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Sauget Sites - Area 2- St. Clair County
Site O - L1631210020
ILD000672329
Site P - L1631210002
ILD984809293
Site Q - L1631210001
ILD000605790
Site R - L1631210003
ILD980606982
Site S
Superfund/HRS

CERCLA
Expanded Site Inspection Report

Illinois Environmental Protection Agency

2200 Churchill Road
P. O. Box 19276
Springfield, IL 62794-9276

SCREENED

Printed on Recycled Paper

098378

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SECTION 1

INTRODUCTION

Illinois Environmental Protection Agency's (IEPA or Agency) -Remedial program was tasked by Region V of the United States ironmental Protection Agency (USEPA) on September 21, 1993 to duct an Expanded Site Inspection (ESI) of the Sauget Area 2 es located in Sauget, St. Clair County, Illinois.

sites have been added to the Comprehensive Environmental ponse, Compensation and Liability Act Information System RCLIS) over a period of time. These actions were taken as a ılt of the concern over the threat to human health and the ironment that the sites are believed to pose. The sites have ı evaluated in the form of CERCLA Preliminary Assessments formed by the IEPA; an Expanded Site Investigation performed by logy and Environment in 1986, and a Screening Site Inspection formed by the IEPA's Pre-Remedial Unit in the summer of 1991, ıg with several other separate sampling events.

purpose of the ESI has been stated by USEPA in a directive lining Pre-Remedial program strategies. The directive states:

> The objective of the Expanded Site Inspection (ESI) is to provide documentation for preparing the Hazard Ranking System (HRS) package to support National Priority List (NPL) rulemaking. Remaining HRS information requirements are addressed and site hypothesis not completely supported during previous investigations are evaluated. Expanded SI sampling is designed to satisfy HRS data requirements by documenting observed releases, observed contamination, and levels of

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SECTION 2

SITE BACKGROUND

2.1 INTRODUCTION

This section includes descriptive, historical, and regulatory information obtained over the course of the formal CERCLA Expanded Site Inspection (ESI) investigation and previous IEPA activities involving the Sauget Area 2 sites. Section 1.1 of the revised Hazard Ranking System (HRS) defines "site" as: "Area(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located." This may include sources and the area(s) between sources. Additional information about sources included in the Sauget Area 2 is presented in Section Four of this report.

2.2 SITE DESCRIPTION

2.2.1 Introduction

The Sauget Area 2 Sites are comprised of five separate sources of contamination: four landfills: Site Q, Site R, Site P, and "Site S" (as yet to be added to CERCLIS) and the four former settling lagoons which comprise Site O. "Site S" was discovered on an aerial photo dated March 3, 1975, and had been previously unknown. Four sites are situated within the corporate boundary of the village of Sauget and one site is situated within the boundaries of both Sauget and Cahokia in St. Clair County, Illinois.

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Aggregated Sources at Sauget Sites Area 2

Site Name	Source Type	Source Size	Years of Operation	Owner at time of operation
O	Lagoons	*20	1966-1980	Village of Sauget
Q	Landfill	*90	1962-1975	Cahokia Trust
P	Landfill	*35	1972-1984	Union Electric Paul Sauget
R	Landfill	*36	1957-1977	Monsanto Chemical Company
S	Landfill	*6	1974 ?	Village of Sauget

*in acres

2.2.2 Site O

Site O of Area 2 consists of four covered sludge dewatering lagoons associated with the old village of Sauget Wastewater Treatment Plant (WWTP). The site covers approximately 20 acres on Mobile Avenue within the corporate limits of the village of Sauget. The site is bordered on the north by the village of Sauget Physical/Chemical Plant, to the northwest by Clayton Chemical, to the east by tracks of the Terminal Railroad and farmland, to the west by Trade Waste Incineration, and to the south by the American Bottoms Regional Treatment Plant (ABRTP), operated by the village of Sauget. The access road for the ABRTP bisects the lagoons. The village of Sauget retains ownership of the lagoons. The lagoons appear to have been excavated into the Henry Formation sands.

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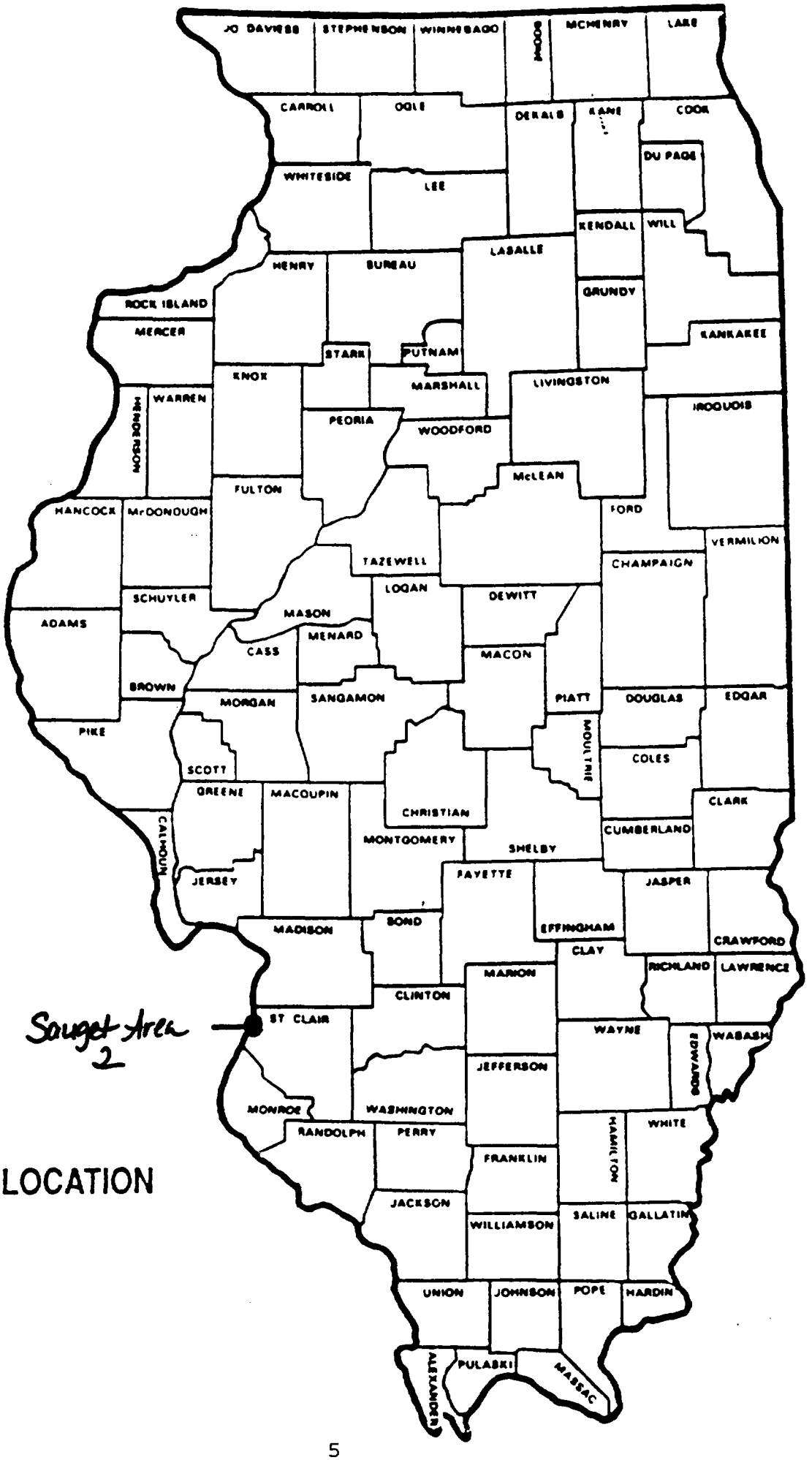

SITE LOCATION

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Source: IEPA, 1994. Base Map: Illinois Department of Transportation, 1985.

FIGURE 2-2

REGIONAL AREA MAP

Scale 1:10560

CERCLA Expanded Site Inspection - Sauget Area 2

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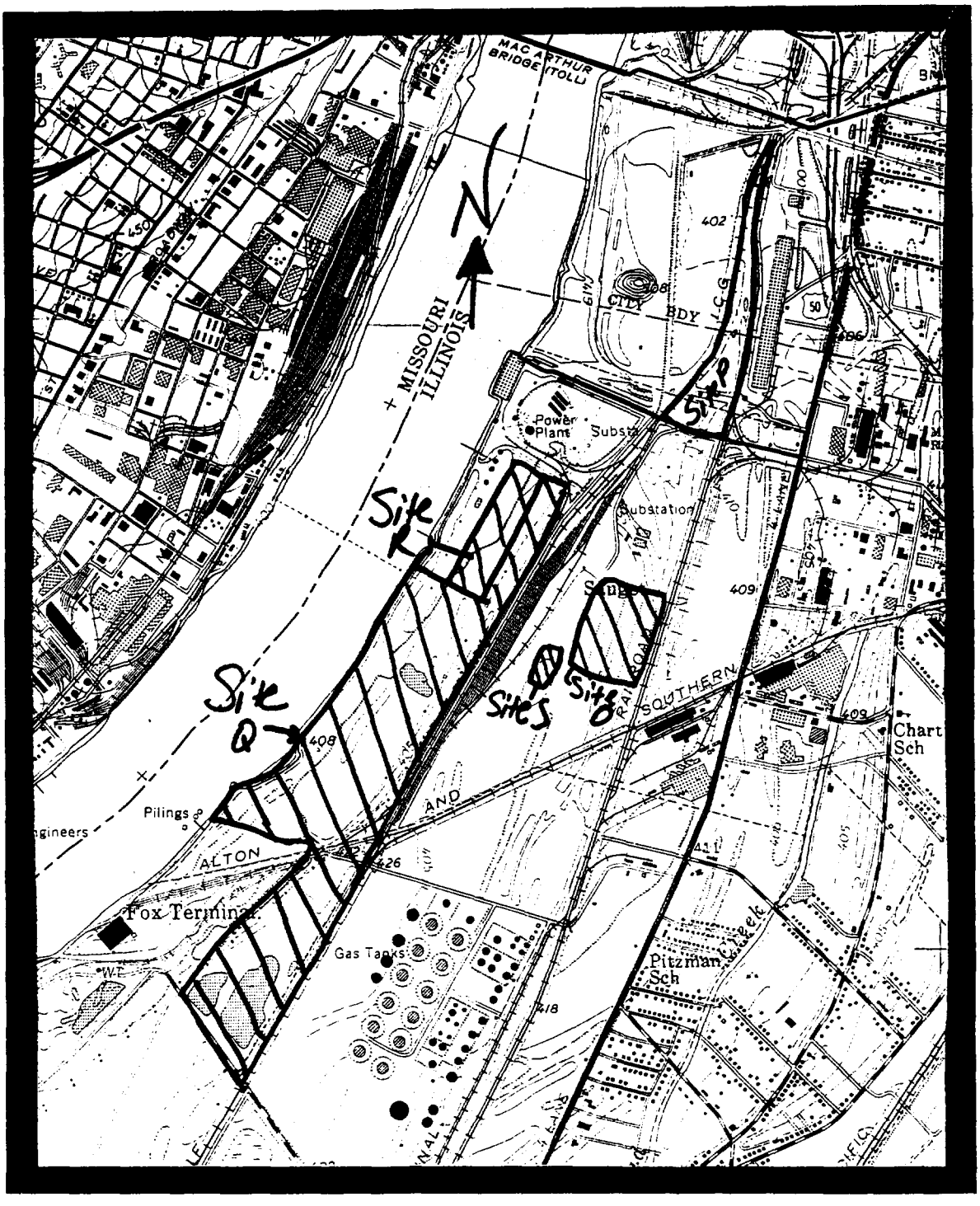


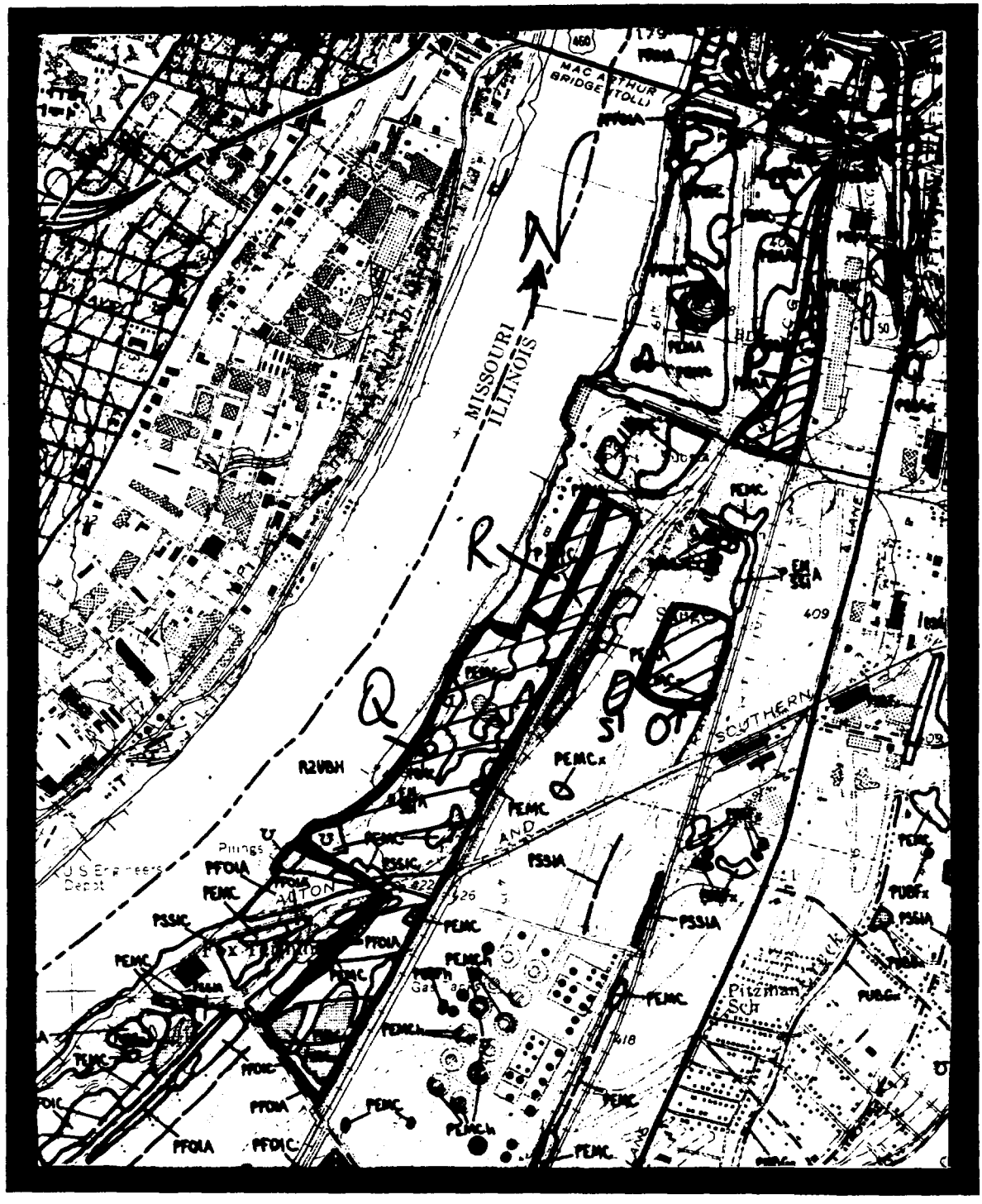
Source: IEPA, 1994. Base Map: USGS, Cahokia Quadrangle, 1974.

FIGURE 2-3

SITE TOPOGRAPHY

Scale : 1 : 2000

CERCLA Expanded Site Inspection - Sauget Area 2



Source: IEPA, 1994. Base Map: U.S. Department of the Interior, 1988.

FIGURE 2-4

WETLANDS INVENTORY MAP

Scale 1:2000

CERCLA Expanded Site Inspection - Sauget Area 2

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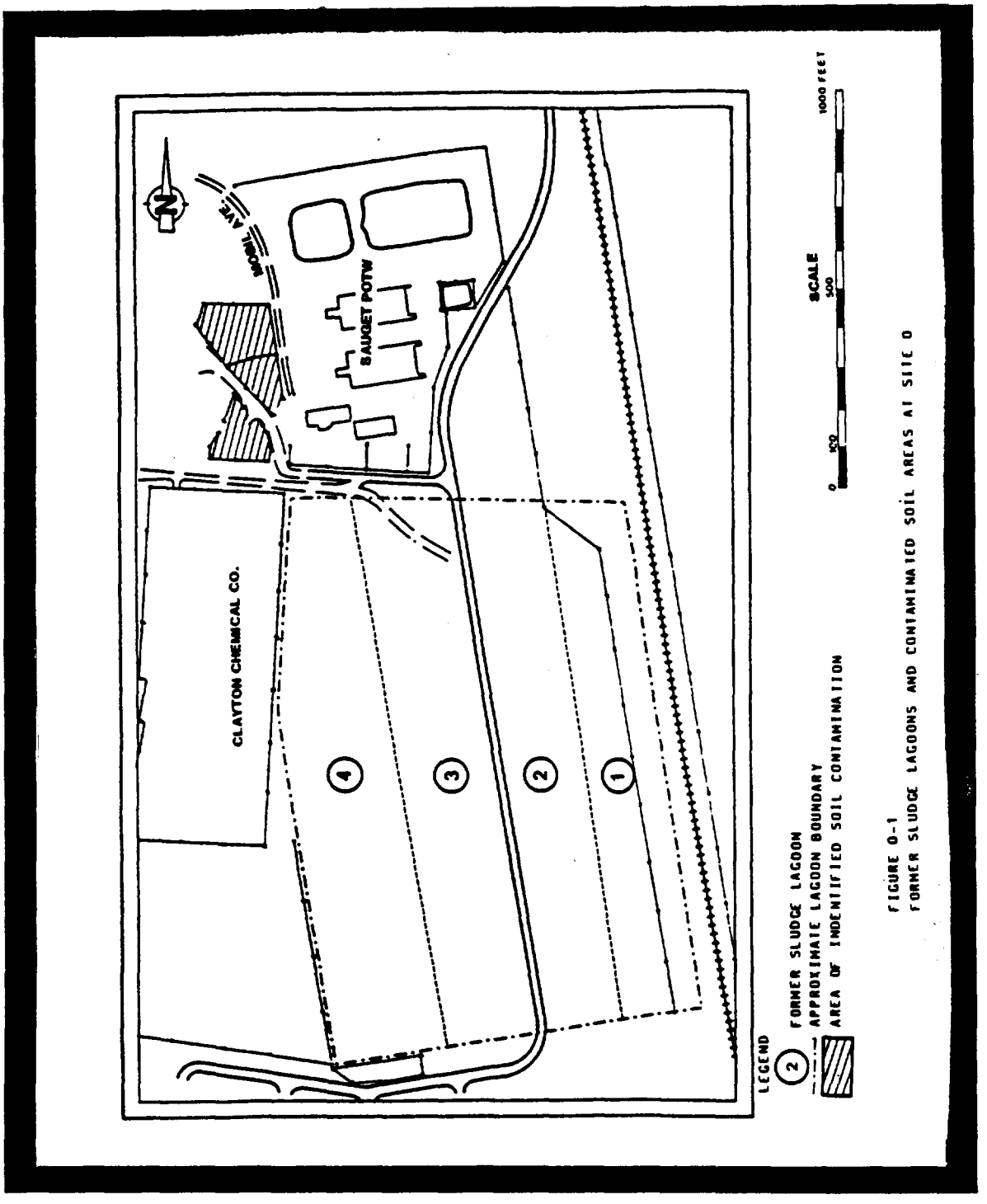

Source: IEPA, 1994. Base Map: Ecology and Environment, 1986.

FIGURE 2-5

SITE O - FEATURES

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According to the Expanded Site Investigation Report prepared for the IEPA by Ecology and Environment in 1986, the depth of waste in the lagoons is approximately seven feet below the surface. However, the IEPA Expanded Site Inspection sampling team found contamination at a depth of approximately one and one-half to two feet. The lagoons are separated into four sections. Each section is separated a berm approximately five feet wide. The lagoons were covered with fill in 1978. IEPA was told that a clay cap had been placed upon the lagoons, however, the ESI sampling team did not find any evidence of an engineered clay cap at the site.

2.2.3 Site P

The site, also known as P.T.s Showclub/Sauget-Monsanto Landfill, is located along Monsanto Avenue in Sauget. The triangularly-shaped site is approximately 20 acres in size (Refer to Figure 2-6). Site P is located on the eastern side of the U.S. Army Corps of Engineers flood control levee (500-year). The site is bordered on the west by the Illinois Central Gulf Railroad; on the south by Monsanto Avenue; on the east by a spur of the Terminal Railroad Association Railroad. The two railroads converge to delineate the northern boundary of the site. Generally, the geology consists of silty sand, underlain by silty clay, followed by fine to coarse-grained sands down to the bedrock.

The site is covered with black cinders and slag material. Surface drainage is towards the south-central portion of the site, which

000359

Central Gulf Railroad tracks. It also includes a northern "dog-leg" portion, situated directly west of Site R.

Vehicular access to the site is controlled by Riverside and Pitzman Avenues along the north and access from the dirt road near the center of the site is currently blocked by concrete blocks placed at the site by Bauer Construction. The concrete was placed at the access point to keep unknown parties from disposing of waste at the site.

Much of the property is leased out to other private businesses. According to Mr. Richard Burke, representative of Eagle Marine, Peavey Grain operates a grain unloading and transfer facility at the rectangular portion of the site. River City Landscaping also operates on a parcel of land south of the Peavey operation. Another portion of the rectangular portion of the property is leased to Bauer Construction who separates metal bars from reinforced concrete.

Several features are apparent on the site and are described in the following paragraph. A borrow pit, approximately two acres in size, is located along the east-central portion of the property. Deteriorating drums were noted emerging from mounded areas within this borrow pit during the March 1994 ESI. Seeps have been noted in the past at various areas of the site. A four-inch diameter pipe, approximately 25 feet in length was located along the western edge

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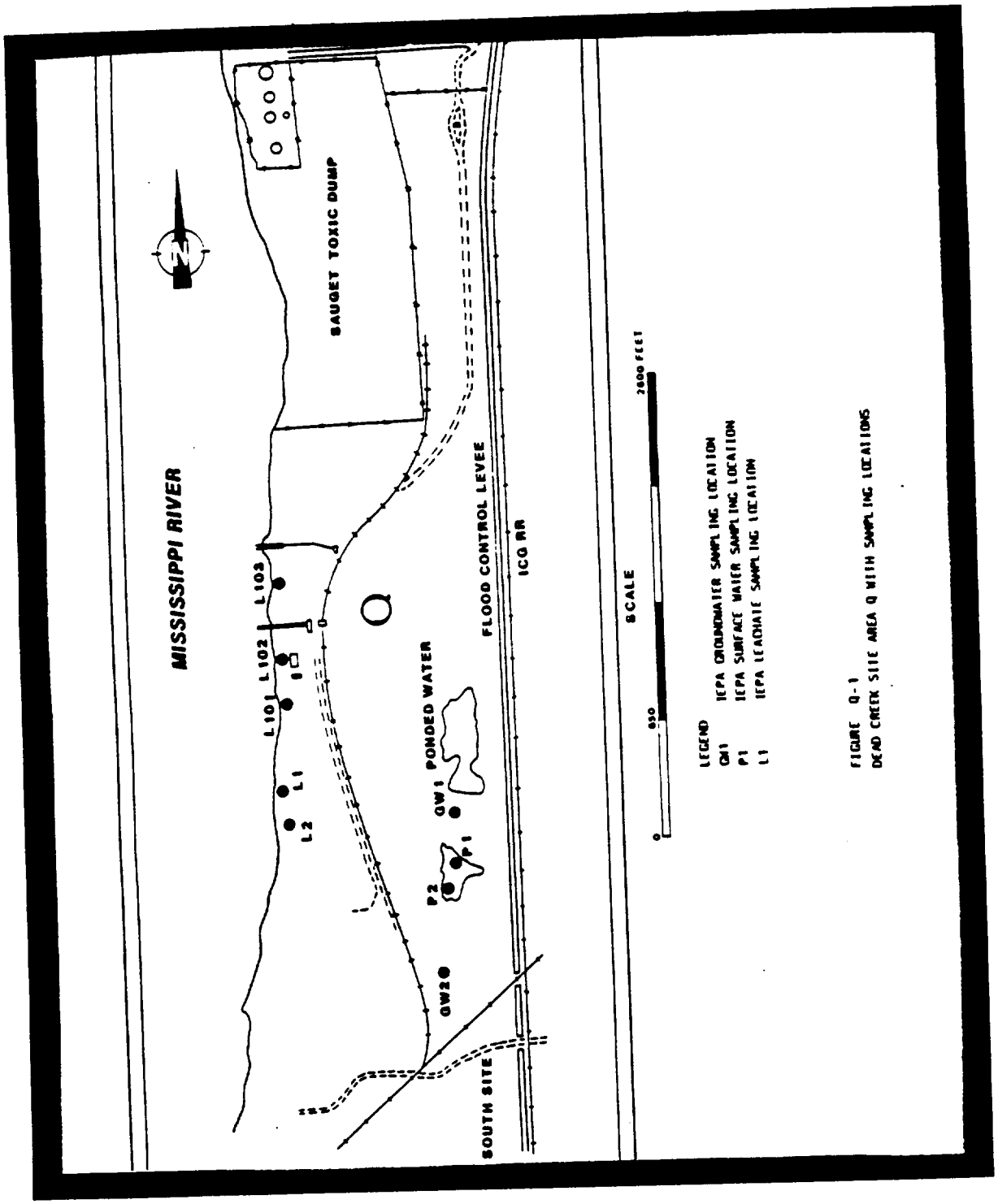

Source: IEPA, 1994. Base Map: Ecology and Environment, 1986.

FIGURE 2-7

SITE Q - FEATURES

009391

of the site. This pipe appeared to allow the direct disposal of liquid wastes into the Mississippi River. Samples taken from near the pipe in 1991 supports this belief. The pipe no longer exists. In the southern extension of the site, wetland areas are located in two borrow pits (according to the National Wetland Inventory maps). The borrow pits were created during the construction of the United States Army Corps of Engineers' levee system. One pit (approximately eleven acres) contains the remnants of drums and solidified wastes. The other borrow pit (approximately five acres) contains similar drums and solidified waste as the easternmost pit. The level of water in these pits is influenced by the level of the Mississippi River. When the river level is high, these pits are inundated with water. When the level of the river falls, the pits are devoid of water. During the flood of 1993, the entire expanse of Site Q was inundated by floodwaters, thus creating a direct release of contaminants into the river.

2.2.5 Site R

The site, also known as the Sauget Toxic/River's Edge Landfill is approximately 40 acres in size. It is located west of the U.S. Army Corps of Engineers flood control levee and is situated along the Mississippi River (Refer to Figure 2-8). The rectangularly-shaped landfill is bordered along the north by Union Electric's abandoned power plant (currently owned by Cahokia Marine Company), to the west by a 200 foot strip of property owned by Monsanto, separating

008392

the landfill from the Mississippi River, to the south and east by Site Q, Trade Waste Incinerator and Clayton Chemical, and to the southeast by the American Bottoms Regional Treatment Plant.

The site is clay-capped and vegetated. The thickness of the cap varies from two to eight feet, according to boring logs. Drainage is directed to ditches around the perimeter of the site. The perimeter drainage trench located along the western boundary of the site is intersected by two additional trenches which divert stormwater to the Mississippi River. Concrete rip-rap extends from the riverbank along the western boundary of the site and extends from the site thirty feet into the Mississippi River. The site is surrounded by an eight-foot cyclone fence, which is under surveillance by the Monsanto Company, which also controls access to the site.

2.2.6 Site S

The site is situated approximately 100 feet west of Site O, within the corporate boundaries of the village of Sauget. Site S is approximately five acres in size and is located on property owned by the village of Sauget. The site is partially covered by the American Bottoms Regional Treatment Plant's asphalted parking area. Site S is bordered to the north by village property and Clayton Chemical, to the east by Site O, and to the west by the Trade Waste Incinerator, and the south by the ABRTP. The site is separated from Clayton Chemical and Trade Waste by fencing.

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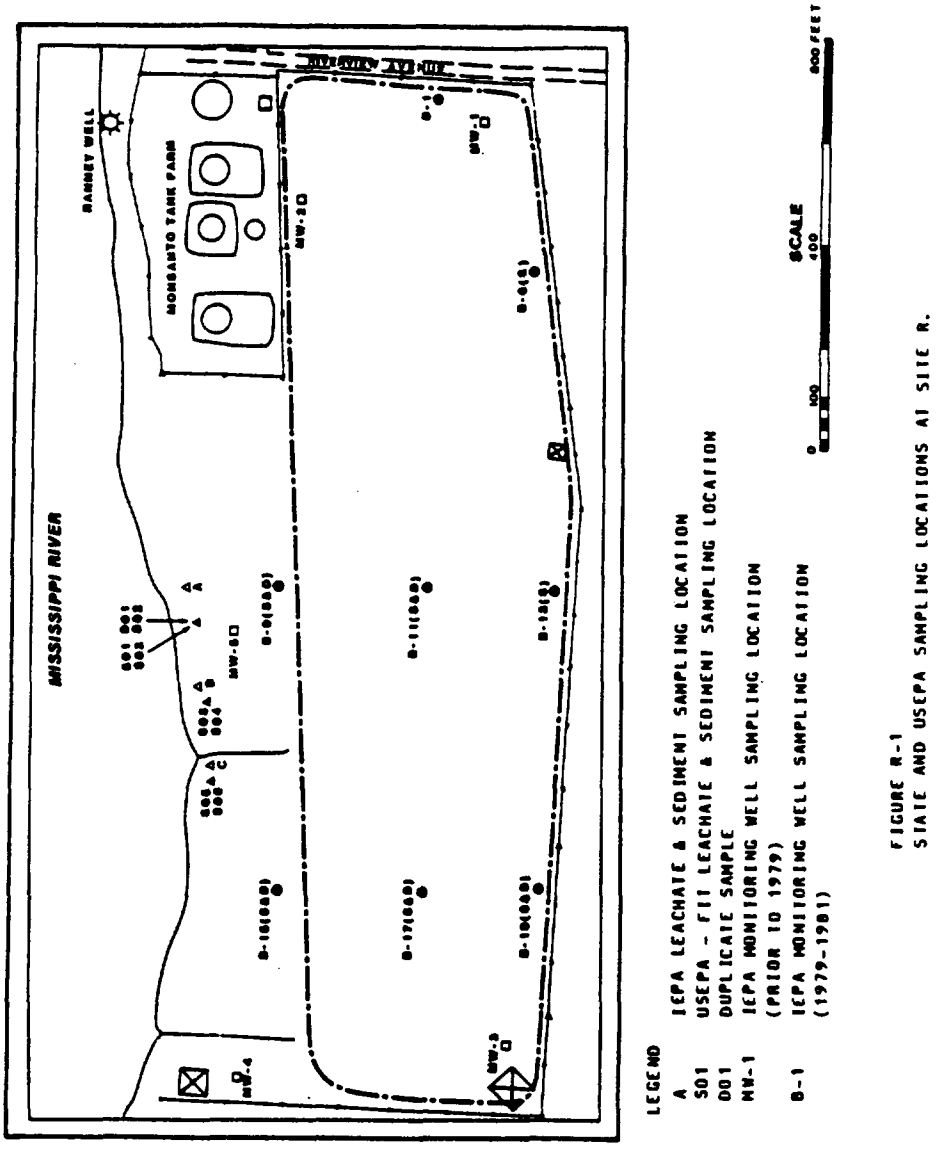

FIGURE R-1
STATE AND USEPA SAMPLING LOCATIONS AT SITE R.

Source: IEPA, 1994. Base Map: Ecology and Environment, 1986.

FIGURE 2-8

SITE R - FEATURES

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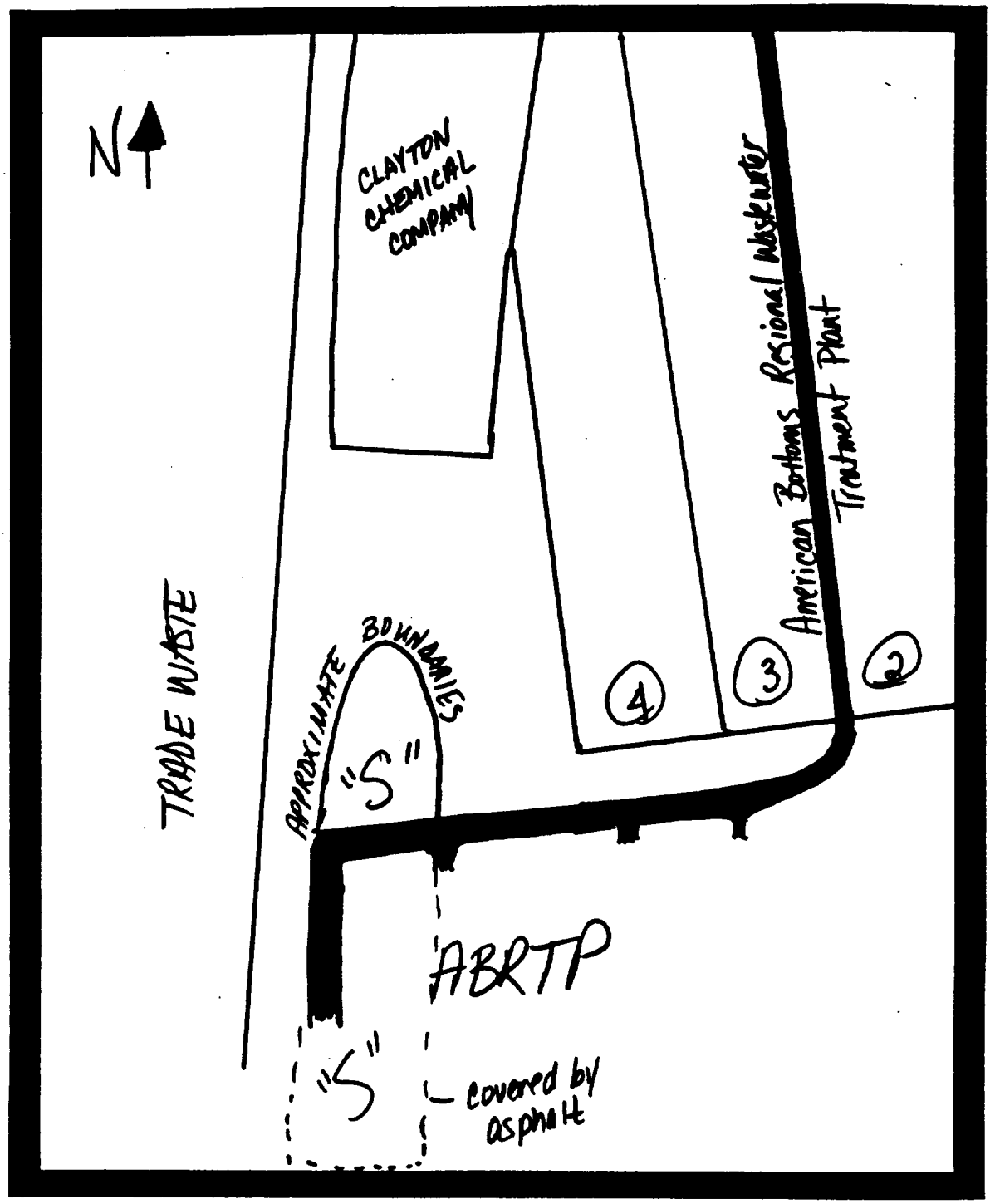

Source: IEPA, 1994. Base Map: Ecology and Environment, 1986.

FIGURE 2-9

SITE S - FEATURES

Scale: 1:300

CERCLA Expanded Site Inspection - Sauget Area 2

An aerial photograph from March 3, 1974 shows the site as a drum disposal area of unknown depth. In the photo, drums and standing liquid can be seen in the excavation. A dirt road leading from Clayton Chemical to the drum disposal area can also be seen on the aerial photo. Currently, no other official information is available concerning the site.

2.3 SITE HISTORIES

2.3.1 Introduction

This portion of the ESI provides relatively brief, general, and regulatory histories of the activities which have taken place at the Sauget Area 2 Sites.

2.3.2 Site O

The Sauget Treatment Plant has been in operation in some form since approximately 1966. The plant primarily treated effluent from area industries, but also provided treatment for the entire village of Sauget. Approximately ten million gallons per day (gpd) of waste water was treated at this facility, of which over 95 percent of the influent came from industrial sources. Area industries served by the village of Sauget Wastewater Treatment Plant include: Monsanto Chemical, Cerro Copper, Sterling Steel Foundry, Amax Zinc, Rogers Cartage, Edwin Cooper, and Midwest Rubber. Effluent from the treatment plant was directed to a National Pollutant Discharge Elimination System (NPDES) permitted discharge point in the

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including chlorinated benzenes, xylene, and aliphatic hydrocarbons, at concentrations ranging from 120 to 820 ppm. The lagoons are presently covered with approximately two fill of clay and have a vegetative cover.

Extensive construction/excavation has been done since 1981 in the area surrounding the former Sauget Treatment Plant. The new American Bottoms Regional Treatment Plant, completed in 1985, is located immediately south of the former sludge lagoons. Several problems involving chemical wastes were encountered during excavation work for the construction of this facility. In 1984, workers uncovered a black, tar-like substance with a strong solvent odor while digging a trench for sewer and water lines to the new treatment plant. Although file information is incomplete concerning the exact location of this incident, it is thought to be in the southern portion of lagoons three and four. Two samples of the waste material were collected by Envirodyne Engineers, Inc. (EEI) of St. Louis, and a limited organic analysis was run. Both samples showed the presence of PCBs (477 to 653 ppm), phenol (0.28 to 12.0 ppm), and oil and grease (29 to 35 percent). Benzene was also detected at trace levels (1 ppb) in both samples.

Several additional locations have reportedly been sampled by EEI as a result of uncovering waste materials during excavation activities around the Sauget Treatment Plant. However, attempts to gather information concerning specific sample locations and analytical

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data have been of limited success. Chemical data for two soil samples collected from excavated soil piles in the area of the former sludge lagoons was acquired. These results are shown in Appendix F. Both samples show high levels of several chlorinated organics and other priority pollutants. Values were listed for total PCBs, however, the PCB results could not be verified by the laboratory. Although limited data had been acquired, it appears that the former sludge lagoon area likely contains widespread organic and inorganic contamination.

2.3.3 Site P

Sauget and Company entered into a lease agreement with the Union Electric Company in St. Louis to operate a waste disposal facility in 1972. In January 1973, IEPA issued an operating permit to Sauget and Company to accept only non-chemical waste from Monsanto. In 1974, Sauget and Company subsequently applied for, and was granted, a supplemental permit which allowed acceptance of general waste and diatomaceous earth filter cake from Edwin Cooper,Inc. (now Ethyl Corporation). Also at this time, the IEPA began conducting routine inspections of the facility, at which time no violations were evident. In October 1975, an inspector observed a small amount of yellowish, tar-like liquid in an area adjacent to several crushed fiber drums which were labelled "Monsanto ACL-85, Chlorine Composition." Sauget and Company and Monsanto were subsequently notified of this permit violation, and the matter was not further addressed. The site was operated in general compliance until

009398

2.3.4 Site Q

According to the Sauget Expanded Site Investigation prepared by Ecology and Environment for the IEPA in 1988, disposal operations began at Site Q in approximately 1962. Union Electric Company operated a flyash pond the site in an area immediately south of Monsanto's chemical dump (Site R). IEPA inspections in the early 1970's documented several violations of the Illinois Environmental Protection Act, including open burning, use of unsuitable cover materials (cinders and flyash), and acceptance of liquid chemical wastes. Septic tank pumpings were also accepted at the site from approximately 1968 to 1972, and were apparently co-disposed of with general municipal refuse.

In April 1971, a complaint was filed by IEPA against Sauget and Company (the landfill operator) for the violations listed above. The company was ordered to cease and desist open burning, accepting liquid chemical wastes, open dumping, and using cinders and flyash as cover material. In July 1972, a smoldering underground fire was observed by IEPA inspectors at the site. The fire continued to smolder until October 1972 despite repeated attempts to extinguish it. Underground fires were a continuing problem, as documented by later IEPA inspection reports. In the spring of 1973, flood waters from the Mississippi River inundated Site Q. This condition persisted into the fall, and operations at the site were discontinued. Exposed refuse was observed being carried downstream in the river at that time.

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Sauget and Company filed a permit application to IEPA in 1972 for a proposed extension to the existing landfill. The proposed extension was located south of the Alton and Southern railroad tracks, and will be referred to as the southern extension. IEPA denied issuance of a permit for this extension several times, as Sauget and Company had filed repeated applications. Although approval of the southern extension was never issued, disposal operations continued in this area.

In the early 1970's, IEPA collected several samples from Site Q. Approximate sample locations are shown in Figure Q-1. Analytical data for samples collected from ponded water, leachate seeps, and groundwater are provided in Appendix F. The first set of samples, collected in October 1972, consisted of one sample from ponded water and one leachate sample. Results of these samples showed the presence of elevated levels of several metals; including copper, iron, lead, mercury, and zinc. Groundwater samples were collected in January 1973 from two monitoring wells at Site Q. Sample GW-1 showed trace levels of cadmium, silver, and phenols; while GW-2 showed very little evidence of contamination. Samples were again taken by the IEPA from ponded water at Site Q on two occasions in April 1973. Analytical results revealed low levels of boron, cadmium, copper, iron, lead, manganese, mercury, nickel, and zinc in sample P-2 and/or P-3. Although the data from samples collected in the early 1970's showed the presence of several contaminants, most notably phenol and heavy metals, no conclusive evidence of

8400

contamination at Site Q was obtained.

IEPA collected samples from leachate seeps along the Mississippi River in October 1981 and again in September 1983. These locations may be found in Appendix F. Data for the 1981 samples revealed the presence of several metals as well as PCBs and phenols. September 1983 samples showed similar results.

The cinders and flyash used as cover materials at Site Q have been the subject of numerous investigations and complaints by the IEPA. In addition, the depth of final cover has been deemed inadequate. Illinois Pollution Control Board Case Number 77-84 was filed against Sauget and Company and Paul Sauget in May 1977. As a result of the findings in this case, a monetary penalty was invoked, and Sauget and Company was ordered to place two feet of suitable cover material on the entire site by February 1981. Sauget's failure to comply with these orders led the Illinois Attorney General's office to file a similar case. Site Q had been a chronic enforcement problem and Paul Sauget was found in contempt of court for failure to comply with court orders.

Laboratory tests run on the cinders and flyash indicate permeability values in the range of 9x10 -3 centimeters per second, which is considered unsuitable by IEPA. Recent flooding has also caused erosion of some of this material, thereby exposing new waste materials. In addition, metals analysis of the cover material

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showed unacceptably high levels of arsenic, copper, lead, and zinc. In 1972, IEPA collected samples from stockpiled flyash at Site Q, and ran leach tests for inorganic constituents.

IEPA's Notices of Violations concerning disposal of chemical wastes at Site Q in early inspections are supported by more recent information. Notification of Hazardous Waste Site Forms were submitted to USEPA from three companies for this site: Browning-Ferris Industries, Clayton Chemical (as agent for Paul Sauget), and Pillsbury Company. These notices indicate disposal of organics, inorganics, solvents, pesticides, paint sludge, and unknown wastes at the site. In May 1980, workers uncovered buried drums and unknown wastes while excavating for construction of a railroad spur on the property. Workers observed a haze or smoke rising from the material after it was uncovered, suggesting corrosive and/or reactive properties.

As a result of the May 1980 incident, USEPA asked its FIT contractor (Ecology and Environment, Inc.) to perform a detailed study to determine the extent of chemical contamination at Site Q. The study included a systematic geophysical investigation using EM (electromagnetometry), and ground penetrating radar (GPR), followed by a drilling and sampling program to investigate possible subsurface contamination. The investigation was limited to the northern portion of the site which amounts to approximately 25 percent of the area.

Technos, Incorporated of Miami, Florida was contracted to perform the geophysical investigation. This investigation was completed in June 1983. Results of the geophysical investigation identified the probable limits of landfilling and burial zones of relatively large concentrations of iron bearing materials such as drums or car bodies. These iron bearing zones were found in several distinct locations in the north-central and western portions of the study area.

Following the geophysical investigation, a drilling/sampling program was conducted to determine if subsurface soils were contaminated. The program consisted of drilling 18 test borings through the landfill, and the collection of 35 soil samples for full priority pollutant analysis, as designated by USEPA. Subsurface soil samples were collected at depths ranging from 10 to 26 feet. A wide variety of organic compounds were detected at high concentrations in these samples. The samples were run for 112 organic compounds and 63 compounds were confirmed to be present in the subsurface samples. Compounds detected at 1000 ppb or greater include 2,4-dichlorophenol, 1,2,4-trichlorobenzene, 1,4-dichlorobenzene, bis(2-ethylhexyl)phthalate, toluene, o-xylene, and Arochlor 1260. Also, 2,3,7,8-tetrachlorodibenzo(p)dioxin was detected in two of the borings. Compounds detected in samples taken from Site Q included many of the compounds detected in samples taken from Site R. Contamination was detected across the entire area investigated, which suggested that disposal of large

009403

quantities of chemical wastes occurred specifically in the northern portion of Site Q and probably over the entire site area.

