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Environmental Protection
Agency

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Remedial Response

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March 1991

EPA

Superfund Record of Decision:

Main Street Well Field, IN

50272-101

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SUPERFUND RECORD OF DECISION
Main Street Well Field, IN
Second Remedial Action

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Washington, D.C. 20460

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14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 48-acre Main Street Well Field (MSWF) site is in Elkhart, Elkhart County, Indiana. The well field provides the primary water supply for the 44,000 city residents. Adjacent to the site are several industrial properties, Excel and Durakool to the east; Elkhart Products to the west that used TCE and other organic solvents as part of their operations. The site is bounded by Christiana Creek to the north and the St. Joseph River to the south. MSWF is located in both a wetlands and a floodplain, and overlies a sole source aquifer. Since the early 1900s, an onsite treatment and pumping station has been used for the purification and distribution of water to the surrounding community. The well field contains 17 production wells, two interceptors used as production wells, two 2-million gallon storage tanks, an air stripper facility, and recharge ponds. Site contamination first occurred during the 1950s when phenols from a nearby fuel tank farm, east of the well field, were detected in onsite wells. The contamination was mitigated by excavating six recharge ponds and diverting the water to those ponds from Christiana Creek. During routine sampling in 1981, EPA identified TCE contamination in onsite wells. Sampling wells were installed on the Excel and Durakool properties, and the results of this testing indicated these

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Main Street Well Field, IN
Second Remedial Action
Contaminated Media: soil, gw
Key Contaminants: VOCs (PCE, TCE, xylenes), other organics (PAHs), metals (arsenic)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 80
	20. Security Class (This Page) None	22. Price

(See ANSI-Z39.18) *See Instructions on Reverse* OPTIONAL FORM 272 (4-77) (Formerly NTIS-35) Department of Commerce

Abstract (Continued)

industries were the likely sources of contamination. Subsequently in 1981, the city constructed two eastern interceptor wells, which discharged to Christiana Creek, and removed the nearby production wells from service. As a result, TCE levels in finishing and production wells dropped significantly. In 1984, TCE levels on the west side of the field increased, and EPA suspected a second plume had impacted the well field. A 1985 Record of Decision (ROD) provided for construction of an air stripping facility to treat water from the seven production wells and the two eastside interceptions. Subsequent investigations further characterized onsite contamination and led to the discovery of a TCE-contaminated paint layer on the soil in eastern area of the site. This ROD addresses management of migration of the western contaminant plume, as well as source control on the east side of the well field. A third remedial action may be necessary if further onsite contamination is identified. The primary contaminants of concern affecting the soil and ground water are VOCs including PCE, TCE, and xylenes; other organics including PAHs; and metals including arsenic.

The selected remedial action for this site includes treating 22,000 cubic feet of contaminated soil by in-situ vacuum extraction; removing the soil containing the 60 cubic yards of soil containing the paint layer, followed by offsite incineration or suitable treatment based on waste characterization and offsite disposal in accordance with the Land Disposal Restrictions Soil and Debris Treatability Variance; constructing new interceptor wells on the west side of the field; continued pumping and treatment of ground water using the existing air stripping unit; ground water monitoring; and implementing institutional controls including deed restrictions. The estimated present worth cost for this remedial action is $3,370,000, which includes an estimated annual M cost of $130,000 for 20 years.

PERFORMANCE STANDARDS OR GOALS: Performance standards for soil and ground water are based on a 10^{-5} excess lifetime cancer risk. Chemical-specific goals for soil include TCE 100 ug/kg. Interceptor wells will remain operational as long as plumes entering the field have cancer risk levels greater than 10^{-6}. Chemical-specific goals for ground water include PCE 0.6 ug/l and TCE 1 ug/l.

Declaration For the Record of Decision

SITE NAME AND LOCATION

Main Street Well Field
Elkhart, Indiana

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Main Street Well Field site in Elkhart, Indiana, developed in accordance with CERCLA, as amended by SARA and, to the extent practicable, the National Contingency Plan. This decision is based on the administrative record for this site.

The State of Indiana concurs with the selected remedy.

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from this 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 operable unit is the second for this site. The first operable unit provided an alternate water supply by selecting air stripping as the cost effective remedy. The function of this second operable unit is to provide remediation of soil and ground water contamination in areas of known contamination on the East side of the well field and well field restoration by intercepting the plume from undefined sources on the West side of the well field. A third operable unit may be required if additional sources are identified.

The major components of the selected remedy include:

- In-Situ Vacuum Extraction of VOCs in contaminated soil;
- Removal of a small paint layer and off-site disposal in accordance with the Soil and Debris Treatability Variance;
- Installation of new interceptors on the West side of the well field to prevent continued plume migration into the well field and provide well field restoration;
- Continued use of the existing air stripper to assure a clean drinking water supply;
- Ground water monitoring to assure adequate performance of the air stripper and attainment of ground water standards;
- Deed restrictions on East Side property with contaminated soil until the soil and ground water cleanup standards are met.

DECLARATION

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable for this site. This remedy satisfies the statutory preference for treatment as a principal element of the remedy.

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

Valdas V. Adamkus

Regional Administrator

3/29/91.

Date

Record of Decision Summary
Main Street Well Field
Elkhart, Indiana

I. SITE NAME, LOCATION AND DESCRIPTION

The well field:

The Main Street Well Field (MSWF) is located in the City of Elkhart, Elkhart County, Indiana, at 942 N. Main St. It covers approximately 48 acres. The Elkhart Water Works (EWW) maintains three well fields currently and a fourth well field will go on-line in 1991 to supplement the city's demand. MSWF is the primary water supply for the city and supplies approximately 80 percent of EWW's production capacity for a city of approximately 44,000 people. The well field currently contains 17 production wells, two existing interceptors used as production wells, two 2-million gallon storage tanks, an air stripping facility, six recharge ponds and a treatment/pumping station (See figure 1).

Geology/Hydrology:

The aquifer system in northwest Elkhart County consists of coarse sand and gravel deposits averaging 175 feet in thickness. In the MSWF area, sand and gravel (glacial outwash) occurs to depths ranging from 42 to 58 feet. These deposits consist of mixed sands and sands and gravels. Regionally, below the outwash is a gray and hard to very dense silty clay layer which separates the unconfined aquifer from a deeper aquifer. The lower aquifer ranges from 0 to 120 feet thick within the city boundaries. The confining layer is at least 10 to 160 feet thick in the vicinity of Miles Laboratory. The Miles investigative data, in conjunction with data collected during all phases of the RI, indicates that the lower aquifer interfingers with the till layer and eventually pinches out locally northwest of and beneath the well field. The till is continuous throughout the study area and the lower aquifer appears to be absent beneath the MSWF. This till layer acts as an aquitard or confining layer in the study area. Beneath the clay and silt till lie bedrock units of the Coldwater and Ellsworth Shales of Mississippian age and the Sunbury Shale of Devonian age. See figure 2.

The regional aquifer, inclusive of MSWF, is part of a designated sole source aquifer. The direction of regional ground water flow is generally south, toward the St. Joseph River and its tributary, Christiana Creek. This southerly flow is more predominant east of the well field. In the area west of the well field, the ground water flow tends from northwest to southeast toward the well field. The ground water flow in this area is subject to influence by natural factors, such as Christiana Creek and by ground water pumpage and recharge. The effect of MSWF on ground water flow patterns is dependent upon ground water levels; the number, location and rate of pumping of the supply wells; the recharge from Christiana Creek and other industrial ground water use and recharge.

Horizontal gradients in the unconfined aquifer measured in the direction of ground water flow, range from .003 to .020 ft/ft. These gradients do not represent natural gradients because of the draw-down induced by various pumping wells and pumping rates. Similarly, the pumping and recharge significantly affects the ground water velocity. The regional velocity is approximately 102 ft/year. However, near the well field it can be significantly higher - 470 ft/yr measured west of the well field, and 820 ft/yr measured southeast of the well field.

The water-table configuration is dramatically influenced by artificial recharge, draw-down from the MSWF, and draw-down from the industrial wells in the study area. The response of the water-table is directly related to the number of wells pumping and the rates at which they are pumped. Subsequently, the ground water flow patterns are also impacted and change on a daily, or even an hourly basis. Therefore, the dynamic nature of the unconfined aquifer and impact of the pumping-wells induces a potential for ground water mixing and rapid fluctuations in flow velocities.

II. Site History and Enforcement Activities:

Contamination History:

The first known incident of ground water contamination at the MSWF was in the mid-50's. Ground water was contaminated with phenols as a result of releases from a fuel tank farm east of the well field. The contamination problem was mitigated by excavating six recharge ponds in the well field and diverting water to those ponds from Christiana Creek. EWW acquired the water rights to Christiana Creek from the Indiana-Michigan state line to MSWF.

In 1981, MSWF was sampled as part of U. S. Environmental Protection Agency's (EPA's) National Ground water Supply Survey. The well field was found to be contaminated with trichloroethene (TCE) at 94 ppb, 1,2-dichloroethene (1,2-DCE) at 33 ppb, 1,1,1-trichloroethane (TCA) at 5 ppb and 1,1-dichloroethane (DCA) at 2 ppb. Observation wells were installed near and on the Excel and Durakool properties located on the East side of the well field. The results of this sampling program indicated that both industries were likely sources of ground water contamination affecting the MSWF. The city installed two interceptor wells in the well field on the eastern edge of the property and took production wells near that area out of service. The interceptor wells were discharged to Christiana Creek under an NPDES permit.

TCE levels in the finished water supply and production wells

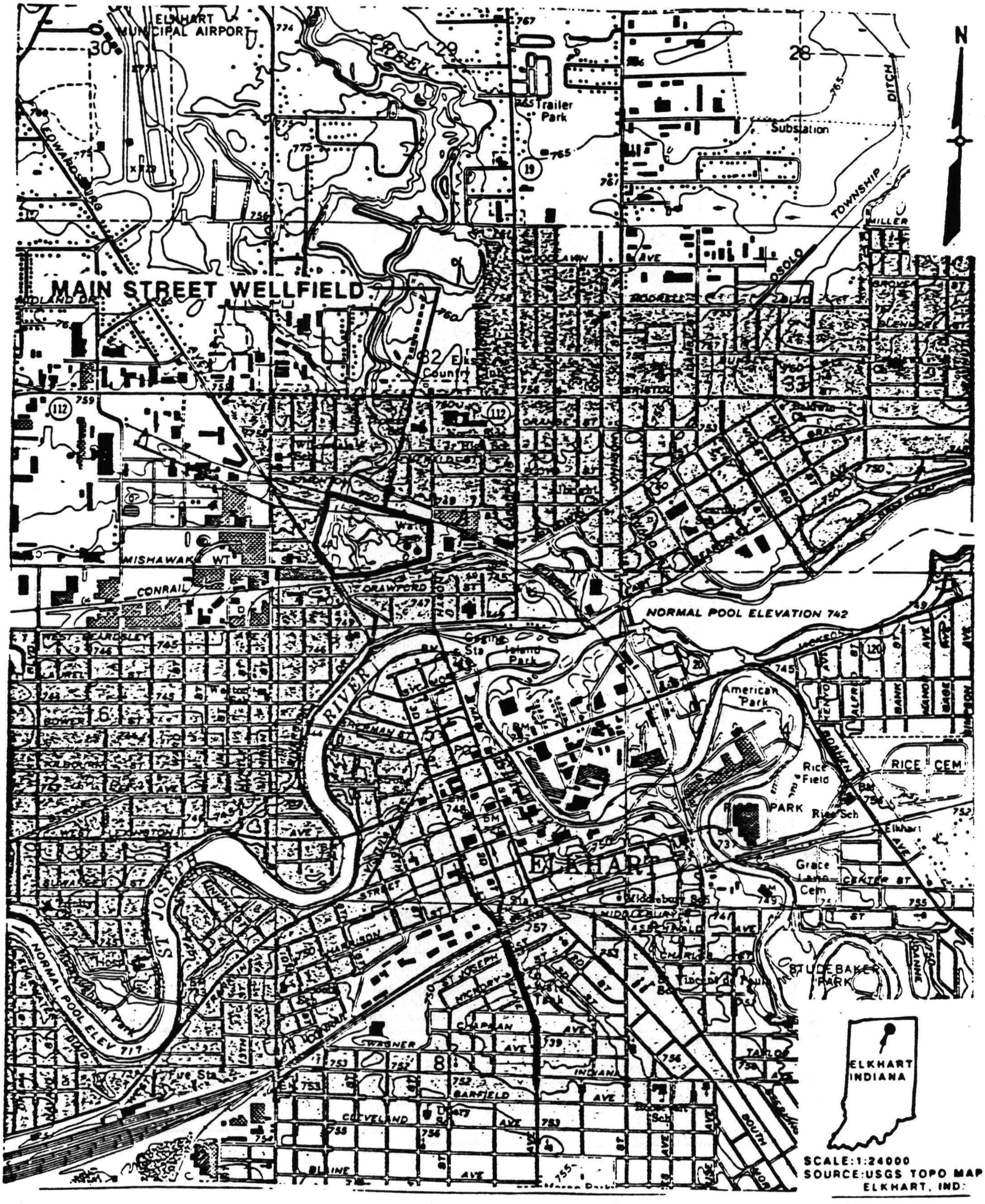


FIGURE 1
Site Location Map

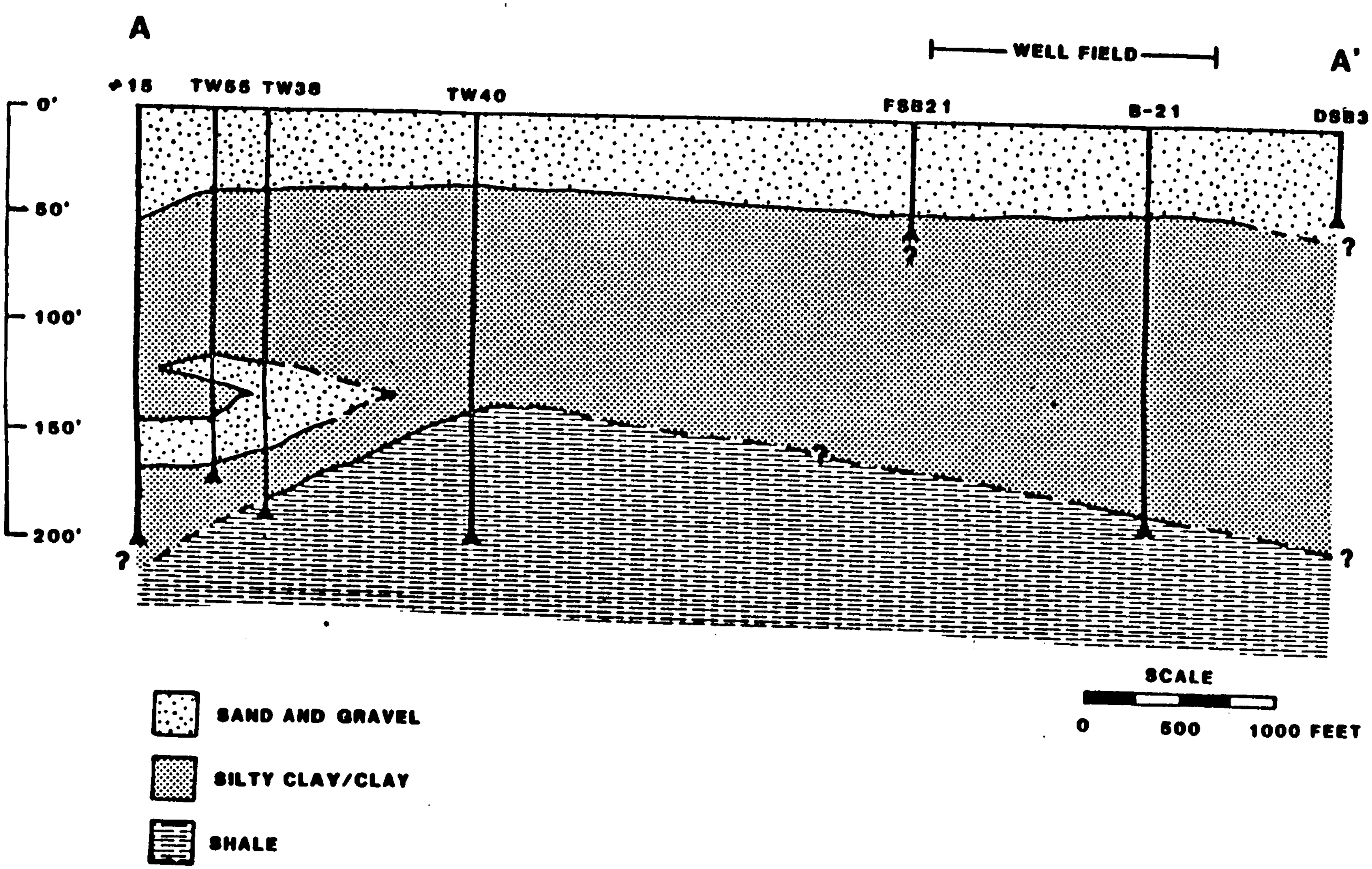


FIGURE 2
Generic-schematic Geologic Cross-section
of the Main Street Well Field Site

dropped significantly following installation of the interceptor wells. However, in 1984, TCE levels on the west side of the well field began to increase. One well increased from 14 to 75 ppb of TCE. EPA suspected that a separate plume had reached or been drawn into the well field. In 1985, all 15 production wells showed measurable TCE levels.

First Operable Unit:

MSWF was proposed for inclusion on the National Priorities List (NPL) in December 1982, and was placed on the NPL in September, 1983. In April 1985, EPA began a Phased Feasibility Study (PFS) to address alternatives for an alternate water supply. In August 1985, USEPA signed a Record of Decision (ROD) recommending air stripping. The facility is designed to obtain removal efficiencies of 99.1 percent of TCE. Seven production wells plus the two east side interceptors were piped to the air stripper. The facility has a capacity of 6.45 million gallons per day. The air stripping facility consists of three stripping units (towers); each has a diameter of 10 feet, a tower height of 30 feet and a total stack height of 55 feet. The air stripper went on-line in September 1987.

Previous Studies:

1. East Side

Two companies operating on the East side of the well field have been present since the 1920s and 1930s. Over the years, both have expanded their operations at that location and thus, their buildings have seen several additions and changes. Excel manufactures automobile and truck sash and window assemblies. Durakool manufactures relay and tilt switches. Both industries have used TCE and other chlorinated solvents for degreasing in their processes. In 1983, Excel and Durakool retained the same consultant to conduct a voluntary investigation of their properties. TCE concentrations in soil on the Excel property ranged from 0 to 570,000 ppb. On the Durakool property, concentrations ranged from 0 to 5,000 ppb. In 1984, the State and EPA determined that the investigative work done by Excel and Durakool was not adequate to meet the requirements of an RI/FS. Federal funds were authorized in 1984 for a federal-lead RI/FS, beginning with a PFS. Special notice was issued after EPA completion of the PFS and signing of the ROD to Excel and Durakool offering these companies the opportunity to implement the air stripper remedy and complete the RI/FS. The response was not acceptable and was therefore, rejected. EPA and the Indiana Department of Environmental Management (IDEM) funded construction of the air stripper and continued the RI/FS as federally funded response activities.

2. West Side

Little was known about why the western production wells were contaminated in 1984. The idea of a western plume was still only a theory in 1984. This seemed a likely scenario given the highly industrial nature of the area west of the well field. However, without more specific information, there was no one to notice or provide the opportunity to undertake the RI/FS.

Identification of sources of the West side contaminated plume is more challenging than the East or North side of the well field due to the diversity of industry, the higher building tenant turn-over and the almost ubiquitous use of chlorinated solvents, many related to metal finishing operations. Several private response actions have been performed on the West side, however, and these source areas are likely contributors.

Soil sampling and removal of contaminated soil was conducted by Miles Laboratory between 1984 and 1985 after exposing underground degreasing tanks during demolition of old buildings on the old Adams & Westlake property which it had purchased. Miles removed over 900 yards of soil containing TCE and 1,1,1-TCA.

TCE contamination of the ground water was discovered on another part of the Miles Laboratory property in 1984. Investigations into the likely source of contamination suggested that the source of the TCE contaminated ground water was west of Miles (at Elkhart Products). TCE is reportedly not used by Miles at this facility. In 1985, an additional release of 180 gallons of methylene chloride, ethyl alcohol and acetone occurred at the Miles facility. Contaminated soil was removed and ground water recovered. This area is currently undergoing a RCRA Facility Investigation (RFI).

TCE spill events occurred at the Elkhart Products Corporation (EPC) site located west of Miles Laboratory. EPC is a manufacturer of copper fittings and custom fabricated tubular products. EPC investigated their own property from August 1985 through February 1986. They are currently vapor extracting contaminated soil and treating contaminated ground water using air stripping.

