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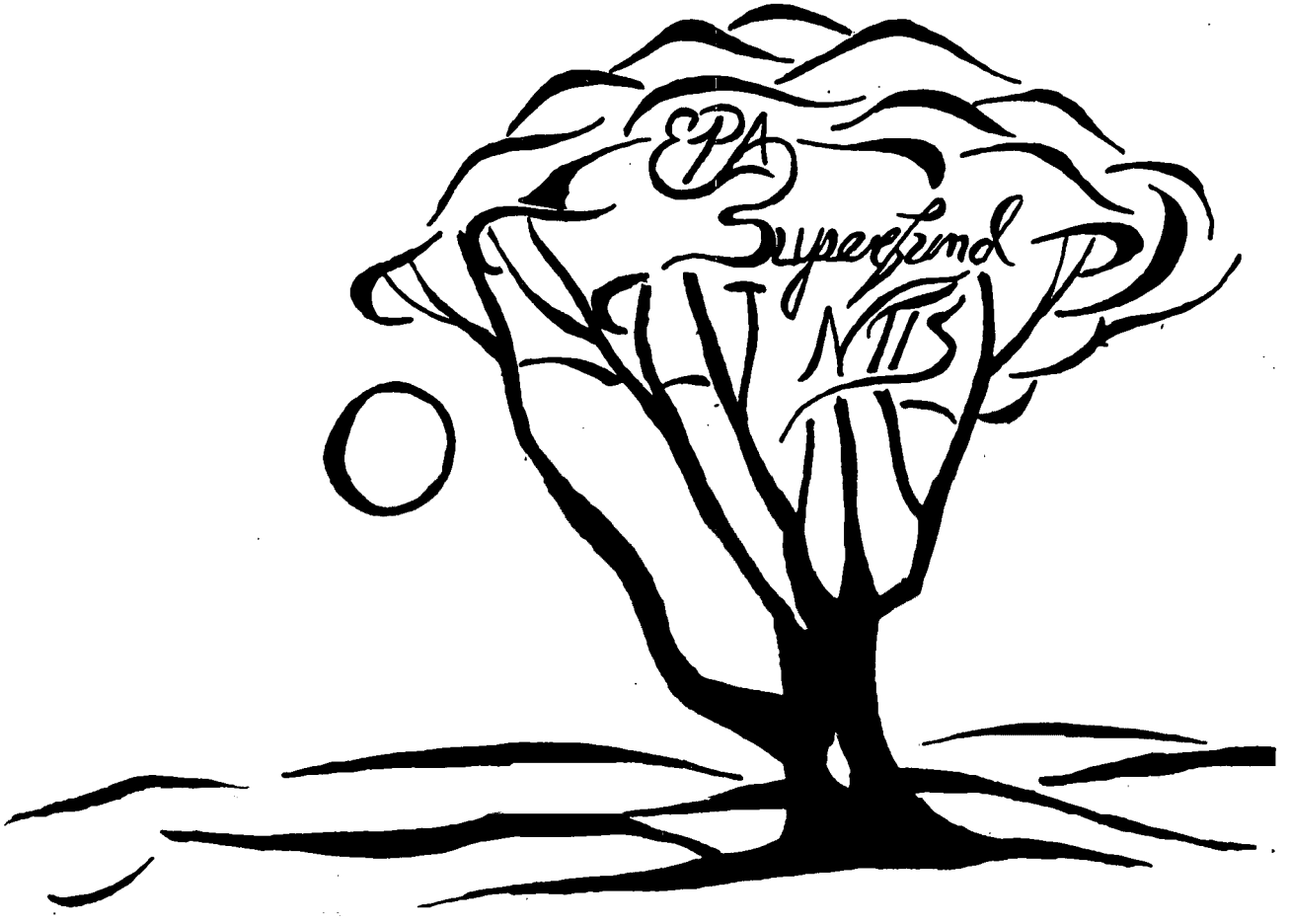
EPA Superfund Record of Decision:

Conrail Rail Yard (O.U. 2), Elkhart, IN 9/09/1994



DECLARATION FOR THE RECORD OF DECISION

SITE NAME AND LOCATION

Conrail Railyard
Elkhart County, Indiana

STATEMENT OF BASIS AND PURPOSE

This decision document represents the selected Final Remedial Action for the Conrail Railyard site in Elkhart County, Indiana. This action was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, with the National Oil and Hazardous Substances Contingency Plan (NCP). The decisions contained herein are based on information contained in the administrative record for this site.

The State of Indiana concurs with the selected remedy. The concurrence letter is attached to this Declaration.

ASSESSMENT OF THE REMEDY

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this Record of Decision (ROD), may present an imminent and substantial endangerment to public health, welfare, or the environment.

DESCRIPTION OF THE REMEDY

This remedy is intended to be the final action and is the second of two operable units for this site. This final action fully addresses the elimination or reduction of public exposure to ground-water contamination and source areas associated with the site.

Specifically, this Final Remedial Action involves the provision of a safe, permanent drinking water supply to residents who are potentially at risk, taking actions to clean up the contamination in the aquifer, and remediation of contaminated soils on the railyard that are source areas for the ground-water contamination. The major components of the selected remedy include:

- Institutional actions such as ground-water and air monitoring, well abandonment, access restrictions, and deed restrictions, to limit the potential for human exposure to contaminated media;

- Additional source investigations and remediation, as appropriate, to identify other source areas that could

be contributing to ground-water contamination;

- Monitoring and, if necessary, vapor abatement actions in building floors and basements of areas north of the railyard;

- Soil vapor extraction of Volatile Organic Compound (VOC) contamination in the Trichloroethylene (TCE) source area, and air sparing in the saturated zone in the carbon tetrachloride (CCl_4) source area, in conjunction with vapor extraction of the overlying unsaturated zone, and treatment of these vapors;

- Extension of the City of Elkhart municipal water supply system to all residences in the area bounded by the Conrail facility to the south, the St. Joseph River to the north, Baugo Bay to the west, and Nappanee Street (State Route 19) to the east. Approximately 500 residences are being hooked up to city water under the Interim Remedial Action. This final remedy will provide this hookup to all remaining residences and businesses in the area described above; and

- Ground-water extraction and treatment to achieve ground water standards throughout the plumes which will be achieved by emphasizing remediation of "hot spots" (i.e. areas of relatively high contaminant concentrations or where DNAPL sources are identified). Collected ground water will be treated using air stripping and discharged to the St. Joseph River. Exhaust from the air stripper(s) will be treated by carbon adsorption prior to emission; spent carbon will be disposed of properly.

STATUTORY DETERMINATIONS

This Final Remedial Action is protective of human health and the environment, complies with Federal and State applicable or relevant and appropriate requirements and is cost-effective. This remedy satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principle element and utilize permanent solutions and alternative treatment technologies to the maximum extent practicable for this site.

Because this remedy will result in hazardous substances remaining on site above health-based levels, a review will be conducted to ensure that the remedy continues to provide adequate protection of human health and the environment within five years after commencement of the remedial action.

September 9, 1994
Date

for David A. Ullrick
Valdas V. Adamkus
Regional Administrator, Region V

RECORD OF DECISION SUMMARY
CONRAIL

I. SITE NAME, LOCATION, AND DESCRIPTION

The Conrail Railyard site is located adjacent to and within the southwestern city limits of Elkhart, Indiana. The site includes the 675 acre railyard facility which is approximately bounded to the north by US33 (Franklin Street), on the east by State Route 19, to the south by Mishawaka Road, and to the west by State Route 219 (see Figure 1), and certain areas of contamination that extend in two directions, northeast and northwest from the Conrail railyard. The Elkhart railyard is an electronically controlled hump yard which serves as a classification distribution yard for freight cars. It contains 72 classification tracks where cars are separated and switched to a specific track corresponding to a particular destination. The yard processes approximately 74 trains per day via 15 receiving and 14 departing tracks. Car repair, engine cleaning, and diesel refueling facilities are also located at the yard.

The study area, which includes the railyard, encompasses roughly 2,500 acres, with the topography generally being flat. The study area is bounded on the north by the St. Joseph River, on the west by Baugo Bay, on the east by Oakland Avenue, and on the south by the southern border of the Conrail railyard. There are several light industrial properties located within the study area to the north and northwest of the railyard, as well as the numerous light industries surrounding the study area to the east and south. Within the above referenced study area, there are also several residential areas, comprised mainly of single-family homes. Approximately 3,500 people live within this study area, within about a mile and a half of the site. Of this total, about 3,000 of the people use private residential wells for their water supply, and another 300 get their water supply from a private utility, whose well is also located in the study area. The closest downgradient residences to the site are those located directly across US33, just to the north of the railyard (one or two hundred feet away).

The major surface water bodies in the vicinity of the study area are the St. Joseph River and Baugo Bay. The St. Joseph River flows westward and is located a little over a mile north of the Conrail site. Baugo Bay flows north into the St. Joseph River, and is located immediately to the west of the study area. Crawford ditch originates at the site, and flows intermittently to the St. Joseph River. Floodplains and wetland areas exist along both the St. Joseph River and Baugo Bay.

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

The railyard began operations in 1956 as part of the New York Central Railroad, and continued operations as a subsidiary of the

Penn Central Transportation Company until 1976. From 1961 to 1968, numerous citizen complaints regarding oil discharges from the railyard to the St. Joseph River were filed with state and local authorities. Based on interviews with ex-employees of the railyard, and other information, between 1966 and 1969 a tank car containing carbon tetrachloride collided with another car during humping operations at the railyard causing the release of approximately 16,000 gallons of carbon tetrachloride.

In 1976 operations at the railyard were transferred to the Consolidated Rail Corporation (Conrail). From 1976 to the present, spills and releases of oil, diesel fuel, hydrochloric acid, caustic soda, and various petroleum-related substances have occurred there. Reports also indicate that a track-cleaning substance (the chemical composition of which is unknown) and engine degreasers were used and disposed of at the railyard.

Initial Investigations and Removal Actions

In June 1986, a resident on County Road 1, just to the north of US33, reported to U.S. EPA that his residential well contained elevated levels of volatile organic compounds. On July 2, 1986, U.S. EPA/Technical Assistance Team (TAT) collected and analyzed a water sample from this residential well. Sample analysis indicated the presence of trichloroethylene (TCE) at 800 parts per billion (ppb) and carbon tetrachloride (CCl_4) at 485 ppb. Based on this finding, EPA/TAT initiated a ground water sampling program in the County Road 1 and LaRue Street areas, located to the northwest and northeast of the railyard, respectively. Samples were also taken at residences in the Vistula Avenue area, to the northwest of the County Road 1 area. Ground water sampling began on July 17, 1986. A total of 88 residential wells were sampled by EPA/TAT. Concurrently, 11 additional residential wells were sampled by individual well owners. TCE concentrations as high as 4,870 ppb and CCl_4 concentrations as high as 6,680 ppb were detected. A total of 63 ground water samples showed detectable levels of TCE, CCl_4, or both.

Bottled water was provided to residents whose wells were affected by the contamination. A portion of the residents in the LaRue Street area were later connected to a water-main extension from the City of Elkhart. Many of the residences, however, had carbon filter units installed to ensure a safe drinking water supply. Two types of activated carbon filter units were installed in residences: point-of-use units and whole-house units. In all, 20 point-of-use and 56 whole-house units were installed. Although homeowners are ultimately responsible for the operation and maintenance of these units, the Indiana Department of Environmental Management (IDEM) assisted in their operation and maintenance until 1992. IDEM also periodically sampled residential wells in the area to monitor the migration of

contamination. During this time period, IDEM identified other residents with contaminated wells and installed filtration systems as needed.

EPA/TAT also conducted an inspection of the Conrail site in July and August 1986. Seven water/liquid samples and 21 soil samples were collected at the Conrail site on July 31 and August 1, 1986. The results of the analyses revealed TCE concentrations as high as 5,850 ppb and CCl_4 concentrations as high as 117 ppb in soil samples. Based on these results, the downgradient location of TCE- and CCl_4-contaminated private wells from the railyard, and the history of poor waste handling practices at the railyard, the Conrail site was placed on a roster of sites proposed for inclusion on the National Priorities List (NPL) in June 1988. The site was listed on the NPL in August 1990.

