United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R07-92/057
September 1992

EPA

Superfund Record of Decision:

Des Moines TCE ,IA

NOTICE

The appendices listed in the index that are not found in this document have been removed at the request of the issuing agency. They contain material which supplement, but adds no further applicable information to the content of the document. All supplemental material is, however, contained in the administrative record for this site.

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REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R07-92/057	2.	3. Recipient's Accession No.

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SUPERFUND RECORD OF DECISION
Des Moines TCE, IA
Second Remedial Action - Final

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15. Supplementary Notes
PB93-964302

16. Abstract (Limit: 200 words)

The Des Moines TCE site is located southwest of downtown Des Moines, PolkCounty, Iowa. Land use in the area is predominantly industrial and commercial, and part of the site lies within the floodplain of the Raccoon River. An underground infiltration gallery, used by the Des Moines Water Works, is located directly south of the site and serves as a source of public drinking water. EPA site investigations began in the mid-1970's when chlorinated organic contaminants were detected in the Des Moines public water supply. Water from the Des Moines Water Works north infiltration gallery was found to be contaminated with trichloroethylene (TCE), dichloroethylene (DCE), and vinyl chloride at levels above accepted drinking water standards. Several businesses that handled the contaminants of concern are or were located within the site boundaries. A 1986 ROD addressed OU1 and provided for extraction of ground water in the floodplain of the Raccoon River through recovery wells and treating the water using air stripping, with discharge to the Raccoon River. This ROD addresses OU3, which encompasses potential sources of ground water contamination in an area north of the Raccoon River, commonly known as the "North Plume." Future RODs will address the South Area Source Control unit as OU2 to mitigate the release of contamination

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Des Moines TCE, IA
Second Remedial Action - Final
Contaminated Media: None
Key Contaminants: None

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 14
	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)

entering the ground water, the South Pond Drainage Area Source Control unit as OU4 to address pesticide soil contamination in the southeast portion of the site, as well as contaminated buildings on the adjacent Dico property. Based on samples taken at 13 ground water monitoring wells installed in OU3 only one of the 13 wells showed contamination at levels of concern. In general, the contaminant concentrations in that well have shown a decreasing trend in the last five sampling rounds. No specific source of contamination in this well was found during EPA's investigation of OU3.

The selected remedial action for OU3 includes no action with periodic groundwater monitoring. Ground water from the OU3 area will continue to be captured and treated by the OU1 extraction and treatment system. There are no present worth costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS: Not applicable.

RECORD OF DECISION
DECLARATION
REMEDIAL ALTERNATIVE SELECTION

SITE NAME AND LOCATION

Des Moines TCE Site, Operable Unit Three - North Plume
Des Moines, Iowa

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial alternative for Operable Unit 3 of the Des Moines TCE Site in Des Moines, Iowa. The Operable Unit remedy was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) 42 U.S.C. Section 9601 **et seq.**, and, to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) 40 C.F.R. Part 300. This decision is based on the documents and information contained in the Administrative Record for the site. A copy of the Administrative Record is available for review in the U.S. Environmental Protection Agency (EPA) Region VII Docket Room in Kansas City, Kansas and at the Des Moines Public Library in Des Moines, Iowa.

The State of Iowa concurs on the remedy selected for this Operable Unit.

DESCRIPTION OF THE SELECTED REMEDY

In consultation with the State of Iowa, EPA has determined that no remedial action, other than continued monitoring, is required for Operable Unit 3 of the Des Moines TCE Site at this time. Ground water samples will be collected and analyzed on a periodic basis from selected monitoring wells in the Operable Unit 3 area. The monitoring well network and sampling frequency will be reassessed after two years of operation. In addition, this monitoring effort will be evaluated in a five year review.

DECLARATION STATEMENT

EPA conducted a remedial investigation in the Operable Unit 3 area from 1988 to 1992. As part of the remedial investigation, EPA completed a risk assessment which concluded that the hazard presented to the public by contaminants located within the area are below a level that requires a remedial action. The contaminant levels currently present a carcinogenic risk of 3×10^{-6} and a noncarcinogenic risk of 0.004 and the contaminant levels have been shown to be steadily declining.