III. Community Participation:

EPA and IDEM have been conducting community relations activities at the site since 1985. Fact sheets were issued periodically to inform the community of air stripper construction and RI/FS progress. In addition, an availability session was held to provide the community, including the potentially responsible parties, an opportunity to have their questions answered.

The Remedial Investigation Report was released to the public in May, 1989. The Phase III Technical Memorandum and Feasibility Study was released to the public in January, 1991. These documents were made available to the public in both the Administrative Record maintained at the EPA Region 5 office and at the Elkhart Public Library and at the information repository in the City Engineer's Office. The notice of the availability of these two documents was published in the Elkhart Truth on January 18, 1991. A public Comment period was held from January 23, 1991 through March 22, 1991. In addition, a public meeting was held on February 7, 1991. At this meeting, representatives from EPA and IDEM answered questions about site risks and the remedial alternatives under consideration. A response to the comments received during this period is included in the Responsiveness Summary, which is part of this Record of Decision. This decision document presents the selected remedial action for the MSWF site in Elkhart, Indiana, chosen in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Contingency Plan. The decision for this site is based on the Administrative Record.

IV. Scope and Role of Operable Unit:

Main Street Well Field is a multi-source, multi-plume Superfund site. It is more complex than most sites. As a result, EPA organized the work into operable units (OUs). These are:

- OU One: Alternate Water Supply.
- OU Two: East Side Source Control
- OU Three: Additional Source Control action (if required)

EPA has already selected a remedy for OU One (Alternate Water Supply) as described in the previous section. The contaminated ground water is a principal threat at this site because of the direct ingestion of drinking water from a municipal system and potential unrestricted use of an aquifer that contains contaminants above health-based levels.

The purpose of this OU response action is to prevent current or future exposure to the contaminated soils and contaminant migration into the ground water East of the well field, and to prevent current and potential future contaminant migration into the well field from the West, thus restoring the well field to its highest beneficial use.

Since significant uncontrolled "hot spots" have not been identified West of the well field, it is uncertain how long the plume will continue to exist. If additional sources are identified in other parts (west or north) of the study area, an additional OU may be completed in the future.

V. Summary of Site Characteristics:

Soil investigations at this site were limited to suspected "hot spot" areas. Volatile Organic Compounds (VOCs) were the contaminants of primary concern for identification of hot spots. However, co-disposal with other contaminants needed to be evaluated so that remedial action alternatives could address the entire hot spot. Contaminants selected for investigative purposes were selected based on suspected material disposed of. Where knowledge of possible disposed material was too limited, full chemical scan was conducted.

The study area, or site boundary, was defined by the ground water capture zone of the well field and by the total area of ground water contamination within the capture zone. These boundaries were measured several times over the course of the RI/FS due to the dynamic nature (rapid and frequent changes) of the capture zone, and because its extent defined how far west EPA's response authorities extended under this CERCLA site. This capture zone is shown on Figure 3. Ground water is uncontaminated upgradient of Elkhart Products Co. on the west side and upgradient of Excel on the east side. South of these locations ground water is contaminated and constitutes the ground water study area. This area is over 300 acres, approximately half of which is industrial. In conducting this RI/FS, no attempt was made to provide a comprehensive RI/FS on each property. Instead, areas of known or suspected disposal were the focus of investigative efforts. Priority was given to those areas which remained unremediated or where remediation was completed, but residual contamination concentrations were unknown. This approach prioritized efforts and resources to provide the highest amount of contaminant reduction for the effort expended.

All media were sampled, including air, soil, surface water and ground water. Figure 4 shows the distribution of TCE in the hot spot areas on the East Side of the well field. TCE ranged from 0 to 88,000 ppb on the Excel property and from 0 to 29,000 ppb on the Durakool property. Although other VOCs are present, TCE is the most wide spread and present in the highest concentrations. The distribution of other VOC contaminants is discussed in the RI report. Chemicals detected in a least one soil or ground water sample are shown on Tables 1 and 2. Significant concentrations of VOCs were not detected in West Side soil (generally below 50 ppb), therefore, hot spots could not be defined. While other contaminants, such as inorganics and Polynuclear Aromatic Hydrocarbons (PAHs) were present on the West Side, their presence was not associated with VOCs, therefore, this operable unit RI/FS did not evaluate the extent of such contamination.

Figure 5 shows TCE ground water concentration contours from both East Side and West Side plumes. The East Side plume was measured

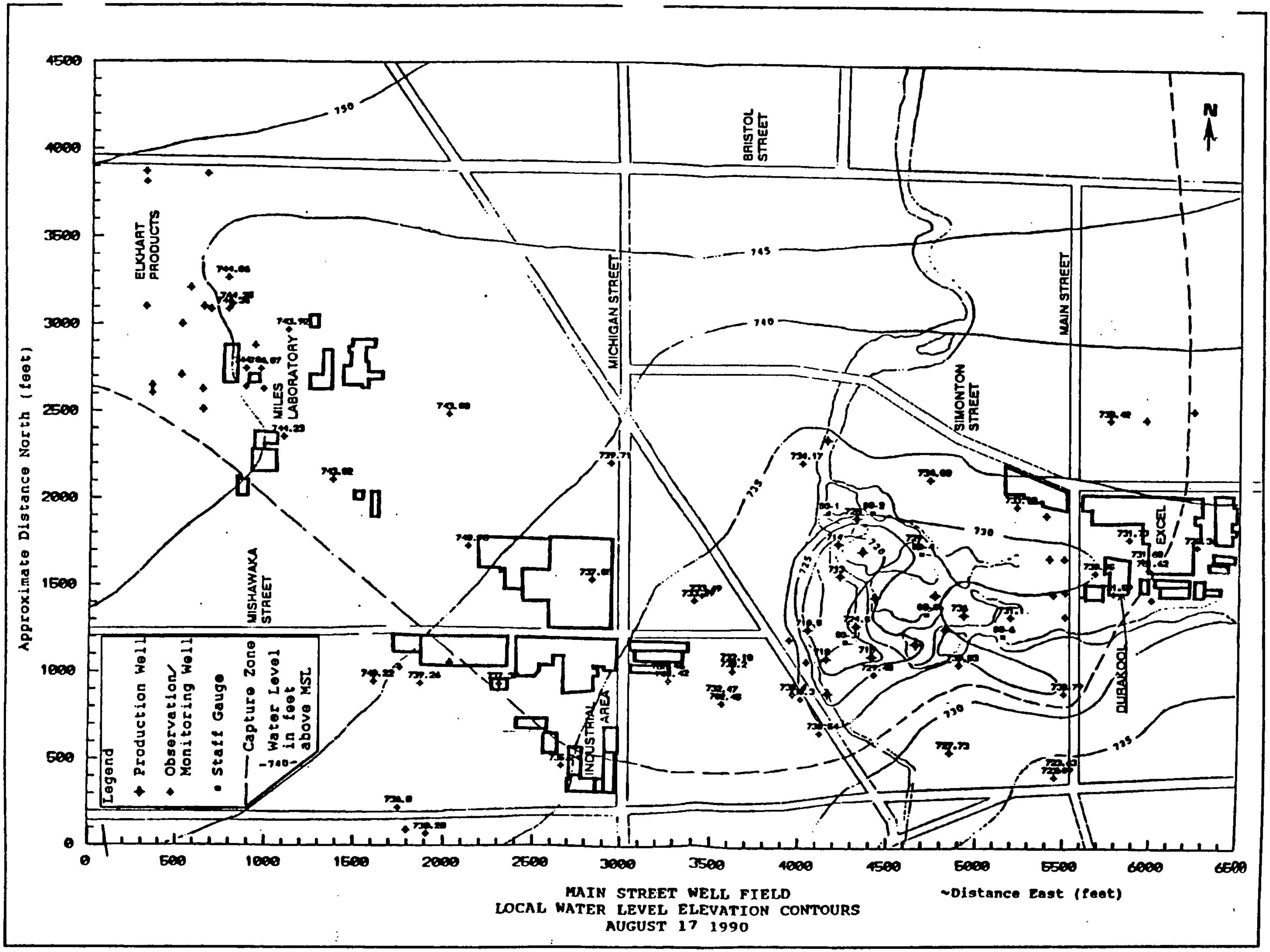


FIGURE 3
Capture Zone

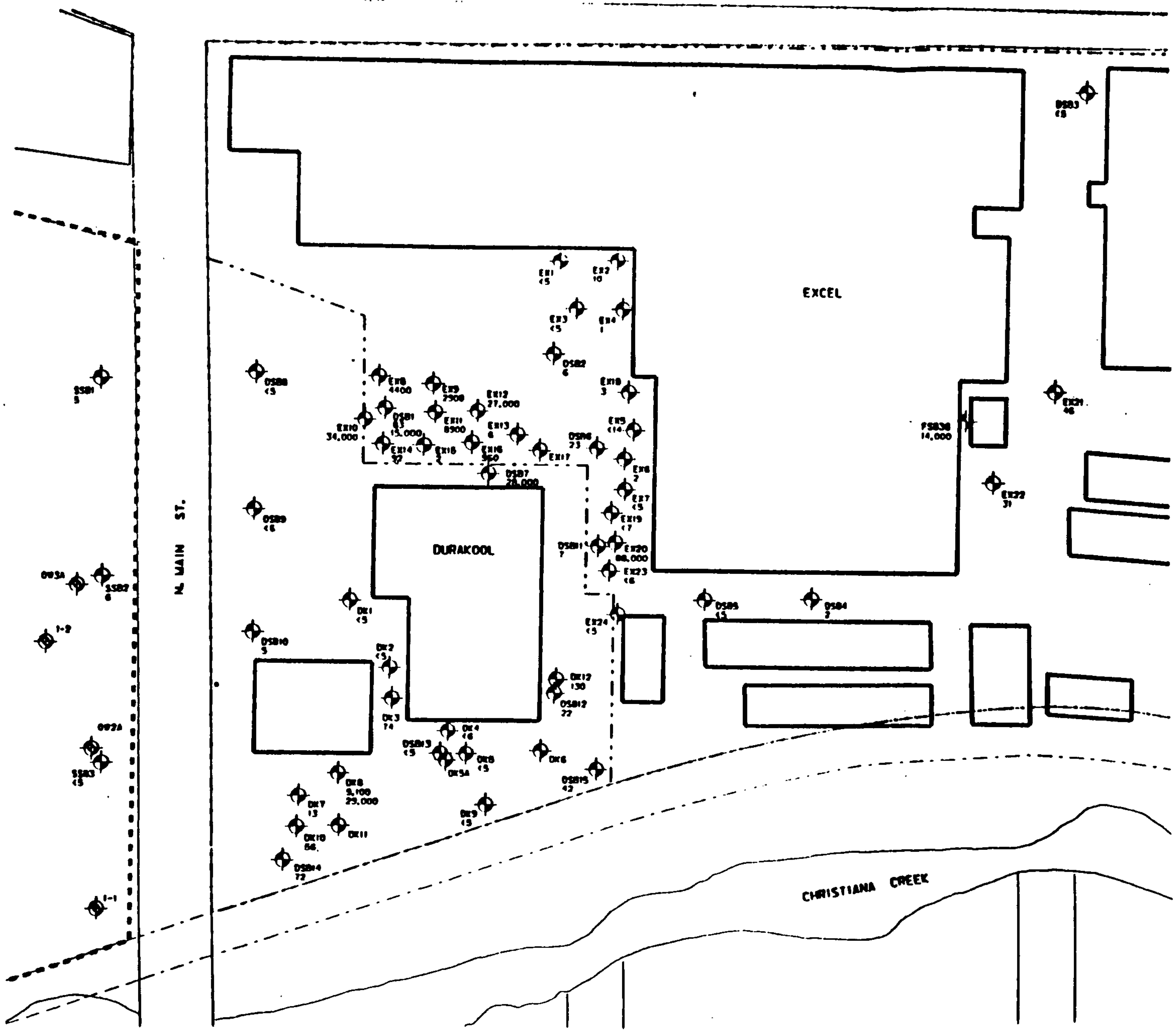


FIGURE 4
TCE on Eastside Properties

TABLE 1 CHEMICALS DETECTED IN AT LEAST ONE SOIL SAMPLE IN THE EAST SIDE OPERABLE UNIT OF THE MAIN STREET WELL FIELD OR IN A BACKGROUND SAMPLE

Chemical	Frequency of Detection			Range of Detected Values, mg/kg		
	East	Well Field	Background	East	Well Field	Background
Acenaphthene	10/166	0/14	0/6	0.034-0.37	-	-
Acenaphthylene	6/166	0/14	0/6	0.052-0.19	-	-
Acetone	85/182	3/15	5/10	0.003-100	0.076-0.14	0.026-0.79
Alpha-chordane	2/61	0/15	0/5	0.011-0.015	-	-
Aluminum	138/138	6/6	9/9	740-9,270	1,110-2,580	1,260-5,720
Anthracene	28/166	0/14	0/6	0.05-1.3	-	-
Antimony	49/138	0/6	7/9	1.1-51.8	-	0.47-30
Arsenic	128/138	6/6	6/9	0.41-26.5	1.9-3.6	1.09-3.1
Barium	137/138	6/6	8/9	3-176	5.4-14.4	8.65-186
Benzene	3/182	0/15	0/10	0.002-0.33	-	-
Benzo(a)anthracene	40/166	0/14	1/6	0.033-3.6	-	0.063
Benzo(a)pyrene	31/166	0/14	1/6	0.037-3.1	-	0.082
Benzo(b)fluoranthene	36/166	0/14	1/6	0.039-2.6	-	0.096
Benzo(g,h,i)perylene	28/166	0/28	1/6	0.049-3.4	-	0.076
Benzo(k)fluoranthene	29/166	0/14	1/6	0.037-2.1	-	0.12
Benzoic acid	4/166	2/14	0/6	0.11-0.75	0.071-0.1	-
Beryllium	67/138	0/6	6/9	0.21-1.7	-	0.21-0.67
Beta-BHC	6/61	0/15	2/5	0.0013-0.13	-	0.013-0.03
Bis(2-Ethylhexyl)phthalate	41/166	10/14	1/6	0.41-40	0.11-0.27	0.048
2-Butanone	4/170	0/15	0/5	0.005-0.12	-	-
Butylbenzylphthalate	3/166	0/14	0/6	0.048-0.82	-	-
Cadmium	54/138	1/6	3/9	0.46-6.3	1.7	0.85-4.7
Calcium	138/138	6/6	9/9	512-124,000	29,900-51,700	841-58,900
Carbon disulfide	6/182	0/15	0/10	0.001-0.066	-	-
Carbon tetrachloride	3/182	0/15	0/10	0.001-0.43	-	-
Chlorobenzene	2/182	0/15	0/10	0.005-0.4	-	-
Chloromethane (methyl chloride)	1/116	0/15	0/4	1.1	-	-
Chromium	138/138	6/6	9/9	2.7-63.8	4.1-9.1	2.9-12
Chrysene	42/166	0/14	1/6	0.035-4	-	0.1
cis-1,3-dichloropropene	1/116	0/15	0/4	0.005	-	-

continued-

Table 1 - continued

Chemical	Frequency of Detection			Range of Detected Values, mg/kg		
	East	Well Field	Background	East	Well Field	Background
Cobalt	131/138	6/6	6/9	1.2-17.6	1.8-4.1	2.93-6.95
Copper	137/138	6/6	9/9	2.4-230	4.4-10.2	3-40
Cyanide	8/138	0/6	0/9	0.53-310	-	-
4,4-DDT	9/61	0/15	2/5	0.00089-0.03	-	0.0021-0.008
Di-N-butyl phthalate	56/166	10/14	0/6	0.042-0.76	0.032-0.43	-
Di-N-octyl phthalate	1/166	0/14	0/6	0.61	-	-
Dibenzo(a,h)anthracene	11/166	0/14	0/6	0.043-0.53	-	-
Dibenzofuran	16/166	0/14	0/6	0.046-0.25	-	-
1,2-Dichlorobenzene	1/166	0/14	0/6	0.01	-	-
1,3-Dichlorobenzene	2/166	0/14	0/6	0.061-0.35	-	-
1,4-Dichlorobenzene	1/103	0/14	0/3	0.096	-	-
1,1-Dichloroethane	1/182	0/15	0/10	0.002	-	-
1,2-Dichloroethene (total)	24/182	0/15	0/10	0.001-58	-	-
1,2-Dichloropropane	1/182	0/15	0/10	0.001	-	-
Dieldrin	2/61	0/15	1/5	0.003-0.004	-	0.0035
Diethyl phthalate	3/166	0/14	0/6	0.05-0.61	-	-
Dimethyl phthalate	0/166	1/14	0/6	-	0.19	-
2,4-Dinitrophenol	1/166	0/14	0/6	1.7	-	-
Ethylbenzene	22/182	0/15	0/10	0.001-390	-	-
Fluoranthene	51/166	0/14	1/6	0.038-7.5	-	3.17
Fluorene	11/166	0/14	0/6	0.047-0.56	-	-
Gamma-chlordane	4/61	0/15	0/5	0.0022-0.041	-	-
Hexachlorobenzene	1/103	0/14	0/3	0.13	-	-
Hexachloroethane	1/166	0/14	0/6	0.099	-	-
Indeno(1,2,3-CD),pyrene	25/166	0/14	1/6	0.065-2.2	-	0.056
Iron	138/138	6/6	9/9	1,820-24,700	4,080-15,700	5,220-18,100
Lead	138/138	6/6	9/9	1.2-1,050	2.5-8.7	2.3-1,060
Magnesium	138/138	6/6	9/9	647-46,200	6,910-17,400	914-17,100
Manganese	138/138	6/6	9/9	43.6-986	84.4-297	88.6-1,160
Mercury	43/138	0/6	2/9	0.1-195	-	0.18-0.34
4-Methyl-2-pentanone	0/182	0/15	1/10	-	-	0.01

continued-

Table 1 - continued

Chemical	Frequency of Detection			Range of Detected Values, mg/kg		
	East	Well Field	Background	East	Well Field	Background
Methylene chloride (Dichloromethane)	74/182	7/15	6/10	0.001-0.26	0.001-0.026	0.004-0.044
2-Methylnaphthalene	27/166	0/14	0/6	0.041-26	-	-
2-Methylphenol	1/166	0/14	0/6	0.01	-	-
N-Nitrosodiphenylamine	2/166	0/14	0/6	0.047-0.051	-	-
Naphthalene	24/166	0/14	1/6	0.034-32	-	0.62
Nickel	130/138	6/6	7/9	2.5-295	4.3-9.1	5-11.46
PCB-1248	1/61	0/15	0/5	0.14	-	-
PCB-1260	1/61	0/15	0/5	0.23	-	-
Pentachlorophenol	2/166	0/14	0/6	0.2-0.26	-	-
Phenanthrene	58/166	0/14	1/6	0.043-7.2	-	0.12
Phenol	1/166	0/14	0/6	0.1	-	-
Potassium	135/138	6/6	7/9	104-761	126-220	99.7-433
Pyrene	52/166	0/14	1/6	0.033-7.5	-	0.17
Silver	47/138	1/6	0/9	0.67-3.7	1.1	-
Sodium	79/138	0/6	9/9	32.7-1,200	-	55-334
Styrene	2/182	0/15	0/10	0.005-0.38	-	-
1,1,2,2-Tetrachloroethane	1/182	0/15	0/10	0.01	-	-
Tetrachloroethene	29/182	2/15	2/10	0.0003-4.6	0.001-0.002	0.005-0.02
Thallium	2/138	0/6	0/9	0.22-0.23	-	-
Tin	2/71	0/6	0/6	40	-	-
Toluene	47/182	10/15	4/10	0.0008-690	0.001-0.005	0.0006-0.002
trans-1,2-Dichloroethene	0/66	0/15	2/6	-	-	0.001-0.003
1,1,1-Trichloroethane	32/182	2/15	2/10	0.0005-25	0.001-0.002	0.004-0.007
1,1,2-Trichloroethane	5/182	0/15	0/10	0.0006-0.006	-	-
Trichloroethene	128/182	12/15	2/10	0.001-88	0.001-0.065	0.007-0.022
2,4,6-Trichlorophenol	1/166	0/14	0/6	0.01	-	-
Vanadium	137/138	6/6	8/9	2.8-33	3.9-10.4	4-22.4
Vinyl acetate	0/182	1/15	0/10	-	0.001	-
Xylenes (total)	50/182	0/15	1/10	0.001-2,300	-	0.002
Zinc	138/138	6/6	9/9	6.9-785	11.5-29.2	13.21-1,160

