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4-28-03

Current Conditions Report

Premcor Refining Group, Inc.
Hartford Refinery and River Dock
Hartford, Illinois

1190500002 – Madison County – ILD041889023

Volume 1 of 3
Text, Figures, Tables, Appendices A through J-1

Clayton Project No. 15-03095.00.001
April 28, 2003

Prepared for:
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St. Louis, Missouri

Prepared by:
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PERMIT SECTION

Clayton
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Collinsville

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April 29, 2003

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Assistant Attorney General
Environmental Bureau / Springfield
ILLINOIS ATTORNEY GENERAL'S OFFICE
500 South Second Street
Springfield, Illinois 62706

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MAY 05 2003
COLLINSVILLE OFFICE

Subject: **1190500002 – Madison Count**
Premcor Refining Group – Hartford Facility
ILD0418889023
Current Conditions Report

Dear Mr. Morgan:

The Premcor Refining Group Inc (Premcor), through its consultant Clayton Group Services (Clayton), has completed an assessment of available information (both published information and our own records) to identify potential sources of contamination at our Hartford, Illinois facility. This assessment is documented in the form of a Current Conditions Report (CCR), which was developed in accordance with the guidance provided in your letter dated January 30, 2003. A copy of this report is enclosed for your review. By copy of this letter, we are also transmitting six (6) copies of the report to the Illinois EPA, Bureau of Land, attention Jim Moore.

Premcor, through Clayton, is using the information gathered for the CCR to develop a free phase hydrocarbon (FPH) recovery enhancement work plan proposal. This plan will address the enhancement of the FPH recovery system and evaluate and propose (if necessary) additional locations for new wells or redesign of existing wells to maximize FPH recovery. We plan to submit this work plan by June 2, 2003. As we have discussed, Premcor believes other parties should bear responsibility or contribute to this work.

Should you have any questions or wish to discuss the CCR, please contact me.

Sincerely,

Jeffrey Dill

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APR 30 2003

Enclosure: Current Conditions Report (1 copy)
cc: Jim Moore (Illinois EPA / BOL – 6 copies)
Clayton Group Services (2 copies)

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LIST OF ACRONYMS AND ABBREVIATIONS

ACFM	Alternative Coker Feed Material
Agency	Illinois Environmental Protection Agency
ALKY	Hydro-Fluoric Alkylation Unit
Apex	Apex Oil Corporation
AOC	AOC Holdings, Inc.
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
bgs	below ground surface
BIO	Biological Oxidation Unit
BP Amoco	British Petroleum Amoco
bpd	barrels per day
BTEX	Benzene, Toluene, Ethylbenzene, and Total Xylenes
Burlington	Burlington Environmental, Inc.
Burns & McDonnell	Burns & McDonnell Waste Consultants, Inc.
CCA	Compliance Commitment Agreement
CCR	Current Conditions Report
CERCLA	Comprehensive Environmental Responsibility Compensation, and Liability Act
Clark	Clark Oil and Refining Corporation Clark Refining and Marketing, Inc.
Clayton	Clayton Group Services, Inc.
CTAP	Critical Trends Assessment Program
CUO	Clean-up Objectives
DAF	Dissolved Air Float
DHDS	Distillate Hydrodesulfurization Unit
DOT	Department of Transportation
EDR	Environmental Data Resources
ENSR	ENSR Consulting and Engineering
ERU	Emergency Response Unit
ESI	Expanded Site Investigation
FCCU	Fluid Catalytic Cracker Unit
FPH	Free-Phase Hydrocarbon
gpm	gallons per minute
GRO	Groundwater Remediation Objective
HWRT	Hartford Wood River Terminal
Heritage	Heritage Remediation Engineering, Inc.
IAC	Illinois Administrative Code
IAF	Induces Air Flotation Units
IDPH	Illinois Department of Public Health

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)

IEMA	Illinois Emergency Management Agency
Illinois EPA	Illinois Environmental Protection Agency
IPCB	Illinois Pollution Control Board
ISGS	Illinois State Geological Survey
Layne	Layne Western Company, Inc.
LPG	Liquified Propane Gas
LQG	Large Quantity Generator
LUST	Leaking Underground Storage Tank
Mathes	John Mathes & Associates, Inc.
mg/kg	milligrams per killogram
mg/L	milligrams per liter
MOSC	Mobil Oil Storage Coking
MTBE	Methyl Tertiary Butyl Ether
NPDES	National Pollutant Discharge Elimination System
NFR	No Further Remediation
NRC	National Response Center
OCS	Office of Chemical Safety
OER	Office of Emergency Response
OPA	Oil Pollution Act of 1990
PCB	Polychlorinated biphenyl
PNA	Polynuclear Aromatic Hydrocarbons
Premcor	The Premcor Refining Group, Inc.
PVC	Polyvinyl Chloride
QRI	Quaternary Resource Investigations
RACR	Remedial Action Completion Report
RAL	Removal Action Level
RAP	Remedial Action Plan
RBCA	Risk-Based Corrective Action
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RO	Remediation Objective
Roberts	Roberts Environmental Drilling, Inc.
RUST	RUST Environment & Infrastructure
SAP	Sampling and Analysis Plan
Shell	Shell Oil Company, Inc.
Sinclair	Sinclair Oil Company
SPCC	Spill Prevention Control and Countermeasure
SRO	Soil Remediation Objective
SRP	Site Remediation Program
SSI	Screening Site Inspection

LIST OF ACRONYMS AND ABBREVIATIONS
(Continued)

SSL	Soil Screening Levels
SVOC	Semi-Volatile Organic Compound
TACO	Tiered Approach to Corrective Action Objectives
TEL	Tetraethyl Lead Building
TEX	Toluene, Ethylbenzene, and Total Xylenes
TIP	Total Isomerization Process
TPH	Total Petroleum Hydrocarbon
TTU	Thermal Treatment Unit
ug/L	micrograms per liter
USCOE	United States Corp of Engineers
USDA	United States Department of Agriculture
U.S. EPA	United States Environmental Protection Agency
VCB	Vapor Control Borehole
VCS	Vapor Control System
VOC	Volatile Organic Compound
WWTP	Waste Water Treatment Plant

EXECUTIVE SUMMARY

Clayton Group Services, Inc. (Clayton) was retained by The Premcor Refining Group, Inc. (Premcor) to assess its Hartford, Illinois facility to develop this Current Conditions Report (CCR). The purpose of this report is to evaluate potential sources of contamination associated with the facility. This report was developed following the guidance provided in the January 30, 2003 letter to Cathleen Bumb of Premcor from James Morgan of the Illinois Attorney General's Office.

Operations at this facility began in 1941. Premcor purchased the facility in 1988. The facility covers an area of approximately 400 acres. Approximately 130 of these acres (referred to as the River Dock area) are located between the Village of Hartford and the Mississippi River. The remaining approximate 270 acres are located on the east side of the Village of Hartford. This area comprises the refinery production equipment and the bulk storage tanks.

The Hartford Refinery and bulk storage area is bordered to the north, south, and east by other petroleum refining and terminal operations. The area is also served by numerous pipeline systems for the delivery and distribution of crude oil and refined petroleum products. In addition to facilities operated by BP Amoco, ConocoPhillips, and Shell Oil Company; Buckeye Partners, Cherokee Pipeline, Explorer Pipeline, Koch Industries, Marathon Ashland, Ozark Pipeline, Platte Pipeline, and St. Louis Pipeline Company currently own and/or operate petroleum pipelines in the area surrounding the Hartford facility. Many of these companies have pipeline right of ways through the facility.

In September 2002, Premcor ceased production of petroleum products from crude oil. Prior to shutdown, the refinery's production capacity was 70,000 barrels per day. The facility now operates as a storage and terminal facility with total petroleum storage capacity of approximately 110 million gallons (2,690,000 barrels). The facility is

regulated as a Large Quantity Generator of hazardous waste generating petroleum product-related wastes.

Currently, Premcor has signed a memorandum of understanding to sell the refining assets to another petroleum company. It is anticipated that refining operations will continue at the location.

The nature of business at this facility involves the movement and storage of thousands of barrels per day of crude oil and refined product. The facility utilizes procedures consistent with good engineering practices including implementation of a Spill Prevention Control and Countermeasure Plan and an Oil Spill Prevention and Response Plan. Despite all the precautions taken, spills and releases have occurred at the facility over its more than 60 years of operation.

The Premcor facility is located on alluvial Mississippi River Valley deposits. These deposits consist of silts and clays underlain by fine-to-medium sand that becomes coarser with depth. Top of bedrock is approximately 130 feet below ground surface. The most productive aquifer in the area is known locally as the American Bottoms, which consists of approximately 100 feet of boulder-to-clay-size material. Locally, groundwater flow is altered by groundwater pumping occurring at the Premcor, BP Amoco, and ConocoPhillips properties to maintain cones of depressions beneath the respective facilities.

The Premcor facility is not part of any regulatory program requiring a groundwater monitoring system. Nevertheless, a number of piezometers have been installed over the years to monitor changes in groundwater flow. Some of these piezometers include pumps used to recover free-phase hydrocarbons (FPH) found beneath a portion of the facility. Premcor is currently evaluating its FPH recovery system. The results of this evaluation will be used to develop a work plan for the enhancement of this system.

To complete the evaluation of potential sources of contamination, the facility was divided into 13 areas. Information used in this evaluation was gathered from facility files and Illinois EPA Bureau of Land, Bureau of Water, and Office of Emergency Response files. The Recognized Environmental Conditions (RECs) identified for each area are as follows:

Area 1 – Administration

Given the existence of the former truck-loading rack and underground gasoline storage tank located in the southwest portion of this area (now used for employee and contractor parking), this portion of the Administration Area has been identified as a REC.

Area 2 – River Dock

This area has been identified as a REC due to operations involving large quantities of petroleum products, operational releases in the Area, and the identification of impacts associated with three lagoons, a landfill, and an unidentified source in the southernmost portion of the Area.

Area 3 – Underground Product Lines

The Underground Product Lines Area has impacted soil and groundwater within the Village of Hartford with petroleum-related products and has been identified as a REC.

Area 4 – Refinery Process I

This area has been identified as a REC due to operational releases, with releases specifically attributed to the Crude Unit and to underground and aboveground product,

wastewater, and process water piping. A historical REC has also been identified because of an unknown amount of spent catalyst.

Area 5 – Refinery Process II

This area has been identified as a REC due to operational releases, with releases specifically attributed to the north drum accumulation area; an oil drum at the vehicle maintenance building; and to underground and aboveground product, wastewater, and process water piping. Historical RECs have also been identified because of operational releases attributed to pipelines.

Area 6 – Asphalt Plant

The area has been identified as a REC due to the release of asphalt because of dismantling the asphalt storage tanks.

Area 7 – Coking Unit

Due to operational releases, this area has been identified as a REC, along with Milo Field located south of the unit, which has been impacted by releases from the Coking Unit.

Area 8 – Bulk Storage Tank North

This area has been identified as a REC due to operational releases, including releases attributed to pipelines and tanks, and the identification of impacts associated with a former tetraethyl lead building, a pump house, and a crude oil tank bottom impoundment. Historical RECs have also been identified because of operational releases attributed to pipelines and tanks:

Area 9 – Bulk Storage Tank South

This area has been identified as a REC due to operational releases attributed to pipelines, the presence of the lime sludge landfill area, above and below ground piping, and product loading.

Area 10 – Waste Water Treatment Plant

This area has been identified as a REC due to operational releases, including releases attributed to the Dissolved Air Float (DAF) unit and a release of asphaltic oil. Due to the presence of a hazardous waste sump and a hazardous waste barrel storage area, this portion of the wastewater treatment plant has been identified as a REC. Historical RECs have also been identified because of operational releases attributed to pipelines.

Area 11 – Storm Water Retention

This area has been identified as a REC because it is used for emergency storm water retention and various volatile, semi-volatile, pesticide/PCB and inorganic constituents at levels equal to or greater than three times offsite background levels have been identified within the Area. It is noted that sludge was removed from the Guard Basin in 1993. Premcor also recorded a declaration of groundwater use restriction of the area in and around the Guard Basin.

Area 12 – Laydown

This area has been identified as a REC due to operational releases, including releases of wastes from roll-off boxes, the presence of historic surface impoundments that contained sludge dredged from the adjacent Guard Basin, and the presence of various volatile,

semi-volatile, pesticide/PCB and inorganic constituents at levels equal to or greater than three times offsite background levels within the Area.

Area 13 – Groundwater

The groundwater beneath the facility has been identified as a REC given the presence of free phase hydrocarbon and dissolved contaminants in the groundwater.

Offsite RECs

Offsite sources (the surrounding refineries, terminals, underground pipelines, the oil cooling reservoir located north of Rand Street, and the former tannery immediately northwest of the facility) have been identified as offsite RECs, potentially impacting the Premcor facility. Premcor is currently participating on a technical group, which includes many surrounding companies, to address the regional groundwater issues in this area.

1.0 INTRODUCTION

Clayton Group Services, Inc. (Clayton) was retained by The Premcor Refining Group, Inc. (Premcor) to assess its Hartford, Illinois facility to develop this Current Conditions Report (CCR). The purpose of this report is to evaluate potential sources of contamination associated with the facility. Figure 1-1 shows the general location of the Hartford facility. This report was developed following the guidance provided in the January 30, 2003 letter to Cathleen Bumb of Premcor from James Morgan of the Illinois Attorney General's Office. This report documents Clayton's review of available public and facility information, and identifies locations within the facility where contamination is likely to be located. The review was conducted in general accordance with American Society for Testing and Materials (ASTM) Method E-1527-00. The report contains: background information about the facility, a description of any potential or known contamination at the facility, a description of any remedial or interim measures taken to date, and identification of recognized environmental conditions as defined by ASTM Method E-1527-00.

2.0 FACILITY BACKGROUND

This section contains a summary of the historical and current use of the facility, past waste management activities, regional and site-specific geology and hydrogeology, and information regarding the area around the facility. The section includes a discussion of: (1) past and present owners, (2) a general description of the facility, (3) a history and description of previous and current waste management activities, (4) a summary of documented past product and waste spills, (5) the geology and hydrogeology of the area, and (6) a summary of the groundwater monitoring system.

2.1 PAST AND PRESENT OWNERS

The Wood River Oil and Refining Company, Inc. completed construction of the Hartford Refinery in May 1941. In 1950, Sinclair Oil Company (Sinclair) acquired the Hartford Refinery. Sinclair operated the Hartford Refinery until 1967, when Clark Oil and Refining Corporation (a Wisconsin corporation) purchased the facility. That purchase excluded the bulk storage and terminal operation now owned by Hartford Wood River Terminal (HWRT) located by Illinois Route 3 and Rand Street in Hartford. In 1981, Apex Oil Corporation (Apex) acquired Clark Oil and Refining Corporation, which continued operating the Hartford Refinery until 1988. Apex and its subsidiaries filed for bankruptcy protection under Chapter 11 of the Internal Revenue Code in 1987. In 1988, AOC Holdings, Inc. (AOC) (60% owned by The Horsham Corporation of Toronto) negotiated with the debtors to purchase certain assets of Apex including the Hartford Refinery. Subsequently, AOC was renamed Clark Oil & Refining Corporation (a Delaware corporation), which became Clark Refining and Marketing, Inc. (Clark), which became The Premcor Refining Group Inc. in May 2000.

The Asset Purchase Agreement entered into between the debtors and Premcor specifically provided that Premcor would not assume any environmental liabilities, particularly

pre-existing liabilities (i.e., pre-1988) of the debtor companies. Apex remains a viable company headquartered in St. Louis, Missouri.

An attempt is made in this document to distinguish between the Clark Oil and Refining Corporation (a Wisconsin corporation) that owned and operated the facility prior to 1988 and the Clark Oil and Refining Corporation (a Delaware corporation whose name was changed to The Premcor Refining Group Inc.) that currently owns and operates the facility. This has been done by referencing anything related to the facility prior to 1988 as Clark and referencing anything related to the facility after 1988 as Premcor.

2.2 GENERAL DESCRIPTION OF FACILITY

The Hartford facility comprises three separate parcels of land totaling approximately 400 acres. Two parcels are located on the east side of the Village of Hartford. The two parcels (north and south) are divided by Hawthorne Street. The north parcel covers an area of approximately 205 acres and is predominately covered by aboveground process storage tanks (ASTs) and refinery equipment. The south parcel covers an area of approximately 65 acres and is covered by ASTs. The truck loading and some bulk storage tanks in this south parcel are currently being leased to the Shell Oil Company. The third parcel (referred to as the River Dock area) is located west of the Village of Hartford between the United States Army Corps of Engineers' (USCOE) flood control levee and the Mississippi River. This parcel covers an area of approximately 130 acres and is largely undeveloped, with the exception of a barge loading and unloading dock. The loading and unloading dock is connected to the rest of the facility through product pipelines. These pipelines run aboveground from the dock to the levee and then underground to the refinery property. Pipelines to the HWRT share portions of the easement for the dock lines. Figure 2-1 shows these areas.

The facility uses procedures consistent with good engineering practices. These practices include implementation of a Spill Prevention Control and Countermeasure (SPCC) plan and an Oil Spill Prevention and Response Plan as required by the Oil Pollution Act (OPA) of 1990. Tank material and construction are compatible with the material stored and the conditions of storage. Liquid chemical storage is confined to tanks with metallurgy and/or properties that minimize corrosion leaks and contamination.

Operating personnel routinely observe and visually inspect the bulk storage tanks for signs of deterioration and leaks. Piping, valves, and appurtenances are observed through the routine course of operations and product transfer. When pipelines are not in service or in standby service for an extended time, the Refinery and River Dock connections are either closed by double block and bleed valves, or blinded or capped to reduce product contamination and prevent spills. Locks are installed on valves where there is a danger of personnel, equipment, or accidental discharge of materials. Starter controls on all oil pumps in non-operating or non-standby status are locked or electrically isolated in the "off" position.

2.2.1 General Site History

When the facility opened in 1941, its initial capacity was 13,000 barrels per day (bpd). When Sinclair purchased the facility in 1950, the capacity increased to 30,000 bpd. Over the succeeding years with changes in ownership and facility expansions, maximum daily crude oil capacity reached approximately 70,000 bpd.

The facility has the capacity to produce 40,000 bpd of gasoline and 25,000 bpd of diesel fuels. In addition, the refinery could produce 650 bpd of asphalt, 1,300 bpd of liquefied petroleum, and 40,000 bpd of petroleum coke. The process units at the refinery include a crude unit, delayed coker unit, fluid catalytic cracker, alkylation unit, reformer, distillate

hydrodesulfurization, total isomerization process, and the biological oxidation unit (wastewater treatment process).

On September 28, 2002, Premcor ceased production of petroleum products from crude oil and began closure of the Hartford Refinery. Hydrocarbons have been removed from the refinery production units. Tankage at the refinery now supports the bulk petroleum storage and terminal operations, which continue. As a storage and terminal facility, it receives, stores, and distributes petroleum products through pipelines and tankage at the refinery and via barges through the river dock facility. The total petroleum storage capacity at the Hartford Refinery is approximately 110 million gallons (2,690,000 barrels). Table 2-1 provides a summary of the storage tanks at the facility. Currently Premcor has signed a memorandum of understanding to sell the refining assets to another petroleum company. It is anticipated that refining operations will continue at the location.

2.2.2 Aerial Photograph and Historical Topographic Map Review

Historical aerial photographs were obtained from the United States Department of Agriculture (USDA) and the Illinois State Geological Survey (ISGS). Historical aerial photographs were provided for the period between 1941 and 1998. A review of these photographs along with copies of the aerial photographs is provided behind the Historical Aerial Photographs tab.

Historical topographic maps were obtained from Environmental Data Resources, Inc. (EDR) for the period between 1951 and 1994. A review of these topographic maps along with copies of the maps is provided behind the Historical Topographic Maps tab.

In 1941, the majority of the refinery was confined to the western portion of the property. The remainder of the refinery property, including south of Hawthorne Street, appeared to

be agricultural land including the current Coking Unit Area, the current Laydown Area, the current Storm Water Retention Area, the Bulk Storage Tanks North Area east of Tank 80-2, the Asphalt Plant Area, and the Bulk Storage Tanks South Area. The River Dock Area appeared to be a mix of agricultural land/forest with a dock and apparent pipeline at their current facility locations. The surrounding properties north of the refinery comprise a tank farm and agricultural land with another tank farm further north and beyond the railroad tracks. In addition, an industrial complex, the former International Shoe Company tannery, was immediately northwest of the refinery. East of the refinery was Route 111, immediately followed by an oil refinery. South of the refinery was Hawthorne Street and agricultural land. The Village of Hartford was west of the refinery. Surrounding properties to the River Dock Area appeared to be a mix of agricultural land/forest with an apparent manmade pond to the north. Development density surrounding the refinery property and the River Dock Area has increased over the years.

By 1951, according to topographic maps, an oil reservoir was adjacent to the tank farm north of the railroad tracks that run along Rand Street on the north side of the Village of Hartford.

By 1955, according to aerial photographs and topographic maps, the operations had expanded in the Refinery Process Areas, east and south of Tank 80-2 in the North Bulk Storage Tanks Area and the Administration Area. The Guard Basin was present in the Storm Water Retention Area, and signs of refinery-related activities were present in the Laydown and Coking Unit Areas. The Asphalt Plant Area appeared similar to its current configuration, although the South Bulk Storage Tanks South Area still appeared as agricultural land. The River Dock Area appeared to be under construction, specifically, the lagoons north of Hawthorne Street and the ponds south of Hawthorne Street. According to aerial photographs, the levee east of the River Dock Area was under construction, and a tank farm was present in the location of the current ConocoPhillips

tank farm south of East Hawthorne Street. According to topographic maps, the tannery had expanded slightly, and the oil reservoir was now identified as an oil-cooling reservoir.

According to 1962 aerial photographs, additional expansion had occurred in the Refinery Process II Area. Two tanks were now present in the Bulk Storage Tanks South Area, and the Duck Pond was present in the Storm Water Retention Area. The River Dock Area now contained all three lagoons north of Hawthorne Street and all three manmade ponds south of Hawthorne. The levee east of the River Dock Area appeared to be completed.

By 1968, according to historical topographic maps, additional expansion had occurred in the Refinery Process Areas, the Administration Area, and the Bulk Storage Tanks North Area. A tank was adjacent to and south of the dock in the River Dock Area. Several manmade ponds were present on the properties north and south of the River Dock Area.

By 1974, according to aerial photographs and topographic maps, operations had expanded further east in the Refinery Process I Area and had now expanded into the Coking Unit Area. The Lime Pits in the Storm Water Retention Area and the Triangle Impoundment in the Bulk Storage Tanks North Area were all present. Additional structures were present in the wastewater treatment plant (WWTP) Area. The Bulk Storage Tanks South Area appeared to be under construction in its current configuration, although only the two northernmost tanks were present.

By 1978, according to aerial photographs, new tanks were present in the WWTP Area, and the Bulk Storage Tanks South Area was completed in its current configuration. Activity was apparent at the landfill in the Bulk Storage Tanks South Area.

By 1988, according to aerial photographs, the entire refinery operation appeared to be in its approximate current configuration, and activity was still apparent at the landfill in the Bulk Storage Tanks South Area. The former tannery appeared to be demolished.

By 1993, according to aerial photographs, vegetation appeared to be developing over the landfill in the Bulk Storage Tanks South Area.

According to the 1994 topographic map, the oil-cooling reservoir now appeared as an unidentified apparent water body.

By 1998, according to aerial photographs, vegetation appeared to cover the landfill.

Data failure prevented Clayton from establishing the history of subject property use since first development. Historical subject property ownership and/or use information was obtained for the time period, 1941 to the present.

2.2.3 Surrounding Area

The Hartford Refinery is bordered to the north, south, and east by petroleum refining and terminal operations, and to the west by the Village of Hartford. The area is served by numerous pipeline systems for delivery and distribution of crude oil and refined petroleum products.

British Petroleum Amoco (BP Amoco) currently operates a petroleum bulk storage terminal directly north of the Hartford Refinery in Wood River, Illinois. The BP Amoco terminal is located on an approximate 800-acre site that formerly operated as a petroleum refinery from 1906 to 1981. Petroleum and chemical storage and handling has continued at the facility from 1981 to the present. The BP Amoco Terminal continues to receive and distribute refined petroleum products via trucks, barges, and underground pipelines.

ConocoPhillips currently operates a 286,400 bpd petroleum refinery directly east of the Hartford Refinery. The ConocoPhillips refinery is located in Roxana, Illinois on 1,888 acres, and was originally constructed in 1918. The ConocoPhillips refinery receives and distributes crude oil and refined products via trucks, railcars, barges, and underground pipelines.

Shell Oil Company, Inc. (Shell) currently operates a petroleum terminal directly south of the Hartford Refinery. The Shell terminal receives and distributes refined petroleum products via trucks and underground pipelines. The area of this operation is on property that Shell leases from Premcor.

In addition to the petroleum pipelines owned and/or operated by Premcor, BP Amoco, ConocoPhillips, and Shell, numerous other petroleum pipeline systems traverse the Hartford, Wood River, and Roxana, Illinois area. Buckeye Partners, Cherokee Pipeline, Explorer Pipeline, Koch Industries, Marathon Ashland, Ozark Pipeline, Platte Pipeline, and St. Louis Pipeline Company currently own and/or operate petroleum pipelines in the area surrounding the Premcor facility. Most of these companies have pipeline right-of-ways through the Premcor facility. Figure 2-1 shows the location of some of these pipelines. Figure 2-2 shows the site location of the Hartford Refinery and surrounding industrialized areas.

Besides the petroleum-related industry in the surrounding area, the International Shoe Company operated a tannery immediately northwest of the Refinery property. Based on a review of the historical aerial photographs and the historical topographic maps, it appears the tannery was in operation since before 1941 to sometime between the late-1950s and 1970s. Demolition of the tannery buildings appears to have started in the late-1970s or early-1980s. All buildings of the former tannery were removed by the late-1980s. This property is currently owned by the Shell Oil Company.

2.3 HISTORY AND DESCRIPTION OF PREVIOUS AND CURRENT WASTE MANAGEMENT UNITS

The facility is regulated as a Large Quantity Generator (LQG) of hazardous waste, generating more than 1,000 kilograms of hazardous waste during many months of the year. Some frequently generated waste streams include dissolved air float (K048), slop oil emulsion solids (K049), primary and secondary wastewater treatment sludge (F037 and F038), heat exchanger bundle cleaning sludge (K050), spent catalysts (D001, D018, K171, and K172), spent reformer charge filters (D007 and D018), laboratory waste (D001, D002, D003, D039, P022, and U144) and tank bottoms (D018). Other hazardous wastes include activated carbon (D001 and D018), paint waste (D001, D008, and D018), and waste sulfide (D001 and D003).

Areas where hazardous wastes were routinely handled included a hazardous waste storage pad (less than 90-day storage) and a bundle-cleaning pad. Further discussion of solid and hazardous waste management units is provided in Section 3.0, which discusses individual areas of the facility.

2.4 SUMMARY OF DOCUMENTED PAST PRODUCT AND WASTE SPILLS

The nature of this business involves the movement and storage of thousands of barrels per day of crude oil and refined product. At the height of operations, this facility refined as many as 70,000 bpd of crude oil.

Despite all the precautions taken above, the nature of this business still leads to spills and releases. It is not possible to document every incidental spill or release that has occurred at the facility over the past 60 years of operations.

Table 2-2 provides a summary of documented past spills that Clayton identified through its review of facility and Illinois Environmental Protection Agency (Illinois EPA) records. Where known, the locations of these past spills have been plotted on Figure 2-3. Further discussion of significant past spills is provided in the discussion of individual areas found in Section 3.0.

Burns & McDonnell Waste Consultants, Inc. (Burns & McDonnell) reviewed the National Response Center (NRC) database of reported releases for the Hartford, Wood River, and Roxana, Illinois area. The search of the database revealed 237 releases to the soil or water reported to the NRC between January 1990 and December 2002. Of these 237 releases, 18 were related to either Clark or Premcor. Burns & McDonnell's summary table is provided in Appendix A. The table provides a summary of only those releases reported to the NRC as identified from their database for the area, including the release number, release date, suspected responsible party, and the released material and quantity.

2.5 GEOLOGY AND HYDROGEOLOGY

The geology and hydrogeology of this area has been summarized in numerous reports previously submitted to the Illinois EPA. The most recent report presenting this information is the December 2002 *Groundwater Monitoring Work Plan for the Hartford Refinery* prepared by Burns & McDonnell. This report was submitted to John Waligore of the Illinois EPA's Division of Legal Counsel on December 13, 2002. Excerpts from the Burns & McDonnell report concerning the geology and hydrogeology follow.

2.5.1 Geology

John Mathes & Associates, Inc. (Mathes) conducted a subsurface investigation for the former Clark Oil and Refining Corporation in 1979. The purpose of the study was to conduct sufficient subsurface exploration to determine the presence of hydrocarbon

products beneath the Hartford Refinery and determine the design of a hydrocarbon recovery system, if necessary. Twenty-seven (27) borings were advanced as part of the study. Details of this investigation are included in a report titled *Engineering Investigation Report Clark Oil Refinery Hartford, Illinois* (the Mathes Report) dated December 18, 1979. This report was included as Exhibit 1 to the December 2002 Burns and McDonnell report.