Because the selected remedy results in hazardous substances, pollutants or contaminants being left at the site above health-

based levels, EPA will conduct a review of the continued adequacy of the selected remedy no less than once every five years as required by Section 121 of SARA. Analytical data collected from the ground water monitoring wells will be used in the review to ensure the selected remedy remains protective of human health and the environment. These reviews will continue until such time that monitoring is no longer required.

9/18/92
Date

for William Rice
Morris Kay
Regional Administrator

RECORD OF DECISION

DECISION SUMMARY

DES MOINES TCE SITE
OPERABLE UNIT 3

DES MOINES IOWA

Prepared by:

U. S. Environmental Protection Agency

Region VII

726 Minnesota Avenue

Kansas City, Kansas 66101

August, 1992

DECISION SUMMARY

RECORD OF DECISION
DES MOINES TCE SITE
OPERABLE UNIT 3

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DECISION SUMMARY

RECORD OF DECISION
DES MOINES TCE SITE
OPERABLE UNIT 3

1. SITE LOCATION AND DESCRIPTION

The Des Moines TCE site is located in the south-central part of the city of Des Moines, Polk County, Iowa, near the downtown commercial/industrial section of the City. Because of the complexity of the Des Moines TCE site, the United States Environmental Protection Agency (EPA) has divided overall site cleanup into four discrete actions, referred to as operable units. Operable Unit 1, referred to as the "Protection of Ground Water" operable unit, addresses those actions necessary to prevent ground water contamination from entering the Des Moines Water Work's underground gallery system, which serves as a source of public drinking water for Des Moines and several surrounding communities. Operable unit 2, referred to as the "South Area Source Control" operable unit, addresses those actions which may be possible to mitigate the release of contaminants entering the ground water. Operable unit 3, referred to as the "North Plume" operable unit, addresses possible sources of ground water contamination north of the Des Moines Water Works and Raccoon River. Operable unit 4, referred to as the "South Pond/Drainage Area Source Control" operable unit, has recently been proposed to address pesticide soil contamination in the southeast portion of the Des Moines TCE site and contaminated buildings on the Dico property.

This Record of Decision selects the remedial alternative for Operable Unit 3. Operable Unit 3 encompasses an area north of the Raccoon River, commonly referred to by EPA as the "North Plume", approximately bounded by 16th and 24th Streets on the east and west, High Street on the north, and the Des Moines Water Works on the south. Operable Unit 3 includes uplands above the Raccoon River and extends onto the flood plain of the Raccoon River. The area is zoned commercial/industrial and includes several small businesses and light industrial facilities. The Des Moines Water Works is located south of the Operable Unit 3 area in the flood plain of the Raccoon River. Figure 1 shows the approximate boundary of Operable Unit 3 and its relationship to Dico and the Des Moines Water Works.

2. SITE HISTORY AND ENFORCEMENT ACTIVITIES

EPA began investigating the Des Moines TCE site in the mid-1970s when chlorinated organic contaminants were detected in the Des Moines public water supply. Water from the Des Moines Water Works north ground water infiltration gallery was found to be

