EPA Region 5 Records Ctr.
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PROPOSED PLAN - GROUNDWATER RESPONSE ACTION
SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION SITE
ROCKFORD, ILLINOIS

July 1995

I. Introduction

The Illinois Environmental Protection Agency (IEPA) in consultation with the United States Environmental Protection Agency Region V (USEPA) is proposing a remedial action that will address groundwater contamination associated with the Southeast Rockford Groundwater Contamination Superfund Site (see page 3) in Rockford, Illinois. The preferred remedial alternative consists of water main extensions to the City of Rockford's water supply, service connections to selected homes and businesses and long-term monitoring of the groundwater contamination plume to determine if additional service connections are needed in the future. This action will rapidly eliminate current and potential human exposures to groundwater contaminants within the major plume of the Study Area (see page 3). The degree to which groundwater will be restored and the time necessary to achieve this will be dependant on the extent to which source areas are remediated. Aquifer restoration is expected to take place over an extended period of time whether or not active groundwater extraction and treatment is sought.

II. Purpose of the Proposed Plan

This proposed plan (plan) is issued pursuant to the public participation requirements of Section 117(e) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. Section 117(e) mandates the publication of a proposed plan for all Superfund sites and the opportunity for public review and comment. In general, this proposed plan provides background information on the site; describes the cleanup alternatives that were considered for the site; presents rationale for identification of a preferred cleanup alternative at the site; and outlines the public's role in the selection of a site remedy.

Also noted in this plan is a summary of the groundwater Remedial Investigation/Feasibility Study (RI/FS). The Remedial Investigation (RI) evaluated the nature and extent of groundwater contamination and estimated human health risks associated with exposures to groundwater contamination at residential wells. The Feasibility Study (FS) identified a range of cleanup alternatives for the site based on the results of the RI. Both the RI and FS reports are available at either of the two site information repositories located at the Rockford Public Library-Rock River Branch (3134 South Eleventh Street, Rockford) and the Ken Rock Community Center (3218 South Eleventh Street, Rockford). The site Administrative Record, which also contains this information is located at the Rockford Public Library-Main Branch at 215 North Wyman in Rockford.

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Public comment on the cleanup alternatives mentioned in this plan is an important contribution to the remedy selection process. The IEPA, in consultation with USEPA, may modify the preferred alternative, select another appropriate response action and/or alter the FS report if public comment or new information warrants such modification. It is encouraged, therefore, that the public review and comment on all alternatives identified in this proposed plan.

III. Site Location and Background

The Southeast Rockford Groundwater Contamination Site, as originally proposed for the National Priorities List, is a residential and commercially zoned area of about 0.7 square miles in Rockford, Illinois. The original boundaries of the site included an area of private wells bounded by Harrison Avenue to the north, Sawyer Road to the south, Twenty-First Street to the east and Eighth Street to the west. The "study area" involving groundwater investigations has since been extended from the original site boundaries to include an area of ten square miles with boundaries of Broadway to the north, Sandy Hollow Road to the south, Mulford Road to the east and the Rock River to the west. The boundaries of both the original site and study area are noted on page 3.

Although volatile organic compounds (VOCs) were initially detected in several City of Rockford municipal wells in 1981, the IEPA became aware of a VOC problem in residential wells in 1984 after investigating reports that plating wastes had been illegally disposed of in a private well. In October 1984, the Illinois Department of Public Health (IDPH) initiated a study that involved the sampling of 49 private wells in the vicinity of this well. Significant levels of contaminants associated with plating wastes were not found in the study, but high levels of chlorinated solvents (similar to the VOCs found in the municipal wells earlier) were found in many of these private wells. These solvents included trichloroethene, tetrachloroethene and 1,1,1-trichloroethane. The IDPH collected an additional 337 water samples from private wells between 1985 and 1989 in an effort to determine how many residents were affected. In addition to IDPH's studies, the Illinois State Water Survey also performed a regional groundwater investigation between 1986 and 1988. This investigation also verified widespread residential and municipal well contamination. Several City of Rockford municipal wells were closed as a result of groundwater contamination in southeast Rockford.

The site was proposed for inclusion to the National Priorities List (NPL or "Superfund List") in June 1988 and was formally added to the NPL in March 1989 as a state-lead, federally funded Superfund Site. In August 1989, USEPA sampled 112 residences around the site to determine if an immediate removal action was warranted. The USEPA sampled for trichloroethene, 1,1,1-trichloroethane, cis-1,2 dichloroethene, trans-1,2-dichloroethene, 1,2-dichloroethane and 1,1-dichloroethene. These compounds include chlorinated solvents and the various breakdown products that are formed when chlorinated