In November 1985, IEPA received a sketch from a reporter for a St. Louis newspaper indicating the location of buried drums containing PCBs. The reporter's source of this information is not known, nor has the information been verified.

In August 1993, the Agency received a call from Explorer Pipeline of Tulsa, Oklahoma. They had flown over the flood-inundated Site Q and noticed that an oil sheen appeared on the river in the approximate location of one of their pipes. The pipe is entrenched at a depth of approximately four feet and lays at the southern point of the intersection of the Alton Southern railroad track and the Illinois Terminal Railroad Association track.

Explorer waited until the river receded before excavating to see if their pipe was leaking. Explorer began the operation in the middle of August. Upon excavating around their pipe, they noted that the coating in one area of the pipe had been eroded away. A seam of a greenish-yellow substance appeared in the soil surrounding that section of the pipe.

Based on this information, representatives of the IEPA conducted a site visit. Observing the area in question, IEPA decided that the substance in the excavation should be sampled.

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Sampling at the excavation occurred on September 2, 1993. Sampling was performed by representatives of IEPA's Pre-Remedial Unit. A total of three surface water samples were taken; two samples from the excavation (with one used as a duplicate) and one from a flooded area to the south of the excavation, near a concrete culvert (Refer to Figure 2-10 for sampling locations). In addition, three soil samples were taken as well: one sample from the excavation, one leachate from along the Mississippi River, and one from an area of discolored or stained soil. The excavation remains open, surrounded with warning tape.

Analysis of the samples revealed the presence of volatiles, semi-volatiles, pesticides, PCBs, and metals. Please refer to Appendix F for a sample summary.

During the March, 1994 ESI, the sampling team discovered a number of drums located along the riverbank. These drums have been sampled by both the Illinois EPA as well as the USEPA's Immediate Removal Team. High levels of PCBs were detected in the samples and plans are underway for these drums and affected soils to be removed.

2.3.5 Site R

Site R, also known as Sauget Toxic or River's Edge Landfill operated from 1957 until 1975. The landfill was operated by Sauget and Company and Industrial Salvage and Disposal under contract with Monsanto. According to information provided by the Eckhardt report

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of 1979, Monsanto reported the disposal (for the year in question) of 262,500 tons of liquid and solid industrial wastes in the landfill from the Monsanto W.G. Krummrich Plant in Sauget and the J.F. Queeny Plant in St. Louis, Missouri. The W.G. Krummrich Plant listed the disposal of approximately 290,000 cubic yards of organics, inorganics, solvents, pesticides, and heavy metals. The J.F. Queeny Plant listed 6600 cubic yards of the same wastes. Information provided also listed the underground disposal of drums.

Disposal operations began in the northern portion of the site and as additional area was required, disposal activities were expanded toward the southern boundary of the landfill. Drilling logs indicate that the areas of waste disposal were covered or filled with flyash, cinders, sand and gravel.

In 1979, the landfill was covered with a clay cap and, according to drilling records, varies in thickness from a minimum of two feet to as much as eight feet thick.

In August, 1968, the Illinois Department of Public Health collected five groundwater samples from on-site monitoring wells. Phenols were detected in all wells at concentrations ranging from 15 to 1220 parts per billion. Alkalinity and total solids were analyzed for, but no significant conclusions could be made from the data for said parameters.

009406

IEPA began making routine inspections at Site R in 1971. Photographs of the site at this time suggest that wastes were disposed of in direct contact with groundwater. No segregation of liquid wastes was apparent in these photographs. IEPA collected a number of samples from the monitoring wells in December, 1972. Analytical results of the samples indicate concentrations of iron, zinc, and phenol above the State's water quality standards. Oil was also detected in two wells.

In 1973, IEPA sent notices to Sauget and Company and Monsanto outlining violations of the Environmental Protection Act at Site R. Violations noted included inadequate segregation of wastes, open dumping of chemical wastes, and operation of a disposal facility without the necessary permits. In addition, it was noted that the cinders being used for cover material was not in accordance with the Rules and Regulations set forth by the Illinois Pollution Control Board. These violations were repeated several times in 1973 and 1974.

IEPA monthly inspection reports from 1975 indicate a significant reduction in the volume of chemical waste disposal at Site R. Wastes were being shipped to other unreported locations for disposal or were being incinerated at Monsanto's Krummrich Plant. Monsanto voluntarily ceased disposal operations at the site in 1977 and began closure proceedings. D'Appolonia Consulting Engineers, Incorporated was contracted by Monsanto to conduct a subsurface

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investigation of the site. Twenty soil borings were drilled and eight monitoring wells were installed. The D'Appolonia study concluded that the landfill area consisted of five to twenty feet of flyash, cinders, silty clay, and unidentified waste. The landfill is underlain by alluvium, to 50 feet. Field permeability tests showed that silty sand is the major component of the alluvium. This finding is supported by the evidence of vertical migration of contaminants to a depth of 65 feet, as suggested in the boring logs. Water levels were generally 25 to 30 feet below surface.

In May, 1978, Monsanto filed closure documents to IEPA detailing a closure plan for the site. In general, the plan consisted of specifications for the installation of a drainage system and clay cap, along with details for grading, seeding, and access restriction. The Helmkamp Construction Company was retained to implement the closure plan. An IEPA inspection report from October, 1979 indicated that closure operations at Site R were complete, including installation of a clay cap three to six feet in thickness. In February, 1980, Richard Sinise, an Environmental Control Engineer for Monsanto, filed an Affidavit of Closure for Site R.

IEPA personnel sampled the wells installed by D'Appolonia in October, 1979. Analysis showed the presence of several organic contaminants in the wells, including: chlorotoluene, phenol,

008408

chlorophenol, dichlorobenzene, and diphenyl ether. Some contaminants were detected at levels ranging from 0.81 to 2.1 ppm. Iron, copper, and zinc exceeded water quality standards in several wells.

In October, 1981, IEPA collected leachate and sediment samples at Site R from an area adjacent to the Mississippi River. Leachate and sediment samples were collected from three locations where leachate seeps were observed flowing from the landfill into the river. PCBs and chloroaniline were detected in all sediment samples. Other compounds detected in sediment samples included 2,4-dichlorophenoxyacetic acid (2,4-D), chloronitrobenzene, dichloroaniline, chlorophenol, and dichlorophenol. The presence of 2,4-D and chlorinated phenols in these samples suggested that dioxin was also a potential contaminant at the site. The IEPA subsequently requested assistance from USEPA in securing a laboratory to perform dioxin analysis on leachate samples from Site R. In November, 1981 a USEPA contractor (Ecology and Environment, Inc.) collected leachate and sediment samples at three locations adjacent to the river. A total of eight samples plus three blanks were collected. Dioxin analysis was performed by the Brehm Laboratory at Wright State University. Monsanto obtained split samples and analyzed for chlorinated dibenzo-p-dioxins (CDDs), select organics, and metals. The USEPA samples were analyzed for tetra through octa CDDs and dibenzofurans (CDFs), select organics, and metals. The results revealed the presence of higher chlorinated

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dioxins and furans (hexa through octa isomers) in three of the five samples sent in for analysis.

Inorganic data for the leachate and sediment samples did not show significant inorganic contamination, however, concentrations of chromium, copper, boron, and iron exceeded water quality standards in two or more samples. Elevated levels of arsenic, chromium, copper, lead, and barium were found in several samples.

In 1982, the Illinois Attorney General's office filed suit (Complaint number 82-CH-185) against Monsanto outlining several apparent violations of the Illinois Environmental Protection Act. For the most part, the complaint was directed at alleged water pollution caused by the defendant. Relief requested by the Attorney General included civil penalties and issuance of an injunction directing the defendant to immediately prevent the seepage of wastes into the Mississippi River, and to remove all such wastes from the property. To date, no information has been located concerning a determination in this case.

Monsanto has hired Geraghty and Miller, Environmental Consultant, St. Louis, Missouri, to perform a Remedial Investigation - Feasibility Study as part of the consent order with the state of Illinois.

USEPA file information suggest that fish studies have been

008410

conducted in the Mississippi River in the vicinity of Site R. The Food and Drug Administration (FDA) in Edwardsville, Illinois has found unacceptable concentrations of PCBs in fish collected downstream of Site R. A detailed study was proposed for the area in the immediate vicinity of the site, however, attempts to convince Monsanto to perform study have been unsuccessful to date. Monsanto believes the problem to be further complicated by the existence of the American Bottoms outfall, and will not conduct fish tissue sampling, as the American Bottoms outfall is located immediately northwest of Site R.

2.2.6 Site S

There is currently no file information available for this site, which was discovered through the use of historical aerial photographs provided to this agency by the Illinois Department of Transportation.

A study of the 1974 aerial photograph (Located in Appendix C) revealed the presence of approximately 200 drums in or around the disposal area. A road leading from Clayton Chemical can be noted in the photo.

009411

SECTION 3

SITE INSPECTION ACTIVITIES AND ANALYTICAL RESULTS

3.1 INTRODUCTION

This section outlines procedures utilized and observations made during the CERCLA Expanded Site Inspection conducted at the Sauget Area 2 sites in Sauget, Illinois on March 16 and 17, 1994. Specific portions of this section contain information pertaining to the reconnaissance inspection and sampling procedures. This section also details the analytical results with particular emphasis upon the key samples.

The Expanded Site Inspection for the Sauget Area 2 Sites was conducted in accordance with the site inspection workplan which was developed and submitted to the USEPA Region V offices prior to the initiation of sampling activities.

3.2 RECONNAISSANCE INSPECTION

Several reconnaissance inspections of the Sauget Area 2 Sites have taken place throughout the past year in order to be sure that the area was looked at thoroughly, due to the size of the area in question. Sampling had initially been planned for the fall of 1993. However, due to the flooding of the area during the summer of 1993, this action was postponed until the waters receded.

009412

3.3 SOIL/SEDIMENT/WASTE SAMPLING

On March 16 and 17, 1994, a total of sixteen soil/sediment/waste samples were collected during the CERCLA Expanded Site Inspection at the Sauget Area 2 sites (See Figure 3-1 for sampling locations). All samples were collected using stainless steel hand augers and/or hand shovels, with the exception of sample X101, which was obtained with the use of the Agency drill rig. The soil/sediment/waste was transferred directly from the hand tool and placed directly into the sampling jars, with the exception of the duplicate samples, which were mixed and then placed directly from the mixing pan into the jars.

Standard Illinois EPA decontamination procedures were followed prior to the collection of all samples. The procedures included the scrubbing of all equipment (hand shovels, buckets, augers, etc.) with non-foaming Alconox solution, rinsing with hot tap water, rinsing with acetone, rinsing with hot tap water again, and final rinsed with distilled water. All equipment was then air dried, wrapped and stored in heavy duty aluminum foil for transport to the field. Field decontamination procedures included rinsing the equipment with distilled water.

Sample X101 was taken in order to characterize the wastes in the landfill. Analytical results revealed the presence of volatiles, semi-volatiles, pesticides, PCBs, and metals. The sample was taken with the use of the Agency drill rig and the boring was

009413

approximately 10.7-13 feet in depth.

Samples X102, X103, and X104 were taken in the wetland area along the western boundary of Site P. The samples were taken in order to characterize contamination in the wetland. The samples were taken approximately 300 feet apart in order to show contamination in a one-tenth of a mile length for HRS purposes.

Analytical results revealed the presence of semi-volatiles, PCBs, pesticides, and metals within the top two feet of soil.

Samples X105 and X106 were taken at Site O in order to characterize the waste in the lagoons. Analytical results revealed the presence of volatiles, semi-volatiles, pesticides, PCBs, and metals.

Samples X107-X109 were taken in the borrow pits at the southern end of Site Q. They were taken in order to further characterize the waste in the pits. The samples were taken at the surface and approximately 300 feet apart in order to show contamination in a tenth of a mile wetland frontage for HRS purposes.

Analytical results revealed the presence of semi-volatiles, pesticides, PCBs, and metals.

Samples X110-X112 were taken as surface samples at Site Q (within the top two feet) in order to characterize the wastes at the site.

009414

The site was inundated with floodwaters during the summer of 1993. Analytical results revealed the presence of volatiles, semi-volatiles, pesticides, PCBs, and metals.

Samples X501 and X502 were waste samples taken from two separate drums located at Site Q. These samples were taken in order to characterize the waste in the drums.

3.4 ANALYTICAL RESULTS

Chemical analysis of the sixteen samples collected during the inspection revealed the presence of elevated concentrations of the following: volatiles, semi-volatiles, pesticides, metals, suspected laboratory artifacts, and common inorganic soil constituents. Table 3-3 in Appendix D provides a summary of analytical results. Complete analytic results can be found in Volume II of this report.

3.5 KEY SAMPLES

Table 3-2 identifies those samples taken during the CERCLA Expanded Site Inspection which were shown to contain contaminants at significant levels.

C09415

Source: IEPA, 1994. Base Map: Illinois Department of Transportation, 1974.

Figure 3-1

Scale 1;1800

1994 ESI SAMPLE LOCATION MAP

CERCLA Expanded Site Inspection - Sauget Area 2

009416

TABLE 3-1

SAMPLE	DESCRIPTION	LOCATION	DEPTH
X101	BLACK AND SLUDGE-LIKE WITH DEBRIS. FINE-GRAINED SILT WITH ODOR.	SITE P. LOCATED APPROXIMATELY 90 FEET WEST OF POWER POLE A AND 14 FEET NORTH OF NORTH OF POWER POLE A.	10.7-13 FEET
X102	BLACK, SANDY WITH CLAY.	WETLAND AREA ALONG WESTERN BOUNDARY OF SITE P. 202 FT WEST OF POWER TOWER A AND 130 FEET EAST OF RAILROAD TRACKS ALONG WESTERN BOUNDARY.	1-5 INCHES
X103	BLACK, COARSE-GRAINED SAND 0-4" THEN SILTY.	LOCATED 350 FEET SOUTH OF SAMPLE APPROXIMATELY 30 FEET WEST OF LANDFILL EMBANKMENT.	0-5 INCHES
X104	BLACK, SILTY, FINE-GRAINED.	LOCATED DIRECTLY WEST OF P.T.S SHOWCLUB, APPROXIMATELY 15 FEET WEST OF EMBANKMENT.	0-4 INCHES
X105	BLACK, CLAY-LIKE MATERIAL, MIXED WITH A RUBBERY SUBSTANCE.	LOCATED 259 FEET EAST OF ACCESS ROAD AND 430 FEET SOUTH OF NORTHERN PORTION OF ACCESS ROAD.	6-7 FFET
X106	BLACK, WITH SILTY CLAY. BLACK SUBSTANCE WAS CINDER-LIKE.	LOCATED APPROXIMATELY 173 FEET WEST OF ACCESS ROAD AND 264 FEET NORTH OF SOUTHERN PORTION OF ACCESS ROAD.	2 FEET
X107	DARK BROWN TO BLACK, SILTY AND MOIST.	LOCATED AT SOUTHEASTERN-MOST PART OF BORROW PIT.	4-6 INCHES
X108	BLACK, SILTY AND SANDY WITH ORGANIC MATERIAL.	LOCATED 300 FEET WEST OF X107.	5-8 INCHES
X109	DARK BROWN TO BLACK AND THEN SANDY WITH SOME CLAY.	LOCATED 300 FEET NORTH OF SAMPLE X107.	3-4 INCHES
X110	A LAYER OF BLACK, SILTY , SANDY MATERIAL WITH CINDERS WITH A PASTY, YELLOWISH SUBSTANCE.	LOCATED 213 FEET NORTH-NORTHEAST OF POWER TOWER B.	2-8 FEET
X111	BLACK, TAR-LIKE.	LOCATED APPROXIMATELY 5 FEET TO THE WEST OF X110.	1/4-1 INCH
X112	BLACK ON TOP; RUBBERY, WITH PURPLISH "GOO" FLOWING TO THE SURFACE. UNDER THIS LAYER WAS A BROWNISH-RED WITH YELLOW RUBBERY SUBSTANCE.	LOCATED 125 FEET EAST OF SITE R FENCE AND 24 FEET SOUTH OF RIVERSIDE ROAD.	0-3 INCHES
X113 X114	DARK-BROWN, SILTY, FINE.	LOCATED 62.5 FEET SOUTHEAST OF POWER TOWER C	2-4 INCHES
X501	ORANGE AND PURPLE CRYSTALLINE MATERIAL.	TAKEN FROM DRUM LOCATED IN LOW AREA NEXT TO SITE Q EXCAVATION - SEVENTY-SEVEN FEET, SEVEN INCHES SOUTH-SOUTHEAST OF TELEPHONE POLE NORTHEAST OF INTERSECTION OF ACCESS ROAD AND ALTON AND SOUTHERN RAILROAD TRACKS.	
X502	BLACK, CINDER-LIKE MATERIAL.	TAKEN FROM DRUM LOCATED ALONG MISSISSIPPI RIVER RIVERBANK.	

SAUGET AREA #2

ILD See CERCLIS	Site P				Site Q	
SAMPLING POINT	X101	X102	X103	X104	X105	X106
PARAMETER	soil	soil	soil	soil	soil	soil
VOLATILES						
Methylene Chloride		4.0 J	4.0 J	RE RE		660.0 J
Acetone	73.0	37.0				
Carbon Disulfide	16.0		8.0 J	look at again		
1,1-Dichloroethane		160.0				
1,2-Dichloroethene (total)	4.0 J	22.0				
Chloroform					3200.0 J	
2-Butanone	27.0	9.0 J				
1,1,1-Trichloroethane	4.0 J	130.0			12000.0	
Trichloroethene	8.0 J	11.0 J			3700.0 J	
1,1,2-Trichloroethane		4.0 J				
Benzene				450000.0 DJ		810.0 J
4-Methyl-2-Pentanone	36.0				30000.0	
2-Hexanone						
Tetrachloroethene	140.0				5000.0 J	
Toluene	110.0			260000.0 DJ		840.0 J
Chlorobenzene	42.0			460000.0 DJ		15000.0
Ethylbenzene	50.0			2200000.0 D		1300.0 J
Styrene						
Xylene (total)	260.0			9600000.0 D		4000.0
ug/Kg						
SEMI-VOLATILES						
Phenol						41000.0 J
2-Chlorophenol						24000.0 J
1,3-Dichlorobenzene	4200.0 J					200000.0
1,4-Dichlorobenzene	1300000.0	130.0 J			330000.0	1700000.0 J
1,2-Dichlorobenzene	120000.0 J				820000.0	1300000.0 J
4-Methylphenol				2000.0		
Isophorone						
2-Nitrophenol						120000.0
2,4-Dichlorophenol					86000.0 J	250000.0
1,2,4-Trichlorobenzene					140000.0 J	55000.0 J
Napthalene					180000.0 J	33000.0 J
2-Methylnaphthalene				640.0 J	580000.0	
2,4,5-Trichlorophenol						130000.0
2-Nitroaniline						160000.0 J
Fluorene					82000.0 J	
2,4,5-Trichlorophenol		310.0 J				
Pentachlorophenol					13000000.0	340000.0 J
Phenanthrene		160.0 J	570.0 J			
Di-n-Butylphthalate	3600.0 J	390.0 BJ	1000.0 BJ	940.0 BJ		
Fluoranthene			860.0 J	2400.0 J	95000.0 J	
Pyrene			720.0 J	1700.0 J	940000.0	
Butylbenzylphthalate					63000.0 J	12000000.0
Benzo(a)Anthracene		140.0 J		1100.0 J	400000.0	
Chrysene		140.0 J	600.0 J	2200.0 J	870000.0	
bis(2-Ethylhexyl)Phthalate				920.0 J		
Benzo(b)Fluoranthene		160.0 J	720.0 J	3000.0	160000.0 J	
Benzo(k)Fluoranthene		150.0 J	530.0 J	1900.0 J		
Benzo(a)Pyrene		140.0 J		1600.0 J	160000.0 J	
Indeno(1,2,3-cd)Pyrene			790.0 J	2600.0 J		
Dibenz(a,h)Anthracene					100000.0 J	
Benzo(g,h,i)Perylene			520.0 J	2000.0 J		
ug/Kg						
PESTICIDES						
alpha-BHC						
beta-BHC				5.6 P		25000.0 UX
delta-BHC		13.0 BP	160.0 B			
gamma-BHC (Lindane)		3.0 P		3.7 P	170000.0 UX	25000.0 UX
Dieldrin						
4,4'-DDE	32.0 P	37.0 P				
Endrin						
4,4'-DDD		28.0 P	26.0 P	46.0 P	330000.0 UX	
Endosulfan sulfate						
4,4'-DDT		32.0 BP	49.0 BP	140.0 BP	330000.0 UX	48000.0 UX
Methoxychlor	180.0 P					
Endrin Ketone	52.0				330000.0 UX	48000.0 UX
alpha-Chlordane	32.0 BP					
gamma-Chlordane		10.0 P	36.0 P			25000.0 UX
Toxaphene						
Aroclor-1242		560.0	1500.0	1700.0	2900000.0 C	170000.0 C
Aroclor-1254		1100.0	3400.0	3500.0	930000.0 PC	100000.0 C
Aroclor-1260	570.0 B	1400.0 B	4000.0 B	4600.0 BC	530000.0 BC	95000.0 BC
ug/Kg						
INORGANICS						
Aluminum	12100.0	6680.0	13200.0	10400.0	2430.0	8470.0
Antimony					61.2	
Arsenic	14.2	34.7	27.6	14.2	120.2	10.9
Barium	226.0	74.8	181.0	180.0	1010.0	360.0
Beryllium	0.7 B	3.1	2.7	1.4 B		0.5 B
Cadmium	3.0	5.6	13.3	32.9	2370.0	11.9
Calcium	34400.0	22800.0	40200.0	53400.0	8650.0	11800.0
Chromium	60.8	27.7	36.5	36.2	192.0	34.8
Cobalt	3.1 B	28.6	21.6	17.7	26.3	5.6 B
Copper	33.2	95.2	187.0	231.0	9160.0	332.0
Iron	57600.0	13300.0	17900.0	18700.0	42100.0	14400.0
Lead	217.0	130.0	332.0	378.0	7180.0	99.4
Magnesium	1180.0	4000.0	5460.0	6640.0	1590.0	5530.0
Manganese	54.2	132.0	299.0	369.0	1360.0	250.0
Mercury	5.6	1.0	1.4	3.4	1584.0	14.4
Nickel	24.8	105.0	65.6	48.8	125.0	81.7
Potassium	4840.0	1310.0 B	2170.0	1590.0	756.0 B	950.9
Selenium	17.0	6.7	5.6	3.4	108.0	2.3
Silver			1.0 B	2.4 B	29.8	1.7 B
Sodium	3280.0	563.0 B	252.0 B	205.0 B	427.0 B	164.0 B
Thallium	5.0	1.9 B	2.0	0.6 B	3.4	
Vanadium	43.9	44.0	59.3	38.2	58.6	25.3
Zinc	1310.0	865.0	1920.0	4030.0	60400.0	934.0
Cyanide	2.6				6.6	
mg/Kg						

SAUGET AREA #2

ILD See CERCUS

	Site Q								Drums at Site Q	
SAMPLING POINT	X107	X108	X109	X110	X111	X112	X113	X114	X501	X502
PARAMETER	soil	soil	soil	soil	soil	soil	soil	soil	drum waste	drum waste
VOLATILES										
Methylene Chloride			4.0 J	8.0 J	1100.0 J	7.0 BJ		5.0 J	15.0 B	14.0 B
Acetone				110.0		130.0			29.0	11.0
Carbon Disulfide										
1,1-Dichloroethane										
1,2-Dichloroethene (total)										
Chloroform										
2-Butanone				200.0		19.0			7.0 J	12.0
1,1,1-Trichloroethane										3.0 J
Trichloroethene						3.0 J				
1,1,2-Trichloroethane										
Benzene				4.0 J						
4-Methyl-2-Pentanone										
2-Hexanone						5.0 J				
Tetrachloroethene										
Toluene									6.0 J	4.0 J
Chlorobenzene				3.0 J						
Ethylbenzene										
Styrene									3.0 J	
Xylene (total)				5.0 J		6.0 J			220.0	
ug/kg										
SEMI-VOLATILES										
Phenol										
2-Chlorophenol										
1,3-Dichlorobenzene					use which data?	high detect values				
1,4-Dichlorobenzene										
1,2-Dichlorobenzene										
4-Methylphenol										
Isophorone		340.0 J								high detect values
2-Nitrophenol										
2,4-Dichlorophenol										
1,2,4-Trichlorobenzene										
Napthalene		120.0 J								
2-Methylnaphthalene										
2,4,6-Trichlorophenol										
2-Nitroaniline										
Fluorene										
2,4,5-Trichlorophenol										
Pentachlorophenol		160.0 J								
Phenanthrene							170.0 J			
Di-n-Butylphthalate	910.0 B	1200.0 B	820.0 B				1200.0 B	1300.0 B	550.0 B	
Fluoranthene		110.0 J					300.0 J	190.0 J		
Pyrene		100.0 J					340.0 J	200.0 J		
Butylbenzylphthalate	560.0 U									
Benzo(a)Anthracene	410.0 J	96.0 J					340.0 J	230.0 J		
Chrysene	290.0 J						230.0 J	190.0 J		
bis(2-Ethylhexyl)Phthalate		2000.0						160.0 J		
Benzo(b)Fluoranthene	410.0 J						340.0 J	220.0 J		
Benzo(k)Fluoranthene							130.0 J	160.0 J		
Benzo(a)Pyrene							250.0 J	210.0 J		
Indeno(1,2,3-cd)Pyrene										
Dibenz(a,h)Anthracene										
Benzo(g,h,i)Perylene							270.0 J			
ug/Kg										
PESTICIDES										
alpha-BHC				2.0 JP						
beta-BHC										
delta-BHC	4.6 BP	13.0 BJP		43.0 B	46.0 BP	19000.0 UX	6.0 BP	4.8 BP		
gamma-BHC (Lindane)							0.4 JP	1.2 JP		
Dieldrin		380.0 P	10.0 P					23.0	0.6 JP	250000.0 UX
4,4'-DDE					74.0 P		23.0			
Endrin			47.0 BP							
4,4'-DDD	27.0 P	69.0 P	2.6 JP		26.0 P	38000.0 UX	17.0 P	14.0 P	0.1 JP	490000.0 UX
Endosulfan sulfate			1.5 JP							
4,4'-DDT	27.0 BP	82.0 BP	2.4 JP		54.0 BP		16.0 BP	13.0 BP		
Methoxychlor						190000.0 UX				
Endrin Ketone	49.0 P	120.0 P	4.6 P		130.0 P	38000.0 UX				
alpha-Chlodane		4800.0 UX							0.7 BJ	
gamma-Chlordane	44.0 P	140.0 P	2.7 P		15.0 P	330.0 P	6.0 P	5.4 P	0.4 JP	250000.0 UX
Toxaphene				3600.0						
Aroclor-1242	1300.0 P		110.0		570.0	80000.0 C	220.0	190.0		7400000.0 PC
Aroclor-1254	8200.0 C		570.0	2200.0	1800.0	89000.0 C	550.0	580.0		
Aroclor-1260	7700.0 BC	17000.0 BC	450.0	1700.0 B	2900.0 B	42000.0 BC	710.0 B	720.0 B	22.0 BJ	44000000.0 BC
ug/Kg										
INORGANICS										
Aluminum	22000.0	15100.0	5110.0	1580.0	9470.0	1960.0	13600.0	15300.0	165.0	226.0
Antimony										
Arsenic	5.1	4.7	2.5 B	1.0 B	6.8	3.9	8.5	7.7		
Barium	196.0	285.0	72.8 B	109.0	323.0	134.0	230.0	250.0	2.7 B	4.0 B
Beryllium		0.8 B	0.3 B		0.6 B	0.2 B	0.7 B	0.8 B		
Cadmium	3.8	13.1			5.2	3.0	3.5	3.0		
Calcium	10100.0	7890.0	4170.0	90900.0	106000.0	12000.0	7700.0	7720.0	130.0 B	71600.0
Chromium	31.2	93.7	7.9	6.6	19.2	7.4	21.2	22.5		6.5
Cobalt	9.6 B	8.7 B	3.2 B		6.6	2.7	7.2 B	6.4 B		
Copper	46.3	62.7	5.9 B	6.4	97.7	37.8	56.6	55.1	1.2 B	7.5
Iron	24400.0	21200.0	8650.0	1600.0	15100.0	4180.0	24500.0	25800.0	903.0	76100.0
Lead	72.4	218.0	12.1	26.0	132.0	39.1	63.0	66.3	25.5	11.5
Magnesium	6350.0	4800.0	2900.0	1200.0	9190.0	1760.0	3980.0	4300.0	39.7 B	607.0 B
Manganese	267.0	253.0	94.7	36.9	182.0	104.0	283.0	278.0	7.3	50.6
Mercury	0.1 B	0.1 B		0.2 B	4.9	0.5	0.5	0.2		
Nickel	32.0 B	33.9 B	13.7		32.8	12.3	27.0	30.0	3.6 B	17.8
Potassium	2840.0	2220.0	865.0 B	318.0 B	3800.0	867.0 B	2380.0	2520.0		
Selenium	0.4 B	1.4 B		1.9	1.9	0.3 B				
Silver		158.0 B								
Sodium	165.0 B	158.0 B	99.5 B	1070.0 B	227.0 B	337.0 B	217.0 B	224.0 B	115.0 B	
Thallium										
Vanadium	50.8	34.4	15.5	11.5	27.2	15.9	34.7	27.6	0.7 B	2.0 B
Zinc	321.0	609.0	57.8	65.7	796.0	349.0	495.0	496.0	4.5	33.6
Cyanide										
mg/Kg										

8410

SECTION 4

IDENTIFICATION OF SOURCES

4.1 INTRODUCTION

This section discusses each of the hazardous waste sources which have been identified during the CERCLA Expanded Site Investigation of the Sauget Area 2 Sites. Section 1.1 of the revised Hazard Ranking System (HRS) defines a "source" as: "Any area where a hazardous substance has been deposited, stored, disposed, or placed, plus those soils that have become contaminated from migration of a hazardous substance." This does not include surface water sediments or surface water that has become contaminated. Information concerning the location, physical description, use, period of operation, size, and potential to affect the migration pathways along with analytical data obtained during the Expanded Site Inspection (ESI) is presented for each source.

4.2 SAUGET SITE O / SAUGET WASTEWATER TREATMENT PLANT LAGOONS

The former village of Sauget Wastewater Treatment Plant lagoons were used to dewater sludge from the treatment plant. The lagoons were in operation from 1967 until approximately 1980. Effluent from the various industries in the area ended up at the plant for treatment. The following is a list of those industries that discharged to the treatment plant from 1967 to 1980:

009420

Clayton Chemical Company
Amax Zinc Company
Cerro Copper
Midwest Rubber Reclaiming
Mobil Oil Corporation
Monsanto
Wiese Planning and Engineering
Sterling Steel Foundry, Inc.
Rodgers Cartage
Ethyl Petroleum Additives/Edwin Cooper
Kerr-McGee/Moss American

The four lagoons are approximately twenty acres in size (total). Analytical results of samples taken during the ESI of March, 1994 revealed the presence of numerous compounds of concern, including the following:

Volatiles:

Chlorobenzene	15000 ppb
1,1,1-Trichloroethane	12000 ppb

Semi-volatiles:

1,3 Dichlorobenzene	20000	ppb
1,4 Dichlorobenzene	1700000	ppb
2-Nitrophenol	120000	ppb
2,4 - Dichlorophenol	250000	ppb
2,4,6 Trichlorophenol	130000	ppb
Pentachlorophenol	13000000	ppb
Benzo(a)pyrene	160000	ppb

Pesticides/PCBs

Arochlor (1242)	2900000	ppb
Arochlor (1254)	100000	ppb
Arochlor (1260)	530000	ppb

009401

Inorganics

Antimony	61.2	ppm	Mercury	1584	ppm
Arsenic	120.2	ppm	Nickel	125	ppm
Barium	1010	ppm	Selenium	108	ppm
Cadmium	2370	ppm	Silver	29.8	ppm
Chromium	192	ppm	Vanadium	58.6	ppm
Copper	9160	ppm	Zinc	60400	ppm
Lead	7180	ppm	Cyanide	6.6	ppm
Manganese	1360	ppm			

Pathways of concern include surface water (groundwater to surface water flow) and the air migration pathway. Groundwater and soil exposure are not evaluated for this pathway due to the lack of targets.

4.3 SAUGET SITE P / P.T. S SHOWCLUB

The Illinois EPA permitted Site P was operated by Paul Sauget from 1972 until 1984. The landfill was permitted to accept non-chemical solid waste from Monsanto and Ethyl Corporation. The property was leased from Union Electric of St. Louis. The landfill is unlined, has no leachate collection system and is covered with cinders, ash, and slag from a Southern Railway slag pile.

In January, 1973, IEPA issued a permit for the landfill to accept diatomaceous earth filter cake from Edwin Cooper, Incorporated (now Ethyl Corporation).

Although the landfill was permitted to accept only non-chemical waste, several violations of the permit were noted by the Collinsville Field Office. In October, 1975, an inspector noted a

009422

Semi-Volatiles: (ppb)

1,3-Dichlorobenzene -	4200
1,4-Dichlorobenzene -	1300000
1,2-Dichlorobenzene -	120000
2,4,5-Trichlorophenol -	310
Chrysene -	2200
Benzo(a)Pyrene -	1600

Pesticides/PCBs (ppb)

4,4'DDE -	37	gamma-Chlordane -	36
4,4'DDD -	46	Arochlor -	4600
4,4'DDT -	140	Endrin Ketone -	52

Inorganics (ppm)

Arsenic -	34.7	Magnesium -	8460
Barium -	226	Manganese -	389
Cadmium -	32.9	Mercury -	5.6
Chromium -	60.6	Nickel -	105
Cobalt -	28.6	Zinc -	4030
Lead -	378	Cyanide -	2.6

Pathways of concern at this source include surface water (wetland), including groundwater to surface water, soil exposure and air. The groundwater pathway was not fully evaluated due to the lack of targets.

4.4 SAUGET SITE Q / SAUGET AND COMPANY LANDFILL

The unpermitted Sauget and Company landfill was operated by Paul Sauget from 1962 to 1975. The site is approximately 90 acres in size, including the southern extension, as delineated by the Alton and Southern Railroad. The site is located in the Mississippi River

009423

floodplain; along the river's bank and on the west side of the U.S. Army Corps of Engineers flood control levee and is situated immediately east of Site R.

The site is unlined, uncapped, has no system for leachate collection or run-on/run-off control, and is covered with cinders and flyash. The landfill served as a municipal landfill for the village of Sauget as well as an industrial landfill for the various industries in the St. Louis area.

Peavey Grain, River City Landscape Supply and Bauer Construction are currently operating at the site. They employ 25, 20, and one person respectively.

The landfill was inundated with waters from the Mississippi River during the flood of 1993 as well as the flood of 1973.

Analytical results from the March, 1994 CERCLA ESI revealed the presence of volatiles, semi-volatiles, PCBs, pesticides, and metals. Contaminants of concern include the following:

Volatiles: (ppb)

Methylene Chloride	1100

Semi-Volatiles: (ppb)

Phenanthrene	170
Benzo(a)Anthracene	410
Benzo(a)Pyrene	250

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Pesticides/PCBs: (ppb)

Dieldrin	380
4,4'DDD	69
4,4'DDE	74
4,4'DDT	82
Endrin ketone	130
gamma-Chlordane	330
Arochlor 1260 (soil)	42000
Arochlor 1260 (drum)	44000000

Inorganics: (ppm)

Arsenic	8.8	Magnesium	9190
Barium	323	Manganese	287
Cadmium	13.1	Mercury	4.9
Chromium	93.7	Vanadium	50.8
Lead	218	Zinc	798

4.5 SAUGET SITE R / RIVER'S EDGE LANDFILL - SAUGET TOXIC

The Monsanto-owned chemical landfill was operated by Sauget and Company and Industrial Disposal from 1957 until 1975. The site is approximately 36 acres in size and is located along the banks of the Mississippi River on the west side of the Army Corps of Engineers flood control levee.

The site is capped with an engineered and maintained cover. Leachate collection systems exist along the sides of the landfill and access to the landfill is barred by an eight foot fence and security cameras.

Analytical results from groundwater and soil samples provided to the Agency by Geraghty and Miller, consultants for the Monsanto Company revealed the presence of volatiles, semi-volatiles,

009435

pesticides, PCBs, and metals. Contaminants of concern include the following:

Volatiles: (ppb)

Groundwater: Phenol - 13000DJ
2-Chlorophenol - 2300J

Soil: Chlorobenzene - 4400J
Xylenes - 4500
4-Methyl-2-Pentanone - 240000J
Tetrachloroethene - 1400000J

Semi-volatiles: (ppb)
Soil: Pentachlorophenol - 240J
Phenol - 1400J
1,4-Dichlorobenzene - 4700
Benzo(a)pyrene - 3700J
2-Chloroaniline - 4800

Pesticides/PCBs: (ppb)
Soil: Arochlor 1260 - 6600

Inorganics:
Groundwater: Antimony - 72.3 ppb
Arsenic - 27.7 ppb
Barium - 403 ppb
Manganese - 20400 ppb

Soils: Barium - 268 ppm
Manganese - 384 ppm

4.6 SAUGET SITE S / DRUM DISPOSAL AREA

Currently, there is no file information available to the Agency concerning the operational history of this site. No sampling has occurred at the site, however, the Agency is planning to conduct a study of the site in the fall of 1994. It has been added to the Area 2 Sites due to its proximity to the other Area 2 Sites and the belief that the site was operated by the same operator as the other Area 2 Sites.

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SECTION 5

MIGRATION PATHWAYS

5.1 INTRODUCTION

This section includes data and information which may be useful in analyzing the impact of the Sauget Area 2 Sites on the four migration pathways identified in the CERCLA Hazard Ranking System (HRS). The four migration pathways are groundwater, surface water, air, and soil exposure.

5.2 GROUNDWATER

The Sauget Area 2 Sites are located in a region known as the American Bottoms. Well logs provided to the IEPA from the Illinois State Water Survey (ISIS) indicate that the upper stratigraphy in this region consists of 70-120 feet of unconsolidated alluvium and glacial outwash overlying Mississippian-aged limestone and sandstone formations (Ste. Genevieve and St. Louis limestones). The valley fill deposits are composed of two formations, the uppermost being the Cahokia Alluvium followed by the Mackinaw Member of the Henry Formation.

The Cahokia Alluvium is composed predominantly of silt, clay, and fine sand deposits, generally indicative of an aggrading environment. In the Sauget area, these deposits vary in thickness, with a range of 15 to 30 feet. This formation was laid down via flood events, eolian activity, bank slumping, erosion and/or slugs

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of material deposited directly by tributary streams. The Mississippi River has frequently reworked this formation in such a way that coarser material is intermingled with finer-grained deposits.

Underlying the Cahokia Alluvium is the Mackinaw Member of the Henry Formation. This formation is composed of sand and gravel from glacial outwash. In the Sauget area, this material rests directly on the bedrock surface and varies between 70 and 100 feet in thickness.

Local hydrogeologic information has been obtained through groundwater monitoring in the Sauget area. In the vicinity of the Area 2 Sites, shallow sand and gravel deposits close to the ground surface yield significant quantities of water for nearby homes and business. Horizontal groundwater movement in the shallow deposits generally follow the land surface topography., with lateral movement toward local discharge zones (wells and small streams), and some movement into the deeper unconsolidated aquifers. Groundwater is encountered between 10 and 28 feet below the ground surface in the area. These figures can be used for the depth of aquifer of concern (AOC). Groundwater in the deeper unconsolidated valley fill deposits generally follows the bedrock surface. Accordingly, groundwater generally flows downstream through the sand and gravel aquifers in much the same direction as the original stream flow, but at a much slower rate.

009428

Most area residents are supplied with drinking water by the Illinois-American Water Company (IAWC) which operates an intake on the Mississippi River upstream of Sauget. IAWC sells water to various water departments and districts within the Sauget/Cahokia area. However, some area residents do obtain drinking water from shallow wells. Illinois Department of Public Health (IDPH) files and Illinois State Water Survey (ISWS) well logs indicate at least 50 residents have wells which are used for drinking or irrigation. These wells are located in Cahokia (23), East St. Louis (5), East Carondolet (16) and Dupo (6). These do not include the wells at the homes on Judith Lane in Cahokia or an unknown number of residents in the Schmids Lake area (approximately 2.3 miles southwest) that are not covered by any public water distribution. A 1983 report by the Southwestern Illinois Metropolitan and Regional Planning Commission (SIMRPC) listed 69 residences in Centreville Township (includes Sauget, Cahokia, Alorton, and Centreville) which use private water systems. The same report lists 57 residences in East St. Louis and 365 residences in Sugarloaf Township (includes Dupo and East Carondolet). SIMRPC based their report on 1980 census data.

5.3 SURFACE WATER PATHWAY

Site drainage is controlled by the Army Corps of Engineers 500 year levee for Sauget Area 2 Sites O, P, and S. Sites Q and R are west of the levee are not protected from the river's flood events, such as those of 1973 and 1993. Drainage from these two sites enter the

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Mississippi directly. There are numerous probable points of entry (PPE) as there are numerous leachate seeps and Site Q's pipe which are all located along Sites Q and R. The American Bottoms outfall at river mile 178.2 would be the PPE for the three sites east of the levee. A 15-mile surface water map is included in Appendix B of this report.

The average discharge of the Mississippi River, as measured over a 128 year period at St. Louis, Missouri, is 179,800 cubic feet per second. The 15-mile surface water target distance limit extends to Mississippi River mile 163.2.

Surface water use in the immediate area (from Mississippi River mile 178 to 174) is limited to recreation and freight trafficking. There is an upstream surface water intake at river mile 181, which supplies most of the Illinois residents within a four-mile radius of the site. The city of St. Louis is also supplied by an upstream surface water intake, about 12 miles north at river mile 190. At downstream river mile 149 (about 20 river miles south of the area), the village of Festus, Missouri (population 10,000) utilizes a Ranney well, adjacent to the Mississippi River, for drinking water. A well of this type is assumed to draw in surface water due to its construction and location to the river. On the Illinois side, the nearest downstream surface water intake is located approximately 65 miles south of the Sauget Area 2 sites, at river mile 110. The intake is used by the town of Chester and surrounding communities

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in Randolph County.

The Illinois Department of Conservation (IDOC)'s Resource Inventory for the Mississippi River (between river miles 178-162) shows fish spawning areas, commercial fishing areas, sport fishing areas, important wildlife habitat and bald eagle use at selected areas within the 15-mile target distance limit.

Annual fish production is reported to be approximately 21,738 pounds within the target distance limit. This figure is based on data available for the harvest between river mile 0 and 200.5 was averaged over two years divided by 200.5 river miles, and multiplied by the number of miles in the target distance limit (TDL) to estimate the annual production of the Mississippi River fishery.

Numerous environmentally sensitive areas are located within the 15-mile TDL. According to the U.S. Department of the Interior's National Wetland Inventory maps, there are several wetland areas located on the sites themselves. Three wetlands are located on Site Q and two on Site P.

5.4 SOIL EXPOSURE/DIRECT CONTACT

Under this pathway, workers located within 200 feet of known contamination were considered. Site O has approximately 50 workers,

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and contaminants were detected at a depth of one and one-half to four feet. Site O is surrounded on two sides by fencing which also surrounds the American Bottoms Regional Treatment Plant. An access road cuts across lagoon number three. Therefore, access is not limited.

P.T.s Showclub is situated on top of Site P and employs approximately 35 persons. The showclub is located within 200 feet of samples taken, which show Level 1 concentrations of PCBs and metals. No barrier exists between areas of observed Level 1 contamination and public roads and the showclub.

There are three separate operations located at Site Q, according to Mr. Richard Burke, President of Eagle Marine Industries, Incorporated of St. Louis and owner of Site Q. River City Landscaping of St. Louis operates a section near the southern section of the main portion of Site Q and employs approximately 20 people. Peavey Grain Company operates near mid-Q and employs approximately 25 persons. Bauer construction is in the process of storing concrete with rebar on the southern part of the main portion of Q. Bauer Construction will be separating the concrete from the rebar, producing gravel from the concrete and spreading it on Site Q.

There are currently no workers operating at Site R.

009432

5.5 AIR PATHWAY

Documented releases to the ambient air were observed in the 1988 Ecology and Environment study of the sites. Also, the elevated HNu readings during the site reconnaissance at Site O in June, 1991, denotes off-gassing of contaminants in the soil. It has been estimated that approximately 2000 people live within a mile of the Area 2 sites and approximately 175,000 people live within a four mile radius of the sites, based upon 1990 U.S. Census Bureau figures. The table below shows the four-mile radius population calculation. According to the Illinois Department of Commerce and Community Affairs (1988), approximately 3200 people are employed within two miles of the site.