Remedial Investigations/Feasibility Studies (RI/FS)

On June 27, 1988, U.S. EPA sent a special notice letter to Conrail offering them the opportunity to undertake the RI/FS for the site, including investigations of the ground water contamination emanating from the site. Since Conrail only expressed a willingness to undertake a portion of the RI/FS, U.S. EPA determined that Conrail had not presented a "good faith" offer to conduct the entire RI/FS at the Conrail site. Therefore, on September 30, 1988, U.S. EPA entered into a contract to have the RI/FS conducted. The workplan for the RI/FS was approved in July 1989, and actual investigations for the Conrail site began shortly thereafter.

The Remedial Investigation was conducted in three phases. The first phase, which included a soil gas survey, soil sampling, and ground-water sampling for TCE and CCL_4, was completed in January 1990, and detailed in the April 1990 Preliminary Evaluation Report, as well as being summarized in a June 1990 fact sheet. The Phase I RI results indicated, inter alia, soil contamination with TCE and CCL_4 in the area of track 69 at the Conrail railyard, and ground-water contamination with TCE and CCL_4 in the County Road 1, Vistula Avenue, and LaRue Street areas. The Phase I results also provided a preliminary indication of the vertical extent of contamination. In addition, no ground-water contamination with CCL_4 was detected upgradient of the Conrail railyard during the Phase I RI and no significant concentrations of TCE were detected upgradient of the railyard during the Phase I RI.

The second phase of the Remedial Investigation, which was summarized in the July 1992 "Phase II RI Technical Memorandum", was conducted to, inter alia, preliminarily identify potential sources contributing to the County Road 1 and LaRue Street ground-water contamination areas, evaluate the relationship

between the County Road 1 plume and the Vistula Avenue and Charles Avenue ground-water contamination, define the nature and extent of the sources of contamination, preliminarily identify the residential well usage north of the St. Joseph River, and collect data necessary to support alternatives for an interim remedy.

The third and final phase of the RI at the Conrail Site was conducted to, inter alia, define the path of the ground-water contamination plume originating from the CCL_4 source at track 69, define the areal extent of the TCE source located between tracks 65 and 66 in the west end of the classification yard, investigate reported locations of buried tank cars, further investigate the link between the County Road 1 ground-water contamination and the Charles Avenue ground-water contamination, identify the nature and extent of the potential source on the railyard for the LaRue Street ground-water contamination plume, and define the north-south extent of the track 69 CCL_4 area source and investigate the potential for the presence of additional sources, including dense non-aqueous phase liquids (DNAPLs). DNAPL chemicals are immiscible with and denser than water. Their immiscibility and high density enable DNAPL constituents released to a porous medium to penetrate the unsaturated zone and migrate downward into the saturated zone as a separate nonaqueous phase. This nonaqueous phase may persist as pooled product accumulated on a stratigraphic unit or as residual material throughout the vertical column of the unconsolidated deposit. Results of the Phase III RI, as well as summaries for Phase I and II can be found in the "Remedial Investigation Report" which was completed in April 1994.

Collectively, results from the various investigations indicate that:

- Based on soil sampling data, there are two well-defined source areas (areas of soil contamination that act as a source of ground-water contamination) on the Conrail facility, a CCl_4 source area in the eastern section of the classification yard and a TCE source area in the western section of the classification yard, approximately 1,900 feet west of the eastern straight-a-way between tracks 65 and 66.

- A third potential source area with lower levels of contamination has been identified in the eastern portion of the Conrail railyard, and

- There are two identified ground-water contaminant plumes coming from the Conrail facility, the County Road 1 plume and the LaRue Street plume. Refer to Figure 2 for the locations and approximate extent of these contaminant plumes. The Maximum Contaminant Levels (MCLs) for TCE and CCl_4 have been exceeded in many residential wells within the County Road 1 plume.[1]

Levels of contamination are discussed in Section V of this Record of Decision.

Interim Remedial Action

Based on the Phase I and II RI results, a Record of Decision (ROD) for Interim Remedial Action at the Conrail site was signed in June 1991. After issuance of special notice letters and an attempt to negotiate a consent agreement with Conrail and the Penn Central Transportation Corporation (Penn Central), on July 7, 1992, EPA issued a Unilateral Administrative Order for Remedial Design and Remedial Action (Order) which requires Conrail and Penn Central to perform remedial activities described in the Statement of Work (SOW) attached to the Order. Only Conrail has complied with the Order.[2] The Interim Remedial Action for the Conrail Site, as described in the SOW, consists of the following elements:

- Institutional Controls including deed restrictions for future use of the railyard executed through the Elkhart County Recorder; restrictive covenants ensuring that property outside the Conrail railyard on which components of the remedy will be located (e.g., monitoring wells, treatment facilities) will not be disturbed; and abandonment of residential wells located within the area of contamination;

- Monitoring Program including ground-water monitoring in and around the area of contamination and air monitoring of the treatment system;

- Ground-water Extraction, Collection, Treatment, and

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[1] MCLs for TCE and CCL4 are both 5 ug/L.

[2] After several name changes, the Penn Central Corporation recently changed its name to American Premier Underwriters.

Discharge System will be constructed, operated, and maintained to prevent further horizontal and vertical migration of contaminated ground water located northwest, downgradient from the Conrail railyard by extracting water from the plume, treating it using air stripping, and discharging it to the St. Joseph River;

- Fence installation to enclose ground-water extraction and treatment facilities; and

- Provision of an Alternate Water Supply through the construction and first-year operation and maintenance of a distribution system extending from the City of Elkhart water supply to affected residential/business areas located downgradient from the Conrail railyard, and maintenance of individual water filter units or provision of bottled water for those areas until the distribution system is operational. Quarterly monitoring of residential wells was also required.

The Interim Remedial Action 100% (final) Design was approved for implementation on June 2, 1994. Construction should commence before the end of 1994.

III. HIGHLIGHTS OF COMMUNITY INVOLVEMENT

U.S. EPA and IDEM have been interacting with the community, in terms of the Conrail site, since contamination was first found in residential wells in 1986, starting with the Removal Action, through the sampling of wells and the provision of bottled water, carbon filters, watermain connections, etc. In addition, IDEM has been in contact with residents since that time as a part of its periodic sampling of residential wells, and maintenance of the carbon filter systems.

With respect to the remedial activities, community relations activities began in late 1988, with the development of the Community Relations Plan. In accordance with that plan, various meetings have been held, and facts sheets have been issued. An RI/FS kickoff meeting, held in July 1989, was attended by about 150 people. Availability sessions held in the afternoon and evening of June 26, 1990, to discuss the results of the first phase of investigations, were also widely attended. A public meeting for the Proposed Plan for the Interim Remedial Action was held on May 1, 1991, and attended by about 150 people. Numerous fact sheets have been issued since July 1989.

The Proposed Plan for this Final Remedial Action was released to the public on April 14, 1994, outlining remedial alternatives, and informing residents that the FS and all other documents comprising the Administrative Record for the site, were available at the public information repositories at the Elkhart Public

Library and the Harley Holben Elementary School. The Administrative Record Index is included as Appendix A. A public comment period was held from April 14, 1994, to May 16, 1994, and a public meeting was held on April 25, 1994 to discuss the proposed remedial action with the residents. The public meeting was attended by about 200 people, with numerous questions asked, and several oral comments received. These comments, as well as written comments received, and U.S. EPA's response to the comments are included as Appendix B, the Responsiveness Summary.

Community interest is further evidenced by the creation of a local community interest group, the Citizens League for Environmental Action Now (CLEAN), which has been extensively involved in the Conrail project, in part, through verbal and written communications with both U.S. EPA and IDEM. Media coverage has also been fairly extensive throughout the life of the project, including coverage by local newspapers and television stations.

IV. SCOPE AND ROLE OF THE FINAL REMEDIAL ACTION

This Record of Decision (ROD) is the second and final ROD for the Conrail site. The Interim Remedial Action, outlined in the June 28, 1991 ROD for the Conrail site, required immediate action to hook up residences and businesses within the ground-water contaminant plumes (approximately 500 residences and businesses) to city water and contain the County Road 1 plume via extraction (and treatment) of ground water.

This final Remedial Action will fully address the contaminated ground water and is designed to restore the aquifer as a drinking water source, and will address all known contaminated soils on the railyard which may serve as source areas for the ground water contamination. To mitigate the threat to human health and the environment, the selected remedy provides 1) an alternate water supply to an additional estimated 700 to 1000 residences and businesses that are located between the Conrail railyard to the south, the St. Joseph River to the north, Baugo Bay to the west, and Nappanee Street (SR 19) to the east that are not being hooked up under the Interim remedial Action, 2) treating contaminated groundwater by emphasizing extraction/treatment of contaminated groundwater in "hot spots", and 3) remediating contaminated soil on the railyard by soil vapor extraction/air sparging.

V. SUMMARY OF SITE CHARACTERISTICS

Site Geology and Hydrogeology

The information collected during the subsurface investigations is used to describe geological conditions present in the study area. The 52 soil borings and 77 boreholes for monitoring well installation allowed for extensive coverage, with respect to area

and depth of the study area. The combined results of the subsurface soil investigations that were conducted during the three phases of the RI show that the study area primarily consists of unstratified sand and gravel outwash deposits. Evaluation of the subsurface soil investigation findings also show that silt and clay units are present as discrete and isolated lenses or masses.

The bedrock units beneath the overburden consist of the Coldwater Shale of Mississippian age and the Sunbury and the Ellsworth Shales of Devonian and Mississippian age. Shale was encountered and sampled while drilling at seven locations and in all cases the shale was bluish-gray to greenish-gray, pristine, dry, and extremely dense. The approximate thickness of this overburden ranges from 137 to 169 feet and the median depth to bedrock is 150 feet below ground surface (BGS). The median elevation of the bedrock surface is 600 feet above mean sea level (MSL) and is essentially horizontal under the study area. Because the bedrock is not an aquifer and was observed to be pristine, dry, and extremely dense, the investigation and analysis will focus on the glacial geology.

The depth to the water table in the study area varies from approximately 3 feet BGS to nearly 20 feet BGS. The observed depth to water depends on geographic location, season, and elevation of the ground surface. A comparison of the data recorded during at least 14 separate monitoring events over a three-year time span indicates fluctuations of less than 3 feet observed in the elevation of the potentiometric surface. The relative static water levels among wells were consistent for each monitoring event, causing the shape of the potentiometric contour lines and horizontal ground-water gradients to remain constant in the shallow zone (the water table to approximately 35 feet BGS), the intermediate zone (35 feet BGS to 85 feet BGS), and the deep zone (85 feet BGS to the top of bedrock). The median Phase III horizontal ground-water gradient is 0.0020 ft/ft for the shallow zone, 0.0019 ft/ft for the intermediate zone, and 0.0020 ft/ft for the deep zone. The general ground-water flow direction in all zones is to the west-northwest. In the LaRue Street area, however, the general flow direction is north.

The vertical hydraulic gradients calculated between two wells at various nested locations show a general downward gradient in the study area. The vertical hydraulic gradients and the respective locations of the monitoring wells nests in the study area are consistent with ground water recharge in the railyard and subsequent ground water discharge to the St. Joseph River.

Hydraulic conductivity values were calculated from slug test data collected during the Phase II investigation, and correspond to the filter pack and aquifer material immediately surrounding the screened interval of the tested well. As a basis for comparison,

a hydraulic conductivity value was also derived from the pump test conducted in the study area by a water supply contractor (Peerless-Midwest, Inc). A hydraulic conductivity value calculated from a pump test represents the hydraulic conductivity of the aquifer material within the zone of influence of the pumping. Because of the heterogeneity of the aquifer, variation between slug test data and a large-scale pump test's data within one or two orders of magnitude is not unusual. The geometric mean of Phase II slug test results gives a hydraulic conductivity value of 69 feet per day. The Peerless-Midwest pump test result gives a hydraulic conductivity value of 280 feet per day. The heterogeneity in the site conditions caused variability in input parameters that result in a velocity range for ground water of 11 feet per year to 2,200 feet per year. The mean horizontal flow velocity of ground water, based on a hydraulic conductivity of 69 feet per day, a horizontal gradient of 0.0020, and an effective porosity of 0.25 is 200 feet per year.

Nature and Extent of Contamination

This section discusses the nature and extent of soil and ground-water contamination. Discussion of source areas is based on analytical results from Phase I II, and III soil samples.

Soil Contamination

Fifty-two soil borings, along with subsurface soil sample collection, were completed during three phases of field investigation in order to determine the nature and extent of identified and suspected source areas contributing to identified ground-water contamination. Figure 3 shows the soil boring locations. Based on analytical results from subsurface soil samples, two well-defined source areas (areas of soil contamination that act as a source of ground-water contamination) on the Conrail facility have been identified that contain significant levels of contamination. A third potential CCl_4 source area with lower levels of contamination has been identified in the eastern portion of the Conrail railyard.