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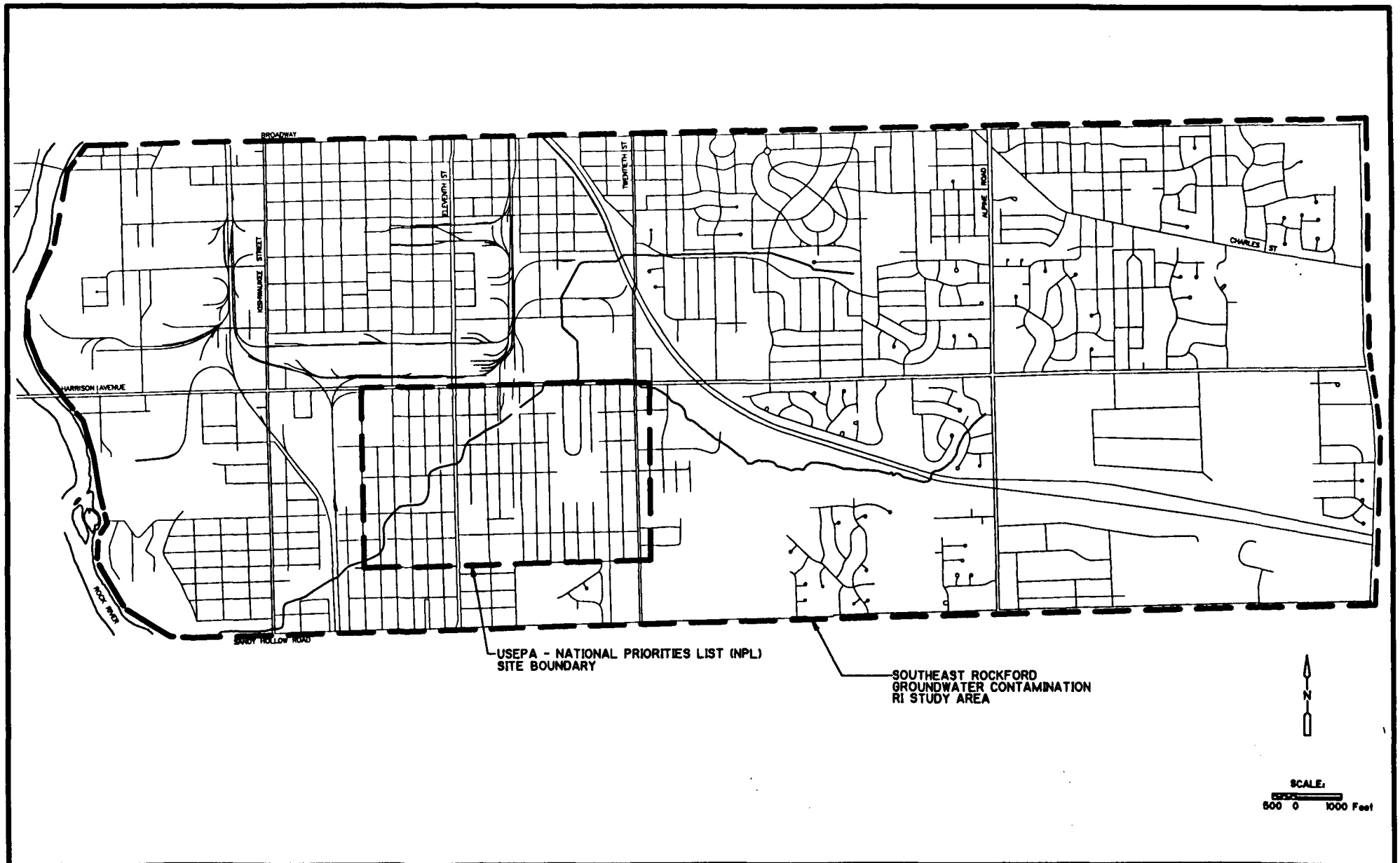

SOUTHEAST ROCKFORD
GROUNDWATER CONTAMINATION STUDY

NPL SITE BOUNDARY

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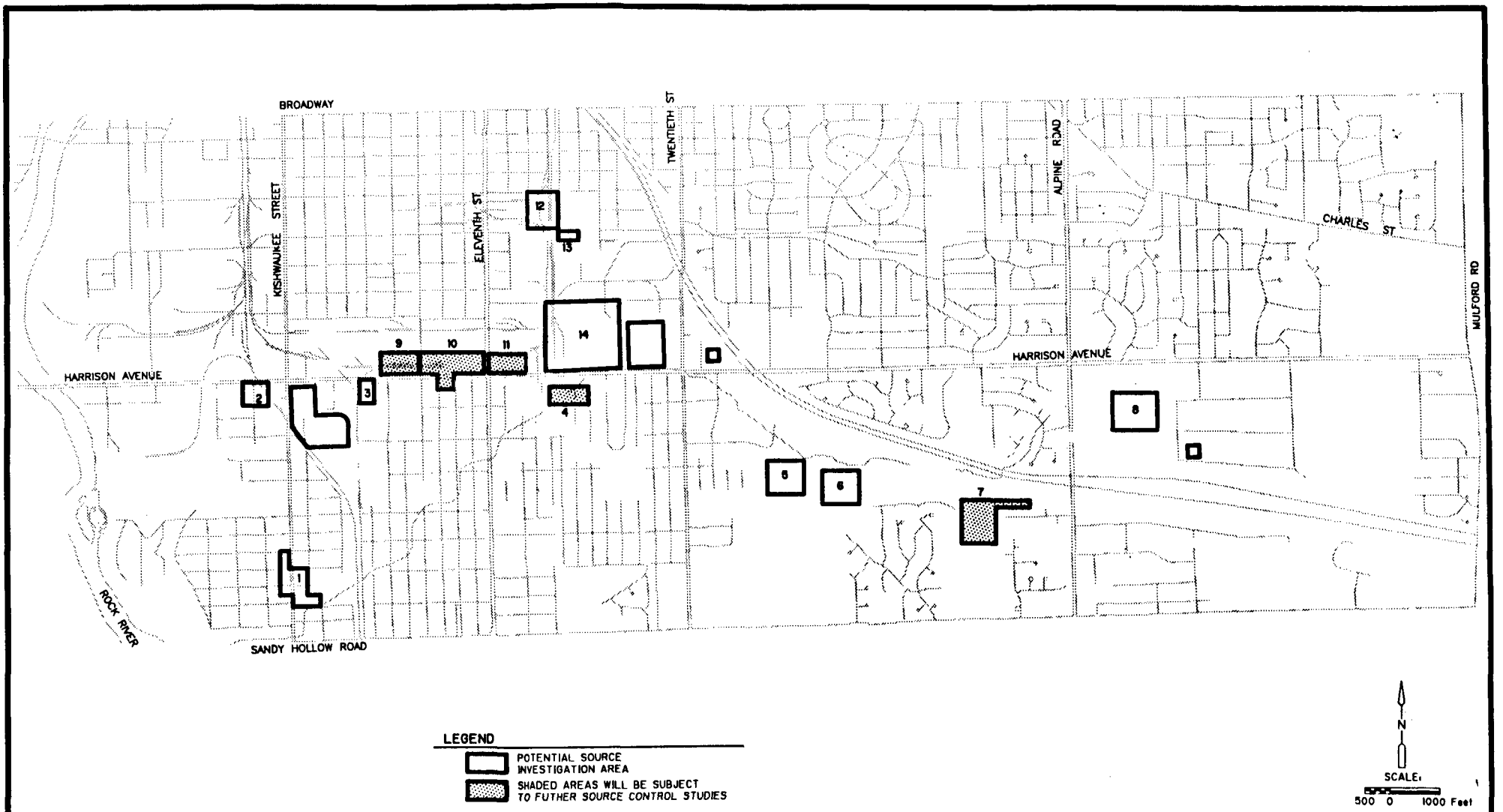
solvents degrade in groundwater. Later that year, USEPA initiated a time critical removal action in which residents whose water well analyses revealed VOC levels greater than or equal to 25% of the Removal Action Level were provided with bottled water as a temporary measure. The same residents received point-of-use carbon filters in December 1989 as another intermediate measure. The USEPA ultimately extended water mains and provided service connections to city water for 283 residences as a time critical removal action. This action was completed in late 1991.