Target Population Calculation

City	Population Density/ Total Population	Area w/in 4-Mile Radius	Population w/in 4-mile radius
St. Louis	7,379/sq mi	14.5 sq mi	106,995
E. St. Louis	4,119/sq mi	9.5 sq mi	39,130
Alorton	2,237	100%	2,237
Cahokia	18,904	100%	18,904
Centreville	9,747	75%	7,310
Unincorporated Areas			

Total Target Population = 174,576

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Also of concern in the air pathway are the numerous wetland areas which exist within a four mile radius of the sites. A map showing the se areas may be found in Appendix C. A Bald Eagle nesting area is present on the south tip of Arsenal Island, approximately 2.5 miles southwest of the Sauget Area 2 Sites.

009434

SECTION 6

BIBLIOGRAPHY

Bureau of the Census. County and City Data Book. 1990 U.S. Census data.

Illinois Department of Conservation Wetland Inventory Maps.

Illinois Environmental Protection Agency. Bureau of Land files for the Sauget Area 1 and 2 Sites. St. Clair County.

Illinois Department of Transportation. Aerial Surveys. Aerial Photographs.

Lutz, Richard. Illinois Department of Conservation. Division of Planning.

United States Geological Survey. Topographic Maps. Quadrangle Maps. Cahokia Quadrangle - 1974, Granite City - 1982, Monks Mound - 1974, French Village - 1982.

084035

Sauget Sites Area #2

L1631210020/St. Clair Co. - Sauget WWTP (Site O) ILD000672329
L1631210001/St. Clair Co. - Sauget and Company Landfill (Site Q) ILD000605790
L1631210003/St. Clair Co. - Sauget Toxic (Site R) ILD980606982
L1631210012/St. Clair Co. - Bliss Waste Oil ILD000665836
L1631210006 St. Clair Co. - Monsanto W.G. Krummrich ILD000722074

CERCLA
Screening Site Inspection Report

Illinois Environmental Protection Agency
P.O. Box 19276
Springfield, IL 62794-9276

054178

Sauget Sites Area 2
See CERCLIS for ILD numbers

TABLE 4-1
SUMMARY

SAMPLING POINT	G201 06-27-91		X102 06-26-91		X103 06-26-91		X104 06-26-91		X105 06-26-91		X106 06-26-91	
PARAMETER												
VOLATILES	(ppb)		(ppb)		(ppb)		(ppb)		(ppb)		(ppb)	
Methylene Chloride	18	B	37	B	--		48	B	580	JB	47	B
Acetone	--		27		--		11		--		34	
Carbon Disulfide	--		--		--		--		--		--	
1,1-Dichloroethane	--		--		--		--		--		--	
1,2-Dichloroethene(total)	--		--		--		--		--		--	
Chloroform	33		--		--		--		--		--	
2-Butanone (MEK)	--		--		--		--		--		--	
1,1,1-Trichloroethane	--		--		--		--		--		--	
Bromodichloromethane	5		--		--		--		--		--	
Trichloroethene	--		--		3	J	--		--		--	
Benzene	--		--		--		--		70	J	--	
4-Methyl-2-Pentanone	--		--		--		--		--		--	
Tetrachloroethene	--		--		--		--		--		--	
Toluene	--		--		--		--		1300		64	
Chlorobenzene	--		--		--		--		--		6	
Ethylbenzene	--		--		--		--		--		--	
Xylene(total)	--		--		--		--		430	J	--	
# of TIC's	(0)		(3)		(2)		(2)		(8)		(10)	
SEMIVOLATILES	(ppb)		(ppb)		(ppb)		(ppb)		(ppb)		(ppb)	
1,4-Dichlorobenzene	--		--		--		--		27000		2100	
4-Chloroaniline	--		--		--		--		--		290	J
2-Methylnaphthalene	--		--		--		--		--		--	
Fluorene	--		--		--		--		--		--	
Pentachlorophenol	--		--		--		--		15000		--	
Phenanthrene	--		--		--		--		--		--	
Anthracene	--		--		--		--		--		--	
Pyrene	--		--		--		--		--		--	
bis(2-Ethylhexyl)phthalate	7	JB	--		220	JB	320	JB	--		--	
Benzo(a)pyrene	--		--		--		--		--		--	
# of TIC's	(1)		(20)		(16)		(14)		(20)		(20)	

Table 4-1

Table 4-1 (continued)

Sauget Sites Area 2
See CERCLIS for ILD numbers

SAMPLING POINT	X107 06-26-91		X108 06-26-91		X109 06-26-91		X110 06-26-91		X111 06-26-91		X112 06-27-91	
PARAMETER												
VOLATILES	(ppb)		(ppb)		(ppb)		(ppb)		(ppb)		(ppb)	
Methylene Chloride	40	B	43	B	4	J	5	J	38	B	84	B
Acetone	16		38		--		--		180		--	
Carbon Disulfide	--		--		--		--		15	J	--	
1,1-Dichloroethane	--		--		--		--		11	J	--	
1,2-Dichloroethene(total)	--		--		--		--		13	J	--	
Chloroform	5		--		5	J	4	J	--		10	
2-Butanone (MEK)	--		--		--		--		52	J	--	
1,1,1-Trichloroethane	--		--		--		--		25	J	--	
Bromodichloromethane	--		--		--		--		--		--	
Trichloroethene	--		--		--		--		--		--	
Benzene	--		--		--		--		14	J	--	
4-Methyl-2-Pentanone	--		--		--		--		72		--	
Tetrachloroethene	--		--		--		--		85		--	
Toluene	7		--		--		--		210		8	
Chlorobenzene	--		--		--		--		--		--	
Ethylbenzene	--		--		--		--		210		--	
Xylene(total)	29		--		--		--		480		--	
# of TIC's	(2)		(3)		(1)		(1)		(10)		(3)	
SEMIVOLATILES	(ppb)		(ppb)		(ppb)		(ppb)		(ppb)		(ppb)	
1,4-Dichlorobenzene	--		--		--		--		--		--	
4-Chloroaniline	--		--		--		--		--		--	
2-Methylnaphthalene	35000		--		--		--		--		--	
Fluorene	11000	J	--		--		--		--		--	
Pentachlorophenol	--		--		--		--		--		--	
Phenanthrene	79000		--		--		--		--		--	
Anthracene	6600	J	--		--		--		--		--	
Pyrene	75000		--		--		--		--		--	
bis(2-Ethylhexyl)phthalate	--		290	JB	180	JB	390	JB	--		--	
Benzo(a)pyrene	16000	J	--		--		--		--		--	
# of TIC's	(20)		(20)		(20)		(20)		(20)		(3)	

Sauget Sites Area 2
See CERCLIS for ILD numbers

TABLE 4-1
SUMMARY

SAMPLING POINT	G201 06-27-91	X102 06-26-91	X103 06-26-91	X104 06-26-91	X105 06-26-91	X106 06-26-91
PARAMETER						
PESTICIDES/PCB'S	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
alpha-BHC	--	--	--	--	21	--
beta-BHC	--	--	--	--	--	--
gamma-BHC (Lindane)	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--
Aldrin	--	--	--	--	--	23
Heptachlor epoxide	--	--	--	--	23	13
Endosulfan I	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	590	570
Endrin	--	--	--	--	110	--
Endosulfan II	--	--	--	--	84	--
4,4'-DDD	--	--	--	--	45	--
4,4'-DDT	--	--	--	--	380	58
Methoxychlor (Mariate)	--	--	--	--	--	--
Endrin Ketone	--	--	--	--	--	110
Aroclor-1242	--	--	--	--	--	--
Aroclor-1254	--	2200	--	--	--	--
Aroclor-1260	--	--	--	--	--	--
INORGANICS	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Aluminum	420	14500	8000	22200	2300	1800
Arsenic	--	6.7	4.8	4.6	2.3	4.0
Barium	83	160	210	120	380	220
Beryllium	--	1.5	120	2.7	--	--
Cadmium	--	--	--	--	1.1	5.7
Calcium	49600	3260	--	6120	58800	106000
Chromium	--	13	8.3	35	12	23
Cobalt	--	--	--	12	--	--
Copper	--	31	7.4	22	47	38
Iron	58	12700	10400	19800	7710	5270
Lead	12	59	11.8	56	83	84
Magnesium	17900	2980	5210	4060	2360	4240
Manganese	--	280	190	530	78	62
Mercury	--	--	--	--	0.75	--
Nickel	--	19	14	34	27	10
Potassium	3160	2730	1690	2140	280	260
Selenium	--	--	--	--	--	--
Sodium	9770	--	--	--	1150	1400
Vanadium	--	37	26	56	17	11
Zinc	--	190	38	100	790	560
Cyanide	--	--	--	--	--	--
Sulfate	42000	220	38	190	190	2700
Sulfide	6600	98	--	--	490	330

Table 4-1 (continued)

Table 4-1 (continued)

Sauget Sites Area 2
See CERCLIS for ILD numbers

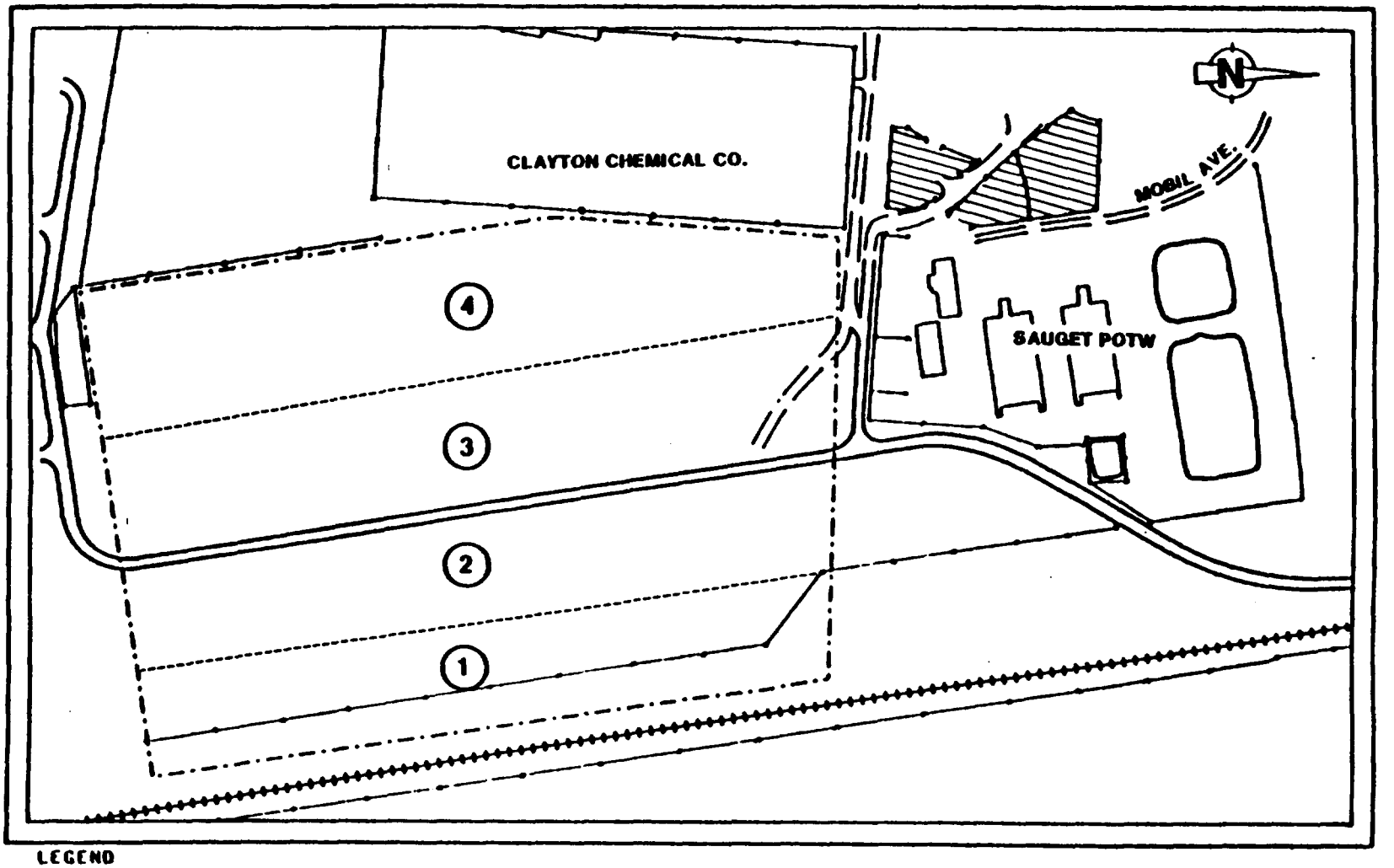
SAMPLING POINT	X107 06-26-91	X108 06-26-91	X109 06-26-91	X110 06-26-91	X111 06-26-91	X112 06-27-91
PARAMETER						
PESTICIDES/PCB'S	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
alpha-BHC	--	--	--	--	--	--
beta-BHC	--	17	--	--	--	--
gamma-BHC (Lindane)	420	--	--	--	--	27
Heptachlor	--	--	--	--	--	29
Aldrin	210	8.7	--	--	--	11
Heptachlor epoxide	270	--	--	--	--	23
Endosulfan I	48	--	--	--	--	--
Dieldrin	2000	21	--	--	--	--
4,4'-DDE	--	--	--	--	--	26
Endrin	--	20	--	--	--	140
Endosulfan II	1600	19	--	--	--	--
4,4'-DDD	240	--	--	--	--	--
4,4'-DDT	1600	35	19	--	--	120
Methoxychlor (Mariate)	2400	--	--	--	--	--
Endrin Ketone	550	17	--	--	--	--
Aroclor-1242	--	--	--	9900 C	--	--
Aroclor-1254	--	--	--	9500 C	17000	--
Aroclor-1260	--	--	--	8100 C	--	--
INORGANICS	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Aluminum	5600	8900	16000	6900	2100	37200
Arsenic	3.4	3.1	4.5	2.6	2.6	11
Barium	81	130	180	84	390	320
Beryllium	--	--	1.1	--	--	2.8
Cadmium	--	--	--	1.6	--	7.3
Calcium	17000	5560	6540	2450	48100	9300
Chromium	6.1	9.2	14	13	20	29
Cobalt	--	--	9.1	--	--	17
Copper	4.7	24	13	10	16	110
Iron	7110	10900	17700	8290	12500	37900
Lead	49	62	43	50	62	190
Magnesium	3960	3040	3790	1750	650	5010
Manganese	150	200	520	100	110	780
Mercury	--	--	--	--	--	0.19
Nickel	9.0	14	18	11	20	38
Potassium	930	1580	2370	1030	260	5240
Selenium	--	--	--	1.3	--	1.1
Sodium	--	--	--	--	1450	--
Vanadium	17	25	38	19	--	80
Zinc	46	150	100	120	150	760
Cyanide	--	--	--	--	--	0.51
Sulfate	170	110	63	70	310	76
Sulfide	130	--	--	--	220	--

E & E

Expanded Site Investigation

1988

0068483



LEGEND

(2) FORMER SLUDGE LAGOON

APPROXIMATE LAGOON BOUNDARY

AREA OF INDENTIFIED SOIL CONTAMINATION

SCALE

0 100 500 1000 FEET

FIGURE O-1
FORMER SLUDGE LAGOONS AND CONTAMINATED SOIL AREAS AT SITE O

TABLE O-1: IDENTIFIED ORGANIC COMPOUNDS IN SAMPLES FROM TRENCH EXCAVATION AT SITE O (COLLECTED JULY 20, 1984 BY RUSSELL AND AXON, INC.)[a]

PARAMETERS	SAMPLE LOCATIONS		
	SAMPLE 1	SAMPLE 2	BLANK
2,4-Dichlorophenol	50.1	159	
Pentachlorophenol	3,600		
2,4,6-Trichlorophenol	39.3	2.2	
Crysene	123	0.45	
Benzo-k-Fluoranthene	15.9		0.098
Bis(2-Ethylhexyl) Phthalate	10.9	12.2	
1,2-Chlorobenzene		8.01	0.1
1,4-Dichlorobenzene		5.06	
Di-Butyl Phthalate	100	1.6	
Phenanthrene	102	2.1	
Pyrene	65.3	1.6	
1,2,4-Trichlorobenzene	*	*	
PCBs	4.2	1.0	
Benzo(a)Pyrene			

NOTE: All results in ppm.
Blanks indicate compound not detected.
* Identified, but values cannot be verified.
a Analysis performed by Envirodyne Engineers, Inc. (EEI), St. Louis, MO.

09485

TABLE 02: ANALYTICAL RESULTS FOR SOIL SAMPLES AT SITE 0 (SPLIT SAMPLES COLLECTED FEBRUARY 19, 1983 BY IEPA AND EEI)

	PARAMETERS				
SAMPLE NO. (Depth)	PCB - IEPA	PCB - EEI	TCDD - IEPA[a]	TCDD - EEI	Comment
1 (0" - F")	1,500	3,690			
2A (0"- F")	7,600	5,350			
2B (7" - 13")	390	716			
3A (0" - 7")	9,100	137,250			
3B (7" - 13")	40	28			
4A (0" - 6")	20,000	21,020			
4A (0" - 6")	-	15,510			Duplicate-EEI
4B (6" - 13")	54,000	149,600			
5A (0" - 6")	32,000	112,930	18	28	
5A (0" - 6")	-	-	17	-	Duplicate-IEPA
5B (6" - 14")	20,000	12,050	4.1	5.1	
6 (0" - 8")	120	90			

NOTE: All results in ng/g (ppb).
Blanks indicate below detection limits.
- Indicates parameter not analyzed.
a Hazelton Raltech, Inc. performed TCDD analysis for IEPA.

TABLE O-3: ANALYTICAL RESULTS FOR SOIL SAMPLES AT SITE O. (SPLIT SAMPLES COLLECTED MARCH 12, 1983 BY IEPA AND EEI)

SAMPLE NO. (Depth)	PARAMETERS TCDD - IEPA[a]	TCDD - EEI	COMMENTS
7A (0"- 6")			
7B (8" - 16")	1.8	44	
8A (0" - 6")	77	Interferences	
8B (6" - 12)	*	19	
8C (13" - 18")		37	
8D (18" - 25")		56	Duplicate
8D (18" - 25")			
9A (0" - 6")	1.3		
9B (6" - 12")	*		
9C (14" - 21")			
9D (22" - 28")	0.92		Control Sample
10A	12		Control Sample
10B	*	13	
11A (0" - 6")			
11B (G" - 18")	*		
12 (10" - 19")	*		
13A (0" - 7")			
13B (7" - 18")	13	13	
14 (0" - 6")	25	170	Composite of soil samples
15 (0" - 16")			
16 (0" - 18")			

NOTE: All results in ng/g (ppb).
Blanks indicate below detection limits.
* Sample not collected by IEPA.
a Hazelton Raltech, Inc. performed TCDD analysis for IEPA.

009487

APPENDIX E

SUMMARY TABLES FOR SITE-SPECIFIC CONTAMINANT LOADING TO THE MISSISSIPPI RIVER

0009458

Table E-9

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT SHALLOW ZONE IN SITE O***

	Area (ft^2)	Flow Rate Q (ft^3/day)	TOCs* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PHAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PHAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PHAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	95,142	-789.69	132,000	-6.51	119,000	-5.87	ND	--	ND	--	--	ND	--
February	94,729	-672.56	132,000	-5.55	119,000	-5.00	ND	--	ND	--	--	ND	--
March	10,260	-122.83	132,000	-1.01	119,000	-0.91	ND	--	ND	--	--	ND	--
April	105,660	359.27	132,000	2.96	119,000	2.67	ND	--	ND	--	--	ND	--
May	111,833	335.50	132,000	2.77	119,000	2.49	ND	--	ND	--	--	ND	--
June	111,270	-46.51	132,000	-0.37	119,000	-0.33	ND	--	ND	--	--	ND	--
July	107,547	-451.70	132,000	-3.73	119,000	-3.36	ND	--	ND	--	--	ND	--
August	99,691	-917.16	132,000	-7.57	119,000	-6.82	ND	--	ND	--	--	ND	--
September	94,128	-1,035.41	132,000	-8.54	119,000	-7.70	ND	--	ND	--	--	ND	--
October	93,113	-875.27	132,000	-7.22	119,000	-6.51	ND	--	ND	--	--	ND	--
November	99,654	-318.89	132,000	-2.63	119,000	-2.37	ND	--	ND	--	--	ND	--
December	100,029	-470.12	132,000	-3.88	119,000	-3.50	ND	--	ND	--	--	ND	--

* Total Organic Carbon.

** Polynuclear aromatics.

*** Data from monitoring wells EE-21, EE-22, EE-23, and EE-24 were used to calculate weighted average concentrations.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1990.

APPENDIX D

ANALYTICAL RESULTS

Table E-10

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT INTERMEDIATE ZONE IN SITE O***

	Area (ft^2)	Flow Rate Q (ft^3/day)	TOCs* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PNAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	52,363	-434.62	100	-0.00259	71	-0.001917	ND	--	ND	--	--	ND	--
February	52,363	-371.78	100	-0.0023	71	-0.00165	ND	--	ND	--	--	ND	--
March	52,363	-62.83	100	-0.00039	71	-0.00028	ND	--	ND	--	--	ND	--
April	52,363	178.03	100	0.00111	71	+0.00079	ND	--	ND	--	--	ND	--
May	52,363	157.09	100	0.00098	71	+0.000697	ND	--	ND	--	--	ND	--
June	52,363	-20.95	100	-0.00013	71	-0.000093	ND	--	ND	--	--	ND	--
July	52,363	-219.93	100	-0.00137	71	-0.000976	ND	--	ND	--	--	ND	--
August	52,363	-481.75	100	-0.003	71	-0.00214	ND	--	ND	--	--	ND	--
September	52,363	-576.00	100	-0.0036	71	-0.00256	ND	--	ND	--	--	ND	--
October	52,363	-492.22	100	-0.0031	71	-0.00218	ND	--	ND	--	--	ND	--
November	52,363	-167.57	100	-0.00104	71	-0.00074	ND	--	ND	--	--	ND	--
December	52,363	-244.10	100	-0.00154	71	-0.00109	ND	--	ND	--	--	ND	--

* Total organic carbon.

** Polynuclear aromatics.

*** Data from monitoring wells GM19D and GM20D (Geraghty & Miller 1986; 1986a) were used to calculate weighted average calculations.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988.

Table E-11

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT SHALLOW ZONE IN SITE Q***

	Area (ft^2)	Flow Rate Q (ft^3/day)	TOCs* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PHAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PHAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PHAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	105,370	-1,369.33	235	-0.02011	130	-0.01112	ND	--	ND	--	--	ND	--
February	109,001	-067.62	235	-0.0137	130	-0.00700	ND	--	ND	--	--	ND	--
March	135,036	763.21	235	0.0115	130	0.00636	ND	--	ND	--	--	ND	--
April	146,401	1,551.05	235	0.0228	130	0.01261	ND	--	ND	--	--	ND	--
May	150,783	889.62	235	0.01307	130	0.00723	ND	--	ND	--	--	ND	--
June	140,815	-267.55	235	-0.00393	130	-0.00217	ND	--	ND	--	--	ND	--
July	129,257	-930.65	235	-0.01367	130	-0.00756	ND	--	ND	--	--	ND	--
August	108,549	-1,639.10	235	-0.0241	130	-0.01330	ND	--	ND	--	--	ND	--
September	99,156	-1,556.70	235	-0.0229	130	-0.01265	ND	--	ND	--	--	ND	--
October	103,733	-1,130.60	235	-0.0166	130	-0.00920	ND	--	ND	--	--	ND	--
November	120,390	372.31	235	0.0055	130	0.00300	ND	--	ND	--	--	ND	--
December	121,159	-594.67	235	-0.0087	130	-0.00483	ND	--	ND	--	--	ND	--

* Total organic carbon.

** Polynuclear aromatics.

*** Data from monitoring wells EE-09, EE-10, and EE-06 were used to calculate weighted average concentrations.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988.

Table E-12

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT SHALLOW ZONE IN SITE B***

	Area (ft^2)	Flow Rate Q (ft^3/day)	TOCs* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PNAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	52,293	-852.38	12,510	-0.67	1,555	-0.003	ND	--	ND	--	--	ND	--
February	54,492	-403.25	12,510	-0.31	1,555	-0.039	ND	--	ND	--	--	ND	--
March	67,015	757.17	12,510	0.58	1,555	0.072	ND	--	ND	--	--	ND	--
April	72,456	1,068.00	12,510	0.84	1,555	0.1038	ND	--	ND	--	--	ND	--
May	74,831	671.43	12,510	0.57	1,555	0.046	ND	--	ND	--	--	ND	--
June	69,003	-230.58	12,510	-0.18	1,555	-0.022	ND	--	ND	--	--	ND	--
July	64,148	-641.46	12,510	-0.50	1,555	-0.062	ND	--	ND	--	--	ND	--
August	53,871	-953.50	12,510	-0.75	1,555	-0.091	ND	--	ND	--	--	ND	--
September	49,210	-536.40	12,510	-0.42	1,555	-0.052	ND	--	ND	--	--	ND	--
October	51,400	-561.16	12,510	-0.44	1,555	-0.054	ND	--	ND	--	--	ND	--
November	63,717	522.47	12,510	0.41	1,555	0.051	ND	--	ND	--	--	ND	--
December	60,229	-361.37	12,510	-0.28	1,555	-0.035	ND	--	ND	--	--	ND	--

* Total Organic Carbon.

** Polynuclear Aromatics.

*** Data from monitoring wells P-1, P-7, P-11, B-26A, and B-28A (Geraghty & Miller 1986; 1986a) were used to calculate weighted average concentrations.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988.

Table E-13

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT INTERMEDIATE ZONE IN SITE B***

	Area (ft^2)	Flow Rate Q (ft^3/day)	TOCs* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PNA** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PNAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	107,700	-74,313	8,998	-41.79	4,440	-20.62	ND	--	ND	--	--	ND	--
February	107,700	-23,694	8,998	-13.32	4,440	-6.57	ND	--	ND	--	--	ND	--
March	107,700	62,466	8,998	35.13	4,440	17.33	ND	--	ND	--	--	ND	--
April	107,700	70,543	8,998	39.67	4,440	19.57	ND	--	ND	--	--	ND	--
May	107,700	30,048	8,998	16.90	4,440	8.34	ND	--	ND	--	--	ND	--
June	107,700	-17,771	8,998	-9.99	4,440	-4.93	ND	--	ND	--	--	ND	--
July	107,700	-42,003	8,998	-23.62	4,440	-11.66	ND	--	ND	--	--	ND	--
August	107,700	-81,852	8,998	-46.03	4,440	-22.71	ND	--	ND	--	--	ND	--
September	107,700	-85,621	8,998	-48.15	4,440	-23.76	ND	--	ND	--	--	ND	--
October	107,700	-37,156	8,998	-20.89	4,440	-10.31	ND	--	ND	--	--	ND	--
November	107,700	48,465	8,998	27.25	4,440	13.45	ND	--	ND	--	--	ND	--
December	107,700	-21,540	8,998	-12.11	4,440	-5.98	ND	--	ND	--	--	ND	--

* Total Organic Carbon.

** Polynuclear Aromatics.

*** Data from monitoring wells GM27B and GM28B (Geraghty & Miller 1986; 1986a) were used to calculate weighted average concentrations.

ND Not Detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988.

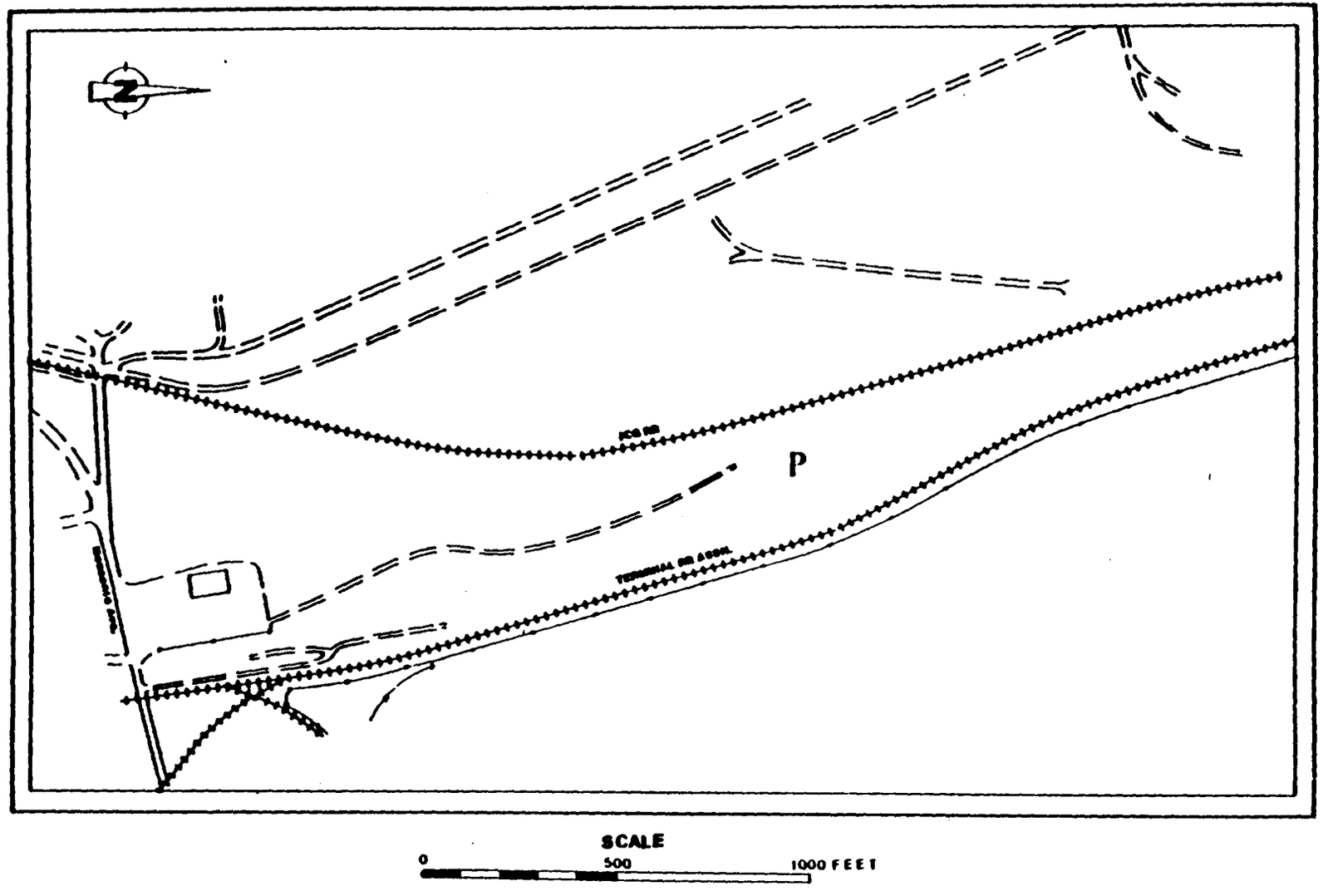
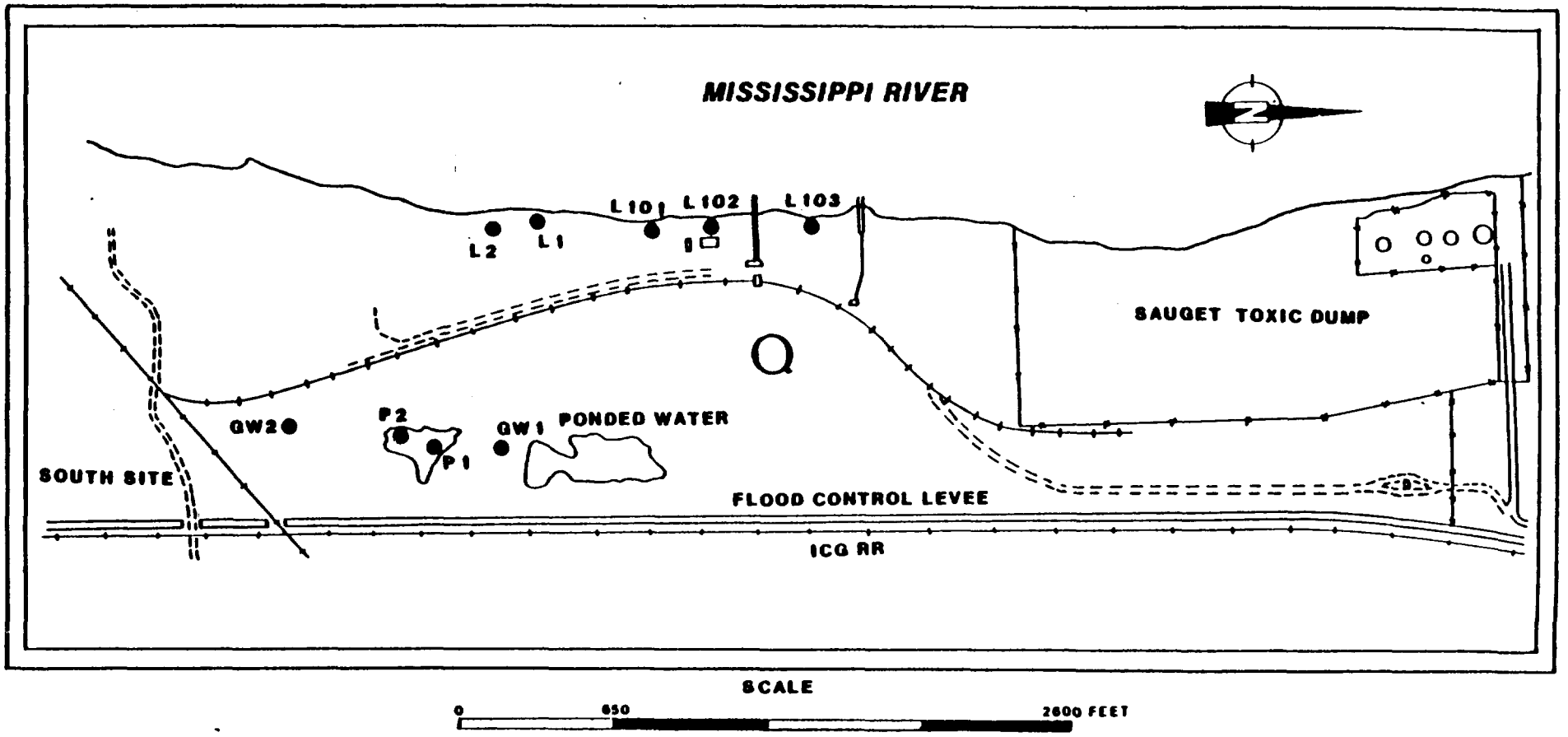


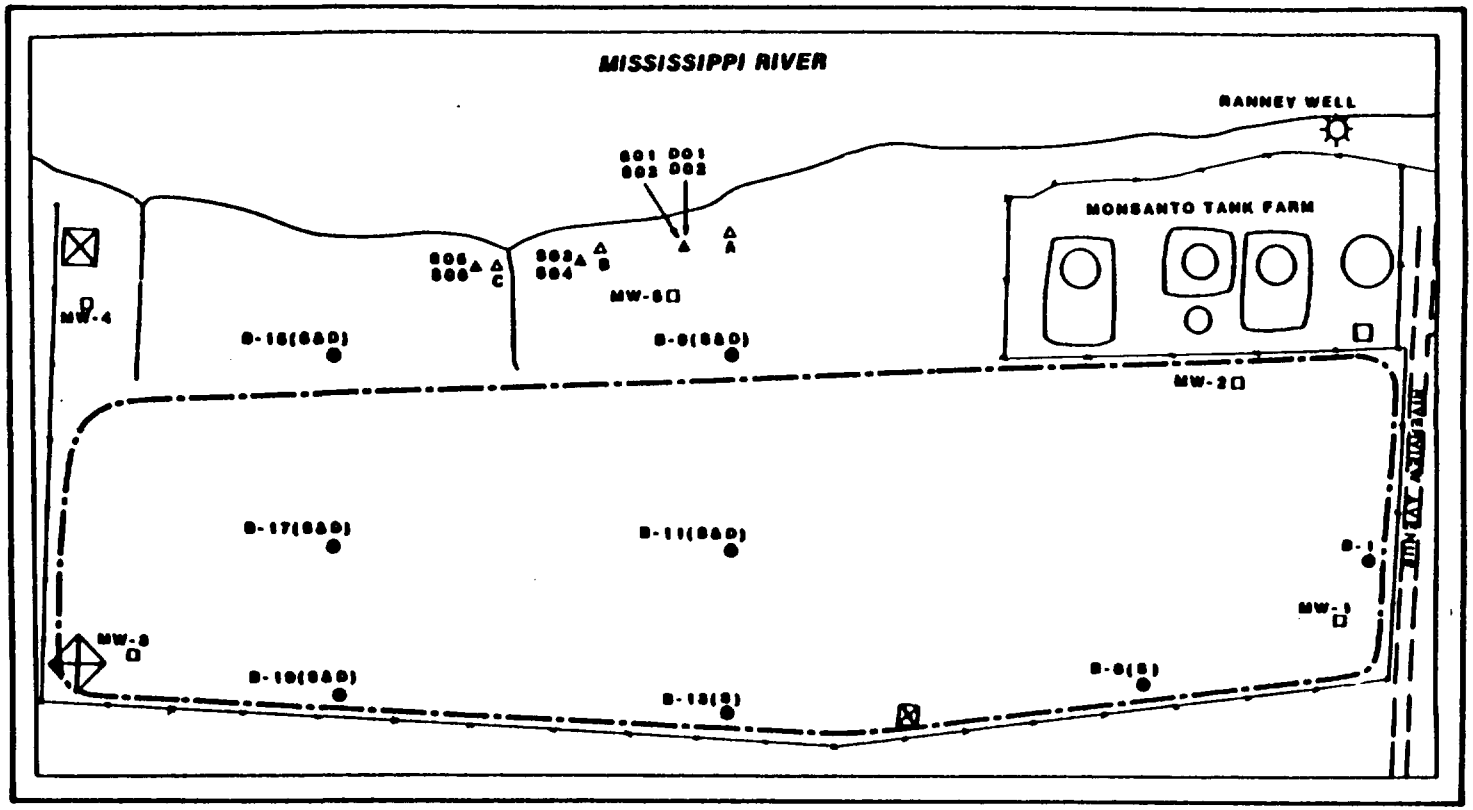
FIGURE P-1
DEAD CREEK SITE AREA P



LEGEND

GW1	IEPA GROUNDWATER SAMPLING LOCATION
P1	IEPA SURFACE WATER SAMPLING LOCATION
L1	IEPA LEACHATE SAMPLING LOCATION

FIGURE Q-1
DEAD CREEK SITE AREA Q WITH SAMPLING LOCATIONS



LEGEND

A	IEPA LEACHATE & SEDIMENT SAMPLING LOCATION
S01	USEPA - FIT LEACHATE & SEDIMENT SAMPLING LOCATION
D01	DUPLICATE SAMPLE
MW-1	IEPA MONITORING WELL SAMPLING LOCATION (PRIOR TO 1979)
B-1	IEPA MONITORING WELL SAMPLING LOCATION (1979-1981)

SCALE
0 100 400 800 FEET

FIGURE R-1
STATE AND USEPA SAMPLING LOCATIONS AT SITE R.

008497

TABLE Q-1: ANALYSIS OF SURFACE AND GROUND WATER SAMPLES COLLECTED BY IEPA AT SITE Q

	SAMPLE LOCATIONS AND DATES					
	10/17/72		1-17-73		4-10-73	4-26-73
PARAMETERS	P-1	L-1	GW-1	GW-2	P-2	P-3
Calcium	80	56	310	137	250	280
Magnesium	8	26	57	205	42	44
Sodium	23	169	275	13	230	205
Potassium	6	30	10	4	85	70
Ammonia	0.19	21	NA	NA	32	36
Boron	7	6.5	NA	NA	2.6	2.8
Cadmium			0.02		NA	0.02
Chromium (Total)					NA	0.03
Copper		0.01			0.02	
Iron		46			60	67
Lead		0.02			0.07	0.07
Manganese					6	6.5
Mercury (ppb)	0.5	0.5			0.4	0.6
Nickel					0.3	0.2
Silver			0.01			
Zinc		0.2		0.1	4.2	5
Alkalinity	46	810	645	375	420	
Chloride	19	4	310	24	210	205
Nitrate	NA	NA	NA	NA	NA	
Phosphate	NA	NA	NA	NA	3.7	5
Sulfate	230	18	325	25	350	270
Hardness	240	560	NA	NA	970	930
Phenols	NA	NA	0.02		NA	NA

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limit.
NA indicated parameter not analyzed.
P = Ponded water, L = Leachate, GW = Groundwater

0054198

TABLE Q-2: ANALYSIS OF LEACHATE SAMPLES FROM SITE Q (COLLECTED OCTOBER 28, 1981 AND SEPTEMBER 29, 1983 BY IEPA)

	SAMPLE LOCATIONS AND DATES				
	10-28-81		9-29-83		
PARAMETERS	L-1	L-2	L101	L012	L103
Alkalinity	255	293	191	158	242
Ammonia	3.8	2.8	6.5	4	3.7
Arsenic	0.057	0.022	0.11	0.034	0.012
Barium	0.8	0.2	0.5	0.4	0.3
Boron	5.8	5.6	37.5	42	23
Cadmium					
COD	445	35	87	94	71
Chloride	15	17	23	22	31
Chromium (Total)	0.08		0.03	0.01	
Copper	0.2	0.04	1.2	0.06	
Cyanide				0.01	0.01
Hardness	1330	1220	1225	1360	1045
Iron	207	17.5	86	36	6.4
Lead	0.26		0.13	0.08	0.02
Magnesium	145	67	81	73	44.5
Manganese	7.7	34	6.7	6.8	2.7
Mercury					
Nickel	0.3		0.1	0.1	
Nitrate	0.24	0.4	0.21	6.1	1.8
Phosphorus	6.1	0.74	3.1	1.3	0.86
Potassium	16.5	9.5	13.4	13.5	17
R.O.E.	1980	1829	1880	2118	1563
Silver	0.02	0.01	0.01		
Sodium	55.7	53.3	56	70	51
Sulfate	1196	1059	1200	1350	900
Zinc	1.2	0.2	0.3	0.2	
Phenol	0.005	0.005			
PCBs (PPB)	0.7	1	0.5		0.1
2,3-D(PPB)					

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limits.

009469

008500

TABLE Q-3: ANALYSIS OF FLYASH USED AS COVER FROM STOCKPILES AT SITE Q (SAMPLED BY IEPA IN 1972)

SAMPLE NUMBERS AND DATES

PARAMETERS	8/3/72			10/16/72		
	5 Years	1 Year	Fresh	5 Years	1 Year	Fresh
Calcium	125	245	285	580	120	130
Magnesium	4.6	6.4	0.5	9	2	
Sodium	10	7.5	58	140	1.3	36
Potassium	7	11	79	56	2	45
Ammonia	1.8	0.36	0.47	0.75	0.05	0.15
Arsenic	NA	NA	NA			0.02
Barium	0.1		0.1			
Boron	0.9	3.6	1.8	1.3	0.6	2.4
Cadmium	0.01	0.01	0.02	0.02		
Chromium				0.03		
Copper	0.09	0.01	0.01	0.06		
Iron	1.3	0.1		0.85	0.1	
Lead	0.03			0.02	0.01	0.02
Manganese	0.69	0.03	0.03	0.75		
Mercury (ppb)	6			6.2		
Nickel	0.1	0.1	0.2	0.12	0.05	0.05
Silver	0.005	0.005	0.005			
Zinc	0.8	0.1		1.05	0.05	0.02
Alkalinity	140	65	120	120	80	135
Chloride	10	12	60	150	4	49
Flouride	0.2	0.2	0.1	0.3	0.3	0.2
Phosphate	NA	NA	NA	1.6	0.07	0.05
Sulfate	290	950	1300	1600	250	270
Hardness	420	1000	1400	1600	340	350
COD	250	33	52	460	26	45

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limit.
NA indicates parameter not analyzed.