In 1996, Premcor retained Quaternary Resource Investigations (QRI) to conduct a thorough non-intrusive subsurface investigation of the Hartford Refinery. The report, *Stratigraphic Evaluation of the Clark Refining Plant Hartford, Illinois* (the QRI Report), was issued in 1996 and included as Exhibit 2 to the December 2002 Burns and McDonnell report. A summary, as well as excerpts of the information, is provided in this section for background information and discussion. The objective of the study was to gather and clarify the following information:

- The stratigraphy beneath the Hartford Refinery
- The net thickness of clay in the upper 50 feet
- The net thickness of sand in the upper 50 feet
- The thickness of alluvium and/or glacial deposits above bedrock
- The influence of the stratigraphy on ground water flow

2.5.1.1 Regional Geology

The Hartford Refinery is located in western Madison County, Illinois, in the Central Lowland Province of the Interior Plains of North America. The major physiographic features of the county are the upland till plains and bluffs and the Alluvial Mississippi River Valley. Wood River and Cahokia Creeks drain the western portion of the county. The Hartford Refinery is located in the Springfield Tills Plain, which is an extensive, relatively flat area overlying till deposits laid down by glaciation. The major kinds of parent material in the area are loess, glacial till, glacial outwash, and alluvium. The

present landscape of the area and the upper 130 feet of the Hartford Refinery were created by processes (alluvial and glaciation) active during the last 125,000 years. The dominant creator of the landscape locally is the Mississippi River. The Mississippi River changed its course frequently during the Pleistocene, as evidenced by local lakes such as Horseshoe Lake (located approximately 10 miles southeast of the Hartford Refinery). The old meander loops are bordered by arcuate ridges and swales that were formed as slackwater bars in former channels. East of the meander loops are partially filled poorly drained swamps with silt and clay from floodwaters (QRI 1996).

The northeastern part of the Mississippi Alluvial Valley in Madison County contains terraces of sand and gravel that stand above the present flood plain. These are outliers of former glacier valley fill sand and gravel. Wood River and Roxana are built on one of these terraces. The front of the terrace has a sharp rise of 12 to 15 feet, such as along Highway 111 between the Hartford Refinery and the ConocoPhillips refinery. This is called the Roxana Terrace and is stratigraphically known as the Henry Formation Mackinaw Member (ISGS *Geology of East St. Louis Area* 1979).

The river- and glacial-laid sediments developed in relatively recent geologic time are underlain by consolidated sedimentary rocks over 3,800 feet thick. These bedrock formations dip gently northeastward from the Ozark Highlands toward the Illinois Basin and predominantly consist of limestone and dolomite with subordinate amounts of sandstone and shale. Mississippian rocks underlie the sediments in the western part of Madison County, and Pennsylvanian rocks underlie the eastern part. The Mississippian bedrock below the Hartford Refinery is believed to be Renault Limestone. Renault Limestone consists of relatively pure limestone and an upper sandy limestone (ISGS *Geology Map of Illinois* 1956).

2.5.1.2 *Local Geology*

The Mathes report indicated fine-grained soils consisting of clays and silts were present at the surface and extend approximately 10 to 15 feet below ground surface (bgs). At some boring locations, thin layers of fine sands were encountered within this region. Underlying the fine-grained soils, fine sands and silty fine sands were encountered, which extended for depths ranging from approximately 3 to 9 feet. In most cases, the fine sand was underlain by medium-to-coarse sands for the remaining depth of the boring. At a limited number of locations, a stratum of gray clay or silty clay separated the fine sand from the more coarse underlying material.

The top of bedrock below the Hartford Refinery is approximately 130 feet bgs. In order to determine the stratigraphy of the unconsolidated material, QRI assessed 186 locations using a geophysical method known as the Pulser™ technique. Data from these locations were collected at approximate 400-foot intervals across the Hartford Refinery. A total of 258 borings were used to compile the stratigraphy described below. The upper 70 to 100 feet of soil below the Hartford Refinery has been deposited in a fluvial environment as described above. These sequences are:

1. Deposition of Channel/Point Bar (35 to 70 feet bgs).
2. Deposition of Natural Levee/Floodplain (Western Portion of Plant) and Colluvium (Eastern Portion of Plant) (25 to 35 feet bgs).
3. Deposition of Crevasse Splay (Western Portion of Plant) and Colluvium (Eastern Portion of Plant) (20 to 25 feet bgs).
4. Deposition of Natural Levee/Floodplain (Western Portion of Plant) and Colluvium (Eastern Portion) (10 to 20 feet bgs).
5. Deposition of Floodplain over the entire plant surface (0 to 10 feet bgs).

The selected cross sections from the QRI report are provided in Appendix B. These include the following:

- Cross section F – F' (west to east through the center of the refinery)
- Cross section M – M' (west to east through the center of the south bulk storage tanks)
- Cross section Q – Q' (north to south through the west side of the facility)
- Cross section X – X' (north to south through the east side of the facility)

Based on the QRI report, the Hartford Refinery can be divided into three stratigraphic zones as shown on Insert 20 of the QRI report (Exhibit 2 to the December 2002 Burns and McDonnell report). Zone 1 lies primarily in the western portion of the refinery and consists of floodplain, natural levee, and crevasse splay deposits in the upper 30 feet. Zone 2 lies in the eastern portion of the refinery and consists of floodplain and colluvium deposits in the upper 30 feet. Zone 3 lies in the southern corner of the refinery and contains channel plug deposits in the upper 50 feet. All zones are similar stratigraphically below 50 feet. Overall, clay increases to the west, and sand increases to the east. Zone 3 represents one arm of a neck cut-off meander.

2.5.2 Hydrogeology

2.5.2.1 Regional Hydrogeology

The most productive aquifer in the area is known locally as the American Bottoms. The region of the aquifer covers an area approximately 175 square miles, 30 miles long with a maximum width of 11 miles. The aquifer consists of sediments of the Cahokia, Henry, and Glasford Formations (ISGS *Quaternary Deposits of Illinois* 1979)

The regional groundwater flow direction for the lower portion (Henry and Glasford) of the American Bottoms has been reported to be southwest. Stratigraphically speaking, the surface and subsurface appear to slope to the southwest, which would support

groundwater flowing to the southwest. However, groundwater pumping (screens typically set >80 feet bgs) by Premcor, ConocoPhillips, and BP Amoco has locally reversed the natural groundwater flow trend (see Insert 9 in the QRI Report – provided in Exhibit 2 of the December 2002 Burns & McDonnell report).

The American Bottoms consists of approximately 100 feet of boulder- to clay-size material in the area. The variability of lithologies in the American Bottoms results in highly differing permeabilities. The coarse alluvial and valley-train sands and gravels have the highest permeabilities and are the most favorable deposits for yielding industrial supplies of groundwater. The variations in lithologies result in certain areas being more productive than others in the aquifer. The most productive zone of the aquifer is reported to be approximately 65 to 95 feet bgs. The zone is probably the glacial valley train of the Henry Formation Mackinaw Member. Below 95 feet, as much as 25 feet of clayey material has been encountered above the bedrock and is probably till material from the Illinoisan age glaciers. The variability in sediment types is due to the change in depositional environments (ISGS *Quaternary Deposits of Illinois* 1979).

A regional groundwater trend investigation of the American Bottoms aquifer was completed by Illinois Critical Trends Assessment Program (CTAP) in 1994 (CTAP *The Changing Illinois Environment: Critical Trends, Volume 2: Water Resources*). This report presents general trends in groundwater elevations for the region, and indicates groundwater elevations throughout the American Bottoms aquifer have increased over the past 100 years. The increase in groundwater elevations appears to be caused by a decrease in pumpage from industrial water supply wells and abundant recharge in the area. Sources of recharge to the aquifer are precipitation, induced infiltration from the Mississippi River and other water bodies, and subsurface flow from the bluffs bordering the surface materials and into the sand and gravel deposits.

Figure 2-4 shows the approximate location of wells located within a 2-mile radius of the facility.

2.5.2.2 Local Hydrogeology

Several strong internal and external competing influences affect the local hydrogeology. Eight production wells (P-1 through P-8) were installed at the Hartford Refinery between 1966 and 1973 for use as makeup/cooling water for the refinery processes. Their locations are shown on Figure 2-5. The production wells are screened in the lower portion of the American Bottoms aquifer, with total depths ranging from 100 to 115 feet bgs. The well information logs for installation of the production wells are included in Exhibit 11 of the December 2002 Burns & McDonnell report. Operation of these wells creates a cone of depression beneath the facility. Production wells currently utilized in some combination are Production Wells P-1, P-2, P-5, P-6, and P-7. Production Wells P-3, P-4, and P-8 are still present at the Hartford Refinery but are no longer utilized. With the discontinuation of refinery operations, only P-1 is being operated in an attempt to maintain the cone of depression.

The BP Amoco facility located to the north of the Hartford Refinery currently operates a groundwater pumping system to maintain a cone of depression beneath its facility. To the east, ConocoPhillips maintains a large network of pumping wells in order to maintain multiple cones of depression. Directly south of the Hartford Refinery is the crude oil storage tank farm owned by ConocoPhillips. This area contains a substantial clay plug that may restrict horizontal flow in the shallow portion of the aquifer to the south. To the west, the Mississippi River exerts a strong influence on the water table in the American Bottoms Aquifer.

No comprehensive local groundwater investigation and/or groundwater modeling (using piezometric data from Premcor, BP Amoco, and ConocoPhillips) has been conducted to

relate the effects of groundwater pumping by the previously named entities, as well as by the local municipalities, on the characteristics of the aquifer near the Hartford, Roxana, and Wood River, Illinois area.

2.6 SUMMARY OF GROUNDWATER MONITORING SYSTEM

The Hartford Refinery property and the River Dock property are not part of any regulatory program requiring a groundwater monitoring system. Nevertheless, a number of piezometers have been installed at the facility over the years. These piezometers provide a network for monitoring and determining changes in groundwater flow for the Hartford Refinery property. In addition, groundwater monitoring has been conducted at the River Dock property as a result of spills in this area.

2.6.1 Refinery Property

Mathes installed the first set of piezometers in 1979 during a subsurface study. A total of 27 borings were advanced throughout the Hartford Refinery with hollow-stemmed augers. A 2-inch polyvinyl chloride (PVC) piezometer was installed in each boring (Piezometers RB-1 through RB-27). Only seven of these piezometers (RB-1, RB-8, RB-10, RB-13, RB-22, RB-25, and RB-26) currently exist. The records of subsurface exploration for the Mathes borings are provided in Appendix B of the Mathes Report (Exhibit 1 of the December 2002 Burns & McDonnell report). Figure 2-5 shows the location of Piezometers RB-1, RB-8, RB-10, RB-13, RB-22, RB-25, and RB-26.

Piezometers RB-29 through RB-35 were installed prior to 1990, and no boring logs or construction diagrams are available. Only three of these piezometers (RB-29, RB-30, and RB-35) currently exist. Figure 2-5 shows the location of Piezometers RB-29, RB-30, and RB-35.

In January 1993, Heritage Remediation Engineering, Inc. (Heritage) installed four piezometers (GB-1, GB-2, GB-3, and GB-4) around the Guard Basin area in the southeastern portion of the Hartford Refinery, and four piezometers (LP-1, LP-2, LP-3, and LP- 4) around the Lime Pit area on the eastern portion of the Hartford Refinery. The soil test boring logs and monitoring well logs are provided as Exhibit 4 of the December 2002 Burns & McDonnell report. Of the eight piezometers installed by Heritage, only Piezometers GB-1 and LP-4 still exist. Figure 2-5 shows the locations of Piezometers GB-1 and LP-4.

In August 1993, Burlington Environmental, Inc. (Burlington) installed two additional piezometers (GB-5 and GB-6) around the Guard Basin, and two additional piezometers (LP-5 and LP-6) around the Lime Pits. The subsurface exploration records are provided as Exhibit 5 of the December 2002 Burns & McDonnell report. Of the four piezometers installed by Burlington, only Piezometer GB-6 still exists. Figure 2-5 shows the location of Piezometer GB-6.

In November 1994, Layne Western Company, Inc. (Layne) installed piezometers RB-36, RB-37, and RB-38. Layne also overdrilled Piezometer RB-10 and replaced the 2-inch piezometer with a 4-inch piezometer. The monitoring well installation reports for these wells are provided as Exhibit 6 of the December 2002 Burns & McDonnell report. Figure 2-5 shows the location of Piezometers RB-36, 37, and 38.

In 1995, Roberts Environmental Drilling, Inc. (Roberts) installed another group of piezometers around the perimeter of the Hartford Refinery. Eighteen (18) borings were installed 400 to 800 feet apart along the perimeter of the Hartford Refinery, including the south property, and converted to 2-inch PVC piezometers (Piezometers RB-39 to RB-56). The boring logs for these piezometers are provided as Exhibit 7 of the December 2002 Burns & McDonnell report. The well completion reports are provided as Exhibit 8 of the December 2002 Burns & McDonnell report.

Table 2-3 provides a monitoring well construction summary. This table was constructed from information obtained from the review of facility and Illinois EPA files.

In May 2002, the piezometer network was examined by Burns & McDonnell for competency of the well structure, surface seal, and integrity. In addition, locations were reviewed in regard to repetitiveness and necessity in the overall monitoring system. Five piezometers (RB-3, RB-4, RB-6, RB-9, and LP-5) were abandoned and sealed following Illinois abandonment guidelines. The abandonment forms are provided as Exhibit 9 of the December 2002 Burns & McDonnell report. New padlocks and vented well caps were placed on all piezometers, and the outside of all existing piezometers was clearly labeled. In addition, a licensed professional surveyor surveyed existing piezometers and production wells for both elevation and location.

Groundwater elevations for the Hartford Refinery have been measured intermittently over the years. RUST Environment & Infrastructure (RUST) performed seven groundwater-gauging events from June 1995 to June 1996. Premcor and/or Burns & McDonnell personnel performed six groundwater-gauging events from November 1998 to July 2002. Table 4 from Burns & McDonnell's December 2002 report, which presents the results of its gauging events, is provided in Appendix C. Groundwater contour maps constructed by RUST and Burns & McDonnell, which represent these data, are provided in Appendix D. Also included at the end of this appendix is a figure showing the location of the FPH plume beneath the Hartford Refinery.

Select piezometers at the Hartford Refinery have been sampled twice for laboratory analysis. The first sampling event occurred in March 2000 at the request of the Illinois EPA. Groundwater samples were collected from various piezometers and production wells for analysis of Methyl Tertiary Butyl Ether (MTBE). Burns & McDonnell checked water levels, purged piezometers, and collected groundwater samples from 10 piezometers (RB-38, RB-39, RB-40, RB-41, RB-42, RB-43, RB-44, RB-45, RB-46, and

RB-47). A water sample was collected from the influent to Tank T-80, which is the combined effluent from Production Wells P-2 and P-7, and from Production Wells P-2, P-5, and P-7. A summary of sample results is provided as Table 2 of the December 2002 Burns & McDonnell report (see Appendix E). Figure 2-5 shows the piezometer and well locations. The results show the presence of MTBE at concentrations ranging from less than 2.0 micrograms per liter (μg/L) to 6,630 μg/L.

The second groundwater sampling event occurred in May 2001 at the request of the Illinois EPA. Groundwater samples were collected from 18 piezometers and one production well. Samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), total metals, and polychlorinated biphenyls (PCBs). Burns & McDonnell personnel collected split samples. A summary of laboratory analytical results from the Burns & McDonnell split samples is provided as Table 3 of the December 2002 Burns & McDonnell report (see Appendix F). Figure 2-5 shows the piezometer and well locations. The results show that petroleum-related compounds were detected in samples collected from some wells. The most prevalent compounds included:

- Benzene at concentrations ranging from non-detect to 5,240 mg/L
- Ethylbenzene at concentrations ranging from non-detect to 6,880 mg/L
- Toluene at concentrations ranging from non-detect to 27,100 mg/L
- Total xylenes at concentrations ranging from non-detect to 36,120 mg/L
- MTBE at concentrations ranging from non-detect to 19,100 mg/L
- Naphthalene at concentrations ranging from non-detect to 3,380 mg/L
- Arsenic at concentrations ranging from non-detect to 7.8 mg/L
- Lead at concentrations ranging from non-detect to 420 mg/L

2.6.2 River Dock Property

Limited groundwater monitoring has been conducted at the River Dock property. The monitoring conducted in this area was associated with spills that occurred in this area. In March 1994, approximately 4,071 barrels spilled from an overhead black oil line approximately 600 feet east of the barge terminal. As part of the spill cleanup, groundwater monitoring was conducted in this area from September 1996 to December 1999. This monitoring revealed no concentrations of analytes exceeded Illinois EPA Class I groundwater remediation objectives (GROs). Based on this and having received approval from the Illinois EPA, the monitoring wells were abandoned in February 2000.

In 1995, Burns & McDonnell conducted a site assessment in the area of the elevated dock located near the floating barge dock. The report was submitted to John Sherrill (Illinois EPA, Bureau of Land) on January 9, 1996. The assessment revealed the presence of benzene in the groundwater at concentrations exceeding Class I Groundwater Quality Standards. Because of this, a biosparging system was installed in 1997. In November 2001, the Illinois EPA Office of Chemical Safety (OCS) agreed the biosparge system could be shut down and groundwater monitoring would need to continue until cleanup objectives (CUOs) were met. Based on this agreement, the biosparging system was shut down on November 29, 2001. In accordance with the agreement, groundwater sampling is now done on a semi-annual basis. The most recent groundwater results indicate only one of the four monitoring wells exceeds Class I Groundwater Quality Standards for benzene.

3.0 POSSIBLE SOURCES AREAS / REMEDIAL MEASURES

The Premcor property has been divided into 13 areas to assess possible sources of contamination and discuss remedial measures taken. These areas are shown on Figure 3-1 and are represented as follows:

- Area 1 – Administration
- Area 2 – River Dock
- Area 3 – Underground Product Lines
- Area 4 – Refinery Process I
- Area 5 – Refinery Process II
- Area 6 – Asphalt Plant
- Area 7 – Coking Unit
- Area 8 – Bulk Storage Tanks North
- Area 9 – Bulk Storage Tanks South (a portion of this area is currently leased by Shell)
- Area 10 – Waste Water Treatment Plant
- Area 11 – Storm Water Retention
- Area 12 – Laydown
- Area 13 – Groundwater

Each area is described in the following sections. Each section includes an evaluation of the nine points of discussion for each area in accordance with the outline provided in the January 30, 2003 letter to Cathleen Bumb of Premcor from James Morgan of the Illinois Attorney General's Office with the exception of Area 13 – Groundwater. The groundwater section presents a discussion of the current conditions of the groundwater under the entire facility including the River Dock Area. The information for the following discussion was obtained from a review of facility files and Illinois EPA Bureau of Land, Bureau of Water, and Office of Emergency Response (OER) files.

3.1 AREA 1 – ADMINISTRATION

No records of any spills, releases, or other incidents were found for this area.

3.1.1 Possible Sources/Areas of Contamination

3.1.1.1 Location of Administration Area

The location of the Administration Area (Area 1) is shown on Figure 3-1.

3.1.1.2 Horizontal and Vertical Boundaries of the Administration Area

The horizontal boundaries of the Administration Area (Area 1) are shown on Figure 3-2. There are no vertical boundaries.

3.1.1.3 Construction, Operation, and Structural Integrity

This area includes the main office building, the facility laboratory, other support buildings, and employee and guest parking lots. The facility laboratory has been closed as a result of the shutdown of refinery operations. Production Well P-1 is located in the east central portion of this area. Premcor continues to pump water from this well (approximately 250 gallons per minute [gpm]) in an attempt to maintain a cone of depression below the property.

3.1.1.4 Material Managed in the Administration Area, Including the General Chemical Composition of the Material Waste

The only wastes managed in this area, excluding ordinary office refuse, were associated with the facility's onsite laboratory. Wastes generated included lead acetate gasoline, ethyl mercaptan, carbon disulfide vials, mercury vials, and broken laboratory glassware.

3.1.1.5 Quantities of Waste/Materials in the Administration Area

Only small quantities of laboratory waste were generated when the refinery was in operation.

3.1.1.6 History of the Use of the Administration Area and the Surrounding Area

The laboratory was closed upon the shutdown of refinery operations. The office building and parking lots are still used by the remaining employees. Areas north, east, and south of the Administration Area are Refinery property or bulk storage areas. The area to the west is the Village of Hartford.

A review of a December 1952 facility drawing (when the refinery was owned and operated by Sinclair) showed a truck-loading rack located in the southwest portion of the Administration Area. The drawing also showed a 2,000-gallon buried gasoline tank in this area. No other information was found concerning the operation or dismantling and abandonment of these operations. The approximate location of the truck-loading rack and underground gasoline storage tank is shown on Figure 3-2.

3.1.1.7 All Available Data and Qualitative Information on the Level of Contamination at the Administration Area

No records of any spills, releases, or other incidents were found for the Administration Area. There is no available data or other information concerning the potential level of contamination at this area. However, given the existence of the former truck-loading rack and the underground gasoline storage tank, the southwest portion of the Administration Area has been identified as a REC.

3.1.1.8 Procedures Used to Close the Administration Area or Remediate Any Contamination Present

No information has been found concerning the closure of the former truck-loading rack or the underground gasoline storage tank.

3.1.1.9 Assessment of the Potential for Contamination Being Present and the Next Steps That Should Be Taken

Further investigation and characterization of the potential for contamination in the area of the former truck-loading rack and underground gasoline storage tank is necessary since the potential for contamination exists based on the historical presence and operation of these features.

3.1.2 Remedial/Interim/Stabilization Measures

No documentation was found concerning any remedial, interim, or stabilization measures taken with respect to the former truck-loading rack or underground gasoline storage tank.

3.2 AREA 2 – RIVER DOCK

Records of spills, releases, or other incidents were found for this area.

3.2.1 Possible Sources/Areas of Contamination

3.2.1.1 Location of River Dock Area

The location of the River Dock Area (Area 2) is shown on Figure 3-1.

3.2.1.2 Horizontal and Vertical Boundaries of the River Dock Area

The horizontal boundaries of the River Dock Area (Area 2) are shown on Figure 3-3. There are no vertical boundaries.

3.2.1.3 Construction, Operation, and Structural Integrity

The facility comprises a currently operating floating dock and supporting shore facilities. The current facility dock is located at Mile 197.3 of the East Bank of the Upper Mississippi River. The floating barge dock is attached to a barge guide in the river. Barge loading arms are located on the floating dock. The facility's capacity is four barges, simultaneously, with operations (loading and off-loading) occurring 24 hours a day, 365 days a year. Various petroleum products are handled at this location. Operations include properly mooring vessels; connecting and supporting transfer hoses; positioning empty, small discharge containment equipment at connections; and ensuring communications and emergency shutdown systems are operable. Product captured by discharge containment equipment is removed with the vacuum collection system and discharged to the shore tank prior to transfer to the refinery via truck, as necessary.

The total petroleum storage capacity is 221,900 gallons (5,283 barrels). Locations of oil storage areas are identified on Figure 3-3. Storage tank identification numbers and tank capacities are provided below:

Tank Number	Substance Stored	Max. Capacity (gal)
T-3-1	Light cycle oil	125,000
A-2	Re-run Material	25,788
T-72	Gasoline	65,776

Secondary containment basins are present at the tanks in the event of a tank overflow, leakage, or rupture.

According to Premcor personnel, secondary containment for Tanks T-3-1, A-2, and T-72 is constructed of compacted clay and covered with gravel. The secondary containment was constructed to contain 110% of the tank capacity. Pumps and pipelines do not have secondary containment. No operations produce process water at the River Dock Area, and there are no storm sewer discharges. Stormwater that accumulates within the secondary containment structures is allowed to evaporate. Accumulated stormwater may be pumped to the ground outside the diked areas to restore secondary containment after inspection to verify it is not visibly contaminated with petroleum. Water suspected of contamination is treated at the refinery or disposed offsite.

The River Dock Area is not surrounded by a fence; however, this area is manned 24 hours a day. The areas containing equipment involved with oil transfers are well illuminated to minimize opportunities for vandalism.

The River Dock Area also contains three lagoons formerly used as part of the refinery's wastewater treatment system prior to construction of the current system. Refinery wastewater was pumped from the air flotation separator at the refinery to the three

oxidation lagoons. The refinery effluent entered Lagoon 1, which discharged through an oil skimmer into Lagoon 2, then flowed into Lagoon 3. The effluent, after passing through the three-stage lagoon system, was discharged to the Mississippi River via a combination of pipes and an open ditch. According to the Illinois EPA (2001), the facility contained four old wastewater lagoons. The Agency stated the lagoons were unlined and received material that Clark (Premcor) had pumped or placed in them. According to ENSR Consulting and Engineering (ENSR) (1994), several impoundment areas adjacent to the Mississippi River were used for emergency overflow from the wastewater treatment system during heavy rainfall events or when the treatment system malfunctioned. ENSR indicated these impoundments had not been used since at least 1984.

The facility also contains a landfill according to the Illinois EPA (1997).

3.2.1.4 Material Managed in the River Dock Area, Including the General Chemical Composition of the Material Waste

The River Dock Area serves as a transfer location for petroleum products transported to and from the refinery via underground and aboveground pipelines. The petroleum products are received from and disbursed to barges in this area.

No process wastes are generated.

Presumably, occasional petroleum-contaminated wastes have resulted from releases or spills occurring at the River Dock Area since it began operations. However, no significant known records were available prior to the 1990s. Since that time, wastes generated have included various petroleum-related products, including black oil, diesel fuel, and gasoline. These wastes are discussed further in Section 3.2.1.7.

The lagoons potentially received wastewater, possibly both process water and stormwater. According to the Illinois EPA (1994), stratified bottom sediment within the northeast lagoon exhibited an oily sludge-like characteristic that appeared to be a result of years of use as a settling lagoon.

The landfill appeared to receive a variety of materials. According to Illinois EPA documentation (1976), Clark representatives indicated the refinery provided only "non-combustibles," including dirt, brick, and rock at this location. The Agency identified "yellowish sludge-like material" at the landfill. Clark representatives were unable to identify the material. Additional materials identified by the Illinois EPA (1978) included an asbestos-like material and an unidentified sludge. A slight gasoline odor was once noted at a pile of rock and mud in February 1980 (Illinois EPA 1980). According to the Illinois EPA (2001), half of the fourth, or southernmost, lagoon is used as a repository for the Village of Hartford's landscape waste and light demolition debris consisting mainly of gravel, broken concrete, and soil.

3.2.1.5 Quantities of Waste/Materials in the River Dock Area

No process wastes are generated. Wastes resulting from releases are discussed in Section 3.2.1.7.

3.2.1.6 History of the Use of the River Dock Area and the Surrounding Area

The River Dock Area facility was constructed in the early-1940s. The current dock was constructed in the early-1980s. The facility has been operated by various entities since the early-1940s. Premcor has operated the dock facility since November 1993.

In general, the surrounding area to the north consists of similar refinery and/or dock facilities (specifically, ConocoPhillips). The surrounding area to the south consists of

similar wastewater lagoons. The Village of Hartford is present to the east, and the Mississippi River is present to the west.

The exact operational dates for the lagoons are unknown; however, a review of historical sources (aerial photographs) indicated Lagoon 1 and Lagoon 2 were present in 1955, although in a slightly different configuration, while Lagoon 3 appeared dry. According to Clark, a new activated sludge wastewater treatment facility was under construction in December 1973. This new facility was to replace the oxidation lagoons later that year. ConocoPhillips operates a series of similar lagoons to the north.

The landfill was used by both the Village of Hartford (through a lease arrangement) and the refinery. Illinois EPA documentation (1974) indicated National Marine Service, Inc. was also involved with the landfill. From March 19, 1974 through February 14, 1980, sporadic landfilling appears to have occurred at this location. According to the Village of Hartford, the Village (on February 10, 1976) informally terminated the lease between Clark and the Village for the tract of land commonly known as the "dump." Subsequently, the Village of Hartford stated the Village board had voted to terminate the lease with Clark on February 17, 1976. In 2001, the Illinois EPA identified the fill area as active.

3.2.1.7 All Available Data and Qualitative Information on the Level of Contamination at the River Dock Area

Information related to releases from the River Dock Area is provided in this section.

March 11, 1994 – Incident 940515

On March 11, 1994, a release of approximately 4,071 barrels of product occurred due to a rupture in an aboveground line approximately 600 feet east of the barge terminal. The

product was a combination of asphalt, light cycle oil (No. 6 fuel oil), and a slurry (similar to No. 6 oil, used as fuel in the crude unit of the refinery).

The product was released from the pipeline and flowed east to a north-south ditch. The product then flowed in a southerly direction within the ditch for approximately 500 feet where it encountered an east-west ditch and then began flowing west towards the Mississippi River (Burns & McDonnell 1994). The majority of the product was stopped by a concrete weir within the east-west ditch. Premcor immediately began recovering free product.

Three separate excavations (north excavation, south excavation, and ditch excavation) were conducted to remediate the spill. A grid confirmation sampling pattern was implemented in the north excavation. One sample revealed the presence of a polynuclear aromatic carbon (PNA) (naphthalene) above Illinois EPA Leaking Underground Storage Tank (LUST) CUOs. A grid confirmation sampling pattern was implemented in the ditch excavation. Two soil samples revealed naphthalene above Illinois EPA LUST CUOs. A third location revealed two PNAs (benzo[a]anthracene and chrysene) above their applicable LUST objectives. An Illinois EPA representative subsequently determined additional excavation would not be required in the area of the above exceedances. A grid confirmation sampling pattern was implemented in the south excavation. Two soil samples revealed naphthalene above Illinois EPA LUST CUOs.

