

DECISION DOCUMENT FOR THE REMEDIATION OF

Jennison Wright

Lucas County, Ohio

prepared by

THE OHIO ENVIRONMENTAL PROTECTION AGENCY

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I certify this to be a true and accurate copy of the official document as filed in the records of the Ohio Environmental Protection Agency.

By: Donna Jackson Date: 6-14-04

DECLARATION

SITE NAME AND LOCATION

The Jennison Wright Facility (the Site) is located in Lucas County, at 2332 Broadway Avenue, in Toledo, Ohio (Site Location Map, Figure 1-1).

STATEMENT OF BASIS AND PURPOSE

This Decision Document presents the selected remedial action for the Jennison Wright facility in Lucas County, Ohio, chosen in accordance with the policies of the Ohio Environmental Protection Agency, statutes and regulations of the State of Ohio, and the National Contingency Plan, 40 CFR Part 300.

ASSESSMENT OF THE SITE

Actual and threatened releases of polynuclear aromatic hydrocarbons (PAHs), various light, non-aqueous phase liquids (LNAPLs) and various dense, non-aqueous phase liquids (DNAPLs) at the Site, if not addressed by implementing the remedial action selected in the Decision Document, constitute a substantial threat to public health or safety and are causing or contributing to air or water pollution or soil contamination. The Site was the location of a wood treating facility from the early 1900s to 1990. While in operation, the facility treated wood products, including railroad ties and flooring, using primarily creosote and other coal tar materials. The plant also used coal tar to manufacture an asphalt pavement sealer known as Jennite.

DESCRIPTION OF THE SELECTED REMEDY

Ohio EPA has selected, as its Preferred Alternative, remediation which encompasses three elements. The elements are described in the Feasibility Study Report (dated January 3, 2001) as Surface Soil Alternative SS-4, Shallow Ground Water Alternative SG-3, and Bedrock Ground Water Alternative BG-3. Both ground water alternatives, as set forth in the Preferred Plan dated April 4, 2003, have been slightly modified by Ohio EPA such that aggressive ground water monitoring during the early years of remedy implementation will be conducted and play a role in any future decision to add additional wells and/or modify monitoring schedules. Thus, additional well installation could exceed the number of wells proposed in Alternatives SG-3 and BG-3.

In addition, a use restriction agreement with limitations on the use of property and a prohibition against the use of ground water beneath the property will be implemented.

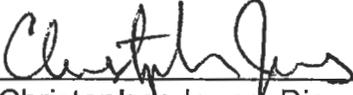
Surface Soil Alternative SS-4 provides for a soil cover consisting of six inches of topsoil placed over the areas to be addressed. The soil cover will serve to eliminate the incidental ingestion, dermal and inhalation hazards presented by dust and volatile constituents.

Alternative SG-3 restricts the future use of the shallow aquifer through deed restrictions and provides for monitored natural attenuation. Use restrictions will be in place until such time as a demonstration can be made that ground water has attenuated to the degree necessary for unrestricted use. The monitored natural attenuation alternative includes the performance of quarterly shallow ground water sampling for one year, and an evaluation of the first year of ground water monitoring data as the first step in developing monitoring schedules for subsequent years. Unsatisfactory progress could necessitate the installation of up to eight new shallow ground water wells.

Alternative BG-3 restricts the future use of the bedrock aquifer and provides for monitored natural attenuation. The monitored natural attenuation alternative will include performance of quarterly bedrock ground water sampling for one year, and an evaluation of the first year of ground water monitoring data as the first step in developing monitoring schedules for subsequent years. Unsatisfactory progress could necessitate the installation of up to six new bedrock ground water wells.

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 and treatment technologies 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.



Christopher Jones, Director

6-11-04
Date

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DECISION SUMMARY

Jennison Wright

Lucas County, Ohio

1.0 SITE BACKGROUND

1.1 Site History

The Jennison Wright Facility (the Site) is located in Lucas County, at 2332 Broadway Avenue, in Toledo, Ohio (Site Location Map, Figure 1-1). The Site was the location of a wood treating facility from the early 1900s to 1990. While in operation, the facility treated wood products, including railroad ties and flooring, using primarily creosote and other coal tar materials. The plant also used coal tar to manufacture an asphalt pavement sealer known as Jennite.

Site Ownership and Operation

The Site is triangular in shape and occupies approximately 23 acres (Historical Site Layout, Figure 2-1). It is bordered on the south by Norfolk and Western Railway Company tracks, on the north and west by the Anthony Wayne Trail, and on the east by abandoned industrial buildings and a residential neighborhood. Jennison Wright operated on the approximately 23-acre Site via two separate leases from two railroad companies. One lease covered the western 16 acres of the Site, while the second lease covered the eastern 6 acres.

Approximately 16 acres of the Site are owned by Norfolk & Western, who leased the property to Jennison Wright. Jennison Wright Corporation (Jennison Wright I) was incorporated in 1910. The assets of Jennison Wright I were sold in 1981 to a newly formed corporation called The Jennison Wright Corp. (Jennison Wright II). The name of Jennison Wright I was changed to J.W. Liquidating Corporation after the sale of assets.

In 1987, Ohio EPA and Jennison Wright II entered into a consent decree to perform a Remedial Investigation (RI) for the entire approximately 23-acre Site to address violations of state hazardous waste and water pollution laws. A RI Report, prepared by Woodward Clyde Consultants, was submitted to the Agency in October 1988; however, Ohio EPA disapproved the Report, listing specific deficiencies. Jennison Wright II filed Chapter 11 bankruptcy on November 17, 1989.

Some time after the Jennison Wright bankruptcy declaration of 1989, Norfolk and Western merged with Southern Railway, and became Norfolk Southern Railway Company. Norfolk Southern (NS) is one of the settling parties under the current order.

About six acres of the property were owned by Penn Central, leased to Jennison Wright I, and eventually sold to Jennison Wright II. Penn Central conveyed its liability to Consolidated Rail Corporation (Conrail) as a result of the Regional Railroad Reauthorization Act.

An Administrative Order on Consent was signed June 2, 1994 among the State of Ohio, Norfolk & Western Railway Company [later Norfolk Southern (NS)] and Conrail for a Remedial Investigation and Feasibility Study for the entire approximately 23-acre Site. Although Jennison Wright I, Jennison Wright II, and Penn Central were invited to participate in the agreement, they declined to enter into the consent agreement. Penn Central indicated it would not participate in the consent order because of a pending court case concerning liability for environmental damage under the Regional Railroad Reauthorization Act.

An Interim Remedial Action (IRA) was undertaken at the Site between October 1994 and April 1995 to remove all vessels, structures, drums, waste piles and residuals of creosote-contaminated soils for appropriate off-Site disposal. Approximately \$6 million dollars was expended during this removal action by Norfolk & Western and Conrail.

On August 15, 1995, the Findings & Orders were amended to add American Premier Underwriters, Inc. (formerly Penn Central).

According to Lucas County Auditor records, Mr. Ron Gorney acquired the 6 acres that had been owned by Jennison Wright II, as forfeited land, on June 2, 1998.

Disposal History

The Site was the location of a wood treating facility from the early 1900s to 1990, when the facility was closed. While in operation, the facility treated wood products, including railroad ties and flooring, using primarily creosote and other coal tar materials. The plant also used coal tar to manufacture an asphalt pavement sealer.

The types of contaminants typically found in association with creosote and coal tar operations include polynuclear aromatic hydrocarbons (PAHs), various light, non-aqueous phase liquids (LNAPLs) and various dense, non-aqueous phase liquids (DNAPLs).

A disposal pit, designated Disposal Area #1, was located in the northern corner of the facility. The pit was covered with soil and other materials sometime prior to 1981. Also in the northern end of the facility, a pit or tank containing creosote and/or coal tar was used for storage while creosote was manufactured from coal tar on-Site. This process was discontinued in 1969. A building used for the production of creosote from coal tar was formerly located at the north end of the facility. At an unknown date, a fire at this location burned a former dock. Another fire occurred at the southwest corner of the Site in October 1983.