A CCl_4 source area was identified in the eastern section of the classification yard based on subsurface soil samples from soil borings B-03, B-24, B-25, B-26 B-40, B-41, and B-42. Based on analytical data from soil samples collected from these borings, CCl_4 contamination was detected in an area bounded on the west and east by B-24 and B-25, respectively (75 feet), and on the north and south by B-41 and B-42, respectively, (30 feet). These borings are highlighted on Figure 3. CCl_4 contamination was detected in soil samples collected from these borings between the depths of 18 feet BGS and 25.5 feet BGS (7.5 feet). The analytical data from these boundary locations are greater than or equal to 1 mg/kg, suggesting that this CCl_4 source area extends

beyond the approximate boundaries established with the data to date. This source is located in the saturated zone, in a stratigraphic unit that is more silty than the stratigraphic units above and below it. B-40 was drilled to the top of bedrock (150 feet) and soil samples were collected throughout the length of the borehole. CCl_4 was detected only once between 58 feet and 150 feet BGS at 16 ug/kg in the 128 to 130-foot interval sample. Chloroform, a degradation product of CCl_4, was also detected in this interval at a concentration of 9 ug/kg. Ground-water data and site background information indicate the presence of a CCl_4 dense non-aqueous phase liquid (DNAPL) source.

A TCE source area was identified in the western section of the classification yard, approximately 1,900 feet west of the eastern straight-a-way between tracks 65 and 66. Approximate dimensions of this source area are based on analytical data from subsurface soil samples collected from soil borings B-27, B-28, B-29, B-47, B-51, and B-52. TCE contamination was detected in an area bounded on the west and east by B-29 and B-32, respectively (120 feet), and on the north and south by B-47 and B-28 (10 feet). These borings are highlighted on Figure 3. TCE contamination was detected in soil samples collected from these soil borings at depths from 0 feet to 4 feet BGS. This TCE source area is located in the unsaturated zone. However, ground- water data from wells located directly downgradient from this source (MW49D and MW49BR) detect TCE contamination at depths much greater than 4 feet BGS, indicating unidentified TCE contamination deeper in the subsurface or an unidentified DNAPL TCE source.

In the eastern portion of the site, CCl_4 contamination was detected in subsurface soil samples collected from soil borings B-48, B-49, and B-50 located on an east-west-trending line, just north of track 6 in the receiving yard at the eastern end of the site, on the Conrail facility in the LaRue Street area. CCl_4 was detected in the 0 to 2-foot BGS sample interval in soil boring B-50. This boring is highlighted on Figure 3.

Ground-water Contamination

Seventy-seven monitoring wells were installed during three phases of field investigation. Figure 4 presents the locations of the monitoring wells and the analytical results associated with these wells.

CCl_4 and TCE contamination were detected in ground-water samples collected from monitoring wells screened in the shallow, intermediate, and deep zones on the Conrail facility, at the St. Joseph River, and in the area between these points. Ground-water flow direction in all three zones is west-northwest, and the County Road 1 ground-water contamination plume as defined by ground-water samples follows this path from the Conrail facility

to the St. Joseph River. Ground water in the Larue Street area flows to the north. Ground-water samples collected from monitoring wells located hydraulically upgradient of the plume and on the Conrail facility, MW27S(shallow) and I(intermediate), MW28S and I, MW29S and I, and MW31S and I, and ground-water samples from monitoring wells MW13S and D(deep), located upgradient of the plume and the site, did not detect any VOC contamination.

The maximum concentration of CCl_4 ground-water contamination was 110,000 ug/L collected from monitoring well MW46S located in the track 69 source area. This concentration is 13.8% of the solubility of CCl_4 and suggests a CCl_4 DNAPL source. Site background information and the detection of CCl_4 in a subsurface soil sample at 130 feet BGS also suggest that the CCl_4 source area in track 69 is a DNAPL source.

The maximum concentration of TCE detected in a ground-water sample was 11,000 ug/L from monitoring well MW41, located immediately downgradient of the Conrail facility. This concentration is 1.4% of the solubility of TCE and suggests a TCE DNAPL source. MW41 is side-gradient of the TCE source area identified in the classification yard. Based on analytical and hydrologic data, the DNAPL source is on the Conrail property, but is, as yet, unidentified.

CCl_4 was detected only in ground-water samples collected from shallow monitoring wells in the LaRue Street plume surrounding the identified CCl_4 soil contamination in the receiving yard on the Conrail facility. The soil contamination probably contributes to the identified CCl_4 ground-water contamination. Monitoring wells upgradient of the soil contamination did not detect CCl_4.

TCE was detected (MW20S- 15 ug/L) above the maximum contaminant level (MCL) for TCE (5 ug/L) in the LaRue Street plume. TCE was detected below the MCL in other samples throughout the plume. Monitoring wells located directly upgradient of the Conrail facility did not detect TCE. Based on ground-water analytical data, the source of the TCE contamination is on the Conrail property, but is, as yet, unidentified.

Additionally, results from quarterly monitoring of residential wells by Conrail under the 1992 Unilateral Administrative Order have indicated that many of the residential wells in the County Road 1 plume are consistently over the MCLS for TCE or CCl_4, or both, and that low levels of 1,1,1-trichloroethane were found in the Harley Holben Elementary School drinking water.

VI. SUMMARY OF SITE RISKS

Based on the findings of the RI, a baseline risk assessment was performed to evaluate the risks posed to human health and the surrounding ecological environment by site contamination. The baseline risk assessment followed the guidance provided in U.S. EPA's Risk Assessment Guidance for Superfund (RAGS): Volume I, Human Health Evaluation Manual. Risk assessment guidelines developed by the State of Indiana were also applied. The findings of this assessment, in addition to the procedures, methods, and assumptions used during the risk assessment process, are described in detail in the April 1994 RI Report. The risk assessment determined that site contamination does not pose significant risks to ecological receptors (e.g., sensitive species), but does pose significant risks to human health. With regard to human health, the risk assessment identified and focussed on the following source areas for the Conrail Site:

- VOC contamination in the ground water and subsurface soil beneath the railyard.

- VOC contamination of ground water in the County Road 1 plume area, extending north and west from the central portion of the railyard. This plume potentially affects an area that encompasses the County Road 1, Charles Avenue, and Vistula Street residential areas.

- VOC contamination of ground water in the LaRue Street plume area, extending north from the eastern portion of the railyard. This plume potentially affects the LaRue Street residential area.

From these source areas, the risk assessment identified the following exposure pathways that appear to have the greatest potential to produce adverse human health effects: direct contact with contaminated soil or ground water (dermal contact or accidental ingestion) and inhalation of contaminants volatilized from the soil or ground water. This risk assessment quantitatively evaluated two groups of receptors; adult workers and visitors exposed to existing site conditions, and local residents of potentially affected areas. The risks to the site workers and visitors consist of inhaling contaminants volatilized from ground water and subsurface soils, and possible direct contact during any excavation activity in contaminated areas.

The risks to the residents in the areas of the County Road 1 plume and LaRue Street plume are from ingestion, dermal exposure, and vapor inhalation of ground water used for domestic purposes, and inhalation of compounds volatilized from the groundwater and infiltrating basements or other enclosed areas. It was assumed that there will be no change in use of the site in the foreseeable future, and no new residences constructed any closer to the site than already exist.

The risk assessment evaluated the following VOCs as contaminants of potential concern: acetone, 2-butanone, CCl_4, chloroform, chloromethane, 1,1-dichloroethane, 1,1-dichloroethene, 1,2-dichloroethene, ethylbenzene, methylene chloride, methyl isobutyl ketone, tetrachloroethene, 1,1,2-trichloroethane, 1,1,1-trichloroethane, TCE, toluene, vinyl chloride, and xylenes. Of these contaminants of potential concern, it was determined that CCl_4, chloroform, 1,1-dichloroethene, 1,2-dichloroethene, TCE, and vinyl chloride contribute significantly to human health risks. Both categories of human health risks, carcinogenic (cancer) and non-carcinogenic (e.g., organ immunological effects, birth defects, skin irritation), were evaluated. Some contaminants may pose both types of risks.

According to the risk assessment, contaminants in three areas at the site pose carcinogenic risks that exceed the 1×10^{-6} level established by EPA as a point of departure for determining protective cleanup levels. These areas and the contaminants that pose these risks include:

- The railyard area-due to subsurface soil contamination (vinyl chloride, and to a lesser extent TCE) and due to ground-water contamination (CCl_4, and to a lesser extent TCE).

- The County Road 1 plume area-due to CCl_4, chloroform, 1,1-dichloroethene, TCE, and vinyl chloride in the ground water.

- The LaRue Street plume area-due to CCl_4, chloroform, and TCE in the ground water.

Contaminants and exposure scenarios which pose significant carcinogenic risks are summarized in Table 1. The risks shown are for reasonable maximum exposure (RME) scenarios. The highest potential cancer risks are posed to residents in the County Road 1 plume area due to ingestion of CCl_4 and TCE in ground water.

The reduction of contaminant concentrations to levels at which they pose an excess lifetime cancer risk between 1×10^{-4} and 1×10^{-6} has been determined by EPA to be an acceptable cleanup level. On the basis of the results of the risk assessment, the more conservative risk (1×10^{-6} as established in the NCP as a point of departure for establishing cleanup levels) can be achieved by reducing the contaminant concentrations in on-site soils and in ground water to the risk based concentrations shown in Table 1. However, the values presented in Table 1 represent the conservative end of the range (10^{-4} to 10^{-6}) of risks that are acceptable for cleanup levels. Values as high as 100 times the risk-based concentrations shown on Table 1 would still fall within the acceptable range.

The risk-based concentrations are calculated values based upon excess cancer risks determined to be posed by the RME input concentrations. The RME input concentrations, the resulting calculated cancer risks, and concentrations at which risks would be reduced to the 1×10^{-6} level are shown in Table 2. These calculations have been performed for each compound in each pathway and the results (risk-based concentrations) are listed in Table 1.

The assessment of non-carcinogenic risks determined that significant risks (hazard indices exceeding 1.0) were posed by CCl_4 and 1,2-dichloroethene as a result of ground water use by residents in the County Road 1 plume and LaRue Street plume areas. In order to reduce the hazard indices below 1.0 (the level below which no adverse health effects are anticipated), contaminant concentrations must be decreased to the levels shown in Table 2. The risk-based concentrations listed in Table 2 were calculated using the same approach used in Table 1.

Ecological Assessment

Ecological impacts from site-related contamination were also evaluated. The objective of the Ecological Assessment (EA), which can be found in the final RI report, was to screen the surface waters and sediments of nearby aquatic and wetland habitats for site-related contaminants to estimate the potential risk that contaminants pose to the natural environment. Results of the EA indicate that few organic compounds were detected above detection limits in the St. Joseph River downstream of Crawford Ditch, Baugo Bay and the ponds. Singular detections of some site-related contaminants, such as CCL_4 and DCE were found in sediments samples from the St. Joseph River. Based on the many sediment samples taken, the singular detections suggest no pervasive sediment contamination present that would likely contribute a significant risk to aquatic life.

In summary, actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare, or the environment. Additionally, by reducing site contaminant concentrations to the risk-based concentrations shown in Tables 1 and 2, residual contaminant concentrations would be unlikely to pose significant adverse health effects through the exposure pathways evaluated in the risk assessment.

VII. DESCRIPTION OF ALTERNATIVES

Remedial action objectives and numerical cleanup goals were

established to define the objectives of the remedial action, in order to determine what types of remedial responses were appropriate for the Conrail site and the extent to which remediation needs to be implemented. These objectives were established taking into consideration regulations and guidance (ARARs and TBCs) from federal and state regulatory agencies and the findings of the site-specific human health and ecological risk assessment to ensure that cleanup goals will be sufficiently protective of human health and the environment.

The general remedial action objectives that were established for the Conrail site include:

- Minimizing potential for human exposure to contaminants by eliminating significant exposure routes and/or reducing contaminant concentrations;
- Minimizing further degradation of the ground water beneath the Conrail facility;
- Minimizing further degradation of the ground water downgradient from the Conrail facility (outside of the railyard property boundaries); and
- Restoring the ground water to its original use as a drinking water source.