Since all previous investigations revealed a large area of groundwater contamination affecting residences with wells, the IEPA began the RI/FS process by sampling an additional 117 private wells as part of the Operable Unit RI. The objective of this sampling event was to determine how many homes had wells with levels of VOCs below the time critical removal action cutoff (discussed above), but above Maximum Contaminant Levels (MCLs). IEPA's sampling revealed that additional residences needed to be connected to the city's water supply system. A proposed plan for the Operable Unit was made public in March 1991. In addition to calling for more residences to be hooked up to the municipal water supply system, the plan also included a temporary granular activated carbon (GAC) water treatment unit to be installed at one municipal well that had since been closed due to unsafe levels of VOCs. This GAC unit was installed to assure sufficient capacity for residents added to the city's water distribution system. By November 1991, an additional 264 homes were connected to city water. Between the USEPA's time critical removal action and IEPA's Operable Unit RI/FS, a total of 547 homes received service connections to the city's water supply system. All residents who received connections were required to have their wells abandoned by USEPA. A Record of Decision (ROD) for the Operable Unit RI/FS was signed on June 14, 1991. Construction of the service connections and GAC unit was initiated immediately and carried out under USEPA's removal action program so that the project could be completed in a shorter timeframe. All 547 homes received hookups to city water by November 1991 and a Remedial Action Report was signed by USEPA on December 21, 1992. The Remedial Action Report certified that the selected remedy for the Operable Unit RI/FS was operational and functional.

After the threat of exposures to groundwater was greatly reduced by the time critical removal action and groundwater Operable Unit action, the next phase of the project involved a groundwater RI/FS. The objective of the RI was to characterize the nature and extent of groundwater contamination as well as to provide information on "source areas" that were responsible for contaminants in and around residence with wells which were abandoned and replaced with hookups to city water. It was decided to take a phased approach in the RI since the locations of these source areas were unknown. A public meeting on the results of the Phase I RI was held in November 1992. IEPA identified two areas of groundwater contamination that included the industrial facility at Harrison Avenue and Alpine Road (Area 8 - see page 5) and a larger area near Ekberg Park (Area 7 - see page 5). Based on preliminary source investigation data, eight potential source areas of contamination were identified in Phase I.



SOUTHEAST ROCKFORD
GROUNDWATER CONTAMINATION STUDY

TOTAL CHLORINATED VOCs IN PHASE II GROUNDWATER, 1993

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Phase II field activities were conducted from January 1993 to January 1994. These activities included the performance of soil borings and test pits at selected source areas, the installation and sampling of additional monitoring wells, and the sampling of selected existing monitoring and residential wells in the study area. The principle objectives of Phase II were to fill in data gaps identified in Phase I and to gather sufficient groundwater information to support a risk assessment and evaluation of potential cleanup options in an FS. The Phase II investigation concluded that there were four source areas that were impacting the major plume that constitutes the site. Although several other plumes of contamination were identified, source areas impacting the major plume included Area 4, Area 7, Area 9/10 and Area 11 (see map, page 5). A brief description of each source area and how it impacts the major plume of contamination is noted below:

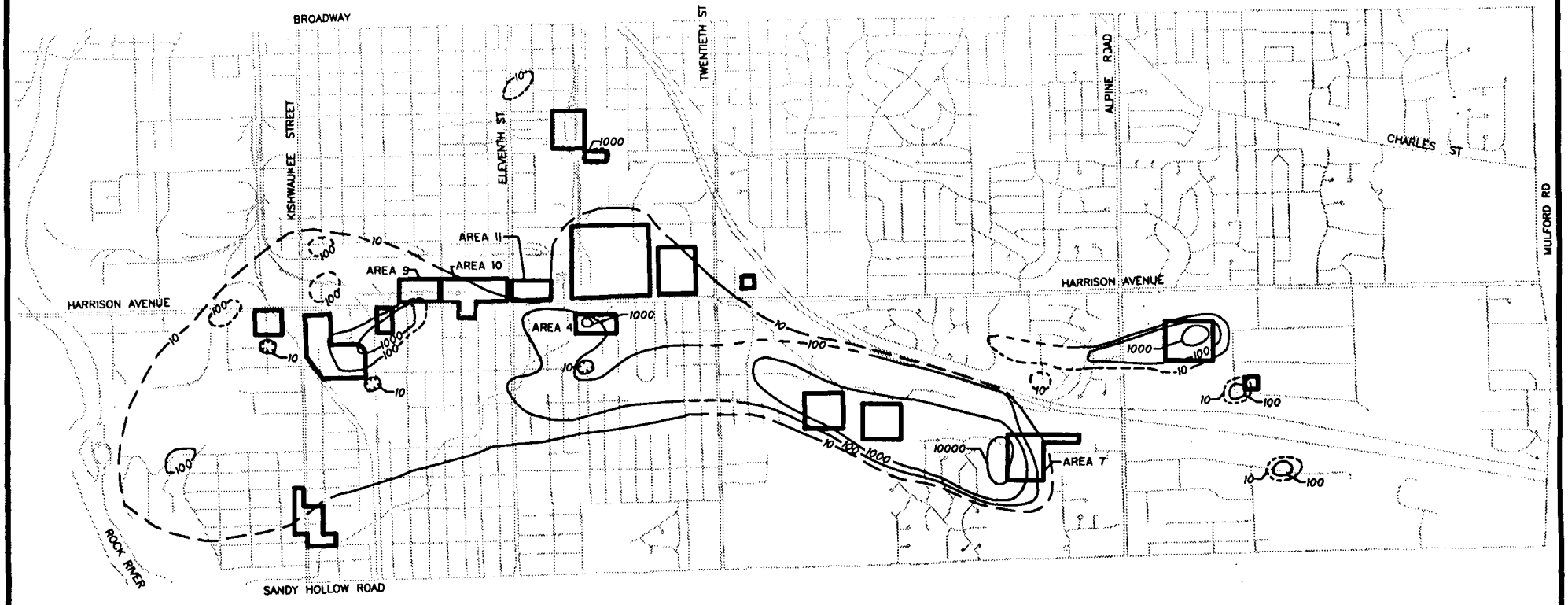
Area 4: At a small manufacturing facility located on Marshall Street between Harrison and Alton Avenues, very high levels of the chlorinated solvent 1,1,1-trichloroethane (TCA) were found in soils beneath a parking lot. IEPA's investigation noted significant groundwater contamination downgradient from the facility as well as high levels of TCA in soil gas.