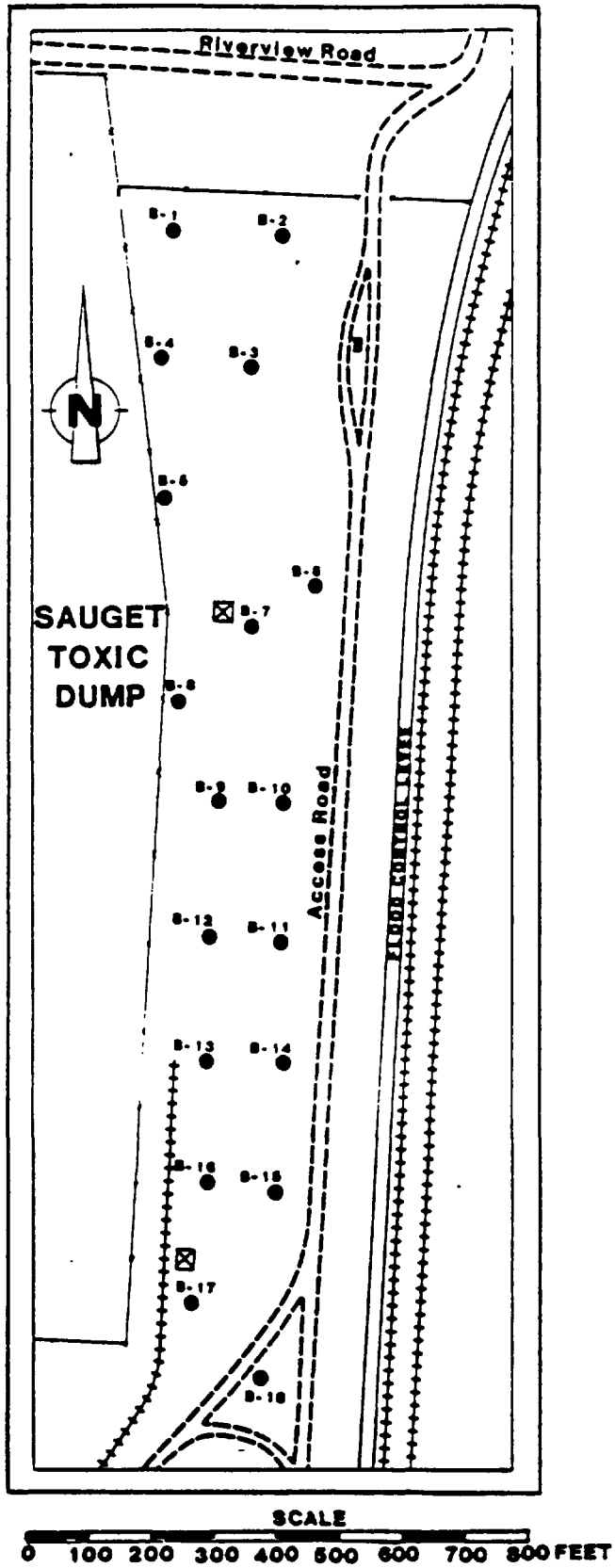


FIGURE Q-2
USEPA - FIT SUBSURFACE SOIL SAMPLING LOCATIONS AT SITE Q

005501

TABLE Q-4: IDENTIFIED ORGANIC COMPOUNDS IN SUBSURFACE SOIL SAMPLES FROM SITE Q (SAMPLES COLLECTED JULY 13, THROUGH JULY 20, 1983 BY ECOLOGY AND ENVIRONMENT, INC.)

PARAMETERS	BORING/SAMPLE NUMBER / DEPTH (in feet)							
	B1A 10.0-11.5	B1B 17.5-19.0	B2A 13.5-15.5	B2B 17.0-19.0	B3A 10.0-12.0	B3B 13.5-15.5	B4A 10.0-12.0	B4B 13.5-15.5
2,3,7,8-TCDD								3.31
2,4,6-trichlorophenol	2,500	170,000	22,000	520	1,400	1,500		94,000
2-chlorophenol	24,000	65,000	800		1,500	LT	57,000	360,000
2,4-dichlorophenol	66,000	3,100,000	31,000	1700	760	4,500		370,000
2,4-dimethyphenol			500					72,000
4,6-dinitro-2-methylphenol						11,000		100,000
pentachlorophenol		86,000	5,400	LT	3,200	100,000	98,000	88,000
phenol	24,000	55,000	45,000	4,400				
2-methylphenol-					560	LT		330,000
4-methylphenol			LT	LT				
2,4,5-trichlorophenol			1,200	2,800			LT	100,000
acenaphthene				460		LT		20,000
1,2,4-trichlorobenzene	LT		LT	720	LT	760	LT	66,000
1,2-dichlorobenzene			1,800	1,200				LT
1,4-dichlorobenzene								LT
fluoranthene			11,000	8,300				56,000
isophorone		8,800	400					
napthalene								62,000
nitrobenzene				LT				
N-nitrosodiphenylamine								LT
bis(2-ethylhexyl)phthalate								
butyl benzyl phthalate	LT							
di-n-butyl phthalate								
di-n-octyl phthalate								
diethyl phthalate								
benzo(a)anthracene								
benzo(a)pyrene								
benzo(b)fluoranthene				400				
benzo(k)fluoranthene								
chrysene								LT
anthracene			600	3,000				LT
benzo(ghi)perylene			1,000	2,700				
fluorene								
phenanthrene								LT
dibenzo(a,h)anthracene			LT	LT				
indeno(1,2,3-cd)phrene								
pyrene			LT					
aniline			1,000	3,000				
4-chloraniline			2,000	2,300				
dibenzofuran			4,600					
2-methylnapthalene							10,000	40,000
3-nitroaniline								
benzene								
Chlorobenzene								
1,2-dichloroethane								
1,1-dichloroethane								
1,1,2,2-tetrachloroethane								
1,2-trans-dichloroethene			7.4	3.7	LM	8.0		
ethylbenzene								
methylene chloride								
tetrachloroethene						977		LM
toluene			960					
trichloroethene						LT		
acetone								
2-butanone								5,100
4-methyl-2-pentanone				2.0				
styrene								
O-xylene								
PCB-1242					69.6			
PCB1254	1,000		485.2					
PCB-1248			2,120.6				68,000	1,000,000
PCB-1260								
PCB-1016								
Total PCB								

NOTE: All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P= The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = not detected.

009502

TABLE Q-4 (continued)

PARAMETERS	85A 13.5-15.5	85B 17.0-19.0	86A 10.0-12.0	86B 13.5-15.5	87A 10.0-12.0	87B 13.5-15.5	88A 13.5-15.5	88B 17.5-19.5
	BORING/SAMPLE NUMBER Depth (in feet)							
2,3,7,8-TCDD								0.11
2,4,6-trichlorophenol	130,000	26,000	2,700	4,800	2,700		480,000	10,000
2-chlorophenol	31,000	8,400	1,600	1,600	LT			
2,4-dichlorophenol	560,000	260,000	17,000	15,000	6,100		1,500,000	64,000
2,4-dimethyphenol			2,000					
4,6-dinitro-2-methylphenol								
pentachlorophenol				16,000	25,000	31,000		
phenol	140,000	250,000	45,000	11,000	1,800			
2-methylphenol-			1,400	600				
4-methylphenol		36,000	7,000	1,400				
2,4,5-trichlorophenol								
acenaphthene								
1,2,4-trichlorobenzene	86,000	13,000					120,000	
1,2-dichlorobenzene	100,000	28,000	LT				180,000	
1,4-dichlorobenzene			3,100	800				
fluoranthene								
isophorone								
napthalene		LT	800	LT			380,000	LT
nitorbenzene	27,000	11,000	LT				52,000	
N-nitrosodiphenylamine								
bis(2-ethylhexyl)phthalate								
butyl benzyl phthalate								
di-n-butyl phthalate			400	LT				
di-n-octyl phthalate								
diethyl phthalate								
benzo(a)anthracene								
benzo(a)pyrene						LT		
benzo(b)fluoranthene						LT		
benzo(k)fluoranthene						LT		
chrysene						LT		
anthracene								
benzo(ghi)perylene								
fluorene								
phenanthrene								
dibenzo(a,h)anthracene								
indeno(1,2,3-cd)phrene								
pyrene								
aniline								
4-chloraniline			9,000					
dibenzofuran								
2-methylnapthalene								
3-nitroaniline								
benzene						3.2	LM	
Chlorobenzene	18,000	27,000	100,000	8.4		4.2	7,100	
1,2-dichloroethane			12,000	3.4				
1,1-dichloroethane								
1,1,2,2-tetrachloroethane								
1,2-trans-dichloroethene								
ethylbenzene			46,000	3.8		4.5		
methylene chloride				15.0	86.0	45.0	LT	
tetrachloroethene					LT			
toluene			50,000	LT		6.1		
trichloroethene						LT		
acetone				330	200	2,600		
2-butanone				LT	LT	LT		
4-methyl-2-pentanone								
styrene								
O-xylene			140,000	13.0	LT	22.0		
PCB-1242	70,000						1,700	2,700
PCB1254	60,000							
PCB-1248				4,700				
PCB-1260					590	13,000	880	1,500
PCB-1016					2,300	46,000		
Total PCB		66,000						

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P = The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = Not detected.

00503

TABLE Q-4 (Continued)

PARAMETERS	B9A 15.0-17.0	B9B 17.0-19.0	B10A 17.0-19.0	B10B 19.0-21.0	B11A 17.0-19.0	B11B 19.0-21.0	B12A 17.0-19.0	B12B 19.0-21.0
	BORING/SAMPLE NUMBER DEPTH (in feet)							
2,3,7,8-TCDD			P		P	P		
2,4,6-trichlorophenol	LT	600	48,000	640			4,400	9,400
2-chlorophenol	640	1,100	1,700	LT			1,200	520
2,4-dichlorophenol	7,400	9,800	170,000	9,60	3,200	20,000	8,800	4,200
2,4-dimethyphenol		LT						
4,6-dinitro-2-methylphenol								
pentachlorophenol		4,800		2,200			24,000	920
phenol	7,500	14,000	32,000	11,000	6,200	37,000	17,000	7,500
2-methylphenol-								
4-methylphenol	1,400	2,300	2,700				1,000	720
2,4,5-trichlorophenol								
acenaphthene								
1,2,4-trichlorobenzene			11,000					
1,2-dichlorobenzene			11,000		LT			800
1,4-dichlorobenzene		LT	27,000		LT			1,000
fluoranthene								
isophorone					17,000	LT		720
naphthalene			6,500		72,000	35,000	LT	640
nitrobenzene								
N-nitrosodiphenylamine						LT	LT	
bis (2-ethylhexyl)phthalate	440				52,000	34,000	440	
butyl benzyl phthalate					LT			
di-n-butyl phthalate		1,500	LT		23,000	LT		
di-n-octyl phthalate								
diethyl phthalate	LT	840						
benzo(a)anthracene								
benzo(a)pyrene								
benzo(b)fluoranthene								1,000
benzo(k)fluoranthene								1,000
chrysene					6,400			
anthracene								
benzo(ghi)perylene								
fluorene								
phenanthrene					5,200			
dibenzo(a,h)anthracene								
indeno(1,2,3-cd)pyrene								
pyrene					5,600			
aniline								
4-chloroaniline								LT
dibenzofuran								
2-methylnapthalene					10,000			
3-nitroaniline								
benzene			LM					
Chlorobenzene			5,200		LM			
1,2-dichloroethane								
1,1-dichloroethane								
1,1,2,2-tetrachloroethane								
1,2-trans-dichloroethene								
ethylbenzene			6,500		220,000			
methylene chloride	3.3	300	8,700	LT				
tetrachloroethene								
toluene			130,000		1,300,000	100,000		LM
trichloroethene					42,000			
acetone	210	14,000		4,400				
2-butanone								
4-methyl-2-pentanone							LT	
styrene								
O-xylene			30,000		650,000	70,000		LM
PCB-1242	600		NA					
PCB-1254			NA					
PCB-1248			NA		38,000	70,000		
PCB-1260	1,500	1,300	NA	120	45,000	681,000	7,000	5,000
PCB-1016								

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P = The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = Not detected.

TABLE Q-4 (Continued)

PARAMETERS	B13A 17.0-19.0	B13B 19.0-21.0	B14A 17.0-19.0	B14B 19.0-21.0	B15A 22.0-24.0	B15B 24.0-26.0	B16A 22.0-24.0	B17A 22.0-24.0
	BORING/SAMPLE NUMBER Depth (in feet)							
2,3,7,8-TCDD								
2,4,6-trichlorophenol	20,000	4,600			800	1,900	7,700	6,400
2-chlorophenol	2,500	3,800			600	1,600	4,600	100,000
2,4-dichlorophenol	9,400	11,000	460,000			11,000	27,000	120,000
2,4-dimethyphenol		LT					680	
4,6-dinitro-2-methylphenol	LT							
pentachlorophenol	12,000	44,000	16,000	16,000	4,200	12,000	39,000	26,000
phenol	8,900	15,000			6,000	13,000	16,000	50,000
2-methylphenol-								
4-methylphenol	920	1,400		16,000		1,000	1,900	9,200
2,4,5-trichlorophenol							LT	
acenaphthene								
1,2,4-trichlorobenzene	2,400	3,000	13,000,000	2,000,000				
1,2-dichlorobenzene			620,000	55,000			LT	
1,4-dichlorobenzene	1,300	2,000	1,200,000	100,000		1,600	4,100	
fluoranthene								
isophorone				14,000				
napthalene		LT	210,000	20,000		720	2,000	
nitrobenzene								
N-nitrosodiphenylamine		400						
bis(2-ethylhexyl)phthalate			1,100,000	220,000			4,600	
butyl benzyl phthalate				LT		LT		
di-n-butyl phthalate		LT	900,000	49,000	LT	3,800		
di-n-octyl phthalate		LT						
diethyl phthalate						LT		
benzo(a)anthracene								
benzo(a)pyrene	LT							
benzo(b)fluroranthene	1,300*							
benzo(k)fluroranthene	1,300*							
chrysene								
anthracene								
benzo(ghi)perylene	880							
fluorene								
phenanthrene								
dibenzo(a,h)anthracene	LT							
indeno(1,2,3-cd)phrene	LT							
pyrene								
aniline							680	
4-chloraniline	LT	2,200					9,600	
dibenzofuran								
2-methylnapthalene				LT				
3-nitroaniline								
benzene			44,000					
Chlorobenzene			63,000	LM				
1,2-dichloroethane								
1,1-dichloroethane			19,000					
1,1,2,2-tetrachloroethane			5,700					
1,2-trans-dichloroethane			11,000					
ethylbenzene			790,000	330,000	LT			
methylene chloride	50.0	13.0	5,800		2.5	23.0		LM
tetrachloroethane			12,000					
toluene			2,400,000	540,000				
trichloroethane			55,000					
acetone	90.0	630			540	1,400		
2-butanone			LM					
4-methyl-2-pentanone		LT	250,000		LT			
styrene				64,000	4.2	5.3		
O-xylene			2,300,000	1,400,000		LT		
PCB-1242						5,000		
PCB 1254								
PCB-1248								
PCB-1260	770	1,300	2,900,000	16,000,000	190	1,000	370	68.0
PCB-1016					210			
Total PCB			-					

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM - Present, but lower than the detection limit for medium hazard analyses
P = The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = Not detected.

009505

TABLE Q-4 (Continued)

PARAMETERS	B17B 24.0-26.0	B18A 22.0-24.0	B18B 24.0-26.0	Blank 1	Blank 2	Spike 81.0 ppb	Spike 81.0 ppb
	BORING/SAMPLE NUMBER Depth (in feet)						
2,3,7,8-TCDD						0.37	0.91
2,4,6-trichlorophenol							
2-chlorophenol							
2,4-dichlorophenol	3,800						
2,4-dimethyphenol							
4,6-dinitro-2-methylphenol							
pentachlorophenol							
phenol							
2-methylphenol-							
4-methylphenol							
2,4,5-trichlorophenol							
acenaphthene							
1,2,4-trichlorobenzene							
1,2-dichlorobenzene							
1,4-dichlorobenzene	550		LT				
fluoranthene					1,000		
isophorone							
napthalene							
nitorbenzene							
N-nitrosodiphenylamine							
bis(2-ethylhexyl)phthalate	580	910	1,400	LT			
butyl benzyl phthalate							
di-n-butyl phthalate			LT				
di-n-octyl phthalate		LT					
diethyl phthalate							
benzo(a)anthracene		520			600		
benzo(a)pyrene					LT		
benzo(b)flu		LT			LT		
benzo(k)fluoranthene		LT			LT		
chrysene		640			560		
anthracene							
benzo(ghi)perylene							
fluorene							
phenanthrene					720		
dibenzo(a,h)anthracene							
indeno(1,2,3-cd)phrene							
pyrene		LT			800		
aniline	51,000	1,700					
4-chloraniline		960					
dibenzofuran							
2-methylnapthalene							
3-nitroaniline							
benzene							
Chlorobenzene	4.1						
1,2-dichloroethane							
1,1-dichloroethane							
1,1,2,2-tetrachloroethane							
1,2-trans-dichloroethene							
ethylbenzene	7.7						
methylene chloride	4.1	19.0	47.0	LM	6.9		
tetrachloroethene							
toluene							
trichloroethene							
acetone	2,000		260				
2-butanone							
4-methyl-2-pentanone							
styrene							
O-xylene	23.0						
PCB-1242							
PCB1254							
PCB-1248							
PCB-1260	160		2,400		260		
PCB-1016							
Total PCB		670					

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P = The sample could ot be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample, could not be cleaned up sufficiently.
Blank = Not detected.

009506

TABLE R-1: A LISTING OF WASTE TYPES AND APPROXIMATE QUANTITIES DEPOSITED AT SITE R AS REPORTED BY MONSANTO

	Approximate Annual Volume (Cubic Yards) 1968	1972
Still Residues		
From Distillation of:		
Nitroaniline and Similar Compounds	1700	94
Cresols, Esters of Phenol		1140
Chlorophenol, Chlorophenol Ether	1070	774
Aniline Derivatives	1300	208
Chlorobenzol	130	13
Nitro Benzene Derivatives	100	1190
Phenol	1020	
Aromatic Caboxylic Acids	1500	
Chlorinated Hydrocarbons		425
By Products		
Mixed Isomers of Nitrochlorobenzene	1700	785
Mixed Isomers of Dichlorophenol	3000	1240
Waste Maleic Anhydride	730	
Waste Chlorobenzenes and Nitrochlorobenzene	120	
Contaminated Acids and Caustic		
Waste Sulfuric Acid with Chloropenol Present	1500	1395
Waste Caustic Soda with Chlorophenol Present	5300	1760
Waste Solvents		
Waste Methanol Contaminated with Mercaptans	600	
Waste Isopropanol (Water and Chlorinated Hydrocarbon)	5500	
Miscellaneous Solvents	1019	
Oily Material	101	
Filter Sludges		
Spent Carbon or Other Filter Media	600	12
Lime Mud from Nitroaniline Production	1000	1195
Gypsum		5600
Obsolete Samples and Sampling Wastes		
Chlorophenols	72	40
Laboratory Samples	208	150
Total	28,270	16,021

NOTE: Blanks indicate waste type not reported.

009507

TABLE R-2: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED AUGUST 22, 1968 BY THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH)

PARAMETERS	SAMPLE LOCATIONS				
	MW-1	MW-3	MW-4	MW-5	MW-6
Total Solids (conductivity mmhos)	320	300	280	250	500
Alkalinity (ppm)	172	148	156	124	248
Phenol (ppb)	1220	25	20	15	1200

009508

TABLE R-3: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED DECEMBER 5, 1972 By IEPA)

PARAMETERS	SAMPLE LOCATIONS MW-1	MW-2	MW-3	MW-5
Calcium	50.2	147	36	49
Magnesium	15.8	36	18	18.5
Sodium	18.5	112	15	18.5
Potassium	3.6	6.7	4.2	3.5
Ammonia	1.5	2	0.65	0.92
Arsenic				
Boron	0.1	0.7	0.1	0.1
Cadmium				
Chromium (Total)				
Copper		0.1		
Iron	2.4	28.2	1.4	8.5
Lead				0. 02
Manganese	0.35	0.61	0.12	0.95
Mercury				
Nickel				
Zinc	0.40	1.42	0.21	2.05
Alkalinity	180	430	145	185
Chloride	22	225	22	22
Fluoride	0.2	0.2	0.2	2
Nitrate	0.1	0.3	0.1	0.1
Phosphate	0.003	0.21	0.05	0.34
Sulfate	16	12	29	32
Conductivity (mmhos)	445	1400	390	470
Phenols	0.088	0.2	0.007	0.014
Oil	1	0	1	0
Hardness	200	530	170	200
COD	46	135	3	8

NOTE: All results in ppm.
Blanks indicate below detection limits.

TABLE R-4: ANALYSIS OF SURFACE WATER SAMPLES FROM WASTE PONDS AT SITE R (COLLECTED JANUARY 18, 1973 BY IEPA)

	SAMPLE LOCATIONS		
PARAMETER	CRYSTALLIZATION POND 221	CRYSTALLIZATION POND 270	SPENT CAUSTIC POND
Phenol	2800	50,000	2,000

NOTE: Results in mg/l (ppm).

009510

TABLE R-5: ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R (COLLECTED FEBRUARY 22, 1973 BY IEPA)

PARAMETERS	SAMPLE LOCATIONS				
	MW-1	MW-2	MW-4	MW-5	RANNEY WELL
Iron	6.8	11	0.8	6.6	1.9
Manganese	0.35	0.55	0.05	1.05	0.92
Mercury (ppb)	0.4			0.2	
Zinc	1.9	0.6		1.5	
Ammonia	1.6	2.6	0.7	1.3	0.98
Phenol (ppb)	150	80			7500
BOD	31	48	1	1	85
COD	51	78	16	13	220

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limits.

005511

TABLE R-6: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED MAY 6, 1974 BY IEPA)

	SAMPLE LOCATIONS					
PARAMETERS	MW-1	MW-2	MW-3	MW-4	MW-5	Ranney Well
Arsenic	0.001	0.001	0.005		0.001	0.002
Barium	0.1	0.3	0.2	0.1	0.2	0.2
Boron	0.3	0.9	8.4	0.2	0.1	
Cadmium		0.02				
COD	44	990	21	14	17	340
Chloride	90	215	30	17	16	25
Cyanide		0.008				0.005
Iron	15	43.2	11.9	2.71	7.5	2.65
Lead	0.008	0.01		0.008	0.014	0.95
Manganese	0.69	1.4	1.1	0.2	0.9	0.95
Nitrate						0.4
Oil	4	7	1			5
Phenols	0.35	120	0.1	0.02	0.1	15
R.O.E.	720	1600	750	270	240	820
Selenium						
Sulfate	220	78	305	48	41	31

NOTE: All results in ppm.
Blanks indicate below detection limits.

003512

TABLE R-7: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED OCTOBER 28, 1975 BY IEPA).

	SAMPLE LOCATIONS			
PARAMETERS	RANNEY WELL	MW-2	MW-4	MW-5
Ammonia				
Arsenic	0.002		0.002	
Barium	0.1	0.1	0.1	0.2
Boron	0.7	0.9	0.5	0.2
Cadmium				
COD	345	210	12	16
Chloride	110	200	23	20
Cyanide		0.02	0.01	
Iron	4.5	13.4	1.45	11
Lead	0.02		0.01	0.04
Manganese	1.3	0.2	0.1	0.7
Nitrate		0.3	0.2	0.1
Oil	3	6	2	3
Phenol	19	1.1	0.025	0.013
R.O.E.	300	920	230	200
Selenium	0.02			
Sulfate	95	6	22	15

NOTE: All results in mg/l, (ppm).
Blanks indicate not detected.

005513

TABLE R-8: ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R (COLLECTED FEBRUARY 17, 1976 BY IEPA)

	SAMPLE LOCATIONS					
PARAMETERS	MW-1	MW-2	MW-3	MW-4	MW-5	RANNEY WELL
Arsenic						0.001
Barium				0.2	0.3	0.1
Boron	0.3	0.8	8	0.5	0.1	1.4
Cadmium						
COD	28	130	8	16	15	390
Chloride	60	410	65	35	35	250
Cyanide	0.01	0.01	0.01	0.01	0.01	0.01
Iron	5.1	19.5	4.3	0.7	7.1	4.6
Lead	0.01	0.02			0.02	
Manganese	0.27	0.27	0.1	0.1	0.85	1.45
Nitrate	0.8	0.1				0.3
Phenols	0.03	0.01				
ROE	370	890	260	220	260	900
Selenium						
Sulfate	110	20	100	44	36	180
PCBs (ppb)						7.7

NOTE: All results in mg/l (ppm) unless noted otherwise.
Blanks indicate below detection limits.

009514

TABLE R-9: ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R (COLLECTED BY IEPA ON OCTOBER 12, 1979)

PARAMETERS	SAMPLE LOCATIONS					
	B-9S	B-9D	B-13D	B-15S	B-17S	B-19S
Inorganics						
Arsenic	0.01	0.004	0.002	0.002	0.002	0.007
Cadmium	0.02		0.01			0.01
Chromium	0.03		0.04			0.03
Copper	1.2	0.32	0.87	0.14	0.42	1.6
Iron	290	100	130	56	110	230
Lead	0.2		0.3		0.1	0.2
Magnesium	31	10	27	83	11	28
Manganese	7.8	1	1.4	1.8	0.99	2.8
Nickel	0.6	0.2	1.9	0.1	0.1	0.2
Zinc	3.3	0.36	3	0.4	0.52	0.87
Organics						
Aliphatic hydrocarbons				*	*	*
Chlorophenol	*	*				0.81
Chlorotoluene	70	40	10	0.34	11	18
Dichlorbenzene						1.6
Diphenylether					0.32	2.1
Phenol	21	56	10	14.3	41.5	22

NOTE: All results in ppm
Blanks indicate below detection limits
* Contaminants present, but not quantified

00951

008516

TABLE R-10: ORGANIC ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R
(COLLECTED BY IEPA ON MARCH 25, 1981)

	SAMPLE LOCATIONS								
PARAMETERS	B-1	B-6S	B-9S	B9D	B11S	B-11D	B-15D	B-17D	B-19D
Aliphatic hydrocarbons					4,000				
Biphenylamine	1,800	250			15,000	1,100	1,300	860	660
Chlorobenzene	3,000	130	720	810	1,000	2,800	2,800	650	300
Chlorophenol	6,600	5,300	11,000	12,000	13,000	3,200	3,200		950
Chloronitrobenzene			2,500	1,500					
Dichlorobenzene	2,600				1,000	800	930	420	360
Dichlorophenol	1,100	700				630	2,900	670	
Trichlorophenol								1,200	

NOTE: All results in ug/l (ppb).
Blanks indicate below detection limit.

008517

TABLE: R-11: ANALYSIS OF LEACHATE AND SEDIMENT SAMPLES FROM SITE R
(COLLECTED OCTOBER 2, 1981 BY IEPA)

PARAMETERS	SAMPLE LOCATIONS					
	SAMPLE A (WATER) D022687	SAMPLE B (WATER) D022688	SAMPLE C (WATER) D022689	SOIL SAMPLE A D022690	SOIL SAMPLE B D022692	SOIL SAMPLE C D022692
PCB			2.6	48	150	230
Toluene	11	40	150			
Chlorobenzene	160	390	1,600			
Chloroaniline	24,000	22,000	38,000	1,700	190	6,900
Chloronitrobenzene	21,000	9,600	820		130	
2.4-D	16,000	17,000	7,800	53	(<5)	(<5)
2,4,5-T				(<5)	(<5)	(<5)
Dichloronitrobenzene	740	590	790			
Dichloroaniline	870	820	2,800			190
Chloronitroaniline	84	33				
Nitroaniline	100	23				
Chlorophenol	15,000	30,000	27,000			290
Phenol	22,000	17,000	12,000			
Methylphenol	570	220	110			
Dichlorophenol	32,000	7,200	2,100	40		
Nitrophenol	600					
Biphenyldiol	1,700					
Aniline	550	120	35			
Methylbenzene	180	2,000	140			
Sucponamide						
4-methyl-2-pentanol	26					
2-methyl cyclopentanol	93					
Biphenyl 2-Ol	300	300	280			310
Benzenesulfonamide	76	630				
Dichlorobenzene		110	250			
Benzoic Acid/Derivatives	12,000	6,600	2,000			
Hydroxybenzoic Acid/ Derivatives	12,000					
2,4-D Isomer	38,000	48,000	29,000			
2,4,5-T Isomer	10,000	12,000	6,500			

NOTE: All results in ppb.
Blanks indicate below detection limits.
( ) indicates values are unconfirmed.

TABLE R-12: COMPILATION OF LEACHATE AND SEDIMENT SAMPLES COLLECTED AT SITE R IN NOVEMBER, 1981

STATION NUMBER	USEPA SAMPLE NUMBER[a]	MONSANTO SAMPLE NUMBER	DESCRIPTION
1	S01	M01	Leachate (5% Sediment)
1	D01		Duplicate for S01
1	S02	M02	Sediment
1	D02		Duplicate for S02
2	S03	M03	Leachate (10% Sediment)
2	S04	M04	Sediment
3	S05	M05	Leachate (10% Sediment
3	S06	M06	Sediment
Blank	S07		City of Chicago tap water. Blank for low level analysis.
Blank	R01		City of Chicago tap water. Blank for medium level analysis.
Blank	R01		City of Chicago tap water. Extra blank for low level analysis.

NOTE: Monsanto did not split samples where no number is listed.
a - Samples collected by Ecology and Environment, Inc.

TABLE R-13: ANALYSIS OF TETRA THROUGH OCTACHLORINATED DIBENZO-P-DIOXINS AND DIBENZOFURANS IN LEACHATE SAMPLES FROM SITE R (COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

SAMPLE LOCATIONS	PARAMETERS									
	TCDDs	TCDFs	PCDDs	PCDFs	HXCDDs	HXCDFs	HPCDDs	HPCDFs	OCDDs	OCDFs
S01					4.5	6.3	86	74	323	30
S03					6.3	10	181	182	675	103
S05					5.8	6.3	152	112	2693	53
S07 (Blank)										
R01 (Blank)										

NOTE: All results in parts per trillion (ppb).
Blanks indicate below detection limits.
Analysis performed by Brehm Laboratory, Wright State University.

TABLE R-14: INORGANIC ANALYSIS OF LEACHATE SAMPLES FROM SITE R (COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

	SAMPLE LOCATIONS							
PARAMETERS	S01	M01	D01	S03	M03	S05	M05	R01
Arsenic	0.034	0.02	0.031	0.016	0.025	0.029	0.065	
Mercury	0.0002		0.0002	0.0002	0.0014	0.0008	0.001	
Selenium	0.038		0.032	0.026		0.031		
Thallium								
Antimony								
Beryllium		0.008			0.005		0.008	
Cadmium		0.006			0.007		0.008	
Chromium	0.04	0.086	0.02	0.015	0.075	0.02	0.07	0.01
Copper		0.073			0.092		0.08	
Lead	0.005		0.008					
Nickel	0.04	0.155			0.124		0.144	
Silver						0.01		
Zinc	0.048	0.216	0.024	0.01	0.216	0.049	0.062	0.31
Aluminum		26.8			30.5		3.22	
Barium		0.5			0.5		0.36	
Boron	19.7	18	17.1	15.35	13.6	21.6	19.1	
Calcium	N/A	368	N/A	N/A	257	N/A	257	N/A
Cobalt		0.03			0.019		0.031	
Iron	0.06	25.5	0.06		30.8	0.63	27.4	
Magnesium	N/A	43.2	N/A	N/A	48.2	N/A	39.8	N/A
Manganese	0.02	6.27	0.32	1.99	2.1	5.4	8.82	0.03
Molybdenum	N/A	0.53	N/A	N/A	0.403	N/A	0.439	N/A
Phosphorus	N/A	0.9	N/A	N/A	0.907	N/A	2.06	N/A
Sodium	N/A	40.4	N/A	N/A	41.8	N/A	44.2	N/A
Tin						0.02	1.4	
Vanadium		0.18			0.138		0.17	
Cyanide	0.071	N/A	0.057	N/A	N/A	N/A	N/A	0.13

NOTE: All Results in ppm.
Blanks indicate below detection limits.
N/A - Parameter not analyzed.
R01 is a water blank.

019530

TABLE R-15: INORGANIC ANALYSIS OF SEDIMENT SAMPLES FROM SITE R (COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

PARAMETERS	SAMPLE LOCATIONS						
	S02	S03	M02	S04	M04	S06	M06
Arsenic	1.1	2.9	5.3	1.25	9.6	1.8	8.2
Mercury						1.6	
Selenium	1.1	1.8		1.5			
Thallium				4.0			1.08
Antimony			0.412		0.489		2.49
Beryllium			0.747	0.61	1.04		28.7
Cadmium			10.7		10.4		25.5
Chromium			7.17		7.89		
Copper				2.45		1.7	33.8
Lead	2.4	2.9	17.4		18.6		69.4
Nickel			29.5	6.8	36.3	9.2	13,900
Zinc	9.5	10	3870	155	4380	170	7.79
Aluminum	150	190	75.4		130	20	30.3
Barium		25	53	17	28.7	26	6590
Boron	N/A	N/A	3660	N/A	4010	N/A	9.45
Calcium			4.7		4.8		12,600
Cobalt	580	660	5870	425	8660	580	4080
Iron	N/A	N/A	1780	N/A	2090	N/A	273
Magnesium	76	46	79.7	42	119	47	22.4
Manganese	N/A	N/A	10.6	N/A	12.5	N/A	366
Molybdenum	N/A	N/A	154	N/A	270	N/A	4720
Phosphorus	N/A	N/A	1840	N/A	1270	N/A	
Sodium			14.4		17		43.9
Tin	28	13	N/A	6.8	N/A	90	N/A
Vanadium							
Cyanide							

NOTE: All results in ppm.
Blanks indicate below detection limit.
N/A - Parameter not analyzed.

TABLE R-16: IDENTIFIED ORGANIC COMPOUNDS IN LEACHATE
AND SEDIMENT SAMPLES FROM SITE R
(COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

	SAMPLE LOCATIONS								
	LEACHATE			SEDIMENT					
PARAMETERS	M01	M03	M05	S02	M02	S04	M04	S06	M06
2-Chlorophenol	340	100		0.26		0.2	200	0.4	
2,4-Dichlorophenol	100					0.42		0.56	
Phenol	130					0.5	300	0.42	300
2,4,6-Trichlorophenol								0.32	
1,4-Dichlorobenzene	30				200		400		600
1,2-Dichlorobenzene	20								
Bis(2 ethylhexyl) Phthalate					400		300		400
Chlorobenzene	160	30							
Aniline	60	40	25						
Chloroanilines	8000	4000	600						
Dichloroanilines	100	40							200
Chloronitrobenzenes	3000	80							
2,4-D	332	100							
PCBs			0.008		0.014		0.034		0.192

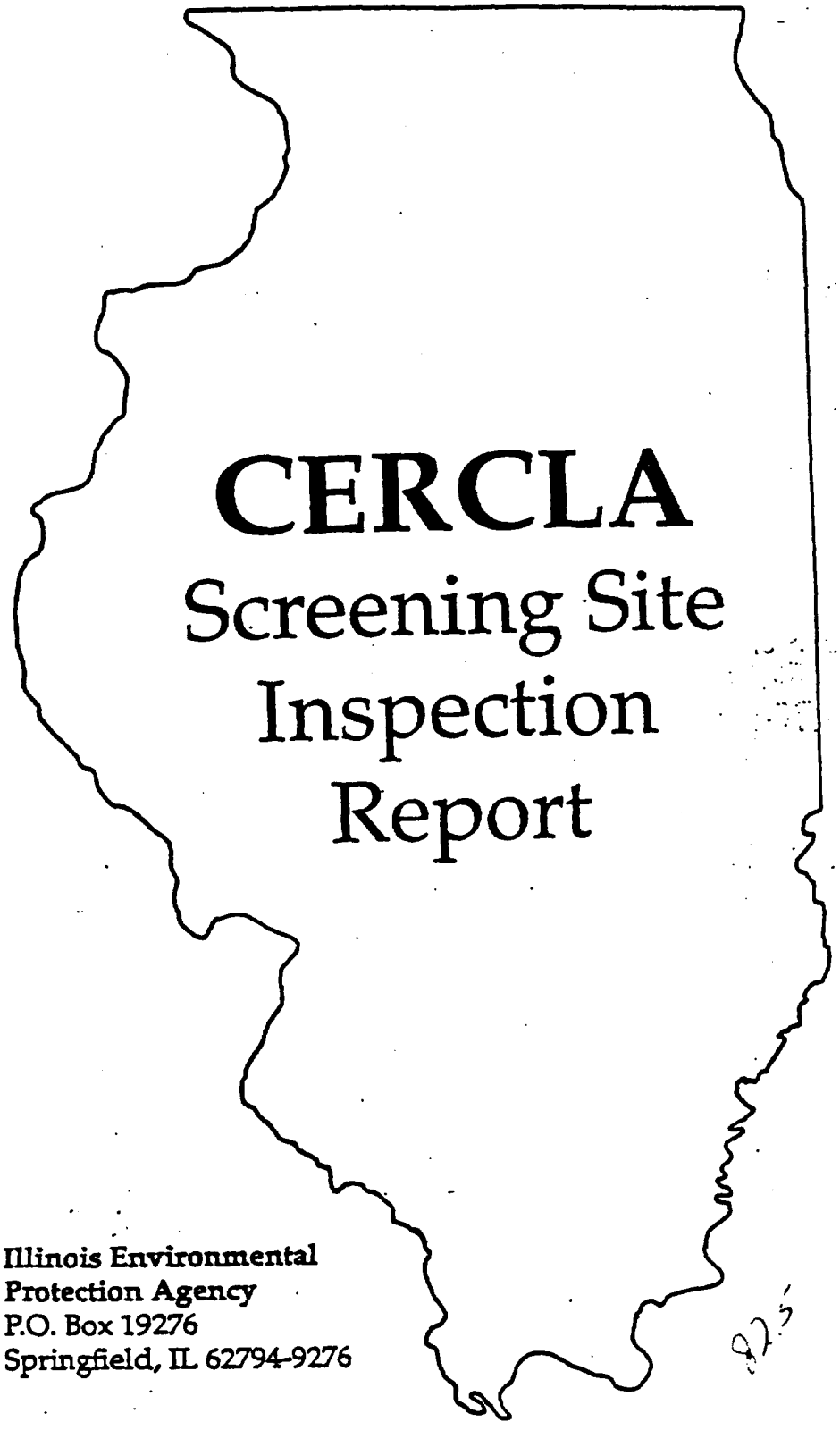
NOTE: All results in parts per billion (ppb).
Blanks indicate below detection limit.

TABLE R-17: COMPARATIVE ANALYSIS OF CHEMICALS DETECTED IN SAMPLES AT SITE R AND THOSE REPORTED TO HAVE BEEN DISPOSED OR MANUFACTURED BY MONSANTO

COMPOUNDS	LEACHATE/SEDIMENT ANALYSIS			GROUNDWATER ANALYSIS	REPORTED DISPOSAL	MANUFACTURED
	IEPA	MONSANTO	USEPA	IEPA	MONSANTO	MONSANTO
PCBs	X	X				X
• Chlorobenzene	X	X		X	X	X
• Dichlorobenzene	X	X		X		X
• Chloroaniline	X	X			X	X
Chloronitrobenzene	X	X		X	X	X
Dichloronitrobenzene	X					
Chlorophenol	X	X	X	X	X	X
Dichlorophenol	X	X	X	X	X	X
2,4-D/isomers	X	X				X
2,4,5,-T/isomers	X					X
• Aniline	X	X				
Dichloroaniline	X				X	
Chloronitroaniline	X				X	X
Nitroaniline	X				X	X
• Phenol	X	X	X	X	X	
Nitrophenol	X					
Methylphenol	X					
Diphenyldiol	X					
Benzoic Acid/Derivatives	X				X	X
4-methyl-2-pentanol	X				X	
2-methylcyclopentanol	X				X	
Benzene Sulfonamide	X				X	
Chlorotoluene	X					X
Dioxins/Dibenzofurans			X		X (By Product)	X (By Product)

Sauget Sites Area #2

L1631210020/St. Clair Co. - Sauget WWTP (Site O) ILD000672329
L1631210001/St. Clair Co. - Sauget and Company Landfill (Site Q) ILD000605790
L1631210003/St. Clair Co. - Sauget Toxic (Site R) ILD980606982
L1631210012/St. Clair Co. - Bliss Waste Oil ILD000665836
L1631210006 St. Clair Co. - Monsanto W.G. Krummrich ILD000722074



CERCLA
Screening Site Inspection Report

Illinois Environmental Protection Agency
P.O. Box 19276
Springfield, IL 62794-9276

Sauget Sites Area 2
See CERCLIS for ILD numbers

TABLE 4-1
SUMMARY

SAMPLING POINT	G201 06-27-91		X102 06-26-91		X103 06-26-91		X104 06-26-91		X105 06-26-91		X106 06-26-91	
PARAMETER												
VOLATILES	(ppb)		(ppb)		(ppb)		(ppb)		(ppb)		(ppb)	
Methylene Chloride	18	B	37	B	--		48	B	580	JB	47	B
Acetone	--		27		--		11		--		34	
Carbon Disulfide	--		--		--		--		--		--	
1,1-Dichloroethane	--		--		--		--		--		--	
1,2-Dichloroethene(total)	--		--		--		--		--		--	
Chloroform	33		--		--		--		--		--	
2-Butanone (MEK)	--		--		--		--		--		--	
1,1,1-Trichloroethane	--		--		--		--		--		--	
Bromodichloromethane	5		--		--		--		--		--	
Trichloroethene	--		--		3	J	--		--		--	
Benzene	--		--		--		--		70	J	--	
4-Methyl-2-Pentanone	--		--		--		--		--		--	
Tetrachloroethene	--		--		--		--		--		--	
Toluene	--		--		--		--		1300		64	
Chlorobenzene	--		--		--		--		--		6	
Ethylbenzene	--		--		--		--		--		--	
Xylene(total)	--		--		--		--		430	J	--	
# of TIC's	(0)		(3)		(2)		(2)		(8)		(10)	
SEMIVOLATILES	(ppb)		(ppb)		(ppb)		(ppb)		(ppb)		(ppb)	
1,4-Dichlorobenzene	--		--		--		--		27000		2100	
4-Chloroaniline	--		--		--		--		--		290	J
2-Methylnaphthalene	--		--		--		--		--		--	
Fluorene	--		--		--		--		--		--	
Pentachlorophenol	--		--		--		--		15000		--	
Phenanthrene	--		--		--		--		--		--	
Anthracene	--		--		--		--		--		--	
Pyrene	--		--		--		--		--		--	
bis(2-Ethylhexyl)phthalate	7	JB	--		220	JB	320	JB	--		--	
Benzo(a)pyrene	--		--		--		--		--		--	
# of TIC's	(1)		(20)		(16)		(14)		(20)		(20)	

008556

Sauget Sites Area 2
See CERCLIS for ILD numbers

Table 4-1 (continued)

SAMPLING POINT	X107		X108		X109		X110		X111		X112	
	06-26-91		06-26-91		06-26-91		06-26-91		06-26-91		06-27-91	
PARAMETER												
VOLATILES	(ppb)		(ppb)		(ppb)		(ppb)		(ppb)		(ppb)	
Methylene Chloride	40	B	43	B	4	J	5	J	38	B	84	B
Acetone	16		38		--		--		180		--	
Carbon Disulfide	--		--		--		--		15	J	--	
1,1-Dichloroethane	--		--		--		--		11	J	--	
1,2-Dichloroethene(total)	--		--		--		--		13	J	--	
Chloroform	5		--		5	J	4	J	--		10	
2-Butanone (MEK)	--		--		--		--		52	J	--	
1,1,1-Trichloroethane	--		--		--		--		25	J	--	
Bromodichloromethane	--		--		--		--		--		--	
Trichloroethene	--		--		--		--		--		--	
Benzene	--		--		--		--		14	J	--	
4-Methyl-2-Pentanone	--		--		--		--		72		--	
Tetrachloroethene	--		--		--		--		85		--	
Toluene	7		--		--		--		210		8	
Chlorobenzene	--		--		--		--		--		--	
Ethylbenzene	--		--		--		--		210		--	
Xylene(total)	29		--		--		--		480		--	
# of TIC's	(2)		(3)		(1)		(1)		(10)		(3)	
SEMIVOLATILES	(ppb)		(ppb)		(ppb)		(ppb)		(ppb)		(ppb)	
1,4-Dichlorobenzene	--		--		--		--		--		--	
4-Chloroaniline	--		--		--		--		--		--	
2-Methylnaphthalene	35000		--		--		--		--		--	
Fluorene	11000	J	--		--		--		--		--	
Pentachlorophenol	--		--		--		--		--		--	
Phenanthrene	79000		--		--		--		--		--	
Anthracene	6600	J	--		--		--		--		--	
Pyrene	75000		--		--		--		--		--	
bis(2-Ethylhexyl)phthalate	--		290	JB	180	JB	390	JB	--		--	
Benzo(a)pyrene	16000	J	--		--		--		--		--	
# of TIC's	(20)		(20)		(20)		(20)		(20)		(3)	

Sauget Sites Area 2
See CERCLIS for ILD numbers

TABLE 4-1
SUMMARY

SAMPLING POINT	G201 06-27-91	X102 06-26-91	X103 06-26-91	X104 06-26-91	X105 06-26-91	X106 06-26-91
PARAMETER						
PESTICIDES/PCB'S	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
alpha-BHC	--	--	--	--	21	--
beta-BHC	--	--	--	--	--	--
gamma-BHC (Lindane)	--	--	--	--	--	--
Heptachlor	--	--	--	--	--	--
Aldrin	--	--	--	--	--	23
Heptachlor epoxide	--	--	--	--	23	13
Endosulfan I	--	--	--	--	--	--
Dieldrin	--	--	--	--	--	--
4,4'-DDE	--	--	--	--	590	570
Endrin	--	--	--	--	110	--
Endosulfan II	--	--	--	--	84	--
4,4'-DDD	--	--	--	--	45	--
4,4'-DDT	--	--	--	--	380	58
Methoxychlor (Mariate)	--	--	--	--	--	--
Endrin Ketone	--	--	--	--	--	110
Aroclor-1242	--	--	--	--	--	--
Aroclor-1254	--	2200	--	--	--	--
Aroclor-1260	--	--	--	--	--	--
INORGANICS	(ppb)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Aluminum	420	14500	8000	22200	2300	1800
Arsenic	--	6.7	4.8	4.6	2.3	4.0
Barium	83	160	210	120	380	220
Beryllium	--	1.5	120	2.7	--	--
Cadmium	--	--	--	--	1.1	5.7
Calcium	49600	3260	--	6120	58800	106000
Chromium	--	13	8.3	35	12	23
Cobalt	--	--	--	12	--	--
Copper	--	31	7.4	22	47	38
Iron	58	12700	10400	19800	7710	5270
Lead	12	59	11.8	56	83	84
Magnesium	17900	2980	5210	4060	2360	4240
Manganese	--	280	190	530	78	62
Mercury	--	--	--	--	0.75	--
Nickel	--	19	14	34	27	10
Potassium	3160	2730	1690	2140	280	260
Selenium	--	--	--	--	--	--
Sodium	9770	--	--	--	1150	1400
Vanadium	--	37	26	56	17	11
Zinc	--	190	38	100	790	560
Cyanide	--	--	--	--	--	--
Sulfate	42000	220	38	190	190	2700
Sulfide	6600	98	--	--	490	330

Table 4-1 (continued)

Sauget Sites Area 2
See CERCLIS for ILD numbers

SAMPLING POINT	X107 06-26-91	X108 06-26-91	X109 06-26-91	X110 06-26-91	X111 06-26-91	X112 06-27-91
PARAMETER	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(ppb)
PESTICIDES/PCB'S						
alpha-BHC	--	--	--	--	--	--
beta-BHC	--	17	--	--	--	--
gamma-BHC (Lindane)	420	--	--	--	--	27
Heptachlor	--	--	--	--	--	29
Aldrin	210	8.7	--	--	--	11
Heptachlor epoxide	270	--	--	--	--	23
Endosulfan I	48	--	--	--	--	--
Dieldrin	2000	21	--	--	--	--
4,4'-DDE	--	--	--	--	--	26
Endrin	--	20	--	--	--	140
Endosulfan II	1600	19	--	--	--	--
4,4'-DDD	240	--	--	--	--	--
4,4'-DDT	1600	35	19	--	--	120
Methoxychlor (Mariate)	2400	--	--	--	--	--
Endrin Ketone	550	17	--	--	--	--
Aroclor-1242	--	--	--	--	--	--
Aroclor-1254	--	--	--	9900 C	--	--
Aroclor-1260	--	--	--	9500 C	17000	--
				8100 C	--	--
INORGANICS	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Aluminum	5600	8900	16000	6900	2100	37200
Arsenic	3.4	3.1	4.5	2.6	2.6	11
Barium	81	130	180	84	390	320
Beryllium	--	--	1.1	--	--	2.8
Cadmium	--	--	--	1.6	--	7.3
Calcium	17000	5560	6540	2450	48100	9300
Chromium	6.1	9.2	14	13	20	29
Cobalt	--	--	9.1	--	--	17
Copper	4.7	24	13	10	16	110
Iron	7110	10900	17700	8290	12500	37900
Lead	49	62	43	50	62	190
Magnesium	3960	3040	3790	1750	650	5010
Manganese	150	200	520	100	110	780
Mercury	--	--	--	--	--	0.19
Nickel	9.0	14	18	11	20	38
Potassium	930	1580	2370	1030	260	5240
Selenium	--	--	--	1.3	--	1.1
Sodium	--	--	--	--	1450	--
Vanadium	17	25	38	19	--	80
Zinc	46	150	100	120	150	760
Cyanide	--	--	--	--	--	0.51
Sulfate	170	110	63	70	310	76
Sulfide	130	--	--	--	220	--

Table 5-5. Summary of Target Compound List Semivolatile Organic Compounds Detected in Sediment Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	Equipment Blank
Sample Date:	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/L
Parameter									
2-Methylphenol (o-cresol)	--	--	--	--	--	--	45 J	--	--
2,4-Dimethylphenol	--	--	--	--	--	--	29 J	--	--
Naphthalene	--	--	--	--	--	--	230 J	200 J	--
2-Methylnaphthalene	--	--	--	--	--	--	410	360	--
Acenaphthene	--	--	--	--	--	--	20 J	--	--
Dibenzofuran	--	--	--	--	--	--	51 J	66 J	--
Diethylphthalate	22 J	28 J	19 J	17 J	--	--	14 J	--	--
Fluorene	--	--	--	--	--	--	31 J	15 J	--
Phenanthrene	--	--	--	--	--	--	370	270 J	--
Anthracene	--	--	--	--	--	--	91 J	44 J	--
Carbazole	--	--	--	--	--	--	31 J	32 J	--
Di-n-butylphthalate	--	--	9 J	--	--	--	13 J	--	--
Fluoranthene	--	--	54 J	--	160 J	--	170 J	130 J	--
Pyrene	9 J	23 J	48 J	19 J	150 J	25 J	380	180 J	--
Butylbenzylphthalate	11 J	11 J	--	9 J	--	--	25 J	25 J	--
Benzo(a)anthracene	--	--	--	--	130 J	--	450	180 J	--
Chrysene	--	--	44 J	--	140 J	34 J	470	190 J	--
bis(2-Ethylhexyl)phthalate	--	--	53 J	--	--	--	--	54 J	--
Di-n-octylphthalate	37 J	--	22 J	--	--	--	--	32 J	--
Benzo(b)fluoranthene	--	--	--	--	120 J	--	280 J	97 J	--
Benzo(k)fluoranthene	--	--	--	--	110 J	--	130 J	--	--
Benzo(a)pyrene	--	--	--	--	120 J	--	490	210 J	--
Indeno(1,2,3-cd)pyrene	--	--	--	--	38 J	--	100 J	--	--
Benzo(g,h,i)perylene	--	--	--	--	38 J	--	160 J	--	--
Total SVOCs	79	62	249	45	1006	59	3990	2085	--

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
J Estimated value.
-- Not detected.
SVOCs Semivolatile organic compounds.