Past Investigations

On February 4, 1987, the Jennison Wright Corporation and the State of Ohio entered into a Consent Order requiring the Company to conduct a Remedial Investigation/Feasibility Study (RI/FS). The RI reached the following conclusions: organic constituents were found in the upper four feet of soil over much of the Site centered in areas where plant processes were conducted; PAHs were found to extend to the soil/bedrock interface in one area; and a black, tar-like substance was found in voids in the rock at three boring locations. The results of the ground water investigation indicated that shallow and bedrock ground water exist under the Site. Constituents associated with plant operations were found in samples from four shallow and two deep wells at the Site. The RI was not completed until the parties entered into a second Consent Order a few years later.

The Consent Order signed by Ohio EPA, Norfolk and Western, and Conrail in 1994 included a requirement to perform an Interim Remedial Action (IRA). The IRA work began in October 1994 and concluded in March 1995. The objectives of the IRA were to reduce exposure to risks associated with residues, reduce physical risks associated with remaining structures and debris, reduce the risk of fire and remove surface obstructions which might interfere with completion of the RI at the Site.

Wastes removed from the Site during the IRA included 39,500 tons of tar-impacted soil, 885 tons of tar and sludge from tanks, 129,118 gallons of water and 2,100 tons of debris. Approximately 460 tons of steel were decontaminated and recycled, and 3,350 tons of concrete debris were removed, decontaminated, crushed, and used to backfill excavations. Asbestos was removed from three tanks and disposed off-Site.

1.2 Summary of the Remedial Investigation

The Remedial Investigation Report (RETEC, 1997) and Remedial Investigation Report Addendum I (RETEC, 1998) present the results of the RI performed at the Site between April 1996 and March 1998. The RI was structured to gather information required to achieve three goals:

- prepare a Site model which accurately describes existing conditions at the Site with an emphasis on hydrologic conditions, Site stratigraphy, sources of constituents, and the fate and transport of chemicals of interest;
- collect data on chemicals of interest in soil and ground water adequate to allow preparation of baseline human and environmental risk assessments; and
- collect Site physical and chemical data adequate to allow the preliminary evaluation of the feasibility of implementing potential remedial technologies.

Soil and ground water sampling was conducted as part of the RI. Results, relevant to the FS, are summarized below.

The Remedial Investigation was conducted by Norfolk Southern Railway Company (Norfolk & Western Railway Company), Consolidated Rail Corporation (Conrail) and American Premiere Underwriters (formerly Penn Central) and included a number of tasks to identify the nature and extent of Site-related chemical contaminants. The remedial investigation was conducted with oversight by Ohio EPA and was approved on December 30, 1999. The tasks included sampling of soil 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. This Decision Document contains only a brief summary of the findings of the Remedial Investigation and Feasibility Study (FS). Please refer to the Remedial Investigation Report (RI) and FS Report for additional information on contaminant concentrations.

The nature and extent of contamination at the Jennison Wright facility in each environmental medium and the contaminants of concern attributable to the Site are described below.

1.2.1 Soil Contamination

Surface Soil Contamination

Twenty-one (21) surface soil samples were collected during the RI from depths of 0 to 0.5 feet below grade. Samples were collected across the Site in areas that were excavated and backfilled during the IRA and in areas that were left undisturbed. Polynuclear Aromatic Hydrocarbons (PAHs) and carcinogenic PAHs were detected in 19 of the 21 surface soil samples analyzed during the RI. Detected total PAH concentrations ranged from 0.39 to 6,131 mg/kg (milligrams per kilogram), and total carcinogenic PAH concentrations ranged from 0.247 to 3,706 mg/kg. The highest concentrations of PAHs and carcinogenic PAHs were detected in samples from the central and eastern areas of the Site that were not excavated during the IRA.

Subsurface Soil Contamination

Twenty-one (21) subsurface soil samples were collected in the same locations as the surface soil samples from depths of 0.5 to 1.5 feet below grade. Detected total PAH concentrations ranged from 0.13 to 753.1 mg/kg, and total carcinogenic PAH concentrations ranged from 0.082 to 392 mg/kg. The highest total PAH concentration was detected in the center of the Site, immediately outside of the IRA excavated area. Other total PAH concentrations above 200 mg/kg were detected in the center of the Site within the excavated area and in the southwest corner of the Site.

1.2.2 Ground Water Contamination

Shallow Ground Water Contamination

Ground water from 16 shallow monitoring wells was sampled and analyzed for volatile organic compounds (VOCs), PAHs, and metals. Detectable concentrations of PAHs were found in six of the 17 monitoring wells sampled. Naphthalene concentrations of 10,000 ug/l (micrograms per liter) and 6,800 ug/l were detected in MW-10 and MW-19, respectively. Benzene was detected in MW-2, MW-10, and MW-19 at concentrations of 72 ug/l, 44 ug/l, and 26 ug/l, respectively. Arsenic and barium, which were detected in wells across the Site, are believed to be naturally occurring.

Bedrock Ground Water Contamination

Ground water samples from nine monitoring wells screened in the bedrock aquifer were analyzed for PAHs, VOCs, and metals. Detectable concentrations of PAHs were found in five of the nine bedrock monitoring wells in the northern and eastern areas of the Site.

After evaluation of data from the Remedial Investigation, separate lists of Constituents of Interest (COI) for soil and ground water were developed. The COI identified for surface and subsurface soil include priority pollutant PAHs, 1-methylnaphthalene, 2-methylnaphthalene, arsenic, barium, chromium, and mercury. COI identified for shallow and bedrock ground water include benzene, ethylbenzene, toluene, xylene, arsenic, barium, and all 16 PAHs except acenaphthylene and benzo (g,h,i) perylene.

1.2.3 Interim or Removal Actions Taken to Date

The Consent Order signed by Ohio EPA, Norfolk and Western, and Conrail in 1994 included a requirement to perform an Interim Remedial Action (IRA). The IRA work began in October 1994 and concluded in March 1995. The objectives of the IRA were to reduce exposure to risks associated with residues, reduce physical risks associated with remaining structures and debris, reduce the risk of fire and remove surface obstructions which might interfere with completion of the RI at the Site.

Wastes removed from the Site during the IRA included 39,500 tons of tar-impacted soil, 885 tons of tar and sludge from tanks, 129,118 gallons of water and 2,100 tons of debris. Approximately 460 tons of steel were decontaminated and recycled, and 3,350 tons of concrete debris were removed, decontaminated, crushed, and used to backfill excavations. Asbestos was removed from three tanks and disposed off-Site.

2.0 SUMMARY OF SITE RISKS

A baseline risk assessment was conducted to evaluate current and future risk to human health and ecological receptors associated with contaminants present at the Site. The results demonstrate that the existing concentration of contaminants in environmental media pose risks to human health at a level sufficient to trigger the need for remedial actions.

2.1 Risks to Human Health

Human Health Risk Assessment

The relevant portions of the human health risk assessment are represented by two remedial action objectives for protection of human health from contaminants at a site; “cancer risk” and “non-carcinogenic risk.” The risk assessment identifies a number of potential on-Site and off-Site receptors to the on-Site soil and subjects these receptors to a screening process to identify those likely to be the most exposed to contaminants from the Site. This screening identifies the following receptors as those likely to have the highest exposures.

- Local residents adjacent to the Site potentially exposed to dust or volatiles emitted from on-Site soil transported off-Site with the wind.
- Future on-Site excavation workers potentially exposed to subsurface soil through incidental ingestion, dermal contact and inhalation of dust or volatilized constituents.
- Future on-Site industrial workers potentially exposed to surface soil through incidental ingestion, dermal contact and inhalation of dust or volatilized constituents.

These receptors were subjected to quantitative evaluation. Intake equations consistent with Ohio EPA and USEPA guidance were used to estimate exposure to the receptors for each route of potential exposure evaluated.

Non-carcinogenic risk captures health risks other than cancer. A score of 1.0 or less on the “hazard index” is considered acceptable. For all receptors, the hazard indices at the Jennison Wright Site are below a risk value of 1.0. Therefore, any risk currently associated with non-cancer elements is within the acceptable risk range.