Area 7: The most significant source of groundwater contamination in Southeast Rockford. Area 7 was found to contain extremely high levels of chlorinated and non-chlorinated solvents that included TCA, trichloroethene (TCE), tetrachloroethene (PCE), toluene and xylene. Downgradient monitoring wells have shown that groundwater contamination has migrated well beyond Eleventh Street from Area 7 and that the majority of residential wells which have been earlier abandoned were likely impacted by Area 7 contaminants. According to aerial photos, Area 7 was used as a disposal site from the 1950s through the 1970s.

Area 9/10: An unknown source of groundwater contamination appears to be present in the vicinity north of Harrison Avenue along Ninth Street. Downgradient monitoring wells show elevated TCA, TCE, PCE concentrations and various degradation compounds associated with chlorinated solvents present in groundwater.

Area 11: Located east of Eleventh Street and Harrison Avenue, Area 11 is the site of the old Rockford Varnish facility. Contaminants found in soils around Area 11 consist of toluene, xylene and ethylbenzene. These compounds are associated with paints, thinners, coatings and varnishes. Chlorinated solvents were not found at Area 11, however the high levels of the above compounds may have masked the presence of chlorinated solvents in the analyses. Area 11 appears to be a significant source of other VOCs in groundwater.

Over the course of the investigation, several other source areas that have contributed to groundwater contamination were identified. It was determined that these other source areas did not contribute to the major plume of contamination that constitutes the site. Non-contributing source areas will be addressed by other state/federal environmental programs. The map on page 7 shows the major plume of



LEGEND:

~100~ TOTAL CHLORINATED VOC CONTOUR (ug/l) DASHED WHERE INFERRED.

POTENTIAL SOURCE INVESTIGATION AREA. UNNUMBERED AREAS WILL NOT BE SUBJECT TO FURTHER STUDY UNDER THIS PROJECT.

NOTATION:

THIS MAP SHOWS THE EXTENT OF CHLORINATED VOCs IN GROUNDWATER. NON-CHLORINATED VOCs (SUCH AS THOSE FOUND AT AREA 11) WERE FOUND LESS FREQUENTLY IN PHASE II AND DO NOT APPEAR ON THIS MAP.

N

SCALE:
500 0 1000 Feet

SOUTHEAST ROCKFORD
GROUNDWATER CONTAMINATION STUDY

TOTAL CHLORINATED VOCs IN PHASE II GROUNDWATER, 1993

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groundwater contamination that will be addressed in the Proposed Plan. The major constituents of this plume include TCA, TCE, PCE, and degradation products associated with these compounds. Toluene, xylene and ethylbenzene are also prevalent in sections of the major plume and have fostered accelerated degradation of the chlorinated solvents in localized portions of the plume. The Phase II study found that groundwater contamination is present in the sand and gravel aquifer near the ground surface and permeates up to 220 feet below ground in one area into the bedrock aquifer. Groundwater modeling was also performed in the Phase II study. Using reasonable assumptions, this modeling was useful in predicting future contaminant concentrations within the plume and projecting general plume migration directions. Results of the RI summarizing all field investigations (Operable Unit, Phase I and Phase II) performed to date were discussed at three public meetings held in Rockford on February 22 and 23, 1995. More information on the RI results can be found in the "Remedial Investigation Report, Southeast Rockford Groundwater Contamination Study". The document is available for public review at the two site repositories (Ken Rock Community Center and Rockford Public Library - Rock River Branch) and the site Administrative Record (Rockford Public Library - Main Branch).

IV. Scope and Role of the Groundwater Response Action

Contaminated groundwater is considered a threat to human health because of the potential for contact with contaminants from wells that draw drinking water from contaminated aquifers. The principle threats posed by groundwater conditions at this site consist of potential exposures to groundwater through ingestion (drinking), dermal contact, and inhalation of contaminants which might have volatilized (or evaporated) from groundwater. Section V contains a summary of estimated risks from exposure to groundwater.

As mentioned earlier, this proposed plan outlining recommended cleanup alternatives will focus solely on groundwater with the primary objective being to greatly reduce or eliminate potential for long-term exposures to groundwater contaminants at the site. IEPA's Phase II investigation gathered a great deal of source area data and while significant, it is not sufficient to make an informed recommendation on what range of cleanup alternatives are most appropriate for source areas affecting groundwater at this site. As a result, further investigation of the four identified source areas will be necessary. IEPA and USEPA expect all source area investigation fieldwork to be completed by late this summer. A remedy addressing source area contamination will be proposed to the public in 1996.

Complete aquifer restoration is a remedial action objective in the groundwater response action remedies that were evaluated. As such, all evaluated remedies in this document assume that further remedial actions will be implemented at the four identified source areas. These actions are necessary to assure that the preferred remedy will be protective of human health and the environment and be compliant with Federal and State environmental laws.

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V. Summary of Site Groundwater Risks

A human health risk assessment was performed at selected residential wells throughout the site. The objective of this assessment was to evaluate current and future exposures associated with residential water usage at the site in the absence of groundwater remediation. This assessment analyzes the toxicity and degree of hazard posed by site groundwater contamination and describes the probable routes by which these contaminants could come into human contact.

Separate risk estimations were made for compounds present at the site that can cause cancer (carcinogens). Risk estimates for carcinogens were assessed as the additional possibility of developing cancer due to a thirty year exposure to these compounds in groundwater averaged over a lifetime of seventy years. The National Oil and Hazardous Substances Contingency Plan (NCP) establishes acceptable levels of risk for Superfund sites ranging from 1 in 10,000 (1×10^{-4}) to 1 in one million (1×10^{-6}) excess cancer cases. "Excess" means the number of cancer cases in addition to those that would ordinarily occur in a population of that size due to non site-related factors. For non-cancer causing compounds, a risk estimation known as the "hazard index" is used. Typically, hazard index numbers below 1 indicate that no adverse health effects are expected, while values greater than 1 are indicative of possible adverse health effects. Contaminants of concern evaluated in the risk assessment are listed below:

methylene chloride	chloroform
1,1-dichloroethene	1,2-dichloroethane
1,1-dichloroethane	1,1,1-trichloroethane
cis-1,2-dichloroethene	trichloroethene
trans-1,2-dichloroethene	tetrachloroethene

Twenty-four residential wells were sampled in June 1993 to determine if the groundwater contaminant plume had migrated into areas where homes have not been connected to the city water supply. The wells were located at the margins of the plume and were expected to have the highest concentrations of contaminants. Contaminant concentration ranges are noted on page 10.