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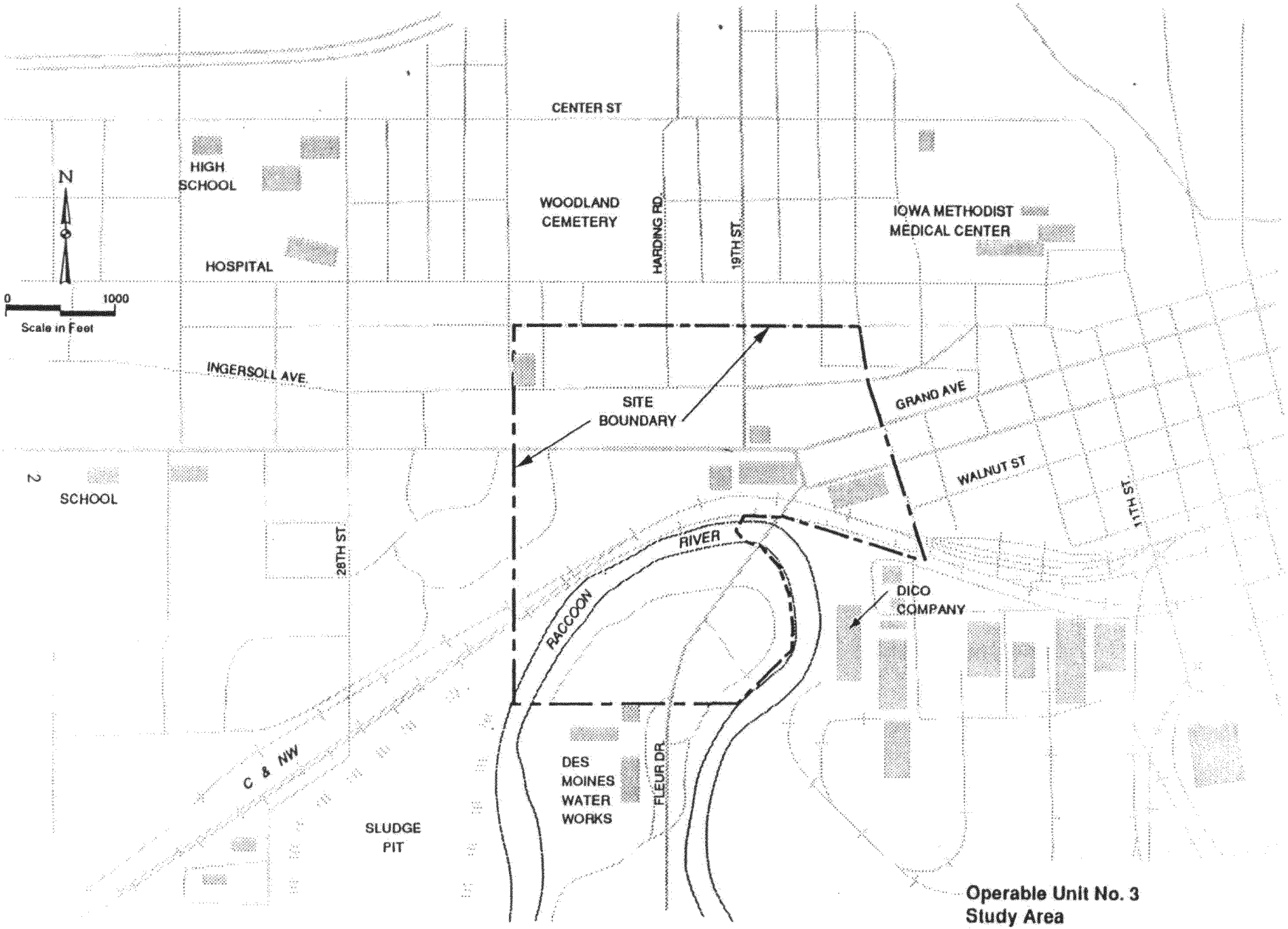

Operable Unit No. 3
Study Area
DES MOINES TCE
OU NO. 3 RI/FS DEN68011.6

FIGURE 1

contaminated with trichloroethylene (TCE), dichloroethylene (DCE), and vinyl chloride at levels above accepted drinking water standards. Extensive investigations were conducted to identify the source or sources of the contamination entering the public drinking water supply through the north infiltration gallery.

These investigations culminated in a remedial investigation and feasibility study (RI/FS) for what is now referred to as Operable Unit 1. In 1986, EPA signed a Record of Decision (ROD) for Operable Unit 1, selecting an operable unit remedial action to prevent ground water contamination from entering the Des Moines Water Works' underground gallery system. The remedial action included capture and extraction of contaminated ground water by recovery wells, treatment of the recovered ground water, and an extensive ground water monitoring program to verify the effectiveness of the ground water capture system. This remedial action was placed into operation in December 1987 and continues in operation at this time.