TABLE 2 CHEMICALS DETECTED IN AT LEAST ONE GROUNDWATER SAMPLE OF THE MAIN STREET WELL FIELD SITE

Chemical	Frequency of Detection				Range of Detected Values, (mg/L)			
	East	West	Wellfield	Background	East	West	Wellfield	Background
Acetone	4/24	27/71	1/30	2/8	0.007-0.023	0.003-0.039	0.017	0.015-0.018
Aluminum	0/8	1/25	*	0/4	-	0.5	*	-
Antimony	0/8	1/25	*	0/4	-	0.045	*	-
Arsenic	0/8	6/25	*	0/4	-	0.0019-0.0075	*	-
Barium	6/8	23/25	*	4/4	0.025-0.111	0.0033-0.166	*	0.056-0.059
Benzene	4/24	8/72	1/30	0/8	0.001-0.0027	0.001-0.025	0.0015	-
Bis(2-Ethylhexyl) Phthalate	1/7	3/29	*	0/3	0.004	0.006-0.11	*	-
Butanone, 2-	0/20	6/60	0/9	0/8	-	0.002-0.014	-	-
Butylbenzylphthalate	0/7	2/29	*	0/3	-	0.004-0.007	*	-
Calcium	7/8	25/25	*	4/4	0.57-92	0.024-143	*	68.9-71.9
Carbon Disulfide	0/24	2/72	2/30	0/8	-	0.005-0.04	0.0002-0.0008	-
Carbon Tetrachloride	0/24	1/72	0/30	0/8	-	0.001	-	-
Chlorobenzene	0/24	0/71	1/30	0/8	-	-	0.0003	-
Chloroform	0/24	3/72	0/30	0/8	-	0.001-0.15	-	-
Chloromethane (Methyl Chloride)	0/5	1/30	0/9	0/8	-	0.0007	-	-
Copper	2/8	4/25	*	2/4	0.029-0.038	0.0029-0.039	*	0.026-0.033
Cyanide	0/8	3/25	*	0/4	-	0.0054-0.193	*	-
Dichloroethane, 1,1-	0/24	29/72	4/30	0/8	-	0.001-0.0076	0.002-0.022	-
Dichloroethane, 1,2-	0/5	1/30	0/9	0/8	-	0.014	-	-
Dichloroethene(Total), 1,2-	4/13	23/60	8/30	0/3	0.039-0.044	0.002-0.41	0.0008-0.068	-
Dichloroethene, 1,1-	0/24	13/72	0/30	0/8	-	0.001-0.052	-	-
Dichloropropane, 1,2-	0/24	3/72	0/30	0/8	-	0.002-0.003	-	-
Iron	4/8	24/25	*	4/4	0.0425-0.878	0.0091-2.24	*	1-1.41
Lead	0/8	11/25	*	0/4	-	0.0018-0.0028	*	-
Magnesium	6/8	22/25	*	4/4	20.7-23.5	0.101-32.3	*	22.7-24.8
Manganese	7/8	19/25	*	4/4	0.0009-0.361	0.0067-0.56	*	0.231-0.247
Methylene Chloride (Dichloromethane)	5/24	30/72	2/30	1/8	0.001-0.01	0.001-0.018	0.001	0.012
Nickel	0/8	1/25	*	0/4	-	0.0229	*	-
Phenol	0/3	1/9	*	0/2	-	0.005	*	-
Potassium	4/8	22/25	*	3/4	1.03-1.84	1.49-5.93	*	1.29-1.84
Selenium	0/8	5/25	*	0/4	-	0.0018-0.0023	*	-
Silver	1/8	2/25	*	1/4	0.0097	0.0093-0.0097	*	0.011
Sodium	6/8	25/25	*	4/4	4.72-26.1	0.0245-756	*	6.68-8.56
Tetrachloroethane, 1,1,2,2-	0/24	1/72	0/30	0/8	-	0.004	-	-
Tetrachloroethene	1/24	19/71	7/30	0/8	0.11	0.002-0.2	0.0007-0.022	-
Toluene	1/24	7/71	6/30	1/8	0.0015	0.0004-0.003	0.0001-0.0043	0.002
Trans-1,2-Dichloroethene	10/19	22/42	9/21	0/8	0.002-0.094	0.001-0.1	0.001-0.005	-
Trichloroethane, 1,1,1-	4/24	27/72	8/30	0/8	0.0016-0.0078	0.002-0.23	0.0004-0.016	-
Trichloroethene	17/24	40/72	19/30	0/8	0.0[illegible]2-0.096	0.001-0.57	0.0016-0.051	-
Vanadi[illegible]	0/8	1/25	*	0/4	-	0.104	*	-
Viny[illegible]ride	2/24	10/72	3/30	0/8	0.012-0.015	0.002-0.11	0.002-0.007	
Zinc	3/8	15/25	*	2/4	0.02-0.033	0.0035-0.0652	*	0.017-0.021

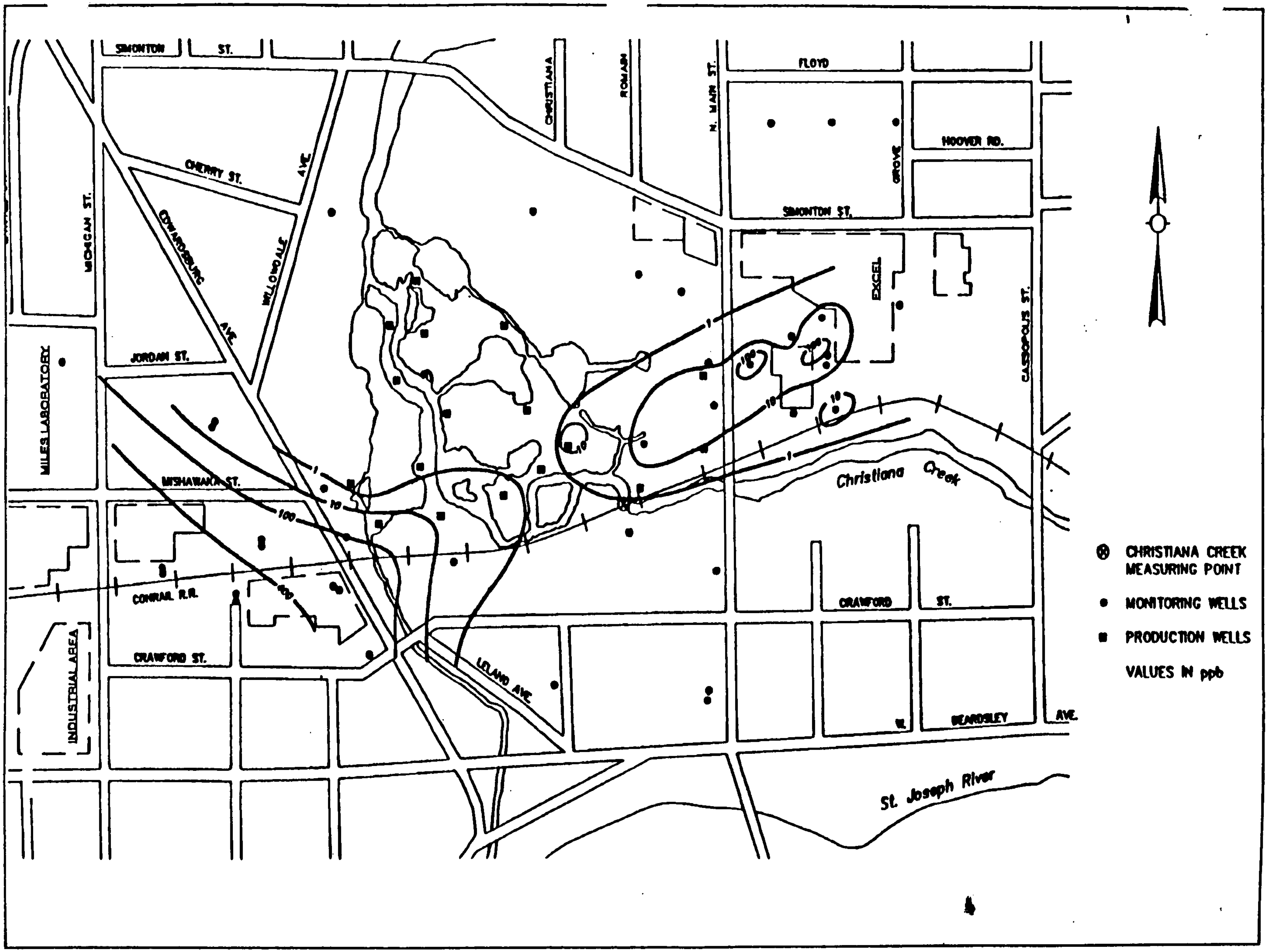


FIGURE 5
TCE Concentrations in Groundwater
Phase II May 1988

at a maximum of 300 ppb and the West Side plume was measured at a maximum of 570 ppb. The ground water contour is somewhat simplistic since the plumes are commingled. The relationship of TCE found in one well to another well is unknown. Analysis of other ground water contaminants showed that several inorganics were present above background, particularly on the West Side. These inorganics were evaluated in accordance with the risk assessment procedures.

During phase III field investigations, a small paint layer was noted in two of three borings taken in suspected disposal areas on the Excel property. The paint layer is not well characterized chemically or in terms of its actual extent. This layer was found to contain the highest level of TCE (88,000 ppb), xylene (2,300 ppm) and lead (2,900 ppm). The layer was visually distinct and samples taken below the layer show that the contaminants were relatively well bound.

Air and surface water pathways were not considered significant since no site related contamination above background was found in monitoring data. The air pathway was modeled in the risk assessment for those chemicals which may present a potential future risk if airborne.

VI. Summary of Site Risks:

A risk assessment was conducted in accordance with the Risk Assessment Guidance for Superfund (RAGS). The purpose of a risk assessment is to analyze the potential adverse health effects, both current and potential future, which may be posed by hazardous substances released from a site if no action were taken to mitigate such releases. The risk assessment consists of contaminant identification (data evaluation and selection of contaminants of concern), toxicity assessment, exposure assessment, and risk characterization.

Contaminant Identification:

The risk assessment screened all the detected chemicals in order to identify the potential chemicals of concern. Screening was based on data quality, frequency of detection, comparison to background, and toxicity in accordance with the RAGS. The potential chemicals of concern for the East Side soil and ground water pathways remaining after screening are shown below.

Ground water	Soil
tetrachlorethane (C)	arsenic (c)
trichloroethene (C)	trichloroethene (C)
vinyl chloride (C)	Carcinogenic PAHs (C)
barium	antimony
cis-1,2-dichloroethene	mercury

trans-1,2-dichloroethene   xylene

(C) indicates carcinogens or potential carcinogens, all others are non-carcinogens.

The risk assessment provides a characterization of the West side plume for the purpose of identifying contaminants in addition to VOCs that may be a concern entering the well field. A summary of risk estimates for the West Side plume are found on page 11 of this decision summary.

Exposure Assessment:

The exposure assessment includes reasonable maximum scenarios for current and future use. Under the no-action alternative, the current exposure scenario assumes the air stripper is not in place and therefore, a worker at the East side property has exposure to contaminated soil and drinking water from the East Side plume untreated for 40 years. A future scenario includes re-zoning the East side property from industrial to residential use. Adults and children living in the homes would be exposed to chemicals potentially remaining in site soils, and the residents would drink the ground water untreated by the air stripper for 30 years. The exposure pathways are summarized in the risk assessment.

Toxicity Assessment:

The toxicity assessment weighs available evidence regarding the potential for particular contaminants to cause adverse effects in exposed individuals and provides, where possible, an estimate of the relationship between the extent of exposure to a contaminant and the increased likelihood and/or severity of adverse effects, including carcinogenic and noncarcinogenic effects.

The toxicity values used in this assessment are summarized in Table 3. Cancer potency factors (CPFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of $(mg/kg\text{-}day)^{-1}$, are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes underestimation of the actual cancer risk highly unlikely. Cancer potency factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans.)

Reference doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans). These uncertainty factors help ensure that the RfDs will not underestimate the potential for occurrence of adverse noncarcinogenic effects.

Risk characterization:

Tables 4 and 5 summarize the risk characterization results. Arsenic and carcinogenic PAHs were included as chemicals of potential concern as a result of application of the simplified screening procedures described above. However, if background comparison and toxicity-concentration screens had been based on average concentrations instead of maximum sample concentrations, they would have been excluded as potential chemicals of concern. They are shown to contribute a risk not greater than 1x10-5. Since their site-relatedness was questionable, as was their association with likely industrial processes, their presence was thought to be within background variability. The chemicals of concern were reduced to VOCs only.

Excess lifetime cancer risks are determined by multiplying the intake level with the cancer potency factor. These risks are probabilities that are generally expressed in scientific notation (e.g., 1x10-6 or 1E-6). An excess lifetime cancer risk of 1x10-6 indicates that as a plausible upper bound, an individual has one in one million chance of developing cancer as a result of site-related exposure to a carcinogen over a 70-year lifetime under the specific exposure conditions at the site.

Potential concern for noncarcinogenic effects of a single contaminant in a single medium is expressed as the hazard quotient (HQ) (or the ratio of the estimated intake derived from the contaminant concentration in a given medium to the contaminant's reference dose). By adding the HQs for all contaminants within a medium or across all media to which a given population may reasonably be exposed, the Hazard Index (HI) can be generated. The HI provides a useful reference point for gauging the potential significance of multiple contaminant exposures within a single medium or across media.

The baseline risk assessment yields the following conclusions:

<u>East Side and Well Field Ground water, East Side soils</u>

TABLE 3 SUMMARY OF ORAL AND INHALATION TOXICITY VALUES FOR CHEMICALS OF POTENTIAL CONCERN AT THE EAST SIDE AREA OF THE MAIN STREET WELL FIELD SITE[a]

Chemical	Oral			Inhalation		
	RfD_s	RfD_c	SF	RfD_s	RfD_c	SF
Antimony	4E-4	4E-4	NA[b]	NA	NA	NA
Arsenic	1E-3	1E-3	1.8E+0	NA	NA	1.5E+1
Barium	5E-2	7E-2	NA	1E-3	1E-4	NA
Mercury	3E-4	3E-4	NA	3E-4	3E-4	NA
trans-1,2-Dichloroethene	2E-1	2E-2	NA	NA	NA	NA
Tetrachloroethene	1E-1	1E-2	5.1E-2[c]	NA	NA	3.3E-3[c]
Trichloroethene	NA	NA	1.1E-2[c]	NA	NA	6E-3[c]
Vinyl chloride	NA	NA	2.3E+0[c]	NA	NA	3E-1[c]
PAHs[d]	4E-1	4E-1	1.2E+1[c]	NA	NA	6.1E+0[c]
Xylenes (Total)	4E+0	2E+0	NA	3E-1	3E-1	NA

(a) RfD_s = subchronic reference dose; RfD_c = chronic reference dose; SF = slope factor. Source: USEPA (1990a,b)

(b) NA = Not available because chemical is not toxic by this route or has not been evaluated.

(c) Weight of Evidence: Cadmium, B1; Tetrachloroethene, B2; Trichloroethene, B2; Vinyl chloride, A; 1,1-DCE, C; Benzo(a)pyrene, B2.

(d) Slope factors based on benzo(a)pyrene developed in the Health Effects Assessment for polynuclear aromatic hydrocarbons (PAHs) (USEPA 1984). Use of this value for all carcinogenic PAHs is likely to result in an overestimate of risk. This value is undergoing evaluation by USEPA. Reference doses based on napthalene. Use of this value for the noncarcinogenic effects of PAHs is likely to result in an overestimate of risk.

TABLE 4 SUMMARY OF POTENTIAL CANCER RISKS FOR FUTURE ADULT RESIDENT

Exposure Medium	Exposure Route	Route-Specific Risk	Chemical[(a)]	Chemical-Specific Risk[(b)]	Rel. Chem. Contribution, %[(c)]
Soil	Oral	7E-6	PCE	3E-9	0.04
			TCE	2E-8	0.28
			Carc. PAHs	2E-6	28.48
			Arsenic	5E-6	71.19
	Dermal	1E-7	PCE	2E-8	16.67
			TCE	1E-7	83.33
	Inhalation	6E-8	PCE	1E-9	1.64
			TCE	6E-8	98.36
	Total	7E-6	PCE	2E-8	0.28
			TCE	2E-7	2.77
			Carc. PAHs	2E-6	27.70
			Arsenic	5E-6	69.25
Groundwater	Oral	3E-4	PCE	2E-5	6.12
			TCE	7E-6	2.14
			VC	3E-4	91.74
	Inhalation	5E-5	PCE	1E-6	2.22
			TCE	4E-6	8.89
			VC	4E-5	88.89
	Total	3E-4	PCE	9E-6	4.17
			TCE	7E-6	3.24
			VC	2E-4	92.59
	Percent risk due to Soil				2.74
	Percent risk due to Groundwater				97.26
	Total	3E-4			100.00

(a) PCE = Tetrachloroethene, TCE = Trichloroethene, Carc. PAHs = Total carcinogenic polynuclear aromatic hydrocarbons, VC = vinyl chloride
(b) These values are from Appendix Page A4-18
(c) Relative contribution to total risk from this chemical or pathway.

TABLE 5 SUMMARY OF POTENTIAL CANCER RISKS FOR CURRENT WORKERS

Exposure Medium	Exposure Route	Route-Specific Risk	Chemical[(a)]	Chemical-Specific Risk[(b)]	Rel. Chem. Contribution, %[(c)]
Soil	Oral	3E-7	PCE	5E-11	0.02
			TCE	2E-9	0.66
			Carc. PAHs	1E-7	33.11
			Arsenic	2E-7	66.21
	Dermal	7E-8	PCE	2E-9	2.78
			TCE	7E-8	97.22
	Inhalation	5E-6	PCE	1E-8	0.20
			TCE	5E-6	99.80
	Total, Soil	5E-6	PCE	1E-8	0.19
			TCE	5E-6	94.16
			Carc. PAHs	1E-7	1.88
			Arsenic	2E-7	3.77
Groundwater	Oral	1E-4	PCE	4E-6	3.77
			TCE	2E-6	1.89
			VC	1E-4	94.34
	Soil				4.83
	Groundwater				95.17
	Total	1E-4			100.00

(a) PCE = Tetrachloroethene, TCE = Trichloroethene, Carc. PAHs = Total carcinogenic polynuclear aromatic hydrocarbons, VC = vinyl chloride

(b) These values are from Appendix Page A4-11.

(c) Relative contribution to total risk from this chemical or pathway.

- Total estimated excess cancer risk for current workers is 1x10-4 (or, 1 in 10,000). Ground water exposure accounts for more than 99 percent of the risk. Over 98 percent of the risk due to ground water exposure is from contamination by vinyl chloride and PCE.

- Total estimated excess cancer risk for future residents is 3x10-4. Ground water exposure contributes approximately 97 percent of the total risk. Over 97 percent of the risk due to groundwater exposure is from contamination by vinyl chloride and PCE.

- Arsenic and carcinogenic PAHs pose risk less than 1x10-5 from ingestion of contaminated soil by hypothetical future residents. Contamination levels of these chemicals in east side soils appear to be similar to background and may not be site related.

- Noncarcinogenic effects in current workers or future residents are unlikely, since no hazard indices exceeded 1.0.

West Side and Well Field Ground water

- Total estimated excess cancer risk for current workers is 8x10-4. Over 89 percent of the risk due to ground water exposure is from contamination by arsenic, 1,1-DCE and vinyl chloride.

- Total estimated excess cancer risk for future residents is 6x10-4. Over 89 percent of the risk due to ground water exposure is from contamination by arsenic, 1,1-DCE and vinyl chloride.

- Noncarcinogenic effects in current workers for future residents are unlikely, since no hazard exceeded 1.0.

Environmental Risks

Environmental receptors are thought to be Christiana Creek and the St. Joseph River. The recharge ponds are not considered a significant environmental receptor of contaminated ground water due to the hydrologic relationship between the ponds and the ground water in that the gradient is from the ponds to the ground water, reversal is not likely. In addition, the ponds are dredged every 2 years to ensure maximum infiltration rates. Samples taken from surface water and sediment within the well field showed no VOCs. The City discharged ground water from the East Side interceptor wells into the creek under an NPDES permit prior to construction of the air stripper. Currently, the ground water is pumped from these interceptor wells directly to the air stripper. The interceptor discharge to the creek was sampled prior to construction of the air stripper and found to contain 94 ppb of TCE, 21 ppb of 1,2-DCE and 2 ppb of 1,1,1-TCE. Downstream samples were free of VOCs. As suspected, it is likely that the contaminants discharged to the creek volatilized before moving far downstream. One sample taken in the creek far downstream showed TCE at 8 ppb. The source of this contamination is uncertain.