Of the wells that were sampled none of them had total carcinogenic risks exceeding 1×10^{-4}, which is the upper limit identified in the NCP. Four wells had carcinogenic risks in the 1×10^{-5} range and nine homes had carcinogenic risks in the range of 1×10^{-6}. The remaining wells had risks below 1×10^{-6}. The dominant contaminant contributing to carcinogenic risks was 1,1-dichloroethene with ingestion the dominant pathway contributing to carcinogenic risk. Hazard indices for sampled wells were all below 1 indicating that the increased risk from exposure to non-carcinogenic contaminants is minimal. At one location, the Safe Water Drinking Act Maximum Contaminant Level (MCL) for TCE was exceeded.

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CHEMICALS DETECTED IN RESIDENTIAL WELLS

Compound	Frequency of Detection (24 wells total)	Range of Detected Concentrations (µg/l)	Range of Detected Concentrations (mg/l)	Range of Detection Limits (µg/l)	MCL (mg/l)	Illinois Groundwater Quality Standards Class I (mg/l)
Methylene Chloride	2/24	0.2J - 0.4J	0.0002J - 0.0004J	2 - 10	-	-
1,1-Dichloroethene	5/24	0.3J - 5	0.0003J - 0.005	1 - 5	0.007	0.007
1,1-Dichloroethane	12/24	0.1J - 15	0.0001J - 0.015	1 - 5	-	-
C-1,2-Dichloroethene	5/24	1 - 10	0.001 - 0.010	1 - 5	0.07	0.07
Trans-1,2-Dichloroethene	1/24	0.2J	0.0002J	1 - 5	0.01	0.1
Chloroform	8/24	0.2J - 0.5J	0.0002J - 0.0005JD	1 - 5	0.10*	-
1,2-Dichloroethane	2/24	0.5J - 0.6J	0.0005J - 0.0006J	1 - 5	0.005	0.005
1,1,1-Trichloroethane	20/24	0.6J - 50D	0.0006J - 0.050D	1 - 5	0.2	0.2
Trichloroethene	20/24	0.2JB - 8	0.0002JB - 0.008	1 - 5	0.005	0.005
Tetrachloroethene	15/24	0.2J - 4	0.0002J - 0.004	1 - 5	0.005	0.005

Notes:

*: For trihalomethanes
Table does not include detections for field blanks, trip blanks, or duplicate samples.
J: Estimated Value
B: Blank Contamination
D: Dilution

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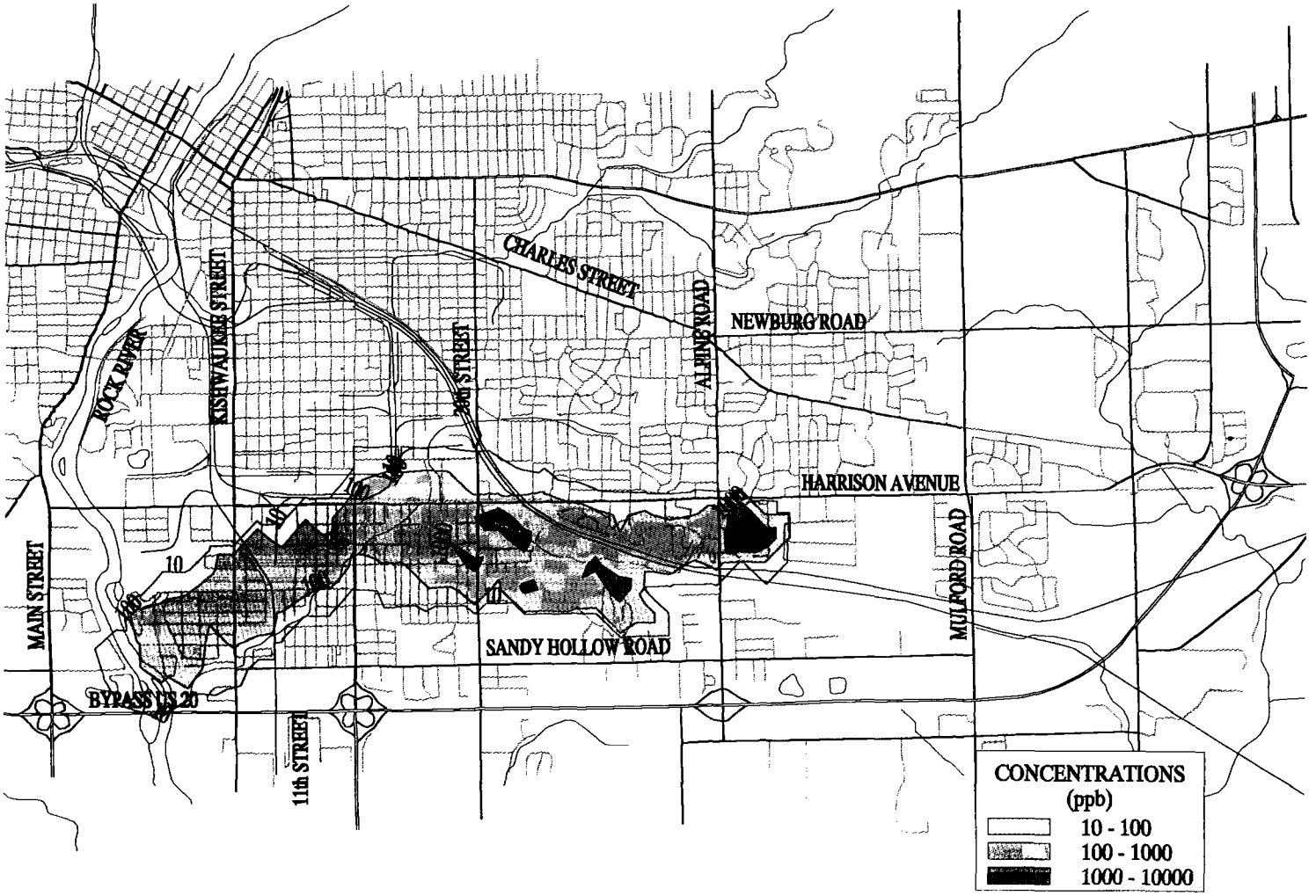
A primary goal of the recommended groundwater response action is to reduce or eliminate potential human exposures to groundwater. IEPA and USEPA feel that this primary goal can be met by eliminating the most likely exposure routes (e.g. contaminated private wells). In the absence of any remedy, a groundwater modeling program that was run on this site indicated a future trend of higher contaminant levels appearing in some residential wells. The elimination of exposure routes in a 70 year predicted plume by means of city water hookups (see Figure 5) coupled with long-term monitoring, will provide assurances that the potential for future adverse health effects from exposure to contaminants in groundwater are greatly minimized. The same groundwater model that was used to predict future movements of the plume at the site was also useful in predicting that the contaminant the plume will eventually merge with the Rock River. Investigations performed to date indicate that the river is not currently being impacted by groundwater contaminants. Groundwater modeling has predicted that water quality in the river will eventually be impacted to a minor degree.