The following soil cleanup standards were established for the Conrail site:

- CCl_4 - 5 mg/kg,
- TCE - 3 mg/kg, and
- vinyl chloride - 0.010 mg/kg

The following ground water cleanup standards were established for the Conrail Site:

- CCl_4 - 5 ug/L,
- TCE - 5 ug/L,
- 1,1-dichloroethene - 7 ug/L,
- 1,2-dichloroethene- 70 ug/L,
- chloroform - 6 ug/L,
- tetrachloroethene - 5 ug/L, and

- vinyl chloride - 2 ug/L.

The FS identified and evaluated alternatives that could be used to address threats and/or potential threats to human health and the environment at the Conrail Site. It should be noted that these alternatives are for the Final Remedial Action only. These alternatives are designed to be consistent with the Interim Remedial Action; however, the costs of the Interim Remedial Action are not included in the cost estimates listed below.

Alternative 1: No Action

The no action alternative includes no remedial actions. Even though certain actions will be implemented at the site under the Interim Remedial Action, these actions have not been instituted to date. Therefore, in compliance with the NCP, the no action alternative is developed and evaluated to serve as a baseline for comparison with other alternatives. Under the no action alternative, no efforts (other than those planned for the Interim Remedial Action) would be made to mitigate the effects of or control the migration of contaminants identified at the Conrail Site.

- **Estimated Cost: $0**
- **Estimated Construction Time Frame: 0 months (O & M: 0 years)**

Alternative 2: Institutional Actions, Additional Source Investigation, Vapor Abatement, Ground-water Containment

This alternative, and each remaining alternative, includes several institutional actions intended to limit the potential for human exposure to contaminated media. Institutional actions include ground-water and air monitoring, water supply extension and well abandonment, restrictive covenants, access restrictions, and deed restrictions. Deed restrictions and restrictive covenants will be implemented on the railyard and the property where the groundwater extraction facilities and monitoring wells are installed, pursuant to Indiana Code (IC) 13-7-8.7-12 and 310 IAC 16-10-2. The main difference between alternative 2 and the Interim Remedy is that alternative 2 provides for additional alternate water supply hook-ups to businesses and residences, as necessary, based on on-going groundwater monitoring.

Groundwater monitoring is necessary since groundwater contamination will not decrease significantly in a short time frame, regardless of which remedial alternative is selected and implemented at the site. Groundwater monitoring can also be used to evaluate the effectiveness of on-going groundwater remedial efforts. Such monitoring would consist of collecting and

analyzing groundwater samples from monitoring wells at regular intervals, and reporting monitoring results.

Groundwater monitoring requirements would have to be changed over time due to changes in groundwater contaminant concentrations and groundwater flow direction.

Air monitoring would be conducted in buildings and basements within the site area to determine if significant VOC concentrations are accumulating in basements or buildings, and to determine any changes in VOC vapor concentrations in buildings and basements as a result of changes in groundwater VOC concentrations. In the event that air monitoring reveals the need for vapor abatement in buildings within the Conrail Site study area, appropriate actions would need to be considered and implemented. Vapor abatement actions could include sealing building floors or basements (e.g., grouting cracks or seams) and/or the installation and operation of venting systems to ensure sufficient air flow to avoid VOC accumulation. The type and extent of actual vapor abatement actions would be specified after the need for action is determined and the types of buildings affected and levels of VOCs are established. Because the need for vapor abatement has not been established, and because the magnitude of any necessary actions cannot be predicted at this time, no costs have been included for vapor abatement for the purposes of cost estimates in this ROD.

The water supply extension under alternative 2 includes the provision for hookup of additional residences or businesses that are found, through ground-water monitoring, to be contaminated over MCLs after the Interim Remedial Action is implemented. Additionally, this, and each remaining alternative, includes provisions for additional source investigations to identify other source areas that could be contributing to ground-water contamination.

Also under this alternative, the groundwater extraction/treatment system operating under the Interim Remedy, which includes 6 extraction wells, would be continued to contain the County Road 1 plume identified northwest of the railyard. In addition, a similar groundwater extraction/treatment system, which would consist of one extraction well, would be operated to contain the contaminated groundwater plume in the La Rue Street area.

Ground water in both the La Rue Street and the County Road One areas would be collected primarily to change ground water flow patterns to restrict further migration of contaminants from the facility to areas downgradient from the facility and to limit any further expansion of ground-water plumes downgradient from the facility, but also to allow treatment of contaminated ground water. Refer to Figure 5 for approximate extraction well

locations for this alternative. Collected ground water would be treated using air stripping and discharged to the St. Joseph River. Exhaust from the air stripper(s) would be treated by vapor phase carbon adsorption prior to emission. Spent carbon would be disposed of properly.

- **Estimated cost: $3,000,000 present worth ($1,300,000 capital cost, $135,000 annual O&M cost)**
- **Estimated Construction Time Frame: 6 to 9 months (O & M: 30 years)**

Alternative 3: Institutional Actions, Additional Source Investigation, Vapor Abatement, In Situ Soil Remediation, Full Hookup to Alternative Water Supply, Ground-Water Extraction/Treatment/Discharge

This alternative includes the institutional actions, additional source investigation, and vapor abatement aspects described in alternative 2.

Under this alternative, soil contamination source areas identified at the site would be addressed using in situ treatment technologies, which include soil vapor extraction and air sparging. VOC contamination in the TCE source area in the unsaturated zone would be treated using vapor extraction. The CCl_4 contamination in the one saturated zone would be treated using air sparging, in conjunction with vapor extraction in the overlying unsaturated zone. Known source areas are identified in Figure 3. Additional source areas may be identified during further investigation at the site. Any additional source areas may be included in the soil remediation action, as determined during the remedial design.

This alternative would also include extension of the City of Elkhart municipal water supply system to all residences in the area bounded by the Conrail facility to the south, the St. Joseph River to the north, Baugo Bay to the west, and Nappanee Street (State Route 19) to the east. Approximately 500 residences are being hooked up to city water under the Interim Remedial Action; this alternative would provide this hookup to all remaining residences in the area described above. The number of additional residences/businesses to be hooked up under this alternative is between 700 and 1000. Private wells within this area would be abandoned once the water supply extension is operational.

Ground-water extraction/treatment under this alternative would restore contaminated groundwater beneath and downgradient of the facility with extraction emphasized in "hot spots". "Hot spots" may occur in contaminated groundwater as DNAPLs or as "slugs" of contamination. Refer to Figure 6 for approximate extraction well locations for alternative 3. The groundwater treatment system

shall be operated until groundwater standards are met throughout the plume. The ground-water extraction, treatment, and discharge system, including any associated air treatment, would be the same as for alternative 2, except with respect to the number and location of extraction wells.

- **Estimated cost: $7,700,000 present worth ($5,000,000 total capital cost, $213,000 annual O&M cost)**
- **Estimated Construction Time Frame: 12 to 18 months (O & M: 30 years)**

Alternative 4: Institutional Actions, Additional Source Investigation, Vapor Abatement, In Situ Soil Remediation, Ground-water Containment Beneath Facility, Ground-water Restoration Off-Facility.

This alternative includes the institutional actions, additional source investigation, and vapor abatement measures described under alternative 2, and the in situ soil treatment described under alternative 3. This alternative does not include additional water main hook-ups, as set forth under alternative 3.

The ground-water extraction/treatment system for this alternative is similar to that for alternative 3, differing in that the number of extraction wells would be increased downgradient from the facility. Due to the additional extraction wells, alternative 4 should attain cleanup goals more quickly downgradient of the facility. Also, an additional extraction well would be installed immediately downgradient from the CCl_4 source area on the railyard to assist in containing and capturing contaminants mobilized by the air sparging system.

Refer to Figure 7 for approximate extraction well locations.

- **Estimated Cost: $6,900,000 present worth ($3,000,000 total capital cost, $307,000 annual O&M cost)**
- **Estimated Construction Time Frame: 6 to 12 months (O & M: 30 years)**

Alternative 5: Institutional Actions, Additional Source Investigation, Vapor Abatement, Soil Excavation and On-Site Thermal Desorption, Ground-water Restoration

This alternative differs from the previous alternatives in that it attempts to restore the aquifer beneath and downgradient from the facility more quickly through ground-water extraction, treatment, and discharge. Refer to Figure 8 for approximate extraction well locations. Additionally, soil contamination on the facility is addressed by excavation and on-site thermal desorption.

This alternative includes the institutional actions, additional source investigation, and vapor abatement measures described under alternative 2.

- **Estimated Cost: $10,200,000 present worth ($5,500,000 total capital cost, $382,000 annual O&M cost)**
- **Estimated Construction Time Frame: 12 to 18 months (O & M: 30 years)**

VIII. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

The NCP requires that the alternatives be evaluated on the basis of the following nine evaluation criteria: (1) Overall protection of human health and the environment; (2) Compliance with applicable or relevant and appropriate requirements (ARARs); (3) Long-term effectiveness and permanence; (4) Reduction of toxicity, mobility, or volume through treatment; (5) Short-term effectiveness; (6) Implementability; (7) Cost; (8) State acceptance; and (9) Community acceptance. This section compares to the alternatives with regard to these nine evaluation criteria.

Threshold Criteria

1. **Overall Protection of Human Health and the Environment** addresses whether a remedy provides adequate protection of human health and the environment and describes how risks posed through each exposure pathway are eliminated, reduced or controlled through treatment, engineering, or institutional controls. The selected remedy must meet these criteria.

The no action alternative provides no protection to human health and the environment which would allow risks to human health to continue unabated. For alternative 2, significant human exposure to contaminated ground water would be essentially eliminated for those users connected to the water supply system. However, not all residents that may potentially be at risk are hooked up to the water supply, the risks posed to site workers by vapor inhalation would continue to exist, and soil contamination beneath the facility would continue to contribute to ground-water contamination.

Alternatives 3,4, and 5 would be fully protective of human health and the environment, with one exception. For alternatives 4 and 5, which do not provide for an extension of the alternate water supply, the possibility exists that the wells of residents that are not hooked up to the water supply system under the Interim Remedial Action may become contaminated either by ineffective plume containment or additional contaminant sources outside of the current plume areas. If this situation occurs, residents

would be exposed to contamination.

2. **Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)** addresses whether a remedy will meet applicable or relevant and appropriate federal and state environmental laws and/or justifies a waiver from such requirements. The selected remedy must meet this criteria or waiver of the ARAR must be attained.

Alternatives 3,4, and 5 are intended to fully comply with all ARARs. However, alternatives 4 and 5, with more aggressive ground-water extraction systems, may achieve ground-water ARARs more quickly than alternative 3. The no action alternative and alternative 2 would not achieve the cleanup goals for soil and ground water that have been established as ARARs since alternative 1 provides no action and alternative 2 does not address contaminated soil and only contains contaminated ground water, as opposed to pumping and treating contaminated ground water to achieve cleanup goals throughout the contaminant plumes.

Primary Balancing Criteria

3. **Long-Term Effectiveness and Permanence** refers to expected residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, once cleanup levels have been met.

The no action alternative does not provide an effective or permanent means of achieving the remedial action objectives. Significant risks would continue to be posed by site contaminants for a long time period. Alternative 2 does not provide a permanent remedy for the site. The LaRue Street plume and risks posed to site workers from contamination in soils present at the site are not addressed under alternative 2.

To the extent possible at this site, alternatives 3, 4, and 5 would provide a permanent, effective remedy. Given the potential at the Conrail site for the presence of previously unidentified, additional sources that may contribute to ground-water contamination, and the potential future releases of contaminants resulting from ongoing rail operations, no alternative for this site can absolutely be considered permanent; however, the additional investigations included in alternatives 3, 4, and 5 will attempt to correct this potential shortfall.

4. **Reduction of Toxicity, Mobility, or Volume Through Treatment** addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently and significantly reduce toxicity, mobility, or volume of

the hazardous substances as their principal element. This preference is satisfied when treatment is used to reduce the principal threats at the site through destruction of toxic contaminants, reduction of the total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media.

The no action alternative includes no treatment and, therefore, provides no reduction in toxicity, mobility, or volume of contaminants.

Implementing alternative 2 is designed to decrease the mobility of contaminants downgradient from the facility. Extraction of contaminants in the County Road 1 plume and LaRue Street plume would decrease the total volume of contaminants in the environment and the air stripping, collection of vapor phase contaminants using carbon adsorption, and the regeneration of carbon would provide destruction of extracted contaminants.

Alternatives 3, 4, and 5 would provide a greater degree of reduction in mobility, volume and toxicity of hazardous substances in the ground water than alternative 2, since alternatives 3,4 and 5 are designed to pump and treat groundwater to meet MCLs throughout the plume, as opposed to only containing the plumes as provided under alternative 2.