In May 1994, Premcor discovered a sheen and small pieces of asphaltic material on the surface of the pond immediately northeast of the spill. This material was also found along the north, west, and south banks of the pond. A sheen was also observed on the Mississippi River. Remediation equipment (booms) was placed into the pond and river. Free product, which appeared to be a heavy asphalt material, was discovered by scuba divers in both the pond and the Mississippi River.

An undated Premcor document stated 17,345 barrels of water and product were recovered and processed at the WWTP bio-treatment plant. Premcor recovered 1,800 barrels of product for recycling through the refinery. Premcor disposed of 16,752 cubic yards of material and soil at the Laidlaw landfill in Roxana, Illinois. The total area remediated was 400 feet in diameter to a depth of 4 to 18 feet. Premcor installed six 4-inch monitoring wells around the area of the spill, and two sumps to collect any remaining product. Additionally, Premcor cleaned 1,500 linear feet of the Mississippi River bank and 2,400 square feet of Mississippi River bottom.

The North Pond area was boomed, and the banks were cleaned. Approximately 285 cubic yards of soil were excavated. South and middle pond contamination was indicated as minimal. Premcor indicated the impoundments had not been used by the current ownership of the refinery, and the material within the impoundments had been present prior to the change in ownership.

According to a December 5, 1994 Illinois EPA OCS/Emergency Response Unit (ERU) Memorandum, the northeast lagoon was slightly impacted. An unknown amount of product seeped into the southwest corner of the lagoon. Subsequent inspections revealed thick, oily, tar-like residue upon the northern banks. Stratified bottom sediment within the lagoon exhibited an oily, sludge-like characteristic that appeared to be a result of years of use as a settling lagoon. Premcor had conducted remediation on the banks of the lagoon by excavating visible oily soil. The excavation has reportedly occurred on two occasions.

Incident 940515 became subject to a complaint (PCB 95-163) filed June 6, 1995 before the Illinois Pollution Control Board (IPCB) by the Attorney General of the State of Illinois on behalf of the Illinois EPA wherein the Area was identified as Area K.

In a March 11, 1996 letter from the Office of the Attorney General to Patricia Sharkey of Mayer, Brown and Platt (representing Premcor), the Agency requested a minimum three-year groundwater sampling program. Sampling was to continue until three consecutive sets of sample data showed levels below groundwater quality standards or groundwater CUOs approved by the Agency.

In a September 10, 1999 letter to the Illinois EPA, Premcor stated that long-term groundwater monitoring requirements (September 1996 to August 1999) for Incident 940515 revealed that no concentrations of PNAs and VOCs exceeded Illinois EPA Class I GROs. Therefore, Premcor requested abandonment of the groundwater monitoring program. On October 5, 1999, the Agency accepted Premcor's submission and approved abandonment of the monitoring wells. On February 22, 2000, Burns & McDonnell abandoned the wells for the groundwater monitoring program. Excerpts from the referenced documentation for this incident are provided as Appendix J-1.

August 1, 1994 – Incident 941701

On August 1, 1994, an overfill spill of approximately 200 gallons of unleaded gasoline occurred at Tank T-72. Premcor immediately placed absorbent booms in the Mississippi River and began removing visually stained soil.

On August 3, 1994, remedial action was conducted, which consisted of soil excavation to an approximate 3-foot depth from the river edge east to the top of the bank. Soil was then excavated to a depth of 2 feet in visually stained areas under the river dock. Heavy oil accumulated in a small sump excavated under the dock. Premcor disposed of approximately 140 cubic yards of impacted soil at the Milam Recycling & Disposal Facility in Fairmont City, Illinois.

On September 27, 1994, upon completion of remedial actions, Burns & McDonnell identified benzene, toluene, ethylbenzene, and total xylenes (BTEX) and PNAs in soil samples. According to Burns & McDonnell, the excavation exposed petroleum hydrocarbons at levels and depths not indicative of a recent gasoline spill. The presence of heavy oil and soil discoloration at depths greater than 3 feet was considered possibly indicative of petroleum contamination prior to the spill date.

A *Site Assessment Report Hartford River Terminal* by Burns & McDonnell (1995), conducted as a result of Incidents 941701 and 950726 (discussed below) and suspected historical releases from previous river dock owners/operators, indicated no free petroleum product was present on the groundwater. Two groundwater samples exceeded the State of Illinois Class I standards for benzene (0.05 mg/L). Several soil samples exceeded former State of Illinois LUST Type A soil CUOs for benzene and carcinogenic and non-carcinogenic PNAs.

Incident 941701 became subject to a complaint (PCB 95-163) filed June 6, 1995 before the IPCB by the Attorney General of the State of Illinois on behalf of the Illinois EPA wherein the Area was identified as Area L.

In a March 11, 1996 letter from the Office of the Illinois Attorney General to Patricia Sharkey of Mayer, Brown and Platt (representing Premcor), the Agency requested a minimum three-year groundwater sampling program. Sampling was to continue until three consecutive sets of sample data showed levels below groundwater quality standards or groundwater CUOs approved by the Agency. In addition, based on soil sampling results from Area L presented in the Burns & McDonnell December 1995 *Site Assessment Report*, Premcor was directed to provide the Agency with a work plan to address levels of volatiles in soil above Tiered Approach to Corrective Action Objectives (TACO) Class I soil CUOs.

The *Remedial Action Plan for Clark Refining and Marketing Co.* by Burns & McDonnell (1996) indicated soil and groundwater impacts near the river dock were in excess of the Illinois EPA TACO Soil CUOs for Industrial/Commercial properties and Groundwater CUOs for Industrial/Commercial properties. Biosparging, in association with four existing deep monitoring wells, was chosen as the most appropriate remedial approach. Upon completion of groundwater remediation, soil sampling was to be conducted to confirm compliance with TACO.

In a October 29, 1996 letter from the Office of the Illinois Attorney General to Patricia Sharkey of Mayer, Brown & Platt regarding People v. Clark Refining & Marketing, Inc., the Area L Remedial Action Plan (RAP) was approved as modified by the October 21, 1996 submission.

In a November 28, 2001 letter to Mr. James O'Brien of the Illinois EPA OCS regarding proposed RAP modifications, Premcor stated the bio-sparge system would be immediately shut down, and the area would undergo groundwater monitoring, for benzene only, until CUOs were met. Premcor and the OCS verbally agreed to these modifications, which were documented in Premcor's letter to the OCS.

On January 17, 2003, Burns & McDonnell submitted the *Remedial Action Report (July 1, 2002 through December 31, 2002)* to Premcor. The December 2002 sampling event indicated only one of the four monitoring wells exceeded Illinois EPA TACO Tier 1 Class I GROs for benzene. Excerpts from the referenced documentation for this incident are provided as Appendix J-2.

April 11, 1995 – Incident 950726

On April 11, 1995, a rupture occurred in a 10-inch line at Tank T-72. Approximately 84 gallons of #2 diesel fuel were released with 5 to 10 gallons reaching the Mississippi

River. Premcor immediately placed containment and absorbent booms in the Mississippi River and used absorbent pads to recover product on the ground. Premcor removed approximately 10 cubic yards of visually impacted soil for proper offsite disposal at Milam Recycling & Disposal.

Incident 950726 became subject to a complaint (PCB 95-163) filed June 6, 1995 before the IPCB by the Attorney General of the State of Illinois on behalf of the Illinois EPA wherein the Area was identified as Area L.

In a September 22, 1995 *Pre-Enforcement Conference* letter to Mr. Russell Eggert of Mayer, Brown & Platt (representing Premcor), the Illinois EPA requested a written commitment and timetable for the performance of all investigation and remediation made necessary by Incident 950726 and eight other releases.

As a result, Incident 950726 was addressed with Incident 941701, which was discussed above. Excerpts from the referenced documentation for this incident are provided as Appendix J-2.

May 1, 1995 – Incident 950893

On May 1, 1995, Premcor personnel reported a sheen on the Mississippi River near the dock. Absorbent booms were deployed into the river. In a May 22, 1995 letter to the Illinois EPA, Premcor stated the sheen was caused by surface runoff (due to spring showers) of residual fuel oil from the 950726 spill on April 11, 1995.

Incident 950893 became subject to a complaint (PCB 95-163) filed June 6, 1995 before the IPCB by the Attorney General of the State of Illinois on behalf of the Illinois EPA wherein the Area was identified as Area L.

In a September 22, 1995 *Pre-Enforcement Conference* letter to Mr. Russell Eggert of Mayer, Brown & Platt (representing Premcor), the Illinois EPA requested a written commitment and timetable for the performance of all investigation and remediation made necessary by Incident 950893 and eight other releases.

As a result, Incident 950893 was addressed with Incident 941701, which was discussed above. Excerpts from the referenced documentation for this incident are provided as Appendix J-2.

Lagoons

Limited information was discovered regarding the lagoons. As discussed above regarding Incident 940515, according to a December 5, 1994 Illinois EPA OCS/ERU Memorandum, the northeast lagoon was slightly impacted by that release. An unknown amount of product seeped into the southwest corner of the lagoon. Subsequent inspections revealed thick, oily, tar-like residue upon the northern banks, and stratified bottom sediment in the lagoon exhibited an oily, sludge-like characteristic that appeared to be a result of years of use as a settling lagoon. Reportedly on two occasions, Premcor had conducted remediation by excavating visible oily soil to the banks of the lagoon.

According to a Comprehensive Environmental Responsibility Compensation, and Liability Act (CERCLA) Screening Site Inspection (SSI) (Illinois EPA, 1997), the volume of these lagoons was unknown and depended upon the river stage. According to the Illinois EPA's Expanded Site Investigation (ESI) (2001), the lagoon source was calculated to cover an area of approximately 150 acres including the landfill.

Analytically significant levels of metals were detected in the sample taken from the northeast corner of the first-stage lagoon near an abandoned effluent discharge pipe. The SSI stated the pathways of concern were groundwater, surface water (including the

environmental threat these metals may pose), and drinking water due to the number of intakes located downstream from these lagoons.

According to the Illinois EPA's ESI (2001), various volatile constituents at levels equal to or greater than three times offsite background levels were detected in shallow soil west of Lagoon 2, although not in deeper soil. Various volatile constituents at levels equal to or greater than three times offsite background levels were detected in shallow soil and deep soil south of Lagoon 1. Deep samples south of Lagoon 1 and west of Lagoon 2, respectively, contained various semi-volatile constituents at levels equal to or greater than three times offsite background levels. Shallow and deep samples south of Lagoon 1 contained various pesticide/PCB constituents at levels equal to or greater than three times offsite background levels. A deep sample south of Lagoon 1 and a shallow and deep sample west of Lagoon 2 contained various inorganic constituents at levels equal to or greater than three times offsite background levels. Excerpts from the referenced documentation for this incident are provided as Appendix J-3.

Landfill

Limited information was discovered regarding the landfill. According to the SSI (Illinois EPA 1997), analytically significant levels of volatiles, semi-volatiles, and metals were detected in samples collected in December 1990 west of the pond south of Hawthorne Street. Pathways of concern included groundwater and surface water.

According to the ESI (Illinois EPA 2001), various volatile constituents at levels equal to or greater than three times offsite background levels were detected in shallow soil and deep soil in the center of the landfill. A shallow sample in the center of the landfill contained various semi-volatile constituents at levels equal to or greater than three times offsite background levels. Shallow and deep samples in the center of the landfill contained various pesticide/PCB constituents at levels equal to or greater than three times

offsite background levels. A shallow and deep sample in the center of the landfill contained various inorganic constituents at levels equal to or greater than three times offsite background levels. Excerpts from the referenced documentation for the landfill are provided as Appendix J-3.

Other

According to a report titled *NICOR National Illinois Inc., Background Soil Investigation, Clark Oil and Refining Corporation Property* (QRI 1995), trace concentrations of PNAs, elevated total petroleum hydrocarbons (TPH), and oil and grease were detected in surface and near-surface soils in the southernmost portion of the River Dock Area. QRI stated these results were indicative of surface contamination from activity unrelated to abutting NICOR surface impoundment operations. As this evaluation was qualitative, and since the Illinois EPA has not established TACO Soil Remediation Objectives (SROs) for TPH, no review of analytical data was conducted as part of this report. Excerpts from the referenced documentation for the lagoons are provided as Appendix J-4.

According to the former Clark SPCC (1973), a barrel storage area was identified south of the dock and adjacent to the Mississippi River. Excerpts from the referenced documentation for the barrels storage area are provided as Appendix J-5.

Conclusion

Based on the documents reviewed that pertain to the River Dock Area, the area has been identified as a REC due to operations involving large quantities of petroleum products and operational releases including:

- On March 11, 1994, approximately 4,071 barrels of asphaltic material were released from an aboveground pipeline (Incident 940515).

- On August 1, 1994, approximately 200 gallons of unleaded gasoline were released from the Tank T-72 area (Incident 941701).
- On April 11, 1995, approximately 84 gallons of #2 diesel fuel were released from the Tank T-72 area (Incident 950726).
- On May 1, 1995, a sheen on the Mississippi River due to residual fuel oil from Incident 950726 (Incident 950893).
- In November 2000, lagoons at which the Illinois EPA identified various volatile, semi-volatile, pesticide/PCB, and inorganic constituents at levels equal to or greater than three times offsite background levels. One lagoon was impacted by Incident 940515.
- In November 2000, a landfill at which the Illinois EPA identified various volatile, semi-volatile, pesticide/PCB, and inorganic constituents at levels equal to or greater than three times offsite background levels.
- Southernmost portion of River Dock Area adjacent to NICOR at which trace concentrations of PNAs, TPH, and oil and grease were detected.
- Barrel Storage Area south of the dock, which likely was subject to various minor releases.

3.2.1.8 Procedures Used to Close the River Dock Area or Remediate Any Contamination Present

Remediation and closure procedures are discussed in Section 3.2.1.7.

3.2.1.9 Assessment of the Potential for Contamination Being Present and the Next Steps That Should Be Taken

Further investigation and characterization of the potential for contamination in the River Dock Area is necessary since the potential for contamination exists based on the historical presence and operation of this area, the identified spill incidents, the lagoon, the landfill, the barrel storage area, and the apparent contamination adjacent to the NICOR property.

3.2.2 Remedial/Interim/Stabilization Measures

3.2.2.1 Description of the Measure

Generally, when Premcor experienced specific releases, Premcor responded by removing the released material and impacted soil, and took other steps as described above to eliminate the obvious effects of the release. Measures are discussed in Section 3.2.1.7.

3.2.2.2 Objectives of the Measure

The objective of the measures was to mitigate environmental impact to the soil and groundwater.

3.2.2.3 Description of the Design, Construction, Operation, and Maintenance of the Measure

Measures are discussed in Section 3.2.1.7.

3.2.2.4 Information Regarding the Actual Implementation and Effectiveness of the Measure

Measures are discussed in Section 3.2.1.7.

3.3 AREA 3 – UNDERGROUND PRODUCT LINES

Records of spills, releases, or other incidents were found for this area.

3.3.1 Possible Sources/Areas of Contamination

3.3.1.1 Location of Underground Product Lines Area

The location of the Underground Product Lines (Area 3) is shown on Figure 3-1.

3.3.1.2 Horizontal and Vertical Boundaries of the Underground Product Lines Area

The horizontal boundaries of the Underground Product Lines (Area 3) are shown on Figure 3-1. There are no vertical boundaries.

3.3.1.3 Construction, Operation, and Structural Integrity

Premcor operates 1-10" gasoline, 1-10" diesel, and 1-14" black oil underground product lines routed from the refinery to the river dock. These lines leave the refinery above ground to the west, and at the fence (property boundary) go underground beneath the railroad tracks to Olive Street. The lines continue west under Elm Street through the Village of Hartford to Illinois Route 3. They continue under Illinois Route 3 and the levee to the dock area. The lines were installed in 1982.

Previous lines were installed in 1953 and consist of 1-3" circulation line, 1-8" black oil line, 1-8" gasoline line, 1-8" distillate line, and 1-14" undesignated line to Olive Street. These lines are no longer in service.

3.3.1.4 Material Managed in the Underground Product Lines Area, Including the General Chemical Composition of the Material Waste

Multiple petroleum products are moved through the pipeline. Waste materials are not generated.

3.3.1.5 Quantities of Waste/Materials in the Underground Product Lines Area

Waste materials are not generated. Quantities of petroleum in the pipelines vary.

3.3.1.6 History of the Use of the Underground Product Lines Area and the Surrounding Area

The original lines were installed in 1953 and consisted of 1-3" circulation line, 1-8" black oil line, 1-8" gasoline line, 1-8" distillate line, and 1-14" undesignated line to Olive Street. New lines were installed in 1982, and the old lines were taken out of service. The facility still uses the product lines.

The pipelines are surrounded by residential portions of the Village of Hartford along Elm Street.

3.3.1.7 All Available Data and Qualitative Information on the Level of Contamination at the Underground Product Lines Area

Information related to releases from the Underground Product Lines is provided in this section.

October 16, 1978 – Hartford Police

On October 16, 1978, a release of gasoline from the pipeline near the intersection of Olive Street and Elm Street in Hartford was reported to the Hartford Police Department. The Hartford Police subsequently contacted the Illinois EPA. Illinois EPA personnel observed pooled gasoline in a hole dug above the pipeline. A recovery truck from Clark arrived and removed the liquid. The quantity of gasoline released or recovered was not noted. The Illinois EPA Memorandum that described this matter is provided as Appendix K-1.

January 8, 1981 – Incident 810008

On January 8, 1981, a release of #6 fuel oil from the pipeline near the intersection of Delmar Street and Elm Street in Hartford was reported. Fuel was observed leaching from under the pavement and entering a storm sewer. The sewer discharged fuel into the Mississippi River near the Clark river dock. An environmental emergency services company was hired to complete the cleanup. The amount released and recovered were both indicated to be 400 gallons. The Illinois EPA Incident Control Sheet is provided as Appendix K-2.

November 20, 1984

On November 20, 1984, a release of "light cycle oil" from the pipeline occurred near 116 East Elm Street and 108 West Elm Street in Hartford. Oil surfaced in the street near both locations. The Village of Hartford flushed the oil into the sewer system. The sewer system discharged to the Mississippi River at the sewer outfall. Discharged oil was recovered, and contaminated driftwood was removed. The quantity of oil released or recovered was not noted. The Illinois EPA Incident Control Sheet is provided as Appendix K-3.

1990 Hartford Hydrocarbon Investigations

Illinois EPA prepared two reports (dated October and November 1990) on hydrocarbons beneath the Village of Hartford. The Agency estimated between 900,000 and 3.2 million gallons of leaded gasoline were present in 1990 beneath the village, despite Premcor voluntarily recovering in excess of 1.0 million gallons since 1978. The Agency indicated the primary source of this plume was the Premcor pipeline. Two other significant leaks were also noted by the Agency: (1) the December 16, 1989 Shell pipeline break northeast of Rand Street and Olive Street, and (2) the Sinclair pipeline east of Olive Street.

Hydrocarbon vapor complaints were recorded for the village dating from 1966. In 1978, two hydrocarbon recovery wells were installed in Hartford. During the spring of 1990, complaints of very strong vapors were received from several residents in Hartford. In addition, fires occurred in several homes as a result of accumulation of hydrocarbon vapors in basements and crawl spaces. The Illinois EPA in conjunction with the Illinois Department of Public Health (IDPH) referred the matter to the Illinois Attorney General's Office in late-May 1990.

On June 6, 1990, the Illinois EPA, IDPH, and the Illinois Attorney General's Office met with the village mayor, Premcor, Shell, and Sinclair. The parties agreed to provide technical assistance to determine the source or sources of the hydrocarbon plume beneath Hartford. Subsequent sampling of the hydrocarbons indicated the chemical composition was similar to leaded gasoline products from the Clark/Premcor facility.

The Illinois EPA identified pipelines near Hartford as possible sources of the hydrocarbon plume beneath the village. Specifically, (1) a 10-inch capped and abandoned Clark product line that runs from the refinery north parallel to Olive Street, (2) three Premcor product lines from the refinery to the Mississippi River, (3) 10 Shell (now

ConocoPhillips) product lines, sewer lines, and water lines from the Shell (now ConocoPhillips) refinery to the Mississippi River, and (4) an inactive 10-inch Sinclair product line that runs parallel to an abandoned Clark line along Olive Street.

Additional information regarding the hydrocarbon impacts to groundwater in the Village of Hartford is provided in Section 3.13.

December 6, 1991 - Incident 913533

On December 6, 1991, Premcor had a release of approximately 30 gallons of asphalt from a pipeline. The release occurred on the east side of Illinois Route 3 and Elm Street in Hartford. External corrosion of the pipeline was determined to be the cause of the release. Premcor personnel recovered the lost product and removed visually affected soil. 276 cubic yards of impacted soil were removed and disposed of at Chain of Rocks Landfill. Additional soil or groundwater remediation or sampling was not conducted. Approximately 400 feet of piping up to the Illinois Route 3 crossing was excavated and replaced.

This release was included with 12 other reported releases in a October 7, 1994 *Pre-Enforcement Conference* letter from the Illinois EPA that indicated Premcor was in non-compliance with the Illinois Environmental Protection Act.

In a June 15, 1995 letter, the Illinois EPA requested follow-up information on the release, specifically offsite sampling results.

March 1992 – History of Hydrocarbon Releases in the Village of Hartford Report (Prepared for Shell Oil)

This report indicated the following additional releases associated with Premcor pipelines were reported to the Hartford Police:

- On November 10, 1982, diesel fuel was released from product lines near East Forest Street at Olive Street.
- On December 21, 1982, an undetermined volume of oil was released near the November 10, 1982 release.

Figures 3 and 4 from this report, showing product lines and releases, are provided as Appendix K-4. Additional information regarding the hydrocarbon impacts to groundwater in the Village of Hartford is provided in Section 3.13.

April 15, 1994

A release of oil from the pipeline occurred near Elm Street and Old St. Louis Road in Hartford. The spill was estimated, as a maximum, less than 25 barrels.

October 28, 1994 – Incident 942432

On October 28, 1994, Premcor was in the process of replacing the 14-inch-diameter Black Oil River Line near Illinois Route 3 when workers accidentally drove a pile through the #1 fuel oil line, which also goes to the Hartford River Terminal. Approximately 6,000 gallons of product were released from the line. The released material was contained in an area of approximately 2,500 square feet on each side of the levee. Due to a 5-foot drop in elevation of the pipeline from Route 3 west through the levee, the majority of the product flowed inside the outer casing of the pipeline and exited along the vertical rise of the pipe where the pipeline begins running aboveground on the

west side of the levee. Premcor personnel used vacuum trucks to recover product from the immediate area surrounding the outer casing of the pipeline on the west side of the levee. Premcor began excavating with shovels around the vertical rise of pipe until clearance was gained from the various pipeline companies to finish excavating with a backhoe. Premcor also excavated two interceptor trenches between the vertical rise of the pipe and the old wastewater treatment lagoons. The interceptor trenches remained free of hydrocarbon from the release. Premcor recovered approximately 10,000 gallons of oil and water. The oil comprised approximately 60 percent of the recovered material.

Premcor began excavating soil from each side of the levee. Both the east and west holes on the west side of the levee were excavated to a 6-foot depth. East of the levee was excavated to a depth of approximately 15 feet to examine and repair the damaged pipeline. Approximately 1,150 cubic yards of soil were excavated and disposed of at a special waste landfill (Milam landfill).

In a December 5, 1994 internal memorandum, the Illinois EPA noted additional areas associated with the release needed soil remediation.

In a December 6, 1994 letter to the Illinois EPA, Premcor submitted details of the release and remediation efforts.

This release was included with eight other reported releases in a September 22, 1995 *Pre-Enforcement Conference* letter from the Illinois EPA that indicated Premcor was in non-compliance with the Illinois Environmental Protection Act.

On behalf of Premcor, Burns & McDonnell submitted to the Illinois EPA a *Summary Report of Spills at the Clark Hartford Refinery* (November 1995) that included Incident 942432.

On behalf of Premcor, Burns & McDonnell submitted a *Sampling and Analysis Plan* (SAP) (November 1995) to the Illinois EPA for Incident 942432. The SAP summarized the proposed intrusive investigation activities to characterize the surface and subsurface conditions. A revised version of this plan, dated March 1996, was subsequently submitted to the Illinois EPA.

On April 7, 1997, Premcor submitted a *Summary Report: Surface and Subsurface Investigations of the Spills at the Clark Hartford Refinery* (dated September 1996) that included an intrusive investigation of Incident 942432.

As part of the intrusive investigation and to determine the approximate vertical and horizontal extent of petroleum hydrocarbons at the site, six surface soil samples were collected, and six soil borings were completed. The sample locations are shown on Figure 2 in Appendix K-5. Six surface samples and eight subsurface samples were submitted for laboratory analysis of BETX, PNAs, or both.

Surface samples were all below TACO Tier 1 values for BETX. Surface composite samples exceeded TACO Tier 1 values for one or more PNAs. Two subsurface samples exceeded the TACO Tier 1 values for benzene. Five subsurface samples exceeded the TACO Tier 1 values for at least one PNA.

On November 10, 1997, Premcor submitted a *Tiered Approach Objective Assessment* to the Illinois EPA. The report was prepared by Burns & McDonnell and was dated November 3, 1997. This TACO Tier 2 assessment indicated two subsurface soil samples had benzene concentrations above the Tier 2 migration to groundwater CUOs. The assessment also determined that one subsurface soil sample had benzo(b)fluoranthene and dibenzo(a,h)anthracene above Tier 2 migration to groundwater CUOs.

September 26, 1999 –Incident 992199

On September 26, 1999 at approximately 4:30 AM, during the routine loading of a barge with #6 oil, Premcor personnel were notified that a pool of hydrocarbon was discovered on East Elm Street in Hartford. The location of the release was near 112 East Elm Street. Approximately five barrels of oil were released.

Investigation of the release revealed that the 14-inch black oil line, which is contained inside an outer PVC pipe, had developed a leak through a crack at a previous pipeline repair location. The released product traveled approximately 5 feet east through the interstitial space of the pipeline to the former pipeline repair location, which had been backfilled with gravel, and surfaced to Elm Street through cracks in the asphalt. Premcor personnel used sand to contain and absorb the product on the surface of Elm Street. No oil reached storm sewers or receiving streams. Premcor immediately began to excavate the petroleum-impacted area around the release location and disposed of the soil and sand at Chain of Rocks Landfill in Granite City, Illinois.

On September 29, 1999, the Illinois EPA sent Premcor a *Non-Compliance Advisory* letter for the release.

On October 1, 1999, Burns & McDonnell personnel collected seven soil samples from the excavation. Laboratory analysis indicated one soil sample exceeded the Illinois EPA corrective action objective for benzo(a)anthracene listed in the TACO Tier 1 residential tables. All other soil samples were below Tier 1 TACO objectives. Following additional excavation in the area, soil samples were collected below the TACO Tier 1 residential corrective action objectives. Figures showing the sample locations and a table summarizing the analytical results are provided as Appendix K-6.

On October 19, 1999, the excavation was backfilled, and the street and sidewalk were repaired.

On November 22, 1999, Premcor submitted a *Remedial Action Completion Report* (RACR) to the Illinois EPA for Incident 992199. The report requested no additional investigation or remediation of the incident based on the confirmation sampling results. On November 29, 1999, Ms. Cheryl Kelly of the Illinois EPA reviewed the report and indicated that the samples met Tier 2 residential soil objectives.

November 8, 2000 – Incident H20002148

On November 8, 2000 at approximately 10:30 AM, Mr. Jim Hickerson of the Village of Hartford contacted Premcor regarding a possible fuel leak to a storm sewer along Market and Elm Streets in Hartford. Premcor personnel collected water samples from the storm sewer and confirmed the release of diesel fuel. Upon identification of the release on November 8, 2000, Premcor immediately contacted all spill notification agencies and conducted excavation activities to identify the source of the release.

On November 14, 2000 at approximately 1:45 PM, a leak in the diesel fuel line was exposed and identified. Investigation of the release revealed the line had developed a hole about the size of a pencil lead on the underneath side of the line. Due to the low permeability soil in the area of the release and the proximity of the fuel line to the storm sewer line (which offered a path of least resistance), only localized soil impact was noted during Premcor's excavation activities.

On November 17, 2000, Burns & McDonnell personnel collected six soil samples from the excavation. Laboratory analysis indicated all confirmation soil samples were below the Illinois EPA TACO Tier 1 residential objectives for BTEX and PNAs. A figure

showing the sample locations and a table summarizing the analytical results are provided as Appendix K-7.

On February 12, 2001, Premcor submitted a RACR to the Illinois EPA for Incident H20002148. The report requested no additional investigation or remediation of the incident based on the confirmation sampling results.

On June 14, 2001, Premcor submitted the RACR to the Office of the Illinois Attorney General. In a June 19, 2001 letter, the Office of the Illinois Attorney General requested information on integrity testing of pipelines adjacent to the release.

October 18, 2001 –Incident H2001-1741

On October 15, 2001 at approximately 12:50 PM, Mr. Jim Hickerson of the Village of Hartford contacted Premcor regarding a possible hydrocarbon leak to a storm sewer along Market and Elm Streets in Hartford. The Village of Hartford had received a complaint of petroleum odors from a resident along Elm Street. Premcor personnel performed a visual inspection of the Elm Street area and identified petroleum hydrocarbons in a storm sewer at the corner of Elm and Market Streets. On October 15, 2001, Premcor personnel notified the Illinois EPA of a possible release. On October 17, 2001, Premcor personnel pressure-tested the pipeline to determine if the pipeline was the source of the release. The pipeline failed the pressure test.

