wide number of development and land use options is possible.

Recommendations

The remedy currently preferred by Ohio EPA presents a very economical approach to the task of remediating the release. However, the method basically relies on the Van Voorhis property as a treatment system by allowing the residual wastes to migrate into the ground water and be carried off the refinery site to degrade on the adjoining property. Although significant consideration was given to the economic cost relative to the oil companies, no consideration of the cost impact on the adjoining land owner was included in the evaluation of remedial options.

I recommend that Ohio EPA be requested to require that location and volume of free product be determined around the impoundment area and along the fence line. This can be easily and quickly accomplished by the use of a Geoprobe™ and the installation of temporary wells. It should be noted that due to the viscosity of free-product, phase separated hydrocarbons will not immediately appear in the wells and some period of time must be allotted for the material to accumulate. The occurrence of the free-product is likely to be discontinuous in the form of lenses and this should be considered when exploring the extent of free-product. Free-product should be recovered from the water table. Due to the shallow depth of ground water, simple recovery devices like interception trenches and sumps can be practically installed. Areas where the soil is saturated with hydrocarbons, excavation and treatment of the impacted soil should be considered. On-site treatment of petroleum contaminated soil is a straight forward process and generally not cost prohibitive. Highly impacted soils could be excavated and stockpiled on the refinery property and treated through enhanced biological degradation.



With the free-product and grossly contaminated soil removed, the natural degradation process should be augmented to facilitate aerobic decay. A broad range of augmentation methods should be considered such as installing a trench infiltration gallery for the injection of oxygen releasing compounds and nutrients or the installation of air sparging units.

Respectfully submitted,
Renz & Associates, Inc

Michael E. Renz
Geologist



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OHIO ENVIRONMENTAL PROTECTION AGENCY

PUBLIC MEETING

REGARDING: RAMP CREEK PREFERRED PLANS

- - -

Heath Municipal Building
1287 Hebron Road
Heath, Ohio
Wednesday, May 26, 1999
6:30 p.m.

- - -

Met, pursuant to assignment, at 6:30 p.m.

BEFORE:

Ms. Tracy Freeman, Public Hearing Officer.

- - -

INDEX

PUBLIC TESTIMONY

PAGE

Mr. Frank Hartzell

4

- - -

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Columbus, Ohio 43215-5201
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Fax - (614)224-5724

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ARMSTRONG & OKEY, INC., Columbus, Ohio

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Wednesday Evening Session,
May 26, 1999.

- - -

HEARING OFFICER FREEMAN: I'd like to welcome everyone to the public hearing portion of tonight's meeting. The purpose of this hearing to is accept comments for the official record regarding the proposed preferred plans for remediation of petroleum contamination at Ramp Creek in Licking County, Ohio.

There are two preferred plans proposed, one for cleanup of petroleum-based contaminants that accumulated in the bottom of five surface impoundments, the other is for groundwater contamination affecting the City of Heath, the sanitary sewer system and water falling near the Ashland facility. Additional details of the proposal are outlined on the fact sheet available at the sign-in table. Complete copies of the preferred plans can also be obtained through Mr. Myers.

Oral comments received at tonight's hearing and written comments received during the public comment period will receive the same consideration. Written comments should be directed to Ohio Environmental Protection Agency, Central District Office, attention Fred Myers, 3232 Alum Creek Drive, Columbus, Ohio 43207. This address is also printed at the bottom of

1 the agenda for tonight's meeting.

2 All written comments must be received by the
3 close of business on June 2nd, 1999.

4 There is no question-and-answer period during
5 tonight's public hearing session. These hearings are
6 held to allow citizens the opportunity to provide input
7 to Ohio EPA's decision-making process.

8 All testimony is recorded on the official
9 record by a court reporter. If you have a question,
10 please include it in your testimony and your questions,
11 along with your comments, will be responded to in
12 writing.

13 The Responsiveness Summary will be provided to
14 everyone who attended tonight's hearing and also to
15 those providing written comments. Ohio EPA will review
16 all comments received during the comment period and at
17 tonight's meeting before a staff recommendation is made
18 to the director of Ohio EPA. All final decisions are
19 appealable to the Environmental Review Appeals
20 Commission, which is a separate board from Ohio EPA that
21 reviews cases in accordance with Ohio's laws and rules.

22 An order issued by the Environmental Review
23 Appeals Commission may be appealed to the Court of
24 Appeals of Franklin County. Lots of "appeals" in that
25 sentence.

1 If you would like to present testimony at the
2 hearing and have not filled out a blue card, I would ask
3 you to do so at this time. I will call the names on the
4 cards in the order in which I receive them.

5 A court reporter is here to make a stenographic
6 record of tonight's proceedings. When I call your name,
7 I would ask that you stand, state your name for the
8 record and then proceed with your testimony.

9 Everyone will have one opportunity to testify,
10 so I would ask that you use your time wisely. You are
11 limited to ten minutes. I will let you know when your
12 time is almost up, if you get close, so that you can
13 complete any concluding remarks.

14 The only card that I have at this time is from
15 Mr. Frank Hartzell. You can either come up here or you
16 can stay at your seat, it's up to you, as long as the
17 court reporter can hear you.

18 MR. HARTZELL: I live at 1257 Hebron Road, and
19 so just hearing this I thought I should offer what I
20 knew about it, which I take the dog for a walk every day
21 up the back here along City Hall along Ramp Creek, so I
22 go along Ramp Creek a lot.

23 I've seen oil on Ramp Creek on three occasions.
24 The dog one day, it was during the winter, went in the
25 water, it was ice on the water but the river was up, and

1 he come back with a whole bunch of oil stuck in his fur.
2 I had to take him home and get the oil out of his fur.
3 I didn't know anything about this at that time.

4 Another time he had a little bit on him when I
5 got back, and it was also high water. But just about
6 two weeks ago I took my mountain bike and went through
7 there and I was rolling through and I saw some
8 distinctive pattern of rainbow come up when I was going
9 along there, you know. It was about two weeks ago, and
10 I hadn't even heard about this yet.

11 So that was my -- what I wanted to give as
12 input. So I think you should continue to look at Ramp
13 Creek.

14 HEARING OFFICER FREEMAN: Do we have any other
15 citizens that wanted to make comments or testimony for
16 the official record?

17 (No response.)

18 HEARING OFFICER FREEMAN: Okay. Well, seeing
19 no further requests to present testimony, I would like
20 to remind you that the public comment period, again, is
21 open through the close of business on June 2nd, which
22 means you may submit any written comments through till
23 5:00 on that day.

24 Also, you may review the plans and related
25 materials at Ohio EPA's Central District Office in

1 Columbus by calling Mr. Myers at the Division of
2 Emergency & Remedial Response, the number is located at
3 the bottom of the fact sheet available at the
4 registration table.

5 As I stated before, we will be around for a few
6 minutes after the meeting, go through some of the maps
7 and explain anything if you have questions you'd like
8 answered.

9 I would like to thank you very much for
10 attending tonight's meeting. We really do appreciate
11 your input into the decision process, and all comments
12 are taken very seriously. Thank you, and good night.

13 (The hearing concluded at 7:42 p.m.)

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CERTIFICATE

I do hereby certify that the foregoing is a true and correct transcript of the proceedings taken by me in this matter on Wednesday, May 26, 1999, and carefully compared with my original stenographic notes.

Maria DiPaolo Jones

Maria DiPaolo Jones, Registered
Diplomate Reporter and CRR.