Alternative 5 would also contain and extract ground-water contamination on the railyard. Alternatives 3, 4, and 5 would also significantly reduce contaminant concentrations and mass in the two identified soil source areas through soil treatment processes (soil vapor extraction or thermal desorption).

5. **Short-Term Effectiveness** addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed, until cleanup levels are achieved.

The no action alternative has the greatest short-term effectiveness since it takes no time to implement and has no adverse effects from its implementation. The remaining alternatives, in order of greatest to least short-term effectiveness, are 2, 3, 4, and 5, since each successive alternative involves a greater degree of remedial activity and, thus, a greater potential for adverse impacts during implementation. Even though alternative 3 takes longer to implement than alternative 4, it still has greater short-term effectiveness since it provides absolute short-term protection to all residents in the site area by providing a clean, alternative drinking water supply.

6. **Implementability** is the technical and administrative

feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

The no action alternative and alternative 2 are readily implementable. Alternatives 3 and 4 are implementable; however, piping, ground-water extraction wells, and soil treatment systems on the railyard would need to be installed in such a manner as to minimize interruption of rail use, and treatability testing would need to be conducted to verify the effectiveness of air sparing/vapor extraction for the site. Alternative 5 would be difficult to implement due to the need for removal of contaminated soil areas with active rails on top of them. Rail service would be disrupted during excavation, treatment, and backfilling of soils.

7. **Cost** includes estimated capital and operation and maintenance (O&M) costs, also expressed as net present worth.

Specific details regarding the costs of the alternatives are available in the FS.

Alternative 1 (no action) costs nothing. Alternative 2 costs approximately $3,000,000. Alternative 3 costs approximately $7,700,000. The increase in costs is primarily due to the extension of the alternate water supply system. Alternative 4 costs approximately $6,900,000 and alternative 5 costs approximately $10,000,000. The relatively high cost of alternative 5 is primarily due to the cost of excavating contaminated soil.

Modifying Criteria

8. State Acceptance

IDEM has been involved throughout the investigations of the Conrail site and concurs with the selected remedy (alternative 3).

9. Community Acceptance

Community acceptance of the selected remedy is discussed in the Responsiveness Summary, which is attached as Appendix B. Basically, CLEAN and the majority of persons who submitted oral or written comments, support the selected remedy (alternative 3).

A complete summary of public comments can be found in the attached Responsiveness Summary.

IX. THE SELECTED REMEDY

Based on the information collected and developed in the RI/FSs, and using the comparative analysis of alternatives described above, U.S. EPA and IDEM have selected alternative 3 as the most appropriate Final Remedial Action for addressing contamination at the Conrail site.

Alternatives 1 and 2 do not provide acceptable Overall Protection of Human Health and the Environment and do not meet ARARs, and alternative 5 is more expensive, difficult to implement and does not provide any significant advantages over alternatives 3 and 4 with respect to the other seven criteria.

Alternatives 3 and 4 compare nearly equally in the first seven criteria, with alternative 3 having a slight advantage in Overall Effectiveness and Long-Term and Short-Term Effectiveness, and alternative 4 having a slight advantage in estimated Cost and may achieve ARARs more quickly. U.S. EPA selected alternative 3 in the Proposed Plan primarily due to the fact that there is significant uncertainty at the Conrail site with respect to possible future ground-water contamination, and alternative 3 is the only alternative that provides absolute protection of public health by providing a clean alternate water supply. The possible presence of DNAPLs (which may move in directions counter to the ground water flow and then contaminate previously clean areas of the aquifer), the possibility of additional sources of contamination both on and off the railyard, and the possibility of further migration of the County Road 1 and LaRue Street plumes if containment measures are not fully effective are all examples of this potential for further contamination of the ground water that is only fully addressed by alternative 3. The recent discovery of low levels of TCE and/or CCl_4 in several wells under the additional residential well sampling program (report cover letter August 12, 1994) and 1,1,1-trichloroethane in the Harley Holben Elementary School drinking water, which is outside of the estimated plume boundaries, exemplifies the unpredictable nature of ground-water contamination at this site, and supports the selection of alternative 3 as the selected remedy. State concurrence on and community acceptance of alternative 3 further support the decision that alternative 3 provides the best balance of the nine criteria used by U.S. EPA for remedy selection.

Four minor changes were made to alternative 3 in response to concerns raised at the April 25, 1994 public meeting and written and oral comments received during the public comment period. These changes, which are underlined, are as follows:

1) Treated ground water will be discharged to the St. Joseph River. <u>If Crawford Ditch has insufficient capacity for the volume of treated water, an alternate system for a permitted</u>

discharge will be used;

2) Treatability testing will need to be conducted to verify the effectiveness of air sparging/vapor extraction for the site. If such testing indicates that air sparging is not suitable for use, a contingency plan will be developed to evaluate and implement other alternatives as appropriate;

3) Additional investigations will be performed to delineate additional source areas, if any, both on and outside of the railyard, at the Conrail site that have not been identified to date; and

4) Although alternative 3 does not employ as many extraction wells as alternatives 4 and 5, it is intended to fully achieve the ground-water ARARs, primarily by focussing on "hot spots" and, if present, any DNAPL source areas.

The selected remedy, including the changes resulting from public comments, is summarized below:

Expanded Institutional Actions

Institutional actions to be implemented at the site include ground-water monitoring, air monitoring, restrictive covenants, access restrictions, deed restrictions, water supply extension, and well abandonment.

Ground-water monitoring is necessary to assess the effectiveness of the extractions system in containing the two contaminant plumes, to determine when cleanup standards have been achieved in the aquifer, and to determine if contamination occurs in previously uncontaminated areas. Such monitoring will be consistent with the monitoring currently being performed by Conrail under the 1992 Unilateral Administrative Order and will consist of the collection and analysis of ground-water samples from monitoring wells at regular intervals, and reporting of monitoring results.

Air monitoring will be conducted in buildings and basements within the Conrail site study area to determine if significant VOC concentrations ("significant" will be defined during remedial design) are accumulating in basements or buildings, and to determine what, if any, changes in VOC vapor concentrations in buildings and basements occur as a result of changes in ground-water VOC concentrations. Air monitoring will consist of sampling with portable analytical equipment capable of detecting VOCs and/or collection of air samples for laboratory analysis for VOCs.

Access restrictions, such as fencing to limit access to ground-

water extraction and treatment facilities, and deed restrictions will be implemented to limit future use of ground water and future use of contaminated areas within the Conrail railyard. Abandonment of water wells will be performed pursuant to 310 IAC 16-10-2, and restrictive covenants pursuant to IC 13-7-8.7-12 may be used for the railyard and property where the ground-water extraction facilities and monitoring wells are located.

The alternate water supply (to be implemented under the Interim Remedial Action) will be expanded to provide service to residences and businesses in the entire area bounded by the Conrail railyard to the south, the St. Joseph River to the north, Baugo Bay to the west, and Nappanee Street (State Route 19) to the east. All private wells in the area to be hooked up will be abandoned. The only exception to this requirement that has been allowed by U.S. EPA under the Interim Remedial Action is for legitimate home cooling systems that utilize ground water.

Additional Investigations

Additional investigations will be performed to delineate suspected source areas, both on and outside of the railyard at the Conrail site, that have not been identified to date. Any newly discovered source areas will be remediated consistent with the other provisions of this selected remedy, as appropriate.

Vapor Abatement

In the event that air monitoring reveals the need for vapor abatement in buildings within the Conrail Site study area, appropriate actions will be considered and implemented. Vapor abatement actions could include sealing building floors or basements (e.g., grouting cracks or seams) and/or the installation and operation of venting systems to ensure sufficient air flow to avoid VOC accumulation. Operation and installation of venting systems will meet the substantive requirements of the Clean Air Act (CAA) and Indiana Regulations for Establishing Emission Levels for VOCs. The type and extent of actual vapor abatement actions will be specified after the need for action is determined and the types of buildings affected and levels of VOCs are established.

In Situ Soil Remediation

The soil contamination source areas identified at the site will be addressed using in situ treatment technologies. Additional source areas may be identified during additional investigation at the site which may be included in the soil remediation action, as determined during the remedial design. VOC contamination in the TCE source area in the unsaturated zone will be treated using

vapor extraction. The CCl_4 contamination in the one saturated source area will be treated using air sparging, in conjunction with vapor extraction in the overlying unsaturated zone. Treatability testing will need to be conducted to verify the effectiveness of air sparging/vapor extraction for the site. It is anticipated that vapor extraction will be implementable; the success of air sparging is more uncertain. Therefore, if treatability testing indicates that air sparging (or vapor extraction) is not suitable for use at the site, a contingency plan will be developed to evaluate and implement other alternatives, as appropriate. Operation and installation of vapor extraction systems and treatability testing will meet the substantive requirements of the CAA and Indiana Regulations for Establishing Emission Levels for VOCs. Contaminants collected by the vapor extraction system(s) will be disposed of properly and will meet the substantive requirements under RCRA and Indiana Regulations for the Treatment and Disposal of Hazardous Waste. Thermal destruction is the preferred method of disposal.

In situ soil remediation will continue until the soil cleanup goals in Section VII are achieved; verification sampling will be performed to assess progress and demonstrate that cleanup goals have been achieved.

Ground-Water Extraction/Treatment

The ground-water extraction/treatment/discharge system that was designed under the Interim Remedial Action for the site will be modified, as appropriate, and operated to contain and remediate the County Road 1 plume identified northwest of the facility. The design for the extraction/treatment/discharge system under the Interim Remedial Action was suspended by U.S. EPA on June 2, 1994 due to compatibility/capacity concerns with the additional extraction/treatment/discharge required by this Final Remedial Action. In addition, a ground water extraction/treatment/ discharge system will be installed and operated to contain and remediate ground-water contamination identified to the northeast of the facility (the LaRue Street plume).

Groundwater will be extracted by being pumped from approximately nine extraction wells (eight in the County Road 1 plume area and one in the LaRue Street plume area), treated using air stripping, and discharged under an appropriate NPDES permit to the St. Joseph River. If Crawford Ditch has insufficient capacity for the volume of treated water, an alternate system will be used for discharge. Vapor emissions from the air stripping system will be treated using vapor-phase carbon to ensure capture, and subsequent proper disposal, of VOCs. Approximate extraction well locations are shown on Figure 6. Results of sampling during the design for the remedial action will be used to determine actual well locations, which will also take into consideration "hot

spots" (i.e. areas of relatively high contaminant concentrations or where DNAPL sources are identified), to the extent possible. The actual number and locations of extraction wells, ground-water pumping rates, and location of treatment facilities and discharge lines will be determined during the design phase for the remedial action.

The extraction/treatment system will be operated until the ground-water cleanup standards in Section VII are achieved throughout the plume. Verification sampling will be performed to assess progress and demonstrate that cleanup standards have been met. All groundwater extraction/treatment and discharge will meet the substantive requirements under the SDWA, CWA, CAA, and all state ARARS identified in section X.

X. STATUTORY DETERMINATIONS

EPA's primary responsibility at Superfund sites is to select remedial actions that are protective of human health and the environment. CERCLA also requires that the selected remedial action for the site comply with applicable or relevant and appropriate environmental standards established under Federal and State environmental laws, unless a waiver is granted. The selected remedy must also be cost-effective and utilize permanent treatment technologies or resource recovery technologies to the maximum extent practicable. The statute also contains a preference for remedies that include treatment as a principle element. The following section discusses how the selected remedy at the Conrail site meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy protects human health and the environment through providing an alternate water supply to affected and potentially affected residents and businesses, and extracting and treating contaminated groundwater. As previously indicated, residents using the ground water can be exposed to the contaminants it contains or may contain in the future. The Interim Remedial Action was designed to provide alternative water supply to all residents within the area of the two identified contaminant plumes. The most significant exposures generally result from direct consumption of the water itself and beverages made with the water, and through dermal contact with the water and inhalation of vapors from the water while bathing. The selected remedy provides absolute protection of human health by providing an alternate water supply to all residents, between the Conrail railyard, the St. Joseph River, Baugo Bay, and Nappanee Street (State Route 19), vapor abatement measures, if necessary, in situ remediation of identified soil contamination in the railyard, extraction and treatment of contaminated ground water, and imposition of access restrictions to contaminated ground

water until aquifer remediation is attained.