VI. Summary of Alternatives

Five response action alternatives were considered in the FS to currently address groundwater contamination at the Southeast Rockford Groundwater Contamination Site. The "No Action" alternative (Alternative 1) is a baseline for comparison to other alternatives. This alternatives inclusion is mandated by the Superfund Amendments and Reauthorization Act (SARA) of 1986. Groundwater response alternatives that were studied in detail include the following:

- Alternative 1: No Action
- Alternative 2a: Use Restrictions
- Alternative 2b: Limited Action
- Alternative 3a: Groundwater Extraction and Air Stripping with Offsite Disposal
- Alternative 3b: Groundwater Extraction and Air Stripping with Onsite Discharge

All the alternatives mentioned above include long-term quarterly groundwater monitoring at selected monitoring wells for periods ranging from 75 to 205 years. In addition, at least four pairs of monitoring wells will be installed at the site to provide better coverage of potential plume movements at the site. The number and location of newly installed monitoring wells will be developed in the remedial design phase of the project after remedy selection. All alternatives assume the continued usage of the GAC treatment unit at the city's municipal well #35 and that remediation will occur at each identified source area at a later date. Costs regarding future operation and maintenance of the GAC unit are not included in cost estimates for alternatives in this Proposed Plan.



SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION STUDY
COMBINED CONCENTRATIONS OF 1,1,1-TCA AND 1,1-DCA
PROJECTED 70-YEAR PLUME

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Alternatives in groups 2 and 3 include service connections to city water for residents and businesses who have private wells within the modeled 70 year contaminant plume. IEPA's has estimated that there are over 400 potable use wells within the 70 year modeled plume. As in previous service connection actions, IEPA and USEPA will request that those receiving connections abandon their wells.

Alternatives 2b, 3a and 3b include active groundwater extraction and treatment to varying degrees as a component of the alternative.

Each of the alternatives is summarized below. The FS report available at both site repositories and in the Administrative Record should be consulted for a more detailed description of all groundwater response actions. Cost figures noted in the alternatives are estimations and were used for comparison only.

Alternative 1: No Action

As mentioned earlier, the Superfund Program requires that the "no action alternative be evaluated at every site to establish a baseline for comparison. No active response actions would be implemented with this alternative, however groundwater would be monitored at selected existing and new monitoring wells on a quarterly basis for 205 years. The installation of at least four pairs of monitoring wells is included as a capital construction cost. Source area remediation is assumed in this alternative.

CAPITAL CONSTRUCTION COSTS:	$34,000
ANNUAL OPERATION AND MAINTENANCE COSTS:	$55,000
PRESENT WORTH COSTS (TOTAL COSTS):	$1,124,000

Alternative 2a: Use Restrictions

This alternative includes controls to restrict public usage of contaminated groundwater in conjunction with quarterly long-term monitoring of the plume for 205 years. Usage of groundwater will be restricted within the modeled 70 year contaminant plume by providing all households and businesses with potable use wells in this zone an opportunity to hook up to city water. If long-term monitoring of the plume indicates that additional wells could become contaminated to levels that could cause adverse health effects, additional households and businesses could receive hookups later. Because of the potential for future hookups, costs for water main extensions on streets where private wells are present (see page 14) were included. IEPA estimated that there are over 200 potable use wells outside the 70 year modeled plume. Natural attenuation (the process by which contaminant concentrations are reduced through adsorption, degradation, dilution and/or transformation over time) is the main component of Alternative 2a.

CAPITAL CONSTRUCTION COSTS:	$2,016,000
ANNUAL OPERATION AND MAINTENANCE COSTS:	$65,000
PRESENT WORTH COSTS:	$3,314,000

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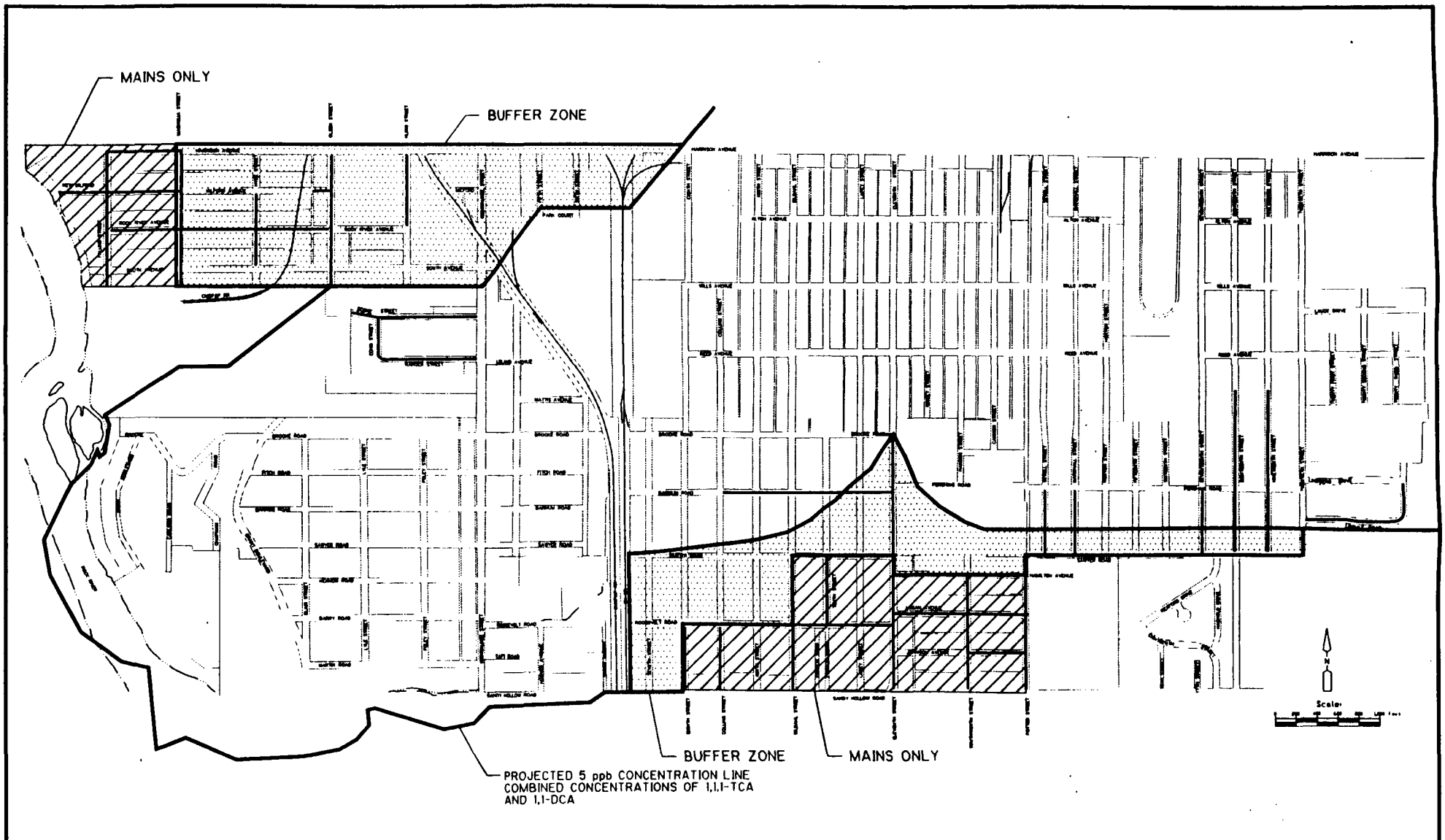