The St. Joseph River is designated recreational use by IDEM. The IDEM adopted water quality criteria for TCE for protection of human ingestion of fish is 807 ppb. No criteria have been established for protection of aquatic life. The Federal Water Quality Criteria (WQC) for protection of aquatic organisms at chronic exposure levels for TCE is 21,900 ppb. For human ingestion of fish at a 1 x 10-5 risk, the WQC for TCE is also 807 ppb. Ground water monitoring well data near the St. Joseph River showed TCE at 12 ppb for the highest concentration. This is well below State and Federal WQC. VOCs were not detected in sediments in the St. Joseph River.

MSWF was identified as a wetland and a floodplain. PAH and inorganic compounds were detected in creek and river sediments. These were attributed to natural and anthropogenic sources unrelated to the hot spots of concern in the study area. This is more thoroughly discussed in section 5 of the RI report. It was concluded that the potential for environmental effects is low.

VII. Description of Alternatives:

Based on the findings of the Remedial Investigation and risk assessment, the following Remedial Action Objectives were developed for the MSWF site:

- Continue to provide a safe source of drinking water through on-going use of the air stripper.
- Control migration of contaminated ground water to the well field to minimize existing ground water contamination within the well field.
- Minimize risk to human health and the environment from direct contact with contaminated soil.
- Reduce migration of soil contaminants to the ground water in areas of known contamination.

The feasibility study documents technology and alternative screening steps. The alternatives evaluated in detail include:

1. No Action

TABLE 6
WASTE QUANTITY TABLE (AREA AND VOLUME)
Main Street Well Field Site
Elkhart, Indiana

	Notes	Area (sq. ft.)	Volume (cu. yds.)	Total Flow (gpm)	Number of Wells
Paint Layer Waste	1 Paint Layer Next to Building	250	30	NOT APPLICABLE	
	1 Potential Paint Layer Under Building	250	30		
	TOTAL	500	60		
Soil	Three Hot Spots Based on RI Data	1A 15,300 2A 17,500 4A 5,800	1A 8,500 2A 6,500 4A 2,200	NOT APPLICABLE	
	Two Potential Hot Spots Based on Previous Information	5A 3,300 6A 5,500	5A 1,800 6A 3,000		
	TOTAL	47,400	22,000		
Groundwater	Assume 4 of 7 Production Wells On-Line at Any Given Time	NOT APPLICABLE		2,820	7 Production 2 Interceptor

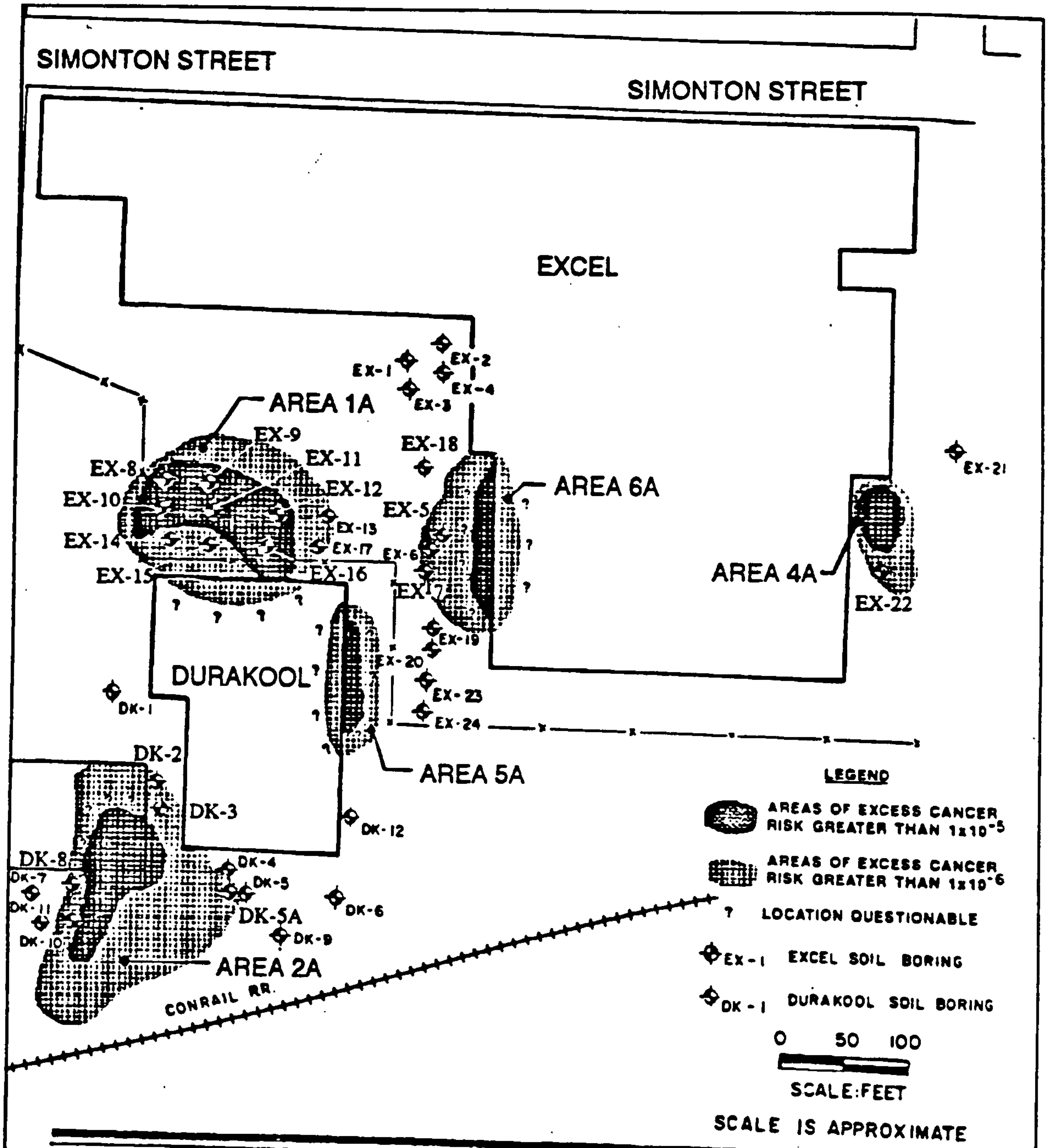


FIGURE 6

LOCATION OF EAST SIDE HOT SPOTS

JAN. 1991

MAIN STREET WELLFIELD
ELKHART, INDIANA

2. In-situ vacuum extraction of contaminants in soil (East Side), paint layer removal, maintain current well and air stripping system, deed restrictions, and ground water monitoring

3. Low temperature thermal desorption and in-situ vacuum extraction of contaminants in soil (East Side), paint layer removal, maintain current well and air stripping system, deed restrictions, and ground water monitoring

4. In-situ vacuum extraction of contaminants in soil (East Side), paint layer removal, new interceptor well system, current air stripper, deed restrictions, and ground water monitoring

5. Low temperature thermal desorption to remove contaminants in soil (East Side), in-situ vacuum extraction of contaminants (East Side), paint layer removal, new interceptor well system, current air stripper, deed restrictions, and ground water monitoring

Consistent with the Agency's intent to streamline Feasibility Studies by recognizing obvious remedies, a containment alternative was not evaluated as a stand alone alternative. VOCs are readily amenable to treatment. In addition, containment for a large volume of soil on actively used property would rely significantly on institutional controls over a highly vulnerable aquifer and would not be consistent with the statutory preference for treatment. See 42 U.S.C. Section 9621 and 40 CFR 300.430(a)(1).

Elements common to all alternatives:

In-situ Vacuum extraction (ISVE): Table 6 and Figure 6 show the areas and estimated volumes of contamination. The mass of chlorinated solvents could range from less than 200 pounds to greater than 1,000 pounds. The hot spots shown result from disposal and/or spillage of solvents, used primarily in degreasing operations at Excel and Durakool. The areas of highest contamination tend to be the surficial soils and the water table interface where contamination may have been transported farther distances by the fluctuating water table. These estimates were based on EPA studies and previous data from the Excel and Durakool 1983 studies. These estimates represent a minimum volume and area of contamination. The actual extent of contamination beneath the buildings is unknown. During the design phase, this will need to be delineated.

ISVE is included in all alternatives, either as a stand alone technology or as used in conjunction with Low Temperature Thermal Desorption (LTTD). The buildings on the East Side are constructed on 4 inch concrete slabs. Penetrating the

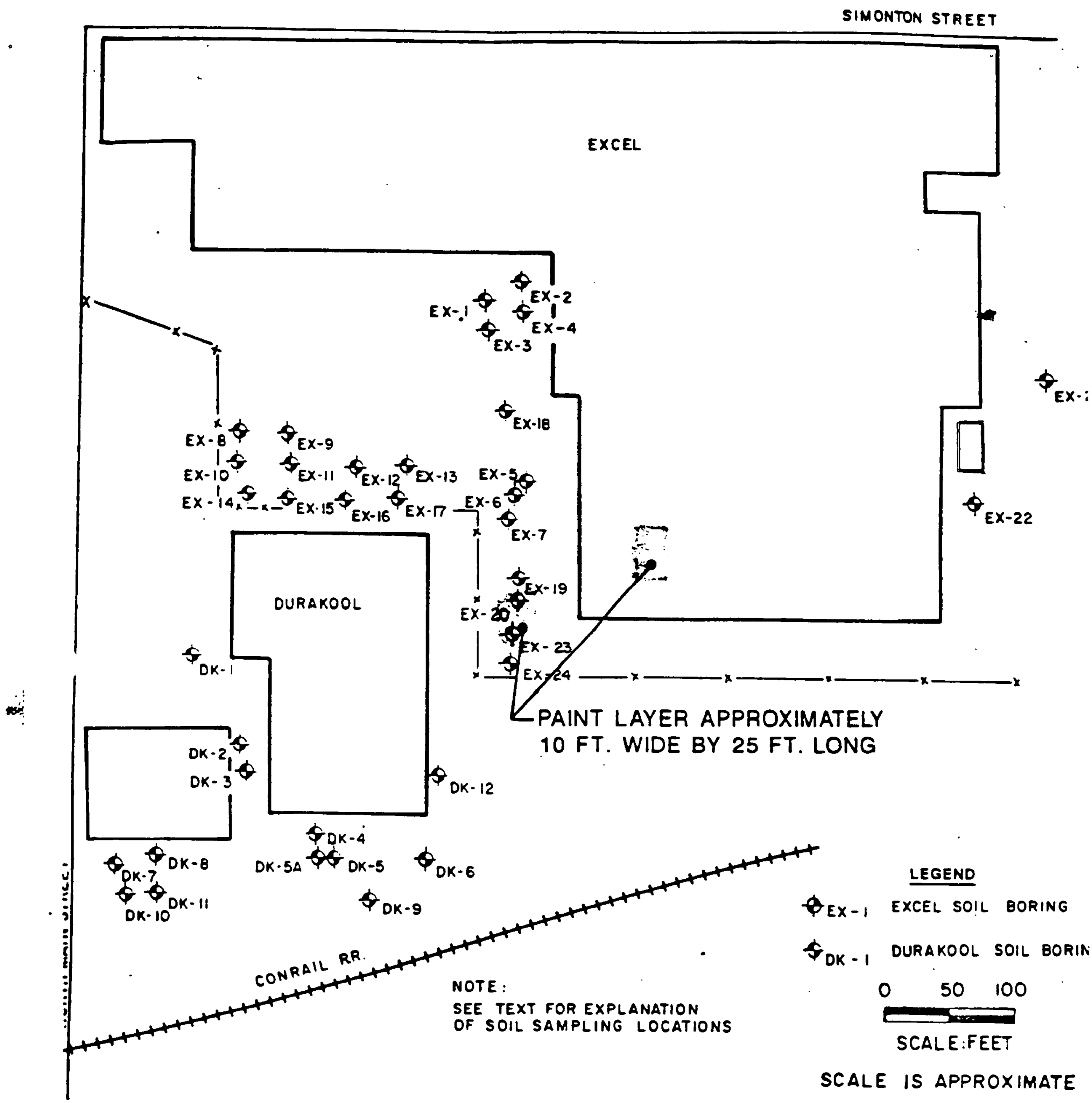


FIGURE 7
Suspected Paint Layer Locations

foundations for vapor well extraction points is technologically feasible and preferable to removing these active manufacturing facilities for remediation of the VOCs (as may be required if LTTD was used alone). Thus LTTD is combined with ISVE in two of the four alternatives.

Paint layer removal: During phase III of the investigation, a small paint residue layer containing xylenes (2,300 ppm), lead (2,910 ppm), as well as TCE and other solvents was noted. The paint layer (approximately 30 cubic yards) is poorly defined by the few borings placed in the disposal area and limited chemical analysis. However, the boring logs in combination with information provided by a hand sketched diagram of the disposal area, suggests that the paint residue layer is very limited and visually distinct. Chemical results showed that contaminants within the layer appear to be well bound and not leaching appreciably. A similar disposal area is thought to exist beneath the building (based on an aerial photograph). The volume estimated for disposal conservatively presumes that the disposal area inside the building also contains paint. Therefore, the volume estimate was doubled to 60 cubic yards. TCE is mixed with the paint. Paint has a high organic content and low porosity, therefore, the VOCs mixed in the paint would tend to remain bound and would not be extracted with ISVE technology. In addition, lead exceeds acceptable levels and is not extractable with ISVE. Due to the very small volume of soil associated with this paint residue, on-site treatment technologies would not be cost effective and therefore, were not evaluated.

Current well and air stripper system: This component requires that operation of the air stripper be continued in order to meet the need for a permanently safe drinking water supply system. Maintaining the current system also includes monitoring to assure adequate performance, operation and maintenance of the system and force mains connecting the existing production wells to the air stripper.

Deed restrictions: Deed restrictions are included for the East Side soil and ground water contaminated property until such time as the cleanup standards are met and sustained for at least 5 years. The City of Elkhart has been requested to prevent residential exposure to the plume on the West Side through whatever means available.

<u>Alternative 1: No Action</u>

The no action alternative involves no ground water interception or treatment. Therefore, the existing air stripper would be abandoned and there would be no pumping of ground water for the purposes of contaminant interception. The no action alternative will result in risk associated with the ground water and soil identified on the East Side. The risk associated with the no action alternative would remain at 1x10-4 for the current worker and $3/10^{-4}$ for the potential future resident on the East Side and at 8x10-4 (current worker) and 6x10-4 (potential future resident) on the West Side. Thus, without any cleanup, the potential lifetime excess cancer risk will exceed the acceptable risk range of 10-4 to 10-6.

The total present net worth of alternative 1 is presumed to be nothing.

<u>Alternative 2: In-situ Vacuum Extraction, Paint Layer Removal, Current Well System, Current Air Stripper, Deed Restrictions, and Ground water Monitoring</u>

Alternative 2 incorporates the use of in-situ vacuum extraction (ISVE) to remediate the volatile organic contaminants documented in the hot spots of soil contamination on the East side. Extraction and treatment of the contaminated ground water is accomplished by maintaining the existing interceptor system and air stripper treatment facility.

Maintaining the operation of the existing interceptor wells and air stripper provides control of the ground water contaminant plume into the well field from the East side but does not provide control of contaminated ground water from the West Side.

ISVE is a process to remove or recover VOCs in vadose-zone (unsaturated) soil. A subsurface gradient is created and vaporized volatile contaminants migrate through the air spaces between soil particles toward extraction points where they are recovered. If emissions control is needed, the removed VOCs are processed through a liquid-vapor separator and then treated by an activated carbon bed, catalytic converter, afterburner. Implementation of ISVE would include installing at least 50 extraction wells to the water table, installing blowers, piping and a temporary support building. The duration of the treatment required to attain the soil cleanup standard is estimated as 12 months.

Deed restrictions are used to prevent use of ground water on the East Side until such time as the soil and ground water standards are met.

In addition to treatment of the TCE contaminated soils, the paint layer will be removed, sampled for the target compound list and disposed of off-site in accordance with RCRA. Additional characterization of the paint layer will be required in the design phase in order to determine the primary functional groups of concern. Based on that information, an off-site treatment technology will be selected. Cost estimates are based on thermal destruction (incineration).

The present net worth of alternative 2 is estimated at $3.8 Million.

Alternative 3: Low Temperature Thermal Desorption, In-situ Vacuum Extraction, Paint Layer Removal, Current Well System, Current Air Stripper, Deed Restriction, and Ground water Monitoring

Alternative 3 addresses the soil contamination in the East Side hot spots by means of removal, to the extent practicable, followed by thermal treatment of the soils with an on-site low temperature thermal desorption (LTTD) treatment system. Recognizing that excavation of large quantities of soil next to and/or beneath the buildings may not be desired or necessary, ISVE is proposed to remove the remaining VOC contamination in these areas.

Two different LTTD systems are currently in operation. One is directly fired, forcing heated air counter-current to the flow of soils and the other system is indirectly fired using an oxygen free atmosphere. Both systems use rotary drums and heat transfer to desorb and remove volatile and semi-volatile organic compounds. The organic compounds are removed by condensation, through carbon absorption, or through combustion and the airstream is then discharged through a stack. Process residuals include processed waste, condensed organic compounds, an aqueous offstream, ash from the afterburner, spent carbon and air emissions (which may require controls, as discussed in the compliance with ARARs section).

Excavated soil would be placed on trucks, hauled to the on-site LTTD laydown area (0.25 miles away), preprocessed to remove any large boulders, then fed into the LTTD unit. The treated soils would be stockpiled and eventually replaced in the original excavation. Treatment of the estimated 14,600 cubic yards would take approximately 60 to 90 days after the system is set up. The ISVE portion of the remedy would require at least 17 extraction wells and the duration would still be expected to extend over 12 months.

The total present net worth of alternative 3 is estimated at $8.5 million.

Alternative 4: In-Situ Vacuum Extraction, Paint Layer Removal, New Interceptor Well System and Current Air Stripper, Deed Restrictions, and Ground water Monitoring

Alternative 4 incorporates a new interceptor well system on the West side of the well field. All other components of the remedy are the same as described in alternative 2.

Construction of the additional interceptor wells on the West side will contain, or block, the plume and prevent contamination from entering the well field.

Construction of the new interceptor wells on the West side is anticipated to decrease the average daily quantity of ground water requiring treatment from 4.1 million gallons per day (MGD) to 1.3 - 2.5 MGD, depending on well field demand. Greater well field demand would require greater pumping of the interceptor wells as well. Construction of the new interceptor wells will also necessitate the construction of approximately 3,000 linear feet of 10-inch diameter ductile force main from the West side interceptor wells to the air stripper building.

Initially, the existing East side interceptors, production wells and new West Side interceptors will be routed through the air stripper. When the production wells decrease concentrations, only the East and West interceptors will be routed to the air stripper. This is expected to take less than 5 years. As the East side ground water cleanup standards are achieved, only the West side interceptors will be routed to the air stripper.

The air stripper was designed for an influent concentration of 310 ppb at 6.5 MGD. At this rate, emissions did not exceed 1x10-6 risk levels, nor did it exceed any State or Federal standard. The air stripper, treating water from the East and West interceptor wells, will emit approximately 2.02 pounds/day (737 pounds/year) of VOCs. The concentration in the influent will increase from the 15 to 20 ppb currently measured to approximately 200 ppb. The concentration will increase because the new western interceptors will be located in the most concentrated portion of the plume and because the existing production wells currently routed to the air stripper will no longer need to be routed to the air stripper. The combined air emissions from both the air stripper and the ISVE are expected to be less than the State regulated permit amount of 25 tons VOCs/year (326 IAC 8-1-6), the State Implementation Plan (SIP) regulated standards of 3 pounds/hour or 15 pounds/day. Therefore, emissions controls will not likely be needed.

During the design phase, estimates for air emission mass and rate will be refined and reevaluated. The estimate for new interceptor capacity will be refined and if an increased flow is required in order to achieve complete interception, the air emissions rates will be reevaluated to ensure that ARARs and protective levels are not exceeded. And if necessary, the air stripper facility would be modified to accommodate projected flow changes. Similarly, if soil concentrations or volume change significantly, air emissions controls will also be evaluated for the ISVE system.

The total present net worth of alternative 4 is estimated at $3.4 million.

Alternative 5: Low Temperature Thermal Desorption, In-Situ Vacuum Extraction, Paint Layer Removal, New Interceptor Well System, Current Air Stripper, Deed Restrictions, and Ground Water Monitoring

Alternative 5 combines the West Side ground water interception system described in Alternative 4 with the LTTD contaminated soils remediation approach identified in Alternative 3.

The total present net worth of alternative 5 is $8.1 million.

VIII. Comparison of Alternatives:

Table 7 summarizes the alternatives relative to the 9 criteria.