Implementation of the selected remedy will reduce contaminant concentrations to levels (hazard indices not exceeding 1.0 and carcinogenic risks not exceeding the range of $1x10^{-4}$ to $1x10^{-6}$) that would be unlikely to pose significant adverse health effects through the identified exposure pathways.

Use of emissions controls (i.e. capture of emissions from air strippers using vapor-phase carbon, and subsequent proper disposal) will meet the substantive requirements under the CAA and the state ARARS identified below, and will protect against short-term exposure to contaminants during the remedial action. No environmental impacts due to site contamination have been identified to date, and discharge of water to the St. Joseph River will be regulated by NPDES to ensure that the remedial action does not affect aquatic life.

Compliance with ARARs

The selected remedial action will meet all identified applicable, or relevant and appropriate Federal and more stringent State requirements. ARARs for the selected remedy and are categorized as chemical, action, and location specific below:

Chemical Specific

- SDWA National Primary Drinking Water Standards (40 CFR Part 141), and Indiana Drinking Water Quality Standards (327 IAC 8).

- CAA National Ambient Standards for Hazardous Air Pollutants (NESHAPs) (40 CFR 61).

- CAA National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50).

- Indiana Regulations for Establishing Emission Levels for VOCs (326 IAC 2, and 326 IAC 8).

Action Specific

- Clean Water Act (CWA) NPDES Permit Regulations (40 CFR Parts 122 and 125).

- CWA State Enforcement Jurisdiction (40 CFR Part 131).

- CWA Sample Preservation Procedures (40 CFR Part 136).

- RCRA Definition and Identification of Hazardous Waste (40 CFR Part 261).

- RCRA Standards for Generators of Hazardous Waste (40 CFR 262).

- RCRA Standards for Transporters of Hazardous Wastes (40 CFR Part 263)

- RCRA Land Disposal Restrictions (LDRs) (40 CFR Part 268).

- Occupational Safety and Health Act (OSHA) Regulations for Workers involved in Hazardous Waste Operations (29 CFR Part 1910).

- Indiana Regulations for the Treatment and Disposal of Hazardous Waste (329 IAC 3.1).

- Indiana Regulations for Permitting of Air Strippers (326 IAC 2, and 326 IAC 8).

- Indiana Regulations for Construction Permits for Water Treatment Facilities (327 IAC 3).

- Indiana NPDES Permit regulations (327 IAC 5 and 327 IAC 2).

- Indiana regulations for the Registration of Groundwater Extraction Wells Which Have a Combined Capability of Pumping Greater Than 70 Gallons per Minute (Indiana Code 13-2-6.1)

- Indiana Fugitive Dust Rules (326 IAC 6).

- Indiana Incinerator Rules (326 IAC 4).

- Indiana Rules Regarding Permanent Abandonment of Wells (310 IAC 16-10-2).

Location Specific

- Construction Within 100-year Floodplain (40 CFR 264).

- U.S. EPA's Statement of Procedures on Floodplain Management and Wetlands Protection (40 CFR Part 6, Appendix A).

- Indiana Regulations Governing Construction in a Floodway (Indiana Code 13-2-22)

To Be Considered Criteria

- U.S. EPA's OSWER Directive 9355.0-28 - Control of Air Emissions from Superfund Air Strippers.

- Elkhart County Groundwater Protection Ordinance.

Pursuant to the Safe Drinking Water Act, EPA has published maximum contaminant levels (MCLs) allowable in regulated public water supplies, 40 CFR Part 141. The MCLs are ARARs at the site since the aquifer is currently used as a drinking water supply for those residences who were not hooked up the alternate water supply provided under the Interim Remedial Action. The selected remedy is intended to meet MCLs for groundwater throughout the plumes by pumping and treating contaminated groundwater. Points of compliance will be throughout the contaminated aquifer and may include extraction wells. Exact locations of points of compliance will be determined during the remedial design.

Extraction of groundwater in hot spots will accelerate attainment of MCLs. The groundwater extraction system portion of the selected remedy will meet NPDES permitting/discharge requirements (40 CFR Parts 122, 125, 131, and 136; and IAC 327), and will utilize the best available demonstrated control technology for treatment and discharge of the groundwater to surface water. For air stripping facilities, IAC 326 establishes permitting requirements for emissions of VOCs, requiring Best Available Control technology (BACT) for new sources with potential emissions exceeding a specified threshold value. U.S. EPA's OSWER Directive 9355.0-28, relating to the control of air emissions at Superfund groundwater sites will also be considered to the extent that it is suitable to VOC air emissions for the groundwater treatment process. In addition, if off-site landfilling of residuals is considered, all Federal (40 CFR Part 268) and State (329 IAC) requirements for landfilling hazardous wastes must be met. For off-site disposal of spent carbon to an approved generation facility, the manifest requirements under the Resource Conservation and Recovery Act (40 CFR Part 262) and the Indiana Administrative Code (Section 329) are applicable.

Cost-Effectiveness

U.S. EPA believes that the selected remedy is cost-effective in mitigating the risks posed by contact with contaminated ground water and soil, within a reasonable period of time. Section 300.430(f)(ii)(D) of the NCP requires U.S. EPA to evaluate cost-effectiveness by comparing all the alternatives which meet the threshold criteria: protection of human health and the environment; and compliance with ARARS, against three additional balancing criteria: long-term effectiveness and permanence; reduction of toxicity, mobility or volume through treatment; and short-term effectiveness. The selected remedy meets these criteria and provides the greatest overall effectiveness in proportion to its cost. The estimated cost for the selected remedy is $7,700,000.

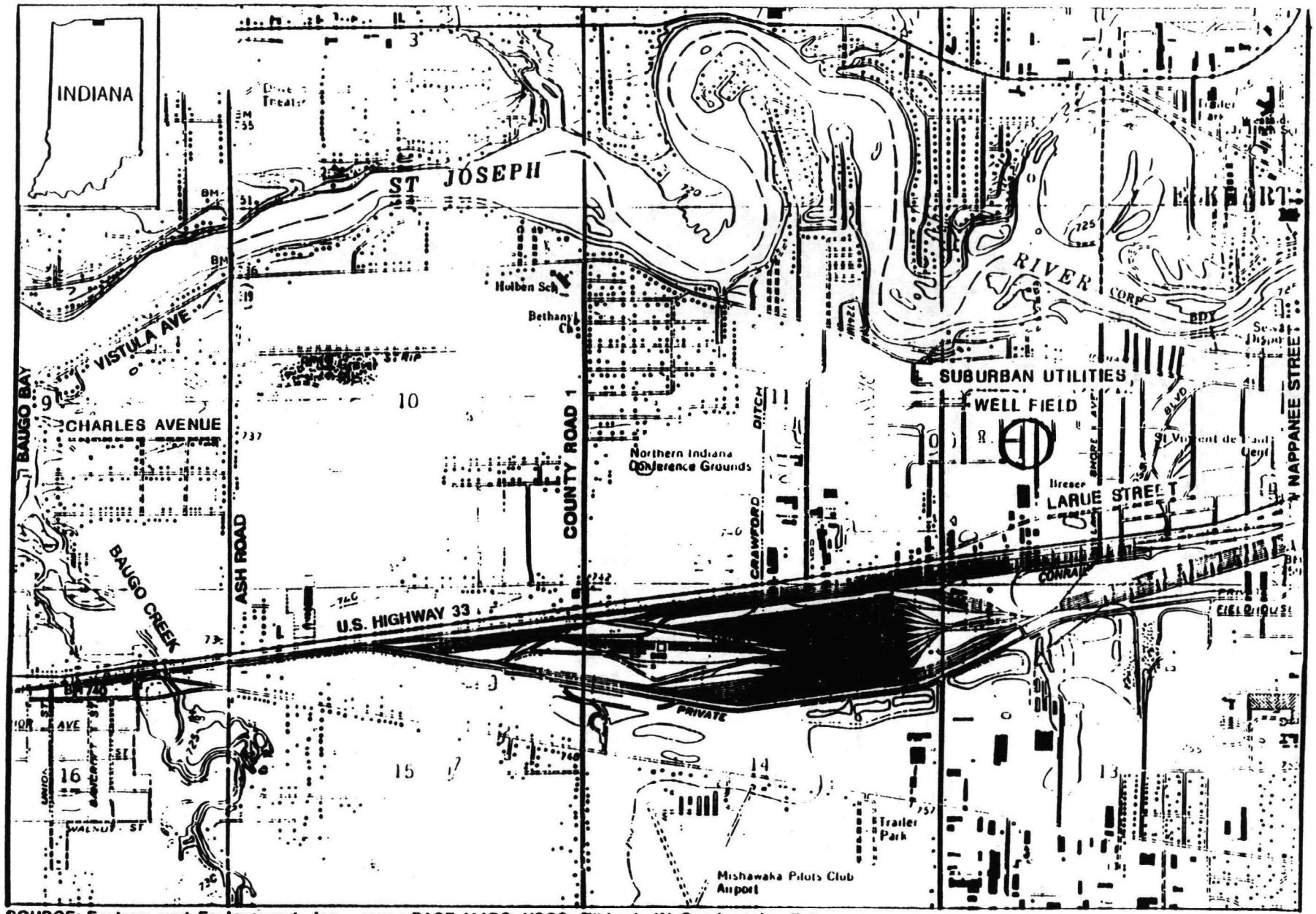
Utilization of Permanent Solutions and Alternative Treatment

Technologies or Resource Recovery Technologies to the Maximum **Extent Practicable**

U.S. EPA and IDEM believe that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a cost-effective manner for the Conrail site. Of those alternatives that are protective of human health and the environment and comply with ARARS, U.S. EPA and IDEM have determined that the selected remedy provides the best balance of trade-offs in terms of long-term effectiveness; reduction in toxicity, mobility or volume achieved through treatment; short-term effectiveness; implementability; and cost, taking into consideration the statutory preference for treatment as a principal element and considering State and community acceptance.

Preference for Treatment as a Principal Element

Ground-water and soil remediation are the principal elements of the selected remedy, and the selected remedy employs both ground-water and soil treatment technologies.



SOURCE: Ecology and Environment, Inc., 1993; BASE MAPS: USGS, Elkhart, IN Quadrangle, 7.5 Minute Series, 1961, Photorevised 1981; USGS, Osceola, IN Quadrangle, 7.5 Minute Series, 1969, Photorevised 1980.