While Operable Unit 1 has successfully mitigated entry of contaminated ground water into the Des Moines Water Works underground gallery system, it did not address the sources of this contamination. EPA designed Operable Unit 2 to identify and remedy the sources of the VOC ground water contamination located on the Dico property. An RI has been performed and the FS is currently under development for Operable Unit 2. Operable Unit 4 will deal with the contaminated buildings and related drainage areas on the Dico property.

In March 1988, the Operable Unit 1 ground water monitoring program identified contaminated ground water entering the recovery system from the north or west of the recovery system, in addition to from the east towards the Dico property. In September 1988, EPA initiated the Operable Unit 3 remedial investigation to determine the nature and extent and identify potential sources of this ground water contamination. This investigation consisted of soil gas surveys, subsurface soil sampling and analysis, installation of ground water monitoring wells, and collection and analysis of ground water samples. Results of the investigation are detailed in the "Remedial Investigation Report, Des Moines TCE Operable Unit 3, April 1992". This document and other relevant information obtained from the RI are contained in the Operable Unit 3 Administrative Record.

In general, the Operable Unit 3 investigation found that TCE, trichloroethane (TCA), tetrachloroethylene (PCE), and DCE are present at low concentrations at isolated locations within the study area. EPA performed a potentially responsible party search in the Operable Unit 3 area and determined that several businesses are or were located within the site boundaries that handled the contaminants of concern. However, specific sources

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of these contaminants were not found during the investigation performed in the area.

3. HIGHLIGHTS OF COMMUNITY PARTICIPATION

EPA opened the public comment period for the Proposed Plan on July 6, 1992 with a notice published in the Des Moines Register. Fact sheets which highlighted site activities and the proposed remedy and indicated the public hearing date were mailed to 254 individuals and 30 media companies who had expressed interest in the site in the past. These fact sheets were mailed by EPA on July 9, 1992.

EPA held a public hearing on July 23, 1992 at the Wallace State Office Building in Des Moines to discuss the proposed remedy with the public. Comments were solicited by EPA from the public at the hearing. Only two comments and/or questions were received by EPA during the hearing. A summary of these comments and EPA's response to them are included in the Responsiveness Summary attached to this Record of Decision.

The public comment period closed on August 4, 1992. No comments were received by EPA during the comment period other than those received during the hearing on July 23.

4. SCOPE AND ROLE OF SELECTED REMEDY FOR THE OPERABLE UNIT

Operable Unit 3 was designed to extend the existing monitoring system, to assure protection of the Des Moines water supply, and to investigate the extent and potential source(s) of contamination detected in the Operable Unit 1 northern monitoring wells. The current investigation has been completed. This Record of Decision was prepared to present the Agency's selected alternative for Operable Unit 3.

EPA has selected a No Action Alternative for Operable Unit 3 of the Des Moines TCE site. The Operable Unit 3 area includes the contamination that remains in the general vicinity north of the Raccoon River within boundaries previously described. Ground water contamination that enters the alluvial setting, in general in the south and east portion of Operable Unit 3, and originating from the Operable Unit 3 study area, will continue to be captured and treated by the Operable Unit 1 active ground water extraction and treatment system. This system currently includes a network of six ground water extraction wells and an air stripper/ground water treatment system. The extraction wells in operation and located at the northern edge of the Dico property have provided the principal withdrawal point for the contamination originating in the direction to the north, in the vicinity of Operable Unit 3.

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Since the startup of the Operable Unit 1 system, much lower levels of contamination have been detected in the alluvium and northern portion of Operable Unit 1. Though these low levels continue to be evident, the Operable Unit 1 system continues to successfully capture and treat the contamination.

The selected remedy provides for long term operation and maintenance (O&M) that will consist of periodic monitoring of the ground water. Selected wells installed as part of the Operable Unit 3 investigation will be monitored on a periodic basis (sampled once every six months) to ensure protection of the Des Moines public water supply. The wells also will be monitored to confirm that the ground water flow pattern continues in a manner as described by this investigation and the available technical literature. The monitoring schedule and the number of wells monitored will be evaluated after two years to assess the adequacy of the monitoring program.

In addition, the remedial action for Operable Unit 1 will be evaluated on an annual basis (as required in the ROD for Operable Unit 1) to assess the performance of the ongoing ground water extraction and treatment system and its effectiveness in capturing the contaminated ground water.