Threshold Criteria:

Overall Protection of Human Health and the Environment:

Alternative 1, no action, does not satisfy the requirement for overall protection of human health and the environment because the risks posed by contaminated soils and ground water would remain. Alternatives 2, 3, 4 and 5 are all protective since they each include treatment of contaminated soil and ground water. Alternatives 2 and 3 are protective in that the VOC contamination is intercepted by the production wells and treated by the air stripper. However, the concentrations are more dilute and the well field itself is not restored. Alternatives 4 and 5 are considered more protective due to the plume containment outside of the well field. The net result is that the well field is restored within a relatively short timeframe (a few years or less).

Compliance with ARARs:

Section 121(d) of SARA requires that remedial actions meet legally applicable or relevant and appropriate requirements (ARARs) of other environmental laws. These laws may include: the Resource Conservation and Recovery Act (RCRA), the Clean Water Act (CWA), the Clean Air Act (CAA), the Safe Drinking Water Act (SDWA), and any state law which has more stringent requirements than the corresponding Federal law. "Legally applicable" requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstances at a CERCLA site. "Relevant and appropriate" requirements are those requirements that, while not legally applicable to the remedial action, address problems or situations sufficiently similar to those encountered at the site that their use is well suited to the remedial action.

Non-promulgated advisories or guidance documents issued by federal or state governments do not have the status of ARARs; however, where no applicable or relevant and appropriate requirements exist, or for some reason may not be sufficiently protective, non-promulgated advisories or guidance documents may be considered in determining the necessary level of cleanup for the protection of human health and the environment.

Table 9 provides a summary of ARARs and other pertinent laws and regulations for the alternatives. Below, however, is a discussion of the significant ARARs for the respective alternatives.

RCRA is a significant ARAR for this operable unit. Chlorinated solvents were disposed of at the site prior to 1980, but the TCE and other solvents came from degreasing operations (RCRA listed processes). Therefore, RCRA is applicable to the treatment, storage and/or disposal of these wastes in this remedial action. In addition, any solid waste derived from the treatment, storage or disposal of a listed RCRA hazardous waste is itself a listed hazardous waste. Therefore, both prior and subsequent to treatment, the soils are considered RCRA listed hazardous wastes. The soil and ground water are also RCRA listed wastes under the "contained-in" rule. Under this rule, any mixture of a non-hazardous material with a RCRA listed hazardous waste must be managed as a hazardous waste as long as the material "contains" hazardous waste.

The paint layer will be removed and disposed of off-site. This layer consists of soil contaminated with RCRA listed hazardous waste and, therefore, RCRA Land Disposal Restrictions (LDRs) apply to its disposal. Because the LDR treatment standards are based on the treatment of industrial process wastes that are physically and chemically less complex than process wastes mixed with soil, until treatment standards for soil and debris are promulgated, there is a presumption that a treatability variance pursuant to 40 CFR 268.44 will be used to comply with the LDRs. (See Superfund LDR Guidance #6A, OSWER Directive #9347.3-06FS, September 1990).

The guidance demonstrates that, based on their physical and chemical properties, RCRA hazardous constituents have been divided into twelve "structural functional groups", as provided in Table 8. Each constituent in a group is treated in relation to a threshold concentration (TC) (column 3 of Table 8). If the constituent concentration is below the TC, then the waste is treated to a level within a specific concentration range (column 2 of Table 8). If the constituent concentration exceeds the TC, then the waste is treated to a level specified in terms of percent reduction (column 4 of Table 8).

TABLE 7
COMPARATIVE EVALUATION OF FINAL ALTERNATIVES
Main Street Well Field Site
Elkhart, Indiana

Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
OVERALL PROTECTIVENESS					
Human Health Protection					
Contact Soil	No reduction in risk. 10^{-4} risk remains.	Greater than 10^{-6} achieved, if needed.	Greater than 10^{-6} achieved, if needed.	Greater than 10^{-6} risk achieved, if needed.	Greater than 10^{-6} risk achieved, if needed.
Groundwater Ingestion	No reduction in risk. 10^{-4} risk remains.	Greater than 10^{-6} risk or better achieved.	Greater than 10^{-6} risk or better achieved.	Greater than 10^{-6} risk achieved.	Greater than 10^{-6} risk achieved.
Overall Protection	No protection.	Protective because of treatment of soil hot spots and treatment of groundwater.	Protective because of treatment of soil hot spots and treatment of groundwater.	Most protective because of treatment of soil hot spots and process control for containing migration of contaminated groundwater.	Most protective because of treatment of soil hot spots and process control for containing migration of contaminated groundwater.
COMPLIANCE WITH ARARS					
Chemical-Specific ARARs	Does not meet ARARs.	Meets ARARs.	Meets ARARs.	Meets ARARs.	Meets ARARs.
Location-Specific ARARs	Not applicable.	Meets ARARs.	Meets ARARs.	Meets ARARs.	Meets ARARs.
Action-Specific ARARs	Does not meet ARARs.	Meets ARARs.	Meets ARARs.	Meets ARARs.	Meets ARARs.
SHORT TERM EFFECTIVENESS					
Community Protection	Soil and groundwater pathways provide unacceptable risks.	Potential threats include VOC releases removal of paint layer.	Higher potential for exposure and community due to airborne discharges during soil hot spot excavation and preprocessing handling activities.	Minimal adverse impacts during short term since only construction activities are removal of paint layer and construction of new extraction wells and forcemain. Potential threats include VOC releases removal of paint layer and construction of new extraction wells.	Same as Alternative 3.
Worker Protection	Not applicable.	Limited exposure potential due to VOC release during ISVE construction	Greatest potential for exposure due to VOC volatilization during excavation and treatment of soils.	Same as Alternative 2.	Same as Alternative 3.
Time Until RAOs are Attained	Not applicable.	Two months for paint layer remediation; ISVE remediation 12 months; groundwater treatment for ± 40 years.	Same as Alternative 2. However, majority of soil remediation accomplished within 6 months.	Two months for paint layer remediation; soil remediation 12 months; groundwater treatment for ± 40 years.	Same as Alternative 4. However, majority of soil remediation accomplished within 6 months.

TABLE 7
COMPARATIVE EVALUATION OF FINAL ALTERNATIVES
Main Street Well Field Site
Elkhart, Indiana

Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
LONG-TERM EFFECTIVENESS AND PERFORMANCE					
Magnitude of Residual Risk	Existing risk remains.	Alternative treats soil hot spots via ISVE. Clean-up levels of 10 ug/kg in soil for COC should be attainable.	Alternative treats soil hot spots via LTTD and ISVE. Clean-up levels of detection limits are projected by LTTD for COC.	Same as Alternative 2.	Same as Alternative 3.
Adequacy and Reliability of Controls	Not applicable.	Source control of soil hot spots is appropriate for providing some control; however, existing groundwater interceptor and production wells do not optimize groundwater plume management.	Same as Alternative 2.	Source control of soil hot spots in conjunction with new groundwater interceptor system provides best process control of groundwater plume management. In addition, greater flexibility in operating air stripper unit process.	Same as Alternative 4.
Reduction of Toxicity, Mobility, and Volume					
Treatment Process Used	None.	Groundwater extraction by existing interceptor and production wells and treatment by air stripper. Paint layer excavated, transported off-site and incinerated. Soil hot spots to be treated by ISVE.	Groundwater extraction by existing interceptor and production wells and treatment by air stripper. Paint layer excavated, transported off-site and incinerated. Soil hot spots existed and treated by LTTD on-site. Soils not readily excavated to be treated by ISVE.	Groundwater extraction by new interceptor well network and treatment by modified air stripper. Paint layer excavated, transported off-site and incinerated. Soil hot spots to be treated by ISVE.	Groundwater extraction by new interceptor well network and treatment by modified air stripper. Paint layer excavated, transported off-site and incinerated. Soil hot spots excavated and treated by LTTD on-site. Soils not readily excavated to be treated by ISVE.
Amount Destroyed or Treated	None.	60 c.y. of paint layer destroyed by off-site incineration. Soil hot spots treated via ISVE extracted from soil. Length of groundwater treatment is ± 40 years due to source control of soil hot spots.	Same as Alternative 2, except soil hot spots treated via LTTD and ISVE for under buildings. Residuals requiring disposal include condensate and filter cake from LTTD.	New interceptor system is engineered for providing control of groundwater plume. Reduced soil hot spots treated via ISVE. Combination of soil source control and efficient extraction system decreases groundwater treatment period to 40 years at 1.28 MGD.	Same as Alternative 4, except soil hot spots treated via LTTD.
Reduction of Toxicity, Mobility, or Volume	None.	ISVE reduces volume of contaminants to groundwater. Toxicity reduced by air stripper process.	LTTD reduces volume of contaminants to groundwater. Toxicity reduced by air stripper process.	Same as Alternative 2.	Same as Alternative 4, except LTTD residuals, soil volume, and mobility of contaminants.

TABLE 7
COMPARATIVE EVALUATION OF FINAL ALTERNATIVES
Main Street Well Field Site
Elkhart, Indiana

Criteria	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Type and Quantity of Residuals After Treatment	None.	Soil residuals.	LTTD generates condensate filter cake and carbon, which requires disposal of soils residuals.	Same as Alternative 2.	Same as Alternative 3.
Statutory Preference for Treatment	Does not satisfy.	Satisfies groundwater and soil hot spot elements for providing treatment. A principal element to address the principal threats at the site.	Same as Alternative 2.	Same as Alternative 2.	Same as Alternative 3.
IMPLEMENTABILITY					
Ability to Construct and Operate	Not applicable.	Components of alternative should be readily implementable.	Site constraints and permitting issues may have problems and for delays.	Same as Alternative 2. In addition, new interceptor system and modifications to air stripper should be easy to implement.	Same as Alternative 3. In addition, new interceptor system and modifications to air stripper should be easy to implement.
Ease of Expansion	Not applicable.	Same as Alternative 2, in addition ISVE can be moved, expanded, remobilized as necessary. Only limitation to ISVE is physical/ chemical properties of COC.	Not readily adaptable. Remobilization is extremely complicated and not practical.	Same as Alternative 2.	Same as Alternative 3.
Ability to Monitor Effectiveness	Not applicable.	Verification of in-situ processes is more difficult.	Soil monitoring and groundwater monitoring are easily accomplished.	Same as Alternative 2.	Same as Alternative 3.
Ability to Obtain Approvals and Coordinate with Other Agencies	Not applicable.	Air discharge issues specific to paint layer excavation need to be addressed.	Same as Alternative 2, in addition, will require coordination with local government to ensure acceptability of LTTD.	Same as Alternative 2.	Same as Alternative 3.
Availability of Equipment and Technologies	Not applicable.	Services and equipment available. ISVE will require coordination with vendors.	Services and equipment available. LTTD will require coordination with vendors.	Same as Alternative 2.	Same as Alternative 3.
COSTS					
Capital Cost	None.	$1,210,000	$5,890,000	$1,470,000	$6,160,000
O&M Cost	Not applicable.	$170,000	$170,000	$130,000	$130,000
Present Worth Costs	Not applicable.	$3,820,000	$8,500,000	$3,370,000	$8,050,000

TABLE 8 ALTERNATE TREATABILITY VARIANCE LEVELS AND TECHNOLOGIES FOR STRUCTURAL/FUNCTIONAL GROUPS

Structural Functional Groups	Concentration Range (ppm)	Threshold Concentration (ppm)	Percent Reduction Range	Technologies that achieved recommended effluent concentration guidance**
ORGANICS	Total Waste Analysis/*	Total Waste Analysis/*		
Halogenated Non-Polar Aromatics	0.5 - 10	100	90 - 99.9	Biological Treatment, Low Temp. Stripping, Soil Washing, Thermal Destruction
Dioxins	0.00001 - 0.05	0.5	90 - 99.9	Dechlorination, Soil Washing, Thermal Destruction
PCBs	0.1 - 10	100	90 - 99.9	Biological Treatment, Dechlorination, Soil Washing, Thermal Destruction
Herbicides	0.002 - 0.02	0.2	90 - 99.9	Thermal Destruction
Halogenated Phenols	0.5 - 40	400	90 - 99	Biological Treatment, Low Temp. Stripping, Soil Washing, Thermal Destruction
Halogenated Aliphatics	0.5 - 2	40	95 - 99.9	Biological Treatment, Low Temp. Stripping, Soil Washing, Thermal Destruction
Halogenated Cyclics	0.5 - 20	200	90 - 99.9	Thermal Destruction
Nitrated Aromatics	2.5 - 10	10,000	99.9 - 99.99	Biological Treatment, Soil Washing Thermal Destruction
Heterocyclics	0.5 - 20	200	90 - 99.9	Biological Treatment, Low Temp. Stripping, Soil Washing, Thermal Destruction
Polynuclear Aromatics	0.5 - 20	400	95 - 99	Biological Treatment, Low Temp. Stripping, Soil Washing, Thermal Destruction
Other Polar Organics	0.5 - 10	100	90 - 99	Biological Treatment, Low Temp. Stripping, Soil Washing, Thermal Destruction
INORGANICS	TCLP	TCLP		
Antimony	0.1 - 0.2	2	90 - 99	Immobilization
Arsenic	0.30 - 1	10	90 - 99.9	Immobilization, Soil Washing
Barium	0.1 - 40	400	90 - 99	Immobilization
Chromium	0.5 - 6	120	95 - 99.9	Immobilization, Soil Washing
Nickel	0.5 - 1	20	95 - 99.9	Immobilization, Soil Washing
Selenium	0.005	0.05	90 - 99	Immobilization
Vanadium	0.2 - 20	200	90 - 99	Immobilization
Cadmium	0.2 - 2	40	95 - 99.9	Immobilization, Soil Washing
Lead	0.1 - 3	300	99 - 99.9	Immobilization, Soil Washing
Mercury	0.0002 - 0.008	0.08	90 - 99	Immobilization

* *TCLP also may be used when evaluating waste with relatively low levels of organics that have been treated through an immobilization process.*

** *Other technologies may be used if treatability studies or other information indicates that they can achieve the necessary concentration or percent-reduction range.*

Sampling of the paint layer indicated the presence of TCE, xylene and lead. The sampling data, however, was limited and additional characterization of the paint layer will be required in the design phase in order to determine the presence of additional functional groups. It is expected that, at a minimum, halogenated aliphatics (e.g., TCE), halogenated non-polar aromatics (e.g., xylene) and lead will be amongst the functional groups used to determine treatment standards and technologies.

Using the limited data available from sampling of the paint layer, the treatability variance would be applied as follows:

	Constituent Concentration	TC	Treatment Level
TCE	88 ppm	40 ppm	95-99.9% red.
xylene	2,300 ppm	100 ppm	90-99.9% red.

(lead was not measured by TCLP, so it is not used in this example.)

The paint layer will be removed, sampled for the full target compound list and, based upon the results of that sampling, it will be taken to a facility capable of the treatment technologies and treatment standards identified in Table 8 for disposal. Should the constituent concentrations be measured at less than the concentration range provided in column 2 of Table 8 prior to any treatment, no treatment will be necessary prior to disposal in a RCRA Subtitle C facility.

The Agency intends to grant a treatability variance for the paint layer under 40 CFR 268.44 to comply with RCRA LDRs unless public comment following release of this ROD overcomes the presumption that a treatability variance is appropriate for this waste.

Since paint layer removal is required for alternatives 2 through 4, the above analysis applies to all alternatives except no action.

With the use of LTTD, the excavation and movement of these soils from their current location for treatment and replacement/redisposal at the same location will trigger the applicability of RCRA LDRs. The treated soils will still be RCRA listed wastes because any solid waste derived from the treatment, storage or disposal of the RCRA listed waste is a RCRA listed waste. LTTD treatment of the soils, however, would meet the LDR treatment standards for TCE under 40 CFR Part 268, Subpart D and, therefore, could be disposed of at the location from which they were removed.

The Hazardous and Sold Waste Amendments of 1984 (HSWA) established minimum technology requirements for disposal of RCRA hazardous wastes into new land disposal units. These technology requirements would not be triggered upon redisposal/replacement of the LTTD-treated soils because no "new" unit would be created.

RCRA closure requirements at 40 CFR Part 264, however, would be triggered by the replacement of the soils into the pre-existing unit. Implementability of RCRA closure would be very difficult due to the large volume of soil and restricted space at the site. The Agency would consider de-listing the waste.

This LTTD ARAR analysis applies to alternatives 3 and 5.

RCRA LDR treatment standards do not apply to soil treated in-situ. RCRA LDRs will not be triggered by alternatives 2 and 4. RCRA regulates air emissions from process vents at 40 CFR 264 Subpart AA. These regulations are neither applicable nor relevant and appropriate because CERCLA waste management activities are considered, as a group, to be fundamentally different than those RCRA regulated hazardous waste treatment, storage or disposal facilities for which the Subpart AA regulations are applicable. See 55 Fed. Reg. 25458, 25459 (June 21, 1990).

Both the ISVE system and the air stripper produce emissions subject to regulation under the Clean Air Act (CAA). Under the CAA, EPA has promulgated National Ambient Air Quality Standards (NAAQS), National Emission Standards for Hazardous Air Pollutants (NESHAPS) and New Source Performance Standards (NSPS).

NAAQS have been promulgated pursuant to Section 109 of the CAA for particulate matter and ozone from "major" sources. States translate these ambient standards into source-specific emission limitations in which upon US EPA approval become incorporated into federally enforceable State Implementation Plans (SIPs). Under the Indiana SIP any new source with a potential of emitting 25 tons of VOCs per year must be used in conjunction with the best available control device to reduce emissions. Neither ISVE nor the air stripper constitute a "major source" under the CAA. Under the Indiana's SIP (APC-19, February 16, 1982) and under the current Indiana air pollution regulation 326 IAC-2-1-1(b)(2)(D), registration is required for sources of VOC air emissions which have the potential for emitting 3 pounds/hour, 15 pounds/day, or 25 tons per year. Such registration requirements may result in the use of emissions controls on sources which exceed these limits. It is anticipated that implementation of any treatment alternative would fall below these emission standards. However, such estimates will be verified in the design phase and controls will be used if required.

Pollutants for which no NAAQS exist, but that cause or contribute to air pollution that may result in serious illness have been identified by EPA under the CAA Subsection 112 and are called

NESHAPS. The only pollutant at this site for which a NESHAPS exists is vinyl chloride. See 40 CFR Part 61, Subpart F. The emission standard for vinyl chloride plants is 10 ppm. While this standard is not applicable because none of the treatment technologies meets the definition of a vinyl chloride plant, it is relevant and appropriate. All treatment alternatives will satisfy this requirement, particularly since the amount of vinyl chloride at the site is very low.

The NSPS are technology-based standards which are neither applicable nor appropriate to the pollutants and chemicals at this site.

Alternatives 4 and 5 require construction of a water main across Christiana creek. Therefore, these alternatives must assure no loss of floodplain or wetland area in accordance with Executive Orders 11988 and 11990.

The SDWA requires the establishment of standards to protect human health from contaminants in drinking water. Maximum Contaminant Levels (MCLs) for specific contaminants have been promulgated under SDWA. Additionally, SDWA maximum contaminant level goals (MCLGs), which are non-enforceable health-based goals, have been set at levels at which no known or anticipated adverse effects on the health of persons is likely to occur. The NCP requires that non-zero MCLGs shall be attained by remedial actions for water that are current or potential sources of drinking water, where MCLGs are relevant and appropriate. See 40 CFR 300.430(e)(2)(i)(B). More stringent standards than MCLs may be appropriate for ground water used as drinking water when multiple contaminants and/or multiple exposure pathways may not be protective of human health and the environment. Ground water cleanup standards for this site have been set lower than the MCLs in order to achieve a residual risk level of 1x10-5 across all media. See the detailed description of the selected remedy for explanation of the ground water standards.

<u>Balancing Criteria:</u>

Short-term Effectiveness:

This evaluation criterion addresses the effects of the alternatives on human health and the environment during construction and implementation. All of the alternatives, with the exception of no action, involve excavation and off-site treatment/disposal of the paint layer waste, as well as treatment of contaminated ground water in the existing air stripper. Alternatives 3 and 5 would have significantly greater short-term impacts than alternatives 2 and 4, such as excavation related dust, handling of contaminated soils and disruption of existing businesses. In addition, excavation of soil near the buildings would require bracing and building support. Therefore, alternatives 2 and 4 would have less short term adverse impacts.

Long-term Effectiveness and Permanence:

The evaluation of alternatives under this criterion address the risk remaining at the MSWF site at the conclusion of remedial actions. The no-action alternative provides no long-term effectiveness and would result in continuation of the elevated 10-4 risk levels that currently exist. The two treatment technologies considered in alternatives 2 through 5, ISVE and LTTD, are radically different in their approach, but are capable of achieving the same cleanup standards.