Following confirmation of the release, Premcor personnel contacted the Illinois Emergency Management Agency (IEMA), NRC, and the Illinois EPA on October 18, 2001. Premcor was given incident H2001-1741 for the reported release.

On October 18, 2001, Premcor personnel contracted Leak Detection Service Inc. from Caseyville, Illinois to identify the exact location of the leak in the pipeline. Following

identification of the location of the release, Premcor personnel excavated the area on October 19, 2001 and repaired the pipeline.

Due to the nature of the release, Premcor personnel were unable to estimate the total volume of diesel fuel released from the pipeline. However, it is believed to be minimal due to the small size of the hole in the fuel line and the low permeability of the soil.

Nine roll-off containers were used to contain soil, asphalt, and concrete removed during excavation activities. Approximately 92 cubic yards of soil were excavated from the release area for disposal. The roll-off containers were transported by Midwest Sanitary Service, Inc. to Roxana Landfill in Roxana, Illinois for disposal.

On November 16, 2001, Burns & McDonnell personnel collected eight confirmation soil samples from the excavation sidewalls and floor. The soil samples were analyzed for BTEX and PNAs. Soil samples SWNE, SWNW, SWSW, BC, BW, and West End contained one or more BTEX or PNA compounds above the TACO Tier 1 residential objectives. A figure showing the sample locations and a table summarizing the analytical results are provided as Appendix K-8.

Upon excavating additional soil north and east of the original excavation, Premcor personnel noted visual hydrocarbon staining that did not appear related to this release. Soil samples exhibited elevated levels of benzene not typically associated with a residual diesel release to the soil.

Excavation of additional soil in the area was determined impractical due to the proximity of the release to Elm Street, sidewalks, residential homes, and numerous underground utilities.

On February 21, 2002, Premcor submitted a RACR for remediation of the incident based on the soil samples collected from the floor and sidewalls of the excavation and the known hydrocarbon plume under the Village of Hartford.

Conclusion

Based on the documents reviewed, the Underground Product Lines Area has been identified as a REC given that this area has impacted soil and groundwater within the Village of Hartford with petroleum-related products, including the following known releases:

- On October 16, 1978, gasoline was released from the pipeline near the intersection of Olive Street and Elm Street in Hartford.
- On January 8, 1981, approximately 400 gallons of #6 fuel oil were released from the pipeline near the intersection of Delmar Street and Elm Street in Hartford (Incident 810008).
- On November 10, 1982, diesel fuel was released from product lines near East Forest Street at Olive Street. On December 21, 1982, an undetermined volume of oil was released near the November 10, 1982 release.
- On November 20, 1984, "light cycle oil" was released from the pipeline near 116 East Elm Street and 108 West Elm Street in Hartford.
- On December 6, 1991, approximately 30 gallons of asphalt were released from the pipeline on the east side of Illinois Route 3 and Elm Street in Hartford (Incident 913533).
- On April 15, 1994, an estimated 25 barrels of oil were released from the pipeline near Elm Street and Old St. Louis Road in Hartford.
- On October 28, 1994, approximately 6,000 gallons of #1 fuel oil were released near Illinois Route 3 on October 28, 1994 (Incident 942432).
- On November 8, 2000, diesel fuel was released near Market and Elm Streets in Hartford (Incident H20002148).

- On October 15, 2001, hydrocarbon fuel was released near Market and Elm Streets in Hartford (Incident H20011741).

Additional unreported, undocumented, or unknown releases from the pipelines are likely over the historic course of operation and have likely impacted soil and groundwater within the Village of Hartford.

Based on the documents reviewed that pertain to the Underground Product Lines Area, the following historic REC was identified:

- On September 26, 1999, approximately five barrels of oil were released near 112 East Elm Street (Incident 992199).

3.3.1.8 Procedures Used to Close the Underground Product Lines Area or Remediate Any Contamination Present

Remediation and closure procedures are discussed in Section 3.3.1.7. An existing free product recovery system exists in the Village of Hartford (reference Section 3.13).

3.3.1.9 Assessment of the Potential for Contamination Being Present and the Next Steps That Should Be Taken

Further investigation and characterization of the potential for contamination in the Underground Product Lines Area is necessary since the potential for contamination exists based on historical operations and the identified spill incidents

3.3.2 Remedial/Interim/Stabilization Measures

3.3.2.1 Description of the Measure

Generally, when Premcor experienced specific releases, Premcor responded by removing the released material and affected soil, and took other steps as described above to eliminate the obvious effects of the release. Measures are discussed in Section 3.3.1.7.

An existing free product recovery system exists in the Village of Hartford (reference Section 3.13).

3.3.2.2 Objectives of the Measure

The objective of the measures was to mitigate environmental impact to the soil and groundwater. The objective of the free product recovery system is described in Section 3.13.

3.3.2.3 Description of the Design, Construction, Operation, and Maintenance of the Measure

Details on the free product recovery system in the Village of Hartford are described in Section 3.13.

3.3.2.4 Information Regarding the Actual Implementation and Effectiveness of the Measure

Measures are discussed in Section 3.3.1.7. Details on the free product recovery system in the Village of Hartford are described in Section 3.13.

3.4 AREA 4 – REFINERY PROCESS I

Records of spills, releases, or other incidents were found for this area.

3.4.1 Possible Sources/Areas of Contamination

3.4.1.1 Location of Refinery Process I Area

The location of the Refinery Process I Area (Area 4) is shown on Figure 3-1.

3.4.1.2 Horizontal and Vertical Boundaries of the Refinery Process I Area

The horizontal boundaries of the Refinery Process I Area (Area 4) are shown on Figure 3-4. There are no vertical boundaries.

3.4.1.3 Construction, Operation, and Structural Integrity

The main units contained in Refinery Process I Area are the Still Catalytic Reformer, the Fluid Catalytic Cracker Unit (FCCU), the Crude Unit, the Distillate Hydrodesulfurization unit (DHDS), and the Boiler House. In September 2002, the refinery ceased production of petroleum products from crude oil. A Refining Flow Diagram is provided as Appendix L-1. For further information, see Section 2.4.

Refining Process II borders Area 4 to the north. The Coking Unit Area is located east of Area 4. Hawthorne Street with the Bulk Storage Tanks South Area beyond is located south, and the Administration Area is located west of Area 4.

3.4.1.4 Material Managed in the Refinery Process I Area, Including the General Chemical Composition of the Material Waste

While the refinery was operating, crude was reduced in the crude units to produce gas oil, distillate, naphtha light straight run, propane, and butane. Crude and coker naphtha passed through the Still Catalytic Reformer to produce reformate (gasoline blending component) and hydrogen. Feed stocks to the FCCU included atmospheric and vacuum still gas oil and coker gas oil to produce full range gasoline, fluid light cycle, liquefied propane gas (LPG), and slurry. Crude coker and FCCU distillates are blended and charged to the DHDS unit to perform hydroprocessing. The reactor in the DHDS uses a cobalt catalyst. Premcor managed the spent cobalt catalyst as D001, D004, D018, and K171. The Boiler House in the Refining Process I Area used plant well water to produce steam used as an energy source to heat products and buildings. Appendix L-2 provides information sheets on some units. For further information, see Section 2.4.

3.4.1.5 Quantities of Waste/Materials in the Refinery Process I Area

FCCU sour water, spent catalyst, spent caustic, FCCU clarified oil sludge, and coke fines were some wastes generated in this area. The quantity of wastes generated as part of the refinery process is unknown.

3.4.1.6 History of the Use of the Refinery Process I Area and the Surrounding Area

According to aerial photographs, the Refining Process I Area has been operating since at least 1941. The Catalytic Reformer has been in operation since 1953, with upgrades in 1968 and 1979. The Crude Unit has been in operation since 1975, and the current FCCU was built in 1971. The Boiler House has been operating since the development of the refinery.

3.4.1.7 All Available Data and Qualitative Information on the Level of Contamination at the Refinery Process I Area

Information related to releases from the Refinery Process I Area is provided in this section.

September 18, 1997 – Incident 971746 – Violation Notice M-1997-00110

On September 18, 1997, an unknown amount of spent catalyst was released from the FCCU due to blower failure. The spent catalyst dust fallout affected the towns of East Alton, Hartford, and Wood River. The facility paid for car washes for the towns' residents to eliminate the dust collected on their cars. The blower electric motor was dismantled, inspected, repaired, and tested; operational practices and procedures were improved to prevent another release. Samples were collected of the white powder substance deposited throughout neighboring areas of the facility. The results of the analysis indicated trace metals were present in the samples; however, no constituent was above EPA standards. Information on this release is provided in Appendix L-4.

Other

Any underground and aboveground product, wastewater, or process water piping may be a concern in the Refining Process I Area. Releases during piping repairs or maintenance may have occurred. No investigation of the piping in this area has been conducted.

Conclusion

Based on the documents reviewed that pertain to the Refining Process I Area, the area has been identified as a REC due to operations involving large quantities of petroleum products in this area.

Based on the documents reviewed that pertain to the Refining Process I Area, the Area contained a historical REC, specifically, the release of an unknown amount of spent catalyst from the FCCU on September 18, 1997 (Incident 971746).

3.4.1.8 Procedures Used to Close the Refinery Process I Area or Remediate Any Contamination Present

Remediation and closure procedures are discussed in Section 3.4.1.7.

3.4.1.9 Assessment of the Potential for Contamination Being Present and the Next Steps That Should Be Taken

Further investigation and characterization of the potential for contamination in the Refinery Process I Area is necessary since the potential for contamination exists based on the historical presence and operation of this area.

3.4.2 Remedial/Interim/Stabilization Measures

3.4.2.1 Description of the Measure

Generally, when Premcor experienced specific releases, Premcor responded by removing the released material and impacted soil, and took other steps as described above to eliminate the obvious effects of the release. Measures are discussed in Section 3.4.1.7.

3.4.2.2 Objectives of the Measure

The objective of the measures was to mitigate environmental impact to the soil and groundwater.

3.4.2.3 Description of the Design, Construction, Operation, and Maintenance of the Measure

Measures are discussed in Section 3.4.1.7..

3.4.2.4 Information Regarding the Actual Implementation and Effectiveness of the Measure

Measures are discussed in Section 3.4.1.7.

3.5 AREA 5 – REFINERY PROCESS II

Records of spills, releases, or other incidents were found for this area.

3.5.1 Possible Sources/Areas of Contamination

3.5.1.1 Location of Refinery Process II Area

The location of the Refinery Process II Area (Area 5) is shown on Figure 3-1.

3.5.1.2 Horizontal and Vertical Boundaries of the Refinery Process II Area

The horizontal boundaries of the Refinery Process II Area (Area 5) are shown on Figure 3-5. There are no vertical boundaries.

3.5.1.3 Construction, Operation, and Structural Integrity

The main units contained in the Refinery Process II Area are the Hydro-Fluoric Alkylation (Alky) Unit, the Cooling Towers, the Vehicle Maintenance Building, the North Drum Accumulation Area, and the Total Isomerization Process (TIP). In September 2002, the refinery ceased production of petroleum products from crude oil. A Refining Flow Diagram is provided as Appendix M-1. For further information, see Section 2.4.

3.5.1.4 Material Managed in the Refinery Process II Area, Including the General Chemical Composition of the Material Waste

Prior to ceasing refinery operations, olefin-rich LPG and isobutene, using hydrofluoric acid in the process, was combined to produce high-octane gasoline blending component,

alkyate, propane, and butane in the Alky Unit. Any waste generated from this unit was directed to the Alky lime pit for neutralization. Periodically, caustic wastes were generated from process upsets or scheduled unit turnaround. The TIP unit converted low-octane crude straight runs into high-octane gasoline blending component, hydrogen, propane, and butane. Premcor removed spent catalyst from six reactor vessels. Reactor vessel PV-2700 performed hydrotreating. This catalyst was managed as K171. The other catalysts from the TIP were managed as non-hazardous special waste. The Vehicle Maintenance Building likely produced used oil from general maintenance of the facility vehicles. Appendix M-2 provides information sheets on some units. For further information, see Section 2.4.

3.5.1.5 Quantities of Waste/Materials in the Refinery Process II Area

An unknown quantity of waste was produced in the Refining Process II Area since its first development.

3.5.1.6 History of the Use of the Refinery Process II Area and the Surrounding Area

According to aerial photographs, the Refining Process II Area was developed between 1941 and 1955. A tank farm existed west of the Alky Unit from initial development of the property until prior to 1993. The isomerization unit was constructed in 1986. The Refining Process II Area is located in the center of the Premcor facility. The Bulk Storage Tanks North Area is located north, east, and west of the Refining Process II Area. The Refining Process I Area borders Area 5 to the south.

3.5.1.7 *All Available Data and Qualitative Information on the Level of Contamination at the Refinery Process II Area*

Information related to releases from the Refinery Process II Area is provided in this section.

May 6, 1993 – Incident 931160

On May 6, 1993, approximately 2,000 gallons of sulfuric acid were released south of Cooling Tower #5. The release occurred when a small pipe broke that connected the storage tank to the sulfuric acid feed pumps. Water was sprayed over the area, and 200 bags of lime were applied to the affected area to neutralize the acid. Water used to clean the release was collected and treated in the wastewater treatment area. Approximately 30 to 40 cubic yards of soil were excavated from the area. In March 1996, a SAP was developed for the collection of confirmation samples at this area. According to a September 1996 Burns & McDonnell report, soil samples were collected, and the results indicated the pH of the soil was within normal limits. Information on this release is provided as Appendix M-3.

November 8, 1995

On November 8, 1995, approximately 58.4 pounds of hydrofluoric acid were released due to failure of a 1-inch nipple on an 8-inch line in the isobutene recycle cooler circuit at the Alky Unit. Soil samples were collected and analyzed for pH. The results indicated the pH of the soil was 7.0. In a November 16, 1995 letter to the Illinois EPA ERU, the release was considered below reportable quantity.

December 17, 1996 – Incident 962322

On December 17, 1996, a spill of wastewater treatment sludge occurred west of the Alky Unit. The spill, which originated from Tank 161, occurred when a reinforced 3-inch rubber hose connected to a frak tank developed a leak. Approximately 82 gallons of wastewater treatment sludge were released impacting 2,500 square feet of soil. The ground was frozen, and the sludge was removed by a vacuum truck and returned to Tank 161. A new hose was installed, and the other hoses were inspected for wear. No samples were collected in association with this incident. Information on this release is provided as Appendix M-4.

Additional Issues

According to the March 1996 Burns & McDonnell *Multi-Media Environmental Compliance Audit,* the Vehicle Maintenance shop had an almost completely buried 55-gallon plastic drum on the southwest corner of the metal building. The drum, which did not have a sealed top, was used to store used oil from vehicle maintenance activities. Heavy oil stains were visible on the ground adjacent to the drum, and several small containers of used oil were observed nearby. There is no further documentation discussing whether the drum has been removed, and the surrounding area has been cleaned.

On February 17, 1994, acidic condensate was released when equipment failure occurred originating at the Alky Unit. Acidic steam affected the following areas: the low pressure relief valve by the DHDS; south and north of the Boiler House; the area surrounding the low pressure steam drum at the Crude Unit; the area surrounding the low pressure condensate drum in the Alky Unit; and the DIB area at the FCCU. The employees working within those areas were examined due to acid exposure, and lime was spread to

neutralize the acid in the affected areas. No incident number was associated with this release, and no further information was contained in the facility files.

In the September 2001 *CERCLA Expanded Site Inspection Report for Clark Oil & Refining Company* prepared by the Illinois EPA, two samples (shallow and deep) were collected from the same borehole north of the drum accumulation area. Results of the analysis revealed various volatile constituents at levels equal to or greater than three times offsite background levels in both samples. The shallow sample contained various semi-volatile organic, pesticide/PCB, and inorganic constituents at levels equal to or greater than three times offsite background levels. Appendix M-5 provides portions of this report.

Any underground and aboveground product, wastewater, or process water piping may also be a concern in the Refining Process II Area. Releases during piping repairs or maintenance may have occurred. No investigation of the piping has been conducted in this area.

Conclusion

Based on the documents reviewed that pertain to the Refining Process II Area, the area has been identified as a REC due to operations involving large quantities of petroleum products, a buried oil drum, and operational releases including:

- On December 17, 1996, approximately 82 gallons of wastewater treatment sludge were released from a hose connected to Tank 161 (Incident 962322).
- In November 2000, the Illinois EPA identified various volatile, semi-volatile, pesticide/PCB and inorganic constituents at levels equal to or greater than three times offsite background levels in the North Drum Accumulation Area.

Based on the documents reviewed that pertain to the Refining Process II Area, the following historical RECs were identified:

- On May 6, 1993, approximately 2,000 gallons of sulfuric acid were released from a pipe on a storage tank south of Cooling Tower 5 (Incident 931160).
- On November 8, 1995, approximately 58.4 pounds of hydrofluoric acid were released from a pipeline associated with the Alky Unit.

3.5.1.8 Procedures Used to Close the Refinery Process II Area or Remediate Any Contamination Present

Incident 931160 was remediated by neutralizing the acid release, removing approximately 30 to 40 cubic yards of soil, and collecting confirmatory samples. The November 8, 1995 release was remediated by neutralizing the acid release and analyzing the affected soil for pH. Incident 962322 was remediated by removing the sludge with a vacuum truck and returning the sludge to Tank 161. A new hose was installed, and the other hoses were inspected for wear.

3.5.1.9 Assessment of the Potential for Contamination Being Present and the Next Steps That Should Be Taken

Further investigation and characterization of the potential for contamination in the Refinery Process II Area is necessary since the potential for contamination exists based on the historical presence and operation of this area and the identified spill incidents.

3.5.2 Remedial/Interim/Stabilization Measures

3.5.2.1 Description of the Measure

Generally, when Premcor experienced specific releases, Premcor responded by removing the released material and impacted soil, and took other steps as described above to eliminate the obvious effects of the release. Measures are discussed in Section 3.5.1.7.

3.5.2.2 Objectives of the Measure

The objective of the measures was to mitigate environmental impact to the soil and groundwater.

3.5.2.3 Description of the Design, Construction, Operation, and Maintenance of the Measure

Measures are discussed in Section 3.5.1.7.

3.5.2.4 Information Regarding the Actual Implementation and Effectiveness of the Measure

Measures are discussed in Section 3.5.1.7.

3.6 AREA 6 – ASPHALT PLANT

Records of spills, releases, or other incidents were found for this area.

3.6.1 Possible Sources/Areas of Contamination

3.6.1.1 Location of Asphalt Plant Area

The location of the Asphalt Plant Area (Area 6) is shown on Figure 3-1.

3.6.1.2 Horizontal and Vertical Boundaries of the Asphalt Plant Area

The horizontal boundaries of the Asphalt Plant Area (Area 6) are shown on Figure 3-6. There are no vertical boundaries.

3.6.1.3 Construction, Operation, and Structural Integrity

Eight ASTs are located northwest of the train tracks in the Asphalt Plant Area. According to Premcor personnel, these tanks are scheduled for removal beginning in April 2003. Ten asphalt waste ASTs located southeast of the train tracks were removed between 2001 and 2002. No additional information was available on the former asphalt production process in this area. For further information, see Section 2.4.

3.6.1.4 Material Managed in the Asphalt Plant Area, Including the General Chemical Composition of the Material Waste

Asphalt waste and ground corncobs (used to solidify the asphalt oil) are contained in the ASTs located in the Asphalt Plant Area. For further information, see Section 2.4.

3.6.1.5 Quantities of Waste/Materials in the Asphalt Plant Area

An unknown quantity of asphalt and ground corncob waste is or was stored in the asphalt ASTs. According to correspondence between Premcor and the Illinois EPA, 244 cubic yards of waste were removed during tank dismantling operations. See Section 3.6.1.7 for further details.

3.6.1.6 History of the Use of the Asphalt Plant Area and the Surrounding Area

According to aerial photographs, the Asphalt Plant was not present in 1941; however, the Asphalt Plant appeared in its approximate current configuration in the 1955 aerial photograph. According to the 1973 SPCC Plan, the Asphalt Plant has not been in operation since at least 1973. No additional information was available on the former asphalt production process in this area. Hawthorne Street, with the Administration Area beyond, is north of the Asphalt Plant Area. The Bulk Storage Tank South area is south and east of the Asphalt Plant Area. Railroad tracks, Olive Street, and a residential area are west of the Asphalt Plant Area.

3.6.1.7 All Available Data and Qualitative Information on the Level of Contamination at the Asphalt Plant Area

Information related to releases from the Asphalt Plant Area is provided in this section.

<u>August 20, 2002 – Violation Number M-2002-01036</u>

During an emergency response due to a rupture in a natural gas pipeline, the OER observed that the nearby dismantling of 10 asphalt-containing ASTs in the Asphalt Plant Area was conducted in an "inappropriate environmental manner." On August 20, 2002, an Illinois EPA representative conducted a Resource Conservation and Recovery Act

(RCRA) inspection of the asphalt tank area. The Agency indicated an unknown amount of waste containing old asphalt and ground corncobs was observed on the ground surface throughout the tank farm but was most prevalent at Tanks A-16, A-17, and 10-18. Oil was observed on water in the pipe alley located in the tank farm and in the excavation resulting from the repair of the natural gas pipeline. The tank farm is approximately 160 feet by 250 feet. A Premcor representative indicated the asphalt waste was a result of the tanks being cut all the way to the ground and asphalt tank bottoms leaking or falling on the ground when loading the roll-off boxes. The Agency and Premcor each collected a sample of the ground corncob and asphalt waste and a sample of the liquid oil found near Tank A-17. The results of the analysis indicated the waste was classified as non-hazardous.

On October 3, 2002, the Illinois EPA issued Premcor a violation notice (M-2002-01036), which is provided as Appendix N. According to the Agency, waste (that did not meet the requirements of the regulations) was openly deposited on the Premcor property, and the waste was disposed in a manner that had the potential to create a water pollution hazard. The suggested resolutions of the violations included discontinuing deposition of waste onsite, cleanup and disposal of waste according to regulations in accordance with the TACO CUOs, and preparation of a RACR that demonstrated the violation issues were addressed. On October 24, 2002, the Agency conducted an inspection to determine if the violation issues had been addressed. The Agency indicated the site had not been remediated, and the violation remained outstanding. On November 21, 2002, Premcor responded to the violation by stating a solidifying agent had been added to the asphalt waste oil, and the waste had been removed and disposed of offsite. 244 cubic yards of asphalt-containing waste were removed from the site. Premcor indicated they would submit a work plan during a comprehensive facility investigation that would encompass the asphalt tank area.

On December 6, 2002, the Illinois EPA rejected the November 21, 2002 submittal from Premcor. The Agency indicated no sampling of the groundwater and soil had been conducted at the Asphalt Tank Area, and a RACR had not been submitted.

Conclusion

Based on the documents reviewed that pertain to the Asphalt Plant Area, the area has been identified as a REC due to operations involving large quantities of petroleum products and operational releases, including:

- On August 20, 2002, an unknown amount of asphaltic material was discovered (Violation Notice M-2002-01036).

3.6.1.8 Procedures Used to Close the Asphalt Plant Area or Remediate Any Contamination Present

Remediation and closure procedures are discussed in Section 3.6.1.7.

3.6.1.9 Assessment of the Potential for Contamination Being Present and the Next Steps That Should Be Taken

Further investigation and characterization of the potential for contamination in the Asphalt Plant Area is necessary since the potential for contamination exists based on the historical presence and operation of this area, and the identified release.

3.6.2 Remedial/Interim/Stabilization Measures

3.6.2.1 Description of the Measure

Generally, when Premcor experienced specific releases, Premcor responded by removing the released material and impacted soil, and took other steps as described above to eliminate the obvious effects of the release. Measures are discussed in Section 3.6.1.7.

3.6.2.2 Objectives of the Measure

The objective of the measures was to mitigate environmental impact to the soil and groundwater.

3.6.2.3 Description of the Design, Construction, Operation, and Maintenance of the Measure

Measures are discussed in Section 3.6.1.7.

3.6.2.4 Information Regarding the Actual Implementation and Effectiveness of the Measure

Measures are discussed in Section 3.6.1.7.

3.7 AREA 7 - COKING UNIT

Records of spills, releases, or other incidents were found for this area.

3.7.1 Possible Sources/Areas of Contamination

3.7.1.1 Location of Coking Unit Area

The location of the Coking Unit is shown on Figure 3-1 as Area 7.

3.7.1.2 Horizontal and Vertical Boundaries of the Coking Unit Area

The horizontal boundaries of the Coking Unit (Area 7) are shown on Figure 3-7. There are no vertical boundaries.

3.7.1.3 Construction, Operation, and Structural Integrity

The Coking Unit was structurally intact at shutdown. The unit operated under State Permit 72110544 and processed approximately 15,000 bpd.

3.7.1.4 Material Managed in the Coking Unit Area, Including the General Chemical Composition of the Material Waste

The coking process takes asphaltic-types of feed and creates naphtha, distillates, gas oils, and coke.

3.7.1.5 Quantities of Waste/Materials in the Coking Unit Area

The coker is a process unit and is not intended to process RCRA wastes. The coker was used to manage alternative coker feed material (ACFM). This included material that would have been classified as hazardous waste (K048, K049, K050, F038, and F050). However, the United States Environmental Protection Agency (U.S. EPA) exempted oil-bearing hazardous waste secondary materials inserted into petroleum refining, including petroleum coking, from the definition of a solid waste (August 6, 1998 *Federal Register*). The IPCB adopted this exemption on December 17, 1998. The coker contains a high-pressure hydrogen desulfurization unit to remove sulfur and nitrogen from the naphtha that is produced. The coker also serves as a sour water stripper, thereby reducing the load on the WWTP.

3.7.1.6 History of the Use of the Coking Unit Area and the Surrounding Area

The coker was installed in 1971 and operated until the refinery was shut down. The property to the north and east, specifically the Laydown Area, and the property to the west, specifically the Refinery Process I Area, is part of the refinery. The property to the south, referred to as Milo Field, is privately owned cropland.

3.7.1.7 All Available Data and Qualitative Information on the Level of Contamination at the Coking Unit Area

Information related to releases from the Coker Unit is provided in this section.

July 9, 1997 – Near Miss Incident 9707091 – Investigation 97007091 – Incident 971227 – Violation Number E-1998-0001

On July 7, 1997, a release occurred when the drain valve on C-Drum was mistakenly opened while the drum was in the heat-up process. The fire crew put water on the released vapors, and steam was used to purge vapors.

On July 9, 1997, the Coker Incident Report described the incident, as well as complaints from residents. As of July 10, 1997, owners of three vehicles had reported complaints, and one farmer had filed a complaint.

A July 14, 1997 Post-Incident Review described actions taken by Premcor, including putting sand on Hawthorne Street and sweeping the sand.

In a July 21, 1997 letter to the Illinois EPA, Premcor stated that approximately 200 feet of roadway was cleared by applying sand and sweeping. Premcor also noted there had been no fire during the incident of July 9, 1997.

On July 25, 1997, a survey of analytical results was presented for soil samples obtained from the farm field. Results were provided for TPH, nickel, vanadium, semi-volatile hydrocarbons, and benzene. On July 25, 1997, Burns & McDonnell reported analytical results from additional samples in the neighboring milo field.

In a September 3, 1997 letter to the Illinois EPA, Premcor stated its conclusions that no damage had occurred, with the exception of the potential for crop loss. Premcor agreed to discuss the potential for crop loss with potentially affected parties. Finally, Premcor stated that all issues related to the July 9, 1997 release had been resolved.

In a January 5, 1998 Violation Notice to Premcor, the Illinois EPA acknowledged that Premcor had performed some response actions, but the Agency had no information to confirm that Premcor had adequately cleaned all residual contaminants attributable to the release. The Agency provided a series of recommendations for resolution of the alleged violations including conducting a thorough investigation, determining remediation objectives (ROs), preparing a RAP, and preparing a RACR.

In a February 17, 1998 letter to the Illinois EPA, Premcor responded to the January 5, 1997 letter.

In a March 18, 1998 letter to Premcor, the Illinois EPA rejected Premcor's above-referenced letter. The Agency informed Premcor that the matter was being referred to the Office of the Illinois Attorney General for formal enforcement action and possible imposition of penalties.

On August 27, 1998, the Assistant Counsel of the Environmental Policy and Chemical Safety Division of Legal Counsel sent Premcor and its attorney a *Notice of Intent to Pursue Legal Action* because, in its opinion, Premcor had not satisfactorily resolved the issue.

In a October 15, 1998 letter to the Illinois EPA, Premcor described the root cause of the incident, which was operator error, and the steps taken to prevent a similar incident.

In two reports dated October 20, 1998 and November 24, 1998, Premcor provided the Illinois EPA with analytical results from samples in the area affected by the July 9, 1997 release. Premcor compared the results to Tier 1 SROs for Residential Properties, Migration to Groundwater, Class I, and concluded no further remediation was needed. Samples were taken at depths of 0 to 6 inches; the sampling locations are unknown.

The file also contains analytical results sent by Teklab to Burns & McDonnell that were apparently taken at approximately the same time as other samples included in the Premcor reports. The sampling locations are unknown.

The file does not provide further information from the Illinois EPA as to whether the Agency accepted Premcor's conclusion that no further remediation was required. Excerpts from the referenced documentation for this incident are provided as Appendix O-1.

August 15, 1999 – Violation Notice A-2000-00020

On August 15, 1999, a fire occurred in the delayed coker unit at Heater H-20. On February 10, 2000, the Illinois EPA issued a Violation Notice that stated the combustion of heavy oil, the feed material, resulted in the emission of air contaminants. The Agency recommended that Premcor initiate a preventive maintenance program and provide the Agency with a description of the program. The Agency also recommended that Premcor provide information on the components that had to be replaced, the costs, the estimated life of the heater after completion of repairs, and the actual and potential emissions from the heater.