For carcinogens, the cancer risk is unacceptable only with respect to future commercial or industrial workers. This cancer risk is estimated to be 3.8×10^{-4} , which is greater than the upper limit of acceptable risk. USEPA and Ohio EPA consider a risk range of 1×10^{-4} to 1×10^{-6} to be acceptable (indicating a potential cancer occurrence of one in ten thousand persons to one in one million persons), with 1×10^{-6} as a point of departure. The score at the Jennison Wright Site calculates a potential cancer occurrence of 3.8 persons in ten thousand, which is higher than the highest acceptable risk of 1.0 cancer per ten thousand persons.

For ground water, the risk assessment conceptual Site model indicates there are two flow regimes; one through shallow unconsolidated deposits and one through bedrock. Direct use of ground water does not occur on or near the Site and is not expected to occur in the foreseeable future.

2.2 Risks to Ecological Receptors

Environmental Risk Assessment

Because the Site is fenced and located in an urban area, large terrestrial receptors (e.g., deer) are not expected to be present on-Site. The Site is unlikely to provide a suitable habitat for small terrestrial species. As a result, potential exposure pathways to terrestrial ecological receptors are considered incomplete and therefore not a risk. Potential exposures to aquatic species in the Maumee River and Lake Erie are also considered incomplete because constituent migration is not expected to reach these water bodies.

3.0 FEASIBILITY STUDY

A Feasibility Study was conducted by Norfolk Southern, Conrail, and American Premier Underwriters, in order to define and analyze appropriate remedial alternatives. That study, which was conducted with oversight by Ohio EPA, was approved on January 3, 2001. The Remedial Investigation and Feasibility Study are the basis for the selection of 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 (RAO's) 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 by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and USEPA 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 and a range of potential exposed receptors (*i.e.*, local residents exposed to dust or volatiles emitted from on-Site soil transported off-Site with the wind; future on-Site excavation workers potentially exposed to subsurface soil through incidental ingestion; and dermal contact and inhalation of dust or volatilized constituents, future on-Site industrial workers potentially exposed to surface soil through incidental ingestion, dermal contact and inhalation of dust or volatilized constituents).

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. 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 1.0 represents the maximum exposure at which no harmful effects are expected.

The RAOs were developed to ensure that remedial actions reduce the projected risk to humans to acceptable levels. The United States Environmental Protection Agency

(USEPA) through the NCP defines acceptable remediation goals for known or suspected carcinogens to be concentration levels that represent an upper bound excess (i.e., above background) lifetime cancer risk 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). Likewise, 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. Exposure paths to be remediated are inhalation, ingestion and dermal contact with volatiles or dust particulates carried by the wind or remaining in the soil. This will be established through the use of additional cover soils in specific areas and the maintenance of a security fence. Contact with contaminated ground waters is addressed through monitored natural attenuation, and contact with the water is eliminated through the use of deed restrictions.

The RAOs developed for the Site are detailed below:

- reduction of surface soil risk to an acceptable level for future on-site worker;
- treatment of on-site ground water to meet screening criteria:
- prevention of on-site ingestion of ground water with concentrations above screening criteria: and
- prevention of off-site migration of ground water with COI concentrations above screening criteria.

5.0 SUMMARY OF REMEDIAL ALTERNATIVES

Three media specific remedial alternatives were considered in the FS: soil alternatives; shallow ground water alternatives; and, bedrock ground water alternatives. 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 FS.

5.1 Soil Alternatives

5.1.1 No Action - FS Alternative SS-1 is included as a baseline to which other remedial technologies can be compared and does not meet RAO for protection of human health and the environment.

5.1.2 Institutional / Engineering Controls - FS Alternative SS-2 achieves its effect by preventing exposures to COI using administrative or physical restriction. These controls are typically legal or institutional restrictions on Site access or use. Engineering controls such as fencing achieve the same goal by physically preventing access.

5.1.3 Soil Cover - FS Alternatives SS-3 and SS-4 are both containment alternatives, using the same cover soil approach but differing in the level of acceptable risk and associated areas to be addressed.

5.1.4 Chemical Oxidation / Stabilization - FS Alternatives SS-5 and SS-6 are both off-Site management alternatives, using the same approach but differing in the level of acceptable risk established for soil.

5.1.5 In-Situ Bioremediation - FS Alternatives SS-7 and SS-8 are both on-Site management alternatives, using the same approach but differing in the level of acceptable risk established for soil and physical areas to be treated.

5.2 Shallow Ground Water Alternatives

5.2.1 No Action - FS Alternative SG-1 is included as a baseline to which other remedial technologies can be compared and does not meet RAO for protection of human health and the environment.

5.2.2 Institutional / Engineering Controls - FS Alternative SG-2 achieves its effect by preventing exposures to COI using administrative or physical restriction. These controls are typically legal or institutional restrictions on Site access or use.

5.2.3 Monitored Natural Attenuation - FS Alternative SG-3 includes an Interim Remedial Action to remove contaminated soils and future monitoring activities to ensure RAOs are met.

5.2.4 Hydraulic Containment - FS Alternative SG-4 consists of a series of recovery wells down gradient from the areas identified to contain concentrations of COI above screening criteria. Recovered water is treated by activated carbon and discharged to

the City of Toledo sewer system.

5.2.5 Biological Containment - FS Alternative SG-5 includes an in-situ ground water treatment system, institutional engineering controls and monitoring. The treatment system would be installed to prevent off Site migration of impacted shallow ground water. The system consists of a microbial fence designed to bio-remediate ground water before it travels off-Site.

5.3 Bedrock Ground Water Alternatives

5.3.1 No Action - FS Alternative BG-1 does not meet RAO for protection of human health and the environment. It does not include any steps to remediate bedrock ground water and it does not include ground water monitoring.

5.3.2 Institutional / Engineering Controls - FS Alternative BG-2 restricts the future use of bedrock ground water as drinking water and provides for ground water monitoring in the bedrock aquifer.

5.3.3 Monitored Natural Attenuation (MNA) - FS Alternative BG-3 restricts the future use of bedrock ground water and provides for MNA.

5.3.4 Hydraulic Containment - FS Alternative BG-4 adds active hydraulic containment technologies to the deed restrictions on ground water usage and to the ground water monitoring program included in BG-2.

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 USEPA'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 FS.
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.

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 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.

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. Three chemical exposure routes have been identified: ingestion, inhalation, or dermal contact with soils, dust or volatilized constituents. The normal criteria for acceptability of risk represent an upperbound excess lifetime cancer risk to an individual to between 1 in 10,000 and 1 in 1,000,000. The total noncarcinogenic adverse health effects should result in a hazard index of less than 1.0.

All of the surface soil alternatives evaluated, except SS-1 and SS-2, were determined to be protective of human health and the environment.

Of the shallow ground water alternatives, all are considered potentially protective except the No Action Alternative SG-1. All of the remaining alternatives for shallow ground water depend on the action of natural attenuation mechanisms to address COI at concentrations above MCLs found on Site.

The No Action alternative for bedrock ground water is not considered protective. All other alternatives for bedrock ground water are considered compliant with ARARs.

6.2.2 Compliance with (ARARs)

All of the surface soil alternatives evaluated, except SS-1 and SS-2, were determined to comply with ARARs.

Of the shallow ground water alternatives, all except the No Action Alternative (SG-1) are considered compliant with ARARs and include deed restrictions to prevent human exposure to ground water.

The No Action alternative for bedrock ground water is not considered compliant with ARARs. All other alternatives for bedrock ground water are considered compliant with ARARs.

6.2.3 Long-Term Effectiveness and Permanence

Surface soil alternatives that address carcinogenic risk at a level of 1×10^{-5} (SS-4, SS-6, SS-8) rank higher than those that address carcinogenic risk at a level of 1×10^{-4} (SS-3, SS-5, and SS-7). Within these grounds, alternatives that include removal and off-Site treatment (SS-5 and SS-6) are considered the most effective. Those that include in situ treatment (SS-7 and SS-8) are

considered least effective because of the need for additional treatability studies to verify performance. All of the alternatives, with the exception of SS-2, are considered effective and permanent.

Shallow ground water alternatives that ensure the prevention of off-Site migration of COI (SG-3, SG-4, and SG-5) rank highest. The Monitored Natural Attenuation alternative (SG-3) is considered as effective as the other two more active alternatives because ground water data collected to date and results of transport modeling indicate that COI have not and will not migrate off-Site. Alternative SG-2, which includes only ground water monitoring, is considered less effective in the long term because a mechanism for preventing off-Site migration is not effectively demonstrated.