SOUTHEAST ROCKFORD GROUNDWATER CONTAMINATION STUDY

WATER MAIN MAP / HOOK-UP AREA

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Alternative 2b: Limited Action

The limited action alternative entails all elements of the above-mentioned alternatives with a provision to actively remediate the majority of highly contaminated groundwater associated with the site. In this alternative, a nest of four pumping wells rated at 250gpm/well (1,000gpm total) would be located north and south of Harrison Avenue at Eighteenth Street. These wells would extract contaminated groundwater and pump the effluent to an air stripper for 125 years, where treatment would occur. Treated groundwater would be discharged to the nearby storm sewer at discharge limits set by IEPA. Natural attenuation is a component of this remedy for the portion of the plume downgradient of the extraction wells.

CAPITAL CONSTRUCTION COSTS:	$3,002,000
ANNUAL OPERATION AND MAINTENANCE COSTS:	$351,000
PRESENT WORTH COSTS:	$10,021,000

Alternative 3a: Groundwater Extraction and Air Stripping with Offsite Disposal

Under this scenario, all of the elements of Alternative 2a would apply. In addition to the use restriction components, full-scale groundwater extraction and treatment would be carried out to achieve contaminant levels in the aquifer at or below discharge limits set by IEPA. Twenty-two wells would be needed for a the pumping network to achieve complete treatment of an estimated 140 billion gallons of contaminated groundwater. Assuming that the source areas would be completely remediated, these wells would pump at a combined rate of 5,347gpm for approximately 75 years. Groundwater would be treated by air stripping (as in Alternative 2b) and treated effluent would be discharged to either the Rock River Water Reclamation District or to surface water. To achieve complete aquifer remediation, some of these wells would be located closer to source areas. With the potential of drawing in more heavily contaminated groundwater, off-gas treatment would be necessary at several pumping wells.

CAPITAL CONSTRUCTION COSTS:	$8,276,000
ANNUAL OPERATION AND MAINTENANCE COSTS:	$2,174,000
PRESENT WORTH COSTS:	$50,723,000

Alternative 3b: Groundwater Extraction and Air Stripping with Onsite Discharge

This alternative is similar to Alternative 3a, however instead of disposing of treated groundwater, the effluent would be used as potable water within the city's municipal water supply system.

CAPITAL CONSTRUCTION COSTS:	$14,314,000
ANNUAL OPERATION AND MAINTENANCE COSTS:	$310,000
PRESENT WORTH COSTS:	$20,362,000

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VII. The Preferred Alternative

The preferred alternative is Alternative 2a. Under this alternative, water utility services (e.g. watermains) will be expanded to potentially serve all homes and businesses with potable use wells within the main plume (see Figure 3). Homes and businesses currently utilizing well water (over 400) within the modeled 70 year plume area will also receive connections to the city's water supply system free of charge. Long-term groundwater monitoring, which is a component of this alternative, will ensure that those not receiving service connections at this stage (over 200) will be eligible for connections in the future if the contaminant plume moves into an area of potable use wells. Future service connections will also be provided to homes and businesses free of charge. Quarterly groundwater monitoring at selected monitoring wells is planned for the site. In addition, at least four pairs of new monitoring wells will be installed to improve coverage around residential areas that still utilize groundwater for potable purposes. Also included in this alternative is the continued use of the GAC treatment unit at the city's municipal well #35. This remedy was found to be the best balance between overall cost and environmental benefits achieved over the other remedies that advocate active groundwater extraction and treatment.

Based on new information or public comment, IEPA, in consultation with USEPA, may later modify the preferred alternative or select another alternative presented in this Proposed Plan and the RI/FS. The public, therefore is encouraged to review and comment on all of the alternatives identified in this Proposed Plan. The RI/FS should be consulted for more information on these alternatives.

VIII. Evaluation Criteria

The Superfund Program requires evaluation of alternatives based on nine criteria by which technical, economic and practical factors associated with each response action alternative must be judged. The nine criteria are categorized into three groups: threshold criteria, primary balancing criteria and modifying criteria. The nine evaluation criteria are summarized below:

<u>Threshold Criteria</u> - These must be satisfied in order for an alternative to be eligible for a final remedy selection.

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

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) - This criteria addresses whether a remedy will meet all of the ARARs of other Federal and State environmental laws and/or justifies a waiver.

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Primary Balancing Criteria - These criteria are used to weigh major tradeoffs among alternatives. They include:

3. Long-Term Effectiveness and Permanence - A criteria concerned with the residual risk and the ability of a remedy to maintain reliable protection of human health and the environment over time, after cleanup goals have been met.

4. Reduction of Toxicity, Mobility or Volume through Treatment - The anticipated performance of the treatment technologies a remedy may employ.

5. Short-Term Effectiveness - Addresses the period of time needed to achieve protection and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until cleanup goals are achieved.