In a February 24, 2000 letter to the Illinois EPA, Premcor provided the requested information. In a March 31, 2000 letter to Premcor, the Agency accepted the information provided by Premcor. Excerpts from the referenced documentation for this incident are provided as Appendix O-2.

February 13, 2000 – Incident 519750 – Violation Notice E-2000-00016
Complaint COAD – IEMA Case 2000-HM-9900133-8

On February 13, 2000, a hydrocarbon release, which resulted from opening a purge valve, occurred from the coker. Approximately 300 pounds of hydrocarbons were released, which forced closure of Hawthorn Street for approximately two hours while a spill contractor cleaned the street. Five cars were impacted and cleaned.

In a February 14, 2000 letter to Premcor, the Illinois EPA requested information on the release. In a February 23, 2000 letter to the Agency, Premcor provided details on the cause of the release and measures to prevent future releases.

In a February 25, 2000 *Non-Compliance Advisory* letter to Premcor, the Illinois EPA requested more information on the release, including soil sampling.

In a March 9, 2000 *Notice of Violation* sent to Premcor, the Chief Legal Counsel of the IEMA requested more information on the release. In a March 17, 2000 letter, Premcor stated the matter involved a miscommunication and all required information had been provided to the Illinois EPA on February 17, 2002.

In a April 10, 2000 letter to the Illinois EPA, Premcor described the root cause of the incident.

On June 13, 2000, Premcor and the Illinois EPA met to discuss the release. In a July 19, 2000 letter to the Agency, Premcor provided a narrative that described the cleanup of the release.

In a August 1, 2000 Violation Notice sent to Premcor, the Illinois EPA stated the Agency had insufficient information to confirm that a thorough investigation of all possible

causes of the release had been undertaken or that all appropriate steps to prevent a recurrence of a similar release had occurred. The Agency stated that the Illinois EPA was referring the matter to the Illinois Attorney General's Office.

In October 2002, Burns & McDonnell submitted a SAP for the Milo Field Area, the area potentially affected by the release. The plan called for soil sampling at three locations. On October 30, 2000, Teklab sent the analytical results to Premcor. Samples were analyzed for nickel, vanadium, PNAs, and BETX. In a November 7, 2000 letter to the OER, Premcor stated that Burns & McDonnell would sample an additional three locations since one of the three initial samples showed benzo(a)pyrene above TACO residential limits. In a December 13, 2000 letter to the ERU, Premcor provided the results of the additional sampling. Because the soil samples collected outside the impacted area showed even higher benzo(a)pyrene levels than the impacted area, Premcor proposed that no further remediation be required. Existing correspondence does not indicate whether the Agency had accepted Premcor's conclusion.

The other issue related to the release was the need for Premcor to provide complete information on the release and modifications to prevent future occurrences. In a November 2, 2000 letter to the Illinois EPA, Premcor addressed these issues. In a November 14, 2000 letter to Premcor, the Agency accepted a *Modified Compliance Plan* as described in Premcor's November 2, 2000 letter.

Excerpts from the referenced documentation for this incident are provided as Appendix O-3.

March 9, 2001 – Violation Notice E-2001-00037 – Release Incident 010402
Release Incident 200110402

An unknown amount of liquid gas oil (estimated by Premcor to be 18 barrels or 756 gallons) escaped from the bottom drain of a coker drum. Premcor stated most of the gas oil went into the coker chute, but acknowledged that some gas went out as a mist over Hawthorne Street. The mist covered an area of approximately 300 feet wide by 1,000 feet long.

In a March 30, 2001 Violation Notice sent to Premcor, the Illinois EPA recommended resolutions for the violation. The recommendations included an investigation into the cause of the release, a focused site investigation, remediation objectives, and preparation of a RAP and RACR.

In a May 11, 2001 letter to the Illinois EPA, Premcor summarized sampling and analysis activities related to the March 9, 2001 release. On April 11, 2001, Burns & McDonnell collected three surface soil samples and analyzed the samples for BETX, PNAs, nickel, and vanadium. One of the three samples contained benzo(a)pyrene above TACO Tier 1 objectives for residential properties. However, Premcor's letter cited previous sampling in the area that showed higher benzo(a)pyrene results in background samples than those collected on April 11, 2001. Premcor concluded from these results that the release on March 9, 2001 did not contribute to the elevated level of benzo(a)pyrene in the one sample, and recommended that no further action was required.

In a May 23, 2001 letter to Premcor, the Illinois EPA stated that the Agency did not agree with the conclusion in the May 11, 2001 letter and that the Agency might refer the matter to the State's Attorney or the U.S. EPA. The file does not contain information after this date.

Excerpts from the referenced documentation for this incident are provided as Appendix O-4.

Additional Issues

The file information contains limited correspondence related to two other occurrences. In June 1985, Clark reported cleaning a ditch alongside the coke storage area. In a July 8, 1985 letter, the Illinois EPA stated that the work done was "very satisfactory."

On July 13, 1991, the Illinois EPA received a call that a release had impacted buildings and vans with oil droplets. Premcor acknowledges they may have been the cause of the problem, resulting from switching from one coke drum to another. Premcor arranged with a car wash to degrease and wash vehicles. No other correspondence related to this incident is in the file.

Excerpts from the referenced documentation for this incident are provided as Appendix O-5.

Conclusion

Based on the documents reviewed that pertain to the Coking Unit Area, the area has been identified as a REC due to operations involving large quantities of petroleum products and operational releases including:

- In 1985, a release to a ditch.
- On July 13, 1991, an unknown amount of material was released from the coker.
- On July 7, 1997, an unknown amount of gas oil was released from the coker (Incident 971227).

- On February 13, 2000, approximately 300 pounds of gas oil were released from the coker (Incident 519750).
- On March 9, 2001, an estimated 756 gallons of gas oil were released from the coker (Incident 010402).

3.7.1.8 Procedures Used to Close the Coking Unit Area or Remediate Any Contamination Present

Remediation and closure procedures are discussed in Section 3.7.1.7.

3.7.1.9 Assessment of the Potential for Contamination Being Present and the Next Steps That Should Be Taken

Further investigation and characterization of the potential for contamination in the Coking Unit Area is necessary since the potential for contamination exists based on the historical presence and operation of this area and the identified releases.

3.7.2 Remedial/Interim/Stabilization Measures

3.7.2.1 Description of the Measure

Generally, when Premcor experienced specific releases, Premcor responded by removing the released material and impacted soil, and took other steps as described above to eliminate the obvious effects of the release. Measures are discussed in Section 3.7.1.7.

3.7.2.2 Objectives of the Measure

The objective of the measures was to mitigate environmental impact to the soil and groundwater.

3.7.2.3 Description of the Design, Construction, Operation, and Maintenance of the Measure

Measures are discussed above in Section 3.7.1.7.

3.7.2.4 Information Regarding the Actual Implementation and Effectiveness of the Measure

Measures are discussed above in Section 3.7.1.7.

3.8 AREA 8 – BULK STORAGE TANKS NORTH

Records of spills, releases, or other incidents were found for this area.

3.8.1 Possible Sources/Areas of Contamination

3.8.1.1 Location of Bulk Storage Tanks North Area

The location of the Bulk Storage Tanks North Area (Area 8) is shown on Figure 3-1.

3.8.1.2 Horizontal and Vertical Boundaries of the Bulk Storage Tanks North Area

The horizontal boundaries of the Bulk Storage Tanks North Area (Area 8) are shown on Figure 3-8. There are no vertical boundaries.

3.8.1.3 Construction, Operation, and Structural Integrity

Locations of oil storage tanks are identified on Figure 3-8. Storage tank identification numbers and tank capacities are provided as Table 2-1.

Secondary containment basins are present at the tanks in the event of a tank overflow, leakage, or rupture. Pumps and pipelines do not have secondary containment. No operations produce process water at the Bulk Storage Tanks North Area.

According to Premcor personnel, secondary containment for storage areas at the Refinery has a capacity of at least 110 percent (%) of the largest tank volume. The dikes are constructed of compacted clay and covered with gravel that is sufficiently impervious to contain spills. Additional dikes and manual shut-off valves are located within each

containment area to provide emergency access and additional spill control, and to minimize stormwater contamination potential.

Drainage from diked storage areas is restrained by valves to prevent spills or excessive leakage of oil into the surface drainage system. The Refinery has curbing and drainage systems for process water and stormwater. This system includes ponds, tanks, oil/water separation devices, and transport systems. Drum storage areas and portable tanks are surrounded by secondary containment curbs or impervious berms.

3.8.1.4 Material Managed in the Bulk Storage Tanks North Area, Including the General Chemical Composition of the Material Waste

The Bulk Storage Tanks North Area serves as a storage location for petroleum products transported to and from the refinery facility via underground and aboveground pipelines. The petroleum products are received from and disbursed to barges in the River Dock Area. The tanks store numerous products identified in Table 2-1. No process wastes are generated.

Presumably, occasional petroleum-contaminated wastes have resulted from releases or spills occurring at the Bulk Storage Tanks North Area since it began operations. However, no significant known records are available prior to the 1990s. Since that time, generated wastes have included various petroleum-related products. These wastes are discussed further in Section 3.2.1.7.

3.8.1.5 Quantities of Waste/Materials in the Bulk Storage Tanks North Area

The total petroleum storage capacity is approximately 110 million gallons (2,690,000 barrels). No process wastes are generated. Wastes resulting from releases are discussed in Section 3.8.1.7.

3.8.1.6 *History of the Use of the Bulk Storage Tanks North Area and the Surrounding Area*

Portions of the Bulk Storage Tanks North Area facility, primarily west of Tank 80-2, were constructed in the early-1940s. According to aerial photographs, by 1955 additional tanks had been constructed east, south, and north of Tank 80-2. Over the years, additional tanks have been constructed, and others have been removed.

In general, the surrounding area consists of refinery operations (by others) to the north, ConocoPhillips refinery operations to the east, and Premcor former refinery operations to the south and west.

3.8.1.7 *All Available Data and Qualitative Information on the Level of Contamination at the Bulk Storage Tanks North Area*

Information related to releases from the Bulk Storage Tanks North Area is provided in this section.

1984

A July 18, 1984 State of Illinois EPA Special Waste Hauling Manifest identified the shipment for offsite disposal of four drums (220 gallons) of tetraethyl lead (TEL)-contaminated dirt. A April 27, 1984 Generator's Waste Material Profile sheet completed by Clark indicated the cause of the release was a leaking pump seal. The referenced documentation for this incident is provided as Appendix P-1.

February 2, 1989

In a February 21, 1989 *Compliance Inquiry* letter sent to Premcor, the Illinois EPA identified an apparent violation of 35 Illinois Administrative Code (IAC) 725.296, specifically, the Agency observed visible contamination within the earthen containment system for Tank 10-2 during an inspection conducted on February 2, 1989. Tank 10-2, now the location of Tank T-162, was used to temporarily store K048 (Dissolved Air Float [DAF] Float), K049 (Slop Oil Emulsion solids), and K051 (API Separator Sludge) before the material was pumped to the Coker Units. The spillage appeared to be the result of years of drips and spills. In a September 27, 1989 letter to Premcor, the Agency stated that, based on a September 14, 1989 Agency inspection, it was determined that the apparent violations of Section 722.134(a) were satisfactorily resolved. The Agency inspection stated that Premcor determined closure of Tank 10-2 was necessary to comply with the apparent violations identified in the February 21, 1989 Agency letter. 409 tons of waste/soil were excavated from within the earthen berm and shipped for offsite disposal. The remaining soil within the berm was then treated with two applications of microbes. Excerpts from the referenced documentation for this incident are provided as Appendix P-2.

February 21, 1993 - Incident 930211 (Area E)

On February 21, 1993, a spill occurred when a rupture disc on the foam system for Tank 120-2 failed. When the system failed, crude oil flowed into the foam line and out of a low point drain on that line. The drain was open on the foam system line as a freeze precaution to prevent the line from splitting because of condensation within the pipe. The root cause of this event was a design mistake that allowed the installation of incorrect rupture discs that failed at a pressure lower than the head pressure of the tank. This event resulted in 750 barrels of crude oil being released into the secondary containment diked area.

Based on first-hand oral accounts, Premcor estimated between 25 and 30 vacuum truckloads of material were recovered from this area. Each vacuum truck holds approximately 50 barrels of material. Hence, between 1,250 barrels and 1,500 barrels of crude oil and water were recovered. The oil was reprocessed through the crude unit, and the water was treated in the aggressive biological wastewater treatment process. The processes of product and water recovery, along with the high viscosity of the released material, suggested to Premcor that all the oil was recovered with the exception of a few gallons.

Incident 930211 became subject to an Illinois EPA *Pre-Enforcement Conference* letter dated September 22, 1995. On March 11, 1996, the Illinois Attorney General's Office approved a sampling plan that included Incident 930211 wherein the Area was identified as Area E.

As a result, Burns & McDonnell conducted site investigations to determine the extent of contamination. Of the 10 surface soil samples analyzed for BTEX constituents, none exceeded the Illinois EPA TACO Tier 1, Table B Soil CUOs for Industrial/Commercial Properties. Of the four surface soil composite samples, only one exceeded TACO Tier 1 values for PNAs. Eleven subsurface soil samples were below TACO Tier 1 values for all BTEX and PNA constituents.

In conclusion, Burns & McDonnell stated the following. No free petroleum product was encountered during soil sampling. All surface soil samples were below TACO Tier 1 values for BTEX constituents. One composite surface soil sample exceeded TACO Tier 1 values for benzo(a)anthracene and benzo(a)pyrene. Elevated levels of PNAs in this sample may have been due to the proximity of sample aliquots to the drainage ditch along the eastern edge of the tank yard. This drainage ditch may contain petroleum hydrocarbons from historic contamination. All subsurface soil samples were below TACO Tier 1 values for both BTEX and PNAs.

According to a 1997 Burns & McDonnell TACO Assessment of the spill site, Area E was below TACO Tier 2 CUOs for the applicable contaminant pathway scenarios. Burns & McDonnell stated this area did not require further assessment or remediation. Excerpts from the referenced documentation for this incident are provided as Appendix P-3

May 28, 1994

A facility Chemical Spill Reporting Form identified an approximate 50-barrel spill of gasoline (alkylate and reformate) at Tank 10-5 due to an overfill. Product was vacuumed up. No further information was available. The referenced documentation for this incident is provided as Appendix P-4.

July 9, 1994 - Incident 941526 (Area D)

On July 9, 1994, Premcor had a release of approximately 308 barrels of naphtha and toluene into the Tank 10-5 diked area. All material was contained within the confines of the secondary containment dike. The area around Hartford and the refinery had experienced heavy rain prior to the release; thus, the diked area surrounding Tank 10-5 was filled with water. Premcor personnel used vacuum trucks to recover the product and rainwater from the diked area. When water levels began to diminish, Premcor personnel added additional water to the diked area to insure the spilled material remained floating on top of the water and could only minimally contact soil in the area. Premcor estimated approximately 307 barrels of the product and 680 barrels of water were recovered. Recovered product was rerun through the process units, while the recovered water was treated in the aggressive biological wastewater treatment process.

Following recovery of the product, Premcor initiated a modified biological augmentation program to remediate the soil surrounding Tank 10-5 by applying activated sludge from the aggressive biological wastewater treatment process to the soil. On June 5, 1995,

Premcor collected a composite soil sample from the impacted area. On August 1, 1995, grab soil samples were collected from the same locations as the previous composite sample.

On June 28, 1995, Premcor began excavating soil surrounding Tank 10-5. Between June 28 and June 30, 1995, four roll-off containers were loaded with soil from this area. Approximately 50 cubic yards of soil were disposed of at Laidlaw Landfill in Roxana, Illinois. On October 12, 1995, Premcor resampled the area by collecting grab soil samples from the locations previously sampled for the composite. Soil samples were analyzed for BTEX and PNAs.

Incident 941526 became subject to a complaint (PCB 95-163) filed June 6, 1995 before the IPCB by the Attorney General of the State of Illinois on behalf of the Illinois EPA. On March 11, 1996, the Illinois Attorney General's Office approved a sampling plan that included Incident 941526 wherein the Area was identified as Area D.

As a result, Burns & McDonnell conducted site investigations to determine the extents of contamination. Of the four surface soil samples analyzed for BTEX constituents, two exceeded the Illinois EPA TACO Tier 1, Table B Soil CUOs for Industrial/Commercial Properties, specifically for benzene only. All four surface soil samples were below the TACO Tier 1 values for naphthalene. Eight subsurface soil samples were collected from four soil borings and submitted for laboratory analysis of BTEX and naphthalene. All four soil borings exceeded TACO Tier 1 values for benzene. All subsurface soil samples were below the TACO Tier 1 values for the remaining BTEX constituents and naphthalene.

In conclusion, Burns & McDonnell stated the following. No free petroleum product was encountered during soil sampling. No surface or subsurface soil samples exceeded TACO Tier 1 values for naphthalene or toluene. These compounds would be representative of the released material, naphtha, and toluene.

According to a 1997 Burns & McDonnell TACO Assessment of the spill site, Area D, which surrounds Tank 10-5 in the tank yard, had surface and subsurface soil concentrations of benzene that exceeded Tier 2 CUOs. The benzene CUO for this area is the generic TACO Tier 1 value, migration to groundwater pathway for surface and subsurface soil.

On behalf of Premcor, in a November 20, 1997 letter to the Illinois EPA, Burns & McDonnell presented a proposal for remediation activity. Burns & McDonnell stated a TACO Tier 2 assessment of Area D was not possible due to difficulty in collecting a site-specific sample for organic carbon analysis. Area D is within the tank farm and directly across an access road from Area C. Assuming the fraction of organic carbon in the two areas is comparable, and thereby applying the site-specific CUOs from Area C to Area D, three shallow subsurface soil samples fall below site-specific CUOs. Thus, two surface and five subsurface soil samples are in excess of the Tier 2 CUO for benzene. Most of the contamination above the Tier 2 CUO is subsurface and historical in nature. As these benzene concentrations are unrelated to the spill event of interest, additional remediation activities are not proposed for Area D. Excerpts from the referenced documentation for this incident are provided as Appendix P-5.

August 9, 1994 - Incident 941772 (Area B)

On August 9, 1994, Premcor had a release of approximately 2,000 barrels of gasoline due to a ruptured gasket on the mixer for Tank 35-2. Most of the product was contained within the dike surrounding Tanks 35-2 and 35-1. Minimal product was observed in

drainage ditches around Tanks 35-3, 55-1, 55-3, and 120-9. During the incident, firefighting foam was applied to the area to minimize vapors and explosion hazards.

Premcor personnel used vacuum trucks to recover free product and water from the areas surrounding the tank. Premcor estimated approximately 1,995 barrels of product and 3,600 barrels of water and entrained gasoline were recovered by this process. Recovered product was rerun through the process units, while recovered water was treated at Premcor's aggressive biological wastewater treatment process. Following drying of the site, Premcor initiated a modified biological augmentation program to remediate the soil by applying activated sludge from the aggressive biological wastewater treatment process. On June 5, 1995, a composite soil sample was collected to determine levels of petroleum hydrocarbons in the soil. On June 20, 1995, Premcor began excavating soil from the area around Tanks 35-1 and 35-2. Between June 20 and June 27, 1995, 22 roll-off containers were loaded with soil. Approximately 225 cubic yards of soil were disposed of at Laidlaw Landfill in Roxana, Illinois. On August 1 and October 12, 1995, Premcor collected grab soil samples from the same locations as the previous composite sample and analyzed for BTEX and PNAs.

Incident 941772 became subject to a complaint (PCB 95-163) filed June 6, 1995 before the IPCB by the Attorney General of the State of Illinois on behalf of the Illinois EPA. On March 11, 1996, the Illinois Attorney General's Office approved a sampling plan that included Incident 941526 wherein the Area was identified as Area B.

As a result, Burns & McDonnell conducted site investigations to determine the extents of contamination. Of the 14 surface soil samples collected, six were below the Illinois EPA TACO Tier 1, Table B Soil CUOs for Industrial/Commercial Properties. The remaining soil samples all exceeded TACO Tier 1 values for at least one BTEX constituent. Eleven subsurface soil samples were collected and submitted for laboratory analysis of BTEX. Six soil samples exceeded TACO Tier 1 values for at least one BTEX constituent. Four

soil samples were below TACO Tier 1 values for toluene, ethylbenzene, and total xylenes (TEX) and below detection limits for benzene. However, the detection limits for benzene in these analyses were above the TACO Tier 1 value due to necessary dilution. These samples were therefore inconclusive with respect to benzene. Two soil samples were below TACO Tier 1 values for all BTEX constituents.

In conclusion, Burns & McDonnell stated the following. No free petroleum product was encountered during surface soil sampling. Eight surface soil samples exceeded TACO Tier 1 values for one or more BTEX constituents. Six subsurface soil samples exceeded the TACO Tier 1 values for one or more BTEX constituents. Four subsurface soil samples were all undefined with respect to benzene due to laboratory dilutions. Subsurface contaminant levels decreased with depth in soil borings. The low permeability silty clay soil in the subsurface, along with the immediate removal of free product at the time of the spill, decreased the risk for contaminant migration to groundwater caused by this release.

According to a 1997 Burns & McDonnell TACO Assessment of the spill site, Area B, which surrounds Tank 35-2 in the tank yard, had surface and subsurface concentrations of BTEX constituents that exceeded the TACO Tier 2 CUOs. The CUOs for this area included the calculated site-specific concentration for benzene (migration to groundwater pathway) and the construction worker scenario concentrations for TEX.

On behalf of Premcor, in a November 20, 1997 letter to the Illinois EPA, Burns & McDonnell presented a proposal for remediation activity. Burns & McDonnell stated Area B had surface and subsurface soil samples in excess of TACO Tier 2 CUOs for BTEX. Of the seven subsurface soil samples in excess of Tier 2 CUOs, four were located within the top 2 feet of the surface, including the two samples with the highest benzene concentrations. As most of the contamination was shallow (less than 2 feet bgs), proposed remediation efforts at this area included surface application of heterotrophic

bacteria and soil aeration through disking. Therefore, remediation efforts were to be concentrated on the top 2 feet of soil in this area. Excerpts from the referenced documentation for this incident are provided as Appendix P-6.

August 15, 1994 – Incident 941873 (Area F)

On August 15, 1994, Shell had a release of approximately 100 barrels of crude oil from their aboveground transfer line in the northeast corner of Tank 200-1 diked area. The spill was confined to the northeast corner of the Tank 200-1 tank yard. Premcor personnel used vacuum trucks to recover free product from the areas surrounding the release. Premcor estimated approximately 98 barrels of product were recovered by this process. Premcor initiated a modified biological augmentation program to remediate the soil by applying activated sludge from the aggressive biological wastewater treatment process. On June 5, 1995, Premcor collected a composite soil sample to determine levels of petroleum hydrocarbons in the soil.

October 10, 1994 – Incident 942288 (Area F)

On October 10, 1994, Premcor had a release of approximately 25 barrels of gasoline from the Tank 120-4 suction line in the northwest corner of the Tank 200-1 diked tank yard. The released product was contained within the Tank 200-1 dike in a 25-foot by 25-foot area. Premcor used vacuum trucks to recover free product from the areas surrounding the release. Premcor estimated approximately 24 barrels of product were recovered by this process. Recovered product was rerun through the process units. Premcor initiated a modified biological augmentation program to remediate the soil by applying activated sludge from the aggressive biological wastewater treatment process. On June 5, 1995, Premcor collected a composite soil sample to determine levels of petroleum hydrocarbons in the area around Tank 200-1. On July 13, 1995, Premcor began excavating impacted soil from the northwest corner of the Tank 200-1 tank yard. Between July 13 and July 17,

1995, three roll-off containers were loaded with soil. Approximately 35 cubic yards of soil were disposed of at Laidlaw Landfill in Roxana, Illinois.

December 17, 1994 – Incident 942855 (Area F)

On December 17, 1994, Premcor had a release of approximately one barrel of crude oil from an aboveground pipeline in the northeast corner of Tank 200-1 tank yard. The spill was confined to the northeast corner of the Tank 200-1 tank yard. The spill occurred in the same area as spill No. 941873. Premcor used vacuum trucks to recover free product from the area surrounding the release. Premcor estimated approximately 40 gallons of product had been recovered by this process. Recovered product was rerun through the process units.

June 7, 1995 – Incident 951217 (Area F)

On June 7, 1995, Premcor had a release of approximately 350 barrels of crude oil from a leaking valve on the south side of Tank 200-1. The release was contained within drainage ditches inside the diked areas of Tank 200-1. Premcor used vacuum trucks to recover free product and water from the areas surrounding the tank. Premcor estimated approximately 699 barrels of product and water were recovered by this process. Recovered product was rerun through the process units, while recovered water was treated at Premcor's aggressive biological wastewater treatment process. On July 11, 1995, Premcor began excavating soil from the area south of Tank 200-1. Between July 11 and July 13, 1995, 13 roll-off containers were loaded with soil and disposed of at a special waste landfill. On October 13, 1995, Premcor resampled the area by collecting grab soil samples from locations previously sampled for the composite. Samples were analyzed for BTEX and PNAs.

Incidents 941873 and 942288 became subject to a complaint (PCB 95-163) filed June 6, 1995 before the IPCB by the Attorney General of the State of Illinois on behalf of the Illinois EPA. Incident 942855 became subject to an Illinois EPA *Pre-Enforcement Conference* letter dated September 22, 1995. On March 11, 1996, the Illinois Attorney General's Office approved a sampling plan that included all four incidents wherein the Area was identified as Area F.

As a result, Burns & McDonnell conducted site investigations to determine the extent of contamination regarding these four releases. Of the 10 surface soil samples analyzed for BTEX, all were below the Illinois EPA TACO Tier 1, Table B Soil CUOs for Industrial/Commercial Properties. Of the four composite samples collected for PNA analysis, all four were below the TACO Tier 1 values. Eight subsurface soil samples were analyzed for BTEX and PNAs. All eight subsurface soil samples were below the TACO Tier 1 values for BTEX and PNAs.

In conclusion, Burns & McDonnell stated the following. No free petroleum product was encountered during soil sampling. All surface soil samples were below the TACO Tier 1 values for BTEX and PNAs. All subsurface soil samples were below the TACO Tier 1 values for BTEX and PNAs.

According to a 1997 Burns & McDonnell TACO Assessment of the spill site, Area F was below TACO Tier 2 CUOs for the applicable contaminant pathway scenarios. Burns & McDonnell stated this area did not require further assessment or remediation. Excerpts from the referenced documentation for this incident are provided as Appendix P-7.

December 16, 1994 - Incident 942837 (Area C)

On December 16, 1994, Premcor had a release of approximately 40 barrels of gas oil due to an overfill of Tank 55-1. The release was contained within the diked area around

Tanks 80-9 and 55-1. Premcor personnel used vacuum trucks to recover the product and water from the diked area. Approximately 1,675 gallons of liquid were recovered. Premcor initiated a modified biological augmentation program to remediate the soil by applying activated sludge from the aggressive biological wastewater treatment process. On June 5, 1995, Premcor collected a composite soil sample. On July 3, 1995, Premcor began excavating soil surrounding Tank 55-1. Between July 3 and July 10, 1995, 19 roll-off containers were loaded with soil. Between September 6 and September 7, 1995, an additional 14 roll-off containers were loaded with soil from the ditch areas surrounding Tank 55-1. Approximately 400 cubic yards of soil were disposed of at Laidlaw Landfill in Roxana, Illinois. On October 13, 1995, Premcor resampled the area by collecting grab samples from the locations previously sampled for the composite. Samples were analyzed for BTEX and PNAs.

Incident 942837 became subject to a complaint (PCB 95-163) filed June 6, 1995 before the IPCB by the Attorney General of the State of Illinois on behalf of the Illinois EPA. On March 11, 1996, the Illinois Attorney General's Office approved a sampling plan that included Incident 942837 wherein the Area was identified as Area C. The sampling plan also incorporated overflow of the gasoline spill (Incident 941772) from drainage from Tank 35-2.

As a result, Burns & McDonnell conducted site investigations to determine the extents of contamination. Of the seven surface soil samples analyzed for BTEX, all were below the Illinois EPA TACO Tier 1, Table B Soil CUOs for Industrial/ Commercial Properties. Of the four composite surface samples collected for analysis of PNAs, two soil samples exceeded the TACO Tier 1 values for at least one PNA. Six subsurface soil samples were analyzed for BTEX and PNAs. Three soil samples exceeded TACO Tier 1 values for benzene. Three soil samples exceeded TACO Tier 1 values for at least one PNA. One soil sample was below TACO Tier 1 values for BTEX and PNAs.

In conclusion, Burns & McDonnell stated the following. No free petroleum product was encountered during soil sampling. Two surface soil samples exceeded TACO Tier 1 values for PNAs. Three subsurface soil samples exceeded TACO Tier 1 values for benzene. Three subsurface soil samples exceeded TACO Tier 1 values for at least one PNA. One soil boring was located outside the spill area. The presence of elevated levels of PNAs at a 5-foot depth in this boring may be due to historic contamination. The increasing levels of petroleum hydrocarbons corresponding to increasing depth in one soil boring may be due to historic contamination.

According to a 1997 Burns & McDonnell TACO Assessment of the spill site, Area C, which surrounds Tank 55-1 in the tank yard, had subsurface soil concentrations of benzene in two samples that exceeded the Tier 2 CUOs. The benzene CUO for this area was a calculated site-specific concentration for the migration to groundwater pathway.