Only those compounds detected are listed.

Table 5-6. Summary of Target Compound List Pesticides and PCBs Detected in Sediment Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	Equipment Blank
Sample Date:	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/L
Parameter									
Pesticides/PCBs									
4,4'-DDE	8.8	–	–	–	–	–	–	–	–
4,4'-DDT	87	–	–	–	–	–	–	–	–
Aroclor-1248	–	–	570 J	–	–	–	79 J	220 J	–
Aroclor-1254	–	–	520 J	64 J	52 J	–	110 J	220 J	–
Aroclor-1260	80	320 J	410 J	92 J	89 J	–	120 J	230 J	–

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
J Estimated value.
– Not detected.
PCB Polychlorinated biphenyls.

Only those compounds detected are listed.

Table 5-7. Summary of Target Analyte List Parameters Detected in Sediment Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	Equipment Blank
Sample Date:	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92	6/30/92
Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	ug/L
Parameter									
Aluminum	10100	10000	11200	10500	11900	11100	11400	7870	–
Antimony	R	R	R	R	R	R	R	R	–
Arsenic	4.3	9.6	3.8	6.3	7.7	4.5	7.3	5.3	–
Barium	92.8	123	107	118	124	111	111	111	–
Calcium	7160	7020	3440	6470	5850	4470	4490	8110	271 B
Chromium	16.2	17.8	18.4	15.8	18.4	18.2	20.1	13.7	–
Cobalt	8.2 B	9.6 B	9.9 B	9.7 B	10.0 B	9.4 B	9.0 B	9.1 B	–
Copper	19.1	22.2	20.6	17.7	20.1	15.5	20.0	19.1	–
Iron	15700	19100	17700	17400	19200	17700	18700	14800	–
Lead	15.1	20.5	12.3	22.6	21.9	13.2	20.2	16.8	–
Magnesium	4950	4610	3090	4150	4120	3790	3810	5450	–
Manganese	473	594	592	549	566	616	461	513	–
Mercury	0.05	0.11	–	0.13	0.06	–	0.05	0.06	–
Nickel	19.0	23.6	21.0	20.6	22.2	20.7	27.9	22.7	–
Potassium	1270	1250	1290	976 B	1290	1110	1300	919 B	–
Sodium	–	–	–	–	–	–	–	–	561 B
Vanadium	31.9	31.7	36.8	29.5	33.4	33.4	55.2	29.2	–
Zinc	99.4	117	116	85.9	128	82.2	171	105	–
Cyanide	–	–	–	–	–	–	–	–	–

– Not detected.
ug/L Micrograms per liter.
mg/kg Milligrams per kilogram.
B Compound is between the contract required detection limit and the instrument detection limit.
R Data were unusable.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-1	SB-1	SB-1	SB-2	SB-2	SB-2
Sample Depth:	12-14 ft	26-28 ft	32-34 ft	12-14 ft	14-16 ft	28-30 ft
Sample Date:	4/9/92	4/9/92	4/9/92	4/10/92	4/10/92	4/13/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Methylene chloride	–	–	–	–	250 J	–
Acetone	–	9800	11000	81000	5300 J	9000 J
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	670 J	–
1,2-Dichloroethane	220000	–	–	–	–	–
2-Butanone (MEK)	–	–	–	–	–	–
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	–	–	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	210000	1400 J	1700	26000 J	200000 D	3900 J
4-Methyl-2-pentanone	–	–	–	–	–	–
Tetrachloroethene	3700 J	–	–	–	1800 J	–
Toluene	16000 J	880 J	1100 J	38000 J	74000 J	830 J
Chlorobenzene	890000	18000	9200	650000	2400000 D	33000
Ethylbenzene	43000 J	760 J	750 J	–	680 J	–
Xylenes	110000	2200 J	1500 J	–	2600 J	350 J
Total VOCs	1492700	33040	25250	795000	2685300	47080

ug/L	Micrograms per liter.
ug/kg	Micrograms per kilogram.
–	Not detected.
E	Concentration is above the calibration range of the instrument.
J	Estimated value.
B	Compound detected in blank.
D	Concentration determined at a secondary dilution factor.
VOCs	Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-3	SB-3	SB-3	SB-4	SB-4	SB-4
Sample Depth:	12 - 14 ft	14 - 16 ft	32 - 24 ft	10-12 ft	12-14 ft	30-32 ft
Sample Date:	4/16/92	4/16/92	4/16/92	4/14/92	4/14/92	4/14/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Methylene chloride	–	–	–	–	–	–
Acetone	500000	320000	–	17000	2500	34000 J
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	150 J	–
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	–	–	–	–	2400	–
1,1,1-Trichloroethane	–	–	–	–	190 J	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	–	–	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	–	–	6300 J	–	7700	31000 J
4-Methyl-2-pentanone	–	–	–	–	–	–
Tetrachloroethene	90000	6800 J	2600 J	660 J	–	–
Toluene	450000	160000	14000 J	43000	24000	110000
Chlorobenzene	420000	160000	120000	29000	14000	350000
Ethylbenzene	970000	63000	–	3800 J	6800	38000 J
Xylenes	1500000	100000	9200 J	25000	43000 J	160000
Total VOCs	3930000	809600	152100	118460	100740	723000

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
– Not detected.
E Concentration is above the calibration range of the instrument.
J Estimated value.
B Compound detected in blank.
D Concentration determined at a secondary dilution factor.
VOCs Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-5	SB-5	SB-5	SB-6	SB-6	SB-6
Sample Depth:	12-14 ft	20-22 ft	28-30 ft	18-20 ft	20-22 ft	28-30 ft
Sample Date:	5/4/92	5/4/92	5/4/92	5/5/92	5/5/92	5/6/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Methylene chloride	–	–	–	–	–	–
Acetone	–	–	14000 B	–	–	–
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	–	–
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	–	–	–	–	–	–
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	–	–	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	13000 J	2000 J	4900 J	–	–	1200 J
4-Methyl-2-pentanone	–	–	–	–	–	–
Tetrachloroethene	–	–	8600	–	–	–
Toluene	32000 J	22000 J	8700	55000	89000	5100 J
Chlorobenzene	460000	270000	130000	140000	200000	33000
Ethylbenzene	–	–	–	18000	27000	1900 J
Xylenes	9700 J	–	–	96000	150000	11000
Total VOCs	514700	294000	166200	309000	466000	52200

ug/L	Micrograms per liter.
ug/kg	Micrograms per kilogram.
–	Not detected.
E	Concentration is above the calibration range of the instrument.
J	Estimated value.
B	Compound detected in blank.
D	Concentration determined at a secondary dilution factor.
VOCs	Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-7	SB-7	SB-7	SB-8	SB-9	SB-9
Sample Depth:	16-18 ft	20-22 ft	24-26 ft	6-8 ft	18-20 ft	20-22 ft
Sample Date:	5/7/92	5/7/92	5/7/92	5/8/92	5/13/92	5/13/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Methylene chloride	–	–	–	–	–	–
Acetone	–	–	–	–	–	150000 EJ
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	5400 J	–	–	–	–	–
1,2-Dichloroethane	–	–	–	3000 J	–	–
2-Butanone (MEK)	–	–	–	–	8600 J	– 8600
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	–	2000 J	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	3900 J	–	2900 J	20000	1600 J	–
4-Methyl-2-pentanone	77000 J	22000 J	67000 J	–	–	–
Tetrachloroethene	–	–	–	–	8300	–
Toluene	3200 J	14000 J	22000	5900 J	–	–
Chlorobenzene	190000 J	100000	110000	5500 J	6000 J	12000
Ethylbenzene	–	–	–	–	7600 J	1700 J
Xylenes	–	–	–	3900 J	26000 J	9200
Total VOCs	279500	136000	201900	40300	58100	181500

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
– Not detected.
E Concentration is above the calibration range of the instrument.
J Estimated value.
B Compound detected in blank.
D Concentration determined at a secondary dilution factor.
VOCs Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-9	SB-9	SB-10	SB-10	SB-10	SB-11
Sample Depth:	28-30 ft	30-32 ft	6-8 ft	18-20 ft	24-26 ft	14-16 ft
Sample Date:	5/13/92	5/13/92	5/14/92	5/14/92	5/14/92	5/19/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Methylene chloride	1400 J	13000 J	27000 J	–	1100 J	–
Acetone	–	–	–	–	19000 J	8000
1,1-Dichloroethane	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	59000 J	–	–	–
Chloroform	–	–	38000 J	–	–	–
1,2-Dichloroethane	–	–	130000 J	–	3200 J	–
2-Butanone (MEK)	10000 J	–	–	–	10000 J	–
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	750000	480000	33000 J	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	6400 J	47000 J	97000 J	30000 J	1500 J	–
4-Methyl-2-pentanone	29000 J	110000 J	–	–	–	–
Tetrachloroethene	7500 J	37000 J	–	–	–	–
Toluene	–	240000	3800000	1200000	60000 J	1800
Chlorobenzene	110000	620000	370000	180000	17000 J	220 J
Ethylbenzene	6000 J	28000 J	–	–	–	–
Xylenes	39000	180000	100000 J	50000 J	3500 J	–
Total VOCs	209300	1275000	5371000	1940000	148300	10020

ug/L	Micrograms per liter.
ug/kg	Micrograms per kilogram.
–	Not detected.
E	Concentration is above the calibration range of the instrument.
J	Estimated value.
B	Compound detected in blank.
D	Concentration determined at a secondary dilution factor.
VOCs	Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-11	SB-11	SB-12	SB-12	SB-12	SB-13
Sample Depth:	16-18 ft	30-32 ft	8-10 ft	22-24 ft	32-34 ft	16-18 ft
Sample Date:	5/19/92	5/20/92	5/15/92	5/18/92	5/18/92	5/21/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Methylene chloride	–	–	–	–	–	–
Acetone	18000 J	–	–	21000 J	3000	–
1,1-Dichloroethene	–	–	290 J	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	–	360 J
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	–	–	2300 J	9000 J	–	2800
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	360 J
Trichloroethene	–	–	360 J	–	–	–
Dibromochloroethane	–	–	–	–	–	300 J
Benzene	–	–	320 J	1300 J	–	2200
4-Methyl-2-pentanone	–	–	–	–	–	–
Tetrachloroethene	–	37000	340 J	1800 J	–	–
Toluene	8700 J	26000	3600 J	9400 J	–	–
Chlorobenzene	–	190000	210 J	41000 J	7900	–
Ethylbenzene	–	9000 J	–	46000 J	3800	–
Xylenes	–	61000	–	230000 EJ	23000	–
Total VOCs	26700	323000	7420	359500	37700	6010

ug/L	Micrograms per liter.
ug/kg	Micrograms per kilogram.
–	Not detected.
E	Concentration is above the calibration range of the instrument.
J	Estimated value.
B	Compound detected in blank.
D	Concentration determined at a secondary dilution factor.
VOCs	Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-13	SB-13	SB-14	SB-14	SB-14	SB-15
Sample Depth:	18-20 ft	30-32 ft	10-12 ft	20-22 ft	30-32 ft	16-18 ft
Sample Date:	5/21/92	5/21/92	5/22/92	5/26/92	5/26/92	5/27/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Methylene chloride	–	–	–	–	10000 J	–
Acetone	2900	6600	–	–	–	200000 J
1,1-Dichloroethane	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	–	–
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	2700 J	2400	3200	–	–	–
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	370 J	–	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	420 J	9700	7200	1100 J	–	–
4-Methyl-2-pentanone	–	–	–	–	–	2800000
Tetrachloroethene	–	–	–	–	–	–
Toluene	–	270 J	540 J	2700 J	–	–
Chlorobenzene	360 J	6900	26000	23000	360000	390000
Ethylbenzene	–	–	–	–	–	510000
Xylenes	–	–	–	2900 J	–	4100000
Total VOCs	6380	25870	37310	29700	370000	8000000

ug/L	Micrograms per liter.
ug/kg	Micrograms per kilogram.
–	Not detected.
E	Concentration is above the calibration range of the instrument.
J	Estimated value.
B	Compound detected in blank.
D	Concentration determined at a secondary dilution factor.
VOCs	Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-15	SB-15	SB-16	SB-16	SB-16	SB-16
Sample Depth:	18-20 ft	26-28 ft	6-8 ft	16-18 ft	28-30 ft	30-32 ft
Sample Date:	5/28/92	5/28/92	5/29/92	5/29/92	5/29/92	5/29/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Methylene chloride	10000 J	–	–	–	–	–
Acetone	–	15000 B	20000 B	–	–	–
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	–	–
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	–	–	1300 J	1600	–	1800
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	–	–	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	–	–	–	–	320 J	390 J
4-Methyl-2-pentanone	470000	16000	–	–	–	–
Tetrachloroethene	–	–	–	–	–	–
Toluene	–	–	–	–	–	–
Chlorobenzene	120000	–	750 J	6900	5100	4200
Ethylbenzene	65000	–	–	–	–	–
Xylenes	460000	–	–	–	–	–
Total VOCs	1125000	31000	22050	8500	5420	6390

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
– Not detected.
E Concentration is above the calibration range of the instrument.
J Estimated value.
B Compound detected in blank.
D Concentration determined at a secondary dilution factor.
VOCs Volatile organic compounds.

Only those compounds detected are listed.

APPENDIX F CONTENTS

1. 1988 EXPANDED SITE INVESTIGATION REPORT PREPARED BY ECOLOGY AND ENVIRONMENT FOR THE STATE OF ILLINOIS.

2. 1991 CERCLA SCREENING SITE INSPECTION REPORT PREPARED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY FOR SAUGET SITES AREA 2.

108436

EXPANDED SITE INVESTIGATION
DEAD CREEK PROJECT SITES
AT CAHOKIA/SAUGET, ILLINOIS
FINAL REPORT
VOLUME 1 OF 2

May 1988

Prepared for:

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
Division of Land Pollution Control
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois 62794-9276

ecology and environment, inc.
111 WEST JACKSON BLVD., CHICAGO, ILLINOIS 60604, TEL. 312-663-9415
International Specialists in the Environment

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Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank
Sample Depth:						
Sample Date:	4/9/92	4/10/92	4/13/92	4/14/92	4/16/92	4/21/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter						
Methylene chloride	–	–	–	–	–	–
Acetone	–	–	–	–	–	–
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	–	–
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	–	–	–	–	–	–
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	–	–	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	–	–	–	–	–	–
4-Methyl-2-pentanone	–	–	–	–	–	–
Tetrachloroethene	–	–	–	–	–	–
Toluene	–	–	–	–	–	–
Chlorobenzene	–	–	–	–	–	–
Ethylbenzene	–	–	–	–	–	–
Xylenes	–	–	–	–	–	–
Total VOCs	–	–	–	–	–	–

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
– Not detected.
E Concentration is above the calibration range of the instrument.
J Estimated value.
B Compound detected in blank.
D Concentration determined at a secondary dilution factor.
VOCs Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank
Sample Depth:						
Sample Date:	4/23/92	4/27/92	5/4/92	5/5/92	5/6/92	5/7/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter						
Methylene chloride	–	–	–	–	–	–
Acetone	21 J	4 J	–	–	–	–
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethane (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	–	–
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	–	–	–	–	–	–
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	4 J	–	–	–	–	–
Trichloroethene	–	–	–	–	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	–	–	–	–	–	–
4-Methyl-2-pentanone	–	–	–	–	–	–
Tetrachloroethene	–	–	–	–	–	–
Toluene	–	–	–	–	–	–
Chlorobenzene	–	–	–	–	–	–
Ethylbenzene	–	–	–	–	–	–
Xylenes	–	–	–	–	–	–
Total VOCs	25	4	–	–	–	–

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
– Not detected.
E Concentration is above the calibration range of the instrument.
J Estimated value.
B Compound detected in blank.
D Concentration determined at a secondary dilution factor.
VOCs Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank
Sample Depth:						
Sample Date:	5/8/92	5/13/92	5/14/92	5/15/92	5/18/92	5/19/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter						
Methylene chloride	–	–	–	–	–	–
Acetone	–	–	–	–	–	–
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	–	–
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	–	–	–	–	–	–
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	1 J
Trichloroethene	–	3 J	–	–	–	1 J
Dibromochloroethane	–	–	–	–	–	2 J
Benzene	–	–	–	–	–	–
4-Methyl-2-pentanone	–	–	–	–	–	–
Tetrachloroethene	–	–	–	–	–	–
Toluene	–	7 J	–	–	–	–
Chlorobenzene	–	1 J	–	–	–	–
Ethylbenzene	–	–	–	–	–	–
Xylenes	–	–	–	–	–	–
Total VOCs	–	11	–	–	–	4

ug/L	Micrograms per liter.
ug/kg	Micrograms per kilogram.
–	Not detected.
E	Concentration is above the calibration range of the instrument.
J	Estimated value.
B	Compound detected in blank.
D	Concentration determined at a secondary dilution factor.
VOCs	Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank
Sample Depth:						
Sample Date:	5/20/92	5/21/92	5/22/92	5/26/92	5/27/92	5/28/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter						
Methylene chloride	–	–	–	–	–	–
Acetone	–	–	–	–	–	–
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	–	–
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	–	–	–	–	–	–
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	–	–	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	–	–	–	–	–	–
4-Methyl-2-pentanone	–	–	–	–	–	–
Tetrachloroethene	–	–	–	–	–	–
Toluene	–	–	–	–	–	–
Chlorobenzene	–	–	–	–	–	–
Ethylbenzene	–	–	–	–	–	–
Xylenes	–	–	–	–	–	–
Total VOCs	–	–	–	–	–	–

ug/L	Micrograms per liter.
ug/kg	Micrograms per kilogram.
–	Not detected.
E	Concentration is above the calibration range of the instrument.
J	Estimated value.
B	Compound detected in blank.
D	Concentration determined at a secondary dilution factor.
VOCs	Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Trip Blank
Sample Depth:	
Sample Date:	5/29/92
Units:	ug/L
Parameter	
Methylene chloride	–
Acetone	–
1,1-Dichloroethene	–
1,2-Dichloroethene (total)	–
Chloroform	–
1,2-Dichloroethane	–
2-Butanone (MEK)	–
1,1,1-Trichloroethane	–
Bromodichloroethane	–
Trichloroethene	–
Dibromochloroethane	–
Benzene	–
4-Methyl-2-pentanone	–
Tetrachloroethene	–
Toluene	–
Chlorobenzene	–
Ethylbenzene	–
Xylenes	–
Total VOCs	–

ug/L	Micrograms per liter.
ug/kg	Micrograms per kilogram.
–	Not detected.
E	Concentration is above the calibration range of the instrument.
J	Estimated value.
B	Compound detected in blank.
D	Concentration determined at a secondary dilution factor.
VOCs	Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:						
Sample Date:	4/9/92	4/10/92	4/13/92	4/14/92	4/16/92	4/21/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter						
Methylene chloride	–	–	–	–	–	–
Acetone	–	–	–	–	–	6 J
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	–	–
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	–	–	–	–	–	–
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	–	2 J	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	–	–	–	0.9 J	–	–
4-Methyl-2-pentanone	–	–	–	–	–	–
Tetrachloroethene	–	–	–	–	–	–
Toluene	–	–	–	–	–	–
Chlorobenzene	–	–	–	1 J	–	–
Ethylbenzene	–	–	–	–	–	–
Xylenes	–	–	–	–	–	–
Total VOCs	–	–	–	3.9	–	6

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
– Not detected.
E Concentration is above the calibration range of the instrument.
J Estimated value.
B Compound detected in blank.
D Concentration determined at a secondary dilution factor.
VOCs Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:						
Sample Date:	4/23/92	4/27/92	5/4/92	5/5/92	5/6/92	5/7/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter						
Methylene chloride	–	–	–	–	–	–
Acetone	–	–	–	–	9 J	–
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	–	–
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	–	–	–	–	–	–
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	–	–	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	–	–	–	–	–	–
4-Methyl-2-pentanone	–	–	–	–	–	–
Tetrachloroethene	–	–	–	–	–	–
Toluene	–	–	–	–	–	–
Chlorobenzene	–	–	–	–	–	–
Ethylbenzene	–	–	–	–	–	–
Xylenes	–	–	–	–	–	–
Total VOCs	–	–	–	–	9	–

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
– Not detected.
E Concentration is above the calibration range of the instrument.
J Estimated value.
B Compound detected in blank.
D Concentration determined at a secondary dilution factor.
VOCs Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:						
Sample Date:	5/8/92	5/13/92	5/14/92	5/15/92	5/18/92	5/19/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter						
Methylene chloride	–	–	–	–	–	–
Acetone	–	16	–	–	–	–
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	–	–
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	–	–	–	–	–	–
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	–	–	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	–	–	–	–	–	–
4-Methyl-2-pentanone	–	–	–	–	–	–
Tetrachloroethene	–	–	–	–	–	–
Toluene	–	–	–	–	–	–
Chlorobenzene	–	–	–	–	–	–
Ethylbenzene	–	–	–	–	–	–
Xylenes	–	–	–	–	–	–
Total VOCs	–	16	–	–	–	–

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
– Not detected.
E Concentration is above the calibration range of the instrument.
J Estimated value.
B Compound detected in blank.
D Concentration determined at a secondary dilution factor.
VOCs Volatile organic compounds.

Only those compounds detected are listed.

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Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:						
Sample Date:	5/20/92	5/21/92	5/22/92	5/26/92	5/27/92	5/28/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter						
Methylene chloride	–	–	–	–	–	–
Acetone	–	–	–	–	–	–
1,1-Dichloroethene	–	–	–	–	–	–
1,2-Dichloroethene (total)	–	–	–	–	–	–
Chloroform	–	–	–	–	–	–
1,2-Dichloroethane	–	–	–	–	–	–
2-Butanone (MEK)	–	–	–	–	–	–
1,1,1-Trichloroethane	–	–	–	–	–	–
Bromodichloroethane	–	–	–	–	–	–
Trichloroethene	–	–	–	–	–	–
Dibromochloroethane	–	–	–	–	–	–
Benzene	–	–	–	–	–	–
4-Methyl-2-pentanone	–	–	–	–	–	–
Tetrachloroethene	–	–	–	–	–	–
Toluene	–	–	–	–	–	–
Chlorobenzene	–	–	–	–	–	–
Ethylbenzene	–	–	–	–	–	–
Xylenes	–	–	–	–	–	–
Total VOCs	–	–	–	–	–	–

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
– Not detected.
E Concentration is above the calibration range of the instrument.
J Estimated value.
B Compound detected in blank.
D Concentration determined at a secondary dilution factor.
VOCs Volatile organic compounds.

Only those compounds detected are listed.

Table 5-8. Summary of Target Compound List Volatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Parameter	Equipment Blank
Sample Location:	Equipment Blank
Sample Depth:	
Sample Date:	5/29/92
Units:	ug/L
Methylene chloride	–
Acetone	–
1,1-Dichloroethene	–
1,2-Dichloroethene (total)	–
Chloroform	–
1,2-Dichloroethane	–
2-Butanone (MEK)	–
1,1,1-Trichloroethane	–
Bromodichloroethane	–
Trichloroethene	–
Dibromochloroethane	–
Benzene	–
4-Methyl-2-pentanone	–
Tetrachloroethene	–
Toluene	–
Chlorobenzene	–
Ethylbenzene	–
Xylenes	–
Total VOCs	–

ug/L	Micrograms per liter.
ug/kg	Micrograms per kilogram.
–	Not detected.
E	Concentration is above the calibration range of the instrument.
J	Estimated value.
B	Compound detected in blank.
D	Concentration determined at a secondary dilution factor.
VOCs	Volatile organic compounds.

Only those compounds detected are listed.

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Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-1	SB-1	SB-1	SB-2	SB-2	SB-2
Sample Depth:	12-14 ft	26-28 ft	32-34 ft	12-14 ft	14-16 ft	28-30 ft
Sample Date:	4/9/92	4/9/92	4/9/92	4/10/92	4/10/92	4/13/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Phenol	2100000	520000	490000	120000 J	390000	720000 D
bis(2-Chloroethyl)ether	–	–	–	–	–	–
2-Chlorophenol	–	289000	64000 J	94000 J	160000	51000 J
1,3-Dichlorobenzene	–	–	–	–	8000 J	–
1,4-Dichlorobenzene	410000	59000 J	12000 J	410000	600000	37000 J
1,2-Dichlorobenzene	260000 J	180000	34000 J	280000	540000	26000 J
2-Methylphenol (o-cresol)	–	–	–	–	–	–
4-Methylphenol (p-cresol)	–	–	–	–	–	–
Nitrobenzene	38000 J	120000 J	22000 J	540000 D	650000	90000
2,4-Dimethylphenol	–	–	–	–	–	–
2,4-Dichlorophenol	1700000	300000	80000	610000 D	630000	93000
1,2,4-Trichlorobenzene	6700 J	78000 J	10000 J	5000 J	8700 J	–
Naphthalene	–	–	720 J	–	–	–
4-Chloroaniline	–	–	–	–	–	–
2-Methylnaphthalene	–	–	–	–	–	–
2,4,6-Trichlorophenol	1200000	110000 J	19000 J	280000 J	400000	81000
2,4,5-Trichlorophenol	–	–	–	–	–	–
2-Nitroaniline	–	–	–	–	–	–
Dimethylphthalate	–	–	–	–	–	–
Acenaphthene	–	–	–	–	–	–
Dibenzofuran	–	–	–	–	–	–
Diethylphthalate	–	–	–	–	–	–
Fluorene	–	–	–	–	–	–
4-Nitroaniline	120000 J	15000 J	–	33000 J	–	–
N-Nitrosodiphenylamine	–	10000 J	–	9100 J	7100 J	–
Pentachlorophenol	–	–	–	–	–	–
Phenanthrene	–	–	–	–	–	–
Anthracene	–	–	–	–	–	–
Carbazole	–	–	–	–	–	–
Di-n-butylphthalate	–	–	–	–	–	–
Fluoranthene	–	–	–	–	–	–
Pyrene	–	–	–	–	–	–
Butylbenzylphthalate	–	–	–	–	–	–
3,3'-Dichlorobenzidine	–	–	–	–	–	–
Benzo(a)anthracene	–	–	–	–	–	–
Chrysene	–	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	960000	32000 J	–	–	–	–
Di-n-octylphthalate	–	–	–	–	–	2100 J
Benzo(b)fluoranthene	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–
Benzo(g,h,i)perylene	–	–	–	–	–	–
Aniline	–	–	–	–	–	–
2-Chloroaniline	170000 J	530000	210000	240000	480000	230000
3-Chloroaniline	–	–	3200 J	–	–	9000 J
Total SVOCs	6984700	2151000	944920	2801100	4073800	1339100

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
J Estimated value.
D Concentration determined at a secondary dilution factor.
R Unusable value.
E Exceeded the instrument calibration range.
– Not detected.
SVOCs Semivolatile organic compounds.

Only those compounds detected are listed.

Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-3	SB-3	SB-3	SB-4	SB-4	SB-4
Sample Depth:	12-14 ft	14-16 ft	32-34 ft	10-12 ft	12-14 ft	30-32 ft
Sample Date:	4/16/92	4/16/92	4/16/92	4/14/92	4/14/92	4/14/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Phenol	1300000	1600000	1100000 D	830000	190000	320000 J
bis(2-Chloroethyl)ether	–	–	–	–	–	–
2-Chlorophenol	960000	1100000	490000	590000	270000	150000 J
1,3-Dichlorobenzene	–	–	–	–	–	–
1,4-Dichlorobenzene	–	96000 J	76000 J	55000 J	51000 J	22000 J
1,2-Dichlorobenzene	96000 J	170000 J	280000	470000	58000 J	75000 J
2-Methylphenol (o-cresol)	–	–	–	54000 J	–	–
4-Methylphenol (p-cresol)	–	–	–	–	–	7300 J
Nitrobenzene	450000 J	420000	110000 J	88000 J	69000	15000 J
2,4-Dimethylphenol	–	–	2700 J	–	–	3500 J
2,4-Dichlorophenol	3200000	3500000 D	950000	1000000 D	4200000 D	110000 J
1,2,4-Trichlorobenzene	–	–	280000	100000 J	72000	32000 J
Naphthalene	530000 J	800000	–	–	–	–
4-Chloroaniline	–	40000 J	34000 DJ	–	–	–
2-Methylnaphthalene	–	–	–	–	–	–
2,4,6-Trichlorophenol	3800000	3500000 D	290000	3700000 D	1700000 D	49000 J
2,4,5-Trichlorophenol	–	–	–	–	–	–
2-Nitroaniline	–	–	–	–	1900 J	–
Dimethylphthalate	–	–	–	–	–	3000 J
Acenaphthene	–	–	–	–	–	–
Dibenzofuran	–	–	–	–	–	–
Diethylphthalate	–	–	–	–	–	–
Fluorene	–	–	–	–	–	–
4-Nitroaniline	320000 J	490000 J	25000 J	52000 J	–	–
N-Nitrosodiphenylamine	–	–	–	–	7900 J	–
Pentachlorophenol	–	–	–	–	–	–
Phenanthrene	–	–	–	–	–	–
Anthracene	–	–	–	–	–	–
Carbazole	–	–	–	–	–	–
Di-n-butylphthalate	–	–	–	–	–	–
Fluoranthene	–	–	–	–	–	–
Pyrene	–	–	–	–	–	–
Butylbenzylphthalate	–	10000 J	7000 J	–	9200 J	–
3,3'-Dichlorobenzidine	–	–	–	–	–	–
Benzo(a)anthracene	–	–	–	–	–	–
Chrysene	–	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	–	–	–	–	–	–
Di-n-octylphthalate	–	–	8900 J	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–
Benzo(g,h,i)perylene	–	–	–	–	–	–
Aniline	–	–	–	4100000	18000 J	–
2-Chloroaniline	1700000	3500000 D	1500000 D	220000 J	110000	73000 J
3-Chloroaniline	–	–	–	–	–	–
Total SVOCs	12156000	15536000	5073500	18257000	6758000	859800

ug/L	Micrograms per liter.
ug/kg	Micrograms per kilogram.
J	Estimated value.
D	Concentration determined at a secondary dilution factor.
R	Unusable value.
E	Exceeded the instrument calibration range.
–	Not detected.
SVOCs	Semivolatile organic compounds.

Only those compounds detected are listed.

SUBSEM.XLS

Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-5	SB-5	SB-5	SB-6	SB-6	SB-6
Sample Depth:	12-14 ft	20-22 ft	28-30 ft	18-20 ft	20-22 ft	28-30 ft
Sample Date:	5/4/92	5/4/92	5/4/92	5/5/92	5/5/92	5/6/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Phenol	280000 J	300000	590000	3300000	5800000 D	1500000
bis(2-Chloroethyl)ether	–	–	–	–	–	–
2-Chlorophenol	230000 J	61000 J	80000 J	4200000	5800000 D	3600000 D
1,3-Dichlorobenzene	–	1300 J	–	–	–	–
1,4-Dichlorobenzene	120000 J	43000 J	27000 J	–	20000 J	12000 J
1,2-Dichlorobenzene	2100000	200000	57000 J	570000 J	1100000	120000 J
2-Methylphenol (o-cresol)	–	–	–	–	–	–
4-Methylphenol (p-cresol)	–	–	–	500000 J	640000	290000
Nitrobenzene	–	100000	–	–	160000 J	110000 J
2,4-Dimethylphenol	–	–	–	120000 J	480000 J	100000 J
2,4-Dichlorophenol	1000000 D	950000 D	370000	4100000	9600000 D	1200000
1,2,4-Trichlorobenzene	4800000	140000	23000 J	280000 J	520000	69000 J
Naphthalene	–	–	–	670000	–	–
4-Chloroaniline	–	–	–	–	–	–
2-Methylnaphthalene	–	–	–	–	–	–
2,4,6-Trichlorophenol	3800000	160000	78000 J	1300000	300000	700000
2,4,5-Trichlorophenol	–	–	–	–	1600000	–
2-Nitroaniline	–	–	–	–	38000 J	–
Dimethylphthalate	–	–	–	–	–	–
Acenaphthene	–	–	–	–	–	–
Dibenzofuran	–	–	–	–	–	–
Diethylphthalate	–	–	–	–	–	–
Fluorene	–	–	–	–	–	–
4-Nitroaniline	–	–	–	–	–	–
N-Nitrosodiphenylamine	–	–	–	–	–	–
Pentachlorophenol	–	–	43000 J	150000 J	–	280000 J
Phenanthrene	–	–	–	–	–	–
Anthracene	–	–	–	–	–	–
Carbazole	–	–	–	–	–	–
Di-n-butylphthalate	–	–	–	–	–	–
Fluoranthene	–	–	–	–	–	–
Pyrene	–	–	–	–	–	–
Butylbenzylphthalate	–	–	–	–	–	–
3,3'-Dichlorobenzidine	–	–	–	R	R	–
Benzo(a)anthracene	–	–	–	–	–	–
Chrysene	–	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	–	–	–	–	22000 J	–
Di-n-octylphthalate	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–
Benzo(g,h,i)perylene	–	–	–	–	–	–
Aniline	–	–	–	–	48000 J	–
2-Chloroaniline	33000 J	970000 D	500000 J	370000 J	790000	140000 J
3-Chloroaniline	–	–	–	–	–	–
Total SVOCs	17343000	2955300	1768000	15540000	27650000	8101000

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
J Estimated value.
D Concentration determined at a secondary dilution factor.
R Unusable value.
E Exceeded the instrument calibration range.
– Not detected.
SVOCs Semivolatile organic compounds.

Only those compounds detected are listed.

SUBSEM.XLS

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Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-7	SB-7	SB-7	SB-8	SB-9	SB-9
Sample Depth:	16-18 ft	20-22 ft	24-26 ft	6-8 ft	18-20 ft	20-22 ft
Sample Date:	5/7/92	5/7/92	5/7/92	5/8/92	5/13/92	5/13/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Phenol	33000 J	120000 J	140000 J	–	1200000 J	270000 J
bis(2-Chloroethyl)ether	–	–	–	–	–	–
2-Chlorophenol	180000 J	100000 J	33000 J	–	–	4600 J
1,3-Dichlorobenzene	–	–	–	–	–	–
1,4-Dichlorobenzene	41000 J	21000 J	33000 J	–	–	–
1,2-Dichlorobenzene	78000 J	35000 J	37000 J	–	–	–
2-Methylphenol (o-cresol)	–	–	–	–	–	–
4-Methylphenol (p-cresol)	–	–	–	–	–	–
Nitrobenzene	370000 J	190000 J	130000 J	–	–	–
2,4-Dimethylphenol	–	–	–	–	–	–
2,4-Dichlorophenol	–	–	–	–	52000 J	13000 J
1,2,4-Trichlorobenzene	–	–	–	–	–	–
Naphthalene	–	–	–	–	–	–
4-Chloroaniline	–	–	–	–	–	20000 J
2-Methylnaphthalene	–	–	–	–	–	–
2,4,6-Trichlorophenol	–	–	–	–	–	11000 J
2,4,5-Trichlorophenol	–	–	–	–	–	–
2-Nitroaniline	–	–	–	–	–	–
Dimethylphthalate	–	–	–	–	13000 J	–
Acenaphthene	–	–	–	–	–	–
Dibenzofuran	–	–	–	–	–	–
Diethylphthalate	–	–	–	–	–	–
Fluorene	–	–	–	–	–	–
4-Nitroaniline	–	–	–	–	–	–
N-Nitrosodiphenylamine	–	–	–	–	–	–
Pentachlorophenol	–	–	–	–	–	–
Phenanthrene	–	–	–	–	–	–
Anthracene	–	–	–	–	–	–
Carbazole	–	–	–	–	–	–
Di-n-butylphthalate	–	–	–	–	–	–
Fluoranthene	–	–	–	–	–	–
Pyrene	–	–	–	–	–	–
Butylbenzylphthalate	–	–	–	–	39000 J	3300 J
3,3'-Dichlorobenzidine	–	–	–	–	–	–
Benzo(a)anthracene	–	–	–	–	–	–
Chrysene	–	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	–	–	–	–	–	–
Di-n-octylphthalate	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–
Benzo(g,h,i)perylene	–	–	–	–	–	–
Aniline	–	–	–	–	–	4100 J
2-Chloroaniline	110000 J	280000 J	140000 J	–	170000 J	41000 J
3-Chloroaniline	–	–	–	–	–	[illegible]
Total SVOCs	812000	746000	513000	–	1475000	372100

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
J Estimated value.
D Concentration determined at a secondary dilution factor.
R Unusable value.
E Exceeded the instrument calibration range.
– Not detected.
SVOCs Semivolatile organic compounds.

Only those compounds detected are listed.

SUBSEM.XLS

Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-9	SB-9	SB-10	SB-10	SB-10	SB-11
Sample Depth:	28-30 ft	30-32 ft	6-8 ft	18-20 ft	24-26 ft	14-16 ft
Sample Date:	5/13/92	5/13/92	5/14/92	5/14/92	5/14/92	5/19/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Phenol	680000	2100000	280000 J	1300000 J	230000	470000
bis(2-Chloroethyl)ether	–	–	–	–	–	–
2-Chlorophenol	140000 J	670000	–	–	12000 J	–
1,3-Dichlorobenzene	–	–	–	–	–	–
1,4-Dichlorobenzene	24000 J	96000 J	–	–	–	–
1,2-Dichlorobenzene	46000 J	20000 J	–	100000 J	–	–
2-Methylphenol (o-cresol)	–	–	–	–	–	–
4-Methylphenol (p-cresol)	–	–	–	440000 J	18000 J	–
Nitrobenzene	52000 J	250000 J	–	–	2900 J	–
2,4-Dimethylphenol	–	–	–	150000 J	2800 J	–
2,4-Dichlorophenol	530000 J	2900000	–	200000 J	34000 J	160000 J
1,2,4-Trichlorobenzene	41000 J	200000 J	–	–	–	41000 J
Naphthalene	–	–	–	–	–	–
4-Chloroaniline	32000 J	–	130000 J	2000000 J	23000 J	–
2-Methylnaphthalene	–	–	–	–	–	–
2,4,6-Trichlorophenol	–	–	–	–	8600 J	130000 J
2,4,5-Trichlorophenol	–	–	–	–	–	–
2-Nitroaniline	–	–	–	1000000 J	13000 J	–
Dimethylphthalate	–	–	–	–	–	–
Acenaphthene	–	–	–	–	–	–
Dibenzofuran	–	–	–	–	–	–
Diethylphthalate	–	–	–	–	–	–
Fluorene	–	–	–	–	–	–
4-Nitroaniline	–	–	–	–	–	9000 J
N-Nitrosodiphenylamine	–	–	–	–	–	–
Pentachlorophenol	–	–	–	–	–	–
Phenanthrene	–	–	–	–	–	–
Anthracene	–	–	–	–	–	–
Carbazole	–	–	–	–	–	–
Di-n-butylphthalate	–	–	–	–	–	–
Fluoranthene	–	–	–	–	–	–
Pyrene	–	–	–	–	–	–
Butylbenzylphthalate	–	–	–	–	–	–
3,3'-Dichlorobenzidine	–	–	–	–	–	–
Benzo(a)anthracene	–	–	–	–	–	–
Chrysene	–	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	–	–	470000 J	–	–	–
Di-n-octylphthalate	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–
Benzo(g,h,i)perylene	–	–	–	–	–	–
Aniline	23000 J	70000 J	–	100000 J	7800 J	–
2-Chloroaniline	590000 J	2500000	200000 J	4900000	110000	–
3-Chloroaniline	15000 J	–	–	190000 J	–	–
Total SVOCs	2173000	8976000	980000	10380000	462100	842000

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
J Estimated value.
D Concentration determined at a secondary dilution factor.
R Unusable value.
E Exceeded the instrument calibration range.
– Not detected.
SVOCs Semivolatile organic compounds.