In evaluating the time required until remedial action objectives are met, consideration should be given to the time necessary to remediate individual elements of the alternatives as well as the entire site. For the MSWF site, it is impossible to quantitatively project the precise duration of the pump and treat element of the various alternatives due to the complex interdependence between the soils and ground water. However, qualitatively several conclusions pertaining to duration of ground water cleanup can be drawn. First, the no action alternative would result in the indefinite, and perhaps perpetual, contamination of the MSWF aquifer. Alternatives 2 and 3 will result in cleanup of the East side aquifer portion in approximately 5 to 10 years, but the well field will remain contaminated. Should contaminants other than VOCs become a future problem, there would be no containment before affecting the well field, at which point the cost of treating a more dilute, higher volume problem would be expensive. Alternatives 4 and 5 provide for plume containment before reaching the well field, thus allowing well field restoration within a few years.

Reduction of Toxicity, Mobility and Volume:

This evaluation criterion addresses the statutory preference for selecting remedial actions that employ treatment technologies that permanently reduce toxicity, mobility or volume of the untreated waste. The no-action alternative provides no reduction of contaminant toxicity, mobility or volume. Alternatives 2 through 5 require removal of the paint layer. Compliance with the soil and debris variance will dictate the type of RCRA facility which will be acceptable for treatment and/or disposal.

Both ISVE and LTTD will reduce the VOCs contamination in the soil, thereby permanently reducing the toxicity and volume in the soil. ISVE would be capable of treating the VOCs to the cleanup standards in-situ with an efficiency of approximately 99.4 percent. It is estimated that up to 1,000 pounds of VOCs may be extracted from the soil. The LTTD removal would achieve approximately a 99.99 percent reduction in VOCs of the treated soil. In combination with ground water treatment, the treatment efficiency of either technology will achieve the VOC standards set by this ROD.

Ground water treatment can address contaminant mobility. The well field is not a perfect hydraulic containment system in that contaminated ground water does escape the capture zone and flow south beyond the well field. Alternatives 4 and 5 which include West side interceptors, would not only prevent contaminant migration into the well field, but beyond that toward the St. Joseph River as well. Alternatives 1, 2 and 3 would allow the contaminant migration to continue to the well field and beyond to the river.

Implementability:

This criterion addresses the technical and administrative feasibility of implementing an alternative, and the availability of various services and materials required for its implementation. The technologies considered, which include LTTD and ISVE, are available from commercial vendors. However, site limitations including confined working areas in close proximity to residential areas at the treatment site and general disruption make implementation of LTTD far more difficult than the ISVE soil treatment alternative. LTTD once mobilized, must be used to the fullest extent at that time since remobilization is costly and not as flexible. ISVE is more flexible in that it can be readily expanded and can be adapted to other areas if necessary.

The air stripper is already on-line and performing as designed. The additional interceptor wells on the West side are readily implementable.

Cost:

Alternatives are evaluated for cost in terms of capital costs, operation and maintenance cost (O&M), and present worth cost. The present worth analysis is used to evaluate expenditures that occur over different time periods by discounting all future costs to a common base year. For cost purposes of this project, 40 years has been assumed. This is slightly over the standard 30 year projection because pumping of the interceptors on the West side and treatment via the air stripper would be required until the sources are identified and controlled or until they diminish through natural processes - an undefined timeframe. As the well field and East side aquifer area is restored, flow to the air stripper will be reduced and operation and maintenance (O&M) costs will be reduced. The costs assumptions for West side interceptors remains the same for both alternatives 4 and 5.

Cost estimates for the paint layer removal assume off-site incineration. This is a relatively high cost per soil volume alternative relative to the ISVE cost per soil volume. Cost assumptions for this element of the remedy are the same for all alternatives. Due to the uncertainty in extent of contamination beneath the buildings, the feasibility study costs are considered lower bound estimates.

Alternatives which include LTTD (3 and 5) are more costly than those which rely on ISVE exclusively (2 and 4). Of the alternatives which include West Side interceptors (4 and 5), alternative 4 is less costly. Capital, operation and maintenance and present worth costs are summarized at the bottom of table 7.

Modifying Criteria:

State Acceptance:

IDEM has been involved throughout this RI/FS and supports the selected remedy.

Community Acceptance:

Community acceptance of the selected remedy is discussed in the responsiveness summary attached.

IX. The Selected Remedy

The selected remedy will reduce the threat from contaminants at the site such that the total excess cumulative carcinogenic risk from exposure to all media do not exceed 1x10-5.

Based on the RI/FS, and using the comparative analysis of alternatives described above, USEPA has selected alternative 4 as the most appropriate remedial action at the MSWF site. IDEM has concurred with selection of alternative 4. A flow chart and conceptual site diagram are shown in Figures 8 and 9 respectively.

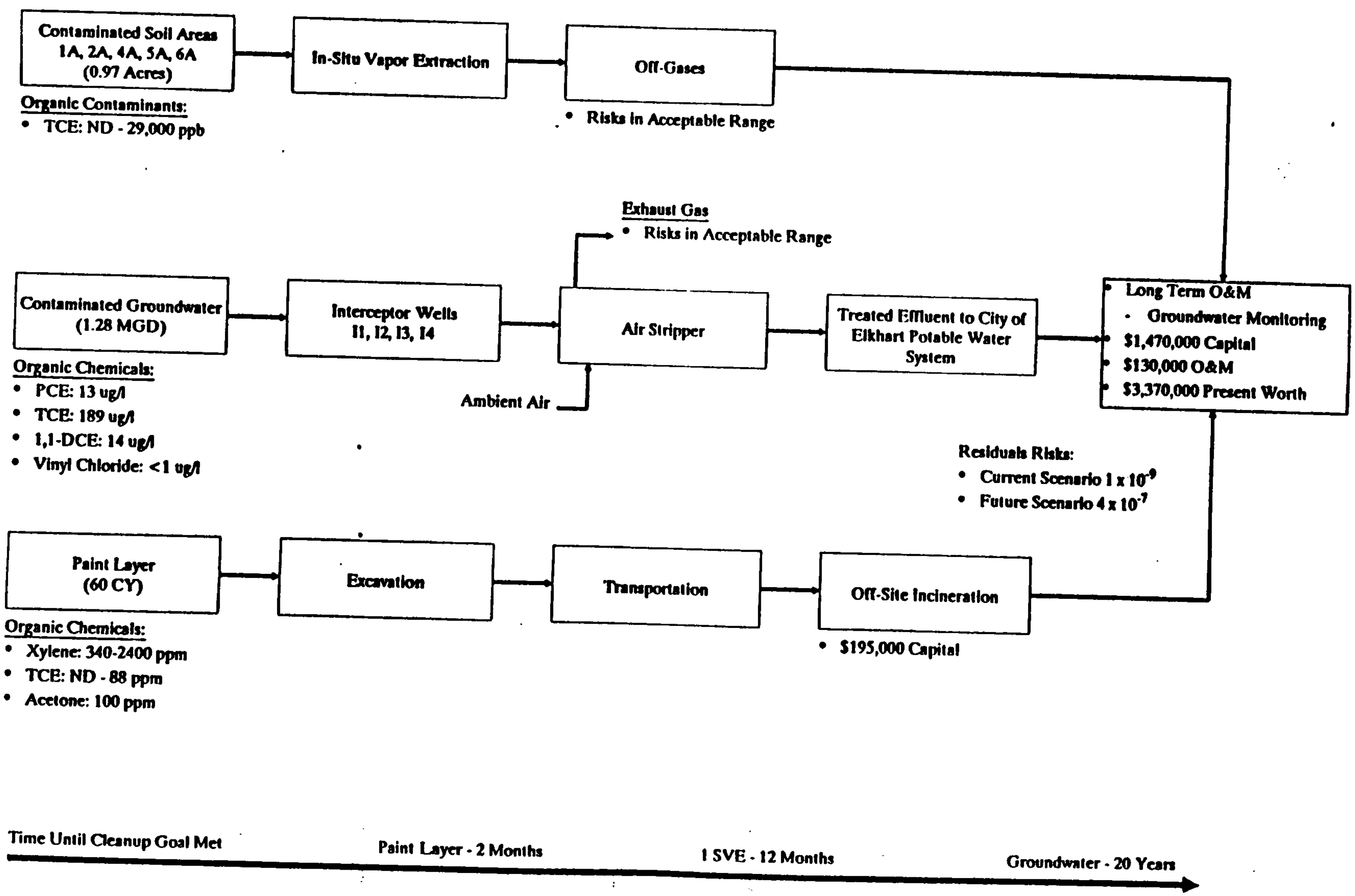
Components:

- Implement ISVE for the treatment of VOCs in the contaminated soils in the East side hot spots.

- Excavate and treat and/or dispose of the contaminated soils associated with the identified paint layer source area(s) at an off-site facility in compliance with State and Federal regulations.

- Construct new interceptor wells (I-3 and I-4) to the west of the well field to contain the plume, construct a new force main to connect the new interceptors to the air stripper, maintain the air stripper and its ancillary support system and monitor.

FIGURE 8
COMPONENTS OF ALTERNATIVE 4
Main Street Well Field Site
Elkhart, Indiana



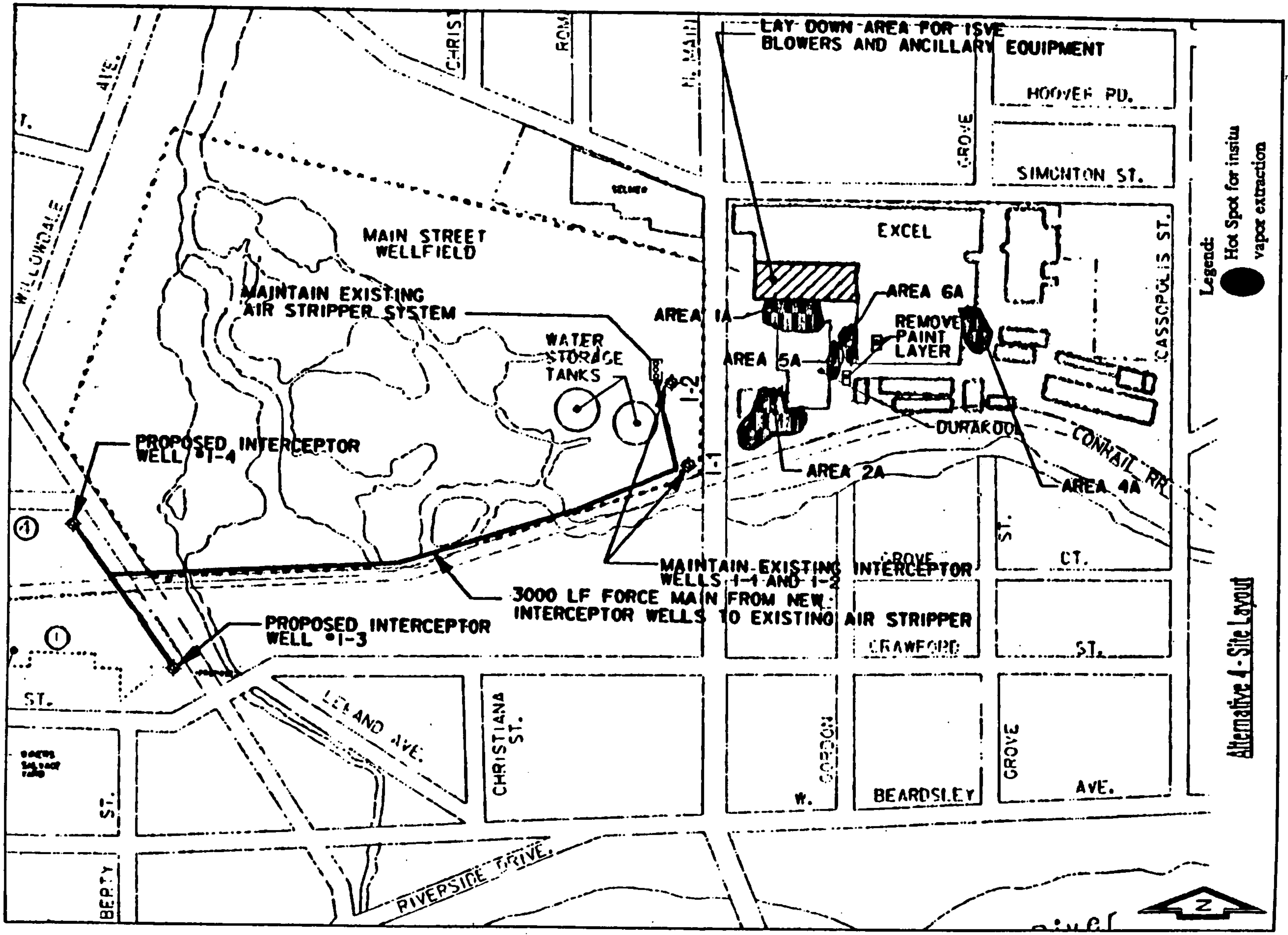


FIGURE 9

Alternative 4 Site Layout

- Place deed restrictions on the installation and use of potable water supply wells on the East Side properties until soil and ground water goals are met and sustained.
- Implement a ground water monitoring program to demonstrate compliance with the cleanup standards.

Rationale:

All alternatives, except no-action, are protective and comply with ARARs. Therefore, alternatives 2 through 5 pass the threshold criteria. Of the alternatives involving treatment, the ISVE alternatives 2 and 4, are less costly than 3 and 5 for the same level of performance as measured by their ability to achieve the cleanup standards. ISVE requires less disruption to businesses and community for implementation and is more flexible in that it can be readily expanded on-site. Given that, there is no inherent advantage in use of the LTTD technology at this site.

Alternatives 2 and 4 differ in their inclusion of West Side interceptors. Under alternative 2, contaminated ground water continues to be drawn into the well field. Although several production wells are routed to the air stripper, the influent concentration to the air stripper is low. For the same, if not lower operating cost, a lower influent flow with a higher contaminant concentration could be achieved while at the same time preventing continued contamination of the well field. Since hot spot areas of contamination on the West Side have not been identified, it is unknown how long this contamination will continue. In addition, the location of the well field in an industrial area makes it vulnerable to future contamination with very little response time should other contamination problems develop. Thus, West Side interception wells provide greater long term protection. The MSWF study area constitutes a class 2A, current use aquifer. Plume interception is consistent with the Agency's intent to restore aquifers to their highest beneficial use in a reasonable timeframe. For these reasons, alternative 4 is selected as the most protective and cost-effective remedy.

Description:

A minimum soil estimate for vapor extraction is 22,000 cubic yards. Volume estimates will be refined in the design phase. ISVE is easier to implement and does not trigger RCRA LDRs because the waste is treated in-situ. The paint layer is considered a listed waste under the RCRA derived-from rule. Additional characterization will be required during the design phase. With high concentration of xylene and lead, this waste may also be RCRA characteristic. The paint layer volume is estimated at 60 cubic yards, assuming the disposal area identified beneath the building received the same waste streams as the disposal area outside the building. ISVE is not a separation technology for mixtures and will not be able to treat this waste stream. Leaving the paint layer waste in place would fail to satisfy RCRA closure requirements, would not meet the cleanup standards, nor would it provide long term protection. Therefore, it will be removed and disposed of in accordance with RCRA.

The existing air stripper does not have air emissions controls on it. Existing air emissions do not exceed risk levels at design concentrations and emissions rates. This remedy, including higher influent concentration as a result of the West side interceptors, and ISVE, is still not anticipated to exceed the State and federal regulatory levels at which control equipment could be required.

The remedial action objectives are translated into cleanup levels for soil, ground water and air as follows:

Cleanup standards for the soil, ground water and air on the East Side are selected at a 1x10-5 level based on potential future use. The 1x10-5 level is very close to standard analytical detection limits for ground water, therefore, its achievement can be reliably measured. At this cleanup level, the soil remediation is expected to achieve ground water protection in the 10-8 range as a single pathway, prevent soils from further contributing to ground water contamination and is achievable with the selected technology. The following table shows the range from which the cleanup standards were selected.

	Current Worker			Future Resident		
	10-4	10-5	10-6	10-4	10-5	10-6
Ground Water (ppb)						
TCE	10	1.0	0.1	10	1.0	0.1
PCE	5	0.5	0.05	6	0.6	0.06
Vinyl Chloride	4	0.4	0.04	3	0.3	0.03
Soil (ppb)						
TCE	*	800	80	*	100	10
PCE**						
Vinyl Chloride***						

* TCE baseline risk not less than 10-4.
** PCE baseline risk not less than 10-6.
*** Vinyl Chloride not detected in soil.

Soil cleanup must achieve 100 ppb (or better) of TCE.

Interceptor wells must continue to operate until the following ground water standards are met on the East Side:

TCE	1.0 ppb
PCE	0.6 ppb
Vinyl Chloride	0.3 ppb*

* The acceptable vinyl chloride standard may be modified slightly based on best available analytical detection limits.

The West side interceptors must continue to operate until the plume entering the well field from the west no longer poses a cumulative contaminant risk of greater than 1x10-6. This is consistent with the ROD for operable unit 1 and is appropriate for the West Side given that without a known relationship between source and ground water, contaminant-specific standards cannot be selected.

It is expected that soil cleanup in combination with the existing ground water treatment provided by the East Side interceptor wells will restore the ground water to the cleanup standards. Ground water monitoring is needed to ensure that cleanup levels are met and maintained. Deed restrictions will ensure that exposure does not occur until cleanup levels are reached.

Air pathways risks were calculated based on the percent of total site risk contribution from the air stripper and ISVE under assumed air flow rates. Air emissions from the air stripper and the ISVE units were evaluated for potential impacts to receptors and to identify whether vapor-phase carbon adsorption treatment may be needed on these units to reduce risks to an acceptable level. At assumed flow rates, emissions would be limited by the following table. For example, both the air stripper and ISVE would require state registration under the SIP for mass discharges in excess of 15 lbs./day. Such registration may or may not require emission control measures. If controls are not required by State regulation, emissions can continue uncontrolled until the site risk based contaminant emission mass is exceeded. The table below shows that TCE emission mass would need to exceed 58.06 lbs./day in order to trigger controls based on risk. Similarly, the ISVE would require an emission mass of 31,765 lbs./day before controls would be needed based on risk.

<u>Air Stripper</u>

Constituent	Mass Discharge (lbs./day) 1x10-5 risk	MSP	SIP
TCE	58.06	137	15
PCE	3.89	total	total
1,1-DCE	4.17	VOCs	VOCs
Vinyl Chloride	< 0.26		

ISVE

Constituent	Mass Discharge (lbs./day) 1x10-5 risk	MSP	SIP
TCE	31,765	137 total VOCs	15 total VOCs
PCE	1,177		

MSP - Major Source/Modification Permit limit at 25 tons/year
SIP - State Implementation Plan Standard at 15 lbs/day

The maximum discharge from the air stripper is expected to be less than 3 lbs./day total VOCs based on expected treatment efficiency and treatment system flow rate. The maximum discharge from the ISVE system is expected to be less than 2 lbs./day. In both cases the discharges will be well below the risk level of 10-5.

Some balancing of contaminant emissions mass and rate between the ISVE and air stripper can occur. Therefore, projected emissions will be reevaluated during design. Regardless of design estimates, precise estimates for ISVE emissions cannot be made due to the limitations inherent in accurately measuring soil concentrations with existing sampling and analytical techniques. Therefore, offgas from ISVE will need to be monitored initially for comparison to acceptable levels.

Some changes may be made to the remedy as a result of the remedial design and construction processes. Such changes, in general, reflect modifications resulting from the availability of more detailed information in the design phase.

Statutory Determinations

Protection of Human Health and the Environment:

The selected remedy provides for remediation of site-related chemicals in soil and ground water on the East Side. Use of ISVE allows for unrestricted access to the land after remediation and allows for aquifer restoration. Removal of the paint layer allows for unrestricted use of the property after implementation of the remedy and it provides long-term protection. Continued use of the air stripper ensures a safe source of drinking water. Installation of the West Side interceptors allows restoration of the well field to its highest beneficial use, contains the plume outside the well field, and protects against long term uncertainty.

Compliance with Applicable or Relevant and Appropriate Requirements:

The selected remedy will meet all identified applicable, or relevant and appropriate, Federal and more stringent State requirements. ARARs are listed on table 9 and discussed in the comparison of alternatives section of this ROD. No ARAR waivers are required as discussed earlier. However, a soil and debris treatability variance may be used for the paint layer to satisfy 40 CFR 268.

Cost-effectiveness:

ISVE in alternative 2 and 4 is a less expensive means of achieving the same level of performance as LTTD in alternatives 3 and 5. The capital cost of ground water interception on the West Side remains the same for all alternatives, as does removal of the paint layer. All costs are estimated over a 40 year period. The volume of ground water requiring treatment decreases over time with alternatives 4 and 5, although the capital expenditure remains the same. A less expensive technology and lower operation and maintenance costs make alternative 4 the most cost effective remedial alternative for soil and ground water remediation and long term protectiveness of the well field.