On behalf of Premcor, in a November 20, 1997 letter to the Illinois EPA, Burns & McDonnell presented a proposal for remediation activity. Burns & McDonnell stated Area C had only two samples in excess of Tier 2 CUOs for benzene. Both subsurface soil samples were collected from a soil boring at depths indicating localized historical contamination. As these benzene concentrations appeared unrelated to the spill event of interest, additional remediation activities were not proposed for Area C. Excerpts from the referenced documentation for this incident are provided as Appendix P-8.

November 13, 1995

A facility internal memorandum identified an approximate 20- to 30-barrel spill of gasoline at the pump house due to a failed expansion joint on the north side of the pump house. Sorbent booms were applied, and the product was vacuumed. No further information was available. The referenced documentation for this incident is provided as Appendix P-9.

June 17, 1996/September 12, 1996

On June 17, 1996, an Illinois EPA Compliance Evaluation Inspection identified a leak of F037 (primary WWT sludge), F038 (secondary WWT sludge), and K049 (Slop Oil Emulsion Solids) from a hard section of hose from Tank 162 to the lime tank. The exact location was not identified. The inspection identified the leak as an apparent violation of 722.134(a), specifically 725.131. In a July 8, 1996 *Compliance Inquiry* letter, the Agency identified several apparent violations, including a leak of the same wastes elsewhere at the facility, although the above leak was not mentioned in the letter. On September 12, 1996, an Illinois EPA Follow-Up Inspection stated the contaminated soil and gravel from the area of the leaking hose had been cleaned up, and the material was shipped offsite for disposal. The inspection stated this technically remediated the apparent violation of 722.134(a), specifically 725.131. Excerpts from the referenced documentation for this incident are provided as Appendix P-10.

May 26, 1998 - Incident 981246

On May 26, 1998, Premcor had a fire in its recovered oil process area. Vapors escaped from one of the enclosed fract tanks used in the recovered oil process and then ignited. The fire burned the expelled liquid from the tank. The resulting ground fire destroyed the transfer hoses used to connect the recovered oil process tanks. Oil leaking from the damaged hoses continued to fuel the fire. The fire was contained inside the diked area around Tank 5-10, and a combination of water and foam was applied to extinguish the flames. The fire resulted in the total loss of the recovered oil processing equipment and caused damage to adjacent tanks, equipment, and piping.

Immediately after extinguishing the fire, Premcor personnel used vacuum trucks to recover the remaining free product and water from the area surrounding the tank. Premcor estimated approximately 140 barrels of oil and 500 barrels of water were

recovered. Recovered oil was reprocessed, while recovered water was treated at Premcor's aggressive biological wastewater treatment process. In August and September 1998, Premcor excavated soil from the area around Tank 5-10. Twenty roll-off containers (containing 12 cubic yards each) were loaded with soil. Approximately 240 cubic yards of soil were disposed of at an approved landfill.

In response to the release, Premcor proceeded with an ESI near Tank 5-10. Premcor prepared a SAP (dated October 1998) to address surface soil sampling in the Tank 5-10 vicinity. Burns & McDonnell conducted the surface soil sampling in accordance with the Premcor SAP. In February 1999, Burns & McDonnell prepared a SAP to address additional surface soil sampling, subsurface soil sampling, and groundwater sampling as requested by the Illinois EPA. On March 22, 1999, the Illinois EPA approved this SAP. Field sampling was conducted on March 30 and March 31, 1999.

Findings of the investigation were submitted to the Illinois EPA in the *Site Investigation Report for the Tank 5-10 Area* prepared by Burns & McDonnell and dated April 1999. Burns & McDonnell concluded soil sampling results for the Tank 5-10 area indicated 11 of the 17 surface soil samples were in excess of Tier 1 CUOs for at least one of the following compounds: benzene, toluene, ethylbenzene, and benzo(a)anthracene. Subsurface sampling indicated three of the nine soil borings had concentrations in excess of the Tier 1 ROs for at least one of the following compounds: benzene, toluene, and benzo(a)anthracene. Tier 2 calculations included in the ROR used Soil Screening Levels (SSL) and Risk-Based Corrective Action (RBCA) equations along with site-specific, chemical-specific, and default parameters to generate ROs based on risk associated with this specific site. Burns & McDonnell prepared Tier 2 and Tier 3 remediation objective (RO) calculations for the identified contamination. Based on this information, the proposed RO for benzene in soil was 31.2 milligrams per kilogram (mg/kg). (The most restrictive exposure pathway for benzene is the soil component of the groundwater ingestion.) All surface and subsurface soil benzene concentrations in the area were below

31.2 mg/kg. The proposed RO for benzo(a)anthracene in soil was 23 mg/kg. (The most restrictive exposure pathway for benzo(a)anthracene is industrial-commercial ingestion.) All surface and subsurface soil benzo(a)anthracene concentrations in the area were below 23 mg/kg.

The proposed RO for ethylbenzene in soil was 400 mg/kg. (Results from all exposure pathway calculations for ethylbenzene were in excess of the soil saturation limit, so the soil saturation limit was used.) All surface and subsurface soil ethylbenzene concentrations in the area were below 400 mg/kg. The proposed RO for toluene in soil was 650 mg/kg. (Results from all exposure pathway calculations for toluene were in excess of the soil saturation limit, so the soil saturation limit was used.) Toluene concentrations in two surface soil samples were in excess of the proposed RO.

The proposed RO for benzene in groundwater was 97 mg/L. The benzene concentration in the groundwater sample from the release area was below 97 mg/L. The proposed GROs for benzo(a)anthracene, toluene, and benzene at the source were greater than the solubility of each chemical in water; therefore, the water solubility was proposed as the RO for each of these compounds. There were no detections of the compounds of concern in the groundwater sample above the chemical-specific solubility in water.

Burns & McDonnell stated that upon final acceptance of proposed CUOs, Premcor would prepare a RAP to address the site areas that remain in excess of the proposed ROs. The RAP would also address necessary institutional controls, as well as sampling requirements, following completion of the remedial effort. Excerpts from the referenced documentation for this incident are provided as Appendix P-11.

December 1990/February 6, 1997

According to the Illinois EPA CERCLA SSI, which collected samples in December 1990, analytically significant levels of volatiles, naphthalene, and cobalt were detected in soil samples collected from the north and south sides of the TEL Building. Pathways of concern included groundwater and soil exposure. Sample results from the location of Tanks 35-1 and 35-2 revealed analytically significant levels of volatiles, semi-volatiles, heptachlor, and metals. A sample from the Tank 10-2 area showed analytically significant levels of pyrene, benzo(a)anthracene, Endosulfan II, cobalt, and mercury. Pathways of concern included groundwater and soil exposure. Soil samples from the tank bottoms pit location (also known as the Triangle Impoundment) revealed analytically significant levels of volatiles, semi-volatiles, Endosulfan II, and metals. Pathways of concern included groundwater and soil exposure.

Groundwater results from two wells, one near the TEL Building and one near Process Well 3, revealed the presence of volatiles, semi-volatiles, pesticides, metals, laboratory artifacts, and common inorganic groundwater constituents. Excerpts from the referenced documentation for this incident are provided as Appendix P-12.

CERCLA Expanded Site Inspection

According to the Illinois EPA CERCLA ESI (2001), shallow and deep soil samples were collected in November 2000 from several locations within the Bulk Storage Tanks North Area, specifically, the former TEL Building, Tanks 35-1 and 35-2, Tank 162 (formerly Tank 10-2), Tank 120-2, and the Triangle Impoundment. All samples from the former TEL Building, Tanks 35-1 and 35-2, Tank 162 (formerly Tank 10-2), Tank 120-2, and the Triangle Impoundment contained various volatile constituents at levels equal to or greater than three times offsite background levels.

All samples from the former TEL Building, Tanks 35-1 and 35-2, Tank 162 (formerly Tank 10-2), and the Triangle Impoundment contained various semi-volatile constituents at levels equal to or greater than three times offsite background levels.

Samples from Tanks 35-1 and 35-2, Tank 162 (formerly Tank 10-2), and the Triangle Impoundment contained various pesticide/PCB constituents at levels equal to or greater than three times offsite background levels.

A deep sample from the former TEL Building and a shallow sample from Tanks 35-1 and 35-2, the sample from Tank 120-2, and the shallow and deep sample from the Triangle Impoundment contained various inorganic constituents at levels equal to or greater than three times offsite background levels. The referenced documentation for this report is provided as Appendix P-13.

Additional Issues

A July 25, 2001 letter from the Illinois EPA stated an inspection of the facility was conducted on April 10, 2001 to determine the site's compliance with the Illinois Environmental Protection Act and 35 IAC 703, 721, 722, 724 and 728 regulations. According to the April 10, 2001 Illinois EPA Inspection Report, the purpose was to obtain samples for laboratory analysis of the soils and sludge in the Triangle Surface Impoundment.

The Triangle Surface Impoundment, located south of Tank 200-1, covers an area about 8,450 square feet. The Triangle Surface Impoundment is a manmade diked excavation formed primarily of earthen materials. According to Premcor, this impoundment contains crude oil tank bottoms. The surface impoundment was covered with a dry crust of weathered petroleum hydrocarbons. The sludge under the crust was a wet, sticky, oily sludge. According to a Premcor representative, no waste had been placed in this

impoundment in over 23 years. At this time, the Illinois EPA does not possess evidence that the waste placed in this impoundment is subject to RCRA.

A sample exceeded the 35 IAC 742: TACO Objectives, Tier 1 SROs for Residential Properties Ingestion Exposure Route-Specific Values for Soils for benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, dibenzo(ah)anthracene, and arsenic. This sample also exceeded the Soil Component of the Groundwater Ingestion Exposure Route Values for benzene, ethylbenzene, xylenes, and lead.

A second sample exceeded the 35 IAC 742: TACO Tier 1 SROs for Residential Properties Ingestion Exposure Route-Specific Values for Soils for naphthalene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c,d)pyrene, chrysene, dibenzo(a,h)anthracene, arsenic, and beryllium. The sample also exceeded the Soil Component of the Groundwater Ingestion Exposure Route Values for BETX and lead.

On April 12, 2001, Premcor began removing waste from the Triangle Surface Impoundment. As of July 11, 2001, Premcor had removed the following from the Triangle Surface Impoundment:

- 3,010 barrels of oil recovered
- 5,850 barrels of water recovered
- 66 tons of AFCM were recovered
- 2,500 barrels of slurried Triangle waste still onsite waiting to be processed
- 1,066 barrels of waste estimated to still be in the Triangle Surface Impoundment

On July 23, 2001, a Premcor representative stated that Premcor's intentions were to enter into the State of Illinois Site Remediation Program (SRP) for the cleanup of the Triangle Surface Impoundment.

In a August 10, 2001 letter to the Illinois EPA, Premcor enclosed an application into the Illinois SRP for a focused No Further Remediation (NFR) letter, specifically for volatiles, semi-volatiles, and metals. Excerpts from the referenced documentation for this incident are provided as Appendix P-14.

1994

According to ENSR's *Environmental Due Diligence Evaluation and Liability Cost Estimates Relative to Clark Facilities: Refineries, Terminals, Gasoline Stations, and Pipeline* (1994), based on ENSR's previous 1990 inspection, apparent significant visible oil contamination as well as material that could be defined as hazardous waste was observed at the bermed areas around the storage tanks. Based on ENSR's current 1994 inspection, several significant actions had occurred regarding the previously identified areas of onsite contamination. However, the areas within the containment berms of the slop oil (recycle oil) interim storage tanks (R-13, R-16, 10-1, 10-6, and generally most of the "10" identified tanks) were heavily oil stained as in 1990. ENSR also stated that, like most petroleum refineries, past tank bottoms and water drains from storage tanks were spread on the containment berms and discharged into the containment areas to infiltrate into the soil. Various major and minor spills within the containment areas had resulted in significant oily material surface contamination. This contamination was now being addressed by a program consisting of removal of oily material-saturated soil contamination and application of bio-sludge from the biological treatment unit to visible oily material/soil contamination. At the time of ENSR's 1994 inspection, the biodegradation program had recently started; thus, results had not been established. The plan was to continue the program as a long-term effort with periodic monitoring. The referenced documentation for this location is provided as Appendix P-15.

Conclusion

Based on the documents reviewed that pertain to the Bulk Storage Tanks North Area, the area as been identified as a REC due to operations involving large quantities of petroleum products and operational releases including:

- Until the late-1970s, crude oil tank bottoms were disposed in the Triangle Impoundment.
- In 1984, a release resulting in the disposal of four drums (220 gallons) of TEL-contaminated soil from the former TEL Building area.
- In 1989, a release resulting in the excavation of 409 tons of waste/soil from the Tank 10-2 Area.
- On February 21, 1993, approximately 750 barrels of crude oil were released from Tank 120-2 (Incident 930211).
- On an unknown date, approximately 50 barrels of gasoline were released at Tank 10-5. On July 9, 1994, approximately 308 barrels of naphtha and toluene were released at Tank 10-5 (Incident 941526).
- On August 9, 1994, approximately 2,000 barrels of gasoline were released at the Tanks 35-1 and 35-2 area (Incident 941772).
- On December 16, 1994, approximately 40 barrels of gas oil were released at the Tank 55-1 area (Incident 942837).
- On November 13, 1995, approximately 20 to 30 barrels of gasoline were released at the pump house.
- On June 17, 1996, an unknown amount of F037, F038, and K049 released from a hose in the Tank 162 area was discovered.
- On May 26, 1998, approximately 140 barrels of recovered oil were released at the Tank 5-10 area (Incident 981246).

Based on the documents reviewed that pertain to the Bulk Storage Tanks North Area, the following historical RECs were identified:

- On August 15, 1994, approximately 100 barrels of crude oil were released at the Tank 200-1 area (Incident 941873)
- On October 10, 1994, approximately 25 barrels of gasoline were released at the Tank 200-1 area (Incident 942288).
- On December 17, 1994, approximately one barrel of crude oil was released at the Tank 200-1 area (Incident 942855).
- On June 7, 1995, approximately 350 barrels of crude oil were released at the Tank 200-1 area (Incident 951217).

3.8.1.8 Procedures Used to Close the Bulk Storage Tanks North Area or Remediate Any Contamination Present

Remediation and closure procedures are discussed in Section 3.2.1.7.

3.8.1.9 Assessment of the Potential for Contamination Being Present and the Next Steps That Should Be Taken

Further investigation and characterization of the potential for contamination in the Bulk Storage Tanks North Area is necessary since the potential for contamination exists based on the historical presence and operation of this area, the identified spill incidents, and the Triangle Impoundment.

3.8.2 Remedial/Interim/Stabilization Measures

3.8.2.1 Description of the Measure

Generally, when Premcor experienced specific releases, Premcor responded by removing the released material and impacted soil, and took other steps as described above to eliminate the obvious effects of the release. Measures are discussed in Section 3.8.1.7.

3.8.2.2 Objectives of the Measure

The objective of the measures was to mitigate environmental impact to the soil and groundwater.

3.8.2.3 Description of the Design, Construction, Operation, and Maintenance of the Measure

Measures are discussed in Section 3.8.1.7.

3.8.2.4 Information Regarding the Actual Implementation and Effectiveness of the Measure

Measures are discussed in Section 3.8.1.7.

3.9 AREA 9 – BULK STORAGE TANKS SOUTH

Records of spills, releases, or other incidents were found for this area.

3.9.1 Possible Sources/Areas of Contamination

3.9.1.1 Location of Bulk Storage Tanks South Area

The location of the Bulk Storage Tanks South Area (Area 9) is shown on Figure 3-1. A portion of this area is leased to Shell for use as a terminal truck-loading and bulk storage facility. Currently, Premcor controls only the four bulk storage tanks (120-7, 120-8, 120-10, and 120-11) in the northeast portion of this area. Shell controls the terminal truck-loading areas and the five bulk storage tanks (1 through 5) in the southern portion of this area.

3.9.1.2 Horizontal and Vertical Boundaries of the Bulk Storage Tanks South Area

The horizontal boundaries of the Bulk Storage Tanks South Area (Area 9) are shown on Figure 3-9. There are no vertical boundaries.

3.9.1.3 Construction, Operation, and Structural Integrity

The total petroleum storage capacity in the Bulk Storage Tanks South Area is 17,393,104 gallons (552,162 barrels). Locations of oil storage areas are identified on Figure 3-9. Storage tank identification numbers and tank capacities are provided in Appendix Q-1.

Secondary containment basins are present at the tanks in the event of a tank overflow, leakage, or rupture. According to Premcor personnel, secondary containment for storage areas at the Refinery has a capacity of at least 110 percent (%) of the largest tank volume. The dikes are constructed of compacted clay and covered with gravel that is sufficiently impervious to contain spills. Additional dikes and manual shut-off valves are located within each containment area to provide emergency access and additional spill control, and to minimize storm water contamination potential. Drainage from diked storage areas is restrained by valves to prevent spills or excessive leakage of oil into the surface drainage system.

All aboveground valve and pipeline systems are routinely inspected by operating personnel. In most areas, inspections are conducted on a daily basis especially where high-volume product transfers occur.

Four propane gas tanks are located in the northwest portion of this area. Terminal truck loading (five loading stations) is located on the northern side of the Bulk Storage Tanks South Area. Each loading station includes a spill collection system comprising individual catch basins beneath each loading station. The catch basins are connected to a common sump and a 2,000-gallon slop oil storage tank. Potential spills at the loading stations would be contained by the loading station catch basin, sump, and slop oil storage tank. A landfill containing lime sludge pit wastes from the stormwater retention area (and possible other facility waste) is located west of storage tanks 120-7, 120-8, 120-10, and 120-11, and north of Tanks 4 and 5.

3.9.1.4 *Material Managed in the Bulk Storage Tanks South Area, Including the General Chemical Composition of the Material Waste*

AST 120-8 contains naphtha. Tanks 120-7 and 120-10 contain gas oil. Storage Tank 120-11 contains #2 Stripper, and Tank 2 contains premium-unleaded gasoline. ASTs 1 and 5 contain unleaded gasoline, and Tanks 3 and 4 store #2 fuel oil.

The landfill covers approximately 7 acres. The landfill contains dredged sludge from the lime pits located on the west side of the stormwater retention area. Figure 3-9 shows the location of the landfill.

3.9.1.5 *Quantities of Waste/Materials in the Bulk Storage Tanks South Area*

No process wastes are generated in the Bulk Storage Tanks South Area. No waste materials are contained in the storage tanks in this area. According to a December 1994 ENSR report, the lime pit sludge landfill may have been used for the disposal of other refinery waste along with the lime pit sludge. The content of the other refinery waste is unknown. According to refinery personnel, these samples showed "no constituents of concern." No documentation of the landfill sample results was reviewed.

3.9.1.6 *History of the Use of the Bulk Storage Tanks South Area and the Surrounding Area*

Prior to construction of the bulk south storage tanks, the land was primarily used for agricultural purposes. ASTs 120-7 and 120-8 were constructed in 1957. The truck terminal was constructed in 1974. Tanks 1 through 5 were constructed in 1974, and Tanks 120-10 and 120-11 were constructed in 1975. According to aerial photographs, disposal at the lime pit sludge landfill began between 1974 and 1978. The landfills were closed between 1993 and 1998.

The Bulk South Storage Tanks Area is bordered to the north by the Refining Process I Area. Agricultural fields are located east and south of the Bulk Storage Tanks South Area. A commercial property is located south of the Bulk Storage Tanks South Area. The Asphalt Plant Area and railroad tracks, with Olive Street beyond, are located to the west of the Bulk South Storage Tanks Area.

3.9.1.7 All Available Data and Qualitative Information on the Level of Contamination at the Bulk Storage Tanks South Area

Information related to releases from the Bulk Storage Tanks South Area is provided in this section.

August 23, 1994 – Incident 941913 – NRC 256953

On August 23, 1994, approximately 3,500 gallons (50 barrels) of gas oil were released from a 6-inch gas oil line on the south property entrance of the transfer lines located in the west pit. The leak occurred in the Tank 120-7 line located inside the west pit tunnel running under Hawthorne Street. The line was minimally used until repair of the line could be accomplished. Gas oil and water were removed from the west pit using a vacuum truck, and a catch basin and recovery pump were installed in the south property pit. The line was not repaired until correct timing with operations could be accomplished. A narrative of this release is provided as Appendix Q-2. The remediation of this area is discussed in Section 3.9.1.8.

September 25, 1994 – Incident 942188 – NRC 262288

On September 25, 1994, a release was reported when the 10-inch suction line for the FCCU was being purged back to the charge tank while repairs for incident number 941913 were being conducted. Approximately 1,700 barrels of gas oil were released

from the concrete pit on the north side of Hawthorne Street and from the tunnel on the south side. An estimated 17,980 square feet of soil north of Hawthorne Street and 6,680 square feet of soil south of Hawthorne Street were affected by the release.

Vacuum trucks removed approximately 1,400 barrels of gas oil. Recovered product was returned through the process units. Soil was excavated from depths of 6 inches to 1-foot bgs on the north side of Hawthorne Street. On the south side of Hawthorne Street, soil was excavated from depths of 8 inches to 5 feet bgs. Approximately 1,500 cubic yards of soil were excavated and disposed of as special waste at a landfill. A modified biological augmentation program was initiated by applying activated sludge from the WWTP area to the soil. Premcor collected grab soil samples from September 29, 1994 to October 13, 1995 to determine if CUOs had been reached. The analytical data are summarized in Appendix Q-2.

Ten surface and 12 subsurface soil samples were collected in association with incident numbers 942188 and 941913. The samples were analyzed for BTEX and PNAs. All surface soil samples were below TACO Tier 1 ROs for BTEX and PNAs. All subsurface soil samples were below TACO Tier 1 ROs except soil borings SB-1 and SB-3. Soil boring SB-1 exceeded benzene ROs, and SB-3 exceeded chrysene ROs. Both samples were collected outside the spill area and may be associated with historic events. Appendix Q-3 provides the results of the soil sampling. According to the Burns & McDonnell TACO assessment of the Incident 942188 and Incident 941913 release area, Tier 2 CUOs had been reached. Appendix Q-4 provides portions of the Burns & McDonnell report. No further documentation on these incidents was available.

Other

Truck terminal pumps are located on the north side of the Bulk Storage Tanks South property. General releases associated with piping repairs and loading of product into

trucks may have occurred. Additionally, above or belowground product piping throughout Area 9 could potentially have had releases throughout the facility's operations.

As discussed in Sections 3.9.1.5 and 3.9.1.6, a lime pit sludge landfill exists in the western portion of the Area 9. No sampling documentation was available in association with the landfill.

Conclusion

Based on the documents reviewed that pertain to the Bulk Storage Tanks South Area, the area has been identified as a REC due to operations involving large quantities of petroleum products, product loading at the truck terminal, a lime sludge pit landfill, and operational releases including:

- On August 23, 1994, approximately 3,500 gallons of gas oil were released from a pipeline (Incident 941913).
- On September 25, 1994, approximately 1,700 barrels of gas oil were released from a pipeline (Incident 942188).

3.9.1.8 Procedures Used to Close the Bulk Storage Tanks South Area or Remediate Any Contamination Present

Remediation and closure procedures are discussed in Section 3.9.1.7.

3.9.1.9 Assessment of the Potential for Contamination Being Present and the Next Steps That Should Be Taken

Further investigation and characterization of the potential for contamination in the Bulk Storage Tanks South Area is necessary since the potential for contamination exists based

on the historical presence and operation of this area, the identified spill incidents, and the landfill.

3.9.2 Remedial/Interim/Stabilization Measures

3.9.2.1 Description of the Measure

Generally, when Premcor experienced specific releases, Premcor responded by removing the released material and impacted soil, and took other steps as described above to eliminate the obvious effects of the release. Measures are discussed in Section 3.9.1.7.

3.9.2.2 Objectives of the Measure

The objective of the measures was to mitigate environmental impact to the soil and groundwater.

3.9.2.3 Description of the Design, Construction, Operation, and Maintenance of the Measure

Measures are discussed in Section 3.9.1.7.

3.9.2.4 Information Regarding the Actual Implementation and Effectiveness of the Measure

Measures are discussed in Section 3.9.1.7.

3.10 AREA 10 – WASTEWATER TREATMENT PLANT

Records of spills, releases, or other incidents were found for this area.

3.10.1 Possible Sources/Areas of Contamination

3.10.1.1 Location of Waste Water Treatment Plant Area

The location of the Waste Water Treatment Plant (WWTP) Area (Area 10) is shown on Figure 3-1.

3.10.1.2 Horizontal and Vertical Boundaries of the Waste Water Treatment Plant Area

The horizontal boundaries of the WWTP Area (Area 10) are shown on Figure 3-10. There are no vertical boundaries.

3.10.1.3 Construction, Operation, and Structural Integrity

The WWTP area removes contaminants from wastewater prior to discharge from the facility. The sources of wastewater are the oil sewer, the storm sewer, the #5 lift station, and the sanitary sewer. The oil sewer collects process water from throughout the refinery.

Water pumped from #4 lift station merges with discharges from the Guard Basin, the API (cement pond), the north pond, and the #5 lift station before entering the equalization tanks. In the equalization tanks, oil floats on the surface and is removed by a floating suction device that pumps to Tank 5-10 (North Bulk Storage Tank Area). The water from the equalization tanks is gravity-fed to the DAF unit. The DAF removes non-settleable

emulsions or suspensions from water by injecting a flocculent (polymer) at the Forebay discharge line to promote coagulation and floatation of the solids.

The refinery sanitary sewer system enters the WWTP at a unit referred to as the Clow. Solid waste is shredded in a comminuator before entering a small aeration tank.

The Biological Oxidation Unit (BIO) acts as the final filtration process, removing both dissolved and suspended organic and inorganic material from the refinery wastewater. The combined DAF and Clow effluent is pumped to dual aerated settling basins. Clarified water overflows a weir and passes through four sand/charcoal filters. The clean water exits the filters and collects in the final effluent sump from which the water is pumped to the firewater pond. The firewater pond level is controlled by an automatic level control that discharges to the Mississippi River.

3.10.1.4 Material Managed in the Waste Water Treatment Plant Area, Including the General Chemical Composition of the Material Waste

The WWTP handles all wastewater from the refinery. The WWTP removes contaminants from wastewater prior to discharge from the facility.

3.10.1.5 Quantities of Waste/Materials in the Waste Water Treatment Plant Area

The WWTP has a National Pollutant Discharge Elimination System (NPDES) discharge permit for treated wastewater discharge to the Mississippi River. DAF float waste (K048) is recycled through the coker at the refinery.

3.10.1.6 History of the Use of the Waste Water Treatment Plant Area and the Surrounding Area

According to Clark's December 11, 1973 SPCC Plan, a new activated sludge WWTP was under construction in December 1973. The property to the east and south is part of the refinery, specifically, the Bulk Storage Tanks North Area and the Administration Area, respectively. The property to the north is the former tannery property currently owned by Shell. The property to the west consists of railroad tracks with Olive Street and the Village of Hartford further west.

3.10.1.7 All Available Data and Qualitative Information on the Level of Contamination at the Waste Water Treatment Plant Area

Information related to releases from the WWTP Area is provided in this section.

April 18, 1991

On April 18, 1991, Illinois EPA sent a *Compliance Inquiry* letter to Premcor. On March 21, 1991, Illinois EPA completed an inspection of the Premcor facility and found several areas of non-compliance at the facility, specifically, no demonstration that in-ground piping at Tank 4 had secondary containment, and no disconnect couplings or check values at Tank 4. Instead, an unlabeled and open 55-gallon drum was being used to collect drippage/spillage from the ancillary equipment outside Tank 4's containment system. Lack of overfill protection controls was also noted at Tanks 4 and T1-18.

In a June 13, 1991 *Pre-Enforcement Conference* letter to Premcor, the Illinois EPA stated that some violations noted in the April 18, 1991 letter had not been resolved.

April 19, 1994 - Incident 940851

Premcor had a release of approximately 25 barrels of asphalt due to a leaking gasket on the 14-inch-diameter Black Oil River Line in the northwest corner of the BIO unit. The released product was contained in a ditch along the railroad tracks between the Hartford Refinery and Shell Oil property.

Premcor used vacuum trucks to recover approximately 20 barrels of liquid, which were transported to the Hartford Refinery for reprocessing. The visually impacted area was excavated to a depth of 12 inches and placed in three roll-off containers. Approximately 32 cubic yards of soil were transported to Laidlaw Landfill in Roxana, Illinois for disposal. Premcor collected one composite soil sample prior to backfilling. Mr. Tom Powell of the Illinois EPA also collected a soil sample from the excavation prior to Premcor backfilling with soil and rock.

This release was included with 12 other reported releases in a October 7, 1994 *Pre-Enforcement Conference* letter from Illinois EPA that indicated Premcor was in non-compliance with the Illinois Environmental Protection Act. In a June 15, 1995 letter, the Agency requested follow-up information on the release.

On behalf of Premcor, Burns & McDonnell submitted a *Summary Report of Spills at the Clark Hartford Refinery* (dated November 1995) to Illinois EPA that included Incident 940851. The table and figures from this report are provided as Appendix R-1.

On behalf of Premcor, Burns & McDonnell submitted a SAP (dated March 1996) to Illinois EPA for Incident 940851. The SAP summarized proposed intrusive investigation activities to characterize surface and subsurface conditions.

On April 7, 1997, Premcor submitted a *Summary Report: Surface and Subsurface Investigations of the Spills at the Clark Hartford Refinery* (dated September 1996), which included an intrusive investigation of Incident 940851.