Only those compounds detected are listed.

Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-11	SB-11	SB-12	SB-12	SB-12	SB-12
Sample Depth:	16-18 ft	30-32 ft	8-10 ft	22-24 ft	32-34 ft	32-34 ft
Sample Date:	5/19/92	5/20/92	5/15/92	5/18/92	5/18/92	5/18/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Phenol	480000 J	9700 J	1800 J	5100000	1200000 E	710000 D
bis(2-Chloroethyl)ether	–	–	–	–	–	–
2-Chlorophenol	–	–	–	470000 J	130000	130000
1,3-Dichlorobenzene	–	–	–	–	–	–
1,4-Dichlorobenzene	–	–	–	–	2000 J	3000 J
1,2-Dichlorobenzene	–	–	–	610000 J	390000	390000
2-Methylphenol (o-cresol)	–	–	–	–	–	–
4-Methylphenol (p-cresol)	–	–	–	–	21000 J	21000 J
Nitrobenzene	–	–	–	–	16000 J	16000 J
2,4-Dimethylphenol	–	–	–	–	5000 J	5000 J
2,4-Dichlorophenol	–	19000 J	480 J	2800000	580000 E	370000 D
1,2,4-Trichlorobenzene	–	–	–	230000 J	84000	84000
Naphthalene	–	–	–	–	–	–
4-Chloroaniline	–	28000 J	–	–	–	–
2-Methylnaphthalene	–	–	–	–	–	–
2,4,6-Trichlorophenol	–	–	–	530000 J	93000	93000
2,4,5-Trichlorophenol	–	–	–	–	–	–
2-Nitroaniline	–	–	–	–	–	–
Dimethylphthalate	–	–	–	–	–	–
Acenaphthene	–	–	–	–	–	–
Dibenzofuran	–	–	–	–	–	–
Diethylphthalate	–	–	280 J	–	–	–
Fluorene	–	–	–	–	–	–
4-Nitroaniline	–	–	–	–	–	–
N-Nitrosodiphenylamine	–	–	–	–	–	–
Pentachlorophenol	–	–	–	–	25000 J	25000 J
Phenanthrene	–	–	–	–	–	–
Anthracene	–	–	–	–	–	–
Carbazole	–	–	–	–	–	–
Di-n-butylphthalate	–	–	–	–	–	–
Fluoranthene	–	–	–	–	–	–
Pyrene	–	–	–	–	–	–
Butylbenzylphthalate	–	–	–	–	–	–
3,3'-Dichlorobenzidine	–	–	–	–	–	–
Benzo(a)anthracene	–	–	–	–	–	–
Chrysene	–	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	–	–	–	–	–	–
Di-n-octylphthalate	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–
Benzo(g,h,i)perylene	–	–	–	–	–	–
Aniline	–	–	440 J	980000 J	–	120000 DJ
2-Chloroaniline	–	230000 J	590 J	–	170000	170000 J
3-Chloroaniline	–	8200 J	–	–	18000 J	18000 J
Total SVOCs	480000	289900	3660	10630000	2736000	2156000

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
J Estimated value.
D Concentration determined at a secondary dilution factor.
R Unuseable value.
E Exceeded the instrument calibration range.
– Not detected.
SVOCs Semivolatile organic compounds.

Only those compounds detected are listed.

Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-13	SB-13	SB-13	SB-14	SB-14	SB-14
Sample Depth:	16-18 ft	18-20 ft	30-32 ft	10-12 ft	20-22 ft	30-32 ft
Sample Date:	5/21/92	5/21/92	5/21/92	5/22/92	5/26/92	5/26/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Phenol	140 J	21000 J	460000	6500 J	2800000	890000
bis(2-Chloroethyl)ether	31 J	–	–	–	–	–
2-Chlorophenol	430 J	260000 EJ	120000	–	840000 J	220000 J
1,3-Dichlorobenzene	–	–	–	–	–	–
1,4-Dichlorobenzene	–	–	–	15000	–	–
1,2-Dichlorobenzene	–	–	–	9600 J	9100 J	440000
2-Methylphenol (o-cresol)	–	999 J	–	–	–	–
4-Methylphenol (p-cresol)	–	–	33000 J	4800 J	59000 J	59000 J
Nitrobenzene	–	–	–	–	5700 J	87000 J
2,4-Dimethylphenol	–	–	–	[illegible]	–	–
2,4-Dichlorophenol	39 J	230000 EJ	150000	1800 J	120000 J	690000
1,2,4-Trichlorobenzene	–	–	–	940 J	–	170000 J
Naphthalene	24 J	27000	23000 J	1500 J	–	–
4-Chloroaniline	–	65000 DJ	–	9700 J	–	–
2-Methylnaphthalene	20 J	–	–	–	–	–
2,4,6-Trichlorophenol	–	67000	22000 J	640 J	42000 J	130000 J
2,4,5-Trichlorophenol	–	–	–	–	–	–
2-Nitroaniline	–	–	–	3000 J	–	–
Dimethylphthalate	–	–	–	–	–	–
Acenaphthene	–	–	–	–	–	–
Dibenzofuran	–	–	–	–	–	–
Diethylphthalate	–	–	–	–	–	–
Fluorene	–	–	–	–	–	–
4-Nitroaniline	–	–	–	[illegible]	–	–
N-Nitrosodiphenylamine	–	–	–	–	–	–
Pentachlorophenol	–	790000 EJ	–	–	–	–
Phenanthrene	–	–	–	–	–	–
Anthracene	–	–	–	–	–	–
Carbazole	–	–	–	–	–	–
Di-n-butylphthalate	30 J	–	–	–	–	–
Fluoranthene	–	–	–	–	–	–
Pyrene	–	–	–	–	–	–
Butylbenzylphthalate	17 J	–	–	–	–	–
3,3'-Dichlorobenzidine	–	–	–	–	–	–
Benzo(a)anthracene	–	–	–	–	–	–
Chrysene	–	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	–	–	–	–	–	–
Di-n-octylphthalate	47 J	–	–	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–
Benzo(g,h,i)perylene	–	–	–	–	–	–
Aniline	–	–	–	–	–	–
2-Chloroaniline	–	39000 DJ	–	8000 J	29000 J	43000 J
3-Chloroaniline	–	[illegible]	–	9400 J	–	–
Total SVOCs	736	1547990	808000	8371540	3904800	2729000

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
J Estimated value.
D Concentration determined at a secondary dilution factor.
R Unusable value.
E Exceeded the instrument calibration range.
– Not detected.
SVOCs Semivolatile organic compounds.

Only those compounds detected are listed.

Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-15	SB-15	SB-15	SB-16	SB-16	SB-16
Sample Depth:	16-18 ft	18-20 ft	26-28 ft	6-8 ft	16-18 ft	28-30 ft
Sample Date:	5/27/92	5/28/92	5/28/92	5/29/92	5/29/92	5/29/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Phenol	640000 J	150000 J	7300 J	R	–	–
bis(2-Chloroethyl)ether	–	–	–	–	–	–
2-Chlorophenol	1100000 J	220000 J	–	R	230000 D	950000
1,3-Dichlorobenzene	–	–	–	–	–	–
1,4-Dichlorobenzene	–	–	–	–	–	–
1,2-Dichlorobenzene	–	30000 J	–	12000 J	6200 J	–
2-Methylphenol (o-cresol)	–	–	–	–	–	–
4-Methylphenol (p-cresol)	–	–	–	R	–	–
Nitrobenzene	580000 J	97000 J	–	1900 J	8500 J	–
2,4-Dimethylphenol	–	–	–	18000 J	–	–
2,4-Dichlorophenol	16000000 D	2600000 D	19000 J	46000	58000	240000 J
1,2,4-Trichlorobenzene	–	–	–	5800 J	3300 J	–
Naphthalene	–	–	–	–	–	–
4-Chloroaniline	–	–	–	–	40000	–
2-Methylnaphthalene	–	–	–	–	–	–
2,4,6-Trichlorophenol	1900000	540000	–	23000	9800 J	51000 J
2,4,5-Trichlorophenol	–	–	–	–	–	–
2-Nitroaniline	–	–	–	–	–	–
Dimethylphthalate	–	–	–	–	–	–
Acenaphthene	–	–	–	–	–	–
Dibenzofuran	–	–	–	–	–	–
Diethylphthalate	–	–	–	–	–	–
Fluorene	–	–	–	–	–	–
4-Nitroaniline	–	–	–	350000 DJ	–	–
N-Nitrosodiphenylamine	–	–	–	–	–	–
Pentachlorophenol	–	–	–	40000	–	–
Phenanthrene	–	–	–	–	–	–
Anthracene	–	–	–	–	–	–
Carbazole	–	–	–	–	–	–
Di-n-butylphthalate	–	–	–	–	–	–
Fluoranthene	–	–	–	–	–	–
Pyrene	–	–	–	–	–	–
Butylbenzylphthalate	–	–	–	–	180 J	–
3,3'-Dichlorobenzidine	–	–	–	–	–	–
Benzo(a)anthracene	–	–	–	–	–	–
Chrysene	–	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	–	–	–	–	–	–
Di-n-octylphthalate	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–
Benzo(g,h,i)perylene	–	–	–	–	–	–
Aniline	–	–	–	–	–	–
2-Chloroaniline	720000 J	190000 J	–	8600 J	190000 D	160000 J
3-Chloroaniline	–	–	–	–	40000 DJ	–
Total SVOCs	20940000	3827000	26300	549300	589980	1401000

ug/L	Micrograms per liter.
ug/kg	Micrograms per kilogram.
J	Estimated value.
D	Concentration determined at a secondary dilution factor.
R	Unusable value.
E	Exceeded the instrument calibration range.
–	Not detected.
SVOCs	Semivolatile organic compounds.

Only those compounds detected are listed.

SUBSEM.XLS

009557

Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Parameter	
Sample Location:	SB-16
Sample Depth:	30-32 ft
Sample Date:	5/29/92
Units:	ug/kg
Phenol	~~420000 EJ~~
bis(2-Chloroethyl)ether	–
2-Chlorophenol	~~460000 EJ~~
1,3-Dichlorobenzene	–
1,4-Dichlorobenzene	–
1,2-Dichlorobenzene	–
2-Methylphenol (o-cresol)	–
4-Methylphenol (p-cresol)	~~38000 J~~
Nitrobenzene	~~690 J~~
2,4-Dimethylphenol	–
2,4-Dichlorophenol	~~420000 DJ~~
1,2,4-Trichlorobenzene	–
Naphthalene	–
4-Chloroaniline	–
2-Methylnaphthalene	–
2,4,6-Trichlorophenol	~~51000 J~~
2,4,5-Trichlorophenol	–
2-Nitroaniline	–
Dimethylphthalate	–
Acenaphthene	–
Dibenzofuran	–
Diethylphthalate	–
Fluorene	–
4-Nitroaniline	–
N-Nitrosodiphenylamine	–
Pentachlorophenol	–
Phenanthrene	–
Anthracene	–
Carbazole	–
Di-n-butylphthalate	–
Fluoranthene	–
Pyrene	–
Butylbenzylphthalate	–
3,3'-Dichlorobenzidine	–
Benzo(a)anthracene	–
Chrysene	–
bis(2-Ethylhexyl)phthalate	–
Di-n-octylphthalate	–
Benzo(b)fluoranthene	–
Benzo(k)fluoranthene	–
Benzo(a)pyrene	–
Indeno(1,2,3-cd)pyrene	–
Benzo(g,h,i)perylene	–
Aniline	–
2-Chloroaniline	~~49000~~
3-Chloroaniline	–
Total SVOCs	1436690

ug/L	Micrograms per liter.
ug/kg	Micrograms per kilogram.
J	Estimated value.
D	Concentration determined at a secondary dilution factor.
R	Unusable value.
E	Exceeded the instrument calibration range.
–	Not detected.
SVOCs	Semivolatile organic compounds.

Only those compounds detected are listed.

Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:						
Sample Date:	4/9/92	4/10/92	4/13/92	4/14/92	4/16/92	4/21/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter						
Phenol	–	–	–	–	–	–
bis(2-Chloroethyl)ether	–	–	–	–	–	–
2-Chlorophenol	–	–	–	–	–	–
1,3-Dichlorobenzene	–	–	–	–	–	–
1,4-Dichlorobenzene	–	–	–	–	–	–
1,2-Dichlorobenzene	–	–	–	–	–	–
2-Methylphenol (o-cresol)	–	–	–	–	–	–
4-Methylphenol (p-cresol)	–	–	–	–	–	–
Nitrobenzene	–	–	–	–	–	–
2,4-Dimethylphenol	–	–	–	–	–	–
2,4-Dichlorophenol	–	–	–	–	–	–
1,2,4-Trichlorobenzene	–	–	–	–	–	–
Naphthalene	–	–	–	–	–	–
4-Chloroaniline	–	–	–	–	–	–
2-Methylnaphthalene	–	–	–	–	–	–
2,4,6-Trichlorophenol	–	–	–	–	–	–
2,4,5-Trichlorophenol	–	–	–	–	–	–
2-Nitroaniline	–	–	–	–	–	–
Dimethylphthalate	–	–	–	–	–	–
Acenaphthene	–	–	–	–	–	–
Dibenzofuran	–	–	–	–	–	–
Diethylphthalate	–	–	–	–	–	–
Fluorene	–	–	–	–	–	–
4-Nitroaniline	–	–	–	–	–	–
N-Nitrosodiphenylamine	–	–	–	–	–	–
Pentachlorophenol	–	–	–	–	–	–
Phenanthrene	–	–	–	–	–	–
Anthracene	–	–	–	–	–	–
Carbazole	–	0.3 J	–	–	–	–
Di-n-butylphthalate	–	–	–	–	–	–
Fluoranthene	–	–	–	–	–	–
Pyrene	–	1 J	–	–	–	–
Butylbenzylphthalate	–	–	–	–	–	–
3,3'-Dichlorobenzidine	–	–	–	–	–	–
Benzo(a)anthracene	–	–	–	–	–	–
Chrysene	0.8 J	360 D	0.7 J	–	4 J	6 J
bis(2-Ethylhexyl)phthalate	–	–	–	–	–	–
Di-n-octylphthalate	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–
Benzo(g,h,i)perylene	–	–	–	–	–	–
2-Chloroaniline	–	–	–	–	–	–
3-Chloroaniline	–	–	–	–	–	–
Total SVOCs	0.8	361.3	0.7	–	4	6

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
J Estimated value.
D Concentration determined at a secondary dilution factor.
R Unusable value.
E Exceeded the instrument calibration range.
– Not detected.
SVOCs Semivolatile organic compounds.

Only those compounds detected are listed.

SUBSEM.XLS

Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:						
Sample Date:	4/23/92	4/27/92	5/4/92	5/5/92	5/6/92	5/7/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter						
Phenol	–	0.4 J	–	–	–	–
bis(2-Chloroethyl)ether	–	–	–	–	–	–
2-Chlorophenol	–	–	–	–	–	–
1,3-Dichlorobenzene	–	–	–	–	–	–
1,4-Dichlorobenzene	–	–	–	–	–	–
1,2-Dichlorobenzene	–	–	–	–	–	–
2-Methylphenol (o-cresol)	–	–	–	–	–	–
4-Methylphenol (p-cresol)	–	–	–	–	–	–
Nitrobenzene	–	–	2 J	1 J	–	–
2,4-Dimethylphenol	–	–	–	–	–	–
2,4-Dichlorophenol	–	–	–	–	–	–
1,2,4-Trichlorobenzene	–	–	–	–	–	–
Naphthalene	–	0.7 J	–	–	6 J	0.3 J
4-Chloroaniline	–	–	–	–	–	–
2-Methylnaphthalene	–	–	–	–	–	–
2,4,6-Trichlorophenol	–	–	–	–	–	–
2,4,5-Trichlorophenol	–	–	–	–	–	–
2-Nitroaniline	–	–	–	–	–	–
Dimethylphthalate	–	–	–	–	–	–
Acenaphthene	–	–	–	–	–	–
Dibenzofuran	–	–	–	–	–	–
Diethylphthalate	–	–	–	–	–	–
Fluorene	–	–	–	–	–	–
4-Nitroaniline	–	–	–	–	–	–
N-Nitrosodiphenylamine	–	–	–	–	–	–
Pentachlorophenol	–	–	–	–	–	–
Phenanthrene	–	–	–	–	–	–
Anthracene	–	–	–	–	–	–
Carbazole	–	–	–	–	–	–
Di-n-butylphthalate	–	–	–	–	–	–
Fluoranthene	–	–	–	–	–	–
Pyrene	–	–	–	–	–	–
Butylbenzylphthalate	–	–	–	–	–	–
3,3'-Dichlorobenzidine	–	–	–	–	–	–
Benzo(a)anthracene	–	–	–	–	–	–
Chrysene	13 J	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	–	–	–	–	–	–
Di-n-octylphthalate	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–
Benzo(g,h,i)perylene	–	–	–	–	–	–
2-Chloroaniline	–	–	–	–	–	–
3-Chloroaniline	–	–	–	–	–	–
Total SVOCs	13	1.1	2	1	6	0.3

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
J Estimated value.
D Concentration determined at a secondary dilution factor.
R Unusable value.
E Exceeded the instrument calibration range.
– Not detected.
SVOCs Semivolatile organic compounds.

Only those compounds detected are listed.

Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:						
Sample Date:	5/8/92	5/13/92	5/14/92	5/15/92	5/18/92	5/19/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter						
Phenol	–	–	–	–	–	–
bis(2-Chloroethyl)ether	–	–	–	–	–	–
2-Chlorophenol	–	–	–	–	–	–
1,3-Dichlorobenzene	–	–	–	–	–	–
1,4-Dichlorobenzene	–	–	–	–	–	–
1,2-Dichlorobenzene	–	–	–	–	–	–
2-Methylphenol (o-cresol)	–	–	–	–	–	–
4-Methylphenol (p-cresol)	–	–	–	–	–	–
Nitrobenzene	–	–	–	–	–	–
2,4-Dimethylphenol	–	–	–	–	–	–
2,4-Dichlorophenol	–	–	–	–	–	–
1,2,4-Trichlorobenzene	–	–	–	–	–	–
Naphthalene	–	–	–	–	–	–
4-Chloroaniline	–	–	–	–	–	–
2-Methylnaphthalene	–	–	–	–	–	–
2,4,6-Trichlorophenol	–	–	–	–	–	–
2,4,5-Trichlorophenol	–	–	–	–	–	–
2-Nitroaniline	–	–	–	–	–	–
Dimethylphthalate	–	–	–	–	–	–
Acenaphthene	–	–	–	–	–	–
Dibenzofuran	–	–	–	–	–	–
Diethylphthalate	–	–	–	–	–	–
Fluorene	–	–	–	–	–	–
4-Nitroaniline	–	–	–	–	–	–
N-Nitrosodiphenylamine	–	–	–	–	–	–
Pentachlorophenol	–	–	–	–	–	–
Phenanthrene	–	–	–	–	–	–
Anthracene	–	–	–	–	–	–
Carbazole	–	–	–	–	–	–
Di-n-butylphthalate	–	–	–	–	–	–
Fluoranthene	–	–	–	–	–	–
Pyrene	–	–	–	–	–	–
Butylbenzylphthalate	–	–	–	–	–	R
3,3'-Dichlorobenzidine	–	–	–	–	–	–
Benzo(a)anthracene	–	–	–	–	–	–
Chrysene	–	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	–	–	–	–	–	–
Di-n-octylphthalate	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–
Benzo(g,h,i)perylene	–	–	–	–	–	–
2-Chloroaniline	–	–	–	–	–	–
3-Chloroaniline	–	–	–	–	–	–
Total SVOCs	–	–	–	–	–	–

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
J Estimated value.
D Concentration determined at a secondary dilution factor.
R Unusable value.
E Exceeded the instrument calibration range.
– Not detected.
SVOCs Semivolatile organic compounds.

Only those compounds detected are listed.

Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:						
Sample Date:	5/20/92	5/21/92	5/22/92	5/26/92	5/27/92	5/28/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter						
Phenol	–	–	–	–	–	–
bis(2-Chloroethyl)ether	–	–	–	–	–	–
2-Chlorophenol	–	–	–	–	–	–
1,3-Dichlorobenzene	–	–	–	–	–	–
1,4-Dichlorobenzene	–	–	–	–	–	–
1,2-Dichlorobenzene	–	–	–	–	–	–
2-Methylphenol (o-cresol)	–	–	–	–	–	–
4-Methylphenol (p-cresol)	–	–	–	–	–	–
Nitrobenzene	–	–	–	–	–	–
2,4-Dimethylphenol	–	–	–	–	–	–
2,4-Dichlorophenol	–	–	–	1 J	–	–
1,2,4-Trichlorobenzene	–	–	–	–	–	–
Naphthalene	–	–	–	–	–	–
4-Chloroaniline	–	–	–	–	–	–
2-Methylnaphthalene	–	–	–	–	–	–
2,4,6-Trichlorophenol	–	–	–	–	–	–
2,4,5-Trichlorophenol	–	–	–	–	–	–
2-Nitroaniline	–	–	–	–	–	–
Dimethylphthalate	–	–	–	–	–	–
Acenaphthene	–	–	–	–	–	–
Dibenzofuran	–	–	–	–	–	–
Diethylphthalate	–	–	–	–	–	–
Fluorene	–	–	–	–	–	–
4-Nitroaniline	–	–	–	–	–	–
N-Nitrosodiphenylamine	–	–	–	–	–	–
Pentachlorophenol	–	–	–	–	–	–
Phenanthrene	–	–	–	–	–	–
Anthracene	–	–	–	–	–	–
Carbazole	–	–	–	–	–	–
Di-n-butylphthalate	–	–	–	–	–	–
Fluoranthene	–	–	–	–	–	–
Pyrene	–	–	–	–	–	–
Butylbenzylphthalate	R	R	–	–	–	–
3,3'-Dichlorobenzidine	–	–	–	–	–	–
Benzo(a)anthracene	–	–	–	–	–	–
Chrysene	–	–	–	–	–	–
bis(2-Ethylhexyl)phthalate	–	–	–	–	–	–
Di-n-ectylphthalate	–	–	–	–	–	–
Benzo(b)fluoranthene	–	–	–	–	–	–
Benzo(k)fluoranthene	–	–	–	–	–	–
Benzo(a)pyrene	–	–	–	–	–	–
Indeno(1,2,3-cd)pyrene	–	–	–	–	–	–
Benzo(g,h,i)perylene	–	–	–	–	–	–
2-Chloroaniline	–	–	–	–	–	–
3-Chloroaniline	–	–	–	–	–	–
Total SVOCs	–	–	–	1	–	–

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
J Estimated value.
D Concentration determined at a secondary dilution factor.
R Unusable value.
E Exceeded the instrument calibration range.
– Not detected.
SVOCs Semivolatile organic compounds.

Only those compounds detected are listed.

008562

Table 5-9. Summary of Target Compound List Semivolatile Organic Compounds Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank
Sample Depth:	
Sample Date:	5/29/92
Units:	ug/L
Parameter	
Phenol	5 J
bis(2-Chloroethyl)ether	–
2-Chlorophenol	–
1,3-Dichlorobenzene	–
1,4-Dichlorobenzene	–
1,2-Dichlorobenzene	–
2-Methylphenol (o-cresol)	1 J
4-Methylphenol (p-cresol)	3 J
Nitrobenzene	–
2,4-Dimethylphenol	–
2,4-Dichlorophenol	–
1,2,4-Trichlorobenzene	–
Naphthalene	8 J
4-Chloroaniline	–
2-Methylnaphthalene	2 J
2,4,6-Trichlorophenol	–
2,4,5-Trichlorophenol	–
2-Nitroaniline	–
Dimethylphthalate	–
Acenaphthene	–
Dibenzofuran	–
Diethylphthalate	–
Fluorene	–
4-Nitroaniline	–
N-Nitrosodiphenylamine	–
Pentachlorophenol	–
Phenanthrene	–
Anthracene	–
Carbazole	–
Di-n-butylphthalate	–
Fluoranthene	–
Pyrene	–
Butylbenzylphthalate	–
3,3'-Dichlorobenzidine	–
Benzo(a)anthracene	–
Chrysene	6 J
bis(2-Ethylhexyl)phthalate	–
Di-n-octylphthalate	–
Benzo(b)fluoranthene	–
Benzo(k)fluoranthene	–
Benzo(a)pyrene	–
Indeno(1,2,3-cd)pyrene	–
Benzo(g,h,i)perylene	–
2-Chloroaniline	–
3-Chloroaniline	–
Total SVOCs	25

ug/L Micrograms per liter.
ug/kg Micrograms per kilogram.
J Estimated value.
D Concentration determined at a secondary dilution factor.
R Unusable value.
E Exceeded the instrument calibration range.
– Not detected.
SVOCs Semivolatile organic compounds.

Only those compounds detected are listed.

Table 5-10. Summary of Target Compound List Pesticides, PCBs, and Herbicides Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-1	SB-1	SB-1	SB-2	SB-2	SB-2	SB-3
Sample Depth:	12-14 ft	26-28 ft	32-34 ft	12-14 ft	14-16 ft	28-30 ft	12-14 ft
Sample Date:	4/9/92	4/9/92	4/9/92	4/10/92	4/10/92	4/13/92	4/16/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter							
Pesticides/PCBs							
beta-BHC	–	–	–	–	–	–	–
delta-BHC	–	–	–	–	–	–	–
Heptachlor epoxide	–	–	–	–	–	–	–
Endosulfan I	–	–	–	–	3000 JN	R	–
4,4'-DDE	–	–	–	–	–	–	22000 J
Endrin	–	R	R	–	–	–	4600 J
Endosulfan II	R	–	–	–	R	–	–
4,4'-DDD	–	–	–	–	–	–	–
4,4'-DDT	–	–	–	1400	–	–	–
Methoxychlor	–	–	–	–	–	–	–
Endrin ketone	R	R	R	–	R	R	R
Endrin aldehyde	–	–	–	–	–	–	5900 JN
alpha-Chlordane	–	–	–	–	–	–	–
gamma-Chlordane	–	–	–	–	–	–	–
Aroclor-1248	–	–	–	–	–	–	4800000 J
Aroclor-1254	–	–	–	–	–	–	–
Aroclor-1260	–	–	–	–	–	–	–
Herbicides							
2,4-D	NA	NA	NA	NA	NA	NA	NA

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
D Concentration determined at a secondary dilution factor.
NA Not analyzed.
J Estimated value.
R Unusable value.
N Presumptive evidence of the compound present.
– Not detected.
PCBs Polychlorinated biphenyls.

Only those compounds detected are listed.

Table 5-10. Summary of Target Compound List Pesticides, PCBs, and Herbicides Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-3	SB-3	SB-4	SB-4	SB-4	SB-5	SB-5
Sample Depth:	14-16 ft	32-34 ft	10-12 ft	12-14 ft	30-32 ft	12-14 ft	20-22 ft
Sample Date:	4/16/92	4/16/92	4/14/92	4/14/92	4/14/92	5/4/92	5/4/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter							
Pesticides/PCBs							
beta-BHC	–	–	7600 JN	–	–	–	–
delta-BHC	–	–	–	–	–	–	–
Heptachlor epoxide	–	–	–	–	–	–	–
Endosulfan I	–	–	–	–	–	–	–
4,4'-DDE	–	–	–	–	–	–	–
Endrin	–	–	–	–	–	–	–
Endosulfan II	–	3300	R	–	–	–	–
4,4'-DDD	720	–	–	–	–	–	–
4,4'-DDT	–	–	52000	–	–	–	–
Methoxychlor	–	–	–	–	–	–	–
Endrin ketone	R	15000	4800	–	99000 JN	11000	–
Endrin aldehyde	2000 J	–	–	–	–	–	–
alpha-Chlordane	–	420	–	–	–	–	–
gamma-Chlordane	–	–	–	–	–	–	–
Aroclor-1248	900000 J	–	–	–	–	470000 J	62000 J
Aroclor-1254	–	–	–	–	–	1100000 J	120000 JN
Aroclor-1260	–	–	–	100000	–	–	–
Herbicides							
2,4-D	NA	NA	NA	NA	NA	NA	NA

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
D Concentration determined at a secondary dilution factor.
NA Not analyzed.
J Estimated value.
R Unusable value.
N Presumptive evidence of the compound present.
– Not detected.
PCBs Polychlorinated biphenyls.

Only those compounds detected are listed.

Table 5-10. Summary of Target Compound List Pesticides, PCBs, and Herbicides Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-5	SB-6	SB-6	SB-6	SB-7	SB-7	SB-7
Sample Depth:	28-30 ft	18-20 ft	20-22 ft	28-30 ft	16-18 ft	20-22 ft	24-26 ft
Sample Date:	5/4/92	5/5/92	5/5/92	5/6/92	5/7/92	5/7/92	5/7/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter							
Pesticides/PCBs							
beta-BHC	–	–	–	–	–	–	–
delta-BHC	–	–	–	–	–	–	–
Heptachlor epoxide	–	600 DJ	–	–	–	–	–
Endosulfan I	–	–	–	–	–	–	–
4,4'-DDE	–	–	–	–	–	–	–
Endrin	–	–	–	–	–	–	–
Endosulfan II	–	–	45000 DJ	–	–	–	–
4,4'-DDD	–	–	–	–	–	–	–
4,4'-DDT	–	–	–	–	–	–	–
Methoxychlor	–	–	–	–	–	–	–
Endrin ketone	–	–	–	–	–	–	–
Endrin aldehyde	–	–	29000 DJ	–	–	–	–
alpha-Chlordane	–	1700 DJ	–	–	–	–	–
gamma-Chlordane	–	300 J	–	–	–	–	–
Aroclor-1248	12000 J	–	1200000 DJ	28000 J	–	–	–
Aroclor-1254	22000 J	–	–	–	–	–	–
Aroclor-1260	–	–	–	–	–	–	–
Herbicides							
2,4-D	NA	NA	NA	NA	NA	NA	NA

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
D Concentration determined at a secondary dilution factor.
NA Not analyzed.
J Estimated value.
R Unusable value.
N Presumptive evidence of the compound present.
– Not detected.
PCBs Polychlorinated biphenyls.

Only those compounds detected are listed.

Table 5-10. Summary of Target Compound List Pesticides, PCBs, and Herbicides Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-8	SB-9	SB-9	SB-9	SB-9	SB-10	SB-10
Sample Depth:	6-8 ft	18-20 ft	20-22 ft	28-30 ft	30-32 ft	6-8 ft	18-20 ft
Sample Date:	5/8/92	5/13/92	5/13/92	5/13/92	5/13/92	5/14/92	5/14/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter							
Pesticides/PCBs							
beta-BHC	–	–	–	–	–	–	–
delta-BHC	–	–	–	–	–	–	330 J
Heptachlor epoxide	–	–	–	–	–	440 J	R
Endosulfan I	–	–	–	–	–	–	–
4,4'-DDE	–	–	–	–	–	–	–
Endrin	–	–	–	–	–	–	–
Endosulfan II	3500 J	–	–	–	–	1100 J	–
4,4'-DDD	–	–	–	–	–	–	–
4,4'-DDT	–	–	–	–	–	–	–
Methoxychlor	–	–	–	–	R	–	–
Endrin ketone	–	–	–	–	–	–	–
Endrin aldehyde	R	–	–	–	–	–	–
alpha-Chlordane	–	–	–	–	–	–	280 J
gamma-Chlordane	–	–	–	–	–	450 J	620 J
Aroclor-1248	270000 J	16000 J	7200 J	7000 J	160000 JN	130000 J	130000 J
Aroclor-1254	–	–	–	–	–	–	–
Aroclor-1260	–	3700 J	1000 J	14000 J	100000 J	9800 J	34000 J
Herbicides							
2,4-D	NA	NA	NA	NA	NA	970 J	NA

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
D Concentration determined at a secondary dilution factor.
NA Not analyzed.
J Estimated value.
R Unusable value.
N Presumptive evidence of the compound present.
– Not detected.
PCBs Polychlorinated biphenyls.

Only those compounds detected are listed.

Table 5-10. Summary of Target Compound List Pesticides, PCBs, and Herbicides Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-10	SB-11	SB-11	SB-11	SB-12	SB-12	SB-12
Sample Depth:	24-26 ft	14-16 ft	16-18 ft	30-32 ft	8-10 ft	22-24 ft	32-34 ft
Sample Date:	5/14/92	5/19/92	5/19/92	5/20/92	5/15/92	5/18/92	5/18/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter							
Pesticides/PCBs							
beta-BHC	–	–	–	–	–	–	–
delta-BHC	–	–	–	–	–	–	–
Heptachlor epoxide	–	–	–	–	–	–	–
Endosulfan I	–	–	–	–	–	–	–
4,4'-DDE	–	–	–	–	–	–	–
Endrin	–	–	–	–	–	–	–
Endosulfan II	–	R	–	–	–	6100 J	–
4,4'-DDD	–	–	–	–	–	–	–
4,4'-DDT	–	–	–	–	–	–	–
Methoxychlor	–	–	–	–	–	–	–
Endrin ketone	–	–	–	–	–	–	–
Endrin aldehyde	–	–	–	–	–	–	–
alpha-Chlordane	–	–	–	–	–	–	–
gamma-Chlordane	–	–	–	–	–	3500 J	–
Aroclor-1248	49000 J	25000 J	19000 J	8400 J	–	800000 J	75 J
Aroclor-1254	–	–	11000 J	–	–	–	–
Aroclor-1260	24000 J	–	–	–	–	–	–
Herbicides							
2,4-D	2600	NA	1700	–	7.5 J	NA	3200

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
D Concentration determined at a secondary dilution factor.
NA Not analyzed.
J Estimated value.
R Unusable value.
N Presumptive evidence of the compound present.
– Not detected.
PCBs Polychlorinated biphenyls.

Only those compounds detected are listed.

Table 5-10. Summary of Target Compound List Pesticides, PCBs, and Herbicides Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-13	SB-13	SB-13	SB-14	SB-14	SB-14	SB-15
Sample Depth:	16-18 ft	18-20 ft	30-32 ft	10-12 ft	20-22 ft	30-32 ft	16-18 ft
Sample Date:	5/21/92	5/21/92	5/21/92	5/22/92	5/26/92	5/26/92	5/27/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter							
Pesticides/PCBs							
beta-BHC	–	–	–	–	–	–	–
delta-BHC	–	–	–	–	–	–	–
Heptachlor epoxide	–	–	–	–	–	–	–
Endosulfan I	–	–	–	–	–	–	–
4,4'-DDE	–	–	–	–	–	–	–
Endrin	–	–	–	–	–	–	–
Endosulfan II	–	–	–	–	–	–	–
4,4'-DDD	–	–	–	–	–	–	–
4,4'-DDT	–	–	–	–	–	–	R
Methoxychlor	–	–	–	–	–	–	–
Endrin ketone	–	–	–	–	–	–	–
Endrin aldehyde	–	–	–	–	–	–	–
alpha-Chlordane	–	–	–	–	–	–	–
gamma-Chlordane	–	–	–	–	–	–	–
Aroclor-1248	–	–	–	–	–	–	–
Aroclor-1254	–	–	–	–	–	–	–
Aroclor-1260	–	–	–	–	–	–	–
Herbicides							
2,4-D	110	NA	98	NA	23000	130000	720000

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
D Concentration determined at a secondary dilution factor.
NA Not analyzed.
J Estimated value.
R Unusable value.
N Presumptive evidence of the compound present.
– Not detected.
PCBs Polychlorinated biphenyls.

Only those compounds detected are listed.

Table 5-10. Summary of Target Compound List Pesticides, PCBs, and Herbicides Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-15	SB-15	SB-16	SB-16	SB-16	SB-16
Sample Depth:	18-20 ft	26-28 ft	6-8 ft	16-18 ft	28-30 ft	30-32 ft
Sample Date:	5/28/92	5/28/92	5/29/92	5/29/92	5/29/92	5/29/92
Units:	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Parameter						
Pesticides/PCBs						
beta-BHC	–	–	–	–	–	–
delta-BHC	–	–	–	–	–	–
Heptachlor epoxide	–	–	–	–	–	–
Endosulfan I	–	–	–	–	–	–
4,4'-DDE	–	–	–	240 J	–	–
Endrin	–	–	–	–	–	19
Endosulfan II	–	–	–	–	–	–
4,4'-DDD	–	–	–	–	–	–
4,4'-DDT	–	–	420	–	11 J	–
Methoxychlor	–	–	–	–	–	–
Endrin ketone	–	–	–	–	–	–
Endrin aldehyde	–	–	R	–	–	–
alpha-Chlordane	–	–	–	–	–	–
gamma-Chlordane	–	–	–	–	–	–
Aroclor-1248	–	–	–	–	–	–
Aroclor-1254	–	–	–	–	–	–
Aroclor-1260	–	–	–	–	–	–
Herbicides						
2,4-D	NA	5200	NA	310	8900	NA

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
D Concentration determined at a secondary dilution factor.
NA Not analyzed.
J Estimated value.
R Unusable value.
N Presumptive evidence of the compound present.
– Not detected.
PCBs Polychlorinated biphenyls.

Only those compounds detected are listed.

009570

Table 5-10. Summary of Target Compound List Pesticides, PCBs, and Herbicides Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:							
Sample Date:	4/9/92	4/10/92	4/13/92	4/14/92	4/16/92	4/23/92	4/27/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter							
Pesticides/PCBs							
beta-BHC	–	–	–	–	–	–	–
delta-BHC	–	–	–	–	–	–	–
Heptachlor epoxide	–	–	–	–	–	–	–
Endosulfan I	–	–	–	–	–	–	–
4,4'-DDE	–	–	–	–	–	–	–
Endrin	–	–	–	–	–	–	–
Endosulfan II	–	–	–	–	–	–	–
4,4'-DDD	–	–	–	–	–	–	–
4,4'-DDT	–	–	–	–	–	–	–
Methoxychlor	–	–	–	–	–	–	–
Endrin ketone	–	–	–	–	–	–	–
Endrin aldehyde	–	–	–	–	–	–	–
alpha-Chlordane	–	–	–	–	–	–	–
gamma-Chlordane	–	–	–	–	–	–	–
Aroclor-1248	–	–	–	–	–	–	–
Aroclor-1254	–	–	–	–	–	–	–
Aroclor-1260	–	–	–	–	–	–	–
Herbicides							
2,4-D	NA	NA	NA	NA	NA	NA	NA

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
D Concentration determined at a secondary dilution factor.
NA Not analyzed.
J Estimated value.
R Unusable value.
N Presumptive evidence of the compound present.
– Not detected.
PCBs Polychlorinated biphenyls.

Only those compounds detected are listed.

Table 5-10. Summary of Target Compound List Pesticides, PCBs, and Herbicides Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:							
Sample Date:	5/4/92	5/5/92	5/6/92	5/7/92	5/8/92	5/13/92	5/14/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter							
Pesticides/PCBs							
beta-BHC	–	–	–	–	–	–	–
delta-BHC	–	–	–	–	–	–	–
Heptachlor epoxide	–	–	–	–	–	–	–
Endosulfan I	–	–	–	–	–	–	–
4,4'-DDE	–	–	–	–	–	–	–
Endrin	–	–	–	–	–	–	–
Endosulfan II	–	–	–	–	–	–	–
4,4'-DDD	–	–	–	–	–	–	–
4,4'-DDT	–	–	–	–	–	–	–
Methoxychlor	–	–	–	–	–	–	–
Endrin ketone	–	–	–	–	–	–	–
Endrin aldehyde	–	–	–	–	–	–	–
alpha-Chlordane	–	–	–	–	–	–	–
gamma-Chlordane	–	–	–	–	–	–	–
Aroclor-1248	–	–	–	–	–	–	–
Aroclor-1254	–	–	–	–	–	–	–
Aroclor-1260	–	–	–	–	–	–	–
Herbicides							
2,4-D	NA	NA	NA	NA	NA	NA	NA

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
D Concentration determined at a secondary dilution factor.
NA Not analyzed.
J Estimated value.
R Unusable value.
N Presumptive evidence of the compound present.
– Not detected.
PCBs Polychlorinated biphenyls.

Only those compounds detected are listed.

Table 5-10. Summary of Target Compound List Pesticides, PCBs, and Herbicides Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:							
Sample Date:	5/15/92	5/18/92	5/19/92	5/20/92	5/21/92	5/22/92	5/26/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter							
Pesticides/PCBs							
beta-BHC	–	–	–	–	–	–	–
delta-BHC	–	–	–	–	–	–	–
Heptachlor epoxide	–	–	–	–	–	–	–
Endosulfan I	–	–	–	–	–	–	–
4,4'-DDE	–	–	–	–	–	–	–
Endrin	–	–	–	–	–	–	–
Endosulfan II	–	–	–	–	–	–	–
4,4'-DDD	–	–	–	–	–	–	–
4,4'-DDT	–	–	–	–	–	–	–
Methoxychlor	–	–	–	–	–	–	–
Endrin ketone	–	–	–	–	–	–	–
Endrin aldehyde	–	–	–	–	–	–	–
alpha-Chlordane	–	–	–	–	–	–	–
gamma-Chlordane	–	–	–	–	–	–	–
Aroclor-1248	–	–	–	–	–	–	–
Aroclor-1254	–	–	–	–	–	–	–
Aroclor-1260	–	–	–	–	–	–	–
Herbicides							
2,4-D	NA	NA	NA	NA	NA	NA	NA

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
D Concentration determined at a secondary dilution factor.
NA Not analyzed.
J Estimated value.
R Unusable value.
N Presumptive evidence of the compound present.
– Not detected.
PCBs Polychlorinated biphenyls.

Only those compounds detected are listed.

Table 5-10. Summary of Target Compound List Pesticides, PCBs, and Herbicides Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:			
Sample Date:	5/27/92	5/28/92	5/29/92
Units:	ug/L	ug/L	ug/L
Parameter			
Pesticides/PCBs			
beta-BHC	–	–	–
delta-BHC	–	–	–
Heptachlor epoxide	–	–	–
Endosulfan I	–	–	–
4,4'-DDE	–	–	–
Endrin	–	–	–
Endosulfan II	–	–	–
4,4'-DDD	–	–	–
4,4'-DDT	–	–	–
Methoxychlor	–	–	–
Endrin ketone	–	–	–
Endrin aldehyde	–	–	–
alpha-Chlordane	–	–	–
gamma-Chlordane	–	–	–
Aroclor-1248	–	–	–
Aroclor-1254	–	–	–
Aroclor-1260	–	–	–
Herbicides			
2,4-D	NA	NA	NA

ug/kg Micrograms per kilogram.
ug/L Micrograms per liter.
D Concentration determined at a secondary dilution factor.
NA Not analyzed.
J Estimated value.
R Unusable value.
N Presumptive evidence of the compound present.
– Not detected.
PCBs Polychlorinated biphenyls.

Only those compounds detected are listed.

Table 5-11. Summary of Target Analyte List Parameters Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-1	SB-1	SB-1	SB-2	SB-2	SB-2	SB-3
Sample Depth:	12-14 ft	26-28 ft	32-34 ft	12-14 ft	14-16 ft	28-30 ft	12-14 ft
Sample Date:	4/9/92	4/9/92	4/9/92	4/10/92	4/10/92	4/13/92	4/16/92
Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Parameter							
Aluminum	7890	6350	8660	4080	3280	10100	3670 J
Antimony	–	–	–	–	–	–	–
Arsenic	6.6	–	4.5	3.7	–	4.7	–
Barium	71.1	180	237	62.8	62.2	117	70.8
Beryllium	–	–	–	–	–	–	–
Cadmium	–	–	–	–	–	–	–
Calcium	11500	12700	15800	7580	4670	7620	5860
Chromium	20.4 J	11.6 J	14.7 J	13.0 J	11.4 J	14.7 J	19.6
Cobalt	27.1	18.6	17.9	81.5	43.6	10.9	16.5 B
Copper	78.8 J	13.4 J	15.2 J	183 J	120 J	16.6 J	219 J
Iron	12100	10100	14600	10100	11000	13900	13500
Lead	16.8 J	6.8 J	10.3 J	8.1 J	3.6 J	10.6 J	6.0 J
Magnesium	856 B	5360	5930	540 B	291 B	4700	335 B
Manganese	59.8	209	734	73.8	36.3	623	29.9
Mercury	0.44	–	–	–	–	–	–
Nickel	65.5	21.9	28.8	20.4	26.1	24.0	40.2
Potassium	580	1380	1730	501	432	1670	495 B
Selenium	–	–	–	–	–	–	–
Sodium	423 B	573 B	2060	608 B	230 B	3190	339 B
Vanadium	183 J	21.1 J	25.4 J	17.5 J	13.3 J	27.3 J	13.6 B
Zinc	167 J	39.6 J	52.9 J	61.5 J	53.9 J	R	79.7
Cyanide	–	–	–	–	–	–	–

–	Not detected.
ug/L	Micrograms per liter.
mg/kg	Milligrams per kilogram.
J	Estimated value.
R	Unusable value.
B	Compound is between the contract required detection limit and the instrument detection limit.