Alternative BG-4 ranks highest for long-term effectiveness because it provides active treatment. Alternative BG-3 ranks higher than BG-2 on this criteria because it includes provisions for verifying that natural attenuation mechanisms will prevent off-Site migration of COI and will restore on-Site ground water in a reasonable time.

6.2.4 Reduction of Toxicity, Mobility or Volume Through Treatment

Four soil alternatives (SS-5, SS-6, SS-7, SS-8) provide treatment that can reduce the toxicity, mobility and volume of COI. Those that include removal and off-Site treatment (SS-5 and SS-6) rank higher because of the increased certainty of the effectiveness of treatment. In situ bio-remediation alternatives rank lower because of uncertainties that will have to be addressed in treatability studies.

Shallow ground water alternatives SG-4 and SG-5 provide active treatment of COI. For that reason, they rank highest for reduction in toxicity, mobility and volume, although the level of treatment provided is not expected to be significantly higher than that provided by natural attenuation mechanisms evaluated in alternative SG-3.

Alternative BG-4 ranks highest for reduction in toxicity, mobility and volume of COI because it provides active treatment. Alternative BG-3 ranks higher than BG-2 on this criteria because it includes provisions for verifying that natural attenuation mechanisms will prevent off-Site migration of COI and will restore on-Site ground water in a reasonable time.

6.2.5 Short-Term Effectiveness

Surface soil alternatives that include removal (SS-5 and SS-6), and those that provide a soil cover (SS-3 and SS-4), can be completed quickly. Alternatives that include in situ Bioremediation (SS-7 and SS-8) will take up to several years to implement. All of the alternatives are considered effective in the short term and none will cause any short term risks that cannot be effectively controlled during construction.

Alternatives SG-3, SG-4 and SG-5 rank higher than alternative SG-2 in terms

of short term effectiveness, for the same reasons as in long term effectiveness. None of the alternatives cause significant increases in short term risk that cannot be easily addressed during construction.

Alternative BG-4 ranks highest for short term effectiveness because it provides active treatment. Alternative BG-3 ranks higher than BG-2 on this criteria because it includes provisions for verifying that natural attenuation mechanisms will prevent off-Site migration of COI and will restore on-Site ground water in a reasonable time.

6.2.6 Implementability

All the soil alternatives are considered readily implementable. Alternatives SS-3, SS-4, SS-5, and SS-6 are considered equally implementable with no significant technical or administrative difficulties. Alternatives SS-7 and SS-8 are ranked somewhat lower because of potential difficulties gaining public approval and restrictions on-Site redevelopment.

All shallow ground water alternatives are expected to be easily implemented. Alternative SG-2 and SG-3 are considered somewhat easier to implement because there are fewer administrative and permitting requirements to be addressed.

All bedrock ground water alternatives are expected to be easily implemented. Alternative BG-2 and BG-3 are considered somewhat easier to implement because there are fewer administrative and permitting requirements to be addressed.

6.2.7 Cost

Total costs for the soil alternatives rated as protective and compliant with ARARs range from \$294,800 to \$6,215,200.

Total costs for the shallow ground water alternatives that are considered protective and potentially compliant with ARARs range between \$391,500 and \$2,842,000.

Total estimated costs for the three bedrock ground water alternatives considered to be protective and potentially compliant with ARARs range between \$292,000 and \$2,382,900.

6.2.8 Community Acceptance

Only one set of comments was received by Ohio EPA from interested parties during the public comment period on the Jennison Wright Preferred Plan. This set of comments was drafted by the Settling Parties to the Order. NWDO-DERR, NWDO-DDAGW, and CO-DERR reviewed the Settling Parties' comments and provided responses, which resulted in certain modifications, as documented in Appendix A (Responsiveness Summary).

7.0 SELECTED REMEDIAL ALTERNATIVE

Ohio EPA has selected a Preferred Alternative which encompasses three elements: Surface Soil Alternative SS-4; Shallow Ground Water Alternative SG-3; and Bedrock Ground Water Alternative BG-3. Both ground water alternatives set forth in the Preferred Plan have been slightly modified by Ohio EPA, such that aggressive ground water monitoring during the early years of remedy implementation will be conducted and play a role in the decision to add additional wells and/or modify the monitoring schedules.

In addition, a use restriction agreement which provides for limitations on the use of the property and a prohibition against the use of ground water beneath the property, will be implemented.

7.1 Detailed Analysis of Surface Soil Alternative SS-4

Surface Soil Alternative SS-4 provides for a soil cover consisting of six inches of topsoil placed over the target areas to be addressed. The soil cover will serve to eliminate the incidental ingestion, dermal and inhalation hazards presented by dust and volatile constituents. With a calculated risk of 1×10^{-5} (mid-way between the acceptable range of 1×10^{-4} and 1×10^{-6}), the excess lifetime cancer risk is one in one hundred thousand. This alternative ranks high for long and short-term effectiveness. SS-4 has an estimated cost ranging between \$567,400 and \$1,215,9000, making it the most cost effective, active surface soil remedy. SS-4 scores high for implementability and would mesh effectively with future Site redevelopment. In keeping with this focus, long-term effectiveness and permanence rank high when applied to this alternative. SS-4 has been evaluated as having the highest overall ranking when analyzed against the five balancing criteria and is recommended as the preferred remedial alternative for surface soil. Construction of a cover over effected portions of the Site is considered an especially appropriate remedy because options for Site redevelopment are being actively pursued. Redevelopment uses under consideration include commercial and industrial uses. These particular types of redevelopment can cost-effectively incorporate the construction of covers over portions of the Site because they are likely to include requirements for placement of topsoil and construction of paved parking lots. Substitute barriers shown to be equal to or greater than the required six inches of soil cover for protectiveness may be considered. Limitations placed on intrusive activities will be specified in the future drafting of property use restrictions, which may impact building design.

Figure 6-2, Conceptual Layout, depicts the areas (an estimated area of 530,000 square feet or 12.2 acres) that is the target of the elements of Surface Soil Alternative SS-4.

7.1.1 Performance Standards for Surface Soil

- To place a six (6) inch soil cover over the depicted target area such that a risk reduction equal to 1×10^{-5} is achieved, maintained and confirmed through sampling and analyses. These activities

will be documented in a construction completion report. Alternative barriers of equivalent performance may be considered.

- To implement a long-term O&M program, including regularly scheduled inspections and associated reporting, which will preserve the integrity of the soil cover from problems such as thinning or erosion, dying or dead vegetation, the creation of fugitive dust, and poor drainage (e.g., standing or ponding water). The O&M program will also serve to protect the integrity of the fence.
- To provide Ohio EPA a copy of the deed restrictions filed (for the Site) at the Lucas County Recorder's Office. The restrictions will limit the use of the Site to industrial and/or commercial activities, will restrict intrusive activities. A land use restriction agreement will be entered into by the property owners and Ohio EPA to limit use of the Site as described above. Language in the land use restriction agreement will be finalized during negotiation of a consensual Remedial Design/Remedial Action (RD/RA) order.

7.2 Detailed Analysis of Shallow Ground Water Alternative SG-3

Alternative SG-3 restricts the future use of the shallow aquifer through deed restrictions and provides for monitored natural attenuation. Use restrictions will be in place until such time as a demonstration can be made that ground water has attenuated to the degree necessary for unrestricted use. The elements of the monitored natural attenuation include performance of quarterly ground water sampling for one year. Evaluation of this information by Ohio EPA will determine the frequency of subsequent ground water monitoring events and/or the need for additional monitoring wells. A total of thirty (30) years of monitoring are necessary, however the mechanism through which this obligation is met will be determined in a phased approach.

Alternative SG-3 ranks the same as hydraulic or biological containment for short- and long-term effectiveness, yet is less expensive.

The estimated cost for SG-3 is given as being between \$623,200 and \$1,335,400. The monitoring schedule and potential for new well construction each have associated costs. Utilizing a phased approach, these costs become variable and thus unpredictable. Therefore, the given cost range has been retained from the original estimate provided in the FS for use in comparing alternatives rather than predicting the actual costs.