Use of Permanent Solutions and Alternative Treatment to the Maximum Extent Practicable:

Alternative 4 permanently reduces soil contamination by using ISVE. ISVE is still considered an innovative technology. Since VOCs are highly amenable to treatment, all alternatives except no action incorporated a treatment technology which would permanently reduce contamination. Thus, any of the alternatives would have met this criteria. ISVE eliminates the need for further treatment of residuals off-site. Alternative 4 presents the best balance of long- and short-term effectiveness, implementability, reduction in toxicity, mobility and volume and overall cost.

Satisfy the Preference for Treatment that Reduces Toxicity, Mobility, or Volume as a Principal element:

This selected remedy satisfies the preference for treatment that reduces toxicity, mobility or volume. Both the ISVE and air stripping systems reduce mobility and volume in soils and ground water. However, since both technologies transfer contaminants into the air, toxicity reduction does not occur. The selected remedy satisfies the statutory preference for treatment as a principal element.

TABLE 9

COMPARISON OF ARARS FOR EACH ALTERNATIVE
Main Street Well Field Site
Elkhart, Indiana

Law	Regulation Title	Applies	ARAR *	1	2	3	4	5
Federal:								
Section 10 of the River and Harbor Act of 1899, as Amended	Permits for Structures or Work in or Affecting Navigable Waters of the United States	Provides procedures for the C.O.E. for reviewing permits to authorize structures or work affecting navigable water, including wetland areas.	*				X	X
	Permits for Discharge of Dredged or Fill Material into Waters of the United States	Provides procedures for the C.O.E. for reviewing permits to authorize the discharge of dredged or fill material into navigable water (including wetlands).	*				X	X
Executive Orders 11988, Floodplain Management, and 11990, Protection of Wetlands	Procedures for Implementing the Requirements of the Council of Environmental Quality on NEPA	Provides policies and procedures for floodplain management and wetland protection.	*				X	X
		Requires EPA programs to determine if proposed actions will be in or affect a floodplain or wetland.	*				X	X
CAA; Clean Air Act of 1963, as Amended	National Emission Standards for Hazardous Air Pollutants	Requires all Federal projects, licenses, permits, plans, and financial assistance activities to conform to any State Air Quality Implementation Plan (SIP).	R;AP		X	X	X	X
		Identifies substances that have been designated hazardous air pollutants, and for which a Federal Register notice has been published. Listed substances include trichloroethylene and vinyl chloride.	A		X	X	X	X
		Requires that no owner or operator shall construct or modify any stationary source without first obtaining written approval from the Administrator.	A		X	X	X	X
		The owner or operator shall submit an application for approval of the construction of any new source or modification of any existing source.	A		X	X	X	X
		Specifies compliance with emission standards. Also, specifies regulations for emission tests and maintenance and monitoring requirements.	A		X	X	X	X
		Defines modification to a stationary source and specifies tasks that must be performed in the event that a modification is performed.	R;AP				X	X

TABLE 9

COMPARISON OF ARARS FOR EACH ALTERNATIVE
Main Street Well Field Site
Elkhart, Indiana
(Continued)

Law	Regulation Title	Applies	ARAR *	1	2	3	4	5
CAA; Clean Air Act of 1963, as Amended	National Emission Standards for Hazardous Air Pollutants	Prohibits concealing emissions.	A		x	x	x	x
		National emission standard for vinyl chloride. Applies to plants which produce ethylene dichloride, vinyl chloride, process, and/or one or more polymers containing any fraction of polymerized vinyl chloride.	R;AP		x	x	x	x
		Specifies standards for pumps, compressors, pressure relief devices, sampling connection systems, open ended valves or lines, valves, flanges, and other connectors, product accumulator vessels, and control devices or systems that are intended to operate in the volatile hazardous air pollutant (VHAP).	A		x	x	x	x
		Establishes test methods and procedures, recordkeeping requirements, and reporting requirements that an owner or operator are subject to when a VHAP is involved.	A		x	x	x	x
CAA; Clean Air Act, Title I Amendments of 1990	Federal Ozone Measures - Control Techniques Guidelines for VOC Sources	Within 3 years after the date of enactment of the CAA Amendments of 1990, the Administrator shall issue control techniques guidelines of stationary sources of VOC emissions	*		x	x	x	x
CAA; Clean Air Act, Title III Amendments of 1990	Hazardous Air Pollutants-Definitions	Congress established an initial list of hazardous pollutants. Included in the list are PCE, TCE, vinyl chloride, and xylenes.	*		x	x	x	x
SDWA; Safe Drinking Water Act	National Primary Drinking Water Regulations	Establishes national revised primary drinking water regulations of MCLs for organic chemicals.	A	x	x	x	x	x
SWDA; Solid Waste Disposal Act as amended by RCRA of 1976	Identification and Listing Hazardous Waste	Defines those solid wastes which are subject to regulation as hazardous wastes. Halogenated solvents, e.g. TCE, are listed as F002 compounds.	A		x	x	x	x
	Standards Applicable to Generators of Hazardous Waste	Establishes hazardous waste determination, accumulation time, and recordkeeping and reporting procedures for hazardous waste generators.	R;AP		x	x	x	x

TABLE 9

COMPARISON OF ARARS FOR EACH ALTERNATIVE
Main Street Well Field Site
Elkhart, Indiana
(Continued)

Law	Regulation Title	Applies	ARAR *	1	2	3	4	5
	Standards Applicable to Transporters of Hazardous Waste	Establishes standards for off-site transportation of hazardous waste if manifested under 40 CFR 262.	*		X	X	X	X
	Land Disposal Restrictions-Prohibitions on Land Disposal	Lists EPA hazardous wastes that are prohibited from land disposal.	A		X	X	X	X
Solid Waste Disposal Act as Amended by RCRA of 1976	Land Disposal Restrictions-Treatment Standards	Restricts wastes from being land disposed above specified concentrations. Listed compounds include: Acetone, <0.59 ppm; PCE <0.05 ppm; TCE <0.091 ppm; and Xylene <0.15 ppm.	A		X	X	X	X
CERCLA; Comprehensive Environmental Response, Compensation, and Liability Act	National Oil and Hazardous Substances Pollution Contingency Plan - Scope	The NCP provides for efficient, coordinated, and effective response to discharges of oil and releases of hazardous substances, pollutants, and contaminants.	A	X	X	X	X	X
	National Oil and Hazardous Substances Pollution Contingency Plan - Worker Health and Safety	Response actions will comply with the provisions for response action worker safety and health in 29 CFR 1910.120 and the requirements, standards, and regulations of the Occupational Safety and Health Act of 1970 [29 USC 651 et seq] [OSH Act] and state laws with plans approved under Section 18 of the OSH Act.	A		X	X	X	X
	National Oil and Hazardous Substances Pollution Contingency Plan - Remedial Investigation/Feasibility Study and Selection of Remedy, Feasibility Study	Establishes remedial action objectives specifying contaminants and media of concern, potential exposure pathways, and remediation goals.	A	X	X	X	X	X
HMTA; Hazardous Materials Transportation Act	Hazardous Materials Program Procedures	Regulates transportation of hazardous materials.	*		X	X	X	X
	General Information, Regulations, and Definitions	Prescribes the requirements of the department of transportation governing the transportation of hazardous materials and the manufacturer, fabrication, marking, maintenance, reconditioning, repairing, or testing of a packaging of a container which represented, marked, certified, or sold for use in transporting hazardous waste.	*		X	X	X	X

TABLE 9

COMPARISON OF ARARS FOR EACH ALTERNATIVE
Main Street Well Field Site
Elkhart, Indiana
(Continued)

Law	Regulation Title	Applies	ARAR *	1	2	3	4	5
	Hazardous Materials Tables and Hazardous Materials Communications Regulations	Provides tables of hazardous materials along with their descriptions, proper shipping names, classes, labels, packaging and other requirements.	*		X	X	X	X
HMTA: Hazardous Materials Transportation Act	Shippers--General Requirements for Shipments and Packaging	Defines regulated material and their preparation for transportation.	*		X	X	X	X
	Carriage by Public Highway	Prescribes general regulations for the transportation of hazardous materials by public highway. Also, provides loading and unloading requirements.	*		X	X	X	X
State:								
Environmental Management Act, IC 13-7 (1984 Supp.)	Issuances of Certificates of Environmental Compatibility	Describes the policies and procedures to be followed regarding certificates of environmental compatibility for facilities which have received a construction permit.	R;AP		X	X	X	X
Professional and Occupational Rules	Water Well Drillers	Specifies requirements for water well installations including well records, well drilling procedures, installations specifications, and minimum well construction standards.	*				X	X
Air Pollution Control Board, IAC Title 326	Construction and Operating Permit Requirements	This rule applies to any currently operating or proposed to operate source or facility which has potential emissions of regulated pollutants.	A		X	X	X	X
	Opacity Limitations	Regulates visible emissions emitted by any facility or source not granted a temporary exemption.	R;AP		X	X	X	X
	Fugitive Dust Emissions	Establishes that this rule applies to all sources of particulate matter to the extent that some portion of the material escapes beyond the property line.	R;AP		X	X	X	X

TABLE 9

COMPARISON OF ARARS FOR EACH ALTERNATIVE
Main Street Well Field Site
Elkhart, Indiana
(Continued)

Law	Regulation Title	Applies	ARAR *	1	2	3	4	5
Air Pollution Control Board, IAC Title 326	Fugitive Dust Emissions - Emission Limitations	Establishes the criteria which define a violation of this rule. Violations include: causing fugitive dust concentrations greater than 67% in excess of ambient upwind concentrations; when fugitive dust is comprised of 50% or more respirable dust; when the ground level ambient air concentration exceeds 50% mg/cm above background concentrations for 60 minutes; and when fugitive dust is visible crossing the property line.	R;AP		X	X	X	X
	Fugitive Dust Emissions - Multiple Sources of Fugitive Dust	Requires that the total of all particles leaving the boundary regardless of whether from a single operation or a number of operations shall be in compliance with the allowable limits of 326IAC 6-4-2.	R;AP		X	X	X	X
	Fugitive Dust Emissions - Motor Vehicles Fugitive Dust Sources	Requires that vehicles traveling on public road systems to be constructed so as to prevent its contents from dripping, sifting, leaking, or escaping the vehicle in a manner that would create conditions which result in fugitive dust. This rule applies only to cargo and mud tracked by the vehicle.	*		X	X	X	X
	Volatile Organic Compounds Rules - New Facilities; General Reduction Requirements	Requires new facilities (as of January 1, 1980), which have potential emissions of 22.7 megagrams (25 tons) or more per year to reduce VOC emissions using best available control technology (BACT).	A		X	X	X	X
	New Source Performance Standards	Regulation applies to plants that manufacture ethylene dichloride, vinyl chloride, or PVC. Specified emission standards for hazardous air pollutants of any stationary source. Includes standards for vinyl chloride.	*		X	X	X	X
Solid Waste Management Board, IAC Title 329	Existing Hazardous Waste Facility Standards: General Facility Standards - Security	Requires the owner or operator to prevent unknowing entry, and minimize the possibility for the unauthorized entry of persons or livestock onto the active portion of a facility.	R;AP		X	X	X	X

TABLE 9

COMPARISON OF ARARS FOR EACH ALTERNATIVE
Main Street Well Field Site
Elkhart, Indiana
(Continued)

Law	Regulation Title	Applies	ARAR *	1	2	3	4	5
Indiana Occupation Safety and Health Act, IC 223 (1984 Supp.)	Health and Safety Standards	Adopts Federal OSHA Regulations (29 CFR 1910), but does not permit adopting or enforcing provisions more stringent than US Dept. of Labor Occupational Safety and Health Act of 1970.	*		x	x	x	x
Building and Safety Regulations, IC 22-11 (1982 Ed.)	Building Codes	Specifies safety standards and other building codes.	*		x	x	x	x
	Electrical Codes	Specifies electrical codes.	*		x	x	x	x
	Mechanical Codes	Specifies mechanical codes.	*		x	x	x	x
Soil and Minerals		Referred to as the "Land Conservation Act of 1969," and includes Pollution Control; Plugging of Wells, and Pollution Control and Waste; Test Holes. This act was implemented to protect the waters and lands of the state against pollution, and the loss and impairment of water sources through well control.	A		x	x	x	x
Regulations of Carriers Generally		Referred to as the "Motor Carrier Act of 1935," this law regulates route designations, permits and certification, registration, contract carriers and other motor carrier activities.	*		x	x	x	x

A/RP/MAINSTRT/AVO

* : This table may contain regulations which may not meet the technical definition of ARARs, but are included for reference.

A = Applicable; R = Relevant; AP = upriate continued

Table 9

To Be Considered Criteria, Advisories or Guidance

OSWER Directive 9355.0-28 on Air Stripper Controls
OSWER Directive 9355.4-02 on Establishing Soil Lead Cleanup Levels at Superfund Sites
Executive Order 11988 on Floodplains
Executive Order 11990 on Wetlands

MAIN STREET WELL FIELD
SUPERFUND SITE
ELKHART, INDIANA

RESPONSIVENESS SUMMARY

I. RESPONSIVENESS SUMMARY OVERVIEW

In accordance with CERCLA Section 117, a public comment period was held from January 19, 1991 to March 22, 1991, to allow interested parties to comment on the United States Environmental Protection Agency's (EPA's) Feasibility Study (FS) and Proposed Plan for remedy selection at the Main Street Well field Superfund Site. At a February 7, 1991 public meeting, EPA and Indiana Department of Environmental Management (IDEM) officials presented the Proposed Plan for the Main Street Well Field, answered questions and accepted comments from the public. Written comments were also received through the mail.

II. BACKGROUND OF COMMUNITY CONCERNS

Since the Main Street Well Field is the largest of Elkhart's well fields, providing 80 percent of the city's potable water, the issue of providing usable water has been an ongoing concern for the residents since discovery of the contamination in 1981.

An interim ROD was signed in 1985, providing authorization for construction of an air stripper. In operation since 1987, the air stripper has worked to provide the citizens a reliable source of clean water. Since then, the public has expressed little concern about the quality of water from the well field.

There has been an overall acceptance of EPA's extensive work since the air stripper was installed. Since the contamination comes from many sources, not all of which have been identified, the work has taken a relatively long time to get to the point of proposing a final remedy for the site. At the public meeting held February 7, 1991, the city expressed support for the EPA's proposed plan. To this date, no citizens have opposed the remedy.

III. SUMMARY OF SIGNIFICANT COMMENTS RECEIVED DURING THE PUBLIC COMMENT PERIOD AND EPA RESPONSES

The comments are organized into the following categories:

- A. Summary of comments from the community
  1. Mr. Gary Gilot on behalf of Elkhart City Administration
- B. Summary of comments from Potentially Responsible Parties (PRPs)
  1. Mr. Nicholas Valkenburg of Geraghty & Miller, Inc., on behalf of Excel Corp.

2. Ms. Jacqueline Simmons of Ice, Miller, Donadio & Ryan, on behalf of Excel Corp.
3. Mr. Lennie Scott of Miles Laboratory

The comments are paraphrased in order to effectively summarize them in this document. Written comments received at EPA's Region 5 Office are on file and available for review by contacting the site community relations coordinator, Ms. Karen Martin, (312) 886-6128, or (800)621-8431. The reader is referred to the public meeting transcript which is available in the public information repositories, located at the Elkhart Public Library, 300 S. Second St., and the Elkhart City Engineer's Office, 229 S. Second St., Elkhart.

A. SUMMARY OF COMMENTS FROM THE LOCAL COMMUNITY

1. Mr. Gary Gilot, City Engineer, speaking on behalf of the City of Elkhart, stated the City's belief that the proposed plan meets the community's needs, is an adequate remedy, and incorporates cost-effective, proven technologies to accomplish cleanup goals.

EPA's Response: EPA acknowledges receipt of the City of Elkhart's comment, and thanks the City for its support.

B. SUMMARY OF COMMENTS FROM POTENTIALLY RESPONSIBLE PARTIES

1. Mr. Nicholas Valkenburg of Geraghty & Miller, Inc. (G&M), on behalf of Excel Corp.

a. The MSWF capture zone is underestimated.

G&M points to capture zones shown by contour maps drawn for November/December 1989 and August 1990. They note that well field pumpage for those timeframes did not reflect high well field pumping demand, therefore, the capture zone is underestimated. G&M feels the FEMSEEP model used should have been used to evaluate a range of pumping patterns, and then used to determine the sensitivity of the capture zone to changes in pumping. They also feel the model documentation should have been provided. G&M criticize the FEMSEEP model calibration shown in Appendix G. They state that the model consistently calculates water levels that are too high compared to the field measurements, thus underestimating the capture zone. G&M state that a more exact method of capture zone analysis, such as particle-tracking, should have been used because ground water flow at the capture zone edge is difficult to determine visually with accuracy. All of these comments reinforce the underlying concern that more accurate capture zone analysis would have resulted in the identification of additional PRPs.

EPA's Response:

The 6.1 MGD upon which the capture zone is based was pumped primarily from wells on the west side of the well field. A five day pumping test was run to maximize pumping on the west side for a sustained period of time. Unfortunately, the entire well field could not be pumped at the maximum rates because of low water usage during the pumping test. EPA considered use of modeling to define a "worst case" capture zone scenario. However, modeling for this purpose would result in a significant amount of uncertainty in the parameters, calibration would be very costly and the results would be less defensible than actual measurements. G&M correctly indicates that calibration of the FEMSEEP model used was only fair. However, the capture zone was not based on the model. The model was only used to evaluate the adequacy of the proposed western interceptors. The model documentation will be made available in the record and the information repository. EPA feels the capture zone represented in the feasibility study based on actual data collected in the field represents the major forces of capture zone influence.

b. West Side sources have not been identified.

G&M state that without identifying sources on the West Side of the Well Field, EPA cannot judge the risk or the need for remediation. Further, the scope of the RI/FS was too limited to identify sources on the West Side and that without additional studies, a major source or sources may be missed.

EPA's Response:

EPA's focus for source control has always been on "hot spots". Searching for disposal areas in an industrial area which has existed since the turn of the century and where most facilities have used TCE or other chlorinated solvents has been a challenge. Using a grid system over each property for soil sampling would have been expensive and, due to the high permeability of the soils, even a tight grid may have missed disposal areas and thus, not have resulted in identification of disposal areas. EPA used several methods to attempt to identify spill, leak or disposal areas. These include use of 104(e) information response, soil gas survey, historical information where available (including the investigative reports by Miles Laboratory and Elkhart Products) and informants, when available. In addition, EPA's investigative efforts have also focused on sources not yet controlled or where residual contamination after removal actions is unknown. EPA agrees that additional information may be needed on the West side and we intend to pursue such information, however, the extent of any additional field work is unknown now.

EPA does not agree that because additional unremediated sources could not be identified that the need for remediation cannot be determined. The need to intercept and contain the existing ground water plume is clear based on risk. Because specific sources cannot be identified, the duration of the ground water interception system cannot be predicted.

c. The risk assessment does not support soil remediation and overestimates the ground water risk.

G&M states that the risk for TCE in soil are below 1 x 10-6 and therefore do not require remediation. They further state that since 99 percent of the risk relates to ground water which is already being remediated that soil remediation will not reduce the total risk significantly enough to make implementation of soil vapor extraction system cost effective. G&M feels that the risk estimates were overestimated because the 95 percent upper concentration limit was used. G&M state that the risk assessment failed to include the drinking water ARARs, therefore, a possible target level for cleanup was overlooked. They feel the cleanup targets presented are so low they are not likely to be achieved. G&M state that the practice of balancing out total site risks by remediating media that already have an acceptable level of risk is not a standard practice, nor is it clear why remediation of TCE in soil is needed. G&M also note that use of a multiplier of 2.5 times the oral exposure estimate for estimating non-potable domestic water use such as showering is not consistent with other EPA regulatory programs and is excessively conservative.

EPA's Response:

G&M makes several comments concerning the risk assessment and the associated conclusions. In the first two comments they state that because the soil risk from ingestion and contact were determined to be below 1x10-6, the soils need not be remediated and that since the majority of the risk is associated with ground water, soil remediation will not reduce total site risk significantly. This is incorrect because the soils are a source of contamination to the ground water for which the risk is greater. The source must be controlled to minimize future contamination of ground water. G&M suggest that modeling of the hydraulics associated with the pumping wells would result in a more realistic estimate of future concentrations and exposures. EPA does not agree that modeling would provide a more accurate result in this complicated system. Such modeling could tend to oversimplify the dynamics of contaminant partitioning and contaminant transport phenomena. VOC contamination in the well field has been identified for over 10 years. It is reasonable to expect that without remediation ground water risk would continue for an unknown period of time.