6. Implementability - The technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular remedy.

7. Cost - Includes estimated capital and operation and maintenance costs also expressed as net present worth costs.

Modifying Criteria - These criteria are usually taken into account after public comment is received on the FS report and this Proposed Plan. They include:

8. State/Support Agency Acceptance - Reflects aspects of the preferred alternative and other alternatives that the support agency favors or objects to, and any specific comments regarding State ARARs or the proposed use of waivers. The Proposed Plan should address views known at the time the plan is issued but should not speculate. The assessment of State concerns may not be complete until after the public comment period on the FS report and Proposed Plan is held.

9. Community Acceptance - Summarizes the public's general response to the alternatives described in this Proposed Plan and in the FS report based on public comments received. As with State acceptance criteria, evaluations under this criterion usually will not be completed until after the public comment period has ended.

IX. Evaluation of Alternatives

Alternatives 1, 2a, 2b, 3a and 3b were evaluated using the nine criteria described above. A comparative analysis of each criteria applied to the five alternatives is noted below.

Overall Protection - Alternative 1 does not provide any overall protection of human health or the environment. Human health and the environment would be adequately protected by a virtual elimination of exposures to groundwater in Alternatives 2a, 2b, 3a, and 3b.

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Compliance with ARARs - Potential identified ARARs for groundwater response actions in this Proposed Plan include the following:

Illinois Groundwater Quality Standards -- 35 IAC 620;
Illinois Water Pollution Regulations -- 35 IAC Subtitle C;
Illinois Air Pollution Regulations -- 35 IAC Subtitle B;
Safe Water Drinking Act (SWDA);
Clean Water Act (CWA);
NPDES Regulations -- 40 CFR 122;
RCRA Regulations -- 40 CFR 264 AA (Air Emissions from Air Strippers)

Alternative 1 does not meet above-mentioned ARARs because it does not seek any form of remediation of the aquifer. Assuming source controls will be implemented at a later date, ARARs can be met using Alternatives 2a, 2b, 3a and 3b since aquifer restoration is a remedial action objective. ARARs would be met on the shortest timeframe (75 years) with Alternatives 3a and 3b because those remedies remove the largest amount of groundwater contamination. ARARs most applicable to human health (the Safe Water Drinking Act) would be met in Alternatives 2a, 2b, 3a and 3b as soon as service connections are provided to selected homes and businesses. Alternative 2b would attain ARARs in 125 years while groundwater ARARs would be met in 205 years by Alternative 2a according to groundwater models. The main element of aquifer remediation in Alternative 2a is natural attenuation.

Long-Term Effectiveness and Permanence - Alternatives 2a, 2b, 3a and 3b would greatly reduce long-term human risks to groundwater by current hookups to the city water supply system. With long-term groundwater monitoring being a component of every alternative, future exposures to groundwater would be minimized with future hookups to the city's water supply system. Water quality in the city's water supply system is controlled and reliable. Alternative 1 does not provide long-term effectiveness or permanence because no reduction in human exposures to contaminated groundwater occurs.

Reduction of Toxicity, Mobility or Volume through Treatment - Alternative 1 does not reduce the toxicity, mobility or volume of groundwater contaminants. Alternative 2a reduces the toxicity of groundwater contaminants through natural attenuation. Alternative 2b reduces some toxicity, mobility and volume of contaminated groundwater in the environment because a significant portion of the contaminant plume would be treated. Alternatives 3a and 3b offer greatest potential for this criterion because the largest volume of groundwater is being treated to levels which pose little or no threat to the environment.

Short-Term Effectiveness - Alternative 1, which could be implemented on the shortest timeframe does not possess short-term effectiveness because it does not achieve protection of human health and the environment. Construction of watermains and hookups under Alternative 2a can be completed on a fairly short timeframe and would achieve maximum protection of human health once hookups are completed.

Implementability - Alternatives 1 and 2a are easily implementable, since they rely on developed technology and require readily available construction materials. Alternatives 2b and 3a are somewhat less implementable due to administrative considerations in obtaining permits to discharge large amounts of treated groundwater offsite. Alternative 3b is considered the least implementable since the city would have to modify their entire water distribution system to accept such a large amount of treated potable water.

Cost - All alternatives incur some cost. Alternative 1 is the least expensive at $1,124,000, while Alternative 3a is the costliest at $50,723,000. A cost summary of all the alternatives is provided below:

Alternative 1	$1,124,000
Alternative 2a	$3,314,000
Alternative 2b	$10,021,000
Alternative 3a	$50,723,000
Alternative 3b	$20,362,000

State/Support Agency Acceptance - IEPA and USEPA concur in the recommendation of Alternative 2a as the preferred remedy.

Community Acceptance - Community acceptance of the preferred alternative will be considered and evaluated after the public comment period ends and will be described in the Record of Decision for the site.

X. Summary of the Preferred Alternative

In summary, the preferred alternative is believed to provide the best balance of trade-offs among alternatives with respect to the nine criteria used to evaluate remedies. Based on the information available at this time, the IEPA and USEPA believe the preferred alternative would protect human health and the environment, would comply with ARARs, would be cost effective and would utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. The preferred alternative should also satisfy the preference for treatment as a principle element.

XI. Community Participation

IEPA has established two information repositories: one at the Rockford Public Library-Rock River Branch and the other at the Ken Rock Community Center. The documents comprising the Administrative Record upon which IEPA has relied to develop this Proposed Plan are available at the Rockford Public Library-Main Branch.

The IEPA has set a public comment period to begin on July 14, 1995 and end on August 16, 1995 to encourage public participation in the remedy selection process. This public comment period is offered pursuant to CERCLA Section 117(a) as an opportunity for the public

to comment on the FS report and this Proposed Plan for the Southeast Rockford Groundwater Contamination Site. IEPA is particularly interested in comments concerning the preferred alternative identified in this remedy selection process. Written comments should be directed to John Williams, IEPA Hearing Officer at the address listed below.

A formal public hearing will be held at 2:00PM and 6:30PM on August 9, 1995 at the Ken Rock Community Center located at 3218 South Eleventh Street in Rockford, Illinois. The public is invited to attend and contribute verbal and/or written comments for IEPA's consideration. All comments received by IEPA during the public comment period will be summarized and addressed in the Responsiveness Summary as part of the remedy selection process in the finalization of the Record of Decision (ROD) for this site.

The ROD, including the Responsiveness Summary, will be placed in both public repositories with the notice of its availability after it is signed by the Director of IEPA and Regional Administrator of USEPA Region V. The ROD process is expected to conclude within about two months of the close of the public comment period.

Your questions should be directed to:

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