As part of the intrusive investigation and to determine the approximate vertical and horizontal extent of petroleum hydrocarbons at the site, four surface soil samples were collected. The sample locations are shown on Figure 2 in Appendix R-1. The four surface samples were analyzed for BETX. Two surface composite soil samples were analyzed for PNAs.

Surface samples were all below TACO Tier 1 values for BETX. Surface composite samples exceeded TACO Tier 1 values for one or more PNAs. The table and figures from this report are provided as Appendix R-1.

On November 10, 1997, Premcor submitted a *Tiered Approach Objective Assessment* to the Illinois EPA. The report was prepared by Burns & McDonnell and dated November 3, 1997. This TACO Tier 2 assessment indicated soil sample concentrations were below the Tier 2 CUOs.

October 19, 1997

According to Premcor files, a 20- to 25-barrel oil spill occurred while transferring oil from the API to the 510 tank. A mixture of oil and water was vacuumed up. No additional documentation was available for this incident.

August 28, 1998 - Violation Notice L-1998-01390

On August 28, 1998, the Illinois EPA issued a Violation Notice based on a July 23, 1998 inspection of the Premcor facility. Among the violations was hazardous waste under the sealant of the secondary containment for Tank T-171.

In a October 12, 1998 letter to the Illinois EPA, Premcor responded to the violation notice.

On November 5, 1998, Illinois EPA rejected the Compliance Commitment Agreement (CCA) proposed by Premcor dated October 12, 1998 and October 23, 1998.

On November 30, 1998, Illinois EPA accepted the CCA proposed by Premcor dated November 24, 1998. Clayton did not have access to the November 24, 1998 letter from Premcor.

CERCLA Expanded Site Inspection

In November 2000, Illinois EPA conducted a CERCLA ESI. The inspection included collecting two soil samples (a shallow and a deep sample) from the WWTP area. Elevated concentrations of volatiles and semi-volatiles were detected in these samples at levels equal to or greater than three times offsite background levels. Various pesticide/PCB constituents were also detected in the shallow sample, and various inorganic constituents were present in the deep sample at levels equal to or greater than three times offsite background levels. The figure and tables showing these sample results are provided as Appendix R-2.

February 23, 2000 - Violation Notice W-2000-00087

On February 23, 2000, the Illinois EPA issued a Violation Notice for effluent violations at the WWTP.

On March 30, 2000, the Illinois EPA accepted a CCA proposed by Premcor that included upgrades to the WWTP so compliance with the NPDES would be achieved.

April 18, 2001 - Violation Notice M-2001-01015

On April 18, 2001, Illinois EPA issued a Violation Notice based on a February 20, 2001 inspection of the Premcor facility. In relation to the WWTP area, the Illinois EPA observed DAF K048 sludge on the ground between the DAF and the Sanitary Clow. The Illinois EPA alleged that Premcor was operating a hazardous waste disposal facility without a permit. Illinois EPA further alleged that Premcor failed to have a written closure plan for the unpermitted disposal area between the DAF and the Sanitary Clow.

In a May 21, 2001 letter to the Illinois EPA, Premcor responded to the Violation Notice and proposed a CCA. Premcor stated the DAF unit was repaired. Premcor further stated it did not believe that wastewater leaking from the DAF was F038 or F037 material.

On June 28, 2001, Premcor sent a revised CCA to the Illinois EPA, based on discussions with Illinois EPA at a June 11, 2001 meeting. The CCA included a *Closure Plan for the Dissolved Air Floatation Unit Area* prepared by Burns & McDonnell. The closure plan identified the leak from the DAF as wastewater and not K048 sludge. Premcor excavated approximately 5 to 6 cubic yards of crushed rock at the spill location, triple-rinsed the rock (the rinsate was treated through the Premcor WWTP), and replaced the rock.

In a July 24, 2001 letter to Premcor, the Illinois EPA rejected the May 21, 2001 and June 28, 2001 CCA.

In a October 3, 2001 letter to Premcor, Illinois EPA approved (with conditions and modifications) the RCRA Closure Plan submitted June 28, 2001.

On March 14, 2002, Illinois EPA sent Premcor a *Notice of Intent to Pursue Legal Action* for failure to respond adequately to Violation Notices M-2001-01015 and L-2001-01421.

In a March 29, 2002 letter to the Illinois EPA, Premcor provided soil sampling data for the DAF area. Soil samples were collected from beneath the crushed rock. Contamination was noted in some samples, but Premcor concluded that due to the inconsistent nature of the data, both species and spatial, the detected contaminant appeared unrelated to any releases from the DAF area. The analytical data table is provided as Appendix R-3. Premcor stated further excavation to meet TACO Tier 1 criteria was not feasible due to the inconsistent nature of the contamination and because additional excavation would threaten the foundation stability of the equipment.

In a June 3, 2002 letter to Premcor, Illinois EPA stated insufficient information was provided in its March 29, 2002 letter, and Premcor had failed to complete closure of the DAF Area in accordance with Illinois EPA-approved plans.

November 8, 2001 – Asphaltic Oil Release

On November 8, 2001, approximately 420 barrels of heated asphaltic oil spilled along the northern perimeter fence in the northwest section of the Premcor facility. The adjacent tannery property was also impacted by the release. A diagram showing the impacted area is provided as Appendix R-4.

On November 9, 2001, a track-hoe was brought to the site, and soil in the spill area was excavated to a depth of approximately 3 inches to 1 foot below grade to remove visually impacted soil and vegetation. Approximately 1,338 cubic yards of soil were removed.

During a visual inspection of the spill area on November 16, 2001, it was noted that some parts of the original impact area were not remediated, and some product had been tracked with the track-hoe to previously unimpacted areas. On November 26, 2001, approximately 100 additional cubic yards of impacted material were removed by a dowser.

Confirmatory samples were collected by URS Corporation on behalf of Shell Oil. No further information on this spill was provided in the Premcor files.

January 10, 2003 - Violation Notice M-2002-01056

On January 10, 2003, Illinois EPA issued a Violation Notice based on a November 26, 2002 inspection of the Premcor facility. The Illinois EPA stated Premcor had not completed closure of the DAF Area in accordance with plans approved by the Agency on October 3, 2001.

In a February 7, 2003 letter to the Illinois EPA, Premcor stated that the closure plan was being re-evaluated.

On March 6, 2003, Illinois EPA sent Premcor a *Request for a Meeting* letter for Violation Notice M-2002-01056.

NPDES Excursions

Over the course of operation, multiple excursions of Premcor's NPDES have occurred at the WWTP.

Other

Review of a 1974 Premcor drawing shows a "Hazardous Waste Sump" and "Hazardous Waste Barrel Storage Area" east of Tank T-66. A portion of the drawing is provided as Appendix R-5.

Conclusion

Based on the documents reviewed that pertain to the WWTP Area, the area has been identified as a REC due to operations involving large quantities of petroleum-related materials and operational releases, including:

- RCRA-related waste issues associated with the DAF identified in Violation Notices M-2001-01015 and M-2002-01056.
- On November 8, 2001, approximately 420 barrels of asphaltic oil were released near the property boundary.
- A 1974 drawing shows a "Hazardous Waste Sump" and "Hazardous Waste Barrel Storage Area" east of Tank T-66.

Based on the documents reviewed that pertain to the WWTP Area, the following historic REC was identified:

- On April 19, 1994, approximately 25 barrels of asphalt were released from a pipeline (Incident 940851).

3.10.1.8 Procedures Used to Close the Waste Water Treatment Plant Area or Remediate Any Contamination Present

Remediation and closure procedures are discussed in Section 3.10.1.7.

3.10.1.9 Assessment of the Potential for Contamination Being Present and the Next Steps That Should Be Taken

Further investigation and characterization of the potential for contamination in the WWTP Area is necessary since the potential for contamination exists based on the historical presence and operations of this area, the identified spill incidents, and the hazardous waste storage.

3.10.2 Remedial/Interim/Stabilization Measures

3.10.2.1 Description of the Measure

Generally, when Premcor experienced specific releases, Premcor responded by removing the released material and impacted soil, and took other steps as described above to eliminate the obvious effects of the release. Measures are discussed in Section 3.10.1.7.

3.10.2.2 Objectives of the Measure

The objective of the measures was to mitigate environmental impact to the soil and groundwater.

3.10.2.3 Description of the Design, Construction, Operation, and Maintenance of the Measure

Measures are discussed in Section 3.10.1.7.

3.10.2.4 Information Regarding the Actual Implementation and Effectiveness of the Measure

Measures are discussed in Section 3.10.1.7.

3.11 AREA 11 – STORM WATER RETENTION

Records of spills, releases, or other incidents were found for this area.

3.11.1 Possible Sources/Areas of Contamination

3.11.1.1 Location of Storm Water Retention Area

The location of the Storm Water Retention Area (Area 11) is shown on Figure 3-1.

3.11.1.2 Horizontal and Vertical Boundaries of the Storm Water Retention Area

The horizontal boundaries of the Storm Water Retention Area (Area 11) are shown on Figure 3-11. There are no vertical boundaries.

3.11.1.3 Construction, Operation, and Structural Integrity

Historical information on this area shows two specific locations of concern, the Guard Basin and the Lime Pits. The Guard Basin and Lime Pits are surface impoundments. The Guard Basin is part of the refinery's stormwater management system, and the Lime Pits receive sludges from raw water treatment. The impoundments are constructed of earthen materials. The operation of the impoundments is described below.

3.11.1.4 Material Managed in the Storm Water Retention Area, Including the General Chemical Composition of the Material Waste

The Guard Basin contained F037 and F038 wastes, which are primary and secondary wastewater treatment sludge.

Since the Guard Basin received dry weather flow, the sludges that accumulated in the basins were considered hazardous wastes. The constituents resulting in the hazardous classification of these materials were benzene, benzo(a)pyrene, chrysene, lead, and chromium.

According to an April 1993 draft *Guard Basin and Lime Pits Finding of Preliminary Sampling and Analysis Effort and Screening of Closure Technologies,* the Lime Pits received sludges from the raw water treatment system and a minimal amount of waste water from the HF Alkylation Unit.

Most sludges in the Lime Pit (approximately 80 to 95%) were generated from the lime softener used to treat raw water so it could be used as boiler feed water. The pits were operated in such a manner that while one pit was being filled, the Alky Pit allowed the sludges to dry so the sludges could be removed for disposal.

In a December 29, 1993 memo, John Sherrill of the Illinois EPA stated that the Lime Pits and Guard Basin were surface impoundments. The memo further stated the Guard Basin was considered a hazardous waste surface impoundment. No such claim was made about the Lime Pits.

3.11.1.5 Quantities of Waste/Materials in the Storm Water Retention Area

When the Guard Basins were excavated, approximately 55,000 cubic yards of soils were removed. Currently, no waste materials are handled in this area. The Guard Basin is used solely for emergency stormwater retention. Approximately 12,000 cubic yards of materials accumulated in the Lime Pits.

3.11.1.6 History of the Use of the Storm Water Retention Area and the Surrounding Area

The Guard Basin has been in existence since at least 1953. The Lime Pits have been in existence since at least 1974. Prior to 1994, the Guard Basin and Lime Pits accepted the wastes described above. The Guard Basin was closed in 1994 by removal of all wastes. At approximately the same time, the Lime Pits were closed. Prior to closure, and at closure, the sludges were transferred to the Bulk Storage Tanks South Area. The area west of the Storm Water Retention Area is the refinery property, specifically the Bulk Storage Tanks North and Laydown Areas; the areas to the north and south contain the ConocoPhillips Bulk Storage terminals; and the area to the east contains the ConocoPhillips Refinery.

3.11.1.7 All Available Data and Qualitative Information on the Level of Contamination at the Storm Water Retention Area

Information related to releases from the Storm Water Retention Area is provided in this section.

An interoffice memo dated October 8, 1992 states that Premcor decided to close the Guard Basin and remove the sludges (including sludge in the basin and all open ditches carrying F037 and F038 wastes) for onsite disposal.

In April 1993, Premcor prepared a draft *Guard Basin and Lime Pits Findings of Preliminary Sampling and Analysis Effort and Screening of Closure Technologies.* This comprehensive report described the sampling performed at the Lime Pits and the Guard Basin, the soil and groundwater results, an evaluation of closure/remediation alternatives, and site conditions. Appendices included the SAP, the field investigation summary, a summary of analytical data, and the results of sludge stabilization tests. The conclusion

and recommendations sections of the report stated that disposal of Lime Pit sludges in a landfill was the only suitable disposal method. These sections stated that the Guard Basin sludge appeared suitable for disposal in a landfill after stabilization. Onsite disposal was recommended.

In a January 4, 1994 memo to the district files, Chris Cahnovsky of the Illinois EPA described a site visit conducted on January 3, 1994. The memo stated that sludge removal of the western portion of the Guard Basin was completed on December 10, 1993. The memo further stated that approximately 35,000 cubic yards of sludges had been removed, and approximately 10,000 cubic yards remained. Attachments to this memo showed removal dates, quantities, and an estimate of the projected grand total cost, which was over $7 million. The sludges were sent to Peoria Disposal Company as F037 and F038 wastes. Later estimates placed the amount of sludge removal at 55,000 cubic yards.

On May 24, 1994, Black & Veatch submitted a Work Plan/Quality Assurance Project Plan revision to the Illinois EPA that addressed prior concerns about a proposed sampling plan to determine if all contamination had been removed from the Guard Basin. In a June 2, 1994 memo to Carol Barry, John Sherrill of the Illinois EPA stated that the Agency agreed with the work plan and revisions. The memo noted the purpose of the plan was to verify that sludge had been removed from the Guard Basin and to monitor any potential groundwater impacts. The memo further stated:

> *In summary, surface and subsurface soil samples will be taken from the east and west sides of the Guard Basin, which will characterize any remaining contamination. Also, groundwater samples will be collected semi-annually for two years.*

The file contained eight reports from October 21, 1994 to May 13, 1998 showing the results of sampling wells around the Guard Basin.

A December 1996 report titled *Site Investigation Report for the Guard Basin Area* prepared by Burns & McDonnell described the sampling activities and analytical results from implementation of the above-referenced plan. In a May 30, 1997 letter to Premcor, the Illinois EPA concluded that the sludge removal activities in the Guard Basin had been successful, but asked for clarification on high detection limits. The Agency further proposed:

- *An additional downgradient monitoring well be installed, to be located further north, northeast of GB-5.*
- *One additional year of quarterly groundwater samples be collected from GB-4, GB-5, GB-6, and the new well. The groundwater samples are to be analyzed for benzene and arsenic. In addition, GB-1 should be sampled as a control point.*
- *If the downgradient groundwater concentrations do not significantly increase over the reported 1994 through 1997 concentrations, then the Guard Basin groundwater considerations and requirements, pursuant to Section VII (C)(4)(c) and Section VII (C)(4)(c)(d), will be considered satisfied.*
- *A groundwater use restriction by the use of an Illinois EPA-approved institutional control, may be warranted for the Guard Basin area.*

In a June 25, 1997 letter to the Illinois EPA, Premcor addressed the comments in the above-referenced letter. In a July 10, 1997 letter to Premcor, the Illinois EPA stated:

> *The letter from the laboratory explains the elevated detection limits.*
>
> *Additional groundwater monitoring will continue semi-annually for one year, utilizing monitoring wells GB-1, 2, 3, 4, 5, 6. If the down gradient groundwater concentrations do not significantly increase over the reported 1994 through 1997 concentrations, then the Guard Basin groundwater considerations and requirements, pursuant to Section VII (C)(4)(c) and Section VII (C)(4)(c)(d), will be considered satisfied. Also, a groundwater use restriction by the use of an Illinois EPA-approved institutional control, may be warranted for the Guard Basin area. The*

evaluation and decision to use an institutional control can be made after the groundwater sampling events, during 1998.

And, the Guard Basin will be used for emergency stormwater retention only.

In summary, as of July 10, 1997, the Illinois EPA had accepted that the Guard Basin had been adequately cleaned and that Premcor had to

- Continue groundwater monitoring semi-annually for one year.
- Use the Guard Basin for emergency stormwater retention only
- May have to place groundwater use restrictions on the Guard Basin area.

On November 24, 1998, on behalf of Premcor, Mary Buettner provided the Illinois EPA with a recorded declaration of the groundwater use restriction for 53.35 acres of the area in and around the Guard Basin. In a December 7, 1998 letter to Premcor, the Illinois EPA stated:

The Illinois Environmental Protection Agency (Illinois EPA) received the November 24, 1998 letter from Clark's attorney, Mary E. Buettner. Enclosed with her letter was a copy of the recorded declaration of the groundwater use restriction for 53.35 acres of the area in and around the Guard Basin. The groundwater contaminants are arsenic and benzene.

Part or all of the source of the groundwater contamination is from the refinery's storm water management system that historically emptied into the Guard Basin. From 8/30/93 through 1/94, Clark removed approximately 50,000 yd3 of sludge from the Guard Basin. Since 1994, Clark has collected groundwater samples from six groundwater monitoring wells located around the Guard Basin. During the April 23, 1998 groundwater monitoring event, arsenic concentrations from GB-4, GB-5, and GB-6 were in excess of the Class I arsenic groundwater objective of 0.05 mg/L; with concentrations of 0.123 mg/L, 0.013 mg/L, and 0.234 mg/L, respectively. Monitoring wells GB-4 and GB-6 were in excess of the Class I benzene objective of 0.005 ug/L; with concentrations of 7.4 ug/L and 11.1 ug/L, respectively. The six years of sampling

results demonstrate that groundwater contaminant concentrations are decreasing. No further sampling is required. ***With the groundwater use restriction, Clark has met its Guard Basin requirements.***

This letter signifies that Clark has satisfactorily met its obligations in regards to the Guard Basin as referenced in the Opinion and Order of the Pollution Control Board (PCB 95-163), dated January 23, 1997, and Section VII.C.4.d. of the Partial Stipulation and Proposal for Settlement. *(Bold lettering added by Clayton.)*

Excerpts from the referenced documentation for this matter are provided as Appendix S.

CERCLA Expanded Site Inspection

According to the Illinois EPA CERCLA ESI (2001), shallow and deep soil samples were collected in November 2000 from several locations within the Storm Water Retention Area, specifically a drainage ditch southeast of the old flare stack (shallow sample only), near the northwest corner of the Guard Basin (shallow and deep sample) and adjacent to the northeast corner of the old API separator located north of the Guard Basin (shallow sample). The shallow samples from the drainage ditch and adjacent to the old API separator contained various volatiles, semi-volatiles, pesticide/PCBs, and inorganic constituents at levels equal to or greater than three times offsite background levels. The shallow and deep samples near the northwest corner of the Guard Basin contained various volatile constituents at levels equal to or greater than three times offsite background levels. The shallow sample near the Guard Basin contained various semi-volatile, pesticide/PCB and inorganic constituents at levels equal to or greater than three times offsite background levels.

Conclusion

Based on the documents reviewed that pertain to the Storm Water Area, the area was identified as a REC because the area is used for emergency storm water retention. In addition, in November 2000, the Illinois EPA identified various volatile, semi-volatile, pesticide/PCB, and inorganic constituents at levels equal to or greater than three times offsite background levels within the area. However, it is noted that sludge was removed from the Guard Basin in 1993 and that with the recording of a declaration of groundwater use restriction for the area in and around the Guard Basin, Premcor met the Illinois EPA's closure requirements.

3.11.1.8 Procedures Used to Close the Storm Water Retention Area or Remediate Any Contamination Present

Remediation and closure procedures are discussed in Section 3.11.1.7.

3.11.1.9 Assessment of the Potential for Contamination Being Present and the Next Steps That Should Be Taken

The Illinois EPA has stated that Premcor satisfactorily met its obligation regarding the Guard Basin. Premcor also removed the contents of the Lime Pits, and the Illinois EPA did not request further investigation. The Lime Pits are not in use, and the Guard Basin accepts only emergency stormwater runoff. However, further investigation and characterization of the potential for contamination in the Storm Water Area is necessary since the potential for contamination exists based on the historical presence and operation of this area.

3.11.2 Remedial/Interim/Stabilization Measures

3.11.2.1 Description of the Measure

Generally, when Premcor experienced specific releases, Premcor responded by removing the released material and impacted soil, and took other steps as described above to eliminate the obvious effects of the release. Measures are discussed in Section 3.11.1.7.

3.11.2.2 Objectives of the Measure

The objective of the measures was to mitigate environmental impact to the soil and groundwater.

3.11.2.3 Description of the Design, Construction, Operation, and Maintenance of the Measure

Measures are discussed in Section 3.11.1.7.

3.11.2.4 Information Regarding the Actual Implementation and Effectiveness of the Measure

Measures are discussed above in Section 3.11.1.7.

3.12 AREA 12 – LAYDOWN

Records of spills, releases, or other incidents were found for this area.

3.12.1 Possible Sources/Areas of Contamination

3.12.1.1 Location of Laydown Area

The location of the Laydown Area (Area 12) is shown on Figure 3-1.

3.12.1.2 Horizontal and Vertical Boundaries of the Laydown Area

The horizontal boundaries of the Laydown Area (Area 12) are shown on Figure 3-12. There are no vertical boundaries.

3.12.1.3 Construction, Operation, and Structural Integrity

The Laydown Area is a mostly vacant portion of the refinery, with the exception of a cleaning pad, flare stacks, several small tanks, and a roll-off storage area.

3.12.1.4 Material Managed in the Laydown Area, Including the General Chemical Composition of the Material Waste

The Laydown Area serves only as a storage location for petroleum and petroleum-related products. No process wastes are generated. The Illinois EPA identified F037, F0328, and K048 wastes as leaking from roll-off boxes in the Laydown Area. A 1980 diagram showed surface impoundments in the Laydown Area with dredged sludge from the adjacent guard basin. The Guard Basin also contained F037 (primary wastewater treatment sludge) and F038 (secondary wastewater treatment sludge) wastes.

A K048 is identified as "Dissolved Air Flotation (DAF) float for the petroleum refining industry."

3.12.1.5 Quantities of Waste/Materials in the Laydown Area

The quantity of sludge from the guard basin could not be determined. The quantity of waste stored in roll-off boxes varies.

3.12.1.6 History of the Use of the Laydown Area and the Surrounding Area

The Laydown Area has historically been vacant and has not been involved in facility processes except as noted in Section 3.12.1.3.

3.12.1.7 All Available Data and Qualitative Information on the Level of Contamination at the Laydown Area

Information related to releases from the Laydown Area is provided in this section.

October 31, 1980 Dames and Moore Report

A *Closure Plan for Hazardous Waste Management Facilities* prepared for Clark by Dames and Moore included a diagram showing surface impoundments in the Laydown Area with dredged sludge from the adjacent guard basin (Area 11: Storm Water Retention). This diagram is provided as Appendix T-1.

October 20, 1983 Clark Letter

In an October 20, 1983 letter to Illinois EPA, Clark included sample results from a composite soil sample taken from the "guard basin sludge impoundment," which is west

of the guard basin in the Laydown Area. Samples were analyzed for metals, cyanide, sulfide, pH, and flash point. Concentrations of lead, chromium, and cyanide exceeded TACO Tier 1 SROs. This letter and attachments are provided as Appendix T-2.

October/November 1995

In the fall of 1995, emissions of Prussian Blue dye from the flare system were noted. Persian Blue dye (ferric ferrocyanide) is a common pigment for inks and carbon paper. In a January 12, 1996 internal memorandum, Premcor proposed corrective action that included piping modification, installation of a knockout drum, and process modification.

In a March 11, 1998 letter, the Office of the Illinois Attorney General requested an update with regard to the incident. In an April 8, 1998 letter, Premcor summarized the actions taken to mitigate the problem, including the corrective action outlined in its 1996 memorandum.

June 17, 1996 - Incident 961083 - NCR 347575

During an inspection of the roll-off staging area north of the bundle pad by Mr. Chris Cahnovsky of the Illinois EPA, a leaking roll-off box was noted. The roll-off box was filled with the filter press solids from the WWTP tank BIO T-161. Liquid from the filter cake leaked from the roll-off box and impacted soil. The leaking roll-off box was moved to a containment area. Impacted soil was removed and placed in a 20-yard roll-off box for proper disposal. The waste was listed as F037-F038.

In a June 20, 1996 letter to the Illinois EPA, Premcor submitted the above information.

In a July 8, 1996 *Compliance Inquiry* letter, the Illinois EPA requested more information on the release.

In a July 19, 1996 letter to the Illinois EPA, Premcor stated that they had held a meeting with the contractor (Heritage Environmental) to re-emphasize Premcor's commitment to compliance with regulatory requirements.

September 22, 1997 - Incident 971786 - NCR 404630

On September 22, 1997, Premcor experienced a spill incident due to a pump casing failure on Tank T1-18. The result of the casing failure was estimated to be 10 gallons of K048 waste impacting an area of 10 feet by 10 feet. Premcor removed the contaminated material for proper disposal. The remediation generated approximately 6 to 8 cubic yards of sludge and gravel. The sludge and contaminated gravel were placed in a 20-yard roll-off box. The roll-off box was properly closed, labeled, and dated.

November 2000 - CERCLA Expanded Site Inspection

In November 2000, the Illinois EPA conducted a CERCLA ESI. The inspection included collecting two soil samples (shallow and deep) from a boring in the Laydown Area. The shallow sample contained various volatile and inorganic constituents at levels equal to or greater than three times offsite background levels. Both samples contained various semi-volatile and pesticide/PCB constituents at levels equal to or greater than three times offsite background levels. The figure and tables showing these sample results are provided as Appendix T-3.

April 18, 2001 - Violation Notice M-2001-01105

On April 18, 2001, Illinois EPA issued a Violation Notice based on a February 20, 2001 inspection of the Premcor facility. In relation to the Laydown Area, the Agency observed oil liquid and petroleum refinery primary oil/water/solids separation sludge (F037) leaking from several roll-off boxes. The Agency stated Premcor was operating a

hazardous waste disposal facility without a permit. The Agency further stated Premcor failed to have a written closure plan for unpermitted disposal area around the roll-off boxes.

In a May 21, 2001, letter to the Illinois EPA, Premcor proposed a CCA. Premcor stated plastic spill containment devices had been placed beneath the roll-off boxes. As part of remediation efforts, soil impacted from the leaks was recovered, placed in an ACFM roll-off box, and recycled by injection into the Mobil Oil Sludge Coking (MOSC) system. Approximately 30 cubic yards of soil were removed and recycled. A confirmatory soil sampled was collected and analyzed for VOCs, SVOCs, PCBs, metals, mercury, and pH. The results indicated the TACO standards for Industrial/Commercial limits had been met.

On June 28, 2001, Premcor sent a revised CCA to Illinois EPA, based on discussions with the Agency at a June 11, 2001 meeting. The CCA included a *Closure Plan for the Roll-Off Container Storage Area* prepared by Burns & McDonnell. The closure plan identified the sludge generated on the bottom of the WWTP equalization tanks and stored in roll-off boxes as listed hazardous waste (F037). The roll-off boxes were stored in the Laydown Area for injection into the MOSC system. A diagram from this report showing the roll-off area is provided as Appendix T-4.

In a July 24, 2001 letter to Premcor, Illinois EPA rejected the May 21, 2001 and June 28, 2001 CCA.

In a October 3, 2001 letter to Premcor, the Illinois EPA approved (with conditions and modifications) the RCRA Closure Plan submitted June 28, 2001.

On March 14, 2002, the Illinois EPA sent Premcor a *Notice of Intent to Pursue Legal Action* for Violation Notice M-2001-01015 and Violation Notice L-2001-01421.

In a March 29, 2002 letter to the Illinois EPA, Premcor provided soil sampling data for the roll-off area. Contamination was noted in some samples, but Premcor concluded that due to the inconsistent nature of the data, both species and special, the detected contaminant appeared unrelated to any releases from the roll-off area. The analytical data table is provided as Appendix T-4. Premcor stated that further excavation to meet TACO Tier 1 criteria was not feasible due to the inconsistent nature of the contamination. Premcor also provided information on TACO Tier 2 calculations for benzo(a)pyrene in this letter. The text of the letter is provided as Appendix T-4.

In a June 3, 2002 letter to Premcor, the Illinois EPA stated that insufficient information had been provided in Premcor's March 29, 2002 letter, and Premcor had failed to complete closure of the Roll-Off Container Area in accordance with Agency-approved plans.

January 10, 2003 - Violation Notice M-2002-01056

On January 10, 2003, the Illinois EPA issued a Violation Notice based on a November 26, 2002 inspection of the Premcor facility. The Agency observed spent hydrotreating catalyst (K171) on the ground next to a roll-off box in the Laydown Area. The Agency stated Premcor was operating a hazardous waste disposal facility without a permit. The Agency also stated that Premcor had not completed closure of the Roll-Off Container Storage Area in accordance with plans approved by the Agency on October 3, 2001.

In a February 7, 2003 letter to the Illinois EPA, Premcor stated that spent hydrotreating catalyst was found adjacent to the roll-off box. The material was collected and placed into the roll-off box for disposal. The roll-off box was sent offsite under Illinois Hazardous Waste Manifest Number IL 10445722 to TWI and Onyx Environmental Services Facility in Sauget, Illinois.

On March 6, 2003, the Illinois EPA sent Premcor a *Request for a Meeting* for Violation Notice M-2002-01056.