A five year review of the proposed action will be conducted to ensure that the selected alternative is effective and accomplishes the goals as stated. The five year review will include an assessment of the ground water monitoring information and a review of the institutional controls restricting ground water use in the Operable Unit 3 area. The county's ordinance prohibiting usage of ground water for drinking water purposes in the area supplied by the city public water supply and the city's enforcement of the ordnance will be assessed. This review will be conducted in accordance with CERCLA, as amended, and applicable guidance and in a manner to assure the continued protection of the public health and environment. A five year review is required at sites where contamination remains above health based criteria.

5. SITE CHARACTERISTICS

The Operable Unit 3 area is located in a commercial and industrial area of Des Moines, which does not include any residential dwellings.

Topographically the Operable Unit 3 area consists of gently rolling hills that generally slope to the south and southeast toward the Raccoon River. Ground surface elevations range from a high of approximately 950 feet (above mean sea level) in the northwest portion of the Operable Unit 3 area to a low of approximately 800 feet along the Raccoon River. On the western

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half of the site, the uplands are separated from the Raccoon River by relatively steep bluffs. The southeastern portion of the area consists of relatively flat topography 10 to 20 feet above the elevation of the Raccoon River.

The geologic setting for the site combines lowland flood plain, glacio-fluvial (alluvial) deposits, and upland glacial till deposits. These surficial deposits overlay shale, siltstone, and sandstone bedrock. The alluvial flood plain deposits beneath the Raccoon River consist of approximately 30 feet of highly permeable sand and gravel, and represent a major source of water to the Des Moines metropolitan area.

The upland till deposits consist of approximately 60 feet of unsorted and nonstratified clays, silts, sands, and gravels. Sand and gravel deposits in the till generally consist of discontinuous and isolated lenses. The silts and clays in the till generally have low permeability and tend to inhibit ground water movement. The majority of Operable Unit 3 lies on the upland till deposits.

Ground water flow in the upland glacial till deposits is erratic due to the discontinuity of the sand and gravel layers. These layers form localized preferential flow zones due to their highly permeable nature. However they are generally isolated by relatively impermeable silts and clays which inhibit the ground water flow. Ground water flow in the upland is difficult to characterize due to the highly heterogeneous nature of the glacial till, but is generally to the east and southeast toward the Raccoon River flood plain. The flow direction is primarily a result of the elevational difference between the uplands and the flood plain. The ground water flow velocity in the uplands is also observed to be relatively slow through the glacial deposits as a whole. Ground water flow through the alluvium in the flood plain is relatively rapid and to the east along the flow path of the river.

In addition, the Ingersol stream channel, which in the past ran through the area, potentially controls the direction of ground water flow. The low lying area near this channel was filled in over the years, and in the early 1900's provided the general location for the city-constructed Ingersol Run storm sewer. Upon completion, this combined sanitary/storm sewer directed drainage and flow toward the Raccoon River in the vicinity of the Dico, Inc. property. Flow from this sewer historically was directed to the surface after passing under the railroad tracks located and running under Fleur Drive Bridge. This drainage then passed through the Dico property running due south, on its way to the Raccoon River.

The hydraulic connection between ground water in the upland till deposits and the flood plain deposits appears to be limited.

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River elevation and ground water elevation data were collected during the remedial investigation. This data indicates similar trends in elevation changes of the river and ground water due to precipitation, but they are not identical. This indicates that the ground water in the upland area and river are not in direct communication. Ground water in the upland till occurs under perched conditions and discharges slowly to the alluvium. Historic maps obtained from the City during the remedial investigation shows the Ingersol Run, which has been filled, and the Ingersol Run storm sewer are situated such that they may create a preferential flow path which would discharge ground water from the uplands to the alluvium in the vicinity of Fleur Drive. In general, ground water flowing from the Operable Unit 3 study area uplands will discharge to the alluvium in the vicinity of Fleur Drive, via the filled Ingersol Run and the Ingersol Run storm sewer, and be captured and treated by the extraction system on the Dico property.