FIGURE 1 CONRAIL SITE STUDY AREA LOCATION MAP

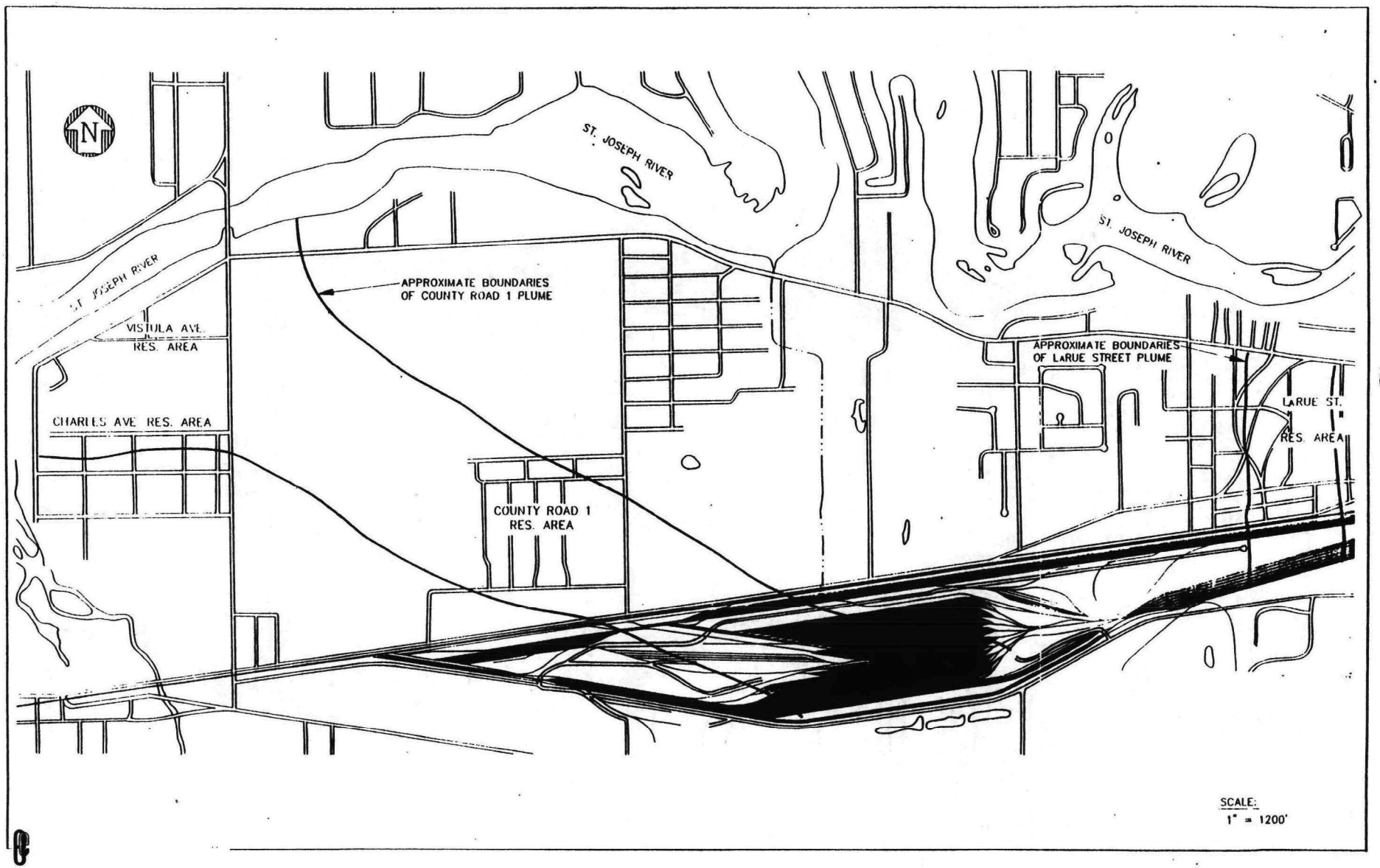
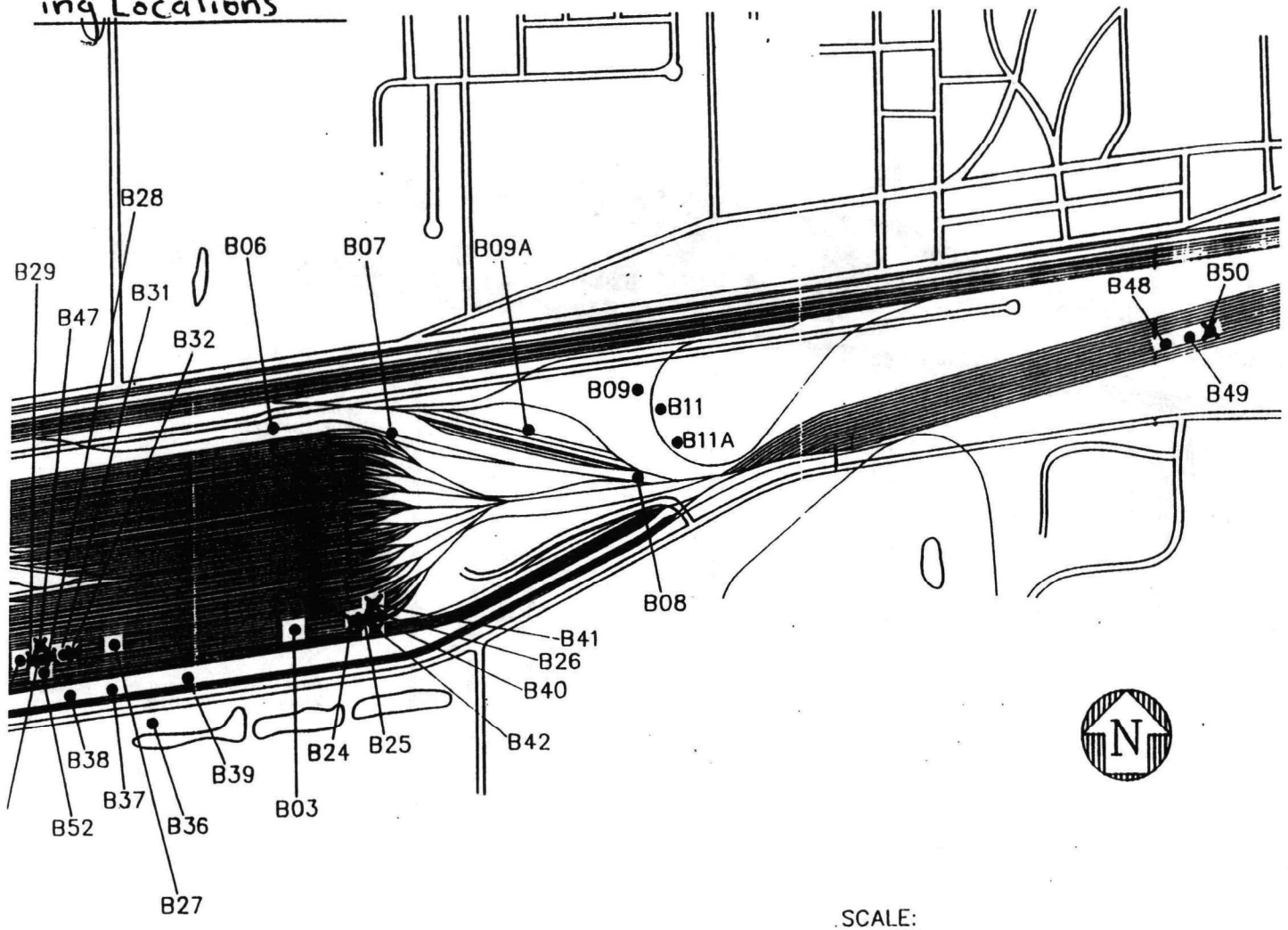


FIGURE 2 APPROXIMATE EXTENT OF GROUNDWATER CONTAMINATION

gure 3
ing Locations



SCALE:

1" = 800'

KEY:

● – SOIL BORING LOCATION

X – SOURCE AREA SOIL BORING

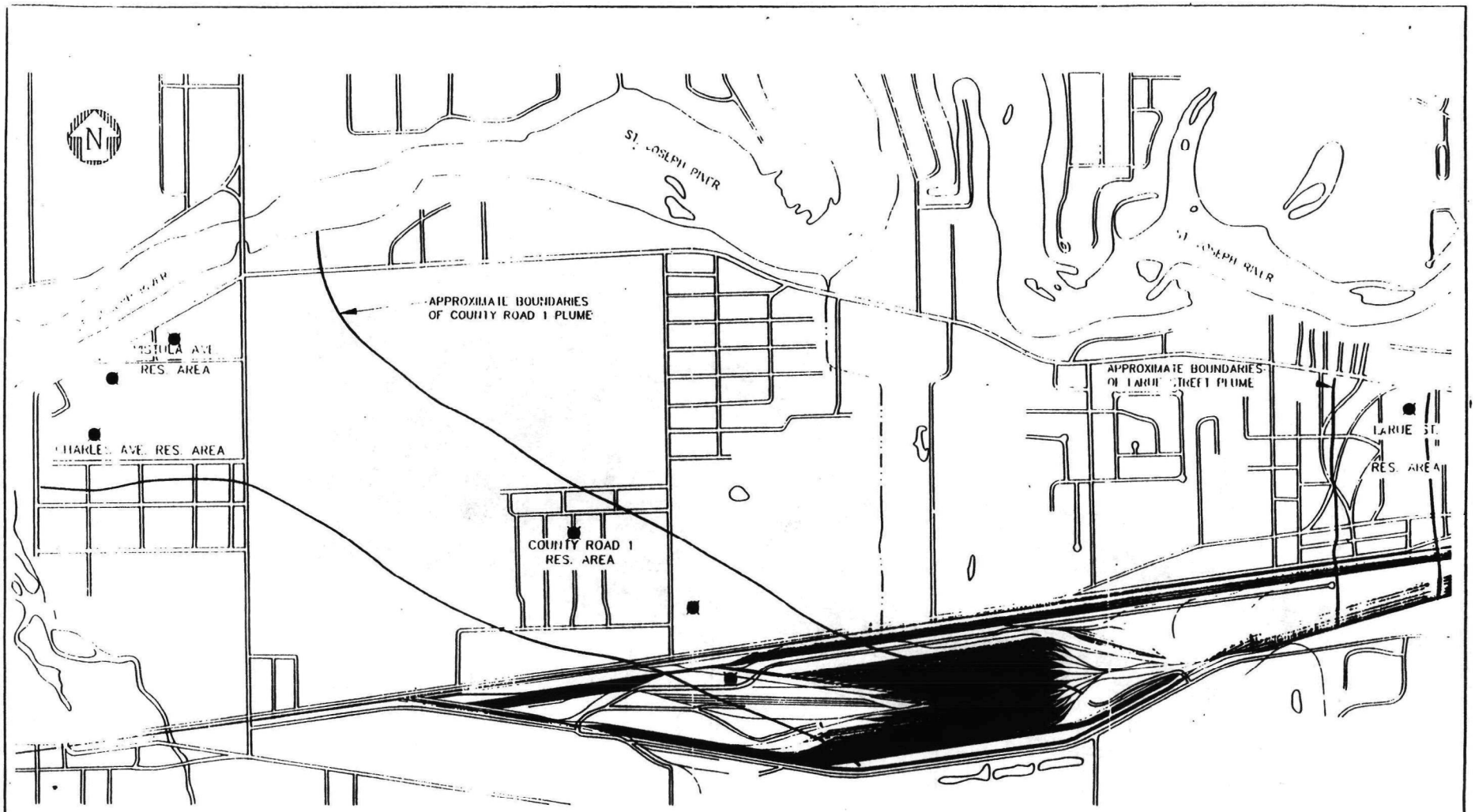


FIGURE 5 APPROXIMATE GROUNDWATER EXTRACTION WELL LOCATIONS FOR ALTERNATIVE 2

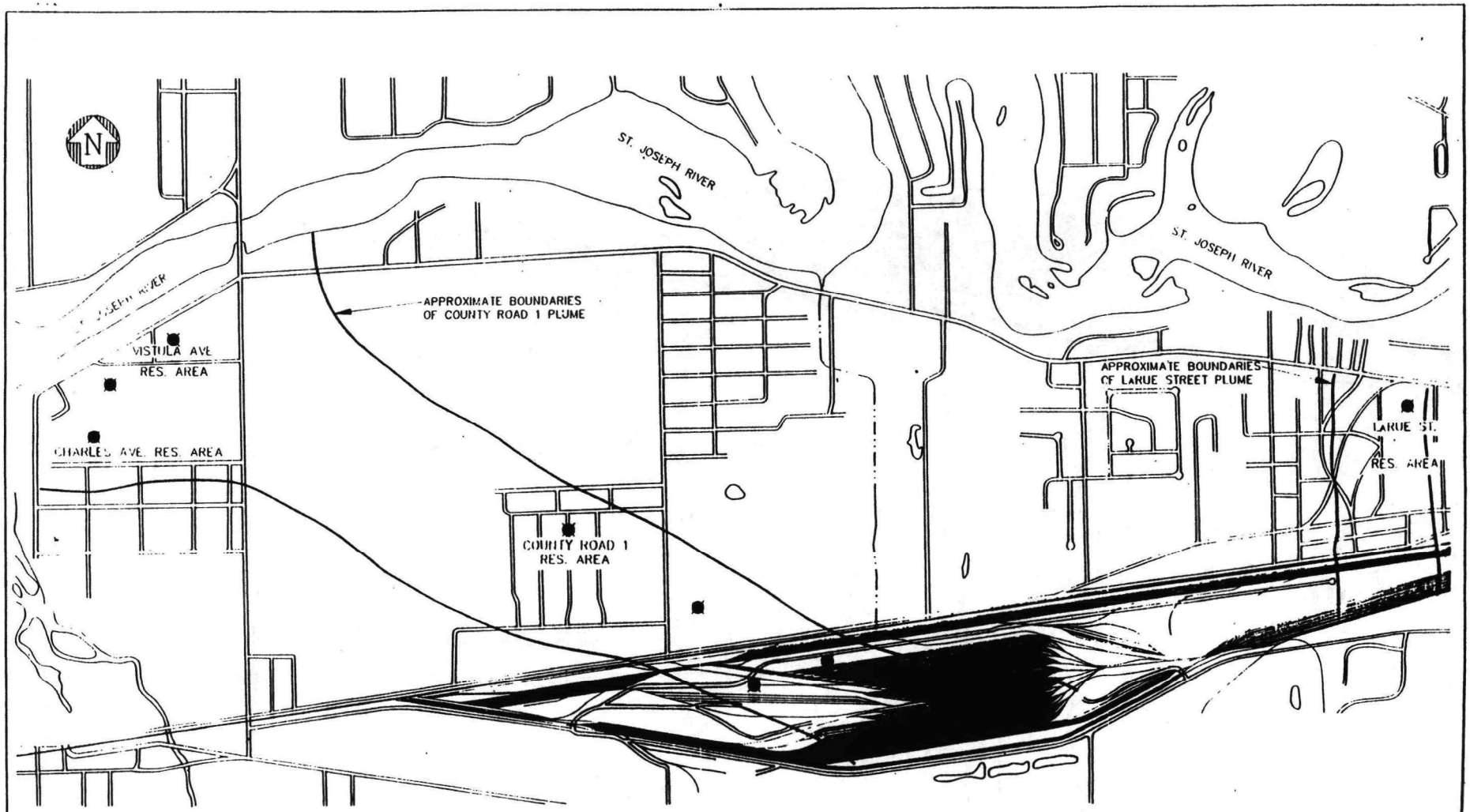


FIGURE 6 APPROXIMATE GROUNDWATER EXTRACTION WELL LOCATIONS FOR ALTERNATIVE 3

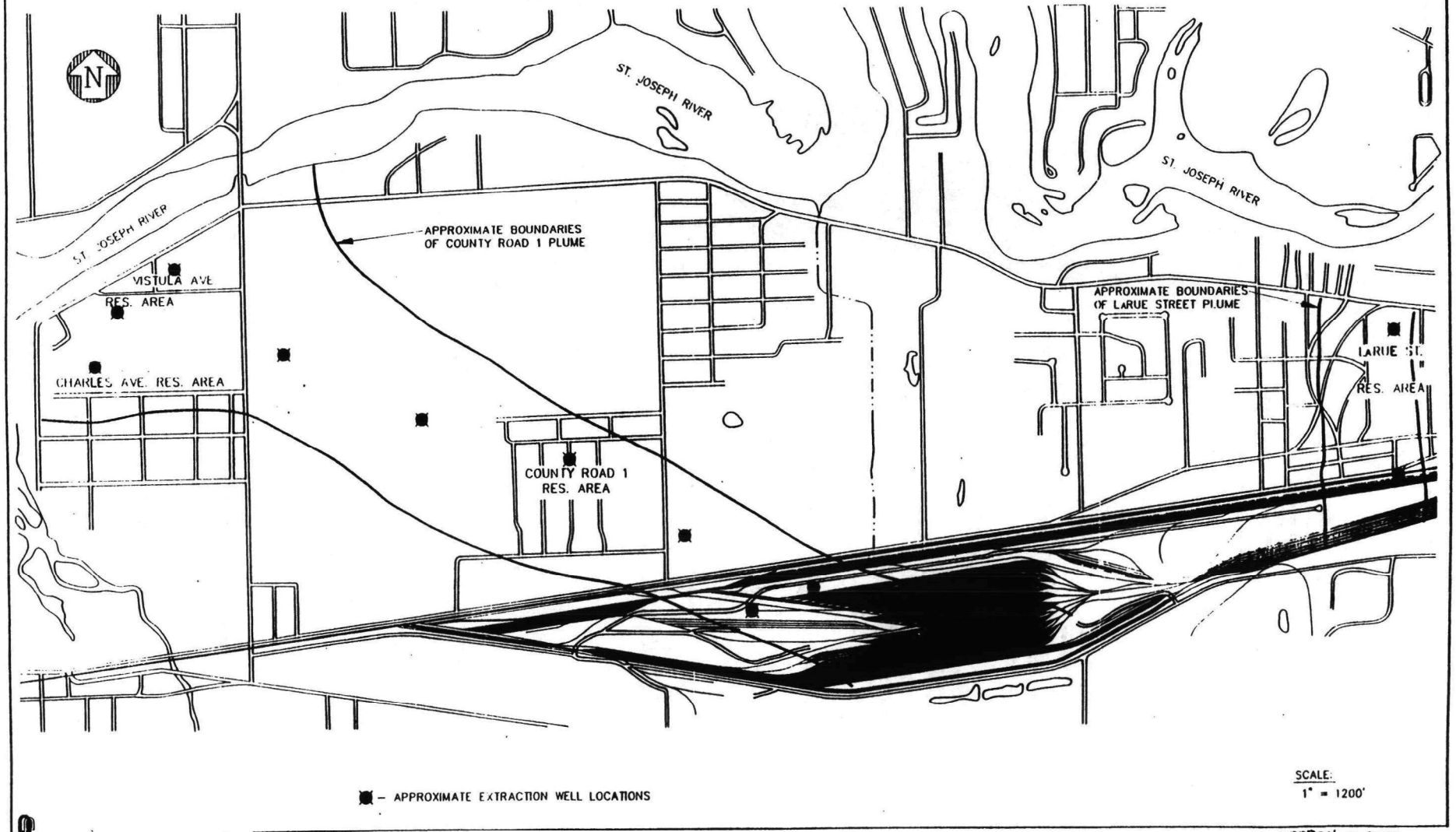


FIGURE 7 · APPROXIMATE GROUNDWATER EXTRACTION WELL LOCATIONS FOR ALTERNATIVE 4

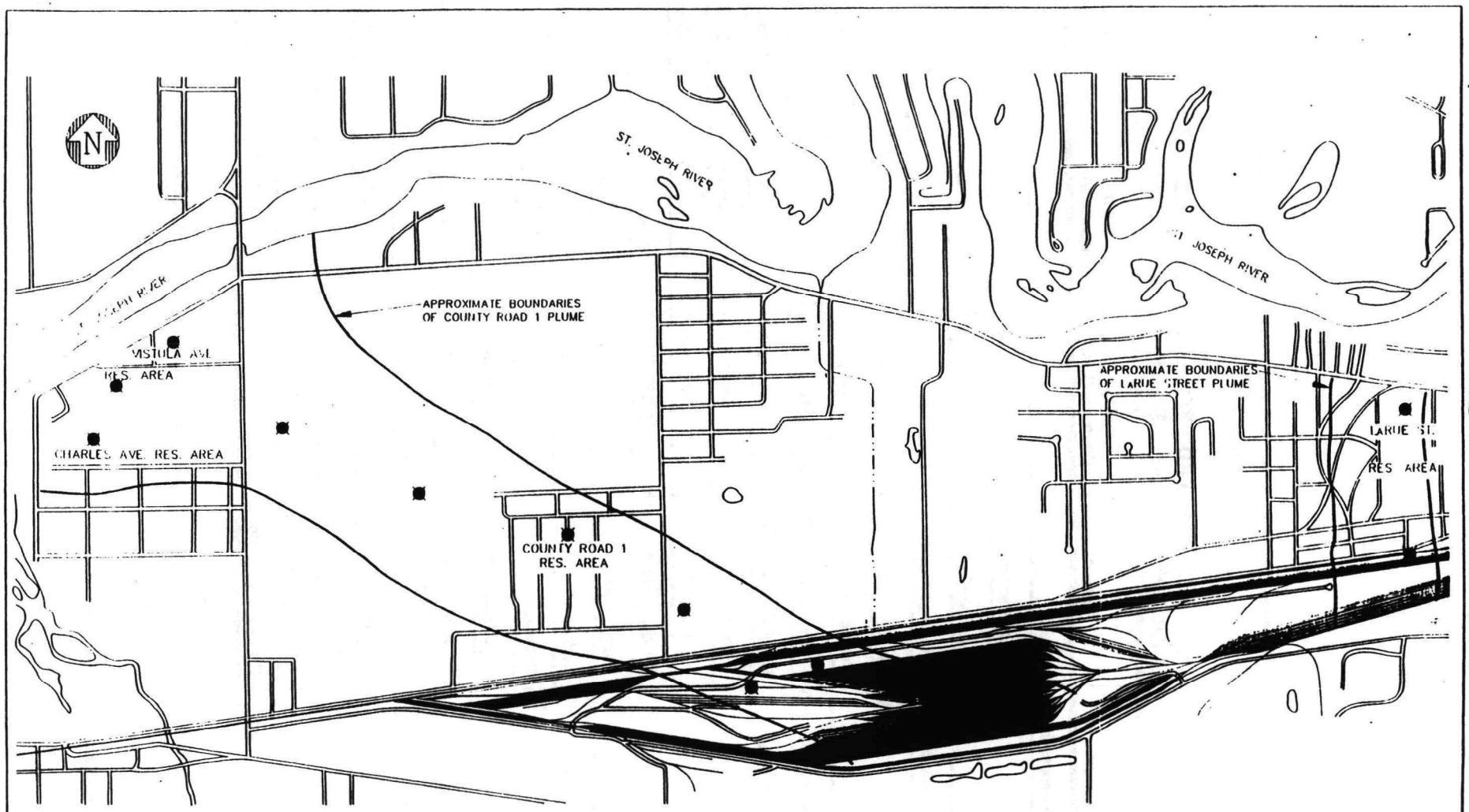


FIGURE 8

APPROXIMATE
GROUNDWATER EXTRACTION
WELL LOCATIONS
FOR ALTERNATIVE 5

Table 1

SUMMARY OF ESTIMATED EXCESS CANCER RISKS AND RESULTING RISK-BASED CONCENTRATIONS

Pathway	Chemical	RME Input Concentration[a]	Excess Cancer Risk	Risk-Based Concentrations[b]
On Site Worker Exposure (Soil)				
Inhalation	Trichloroethene	7,707 µg/kg	2.58E-06	2,990 µg/kg
	Vinyl chloride	8 µg/kg	1.02E-05	0.78 µg/kg
On Site Worker Exposure (Groundwater)				
Inhalation	Carbon tetrachloride	94,500 µg/L	4.15E-04	228 µg/L
	Trichloroethene	7,100 µg/L	3.81E-06	1,860 µg/L
Nearby Residential Exposure - County Road 1 Plume (Groundwater)				
Groundwater usage	Carbon tetrachloride	2,475 µg/L	5.46E-03	0.45 µg/L
	Chloroform	148 µg/L	1.56E-04	0.95 µg/L
	1,1-dichloroethene	48 µg/L	4.72E-04	0.10 µg/L
	Trichloroethene	13,000 µg/L	4.43E-03	2.9 µg/L
	Vinyl chloride	7 µg/L	1.80E-04	0.04 µg/L
Inhalation (indoor air)	Carbon tetrachloride	655 µg/L	1.59E-04	4.1 µg/L
	Chloroform	25 µg/L	1.12E-06	23 µg/L
	1,1-dichloroethene	8 µg/L	8.26E-06	0.97 µg/L
	Trichloroethene	93 µg/L	2.75E-06	34 µg/L
Nearby Residential Exposure - La Rue Street Plume (Groundwater)				
Groundwater usage	Carbon tetrachloride	76 µg/L	1.26E-04	0.60 µg/L
	Chloroform	5 µg/L	4.74E-06	0.95 µg/L
	Trichloroethene	10 µg/L	3.38E-06	3.0 µg/L
Inhalation (Indoor air)	Carbon tetrachloride	44 µg/L	1.06E-05	4.1 µg/L

[a] Derivation of these values is explained in the risk assessment portion of the *Remedial Investigation Report* (E & E 1993).

[b] Concentrations are calculated on the need to reduce excess cancer risk to 1.00E-06 for each compound.

Source: Ecology and Environment, Inc. 1994.

Table 2

SUMMARY OF ESTIMATED HAZARD INDICES AND RESULTING RISK-BASED CONCENTRATIONS

Pathway	Chemical	RME Input Concentration[a]	Hazard Index	Risk-Based Concentrations[b]
On Site Worker Exposure (Soil/Groundwater)				
Inhalation	Total	—	1.52E-02	—
Nearby Residential Exposure - County Road 1 Plume				
Groundwater usage	Carbon tetrachloride	2,475 µg/L	1.01E+02	25 µg/L
	1,2-dichloroethene	203 µg/L	1.23E-00	165 µg/L
Inhalation (indoor air)	Total	—	7.23E-02	—
Nearby Residential Exposure - La Rue Street Plume				
Groundwater usage	Carbon tetrachloride	76 µg/L	3.10E-00	25 µg/L
Inhalation (Indoor air)	Total	—	2.79E-03	—

[a] Derivation of these values is explained in the risk assessment portion of the *Remedial Investigation Report* (E & E 1993).
[b] Concentrations were calculated on a need to reduce the Hazard Index to 1 for each compound.

Source: Ecology and Environment, Inc. 1994.