SG-3 is tied for first in a ranking of permanence. Based on the evaluations presented in this section, SG-3 is considered to have the highest overall ranking in the five balancing criteria and is the preferred remedial alternative for shallow ground water.

Alternative SG-3 includes implementation of two strategies: the use restrictions

placed on the deeds in the form of a restriction to limit future use of shallow aquifer ground water; and, monitored natural attenuation. Section 5.2.2.2 of the FS includes a description of the mechanisms by which natural attenuation can potentially remediate on-Site ground water and prevent off-Site migration of COI. This section discusses requirements for implementation of a monitored natural attenuation remedy for shallow ground water in accordance with the provisions of EPA's policy directive "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites" (USEPA 1997). The policy includes three primary implementation principles for ground water, including the following:

- source control actions, including removal, treatment or containment, should be implemented to substantially reduce the primary sources of contamination;
- soil should be remediated to limit additional leaching of contaminants to ground water; and
- ground water should be returned to its beneficial uses within a reasonable time frame. If that is not practicable, measures should be taken to prevent exposure and off-Site migration.

The first two of these requirements have already been met with the removal of contaminated soil that took place during the IRA. The principles expressed in the third requirement are fundamentally the same as the remedial objectives for shallow ground water. In order to show that monitored natural attenuation is capable of meeting remedial objectives at the Site, the policy requires two types of measures. First, the effectiveness of natural attenuation must be demonstrated with Site characterization, and then its performance must be monitored. The second component of a monitored natural attenuation remedy is performance monitoring.

7.2.1 Performance Standards for Shallow Ground Water

- To design and implement a ground water monitoring program of sufficient scope (i.e., approved by Ohio EPA) to track and assess natural attenuation at the Site for up to 30 years. Monitoring will be performed initially for all on-Site monitoring wells on a quarterly basis for a period of one year. Based on the results of the first year of ground water sampling, the frequency of future ground water monitoring may be modified and/or additional monitoring wells may be installed, as appropriate (approved by Ohio EPA).
- To gauge natural attenuation processes against the detailed Site Conceptual Model to evaluate the effectiveness of monitored natural attenuation. Additional work may be required if the Site Conceptual Model demonstrates that the attenuation processes are not operating as predicted, if the distribution of COI are expanding, if down gradient receptors are being impacted,

and/or if changes in hydrological, chemical or biological conditions are adversely affecting the remedy.

- To provide Ohio EPA a copy of the deed restrictions filed at the Lucas County Recorder's Office for the Site. The deed restrictions will prohibit the future use of the shallow aquifer beneath the entire Site. A ground water use restriction agreement will be entered into between the property owners and Ohio EPA to limit use of the Site as described above. Language in this use restriction agreement will be finalized during negotiation of a consensual Remedial Design/Remedial Action (RD/RA) order.

7.3 Detailed Analysis of Bedrock Ground Water Alternative BG-3

Alternative BG-3 restricts the future use of the bedrock aquifer and provides for monitored natural attenuation. The elements of the monitored natural attenuation will include performance of quarterly ground water sampling for one year. Evaluation of this information by Ohio EPA will determine the frequency of subsequent ground water monitoring schedules and the need for additional monitoring wells. Thirty years of monitoring is necessary, however the mechanism through which this obligation is met will be determined in a phased approach.

7.3.1 Performance Standards for Bedrock Ground Water

- To design and implement a ground water monitoring program of sufficient scope (i.e., approved by Ohio EPA) to track and assess natural attenuation at the Site for up to 30 years. Monitoring will be performed initially for all on-Site monitoring wells on a quarterly basis for a period of one year. Based on the results of the first year of ground water sampling, the frequency of future ground water monitoring may be modified and/or additional monitoring wells may be installed, as appropriate (approved by Ohio EPA).
- To gauge natural attenuation processes against the detailed Site Conceptual Model to evaluate the effectiveness of monitored natural attenuation. Additional work may be required if the Site Conceptual Model demonstrates that the attenuation processes are not operating as predicted, if the distribution of COI are expanding, if down gradient receptors are being impacted, and/or if changes in hydrological, chemical or biological conditions are adversely affecting the remedy.
- To provide Ohio EPA a copy of the deed restrictions filed at the Lucas County Recorder's Office for the Site. The deed restrictions will prohibit the future use of the bedrock aquifer beneath the entire Site. A ground water use restriction agreement will be entered into between the property owners and

Ohio EPA to limit use of the Site as described above. Language in this use restriction agreement will be finalized during negotiation of a consensual Remedial Design/Remedial Action (RD/RA) order.

7.4 Evaluation by Threshold, Balancing, and Modifying Criteria

7.4.1 Overall Protection of Human Health & the Environment

A soil cover and deed restrictions on land usage will prevent direct human contact with COI which exceed acceptable risk levels. Dermal, ingestion, and inhalation exposure pathways will be controlled with both of these actions. The deed restrictions will ensure that the Site will not be used for residential purposes in the future. Based on the assumption used in the Baseline Risk Assessment, a limitation to non-residential use will be required for any alternative in order for it to be considered protective. No environmental risks have been identified for surface soil.

A program of deed restrictions for on-Site shallow ground water usage, and monitoring to verify that off-Site migration in ground water does not occur, will be protective of risks to human health which are related to potential on- and off-Site exposure to COI. There is no identified risk to the environment for shallow ground water.

Alternative BG-3 will be effective in preventing on-Site ingestion of ground water with concentrations of COI above screening criteria and would allow verification that ground water with concentrations of COI above screening criteria was not migrating off-Site. For that reason, this alternative would be considered protective of human health, at least under current conditions. If monitoring shows that ground water at the Site boundary exceeded screening criteria, this would need to be reevaluated. No environmental risks have been identified for bedrock ground water.

The preferred alternative will meet all of the requirements for protectiveness.

7.4.2 Compliance with ARARs

No chemical or location specific ARARs have been identified for this alternative. Occupational Safety and Health Act (OSHA) occupational standards for work at hazardous waste operations sites (29 CFR 1910.120) and Ohio regulations limiting fugitive dust emissions (OAC 3745-17) are action specific ARARs. These requirements can be incorporated into the design for the remedy.

No action specific or location specific ARARs have been identified for SG-3 or BG-3. Although not governed by an ARAR, monitored natural attenuation at the Site will be performed in accordance with USEPA's Monitored Natural Attenuation policy. Federal Maximum Contaminant

Levels (MCLs) are considered a chemical specific ARAR for ground water at the Site. Since the ability of MNA to meet MCLs on-Site within a reasonable time is uncertain, verification of progress toward that end is a major goal of the monitoring program included as part of technology implementation. No action specific or location specific ARARs have been identified for the technologies included in this alternative.

7.4.3 Long-term Effectiveness and Permanence

This criteria is used to evaluate the effectiveness of the preferred alternative in maintaining protection of human health and the environment after construction of the selected remedy. The soil cover provided by Alternative SS-4 will prevent direct exposure to industrial or commercial workers from COI which exceed acceptable risk levels. By preventing exposure, capping will significantly reduce risk to human health and would achieve the Remedial Action Objective (RAO) for this medium. The soil cover will require regular maintenance to ensure adequate protection in the long-term. Regular inspections of the soil cover integrity will be performed to identify areas in need of repair. The deed restriction will be effective in preventing future use of the Site for residential purposes. The long-term effectiveness of Alternative SS-4 will be dependent on effective enforcement of the deed restriction and long-term maintenance of the cover. Any disruption of the cover during future Site redevelopment will have to be repaired.

A deed restriction is effective in preventing on-Site ingestion of impacted shallow and bedrock ground water. It will be effective in the long-term because it is permanently recorded on the property deed and would apply to future property owners. It appears, based on the known data and model results, that monitored natural attenuation will be effective in the long-term for controlling off-Site migration. MNA, in conjunction with the major source reduction already achieved during the IRA, will be effective in reducing the concentration of COI in ground water.

A properly enforced deed restriction will be effective in preventing on-Site ingestion of impacted bedrock ground water. It will be effective in the long-term because it is permanently recorded on the property deed and will remain with the property through any future purchase and sales transaction.