Only those compounds detected are listed.

Table 5-11. Summary of Target Analyte List Parameters Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-3	SB-3	SB-4	SB-4	SB-4	SB-5	SB-5
Sample Depth:	14-16 ft	32-34 ft	10-12 ft	12-14 ft	30-32 ft	12-14 ft	20-22 ft
Sample Date:	4/16/92	4/16/92	4/14/92	4/14/92	4/14/92	5/4/92	5/4/92
Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Parameter							
Aluminum	4980 J	8480 J	3630	3740	6630	861	8220
Antimony	–	–	–	–	–	–	–
Arsenic	3.2	5.2	–	4.1	–	–	8.6
Barium	197	155	247	162	129	68.2	167
Beryllium	–	–	–	–	–	–	–
Cadmium	–	–	–	–	–	–	–
Calcium	7520	8720	8690	8090	12700	13900	13800
Chromium	27.0	14.5	45.9	10.0	24.0	18.7	23.4
Cobalt	59.0	19.8	83.2	71.2	10.4 B	2.4 B	[illegible]
Copper	82.8 J	14.8 J	77.6	129	12.4	18.9	320
Iron	16300	13600	12800	13000	8540	4250	27280
Lead	17.2 J	13.4 J	6.3 J	7.2 J	3.2 J	2.1 J	9.1 J
Magnesium	577 B	4080	337 B	320 B	2110	71.8 B	1890
Manganese	43.6	543	58.1	65.3	81.7	6.0	94.2
Mercury	0.95	–	0.08	–	–	–	0.12
Nickel	44.4	17.4	52.6	69.3	12.5	–	24.3
Potassium	528 B	1280	461 B	498 B	1100 B	–	1050 B
Selenium	–	–	–	–	–	R	R
Sodium	765 B	1690	405 B	278 B	1280	164 B	1270
Vanadium	16.5	21.7	16.9	17.3	18.5	6.0 B	26.4
Zinc	64.6	52.9	125 J	114 J	–	–	–
Cyanide	–	–	–	–	–	–	–

– Not detected.
ug/L Micrograms per liter.
mg/kg Milligrams per kilogram.
J Estimated value.
R Unusable value.
B Compound is between the contract required detection limit and the instrument detection limit.

Only those compounds detected are listed.

Table 5-11. Summary of Target Analyte List Parameters Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-5	SB-6	SB-6	SB-6	SB-7	SB-7	SB-7
Sample Depth:	28-20 ft	18-20 ft	20-22 ft	28-30 ft	16-18 ft	20-22 ft	24-26 ft
Sample Date:	5/4/92	5/5/92	5/5/92	5/7/92	5/7/92	5/7/92	5/7/92
Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Parameter							
Aluminum	11600	1360	1870	7190	4410	4620	3330
Antimony	–	–	–	–	–	–	–
Arsenic	9.4	–	–	6.4	5.7	5.7	3.7
Barium	255	300	293	132	170	158	154
Beryllium	–	–	–	–	–	–	–
Cadmium	–	–	–	–	–	–	–
Calcium	15000	15600	13000	6920	8430	9540	11500
Chromium	16.6	6.8 J	6.7 J	13.0	10.9	23.0	9.1
Cobalt	23.6	23.1	27.4	11.1 B	69.2	51.3	21.5
Copper	54.6	12.9	27.0	16.0	137	126	58.0
Iron	18100	3300	1760	9050	9640	11400	8010
Lead	11.7 J	21.1	24.4	8.2 J	5.5 J	5.5 J	5.8 J
Magnesium	7050	726 B	677 B	2180	4410	5220	5320
Manganese	787	4.8	2.9	132	93.5	92.3	114
Mercury	–	1.5	0.27	0.16	0.27	0.43	–
Nickel	26.7	–	14.0	14.4	11.1	14.9	10.2
Potassium	2250	796 B	821 B	1180 B	1080 B	1190 B	746 B
Selenium	R	–	–	R	R	R	R
Sodium	6810	1700	1610	2080	269 B	564 B	1130 B
Vanadium	27.8	–	–	22.7	47.9	32.4	19.4
Zinc	–	18.6	19.3	36.5	132	66.8	36.1
Cyanide	–	–	–	–	–	–	–

– Not detected.
ug/L Micrograms per liter.
mg/kg Milligrams per kilogram.
J Estimated value.
R Unusable value.
B Compound is between the contract required detection limit and the instrument detection limit.

Only those compounds detected are listed.

Table 5-11. Summary of Target Analyte List Parameters Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-8	SB-9	SB-9	SB-9	SB-9	SB-10	SB-10
Sample Depth:	6-8 ft	18-20 ft	20-22 ft	28-30 ft	30-32 ft	6-8 ft	18-20 ft
Sample Date:	5/8/92	5/13/92	5/13/92	5/13/92	5/13/92	5/14/92	5/14/92
Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Parameter							
Aluminum	8000	4720 J	4640 J	2350 J	17000 J	6290 J	7380 J
Antimony	–	R	R	R	R	R	R
Arsenic	5.0	3.8	5.8	3.9	5.3	147	14.9
Barium	331	210	195	81.3	198	114	111
Beryllium	–	–	–	–	–	1.7	–
Cadmium	1.2	1.2	–	–	–	4.3	1.2
Calcium	8620	10800	18600	7390	9080	14800	14700
Chromium	20.4	21.6	21.9	6.6	23.1	32.0	41.0
Cobalt	6.1 B	25.5	3.5 B	8.3 B	15.2	9.6 B	25.0
Copper	40.6	31.4	20.4	10.9	21.0	40.7	51.7
Iron	15900	42400	12300	6230	21200	42500	34600
Lead	15.1 J	19.5	8.6	4.4	12.9	15.6	26.8
Magnesium	3810	3050	1710	2550	4810	1290	561 B
Manganese	297	125	96.1	134	622	134	102
Mercury	0.80	0.24	1.1	–	–	1.5	0.51
Nickel	16.6	24.0	9.9	11.9	25.7	38.4	67.7
Potassium	671 B	1330	1450	458 B	2530	1620	1890
Selenium	R	–	–	–	–	2.8 J	4.2 J
Sodium	–	1140	1760	2150	4640	2870	1140 B
Vanadium	24.5	36.8	27.1	24.9	35.5	645	90.2
Zinc	336	175	43.1	33.1	72.7	718	2628
Cyanide	–	–	–	–	–	–	–

– Not detected.
ug/L Micrograms per liter.
mg/kg Milligrams per kilogram.
J Estimated value.
R Unusable value.
B Compound is between the contract required detection limit and the instrument detection limit.

Only those compounds detected are listed.

Table 5-11. Summary of Target Analyte List Parameters Detected in Subsurface Soil Samples, Saugat Site R, Monsanto Company, Saugat, Illinois.

Sample Location:	SB-10	SB-11	SB-11	SB-11	SB-12	SB-12	SB-12
Sample Depth:	24-26 ft	14-16 ft	16-18 ft	30-32 ft	8-10 ft	22-24 ft	32-34 ft
Sample Date:	5/14/92	5/19/92	5/19/92	5/20/92	5/15/92	5/18/92	5/18/92
Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Parameter							
Aluminum	2250 J	3450	3430	10200	5710 J	1680 J	11900 J
Antimony	R	–	–	–	R	R	R
Arsenic	–	6.2	4.0	5.9	9.3	–	–
Barium	85.8	89.6	73.0	173	86.4	49.6	260
Beryllium	–	–	–	–	–	–	–
Cadmium	–	–	–	–	1.5	–	–
Calcium	6950	21600	12200	7540	31100	3130	9990
Chromium	6.3	29.2	13.3	14.9	27.5	3.5	18.5
Cobalt	4.2 B	4.1 B	4.4 B	8.2 B	8.4 B	2.5 B	9.4 B
Copper	–	24.9	12.5	16.4	20.6	–	15.7
Iron	6220	16900	11600	16200	33900	3670	14400
Lead	4.1	13.7	9.2	10.6	12.1	3.2	12.4
Magnesium	2820	679 B	635 B	3670	785 B	1490	5410
Manganese	78.9	119	97.8	703	125	80.0	325
Mercury	–	43.0	1.3	–	19.4	0.33	–
Nickel	–	18.6	11.6	17.8	27.6	–	21.2
Potassium	562 B	759 B	578 B	1690	791 B	314 B	1720
Selenium	–	–	–	–	–	–	–
Sodium	409 B	3480	2180	–	486 B	1240	5090
Vanadium	9.1 B	17.4	15.5	24.4	36.5	5.5 B	27.9
Zinc	32.5	81.9	108	–	148	–	85.8
Cyanide	–	–	–	–	–	–	0.33

– Not detected.
ug/L Micrograms per liter.
mg/kg Milligrams per kilogram.
J Estimated value.
R Unusable value.
B Compound is between the contract required detection limit and the instrument detection limit.

Only those compounds detected are listed.

Table 5-11. Summary of Target Analyte List Parameters Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-13	SB-13	SB-13	SB-14	SB-14	SB-14	SB-15
Sample Depth:	16-18 ft	18-20 ft	30-32 ft	10-12 ft	20-22 ft	30-32 ft	16-18 ft
Sample Date:	5/21/92	5/21/92	5/21/92	5/22/92	5/26/92	5/26/92	5/27/92
Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Parameter							
Aluminum	12200	12600	8010	3820	8410	6030	6470
Antimony	–	–	–	–	–	–	–
Arsenic	81.7	89.6	5.3	11.9	9.1	4.8	–
Barium	114	129	209	70.8	181	180	40.0 B
Beryllium	3.1	2.8	–	1.7	–	–	–
Cadmium	5.5	7.0	–	–	1.5	–	–
Calcium	28300	21300	11400	14800	13700	12800	12000
Chromium	39.5	40.9	14.0	11.7	17.6	11.5	18.9
Cobalt	11.1 B	11.5 B	7.0 B	7.9 B	9.4 B	6.3 B	3.3 B
Copper	29.5	31.7	13.3	22.7	19.3	9.9	13.2
Iron	21000	17400	13000	–	16800	11800	16700
Lead	59.4	64.7	9.1	14.1	45.0 J	8.2 J	5.0 J
Magnesium	2570	3180	8810	1110 B	4350	5380	546 B
Manganese	262	206	312	57.7	144	471	61.4
Mercury	0.14	–	–	4.8	6.1	–	3.1
Nickel	37.9	40.3	17.5	19.8	17.9	16.1	18.1
Potassium	1570 B	1950	1560	538 B	1930	1160 B	556 B
Selenium	2.4 J	1.9 J	–	1.7 J	–	–	–
Sodium	591 B	1500 B	1530	–	679 B	2260	–
Vanadium	77.9	82.7	24.2	21.5	26.4	18.5	28.6
Zinc	491	602	53.2	52.9	94.2	37.8	84.5
Cyanide	–	–	–	–	–	–	–

– Not detected.
ug/L Micrograms per liter.
mg/kg Milligrams per kilogram.
J Estimated value.
R Unusable value.
B Compound is between the contract required detection limit and the instrument detection limit.

Only those compounds detected are listed.

Table 5-11. Summary of Target Analyte List Parameters Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	SB-15	SB-15	SB-16	SB-16	SB-16	SB-16
Sample Depth:	18-20 ft	26-28 ft	6-8 ft	16-18 ft	28-30 ft	30-32 ft
Sample Date:	5/28/92	5/28/92	5/29/92	5/29/92	5/29/92	5/29/92
Units:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Parameter						
Aluminum	5240	230	7100	5290	6240	11400
Antimony	–	–	–	–	–	–
Arsenic	4.3	–	8.1	6.5	3.6	12.8
Barium	76.2	32.0 B	117	169	147	219
Beryllium	–	–	–	–	–	–
Cadmium	–	–	–	–	–	–
Calcium	9040	2050	85800	8690	9970	14900
Chromium	25.4	–	21.1	11.1	9.8	16.9
Cobalt	3.8 B	–	6.6 B	5.4 B	7.6 B	9.0 B
Copper	76.4	–	21.9	12.8	7.1	14.6
Iron	9500	–	17400	12200	13900	17300
Lead	8.8 J	2.4 J	14.3 J	15.5 J	7.4 J	14.5 J
Magnesium	1110 B	73.5 B	6570	3420	4980	6630
Manganese	65.0	7.1	457	269	266	619
Mercury	5.2	0.08	9.0	0.08	–	–
Nickel	16.8	–	22.9	15.6	19.4	22.5
Potassium	652 B	–	780 B	1060 B	1290	2100
Selenium	–	–	–	–	–	–
Sodium	–	–	–	988 B	10300	10600
Vanadium	30.0	–	22.5	19.6	18.6	31.8
Zinc	83.3	–	96.1	102	37.0	63.4
Cyanide	–	–	–	–	–	–

–	Not detected.
ug/L	Micrograms per liter.
mg/kg	Milligrams per kilogram.
J	Estimated value.
R	Unusable value.
B	Compound is between the contract required detection limit and the instrument detection limit.

Only those compounds detected are listed.

Table 5-11. Summary of Target Analyte List Parameters Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:							
Sample Date:	4/9/92	4/10/92	4/13/92	4/14/92	4/16/92	4/21/92	4/23/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter							
Aluminum	–	–	–	–	–	–	–
Antimony	–	–	–	–	–	–	–
Arsenic	–	–	–	–	–	–	–
Barium	–	–	–	–	–	–	11.8
Beryllium	–	–	–	–	–	–	–
Cadmium	–	–	–	–	–	–	–
Calcium	66.0 B	80.6 B	92.9 B	84.9 B	113 B	138 B	–
Chromium	–	–	–	–	–	–	–
Cobalt	–	–	–	–	–	–	–
Copper	–	–	–	–	–	–	–
Iron	–	–	–	–	–	–	–
Lead	R	R	R	–	–	–	–
Magnesium	–	–	–	–	–	–	–
Manganese	–	–	–	–	–	–	–
Mercury	–	–	–	–	–	–	–
Nickel	–	–	–	–	–	–	–
Potassium	–	–	–	–	–	–	2180 B
Selenium	–	–	–	–	–	–	–
Sodium	–	–	–	–	–	–	–
Vanadium	–	–	–	–	–	–	–
Zinc	22.7 J	R	133 J	40.1	–	–	R
Cyanide	–	–	–	–	–	–	–

– Not detected.
ug/L Micrograms per liter.
mg/kg Milligrams per kilogram.
J Estimated value.
R Unusable value.
B Compound is between the contract required detection limit and the instrument detection limit.

Only those compounds detected are listed.

025532

SUBTARG.XLS

Table 5-11. Summary of Target Analyte List Parameters Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:							
Sample Date:	4/27/92	5/4/92	5/5/92	5/6/92	5/7/92	5/8/92	5/13/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter							
Aluminum	–	–	–	–	–	–	–
Antimony	–	–	–	–	–	–	R
Arsenic	–	–	–	–	–	–	–
Barium	–	–	–	–	–	–	–
Beryllium	–	–	–	–	–	–	–
Cadmium	–	–	–	–	–	–	–
Calcium	18500	169 B	114 B	122 B	114 B	139 B	166 B
Chromium	–	–	–	–	–	–	–
Cobalt	–	–	–	–	–	–	–
Copper	–	–	–	–	–	–	–
Iron	–	–	–	–	–	–	–
Lead	–	–	–	–	–	–	–
Magnesium	6170	–	–	–	–	–	–
Manganese	–	–	–	–	–	–	–
Mercury	–	–	–	–	–	–	–
Nickel	–	–	–	–	–	–	–
Potassium	1690 B	–	–	–	–	–	–
Selenium	–	–	–	–	–	–	–
Sodium	9900	–	–	–	–	–	–
Vanadium	–	–	–	–	–	–	–
Zinc	539	34.9	–	–	–	23.9	–
Cyanide	–	–	–	–	–	–	–

– Not detected.
ug/L Micrograms per liter.
mg/kg Milligrams per kilogram.
J Estimated value.
R Unusable value.
B Compound is between the contract required detection limit and the instrument detection limit.

Only those compounds detected are listed.

Table 5-11. Summary of Target Analyte List Parameters Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:							
Sample Date:	5/14/92	5/15/92	5/18/92	5/19/92	5/20/92	5/21/92	5/22/92
Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Parameter							
Aluminum	–	–	–	–	–	–	–
Antimony	R	R	R	–	–	–	–
Arsenic	–	–	–	–	–	–	–
Barium	–	–	–	–	–	–	–
Beryllium	–	–	–	–	–	–	–
Cadmium	–	–	–	–	–	–	–
Calcium	192 B	165 B	252 B	226 B	251 B	230 B	271 B
Chromium	–	–	–	–	–	–	–
Cobalt	–	–	–	–	–	–	–
Copper	–	–	–	–	–	–	–
Iron	–	–	–	–	–	–	327
Lead	–	–	–	–	–	–	–
Magnesium	–	–	–	–	–	–	–
Manganese	–	–	–	–	–	–	–
Mercury	–	–	–	–	–	–	–
Nickel	–	–	–	–	–	–	–
Potassium	–	–	–	–	–	–	–
Selenium	–	–	–	–	–	–	–
Sodium	–	–	525 B	–	512 B	–	547 B
Vanadium	–	–	–	–	–	–	–
Zinc	–	–	21.6	–	39.6	–	–
Cyanide	–	–	–	–	–	–	–

– Not detected.
ug/L Micrograms per liter.
mg/kg Milligrams per kilogram.
J Estimated value.
R Unusable value.
B Compound is between the contract required detection limit and the instrument detection limit.

Only those compounds detected are listed.

000334

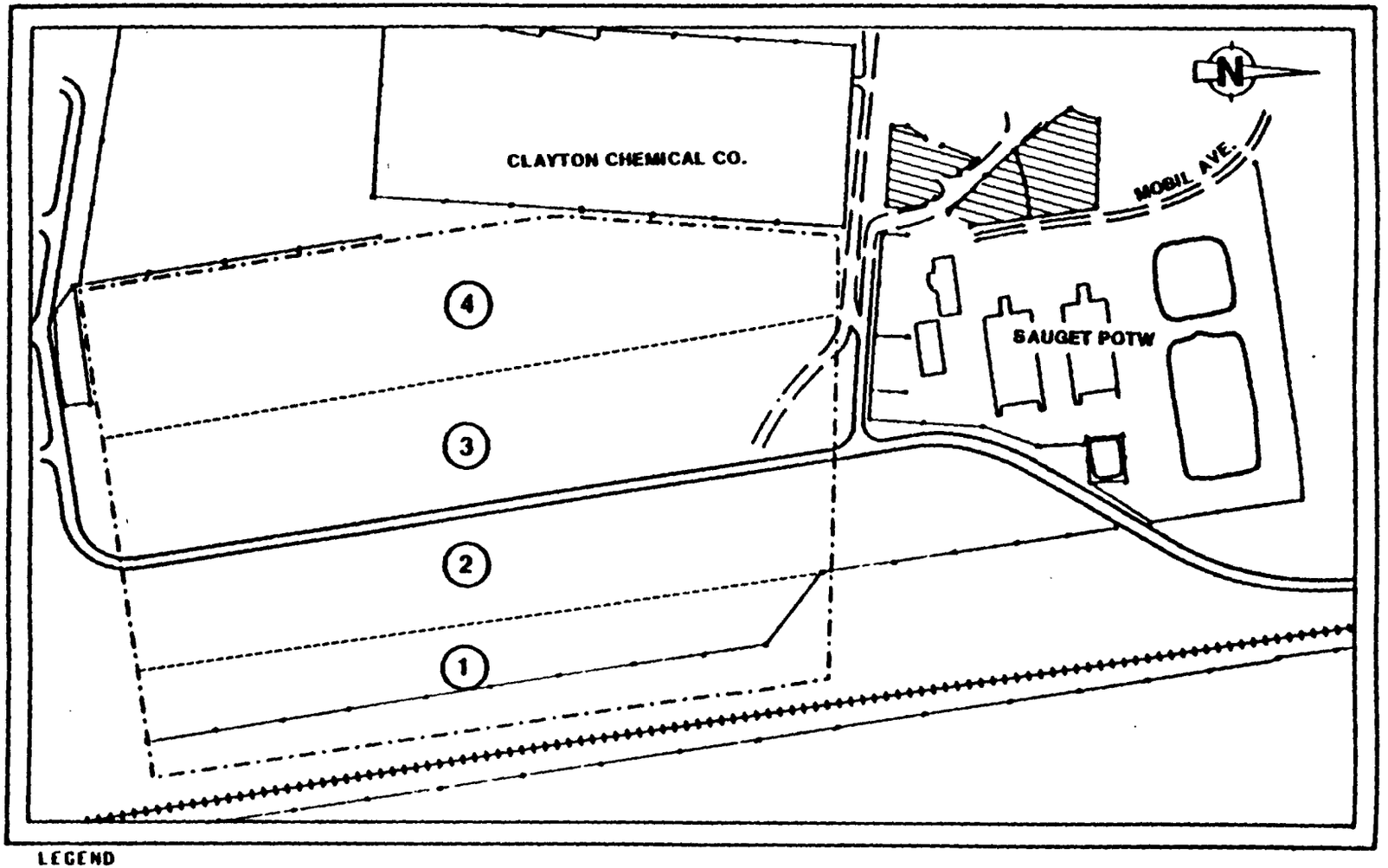
Table 5-11. Summary of Target Analyte List Parameters Detected in Subsurface Soil Samples, Sauget Site R, Monsanto Company, Sauget, Illinois.

Sample Location:	Equipment Blank	Equipment Blank	Equipment Blank	Equipment Blank
Sample Depth:				
Sample Date:	5/26/92	5/27/92	5/28/92	5/29/92
Units:	ug/L	ug/L	ug/L	ug/L
Parameter				
Aluminum	–	–	–	–
Antimony	–	–	–	–
Arsenic	–	–	–	–
Barium	–	–	–	–
Beryllium	–	–	–	–
Cadmium	–	–	–	–
Calcium	281 B	336 B	237 B	316 B
Chromium	–	–	–	–
Cobalt	–	–	–	–
Copper	–	–	–	–
Iron	145	2040	211	73.2 B
Lead	–	–	–	–
Magnesium	–	–	–	–
Manganese	–	10.6 B	–	–
Mercury	–	–	–	–
Nickel	–	–	–	–
Potassium	–	–	–	–
Selenium	–	–	–	–
Sodium	537 B	562 B	535 B	677 B
Vanadium	–	–	–	–
Zinc	–	20.8	–	–
Cyanide	–	–	–	–

–	Not detected.
ug/L	Micrograms per liter.
mg/kg	Milligrams per kilogram.
J	Estimated value.
R	Unusable value.
B	Compound is between the contract required detection limit and the instrument detection limit.

Only those compounds detected are listed.

008438



LEGEND

(2) FORMER SLUDGE LAGOON

APPROXIMATE LAGOON BOUNDARY

AREA OF INDENTIFIED SOIL CONTAMINATION

SCALE

0 100 500 1000 FEET

FIGURE 0-1
FORMER SLUDGE LAGOONS AND CONTAMINATED SOIL AREAS AT SITE 0

TABLE O-1: IDENTIFIED ORGANIC COMPOUNDS IN SAMPLES FROM TRENCH EXCAVATION AT SITE O (COLLECTED JULY 20, 1984 BY RUSSELL AND AXON, INC.)[a]

	SAMPLE LOCATIONS		
PARAMETERS	SAMPLE 1	SAMPLE 2	BLANK
2,4-Dichlorophenol	50.1		
Pentachlorophenol	3,600	159	
2,4,6-Trichlorophenol	39.3		
Crysene	123	2.2	
Benzo-k-Fluoranthene	15.9	0.45	
Bis(2-Ethylhexyl) Phthalate	10.9		0.098
1,2-Chlorobenzene		12.2	
1,4-Dichlorobenzene		8.01	
Di-Butyl Phthalate		5.06	0.1
Phenanthrene	100	1.6	
Pyrene	102	2.1	
1,2,4-Trichlorobenzene	65.3	1.6	
PCBs	*	*	
Benzo(a)Pyrene	4.2	1.0	

NOTE: All results in ppm.
Blanks indicate compound not detected.
* Identified, but values cannot be verified.
a Analysis performed by Envirodyne Engineers, Inc. (EEI), St. Louis, MO.

009439

008440

TABLE 02: ANALYTICAL RESULTS FOR SOIL SAMPLES AT SITE O (SPLIT SAMPLES COLLECTED FEBRUARY 19, 1983 BY IEPA AND EEI)

	PARAMETERS				
SAMPLE NO. (Depth)	PCB - IEPA	PCB - EEI	TCDD - IEPA[a]	TCDD - EEI	Comment
1 (0" - F")	1,500	3,690			
2A (0"- F")	7,600	5,350			
2B (7" - 13")	390	716			
3A (0" - 7")	9,100	137,250			
3B (7" - 13")	40	28			
4A (0" - 6")	20,000	21,020			
4A (0" - 6")	-	15,510			Duplicate-EEI
4B (6" - 13")	54,000	149,600			
5A (0" - 6")	32,000	112,930	18	28	
5A (0" - 6")	-	-	17	-	Duplicate-IEPA
5B (6" - 14")	20,000	12,050	4.1	5.1	
6 (0" - 8")	120	90			

NOTE: All results in ng/g (ppb).
Blanks indicate below detection limits.
- Indicates parameter not analyzed.
a Hazelton Raltech, Inc. performed TCDD analysis for IEPA.

TABLE O-3: ANALYTICAL RESULTS FOR SOIL SAMPLES AT SITE O. (SPLIT SAMPLES COLLECTED MARCH 12, 1983 BY IEPA AND EEI)

	PARAMETERS		
SAMPLE NO. (Depth)	TCDD - IEPA[a]	TCDD - EEI	COMMENTS
7A (0"- 6")			
7B (8" - 16")	1.8	44	
8A (0" - 6")	77	Interferences	
8B (6" - 12)	*	19	
8C (13" - 18")		37	
8D (18" - 25")		56	Duplicate
8D (18" - 25")			
9A (0" - 6")	1.3		
9B (6" - 12")	*		
9C (14" - 21")			
9D (22" - 28")	0.92		Control Sample
10A	12		Control Sample
10B	*	13	
11A (0" - 6")			
11B (G" - 18")	*		
12 (10" - 19")	*		
13A (0" - 7")			
13B (7" - 18")	13	13	
14 (0" - 6")	25	170	Composite of soil samples
15 (0" - 16")			
16 (0" - 18")			

NOTE: All results in ng/g (ppb).
Blanks indicate below detection limits.
* Sample not collected by IEPA.
a Hazelton Raltech, Inc. performed TCDD analysis for IEPA.

008441

APPENDIX E

SUMMARY TABLES FOR SITE-SPECIFIC CONTAMINANT LOADING TO THE MISSISSIPPI RIVER

000442

Table E-9

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT SHALLOW ZONE IN SITE D***

	Area (ft^2)	Flow Rate Q (ft^3/day)	TOCs* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PHAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PHAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PHAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	95,142	-789.69	132,000	-6.51	119,000	-5.87	ND	--	ND	--	--	ND	--
February	94,729	-672.50	132,000	-5.55	119,000	-5.00	ND	--	ND	--	--	ND	--
March	10,260	-122.83	132,000	-1.01	119,000	-0.91	ND	--	ND	--	--	ND	--
April	105,668	359.27	132,000	2.96	119,000	2.67	ND	--	ND	--	--	ND	--
May	111,833	335.50	132,000	2.77	119,000	2.49	ND	--	ND	--	--	ND	--
June	111,270	-44.51	132,000	-0.37	119,000	-0.33	ND	--	ND	--	--	ND	--
July	107,547	-451.70	132,000	-3.73	119,000	-3.36	ND	--	ND	--	--	ND	--
August	99,691	-917.16	132,000	-7.57	119,000	-6.82	ND	--	ND	--	--	ND	--
September	94,120	-1,035.41	132,000	-8.54	119,000	-7.70	ND	--	ND	--	--	ND	--
October	93,113	-875.27	132,000	-7.22	119,000	-6.51	ND	--	ND	--	--	ND	--
November	99,654	-318.09	132,000	-2.63	119,000	-2.37	ND	--	ND	--	--	ND	--
December	100,029	-478.12	132,000	-3.80	119,000	-3.58	ND	--	ND	--	--	ND	--

* Total Organic Carbon.

** Polynuclear aromatics.

*** Data from monitoring wells SS-21, SS-22, SS-23, and SS-24 were used to calculate weighted average concentrations.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988.

APPENDIX D

ANALYTICAL RESULTS

094444

008445

Table E-10

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT INTERMEDIATE ZONE IN SITE O***

	Area (ft^2)	Flow Rate @ (ft^3/day)	TOCs* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PHAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PHAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PHAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	52,363	-434.62	100	-0.00259	71	-0.001917	ND	--	ND	--	--	ND	--
February	52,363	-371.70	100	-0.0023	71	-0.00165	ND	--	ND	--	--	ND	--
March	52,363	-62.03	100	-0.00039	71	-0.00028	ND	--	ND	--	--	ND	--
April	52,363	170.03	100	0.00111	71	+0.00079	ND	--	ND	--	--	ND	--
May	52,363	157.09	100	0.00098	71	+0.000697	ND	--	ND	--	--	ND	--
June	52,363	-20.95	100	-0.00013	71	-0.000093	ND	--	ND	--	--	ND	--
July	52,363	-219.93	100	-0.00137	71	-0.000976	ND	--	ND	--	--	ND	--
August	52,363	-401.75	100	-0.003	71	-0.00214	ND	--	ND	--	--	ND	--
September	52,363	-576.00	100	-0.0036	71	-0.00256	ND	--	ND	--	--	ND	--
October	52,363	-492.22	100	-0.0031	71	-0.00218	ND	--	ND	--	--	ND	--
November	52,363	-167.57	100	-0.00104	71	-0.00074	ND	--	ND	--	--	ND	--
December	52,363	-244.10	100	-0.00154	71	-0.00109	ND	--	ND	--	--	ND	--

* Total organic carbon.

** Polynuclear aromatics.

*** Data from monitoring wells GM19B and GM20B (Geraghty & Miller 1986; 1986a) were used to calculate weighted average calculations.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988.

008446

Table E-11

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT SHALLOW ZONE IN SITE Q***

	Area (ft^2)	Flow Rate Q (ft^3/day)	TOCs* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PNAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	103,370	-1,369.32	235	-0.02011	130	-0.01112	ND	--	ND	--	--	ND	--
February	109,001	-867.42	235	-0.0127	130	-0.00700	ND	--	ND	--	--	ND	--
March	135,016	703.21	235	0.0115	130	0.00636	ND	--	ND	--	--	ND	--
April	146,401	1,551.05	235	0.0220	130	0.01261	ND	--	ND	--	--	ND	--
May	150,703	889.62	235	0.01307	130	0.00723	ND	--	ND	--	--	ND	--
June	140,015	-267.55	235	-0.00393	130	-0.00217	ND	--	ND	--	--	ND	--
July	129,237	-930.65	235	-0.01367	130	-0.00756	ND	--	ND	--	--	ND	--
August	100,549	-1,639.10	235	-0.0241	130	-0.01330	ND	--	ND	--	--	ND	--
September	99,150	-1,556.70	235	-0.0229	130	-0.01265	ND	--	ND	--	--	ND	--
October	103,711	-1,130.60	235	-0.0166	130	-0.00920	ND	--	ND	--	--	ND	--
November	128,390	372.31	235	0.0055	130	0.00300	ND	--	ND	--	--	ND	--
December	121,359	-594.67	235	-0.0087	130	-0.00483	ND	--	ND	--	--	ND	--

* Total organic carbon.

** Polynuclear aromatics.

*** Data from monitoring wells SE-09, SE-10, and SE-06 were used to calculate weighted average concentrations.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988.

Table E-12

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT SHALLOW ZONE IN SITE B***

	Area (ft^2)	Flow Rate Q (ft^3/day)	TOCs* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PNAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	52,293	-852.38	12,510	-0.67	1,555	-0.083	ND	--	ND	--	--	ND	--
February	54,092	-403.25	12,510	-0.31	1,555	-0.039	ND	--	ND	--	--	ND	--
March	67,015	737.17	12,510	0.58	1,555	0.072	ND	--	ND	--	--	ND	--
April	72,456	1,060.00	12,510	0.84	1,555	0.1030	ND	--	ND	--	--	ND	--
May	74,031	471.43	12,510	0.37	1,555	0.046	ND	--	ND	--	--	ND	--
June	69,063	-230.56	12,510	-0.18	1,555	-0.022	ND	--	ND	--	--	ND	--
July	64,148	-641.48	12,510	-0.50	1,555	-0.062	ND	--	ND	--	--	ND	--
August	53,871	-953.50	12,510	-0.75	1,555	-0.091	ND	--	ND	--	--	ND	--
September	49,210	-536.40	12,510	-0.42	1,555	-0.052	ND	--	ND	--	--	ND	--
October	51,400	-561.16	12,510	-0.44	1,555	-0.054	ND	--	ND	--	--	ND	--
November	63,717	522.47	12,510	0.41	1,555	0.051	ND	--	ND	--	--	ND	--
December	60,229	-361.37	12,510	-0.28	1,555	-0.035	ND	--	ND	--	--	ND	--

* Total Organic Carbon.

** Polynuclear Aromatics.

*** Data from monitoring wells P-1, P-7, P-11, B-26A, and B-28A (Geraghty & Miller 1986; 1986a) were used to calculate weighted average concentrations.

ND Not detected.

Negative sign designates contaminant migration toward the river.

Source: Ecology and Environment, Inc. 1988.

Table E-13

CONTAMINANT LOADING TO RIVER DUE TO HORIZONTAL FLOW AT INTERMEDIATE ZONE IN SITE B***

	Area (ft^2)	Flow Rate Q (ft^3/day)	TOCs* Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Volatiles Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Non-Carcinogenic PNAs** Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)	Total PNAs** Loading to River (lb/day)	Total PCBs Weighted Ave. Conc. (ug/L)	Loading to River (lb/day)
January	107,700	-74,313	0,990	-41.79	4,440	-20.62	ND	--	ND	--	--	ND	--
February	107,700	-23,694	0,990	-13.32	4,440	-6.57	ND	--	ND	--	--	ND	--
March	107,700	62,466	0,990	35.13	4,440	17.33	ND	--	ND	--	--	ND	--
April	107,700	70,543	0,990	39.67	4,440	19.57	ND	--	ND	--	--	ND	--
May	107,700	30,048	0,990	16.90	4,440	8.34	ND	--	ND	--	--	ND	--
June	107,700	-17,771	0,990	-9.99	4,440	-4.93	ND	--	ND	--	--	ND	--
July	107,700	-42,083	0,990	-23.62	4,440	-11.66	ND	--	ND	--	--	ND	--
August	107,700	-81,052	0,990	-46.03	4,440	-22.71	ND	--	ND	--	--	ND	--
September	107,700	-85,621	0,990	-48.15	4,440	-23.74	ND	--	ND	--	--	ND	--
October	107,700	-37,156	0,990	-20.89	4,440	-10.31	ND	--	ND	--	--	ND	--
November	107,700	48,465	0,990	27.25	4,440	13.45	ND	--	ND	--	--	ND	--
December	107,700	-21,540	0,990	-12.11	4,440	-5.98	ND	--	ND	--	--	ND	--

* Total Organic Carbon.

** Polynuclear Aromatics.

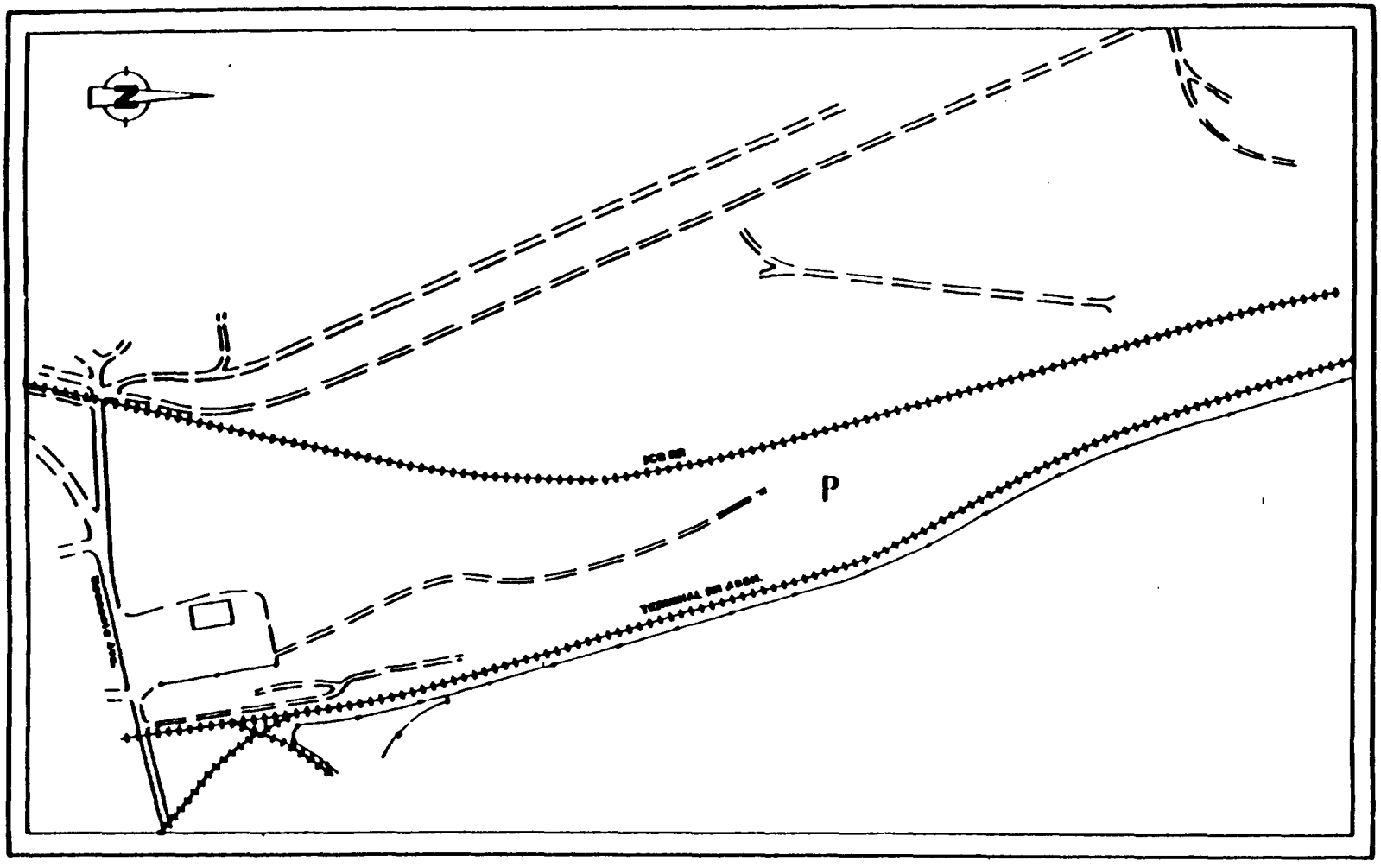
*** Data from monitoring wells GM27B and GM28B (Geraghty & Miller 1986; 1986a) were used to calculate weighted average concentrations.

ND Not Detected.

Negative sign designates contaminant migration toward the river.

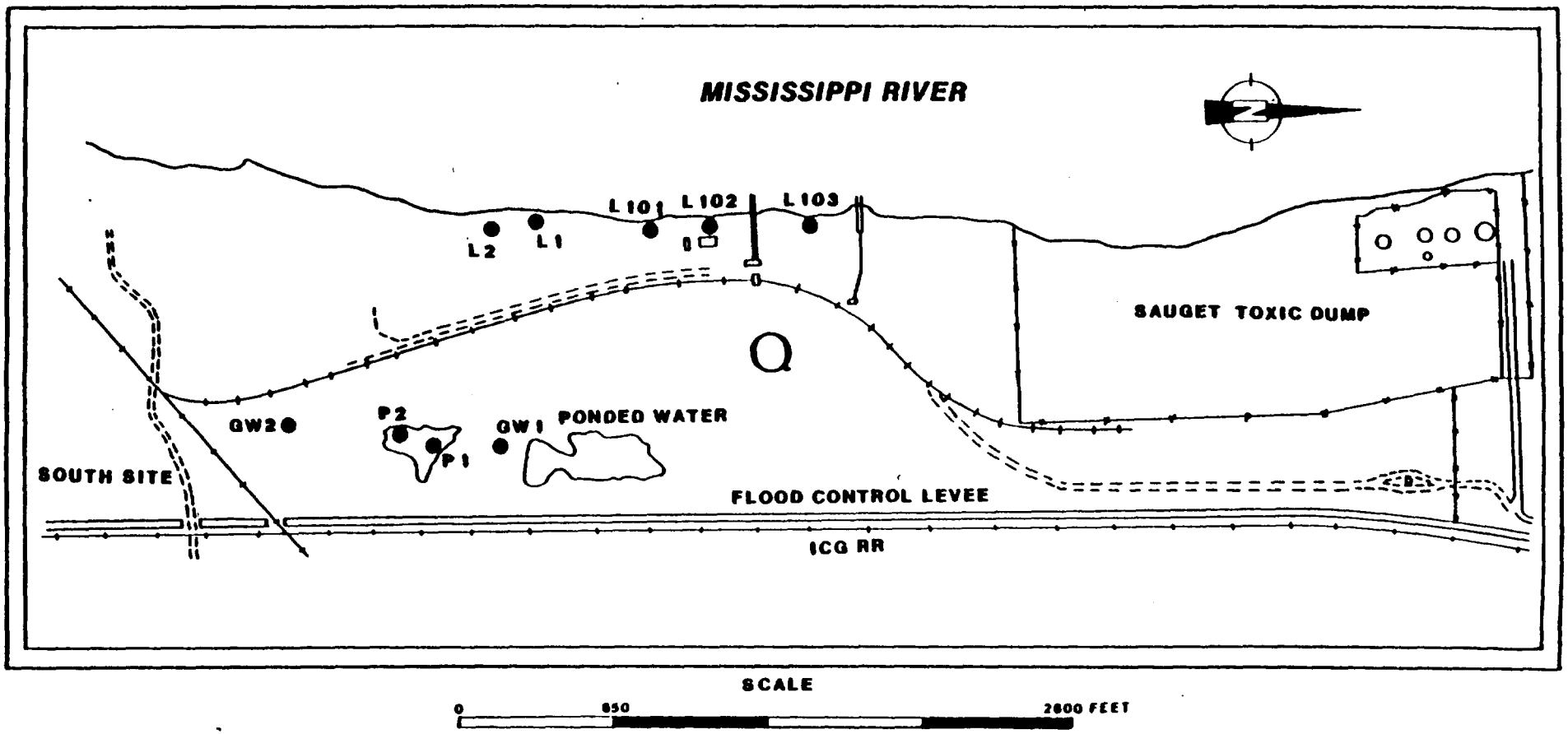
Source: Ecology and Environment, Inc. 1988.