Use of the 95 percent upper confidence level concentration limit is standard practice as identified in the Risk Assessment for Superfund (RAGS) guidance EPA/540/1-89/002, December 1989. Similarly, domestic uses such as showering activities are known to increase the exposure to chemicals. Literature values support a relationship between oral exposure estimates and vapor phase inhalation for typical residential use. Using a mid-range literature value is not unacceptable and is becoming more common in lieu of lengthier calculations. This is not inherently more or less conservative than other approaches.

G&M indicates that ARARs were not included in the baseline risk assessment. ARARs are not supposed to be in the baseline risk assessment, by definition, since the baseline risk assessment evaluates site-specific excess cancer and non-cancer risks. The RAGS emphasizes that preliminary remediation goals are established in the feasibility study (FS) based on ARARs. RAGS does differ from the Superfund Public Health Evaluation Manual (SPHEM) in that way. See the Alternatives Array document for discussion of the preliminary remediation goals. Although there are ARARs for some of the chemicals of concern at this site, ARARs may not be sufficiently protective when there is more than one contaminant and multiple pathways of potential exposure. The ROD summary explains the rationale behind selection of the 1x10-5 risk range for all media at this site. At a 1x10-5 risk level, the soil and ground water standards are detectable and achievable with the selected technologies. Balancing risk by remediating more than one medium is an accepted procedure. (See SPHEM). In considering the media options for remediation, it was obvious that less stringent soil cleanup levels would result in unachievable ground water standards. As the ground water standards are presented in the feasibility study now at 1x10-5, vinyl chloride is still below routine analytical detection limits. In making ground water standards achievable and measurable, the soil cleanup level had to be more stringent. However, the lower soil cleanup level is reliably achievable with the selected technology. In addition, as has been emphasized previously, the soils create the ground water risk, and therefore, it is appropriate to put the remediation emphasis on the source.

d. There is no evidence for a "paint layer".

G&M state that the evidence regarding the paint layer suggests a very limited area where some residue may lie. They state that there is no support for the contention that soil beneath the building is affected by either volatile organic compounds or paint residue and no further investigation is warranted. They point to a discrepancy in documentation concerning how deep the paint layer may be below the surface. They indicate that even if paint was present, the ISVE system would remove the TCE. They suggest that it is inappropriate to develop cost estimates for removal of something there is no data to support exists.

EPA's Response:

The presence of the paint layer is verified by paint residue material found in a limited number of borings as noted by G&M. Site limitations prohibited precise definition of the areal extent of contamination. The information supporting the actual extent is limited (See feasibility study appendix J). If this information is inaccurate and the amount of paint layer material is insignificant, the cost of removal will be low. Given the existing information, it is most appropriate to refine these estimates during remedial design.

ISVE would not be able to remediate the paint layer because the volatiles trapped in the paint layer would not be removed from the paint layer in a reasonable timeframe, therefore, it is not technically practical to use ISVE for solvents trapped in paint. Further, it is appropriate to provide conservative estimates of the volume of soil beneath the building that could be contaminated for cost and engineering implementability considerations. The existing information is sufficient to suggest that additional investigation be conducted beneath the floor of the building. If the waste does not exist beneath the building, then remediation costs will be lower.

e. Costs for the vapor extraction system are overestimated.

G&M suggest there are several cost assumptions within the FS which unnecessarily overestimate the costs, including: additional soil analysis when the existing data base is sufficient, rental of air vacuum units when purchasing is cheaper, construction of a system housing structure when other accommodations can be made considering alternative equipment, such as lower horsepower blowers with mufflers would reduce costs.

EPA's Response:

EPA does not agree that the costs are over estimated. In fact, they are considered biased low because the extent of contamination beneath the buildings is unknown. However, a value engineering review during design might find areas where cost could be reduced. Such activities are encouraged.

2. Ms. Jacqueline Simmons of Ice, Miller, Donadio & Ryan (IMDR), on behalf of Excel Corp.

IMDR reiterate G&M's technical comments. They emphasize that there is no credible evidence to support the existence of a paint layer, that the "confidential sources" referenced in the feasibility study had no personal knowledge of dumping, further that such reference to a "confidential source" is contrary to law and that soil only poses a 1x10-6 risk, therefore, its remediation and that of the supposed paint layer is also contrary to law. If the paint layer were present, it does not pose a risk beneath the building. Further, EPA's failure to identify sources on the west side and underestimate the capture zone harms the PRPs. As a final point, IMDR state that they are willing to implement ISVE on the Excel property.

EPA's response:

The use of "confidential sources" in the FS was not the best choice of words. See appendix J for the information which supports the volume estimates in the FS. The FS use of "confidential sources" is unrelated to the witness statement taken and corrected by Elizabeth Murphy on December 8, 1989. However, the appendix J information is sufficient to support investigation of the area, and if as suggested, the excavated area only contains water, the costs for remediation will be lower than estimated. However, a boring placed inside the building during previous investigative efforts by Excel showed approximately 5 ppm of TCE. All these pieces of information together demonstrate the need to further evaluate this area for whatever may (or may not) be present. Cost estimates in the FS conservatively assume the presence of the paint layer and do include building support for removal of the paint layer if needed. Excel is already familiar with such techniques as they have already been used to remove contaminated soil in conjunction with an underground tank removal conducted at the property.

The existence of the building over contaminated soil does not provide long term protection, it does not achieve cleanup levels and does not constitute closure. See specific response to the G&M comments regarding the risk assessment and ground water model. EPA does not agree that its proposed actions are contrary to law. EPA appreciates Excel's willingness to implement the ISVE without delay and hopes that it will encourage the other PRPs to reach a full settlement without delay.

3. Mr. Lennie Scott of Miles Laboratory

Miles cites several questionable field practices which occurred during the sampling period of May, 1990 on the Miles property. These practices include use of technical grade isopropyl alcohol for use in decontamination when pesticide grade isopropyl alcohol was required by the field sampling plan, residual isopropyl alcohol in split soil samples indicating inadequate cleaning of equipment, use of antifreeze in hoses and the potential contamination of truck beds which held equipment, use of a hard hat to deliver drilling materials and a discrepancy in sample identification.

EPA's Response:

The can of isopropyl alcohol shown in the photograph supplied by Miles, was brought to the site by the driller and was rejected for use by Donohue. It was not used. Instead, Donohue

Analytical Laboratory supplied pesticide grade methanol to be used for decontamination. The use of pesticide grade methanol was noted in the field sampling plan dated February 1989. Therefore, the presence of isopropyl alcohol as a tentatively identified compound in some soil samples is uncertain.

The Miles comment notes the placement of augers directly on the ground, down hole equipment on the pickup truck tail gate without plastic protection and use of a hard hat for materials handling. EPA and its contractor, Donohue, agree that some field procedures did not follow the field plan. However, these situations were called to the attention of the drilling subcontractor and were corrected for all additional work at the site. It is always a challenge in a field program to follow the field plan to the same level of detail in which the plan is written, particularly in the winter months. However, the differences are not significant enough the affect the sampling results.

Finally, Miles notes a discrepancy between the information supplied after the laboratory data was obtained and the issuance of the final technical memorandum. The results shown in the technical memorandum are correct. The information supplied to Miles early was not final and there were in fact some discrepancies. Miles indicates that not all samples are reported in the technical memorandum. This is because the database in the technical memorandum show samples only for which there were positively identified compounds above the detection limit. Tentatively identified compounds including isopropyl alcohol were not reported in the technical memorandum database. They were also not used in the risk assessment for this site.

IV. REMAINING CONCERNS

No remaining concerns from the public comments received have been identified.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

105 South Meridian Street
P.O. Box 6015
Indianapolis 46206-6015
Telephone 317/232-8603

March 28, 1991

Mr. Valdas V. Adamkus
Regional Administrator
U.S. Environmental Protection Agency
230 S. Dearborn Street
Chicago, Illinois 60604

Re: Record of Decision
Main Street Well Field Site
Elkhart, Indiana

Dear Mr. Adamkus:

The Indiana Department of Environmental Management (IDEM) has reviewed the U.S. Environmental Protection Agency's draft Record of Decision. The IDEM is in full concurrence with the selected remedial alternative presented in the document for the second operable unit for this site.

The major components of the selected remedy include:

- In-Situ Vacuum Extraction of VOCs in contaminated soil;
- Removal of a small paint layer and off-site disposal in accordance with the Soil and Debris Treatability Variance;
- Installation of new interceptors on the west side of the well field to prevent continued plume migration into the well field and provide well field restoration;
- Continue use of the existing air stripper to assure a clean drinking water supply;
- Ground water monitoring to assure adequate performance of the air stripper and attainment of ground water standards; and
- Deed restrictions on property with "hot spot" soil contamination until the soil and ground water performance standards are met.

Our staff has been working closely with Region V staff in the selection of an appropriate remedy and is satisfied that the selected alternative adequately addresses the public health, welfare and the environment with regard to the Main Street Well Field site.

Please be assured that IDEM is committed to accomplishing cleanup of all Indiana sites on the National Priorities List and intends to fulfill all obligations required by law to achieve that goal.

Sincerely,

Kathy Prosser

Kathy Prosser
Commissioner

cc: Cindy Nolan, U.S. EPA, Region V

ADMINISTRATIVE RECORD INDEX - UPDATE #3
MAIN STREET WELL FIELD
ELKHART, INDIANA
SECOND OPERABLE UNIT

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	3	91/02/04	Corrected Tables 2-1, 2-2 of Feasibility Study	Michael L. Crosser, DONOHUE & ASSOCIATES, INC.	C.Nolan,USEPA	CORRESPONDENCE	1
	17	91/03/07	Follow-up information to Feasibility Study	Michael L. Crosser, DONOHUE & ASSOCIATES, INC.	C.Nolan,USEPA	CORRESPONDENCE	2
	7	91/03/18	Comments to previous correspondence	R.Lennie Scott, MILES INC.	C.Nolan,USEPA	CORRESPONDENCE	3
	8	91/03/20	Letter Re: Comments to Proposed Plan	Nicholas Valkenburg, GERAGHTY & MILLER, INC.	J.Simmons,IMD&R	CORRESPONDENCE	4
	5	91/03/21	Comments to Proposed Plan	Jacqueline A. Simmons, ICE MILLER DONADIO & RYAN	K.Martin,USEPA	CORRESPONDENCE	5
	50	91/02/07	Public Meeting Transcript	M. Kay Dornburg, OLMSTED & ASSOCIATES	USEPA	MEETING NOTES	6
	2	91/01/07	Public Acceptance Statement	CITY OF ELKHART		OTHER	7
	76	91/03/29	Record of Decision (ROD)	Valdas N. Adamkus, USEPA		REPORTS/STUDIES	8

MAIN STREET WELL FIELD: SECOND OPERABLE UNIT - UPDATE #3
GUIDANCE DOCUMENTS FOR THE ADMINISTRATIVE RECORD.
DOCUMENTS NOT COPIED - MAY BE REVIEWED AT THE
USEPA REGION V OFFICES, CHICAGO, ILLINOIS.

TITLE	AUTHOR	DATE
FEMSEEP Finite Element Groundwater Flow and Transport Model I. Flow Model Users Manual (81 Pages)	D.Meiri,EBASCO ENVIRONMENTAL	90/07/00

ACRONYM GUIDE FOR THE ADMINISTRATIVE RECORD
MAIN STREET WELL FIELD: SECOND OPERABLE UNIT - UPDATE #3
ELKHART, INDIANA

ACRONYM	DEFINITION
IMD&R	ICE MILLER DONADIO & RYAN
ROD	RECORD OF DECISION
USEPA	UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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MAIN STREET WELL FIELD SITE
OPERABLE UNIT #2 - UPDATE #2
ELKHART, INDIANA

FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	6	86/04/01	Durakool correspondence re: construction of new building	Strimbu-USEPA Bakeer-ISBH Bucklen-Durakool	Bucklen-DK Strimbu-USEPA	Correspondence	1
	10	91/01/00	Proposed Plan Fact Sheet	USEPA	C.Nolan-USEPA	Fact Sheet	2
	2	88/06/01	Preliminary Health Assessment	ATSDR	USEPA	Reports/Studies	3
	634	90/10/00	Technical Memorandum Phase III	Donohue & Associates	C.Nolan-USEPA	Reports/Studies	4
	163	91/01/00	Public Comment Draft Feasibility Study	Donohue & Associates	C.Nolan-USEPA	Reports/Studies	5
	1209	91/01/00	Draft Feasibility Study Appendices A - J	Donohue & Associates	C.Nolan-USEPA	Reports/Studies	6

FINAL

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MAIN STREET WELL FIELD
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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	10	90/12/27	Letter Re: Summary of the ground water model description with attached letter (April 3, 1990) and memo (May 7, 1990)	Cindy J. Nolan, USEPA	K.Sayre,Excel Industries	CORRESPONDENCE	1
	5	90/08/20	Letter Re: Response to comments on "Miles property" soil borings and monitoring well installation procedures with cover letter (December 27, 1990)	Cindy J. Nolan, USEPA	L.Scott,Miles Inc.	CORRESPONDENCE	2
	93	00/00/00	Toxicity Summaries	USEPA		OTHER	
	11	00/00/00	Various dated Black-and-White Aerial Photographs taken of the Main-Street Well Field			PHOTOGRAPHS	4
	7	87/06/10	Aerial Photographs with attached cover letters	W.C. Blanton, Ice Miller Donadio & Ryan	N.Nola,USEPA	PHOTOGRAPHS	5
	24	82/07/20	Documentation Records for Hazard Ranking System	Steve Reuter, ISBH	USEPA	REPORTS/STUDIES	6
	51	90/06/25	Determination of Soil-Water Partition Coefficients for Materials from the Main Street Well Field	Robert S. Kerr Environmental Research Laboratory	USEPA	REPORTS/STUDIES	7

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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
			(DRAFT)				
	129	90/08/00	Alternatives Array Document with federal & State ARARs	Donohue & Associates, Inc.	USEPA	REPORTS/STUDIES	8
	29	90/08/30	Work Plan Addendum No. 2 with cover letter	Mansour Ghiasi, Donohue & Associates, Inc.	C.Nolan,USEPA	REPORTS/STUDIES	9

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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCU NUMB
	1	89/05/22	104 (e) followup over the phone as to what site was addressed in the recent Request for Information.	Cindy Nolan-USEPA	Fox Eisele-NIBCO, Inc.	Communication Record	
	3	82/10/14	Response to Information Request of 10/05/82.	David Webster-Durakool, Inc.	Ralph Pickard-ISMB	Correspondence	
	3	82/11/16	Response to Information Request of 10/02/82.	D.L.White-Excel Corp.	Ralph Pickard-ISMB	Correspondence	
	6	82/11/24	Partial response to Indiana Environmental Management Board Requests.	The Selmer Co.	ISMB	Correspondence	
	2	82/12/06	Information requested by the ISMB covering the use of TCE at Selmer's Main Street plant.	H.William Petersen-The Selmer Co.	Ralph Pickard-ISMB	Correspondence	
	3	84/09/11	Advisory the Miles has discovered some soil contaminated with TCE and 1,1,1 Trichloroethane.	Bruce Carter-Miles Laboratories	Terlep-Elkhart Water Work	Correspondence	
	28	85/06/12	Follow-up to letter of 9/11/84 to Mike Terlep of the Elkhart Water Works and subsequent meeting regarding contamination at the Miles site.	Bruce Carter-Miles Laboratories	Marty Risch-ISBH	Correspondence	
	10	86/09/25	Supplemental Response to the an updated Request for Information from the counsel for Excel Corp.	W.C.Blanton-Ice Miller,et al.	Barbara Magel-USEPA	Correspondence	
	2	87/04/13	Response to Request for Information by cousel for Miles Laboratories, Inc.	James Schink-Kirkland & Ellis	Susan Swales-USEPA	Correspondence	
	5	87/06/25	Response to Request for	Joseph Winer-Sam Winer &	Susan Swales-USEPA	Correspondence	

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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT NUMBER
			Information.	Co.			
	4	88/10/17	Response to Request for Information.	John Hendershot-Foura Enterprises	Susan Swales-USEPA	Correspondence	
	7	88/10/20	Response to Request for Information.	David Norwood-AACOA	Susan Swales-USEPA	Correspondence	
	6	88/10/21	Response to Request for .nformation	Charles Walter-Walter Piano Co.	Susan Swales-USEPA	Correspondence	
	8	88/10/27	Response to Request for Information.	Thomas Eisele-EIBCO, Inc.	Susan Swales-USEPA	Correspondence	
	5	88/10/28	Response to Request for Information by the counsel for Trinity Industries, Inc., parent of Hackney, Inc.	Robert Rader-Rader,Addison & Storey	Susan Swales-USEPA	Correspondence	
	4	88/12/05	Response to Request for Information by North American Philips Corp. for the Selmer Co. division.	Mark Fory-North American Philips	Susan Swales-USEPA	Correspondence	
	22	89/04/17	Response to Request for Information by counsel for Elkhart Products Corp.	Terrence Fay-Smith & Schencke	Susan Swales-USEPA	Correspondence	
	4	89/06/27	Response to Request for Information.	LeRoy Ott-Adams & Westlake,Ltd.	Susan Swales-USEPA	Correspondence	
	4	86/06/00	Superfund Program Fact Sheet Main Street Well Field.	USEPA		Fact Sheet	
	6	87/08/00	Superfund Program Update.	USEPA		Fact Sheet	
	3	87/02/27	Memo confirming the Phase II field activities.	Rickie Pelle - CDM	Cindy Nolan - USEPA	Memorandum	
	4	00/00/00	Summary list of solvent users.	USEPA		Other	
	4	84/05/30	Chemical Wastewater/ Materials Inventory Form.	AACOA		Other	

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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCUMENT NUMBER
	4	84/05/30	Chemical Wastewater/ Materials Inventory Form.	Foura Enterprises		Other	
	3	84/05/30	Chemical Wastewater/ Materials Inventory Form.	Michiana Industrial Finishing		Other	
	12	85/06/21	Genrators with F001 or F002 Codes.	USEPA		Other	
	73	85/03/25	Ground Water Contamination Study Prepared For Miles Laboratories, Inc.'s Facility At Elkhart, Indiana.	O.H. Materials Co.	Miles Laboratories, Inc.	Reports/Studies	
	52	85/11/00	Work Plan Memorandum For The Remedial Investigation: Main Street Well Field.	CDM	USEPA	Reports/Studies	
	77	86/04/11	Groundwater Investigation.	Michael O'Hearn-E.C.Jordan	Elkhart Products Corp.	Reports/Studies	
	150	86/07/16	Volume I - Work Plan Technical Submittal Main Street Well Field Remedial Investigation Phase I.	CDM	USEPA	Reports/Studies	
	311	86/12/22	Quality Assurance Project Plan (QAPP) For Phase I Main Street Well Field Remedial Investigation.	CDM	USEPA	Reports/Studies	
	18	87/02/12	Amendment to Work Plan for Main Street Well Field	CDM	USEPA	Reports/Studies	
	130	87/07/02	Transmittal of the following attached reports: Groundwater Investigation prepared by E.C.Jordan; Conceptual Design for Remediation of TCE Contaminated Groundwater by Groundwater Technology, Inc.; and a Summary Test Report for	Thomas Merchant-Elkhart Products	Al Lao-IDEM	Reports/Studies	

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FICHE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOC NUM
			Volatile Organics supplied by Miles Laboratories.				
	68	87/12/12	Site Inspection Report for Hackney, Inc., Elkhart, Indiana.	Margaret Hein-Ecology & Environment	File	Reports/Studies	
	253	88/01/00	Technical Memorandum Phase I Remedial Investigation Field Activities Summary For Main Street Well Field	CDM	USEPA	Reports/Studies	
	307	88/02/01	Quality Assurance Project Plan (QAPP) Addendum For Phase II Main Street Well Field Remedial Investigation/ Feasability Study.	CDM	USEPA	Reports/Studies	
	99	89/02/28	Technical Memorandum Phase II Remedial Investigation Field Activities Summary.	Camp Dresser & McKee, Inc.	USEPA	Reports/Studies	
	29	89/03/21	Appendices to RCRA RFI Work Plan.	Steven Smith-Kirkland & Elllis	Walter Francis-USEPA	Reports/Studies	
	16	89/03/28	Soil Gas Investigation.	Douglas Cushing-EBASCO Services	M.Ghiasi-Donahue & Assoc.	Reports/Studies	
	258	89/05/30	Interim Remedial Investigation Report Main Street Well Field Volume 3 of 3 - Appendix H Data Tables.	Camp Dresser & McKee, Inc,	USEPA	Reports/Studies	
	112	89/05/30	Interim Remedial Investigation Report Main Street Well Field Volume 2 of 3 - Appendices A-F.	Camp Dresser & McKee, Inc.	USEPA	Reports/Studies	
	287	89/05/30	Interim Remedial Investigation Report for Main Street Well Field - Volume 1 of 3.	Camp Dresser & McKee, Inc.	USEPA	Reports/Studies	