7.4.4 Short-term Effectiveness

This criteria evaluates the effectiveness of the preferred alternative in maintaining protection of human health and the environment during remedial construction of the selected remedy. Although the risk assessment showed that there will be no unacceptable risk associated with exposures to on-Site construction workers, controls will be needed during implementation of Alternative SS-4 to meet regulatory worker health and safety requirements and to prevent exposure to the

community. These controls will include the minimization of dust generation by limiting disturbance of surface soil during Site grading and placement of the soil cover. Workers will be required to wear dust masks or respirators to minimize inhalation exposure if conditions warrant. Use of appropriate personal protection equipment and enforcement of decontamination procedures will minimize worker exposures. An air monitoring program with associated dust mitigation procedures will be used to protect the public. Once implemented, the soil cover will achieve the RAO immediately. No short-term risks are involved with obtaining deed restrictions.

In the short-term, the deed restriction will be effective in preventing ingestion of on-Site shallow ground water and monitored natural attenuation will control off-Site migration. On-Site ground water quality will not be improved in the short-term. No short-term risks are introduced.

In the short-term, the deed restriction will be immediately effective in preventing ingestion of on-Site bedrock ground water. On-Site bedrock ground water quality will not be improved in the short-term. There are no short-term risks associated with implementation.

7.4.5 Reduction of Toxicity, Mobility, and Volume through Treatment

This criteria evaluates the anticipated performance of specific treatment technologies within the preferred alternative. Alternative SS-4 will not reduce the toxicity or volume of COI, because no treatment or removal of surface soil will occur beyond the volume of soil removed during the IRA. The NCP does not consider reductions in mobility through containment to meet the requirements for this criterion.

The ability of the monitored natural attenuation processes to reduce the toxicity and volume in the long-term will need to be further evaluated during remedy implementation. Modeling performed during preparation of the Baseline Risk Assessment indicates that COI in shallow ground water will be effectively immobilized.

In bedrock ground water, the mobility of COI is inhibited by slow ground water velocity, an aquifer composed of clay, and by low concentrations of COI and other carbonaceous food sources. The major source control and soil remediation accomplished during the IRA will provide the largest positive effect toward natural attenuation in bedrock ground water. Further reduction in toxicity and volume by monitored natural attenuation will occur, but is expected to be far less than that already achieved through source control actions and soil remediation. If monitoring demonstrates that acceptable progress cannot be made toward returning the ground water to a beneficial use, then measures will be necessary to prevent exposure and off-Site migration.

7.4.6 Implementability

This criteria includes an evaluation of the technical and administrative feasibility of the preferred alternative and availability of required equipment, personnel, and subcontractors. Constructing a soil cover will be easily implemented with conventional construction equipment. Subcontractors with experience and required health and safety training are readily available locally. There are no substantial technical or administrative requirements for alternative SS-4.

The technologies included in alternative SG-3 are readily implementable. Alternative BG-3 is readily implementable. Obtaining a deed restriction will require the consent of the Site owners, who have indicated their willingness to cooperate. Management will be needed to coordinate periodic bedrock ground water monitoring and data analysis.

7.4.7 Cost

Costs include both capital expenditures along with operation and maintenance expenditures for a 30-year term. Utilizing a phased approach, these costs become too variable and thus unpredictable. Therefore, the cost range given has been retained from the original estimate provided in the FS as a range for comparing alternatives rather than predicting the actual costs. If ground water monitoring during the early years allows for the lessening of monitoring, the estimate will be on the low side. Conversely, if ground water monitoring indicates the necessity of increased monitoring and/or the need for additional wells, costs will approach the high end of the estimates. Cost estimates are provided as ranges of costs with an accuracy of plus 50 percent and minus 30 percent.

Estimated capital costs for Alternative SS-4 range from \$385,000 to \$825,000. Estimated operational costs for SS-4 range between \$182,400 and \$390,900. Estimate details are presented in Tables 6-3A and 6-3B of the FS.

The estimated capital cost range for Alternative SG-3 is between \$261,600 and \$560,600. The estimated operational costs range from \$361,600 to \$774,800. The details of these cost estimates are presented in tables 6-9A and 6-9B of the FS.

The estimated capital cost range for Alternative BG-3 is between \$202,500 and \$433,900. The estimated operational costs range from \$231,300 to \$495,600. The details of these cost estimates are presented in tables 6-13A and 6-13B of the FS.

The total estimated capital cost range for the implementation of Alternatives SS-4, SG-3, and BG-3 is between \$849,100 and

\$1,819,500. The total estimated operations cost ranges from \$775,300 to \$1,661,300. The combined total costs, over a 30-year period, range between \$1,624,400 and \$3,480,800.

7.4.8 Community Acceptance

This assessment evaluates the issues and concerns the public may have regarding each of the alternatives. Ohio EPA invited comments from members of the public on whether the Agency's Preferred Alternative for the Site met the needs of the local community and will be an effective response to the conditions present. The comment period included a public meeting where Ohio EPA was present to discuss the remedial investigation, FS Report, and Preferred Plan and answer questions and take comments.

Ohio EPA has considered all comments on the proposed remedy and issued a Responsiveness Summary (Section 9.0) that summarizes and responds to all comments received within the public comment period.

7.5 Summary

The Decision Document outlined above is used to memorialize the recommendation contained in the Preferred Plan concerning how best to address contamination at the Site.

Ohio EPA believes the Decision Document satisfies the statutory requirements of CERCLA Section 121(b) in that it is protective of human health and the environment; complies with ARARs, is cost effective, utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable, and satisfies the preference for treatment as a principal element.

8.0 GLOSSARY

Aquifer -	An underground geological formation capable of holding and yielding water.
ARARs -	Applicable or relevant and appropriate regulations. Those rules 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 USEPA Superfund Program.
Coal Tar -	Derived from carbonization of bituminous coal, often containing carcinogenic components.
Creosote -	Flammable, heavy, oily liquid produced by the destructive distillation of coal tar or wood.
Decision Document -	A statement issued by the Ohio Environmental Protection Agency 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 Waste -	A waste product, listed or defined by RCRA, which may cause harm to humans or the environment.
Human Receptor -	A person exposed to chemicals released from a site.
LNAPLs -	Light, non-aqueous phase liquids.

MCL -	Maximum Contaminant Level. Standards for public drinking water, as established under the Clean Water Act.
MNA -	Monitored Natural Attenuation.
NCP -	National Contingency Plan. A framework for remediation of hazardous materials 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.
PAHs -	Polynuclear aromatic hydrocarbons. Class of semi-volatile chemicals including multiple six-carbon rings. Often found as residue from coal-based chemical processes.
Preferred Plan -	The plan preferred by Ohio EPA, and submitted to the public for comments, to remediate the site in a manner that best satisfies the evaluation criteria.
RCRA -	Resource Conservation and Recovery Act. A federal law that regulates the handling of hazardous wastes.
Remedial Action Objectives (RAO) -	Specific goals of the remedy for reducing risks posed by the site.
Remedial Investigation -	A study conducted to collect information necessary to adequately characterize the site for the purpose of developing and evaluating effective remedial alternatives.
Responsiveness Summary-	A summary of all comments received concerning the Preferred Plan and the Ohio EPA's response to all issues raised in those comments.

Appendix A

RESPONSIVENESS SUMMARY

Jennison Wright Site Lucas County, Ohio

Only one set of comments was received by Ohio EPA on the Jennison Wright Preferred Plan. This set of comments was drafted by Norfolk and Western Railway Company, Consolidated Rail Corporation and American Premier Underwriters, Inc. (the Respondents), the parties who participated in the Director's Final Findings and Orders, and Amendments (Orders). NWDO-DERR, NWDO-DDAGW, and CO-DERR reviewed the Respondents' comments and provided input which resulted in the following responses, reevaluations and compromises.

Both the Feasibility Study and the Preferred Plan presented three areas where contamination would be addressed through the remedy. These areas dealt with surface soils, shallow ground water, and bedrock ground water.

SURFACE SOILS

The proposed remedy for surface soils was identified as SS-4. This remedy required the following elements:

- six (6) inches of topsoil over contaminated areas identified in Figure 6-2 of the FS;
- the entire Site will be seeded to prevent erosion;
- proper drainage will be ensured;
- fencing will be maintained; and
- restrictions regarding property use and prohibition of the use of ground waters will be instituted.