008449



SCALE
0 500 1000 FEET

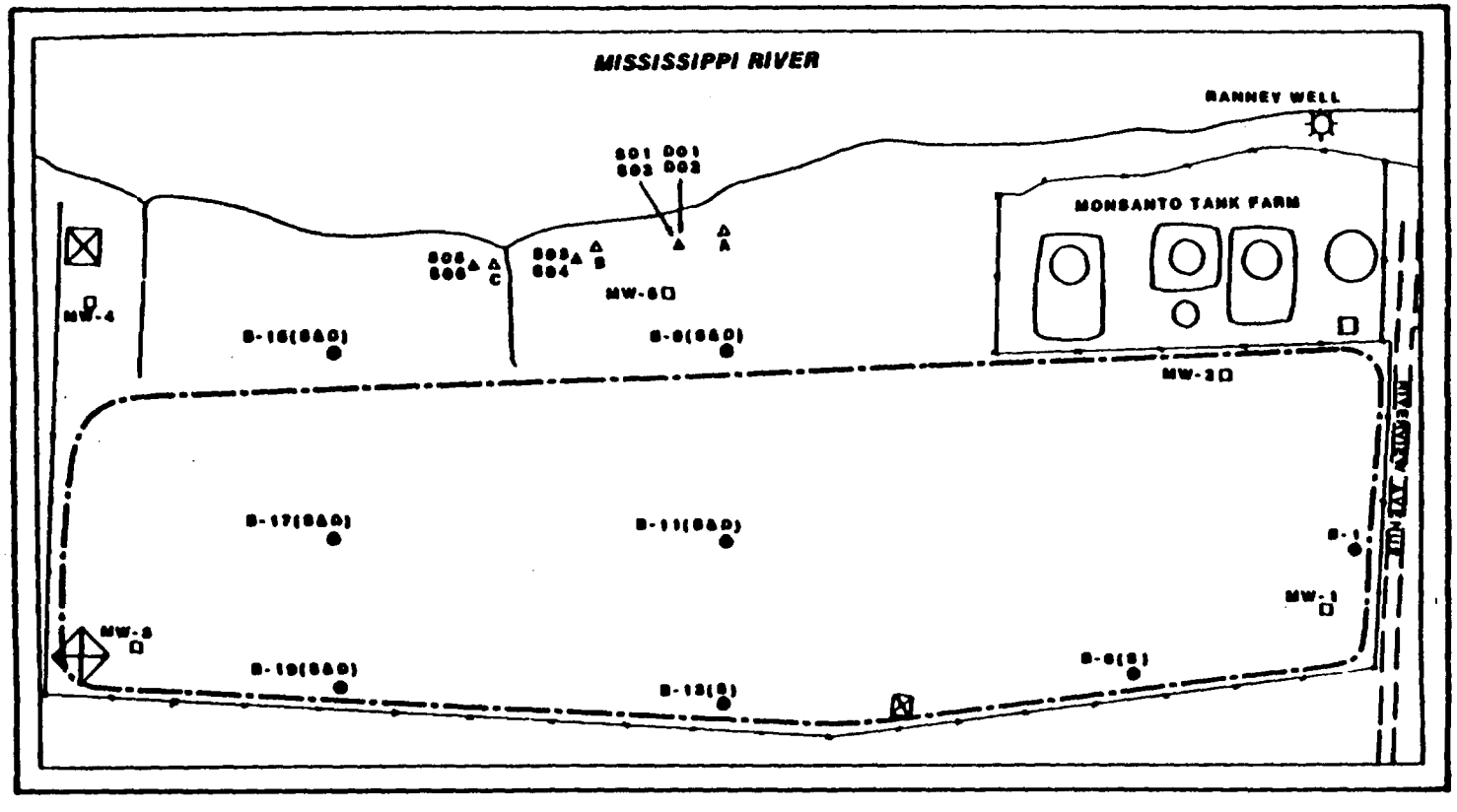
FIGURE P-1
DEAD CREEK SITE AREA P



LEGEND

GW1	IEPA GROUNDWATER SAMPLING LOCATION
P1	IEPA SURFACE WATER SAMPLING LOCATION
L1	IEPA LEACHATE SAMPLING LOCATION

FIGURE Q-1
DEAD CREEK SITE AREA Q WITH SAMPLING LOCATIONS



LEGEND

A	IEPA LEACHATE & SEDIMENT SAMPLING LOCATION
S01	USEPA - FIT LEACHATE & SEDIMENT SAMPLING LOCATION
D01	DUPLICATE SAMPLE
MW-1	IEPA MONITORING WELL SAMPLING LOCATION (PRIOR TO 1979)
B-1	IEPA MONITORING WELL SAMPLING LOCATION (1979-1981)

SCALE

0 100 400 800 FEET

FIGURE R-1
STATE AND USEPA SAMPLING LOCATIONS AT SITE R.

TABLE Q-1: ANALYSIS OF SURFACE AND GROUND WATER SAMPLES COLLECTED BY IEPA AT SITE Q

	SAMPLE LOCATIONS AND DATES					
	10/17/72		1-17-73		4-10-73	4-26-73
PARAMETERS	P-1	L-1	GW-1	GW-2	P-2	P-3
Calcium	80	56	310	137	250	280
Magnesium	8	26	57	205	42	44
Sodium	23	169	275	13	230	205
Potassium	6	30	10	4	85	70
Ammonia	0.19	21	NA	NA	32	36
Boron	7	6.5	NA	NA	2.6	2.8
Cadmium			0.02		NA	0.02
Chromium (Total)					NA	0.03
Copper		0.01			0.02	
Iron		46			60	67
Lead		0.02			0.07	0.07
Manganese					6	6.5
Mercury (ppb)	0.5	0.5			0.4	0.6
Nickel					0.3	0.2
Silver			0.01			
Zinc		0.2		0.1	4.2	5
Alkalinity	46	810	645	375	420	
Chloride	19	4	310	24	210	205
Nitrate	NA	NA	NA	NA	NA	
Phosphate	NA	NA	NA	NA	3.7	5
Sulfate	230	18	325	25	350	270
Hardness	240	560	NA	NA	970	930
Phenols	NA	NA	0.02		NA	NA

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limit.
NA indicated parameter not analyzed.
P = Ponded water, L = Leachate, GW = Groundwater

018452

TABLE Q-2: ANALYSIS OF LEACHATE SAMPLES FROM SITE Q (COLLECTED OCTOBER 28, 1981 AND SEPTEMBER 29, 1983 BY IEPA)

SAMPLE LOCATIONS AND DATES

PARAMETERS	10-28-81 L-1	10-28-81 L-2	9-29-83 L101	9-29-83 L012	9-29-83 L103
Alkalinity	255	293	191	158	242
Ammonia	3.8	2.8	6.5	4	3.7
Arsenic	0.057	0.022	0.11	0.034	0.012
Barium	0.8	0.2	0.5	0.4	0.3
Boron	5.8	5.6	37.5	42	23
Cadmium					
COD	445	35	87	94	71
Chloride	15	17	23	22	31
Chromium (Total)	0.08		0.03	0.01	
Copper	0.2	0.04	1.2	0.06	
Cyanide				0.01	0.01
Hardness	1330	1220	1225	1360	1045
Iron	207	17.5	86	36	6.4
Lead	0.26		0.13	0.08	0.02
Magnesium	145	67	81	73	44.5
Manganese	7.7	34	6.7	6.8	2.7
Mercury					
Nickel	0.3		0.1	0.1	
Nitrate	0.24	0.4	0.21	6.1	1.8
Phosphorus	6.1	0.74	3.1	1.3	0.86
Potassium	16.5	9.5	13.4	13.5	17
R.O.E.	1980	1829	1880	2118	1563
Silver	0.02	0.01	0.01		
Sodium	55.7	53.3	56	70	51
Sulfate	1196	1059	1200	1350	900
Zinc	1.2	0.2	0.3	0.2	
Phenol	0.005	0.005			
PCBs (PPB)	0.7	1	0.5		0.1
2,3-D(PPB)					

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limits.

009453

TABLE Q-3: ANALYSIS OF FLYASH USED AS COVER FROM STOCKPILES AT SITE Q (SAMPLED BY IEPA IN 1972)

SAMPLE NUMBERS AND DATES

PARAMETERS	8/3/72			10/16/72		
	5 Years	1 Year	Fresh	5 Years	1 Year	Fresh
Calcium	125	245	285	580	120	130
Magnesium	4.6	6.4	0.5	9	2	
Sodium	10	7.5	58	140	1.3	36
Potassium	7	11	79	56	2	45
Ammonia	1.8	0.36	0.47	0.75	0.05	0.15
Arsenic	NA	NA	NA			0.02
Barium	0.1		0.1			
Boron	0.9	3.6	1.8	1.3	0.6	2.4
Cadmium	0.01	0.01	0.02	0.02		
Chromium				0.03		
Copper	0.09	0.01	0.01	0.06		
Iron	1.3	0.1		0.85	0.1	
Lead	0.03			0.02	0.01	0.02
Manganese	0.69	0.03	0.03	0.75		
Mercury (ppb)	6			6.2		
Nickel	0.1	0.1	0.2	0.12	0.05	0.05
Silver	0.005	0.005	0.005			
Zinc	0.8	0.1		1.05	0.05	0.02
Alkalinity	140	65	120	120	80	135
Chloride	10	12	60	150	4	49
Flouride	0.2	0.2	0.1	0.3	0.3	0.2
Phosphate	NA	NA	NA	1.6	0.07	0.05
Sulfate	290	950	1300	1600	250	270
Hardness	420	1000	1400	1600	340	350
COD	250	33	52	460	26	45

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limit.
NA indicates parameter not analyzed.

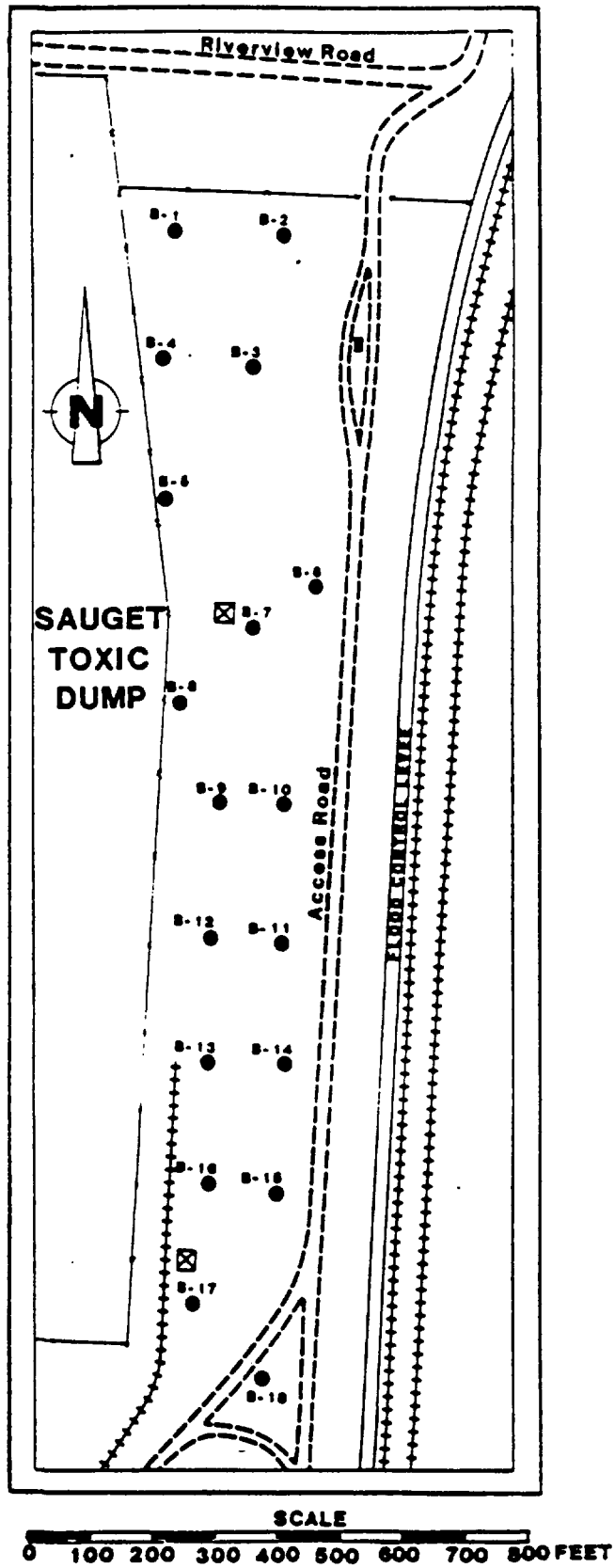


FIGURE Q-2
USEPA - FIT SUBSURFACE SOIL SAMPLING LOCATIONS AT SITE Q

TABLE Q-4: IDENTIFIED ORGANIC COMPOUNDS IN
SUBSURFACE SOIL SAMPLES FROM SITE Q
(SAMPLES COLLECTED JULY 13, THROUGH JULY 20, 1983
BY ECOLOGY AND ENVIRONMENT, INC.)

PARAMETERS	BORING/SAMPLE NUMBER / DEPTH (in feet)							
	B1A 10.0-11.5	B1B 17.5-19.0	B2A 13.5-15.5	B2B 17.0-19.0	B3A 10.0-12.0	B3B 13.5-15.5	B4A 10.0-12.0	B4B 13.5-15.5
2,3,7,8-TCDD								3.31
2,4,6-trichlorophenol	2,500	170,000	22,000	520	1,400	1,500		94,000
2-chlorophenol	24,000	65,000	800		1,500	LT	57,000	360,000
2,4-dichlorophenol	66,000	3,100,000	31,000	1700	760	4,500		370,000
2,4-dimethylphenol			500					72,000
4,6-dinitro-2-methylphenol								
pentachlorophenol		86,000	5,400	LT		11,000		100,000
phenol	24,000	55,000	45,000	4,400	3,200	100,000	98,000	88,000
2-methylphenol-								
4-methylphenol			LT		560	LT		330,000
2,4,5-trichlorophenol				LT				
acenaphthene			1,200	2,800				
1,2,4-trichlorobenzene				480			LT	100,000
1,2-dichlorobenzene	LT		LT			LT		20,000
1,4-dichlorobenzene			1,800	720	LT	760	LT	66,000
fluoranthene				1,200				LT
isophorone								
napthalene			11,000	8,300				LT
nitrobenzene		8,800	400					56,000
N-nitrosodiphenylamine								
bis(2-ethylhexyl)phthalate				LT				62,000
butyl benzyl phthalate								
di-n-butyl phthalate	LT							LT
di-n-octyl phthalate								
diethyl phthalate								
benzo(a)anthracene								
benzo(a)pyrene								
benzo(b)fluoranthene								
benzo(k)fluoranthene								
chrysene				400				
anthracene								
benzo(ghi)perylene								
fluorene			600	3,000				LT
phenanthrene			1,000	2,700				LT
dibenzo(a,h)anthracene								
indeno(1,2,3-cd)phrene								
pyrene			LT	LT				LT
aniline								
4-chloraniline			LT					
dibenzofuran			1,000	3,000				
2-methylnapthalene			2,000	2,300				
3-nitroaniline			4,600					
benzene								
Chlorobenzene							10,000	40,000
1,2-dichloroethane								
1,1-dichloroethane								
1,1,2,2-tetrachloroethane								
1,2-trans-dichloroethene								
ethylbenzene								
methylene chloride			7.4	3.7	LM	8.0		
tetrachloroethene								
toluene								
trichloroethene								
acetone			960			977		LM
2-butanone								
4-methyl-2-pentanone						LT		
styrene								
O-xylene				2.0				5,100
PCB-1242								
PCB1254								
PCB-1248	1,000							
PCB-1260			485.2		69.6			
PCB-1016			2,120.6					
Total PCB							68,000	1,000,000

NOTE: All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P= The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = not detected.

009459

TABLE Q-4 (continued)

PARAMETERS	B5A 13.5-15.5	B5B 17.0-19.0	B6A 10.0-12.0	B6B 13.5-15.5	B7A 10.0-12.0	B7B 13.5-15.5	B8A 13.5-15.5	B8B 17.5-19.5
	BORING/SAMPLE NUMBER Depth (in feet)							
2,3,7,8-TCDD								0.11
2,4,6-trichlorophenol	130,000	26,000	2,700	4,800	2,700		480,000	10,000
2-chlorophenol	31,000	8,400	1,600	1,600	LT			
2,4-dichlorophenol	560,000	260,000	17,000	15,000	6,100		1,500,000	64,000
2,4-dimethyphenol			2,000					
4,6-dinitro-2-methylphenol								
pentachlorophenol				16,000	25,000	31,000		
phenol	140,000	250,000	45,000	11,000	1,800			
2-methylphenol-			1,400	600				
4-methylphenol		36,000	7,000	1,400				
2,4,5-trichlorophenol								
acenaphthene								
1,2,4-trichlorobenzene	86,000	13,000					120,000	
1,2-dichlorobenzene	100,000	28,000	LT				180,000	
1,4-dichlorobenzene			3,100	800				
fluoranthene								
isophorone								
napthalene		LT	800	LT			380,000	LT
nitorbenzene	27,000	11,000	LT				52,000	
N-nitrosodiphenylamine								
bis(2-ethylhexyl)phthalate								
butyl benzyl phthalate								
di-n-butyl phthalate			400	LT				
di-n-octyl phthalate								
diethyl phthalate								
benzo(a)anthracene								
benzo(a)pyrene						LT		
benzo(b)fluoranthene						LT		
benzo(k)fluoranthene						LT		
chrysene						LT		
anthracene								
benzo(ghi)perylene								
fluorene								
phenanthrene								
dibenzo(a,h)anthracene								
indeno(1,2,3-cd)phrene								
pyrene								
aniline								
4-chloraniline			9,000					
dibenzofuran								
2-methylnapthalene								
3-nitroaniline								
benzene						3.2	LM	
Chlorobenzene	18,000	27,000	100,000	8.4		4.2	7,100	
1,2-dichloroethane			12,000	3.4				
1,1-dichloroethane								
1,1,2,2-tetrachloroethane								
1,2-trans-dichloroethene								
ethylbenzene			46,000	3.8		4.5		
methylene chloride				15.0	86.0	45.0	LT	
tetrachloroethene					LT			
toluene			50,000	LT		6.1		
trichloroethene						LT		
acetone				330	200	2,600		
2-butanone				LT	LT	LT		
4-methyl-2-pentanone								
styrene								
O-xylene			140,000	13.0	LT	22.0		
PCB-1242	70,000						1,700	2,700
PCB1254	60,000							
PCB-1248				4,700				
PCB-1260					590	13,000	880	1,500
PCB-1016					2,300	46,000		
Total PCB		66,000						

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P = The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = Not detected.

0 0 9 4 5 7

TABLE Q-4 (Continued)

BORING/SAMPLE NUMBER
DEPTH (in feet)

PARAMETERS	B9A 15.0-17.0	B9B 17.0-19.0	B10A 17.0-19.0	B10B 19.0-21.0	B11A 17.0-19.0	B11B 19.0-21.0	B12A 17.0-19.0	B12B 19.0-21.0
2,3,7,8-TCDD			P		P	P		
2,4,6-trichlorophenol	LT	600	48,000	640			4,400	9,400
2-chlorophenol	640	1,100	1,700	LT			1,200	520
2,4-dichlorophenol	7,400	9,800	170,000	9,60	3,200	20,000	8,800	4,200
2,4-dimethyphenol		LT						
4,6-dinitro-2-methylphenol								
pentachlorophenol		4,800		2,200			24,000	920
phenol	7,500	14,000	32,000	11,000	6,200	37,000	17,000	7,500
2-methylphenol-								
4-methylphenol	1,400	2,300	2,700				1,000	720
2,4,5-trichlorophenol								
acenaphthene								
1,2,4-trichlorobenzene			11,000					
1,2-dichlorobenzene			11,000		LT			800
1,4-dichlorobenzene		LT	27,000		LT			1,000
fluoranthene								
isophorone					17,000	LT		720
naphthalene			6,500		72,000	35,000	LT	640
nitrobenzene								
N-nitrosodiphenylamine						LT	LT	
bis(2-ethylhexyl)phthalate	440				52,000	34,000	440	
butyl benzyl phthalate					LT			
di-n-butyl phthalate		1,500	LT		23,000	LT		
di-n-octyl phthalate								
diethyl phthalate	LT	840						
benzo(a)anthracene								
benzo(a)pyrene								
benzo(b)fluoranthene								1,000
benzo(k)fluoranthene								1,000
chrysene					6,400			
anthracene								
benzo(ghi)perylene								
fluorene								
phenanthrene					5,200			
dibenzo(a,h)anthracene								
indeno(1,2,3-cd)phrene								
pyrene					5,600			
aniline								
4-chloraniline								LT
dibenzofuran								
2-methylnapthalene					10,000			
3-nitroaniline								
benzene			LM					
Chlorobenzene			5,200		LM			
1,2-dichloroethene								
1,1-dichloroethene								
1,1,2,2-tetrachloroethene								
1,2-trans-dichloroethene								
ethylbenzene			6,500		220,000			
methylene chloride	3.3	300	8,700	LT				
tetrachloroethene								
toluene			130,000		1,300,000	100,000		LM
trichloroethene					42,000			
acetone	210	14,000		4,400				
2-butanone								
4-methyl-2-pentanone							LT	
styrene								
O-xylene			30,000		650,000	70,000		LM
PCB-1242	600		NA					
PCB 1254			NA					
PCB-1248			NA		38,000	70,000		
PCB-1260	1,500	1,300	NA	120	45,000	681,000	7,000	5,000
PCB-1016								

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P = The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = Not detected.

009458

TABLE Q-4 (Continued)

BORING/SAMPLE NUMBER
Depth (in feet)

PARAMETERS	B13A 17.0-19.0	B13B 19.0-21.0	B14A 17.0-19.0	B14B 19.0-21.0	B15A 22.0-24.0	B15B 24.0-26.0	B16A 22.0-24.0	B17A 22.0-24.0
2,3,7,8-TCDD								
2,4,6-trichlorophenol	20,000	4,600			800	1,900	7,700	6,400
2-chlorophenol	2,500	3,800			600	1,600	4,600	100,000
2,4-dichlorophenol	9,400	11,000	460,000			11,000	27,000	120,000
2,4-dimethyphenol		LT					680	
4,6-dinitro-2-methylphenol	LT							
pentachlorophenol	12,000	44,000	16,000	16,000	4,200	12,000	39,000	26,000
phenol	8,900	15,000			6,000	13,000	16,000	50,000
2-methylphenol-								
4-methylphenol	920	1,400		16,000		1,000	1,900	9,200
2,4,5-trichlorophenol							LT	
acenaphthene								
1,2,4-trichlorobenzene	2,400	3,000	13,000,000	2,000,000				
1,2-dichlorobenzene			620,000	55,000			LT	
1,4-dichlorobenzene	1,300	2,000	1,200,000	100,000		1,600	4,100	
fluoranthene								
isophorone				14,000				
napthalene		LT	210,000	20,000		720	2,000	
nitorbenzene								
N-nitrosodiphenylamine		400						
bis(2-ethylhexyl)phthalate			1,100,000	220,000			4,600	
butyl benzyl phthalate				LT		LT		
di-n-butyl phthalate		LT	900,000	49,000	LT	3,800		
di-n-octyl phthalate		LT						
diethyl phthalate						LT		
benzo(a)anthracene								
benzo(a)pyrene	LT							
benzo(b)fluroranthene	1,300*							
benzo(k)fluroranthene	1,300*							
chrysene								
anthracene								
benzo(ghi)perylene	880							
fluorene								
phenanthrene								
dibenzo(a,h)anthracene	LT							
indeno(1,2,3-cd)phrene	LT							
pyrene								
aniline							680	
4-chloraniline	LT	2,200					9,600	
dibenzofuran								
2-methylnapthalene				LT				
3-nitroaniline								
benzene			44,000					
Chlorobenzene			63,000	LM				
1,2-dichloroethene								
1,1-dichloroethene			19,000					
1,1,2,2-tetrachloroethene			5,700					
1,2-trans-dichloroethene			11,000					
ethylbenzene			790,000	330,000	LT			
methylene chloride	50.0	13.0	5,800		2.5	23.0		LM
tetrachloroethene			12,000					
toluene			2,400,000	540,000				
trichloroethene			55,000					
acetone	90.0	430			540	1,400		
2-butanone			LM					
4-methyl-2-pentanone		LT	250,000		LT			
styrene				64,000	4.2	5.3		
O-xylene			2,300,000	1,400,000		LT		
PCB-1242						5,000		
PCB1254								
PCB-1248								
PCB-1260	770	1,300	2,900,000	16,000,000	190	1,000	370	68.0
PCB-1016					210			
Total PCB								

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM - Present, but lower than the detection limit for medium hazard analyses
P = The sample could not be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample could not be cleaned up sufficiently.
Blank = Not detected.

008459

TABLE Q-4 (Continued)

PARAMETERS	BORING/SAMPLE NUMBER Depth (in feet) 817B 24.0-26.0	818A 22.0-24.0	818B 24.0-26.0	Blank 1	Blank 2	Spike 81.0 ppb	Spike 81.0 ppb
2,3,7,8-TCDD						0.37	0.91
2,4,6-trichlorophenol							
2-chlorophenol							
2,4-dichlorophenol	3,800						
2,4-dimethyphenol							
4,6-dinitro-2-methylphenol							
pentachlorophenol							
phenol							
2-methylphenol-							
4-methylphenol							
2,4,5-trichlorophenol							
acenaphthene							
1,2,4-trichlorobenzene							
1,2-dichlorobenzene							
1,4-dichlorobenzene	550		LT				
fluoranthene					1,000		
isophorone							
napthalene							
nitrobenzene							
N-nitrosodiphenylamine							
bis(2-ethylhexyl)phthalate	580	910	1,400	LT			
butyl benzyl phthalate							
di-n-butyl phthalate			LT				
di-n-octyl phthalate		LT					
diethyl phthalate							
benzo(a)anthracene		520			600		
benzo(a)pyrene					LT		
benzo(b)flu		LT			LT		
benzo(k)fluoranthene		LT			LT		
chrysene		640			560		
anthracene							
benzo(ghi)perylene							
fluorene							
phenanthrene					720		
dibenzo(a,h)anthracene							
indeno(1,2,3-cd)phrene							
pyrene		LT			800		
aniline	51,000	1,700					
4-chloraniline		960					
dibenzofuran							
2-methylnapthalene							
3-nitroaniline							
benzene							
Chlorobenzene	4.1						
1,2-dichloroethane							
1,1-dichloroethane							
1,1,2,2-tetrachloroethane							
1,2-trans-dichloroethane							
ethylbenzene	7.7						
methylene chloride	6.1	19.0	47.0	LM	6.9		
tetrachloroethene							
toluene							
trichloroethene							
acetone	2,000		260				
2-butanone							
4-methyl-2-pentanone							
styrene							
O-xylene	23.0						
PCB-1242							
PCB1254							
PCB-1248							
PCB-1260	160		2,400		260		
PCB-1016							
Total PCB		670					

All results in ppb.
LT = Present, but lower than the detection limit for low hazard analyses.
LM = Present, but lower than the detection limit for medium hazard analyses.
P = The sample could ot be cleaned up sufficiently to yield TCDD results.
NA = Not analyzed, sample, could not be cleaned up sufficiently.
Blank = Not detected.

009460

TABLE R-1: A LISTING OF WASTE TYPES AND APPROXIMATE QUANTITIES DEPOSITED AT SITE R AS REPORTED BY MONSANTO

	Approximate Annual Volume (Cubic Yards) 1968	1972
Still Residues		
From Distillation of:		
Nitroaniline and Similar Compounds	1700	94
Cresols, Esters of Phenol		1140
Chlorophenol, Chlorophenol Ether	1070	774
Aniline Derivatives	1300	208
Chlorobenzol	130	13
Nitro Benzene Derivatives	100	1190
Phenol	1020	
Aromatic Caboxylic Acids	1500	
Chlorinated Hydrocarbons		425
By Products		
Mixed Isomers of Nitrochlorobenzene	1700	785
Mixed Isomers of Dichlorophenol	3000	1240
Waste Maleic Anhydride	730	
Waste Chlorobenzenes and Nitrochlorobenzene	120	
Contaminated Acids and Caustic		
Waste Sulfuric Acid with Chloropenol Present	1500	1395
Waste Caustic Soda with Chlorophenol Present	5300	1760
Waste Solvents		
Waste Methanol Contaminated with Mercaptans	600	
Waste Isopropanol (Water and Chlorinated Hydrocarbon)	5500	
Miscellaneous Solvents	1019	
Oily Material	101	
Filter Sludges		
Spent Carbon or Other Filter Media	600	12
Lime Mud from Nitroaniline Production	1000	1195
Gypsum		5600
Obsolete Samples and Sampling Wastes		
Chlorophenols	72	40
Laboratory Samples	208	150
Total	28,270	16,021

NOTE: Blanks indicate waste type not reported.

00946

TABLE R-2: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED AUGUST 22, 1968 BY THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH)

PARAMETERS	SAMPLE LOCATIONS				
	MW-1	MW-3	MW-4	MW-5	MW-6
Total Solids (conductivity mmhos)	320	300	280	250	500
Alkalinity (ppm)	172	148	156	124	248
Phenol (ppb)	1220	25	20	15	1200

09462

TABLE R-3: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED DECEMBER 5, 1972 By IEPA)

PARAMETERS	SAMPLE LOCATIONS MW-1	MW-2	MW-3	MW-5
Calcium	50.2	147	36	49
Magnesium	15.8	36	18	18.5
Sodium	18.5	112	15	18.5
Potassium	3.6	6.7	4.2	3.5
Ammonia	1.5	2	0.65	0.92
Arsenic				
Boron	0.1	0.7	0.1	0.1
Cadmium				
Chromium (Total)				
Copper		0.1		
Iron	2.4	28.2	1.4	8.5
Lead				0. 02
Manganese	0.35	0.61	0.12	0.95
Mercury				
Nickel				
Zinc	0.40	1.42	0.21	2.05
Alkalinity	180	430	145	185
Chloride	22	225	22	22
Fluoride	0.2	0.2	0.2	2
Nitrate	0.1	0.3	0.1	0.1
Phosphate	0.003	0.21	0.05	0.34
Sulfate	16	12	29	32
Conductivity (mmhos)	445	1400	390	470
Phenols	0.088	0.2	0.007	0.014
Oil	1	0	1	0
Hardness	200	530	170	200
COD	46	135	3	8

NOTE: All results in ppm.
Blanks indicate below detection limits.

C08946

TABLE R-4: ANALYSIS OF SURFACE WATER SAMPLES FROM WASTE PONDS AT SITE R (COLLECTED JANUARY 18, 1973 BY IEPA)

	SAMPLE LOCATIONS		
PARAMETER	CRYSTALLIZATION POND 221	CRYSTALLIZATION POND 270	SPENT CAUSTIC POND
Phenol	2800	50,000	2,000

NOTE: Results in mg/l (ppm).

009464

TABLE R-5: ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R (COLLECTED FEBRUARY 22, 1973 BY IEPA)

PARAMETERS	SAMPLE LOCATIONS				
	MW-1	MW-2	MW-4	MW-5	RANNEY WELL
Iron	6.8	11	0.8	6.6	1.9
Manganese	0.35	0.55	0.05	1.05	0.92
Mercury (ppb)	0.4			0.2	
Zinc	1.9	0.6		1.5	
Ammonia	1.6	2.6	0.7	1.3	0.98
Phenol (ppb)	150	80			7500
BOD	31	48	1	1	85
COD	51	78	16	13	220

NOTE: All results in ppm unless noted otherwise.
Blanks indicate below detection limits.

009465

TABLE R-6: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED MAY 6, 1974 BY IEPA)

	SAMPLE LOCATIONS					
PARAMETERS	MW-1	MW-2	MW-3	MW-4	MW-5	Ranney Well
Arsenic	0.001	0.001	0.005		0.001	0.002
Barium	0.1	0.3	0.2	0.1	0.2	0.2
Boron	0.3	0.9	8.4	0.2	0.1	
Cadmium		0.02				
COD	44	990	21	14	17	340
Chloride	90	215	30	17	16	25
Cyanide		0.008				0.005
Iron	15	43.2	11.9	2.71	7.5	2.65
Lead	0.008	0.01		0.008	0.014	0.95
Manganese	0.69	1.4	1.1	0.2	0.9	0.95
Nitrate						0.4
Oil	4	7	1			5
Phenols	0.35	120	0.1	0.02	0.1	15
R.O.E.	720	1600	750	270	240	820
Selenium						
Sulfate	220	78	305	48	41	31

NOTE: All results in ppm.
Blanks indicate below detection limits.

009466

TABLE R-7: ANALYSIS OF GROUND WATER SAMPLES FROM SITE R (COLLECTED OCTOBER 28, 1975 BY IEPA).

	SAMPLE LOCATIONS			
PARAMETERS	RANNEY WELL	MW-2	MW-4	MW-5
Ammonia				
Arsenic	0.002		0.002	
Barium	0.1	0.1	0.1	0.2
Boron	0.7	0.9	0.5	0.2
Cadmium				
COD	345	210	12	16
Chloride	110	200	23	20
Cyanide		0.02	0.01	
Iron	4.5	13.4	1.45	11
Lead	0.02		0.01	0.04
Manganese	1.3	0.2	0.1	0.7
Nitrate		0.3	0.2	0.1
Oil	3	6	2	3
Phenol	19	1.1	0.025	0.013
R.O.E.	300	920	230	200
Selenium	0.02			
Sulfate	95	6	22	15

NOTE: All results in mg/l, (ppm).
Blanks indicate not detected.

009467

TABLE R-8: ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R (COLLECTED FEBRUARY 17, 1976 BY IEPA)

	SAMPLE LOCATIONS					
PARAMETERS	MW-1	MW-2	MW-3	MW-4	MW-5	RANNEY WELL
Arsenic						0.001
Barium				0.2	0.3	0.1
Boron	0.3	0.8	8	0.5	0.1	1.4
Cadmium						
COD	28	130	8	16	15	390
Chloride	60	410	65	35	35	250
Cyanide	0.01	0.01	0.01	0.01	0.01	0.01
Iron	5.1	19.5	4.3	0.7	7.1	4.6
Lead	0.01	0.02			0.02	
Manganese	0.27	0.27	0.1	0.1	0.85	1.45
Nitrate	0.8	0.1				0.3
Phenols	0.03	0.01				
ROE	370	890	260	220	260	900
Selenium						
Sulfate	110	20	100	44	36	180
PCBs (ppb)						7.7

NOTE: All results in mg/l (ppm) unless noted otherwise.
Blanks indicate below detection limits.

TABLE R-9: ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R (COLLECTED BY IEPA ON OCTOBER 12, 1979)

PARAMETERS	SAMPLE LOCATIONS					
	B-9S	B-9D	B-13D	B-15S	B-17S	B-19S
Inorganics						
Arsenic	0.01	0.004	0.002	0.002	0.002	0.007
Cadmium	0.02		0.01			0.01
Chromium	0.03		0.04			0.03
Copper	1.2	0.32	0.87	0.14	0.42	1.6
Iron	290	100	130	56	110	230
Lead	0.2		0.3		0.1	0.2
Magnesium	31	10	27	83	11	28
Manganese	7.8	1	1.4	1.8	0.99	2.8
Nickel	0.6	0.2	1.9	0.1	0.1	0.2
Zinc	3.3	0.36	3	0.4	0.52	0.87
Organics						
Aliphatic hydrocarbons				*	*	*
Chlorophenol	*	*				0.81
Chlorotoluene	70	40	10	0.34	11	18
Dichlorbenzene						1.6
Diphenylether					0.32	2.1
Phenol	21	56	10	14.3	41.5	22

NOTE: All results in ppm
Blanks indicate below detection limits
* Contaminants present, but not quantified

009469

TABLE R-10: ORGANIC ANALYSIS OF GROUNDWATER SAMPLES FROM SITE R
(COLLECTED BY IEPA ON MARCH 25, 1981)

PARAMETERS	SAMPLE LOCATIONS								
	B-1	B-6S	B-9S	B9D	B11S	B-11D	B-15D	B-17D	B-19D
Aliphatic hydrocarbons					4,000				
Biphenylamine	1,800	250			15,000	1,100	1,300	860	660
Chlorobenzene	3,000	130	720	810	1,000	2,800	2,800	650	300
Chlorophenol	6,600	5,300	11,000	12,000	13,000	3,200	3,200		950
Chloronitrobenzene			2,500	1,500					
Dichlorobenzene	2,600				1,000	800	930	420	360
Dichlorophenol	1,100	700				630	2,900	670	
Trichlorophenol								1,200	

NOTE: All results in ug/l (ppb).
Blanks indicate below detection limit.

TABLE: R-11: ANALYSIS OF LEACHATE AND SEDIMENT SAMPLES FROM SITE R
(COLLECTED OCTOBER 2, 1981 BY IEPA)

PARAMETERS	SAMPLE LOCATIONS					
	SAMPLE A (WATER) D022687	SAMPLE B (WATER) D022688	SAMPLE C (WATER) D022689	SOIL SAMPLE A D022690	SOIL SAMPLE B D022692	SOIL SAMPLE C D022692
PCB			2.6	48	150	230
Toluene	11	40	150			
Chlorobenzene	160	390	1,600			
Chloroaniline	24,000	22,000	38,000	1,700	190	6,900
Chloronitrobenzene	21,000	9,600	820		130	
2.4-D	16,000	17,000	7,800	53	(<5)	(<5)
2,4,5-T				(<5)	(<5)	(<5)
Dichloronitrobenzene	740	590	790			
Dichloroaniline	870	820	2,800			190
Chloronitroaniline	84	33				
Nitroaniline	100	23				
Chlorophenol	15,000	30,000	27,000			290
Phenol	22,000	17,000	12,000			
Methylphenol	570	220	110			
Dichlorophenol	32,000	7,200	2,100	40		
Nitrophenol	600					
Biphenyldiol	1,700					
Aniline	550	120	35			
Methylbenzene	180	2,000	140			
Sucponamide						
4-methyl-2-pentanol	26					
2-methyl cyclopentanol	93					
Biphenyl 2-Ol	300	300	280			310
Benzenesulfonamide	76	630				
Dichlorobenzene		110	250			
Benzoic Acid/Derivatives	12,000	6,600	2,000			
Hydroxybenzoic Acid/ Derivatives	12,000					
2,4-D Isomer	38,000	48,000	29,000			
2,4,5-T Isomer	10,000	12,000	6,500			

NOTE: All results in ppb.
Blanks indicate below detection limits.
( ) indicates values are unconfirmed.

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TABLE R-12: COMPILATION OF LEACHATE AND SEDIMENT SAMPLES COLLECTED AT SITE R IN NOVEMBER, 1981

STATION NUMBER	USEPA SAMPLE NUMBER[a]	MONSANTO SAMPLE NUMBER	DESCRIPTION
1	S01	M01	Leachate (5% Sediment)
1	D01		Duplicate for S01
1	S02	M02	Sediment
1	D02		Duplicate for S02
2	S03	M03	Leachate (10% Sediment)
2	S04	M04	Sediment
3	S05	M05	Leachate (10% Sediment
3	S06	M06	Sediment
Blank	S07		City of Chicago tap water. Blank for low level analysis.
Blank	R01		City of Chicago tap water. Blank for medium level analysis.
Blank	R01		City of Chicago tap water. Extra blank for low level analysis.

NOTE: Monsanto did not split samples where no number is listed.
a - Samples collected by Ecology and Environment, Inc.

TABLE R-13: ANALYSIS OF TETRA THROUGH OCTACHLORINATED DIBENZO-P-DIOXINS AND DIBENZOFURANS IN LEACHATE SAMPLES FROM SITE R (COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

SAMPLE LOCATIONS	PARAMETERS									
	TCDDs	TCDFs	PCDDs	PCDFs	HXCDDs	HXCDFs	HPCDDs	HPCDFs	OCDDs	OCDFs
S01					4.5	6.3	86	74	323	30
S03					6.3	10	181	182	675	103
S05					5.8	6.3	152	112	2693	53
S07 (Blank)										
R01 (Blank)										

NOTE: All results in parts per trillion (ppb).
Blanks indicate below detection limits.
Analysis performed by Brehm Laboratory, Wright State University.

TABLE R-14: INORGANIC ANALYSIS OF LEACHATE SAMPLES FROM SITE R (COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

	SAMPLE LOCATIONS							
PARAMETERS	S01	M01	D01	S03	M03	S05	M05	R01
Arsenic	0.034	0.02	0.031	0.016	0.025	0.029	0.065	
Mercury	0.0002		0.0002	0.0002	0.0014	0.0008	0.001	
Selenium	0.038		0.032	0.026		0.031		
Thallium								
Antimony								
Beryllium		0.008			0.005		0.008	
Cadmium		0.006			0.007		0.008	
Chromium	0.04	0.086	0.02	0.015	0.075	0.02	0.07	0.01
Copper		0.073			0.092		0.08	
Lead	0.005		0.008					
Nickel	0.04	0.155			0.124		0.144	
Silver						0.01		
Zinc	0.048	0.216	0.024	0.01	0.216	0.049	0.062	0.31
Aluminum		26.8			30.5		3.22	
Barium		0.5			0.5		0.36	
Boron	19.7	18	17.1	15.35	13.6	21.6	19.1	
Calcium	N/A	368	N/A	N/A	257	N/A	257	N/A
Cobalt		0.03			0.019		0.031	
Iron	0.06	25.5	0.06		30.8	0.63	27.4	
Magnesium	N/A	43.2	N/A	N/A	48.2	N/A	39.8	N/A
Manganese	0.02	6.27	0.32	1.99	2.1	5.4	8.82	0.03
Molybdenum	N/A	0.53	N/A	N/A	0.403	N/A	0.439	N/A
Phosphorus	N/A	0.9	N/A	N/A	0.907	N/A	2.06	N/A
Sodium	N/A	40.4	N/A	N/A	41.8	N/A	44.2	N/A
Tin						0.02	1.4	
Vanadium		0.18			0.138		0.17	
Cyanide	0.071	N/A	0.057	N/A	N/A	N/A	N/A	0.13

NOTE: All Results in ppm.
Blanks indicate below detection limits.
N/A - Parameter not analyzed.
R01 is a water blank.

0 0 9 4 7 4

TABLE R-15: INORGANIC ANALYSIS OF SEDIMENT SAMPLES FROM SITE R (COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

	SAMPLE LOCATIONS						
PARAMETERS	S02	S03	M02	S04	M04	S06	M06
Arsenic	1.1	2.9	5.3	1.25	9.6	1.8	8.2
Mercury							
Selenium	1.1	1.8		1.5		1.6	
Thallium							
Antimony				4.0			
Beryllium			0.412		0.489		1.08
Cadmium			0.747	0.61	1.04		2.49
Chromium			10.7		10.4		28.7
Copper			7.17		7.89		25.5
Lead	2.4	2.9		2.45		1.7	
Nickel			17.4		18.6		33.8
Zinc	9.5	10	29.5	6.8	36.3	9.2	69.4
Aluminum	150	190	3870	155	4380	170	13,900
Barium			75.4		130	20	7.79
Boron		25	53	17	28.7	26	30.3
Calcium	N/A	N/A	3660	N/A	4010	N/A	6590
Cobalt			4.7		4.8		9.45
Iron	580	660	5870	425	8660	580	12,600
Magnesium	N/A	N/A	1780	N/A	2090	N/A	4080
Manganese	76	46	79.7	42	119	47	273
Molybdenum	N/A	N/A	10.6	N/A	12.5	N/A	22.4
Phosphorus	N/A	N/A	154	N/A	270	N/A	366
Sodium	N/A	N/A	1840	N/A	1270	N/A	4720
Tin							
Vanadium			14.4		17		43.9
Cyanide	28	13	N/A	6.8	N/A	90	N/A

NOTE: All results in ppm.
Blanks indicate below detection limit.
N/A - Parameter not analyzed.

TABLE R-16: IDENTIFIED ORGANIC COMPOUNDS IN LEACHATE
AND SEDIMENT SAMPLES FROM SITE R
(COLLECTED NOVEMBER 12, 1981 BY ECOLOGY AND ENVIRONMENT, INC.)

	SAMPLE LOCATIONS								
	LEACHATE			SEDIMENT					
PARAMETERS	M01	M03	M05	S02	M02	S04	M04	S06	M06
2-Chlorophenol	340	100		0.26		0.2	200	0.4	
2,4-Dichlorophenol	100					0.42		0.56	
Phenol	130					0.5	300	0.42	300
2,4,6-Trichlorophenol								0.32	
1,4-Dichlorobenzene	30				200		400		600
1,2-Dichlorobenzene	20								
Bis(2 ethylhexyl) Phthalate					400		300		400
Chlorobenzene	160	30							
Aniline	60	40	25						
Chloroanilines	8000	4000	600						
Dichloroanilines	100	40							200
Chloronitrobenzenes	3000	80							
2,4-D	332	100							
PCBs			0.008		0.014		0.034		0.192

NOTE: All results in parts per billion (ppb).
Blanks indicate below detection limit.

TABLE R-17: COMPARATIVE ANALYSIS OF CHEMICALS DETECTED IN SAMPLES AT SITE R AND THOSE REPORTED TO HAVE BEEN DISPOSED OR MANUFACTURED BY MONSANTO

COMPOUNDS	LEACHATE/SEDIMENT ANALYSIS			GROUNDWATER ANALYSIS	REPORTED DISPOSAL	MANUFACTURED
	TEPA	MONSANTO	USEPA	TEPA	MONSANTO	MONSANTO
PCBs	X	X				X
• Chlorobenzene	X	X		X	X	X
• Dichlorobenzene	X	X		X		X
• Chloroaniline	X	X			X	X
Chloronitrobenzene	X	X		X	X	X
Dichloronitrobenzene	X					
Chlorophenol	X	X	X	X	X	X
Dichlorophenol	X	X	X	X	X	X
2,4-D/isomers	X	X				X
2,4,5,-T/isomers	X					X
• Aniline	X	X				
Dichloroaniline	X				X	
Chloronitroaniline	X				X	X
Nitroaniline	X				X	X
• Phenol	X	X	X	X	X	
Nitrophenol	X					
Methylphenol	X					
Diphenyldiol	X					
Benzoic Acid/Derivatives	X				X	X
4-methyl-2-pentanol	X				X	
2-methylcyclopentanol	X				X	
Benzene Sulfonamide	X				X	
Chlorotoluene	X					X
Dioxins/Dibenzofurans			X		X (By Product)	X (By Product)