Soil gas surveys and subsurface soil sampling conducted by EPA in 1988 and 1991, indicate that isolated locations of contaminants exist in the Operable Unit 3 area. These locations contain low levels of TCE, TCA, and DCE. As a result of these studies, EPA installed 13 ground water monitoring wells in the Operable Unit 3 area and has conducted 12 rounds of ground water sampling. Only one of these 13 wells, MW-35, has consistently shown TCE, DCE, and PCE at levels of potential concern. MW-35 is a shallow well, approximately 26 feet deep, installed in a sand lense in the upland glacial till. Since September, 1989, contaminant concentrations in MW-35 have been sporadic and range from 22 to 100 micrograms per liter (ug/l) TCE, 11 to 59 ug/l DCE, and 21 to 350 ug/l PCE. In general, the contaminant concentrations in MW-35 have shown a decreasing trend for the last five sampling rounds (since September 1990). Analytical result for MW-35 samples collected in April 1992 indicate the well contained 6.7 ug/l TCE, 3.5 ug/l DCE, and 25 ug/l PCE at that time. The data indicates that the level of TCE is decreasing in this area.

6. SUMMARY OF SITE RISKS

In conjunction with the Operable Unit 3 remedial investigation, EPA conducted a risk assessment to evaluate the risks to human health and the environment that could result from exposure to contamination in the Operable Unit 3 area. The risk assessment was prepared using actual Operable Unit 3 data and assumptions made regarding maximum exposures that could be reasonably expected to occur for an individual at or near the site. This exposure is defined as the Reasonable Maximum Exposure (RME), and the person most likely to be exposed to contaminants at Operable Unit 3 is defined as the RME individual. The RME individual is used as a reference point in the risk assessment process to help determine what health related risks

are presented by the site. The risk assessment conducted for Operable Unit 3 is presented in the Remedial Investigation Report.

For purposes of the Operable Unit 3 risk assessment, EPA considered the RME individual to be a construction or maintenance worker who periodically performs activities involving soil excavation in the Operable Unit 3 area. The RME individual would be exposed on a periodic and limited basis to contaminated soils and soil vapors. The additive carcinogenic risk for the RME individual based upon accidental ingestion of contaminated soil, dermal contact with contaminated soil, and inhalation of soil vapors is less than 3 additional cancer cases per 1,000,000 exposed individuals. The additive noncarcinogenic hazard index for the RME individual was calculated to be .004. When evaluating the risk resulting from exposure to hazardous substances for people at or near a Superfund site, EPA considers the exposure to be unacceptable if it results in a carcinogenic risk greater than one additional case of cancer for every 10,000 people exposed or a noncarcinogenic hazard index greater than 1. Thus, the risk posed to the RME individual of 3 cases per 1,000,000 exposed people and the hazard index of .004 falls within an acceptable risk range.

EPA considered the possibility of exposure to hazardous substances via consumption of contaminated drinking water. EPA found that the ground water within the Operable Unit 3 area is not used for public consumption. Also, construction of private water supply wells within the area of Operable Unit 3 is prohibited by a county ordinance which prohibits construction of private water supply wells in an area which has access to a public water supply. Thus, EPA concluded that no risk is currently presented through consumption of contaminated ground water.

Exposure to contaminants at Operable Unit 3 for people living in the area (a residential exposure scenario) was considered but dismissed because no residences are currently located within the Operable Unit 3 area. Future residential development of the area is considered unlikely because of the commercial and industrial nature of current land use. Therefore, a future residential exposure scenario was not included in the risk calculations.

Thus, EPA found that no unacceptable risks are presented by contaminants in the Operable Unit 3 area.

An ecological risk assessment was not considered necessary by EPA. The likelihood of exposure to the contaminants by fauna or endangered species at the site was considered negligible, given that the entire site is located within an urban environment. In addition, given that the risk to human health is

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within an acceptable range, risk to fauna that may be present at the site is also believed to be acceptable.

7. EXPLANATION OF SIGNIFICANT CHANGES

The remedy selected and detailed in this Record of Decision is the same as the remedy described in the Proposed Plan released for public review and comment on July 6, 1992. No changes have been made to the alternative.

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