SHALLOW GROUND WATER

The proposed remedy for shallow ground water was identified as SG-3. Ohio EPA modified this option from the presentation in the FS. This remedy required the following elements:

- install eight (8) new shallow wells (this was the modification from the FS, which suggested the installation of only 5 new shallow wells). Sampling would be for all wells on-site;
- quarterly sampling during years 1 and 2;
- bi-annual sampling during years 3, 4, and 5;
- annual sampling during years 6 through 30; and
- prohibitions on the use of shallow ground water.

BEDROCK GROUND WATER

The proposed remedy for bedrock ground water was identified as BG-3. Ohio EPA modified this option from the presentation in the FS. This remedy requires the following elements:

- install six (6) new bedrock wells (this was the modification from the FS, which suggested the installation of only 5 new shallow wells). Sampling would be for all wells on-site;
- quarterly sampling during years 1 and 2;
- bi-annual sampling during years 3, 4, and 5;
- annual sampling during years 6 through 30; and
- prohibitions on the use of shallow ground water Responsiveness Summary.

SPECIFIC COMMENTS AND RESPONSES

Comment

The Respondents' comment letter states on page 2, that *"... the Ohio Preferred Plan requires installation of a soil cover over the entire site. The Settling Parties believe there is no technical basis for this change."*

Response

The Preferred Plan does not require installation of a soil cover over the entire site. Cover soil, six inches in depth, is required over those areas identified on Figure 6-2 of the Feasibility Study. The Plan requires a vegetative cover over the entire site. A vegetative cover is necessary as a control for erosion and dust control. If a vegetative cover can be established with the existing soils, then no additional soil material need be brought on-site for this purpose. There doesn't seem to be any compelling reasons offered to alter any aspects of the soil cover portion of the remedy.

Comment

The comment letter states on page 2, first bullet, that *"...This is consistent with policy under Ohio's Voluntary Action Program (VAP)..."*

Response

This may be a relevant point if and when the Settling Parties are dealing with a VAP site. However, the Respondents are currently operating under an Administrative Consent Order.

Comment

The comment letter states on page 2, second bullet, that *"Placement of pavement, slabs, buildings, or another effective barrier is allowed as a replacement for the required soil cover."*

Response

Substitute barriers shown to be equal to or greater than the required six inches of soil cover for protectiveness may be considered. Limitations placed on intrusive activities will be specified in the future drafting of property use restrictions, which may impact building design.

Comment

The comment letter states on page 2, third bullet, *“If it can be shown that surface soil in a portion of the site does not contribute to unacceptable risk, placement of a cover will not be required in that area.”*

Response

Sampling of surface soils was conducted during the Remedial Investigation for the purpose of identifying those areas that contribute to unacceptable risk. The results of the investigation field work were presented in the Remedial Investigation Report prepared by Remedial Technologies, Inc. (RETEC). Unless a claim is being made that the data presented in the RI Report as factual is now considered to be suspect, in error, or incomplete, Ohio EPA will proceed using the conclusions derived from the information in the RI.

Comment

The comment letter states on page 2, fourth bullet, that *“... surface soil at the site does not cause any unacceptable risk under current site conditions...”* and *“... the Settling Parties should be allowed flexibility in the implementation schedule for the remedial action.”*

Response

Ohio EPA allows flexibility as appropriate. With respect to surface soil, the risk assessment determined that one receptor, a future on-site industrial/commercial worker, has a carcinogenic risk of $3.8E-4$, which exceeds the acceptable risk range.

Comment

Page 3 of the comment letter correctly notes that the remedy described in Ohio EPA's Preferred Plan is significantly greater in scope than Alternative SG-3 set forth in the FS. The comments for SG-3 also make note of upcoming changes in allowable ground water usage in the City of Toledo, requiring changes in the monitored natural attenuation remedy.

Response

With respect to the comment referencing upcoming changes in allowable ground water usage in the City of Toledo, Ohio EPA cannot design or alter a remedy based on “upcoming” changes. Just as monitoring requirements for arsenic (described below) are based on changes which have actually taken place, changes in allowable ground water usage will also need to occur in order to support changes.

Page 4 of the comment letter claims that an Urban Setting Designation (USD) is, with respect to ARARs (Applicable or Relevant and Appropriate Requirements), a relevant and appropriate requirement as specified in Ohio EPA's generic SOW.

The Ohio EPA - Division of Drinking and Ground Water (DDAGW) has stated that the installation of additional monitoring wells should be contingent upon the number of existing monitoring wells that have constituents of interest (COI) above screening criteria concentrations, based on the first phase of sampling.

Figure 3-9 (Distribution of Detected COI in Shallow Ground Water) in the October 2000 FS illustrates which shallow ground water wells have concentrations of COIs detected in the ground water that are above the screening criteria concentrations. Since the submittal of the FS, the drinking water Maximum Contaminant Level (MCL) for arsenic has been reduced to 10 ug/l. This has caused the screening criteria concentration for arsenic to be reduced to 10 micrograms per liter (ug/l). This decrease in the screening criteria concentration for arsenic has caused an increase in the number of wells with concentrations of COIs detected in the ground water. These wells now include MW-2, 6, 8R, 9, 10, 13, 14, 19, and 25. It should be noted that the inclusion of all of these monitoring wells is based on ground water analytical data that was acquired in September 1997. DDAGW recommends that all of the shallow ground water monitoring wells be re-sampled to determine the extent of the contamination. A re-evaluation of the effectiveness of the natural attenuation process using more current analytical data may allow for a reduction in the number of monitoring wells required to be sampled.

Comment

Page 3 of the comment letter states that "Ground water data collected during the RI showed that Constituents of Interest (COI) have not migrated off-site in shallow ground water."

Response

According to the data presented to Ohio EPA, monitoring well MW-25, located off-site, had detections of arsenic at 151 ug/l for sampling conducted in September 1997. This suggests two things: one, contrary to claims, COI have migrated off-site in shallow ground water, and two, modeling of off-site migration based on the existence of a single off-site well (MW-25), is inconclusive.

Comment

Page 3 of the comment letter states that "There is no technical basis for including the full set of monitoring wells in the MNA program."

Response

The data from the RI completed in 1996-97 is six to seven years old. The data necessary to support decisions under MNA must be more current. The following modifications to the Preferred Plan are given to compensate for the age of the data.

- Quarterly sampling for the first year should occur as previously planned for all wells on site.
- The installation of any new monitoring wells should not take place until at least one year of quarterly sampling has taken place. This would forestall and could eliminate the need for 8 new shallow wells and 6 new bedrock wells.

- The first year of quarterly sampling should include all useable, existing wells on-site, which is currently believed to be 17. Results of the first year of quarterly monitoring would be used as a benchmark in conjunction with the last sampling event for each well, to determine whether or not the additional wells described in the Preferred Plan are necessary.
- This new round of quarterly monitoring would be used to ascertain whether the monitoring schedule called for in the Plan must be maintained or altered. Ohio EPA will make these evaluations annually.

Comment

Page 4 of the comment letter suggests that Ohio EPA's Preferred Plan include a contingent remedy to deal with USD establishment.

Response

If changes do occur after a Decision Document is signed, a process to allow for amendment of the Decision Document is laid out in Ohio EPA guidance for Decision Documents. Contingencies need not be built into Preferred Plans and Decision Documents.

Comment

Page 5 of the comment letter claims that given the limited distribution of COI in bedrock wells and that concentrations are only slightly over cleanup standards, there is no technical basis for requiring implementation of the Monitored Natural Attenuation remedy. The Respondents Parties recommend institutional controls only.

Response

The recommendation of Ohio EPA - DDAGW in the Preferred Plan was to implement Monitored Natural Attenuation, Alternative BG-3 - as the remedial alternative for the bedrock ground water at this facility. DDAGW also recommended that additional wells be installed as part of the MNA remedy to properly determine that natural attenuation is in fact working or that detection of the constituents of interest (COI) down gradient of the source areas is being ascertained.

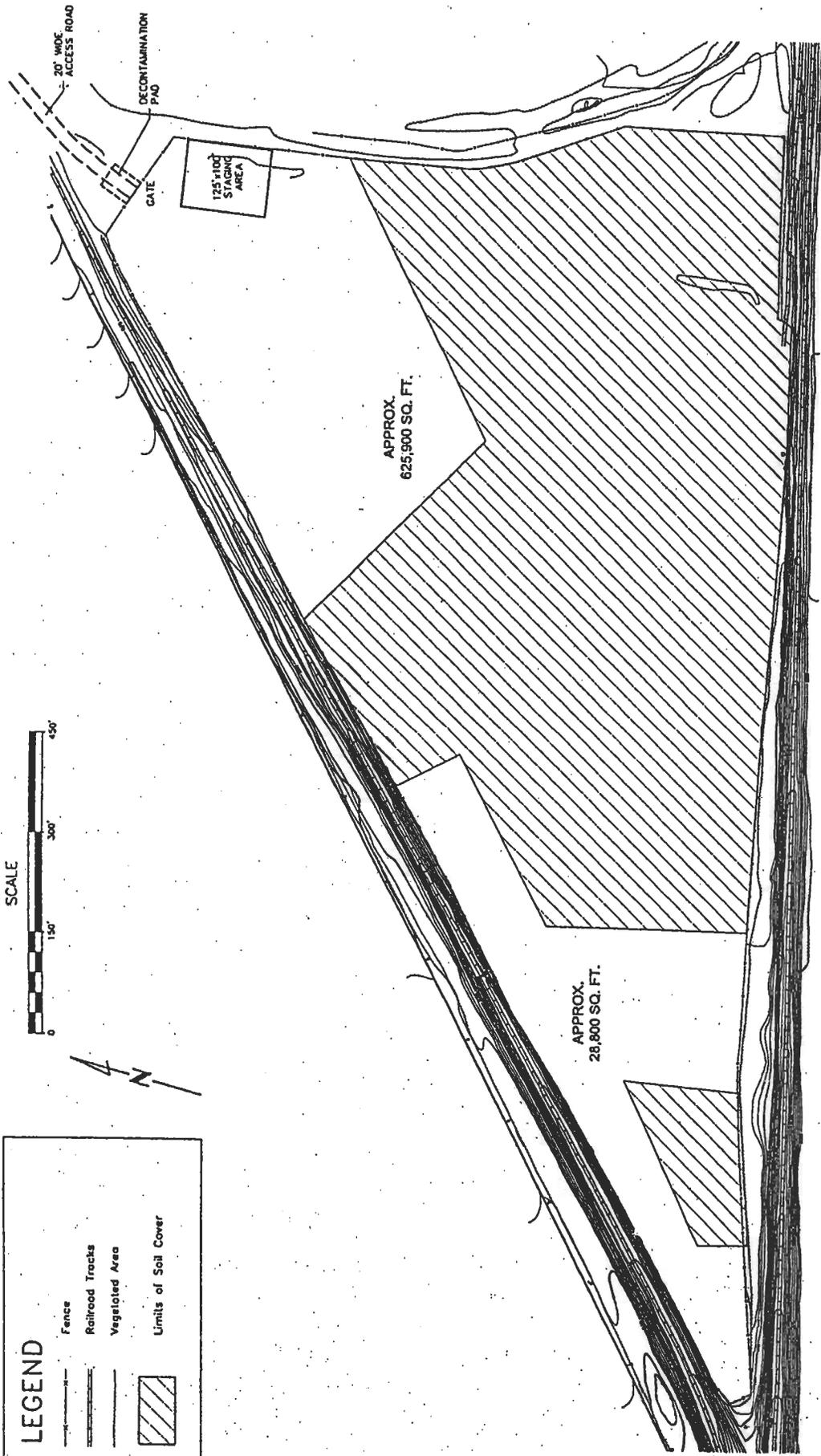
LEGEND

- Fence
- Railroad Tracks
- Vegetated Area
- Limits of Soil Cover

SCALE

0 150 300 450

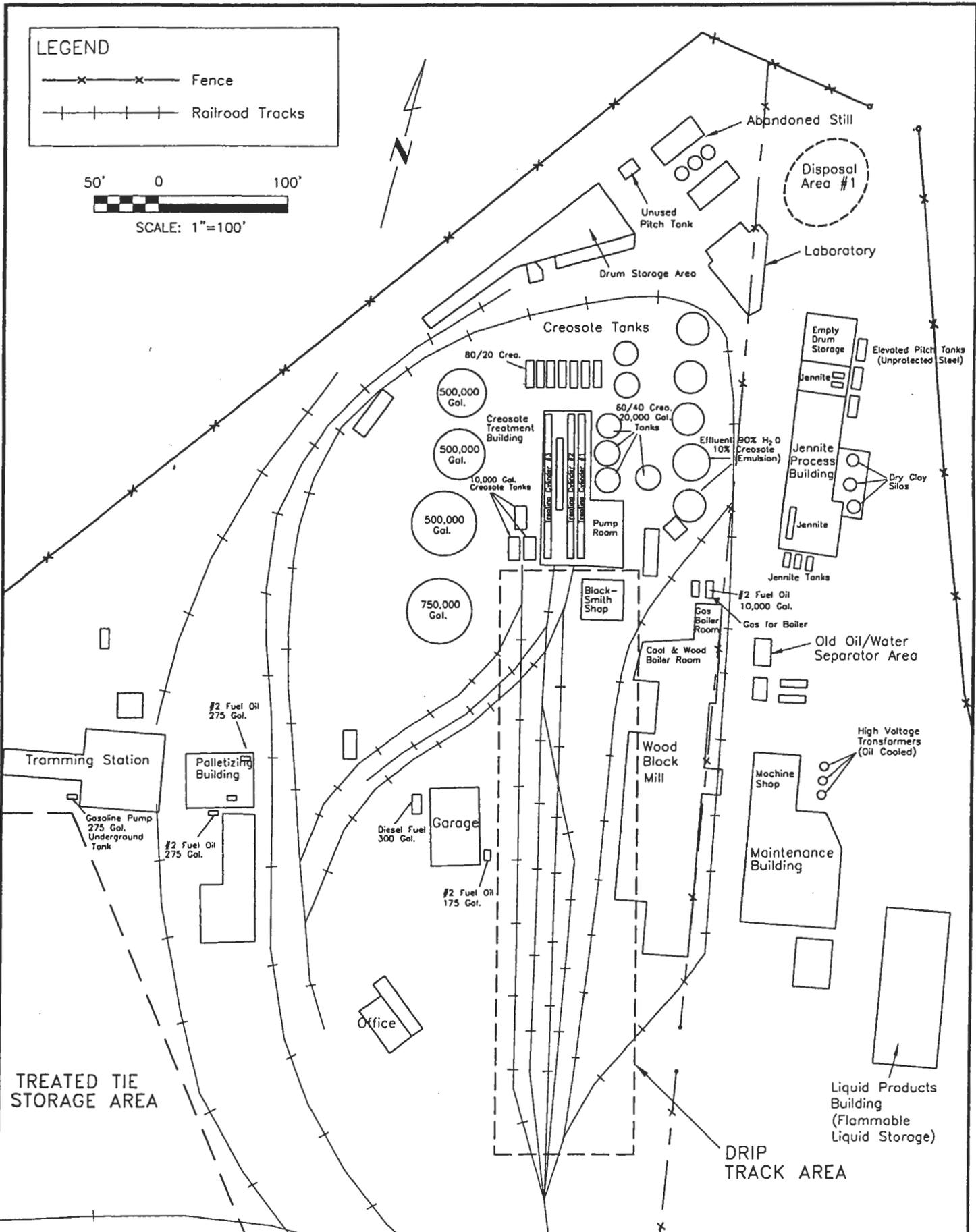
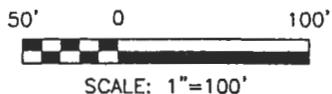
North Arrow



Former Jennison Wright Facility Toledo, Ohio NSCID-01297-800		Conceptual Layout: Alternative SS-4 Soil Cover Rise = 1' x 10'	
CURRENT DATE: 5/00	COORD FILE: 12975021	FIGURE 6-2	

LEGEND

- x—x—x— Fence
- +—+—+—+— Railroad Tracks



Former Jennison Wright Facility
 Toledo, Ohio
 NSC30-01297-800

Historical Site Layout

DATE: 6/00 DRWN: RCW FILE: 01297H01

FIGURE 2-1