Conclusion

Based on the documents reviewed that pertain to the Laydown Area, the area has been identified as a REC due to operations involving historic surface impoundments that contained dredged sludge from the adjacent Guard Basin; the November 2000 identification by the Illinois EPA of various volatile, semi-volatile, pesticide/PCB, and inorganic constituents at levels equal to or greater than three times offsite background levels; and operational releases, including:

- RCRA-related waste issues associated with roll-off box leaks identified in Violation Notices M-2001-01015 and M-2002-01056.
- On June 17, 1996, an unknown amount of primary and secondary wastewater treatment sludge released from a roll-off box was discovered (Incident 961083).
- On September 22, 1997, approximately 10 gallons of DAF were released due to a pump failure (Incident 971786).

3.12.1.8 Procedures Used to Close the Laydown Area or Remediate Any Contamination Present

Remediation and closure procedures are discussed in Section 3.12.1.7.

3.12.1.9 Assessment of the Potential for Contamination Being Present and the Next Steps That Should Be Taken

Further investigation and characterization of the potential for contamination in the Laydown Area is necessary since the potential for contamination exists based on the historical presence and operations of this area and the identified spill incidents.

3.12.2 Remedial/Interim/Stabilization Measures

3.12.2.1 Description of the Measure

Generally, when Premcor experienced specific releases, Premcor responded by removing the released material and impacted soil, and took other steps as described above to eliminate the obvious effects of the release. Measures are discussed in Section 3.12.1.7.

3.12.2.2 Objectives of the Measure

The objective of the measures was to mitigate environmental impact to the soil and groundwater.

3.12.2.3 Description of the Design, Construction, Operation, and Maintenance of the Measure

Measures are discussed above in Section 3.12.1.7.

3.12.2.4 Information Regarding the Actual Implementation and Effectiveness of the Measure

Measures are discussed in Section 3.12.1.7.

3.13 AREA 13 – GROUNDWATER

The Hartford Refinery property and the River Dock property are not part of any regulatory program requiring a groundwater monitoring system. However as discussed in Section 2.6, a number of piezometers have been installed at the refinery property to monitor and determine changes in groundwater flow in the area, and groundwater monitoring has been conducted at the River Dock property as a result of spills in this area. Furthermore, as discussed in Section 2.5.2.2, Premcor (along with surrounding facilities) operates groundwater-pumping systems to maintain cones of depression beneath its facilities. In addition, a number of piezometers within the Hartford Refinery property contain submersible FPH recovery pumps.

3.13.1 Refinery Property

Piezometers RB-8, RB-10, RB-53, and RB-55 contain pneumatic bladder pumps. Figure 2-5 shows the piezometer locations. These piezometers are concentrated in the northwestern quadrant of the Hartford Refinery. Premcor recovers FPH from different combinations of these piezometers. In addition, recovery of FPH has been conducted sporadically in Piezometers RB-52 and RB-56. The shutdown of refinery operations at the end of September 2002 suspended FPH recovery operations from October 2002 through February 2003. Piezometer RB-55 was brought back on line in March 2003, and Piezometer RB-53 was brought back on line in April 2003.

The FPH is pumped from submersible pumps in the piezometers to holding tanks located next to the piezometers. Premcor contractors utilize vacuum trucks to empty the FPH tanks on a weekly basis. Appendix G provides summary tables prepared by Premcor from 1994 to 2002 for the Hartford Refinery FPH recovery. The row "Total Refinery Production" in the table contains the total amount of FPH recovered for each month. Between January 2002 and December 2002, over 21,000 gallons of FPH were recovered

from the recovery wells. As noted above, recovery operations were not operational during October, November, and December 2002 because of the shutdown of refinery operations. Between January 1994 and December 2002, over 350,000 gallons of FPH were recovered from the Hartford Refinery recovery wells. Premcor is currently evaluating its FPH recovery system. The results of this evaluation will be used to develop a work plan for the enhancement of this system.

Premcor maintains three recovery wells previously installed within the Village of Hartford for FPH recovery by the former Clark Oil and Refining Corporation. Figure 93-09-BMP2 from the September 9, 1993 Burlington report titled *Hartford Hydrocarbon Remediation Project Presentation at the Illinois Attorney General Office Springfield, Illinois* is provided in Appendix H, and shows the location of the three recovery wells. FPH recovery began in the late-1970s. FPH recovery data were submitted to the Illinois EPA OER on a monthly basis. However, since the shutdown of refinery operations in September 2002, these reports have not been produced.

Currently, only Hartford Recovery Well 2 contains a submersible FPH recovery pump. Appendix I provides summary tables from 1994 to 2002 for the Village of Hartford FPH recovery. The row in the table titled "Well Recovery Gallons" contains the total amount of FPH recovered each month. Over 4,000 gallons of FPH were recovered from January 2002 through September 2002. Over 82,700 gallons of FPH were recovered from January 1994 through September 2002. This recovery well has not been operational since the shutdown of refinery operations in September 2002.

Premcor voluntarily installed a Vapor Control System (VCS) to assist the North Hartford residents who historically have experienced problems with petroleum vapors in their basements.

To capture the petroleum vapor, the VCS creates a vacuum (low-pressure area) belowground at 12 vapor control boreholes (VCBs). Gasoline vapors are removed from the ground via the VCBs. Underground pipes connect the VCBs to vacuum blowers at the Hartford Terminal, where the vapor is ignited and burned in a Thermal Treatment Unit (TTU). Figure 93-09-BMP2 from the September 9, 1993 Burlington report titled *Hartford Hydrocarbon Remediation Project Presentation at the Illinois Attorney General Office Springfield, Illinois* provided in Appendix H, and shows the location of the VCBs.

In August 1992, vapor recovery within the Village of Hartford began. Premcor submitted a summary of the vapor recovery data to the Illinois EPA OER on a monthly basis. However, since the shutdown of refinery operations in September 2002, these reports have not been produced. Appendix I provides summary tables prepared by Premcor from 1994 to 2002 for the Village of Hartford vapor and FPH recovery. The row "TTU Gallons Removed" in the table contains the total amount of FPH recovered for each month. The quantity in the tables is based on Premcor influent vapor sampling to the TTU, laboratory analysis, and calculations for conversion of hydrocarbon vapor removed to the equivalent of liquid gallons of hydrocarbon removed. Over 42,800 gallons of equivalent FPH have been recovered by the VCS from January 2002 through September 2002. Over 778,000 gallons of equivalent FPH has been recovered by the VCS from January 1994 through September 2002.

3.13.2 River Dock Property

As discussed in Section 2.6.2, limited groundwater monitoring has been conducted in the River Dock area as a result of spills occurring in this area. As part of the cleanup of a 1994 spill, groundwater monitoring was conducted in this area from September 1996 to December 1999. This monitoring revealed no concentrations exceeded Class I groundwater quality standards, and the monitoring wells were abandoned in February 2000.

Biosparging was conducted in the area of the elevated dock located near the floating barge dock. This was discontinued in November 2002 as agreed to by the Illinois EPA OCS. The most recent semi-annual groundwater monitoring (December 2002) indicated only one monitoring well exceeded Class I Groundwater Quality Standards.

3.13.3 Underground Product Lines

The River Dock property is connected to the Refinery property by three product lines running under the Village of Hartford. These lines, along with several other underground product lines in the area, are the subjects of concern related to the FPH found under the northern portion of the Village of Hartford. A November 1990 document obtained from files maintained by the Illinois EPA OER (see Appendix U) summarizes the Agency's position concerning this FPH. Note that only the text portion of the document has been provided in Appendix U. The attachments and figures referred to in the document were not provided. This document indicated that, in 1990, the Agency estimated between 900,000 and 3.8 million gallons of leaded gasoline remained. As discussed in Section 3.13.1, Premcor voluntarily installed a VCS to assist the North Hartford residents who historically have experienced problems with petroleum vapors in their basements.

3.13.4 Potential Offsite Sources

As discussed in Section 2.2.3, the Hartford Refinery is bordered to the north, south, and east by petroleum refining and terminal operations. The area is served by numerous pipeline systems for the delivery and distribution of crude oil and refined petroleum products. In addition to facilities operated by BP Amoco, ConocoPhillips, and Shell Oil Company; Buckeye Partners, Cherokee Pipeline, Explorer Pipeline, Koch Industries, Marathon Ashland, Ozark Pipeline, Platte Pipeline, and St. Louis Pipeline Company currently own and/or operate petroleum pipelines in the area surrounding the Premcor facility. Figure 2-1 shows the location of many of these pipelines. Most of these

companies have pipeline right-of-ways through the Premcor facility. In December 1989, Shell reported the release of 294,000 gallons of unleaded gasoline from an underground pipelines that runs along Rand Street on the north side of the Village of Hartford. In mid-2001, ConocoPhillips reported a release from its wastewater line that runs along Rand Street from its refinery to the river. A portion of Rand Street was closed for approximately a year to perform the pipe repair. The summary table provided in Appendix A lists over 200 releases (not attributable to Premcor) reported to the NRC that occurred in this area between 1990 and 2002. From at least 1951 to 1974, the historical topographic maps show an oil-cooling reservoir located north of the railroad tracks that run along Rand Street.

Besides the petroleum-related industry in the surrounding area, the International Shoe Company operated a tannery immediately northwest of the Refinery property. The tannery is believed to have been in operation since before 1941 to sometime between the late-1950s and 1970s, based on a review of the historical aerial photographs and topographic maps. The former tannery property is currently owned by Shell.

Premcor is currently participating on a technical group, which includes many of the above-mentioned companies, to address the regional groundwater issues in this area.

4.0 CONCLUSIONS

An evaluation of potential sources of contamination associated with Premcor's Hartford facility has been completed for each area discussed in Section 3.0. The following potential source areas have been identified as RECs.

AREA 1 – ADMINISTRATION

Given the existence of the former truck-loading rack and underground gasoline storage tank located in the southwest portion of this area (now used for employee and contractor parking), this portion of the Administration Area has been identified as a REC.

AREA 2 – RIVER DOCK

This area has been identified as a REC due to operations involving large quantities of petroleum products, operational releases in the Area, and the identification of impacts associated with three lagoons, a landfill, and an unidentified source in the southernmost portion of the Area.

AREA 3 – UNDERGROUND PRODUCT LINES

The Underground Product Lines Area has impacted soil and groundwater within the Village of Hartford with petroleum-related products and has been identified as a REC.

AREA 4 – REFINERY PROCESS I

This area has been identified as a REC due to operational releases specifically attributed to the Crude Unit and to underground and aboveground product, wastewater, and process

water piping. A historical REC has been identified because of an unknown amount of spent catalyst.

AREA 5 – REFINERY PROCESS II

This area has been identified as a REC due to operational releases specifically attributed to the North Drum Accumulation Area; an oil drum at the vehicle maintenance building; and to underground and aboveground product, wastewater, and process water piping. Historical RECs have been identified because of operational releases attributed to pipelines.

AREA 6 – ASPHALT PLANT

The area has been identified as a REC due to the release of asphalt from dismantling the asphalt storage tanks.

AREA 7 – COKING UNIT

This area, along with Milo Field located south of the unit, has been identified as a REC due to operational releases from the coking unit.

AREA 8 – BULK STORAGE TANK NORTH

This area has been identified as a REC due to operational releases attributed to pipelines and tanks, and the identification of impacts associated with a former TEL building, a pump house, and a crude oil tank bottom impoundment. Historical RECs have been identified due to operational releases attributed to pipelines and tanks.

AREA 9 – BULK STORAGE TANK SOUTH

This area has been identified as a REC due to operational releases attributed to pipelines, the presence of the lime sludge landfill area, above and below ground piping, and product loading.

AREA 10 – WASTE WATER TREATMENT PLANT

This area has been identified as a REC due to operational releases attributed to the DAF unit and a release of asphaltic oil. Due to the presence of a hazardous waste sump and a hazardous waste barrel storage area, this portion of the WWTP has been identified as a REC. Historical RECs have been identified due to operational releases attributed to pipelines.

AREA 11 – STORM WATER RETENTION

This area has been identified as a REC because of its use for emergency storm water retention. Various volatile, semi-volatile, pesticide/PCB, and inorganic constituents at levels equal to or greater than three times offsite background levels have been identified within the area. It is noted that sludge was removed from the Guard Basin in 1993. Premcor also recorded a declaration of groundwater use restriction for the area in and around the Guard Basin.

AREA 12 – LAYDOWN

This area has been identified as a REC due to operational releases of wastes from roll-off boxes; the presence of historic surface impoundments containing sludge dredged from the adjacent Guard Basin; and the presence of various volatile, semi-volatile, pesticide/PCB,

and inorganic constituents at levels equal to or greater than three times offsite background levels within the area.

AREA 13 – GROUNDWATER

The groundwater beneath the facility has been identified as a REC given the presence of FPH and dissolved contaminants in the groundwater.

Offsite RECs

Offsite sources (the surrounding refineries, terminals, underground pipelines, the oil cooling reservoir located north of Rand Street, and the former tannery immediately northwest of the facility) have been identified as offsite REC, potentially impacting the Premcor facility. Premcor is currently participating on a technical group, which includes many surrounding companies, to address the regional groundwater issues in this area

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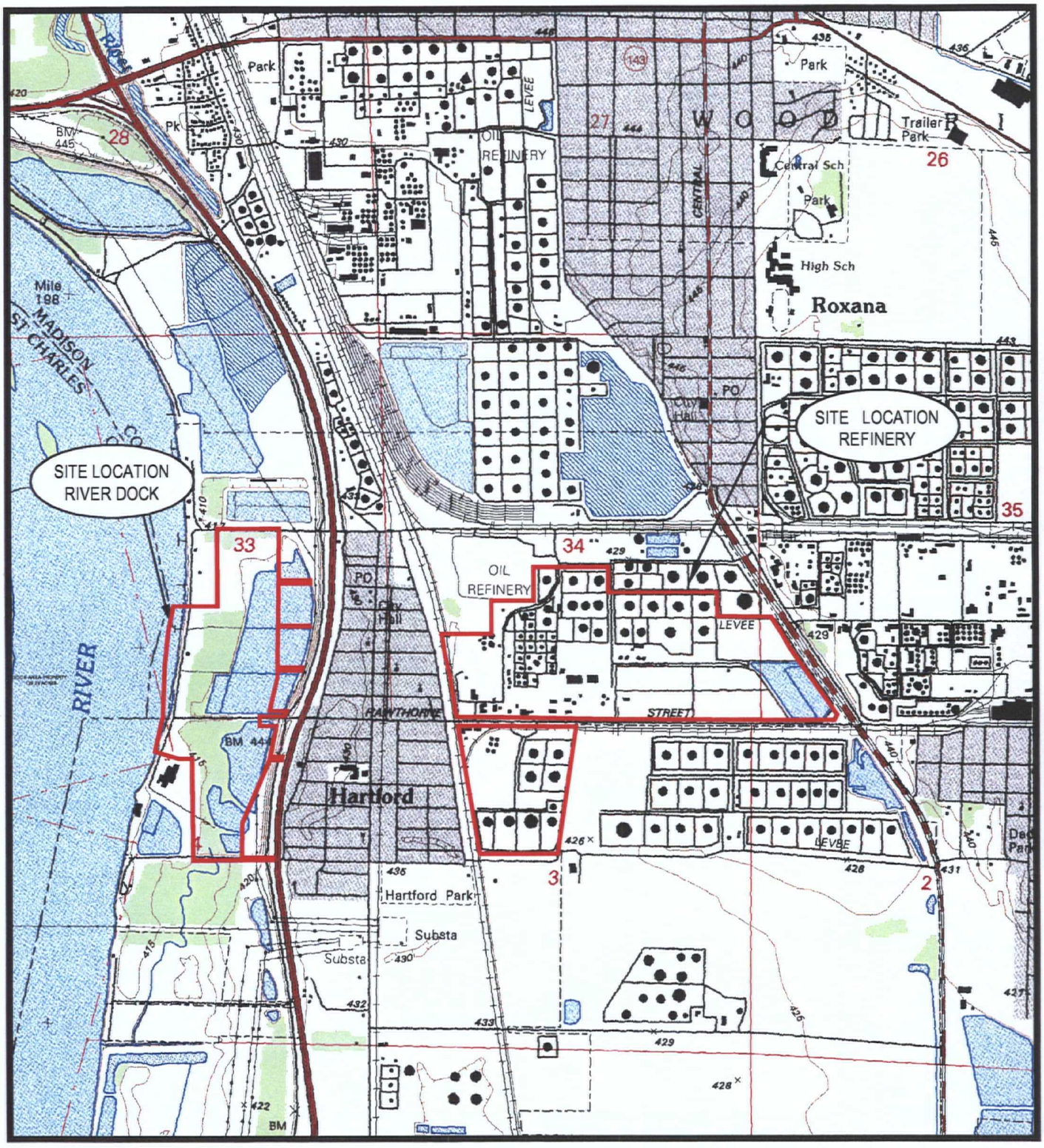
FIGURES

FIGURES



Scale 1:24000

0 1/2 1 MILE

1000 0 1000 2000 3000 FEET

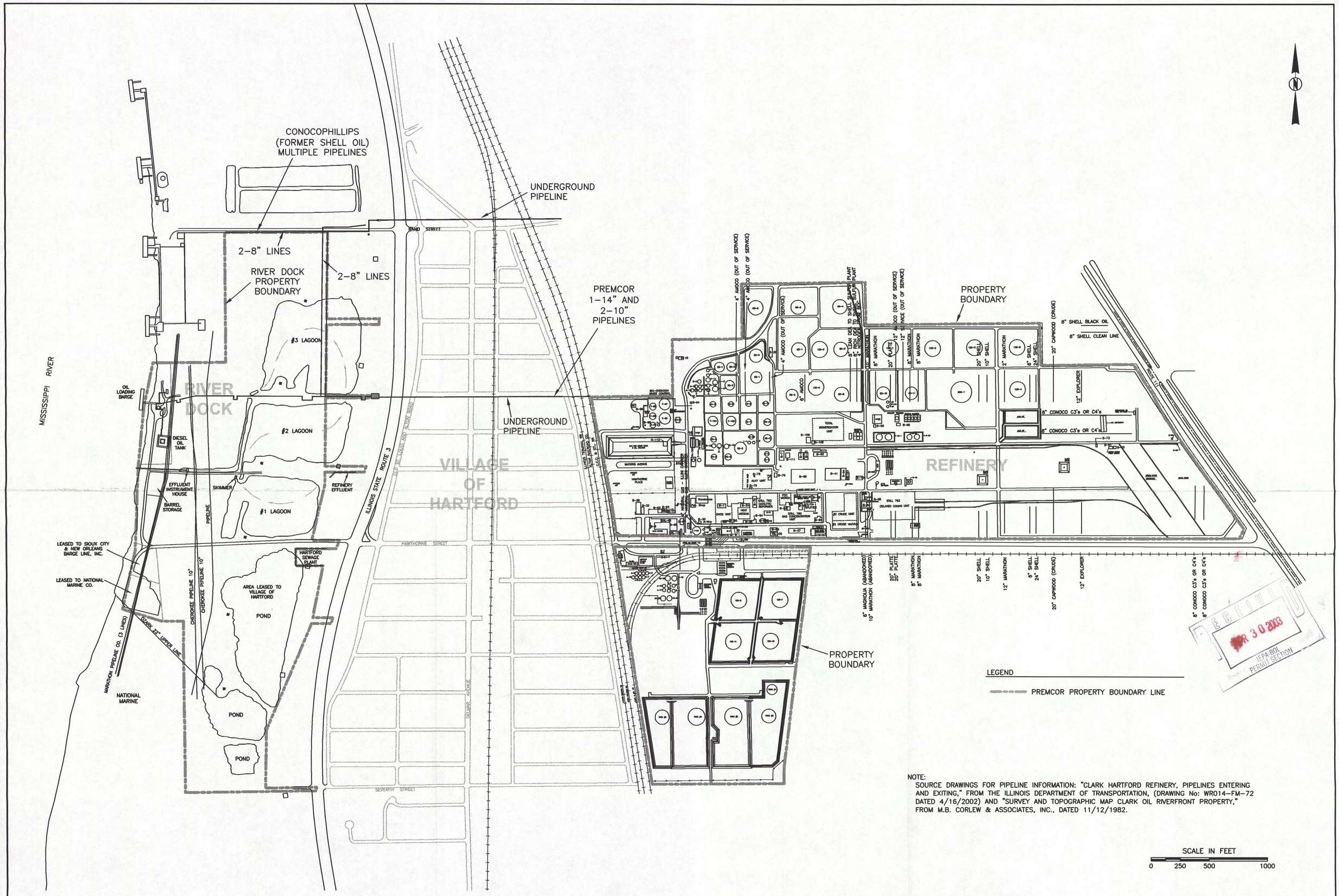
QUADRANGLE LOCATION

FIGURE 1-1

SITE LOCATION MAP

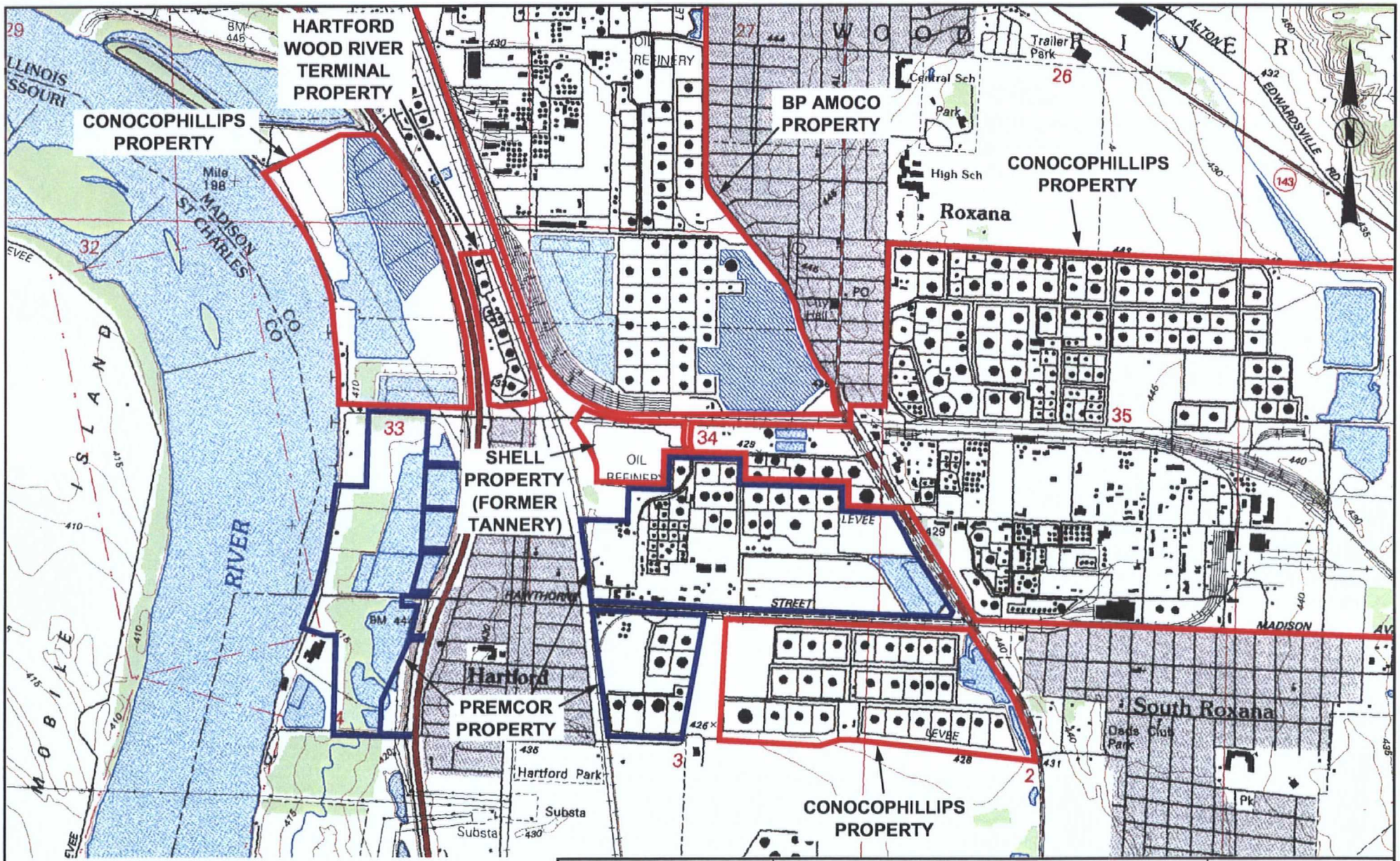
THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

(SOURCE OF MAP IS USGS 7.5 MINUTE QUADRANGLE MAP, WOOD RIVER, ILL.-MO., rev.1994)



NOTE:
SOURCE DRAWINGS FOR PIPELINE INFORMATION: "CLARK HARTFORD REFINERY, PIPELINES ENTERING AND EXITING," FROM THE ILLINOIS DEPARTMENT OF TRANSPORTATION, (DRAWING No: WR014–FM–72 DATED 4/16/2002) AND "SURVEY AND TOPOGRAPHIC MAP CLARK OIL RIVERFRONT PROPERTY," FROM M.B. CORLEW & ASSOCIATES, INC., DATED 11/12/1982.

CHECK BY KDFC	SITE MAP	Clayton GROUP SERVICES
DRAWN BY		
DATE 4–25–03	THE PREMCOR REFINING GROUP, INC.	FIGURE 2–1
SCALE AS SHOWN	HARTFORD, ILLINOIS	
CAD NO. 0309500B		
PRJ NO. 15–03095.00		



SCALE IN FEET

0 1000 2000 4000

SOURCE:
USGS 7.5 MINUTE SERIES TOPOGRAPHIC MAP
(WOOD RIVER, ILL.–MO. – rev.1994)

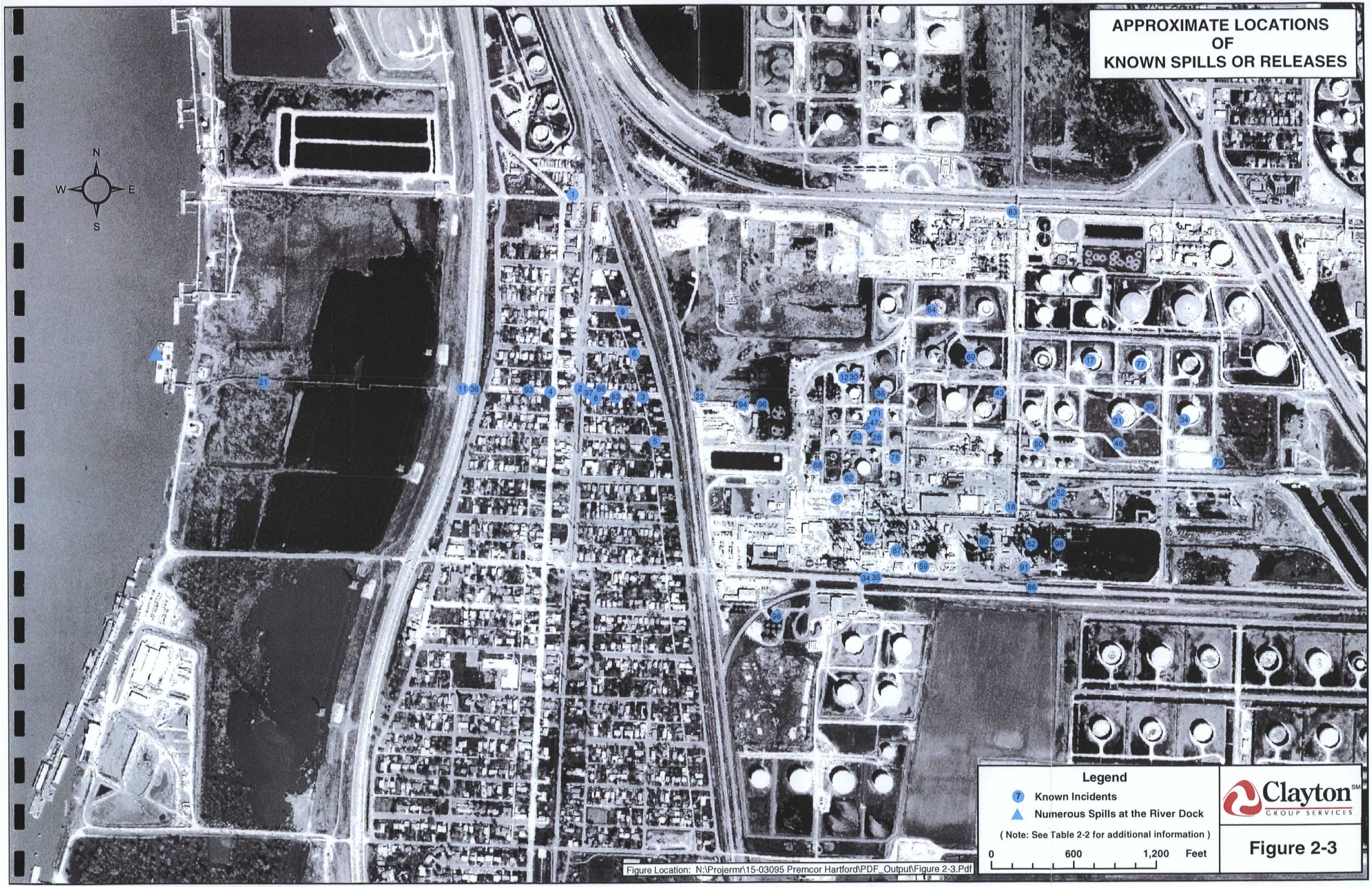
CHK BY	
DWN BY	BCP
DATE	4–15–03
SCALE	AS SHOWN
CAD NO.	0309500A3
PRJ NO.	15–03095

SURROUNDING AREA MAP

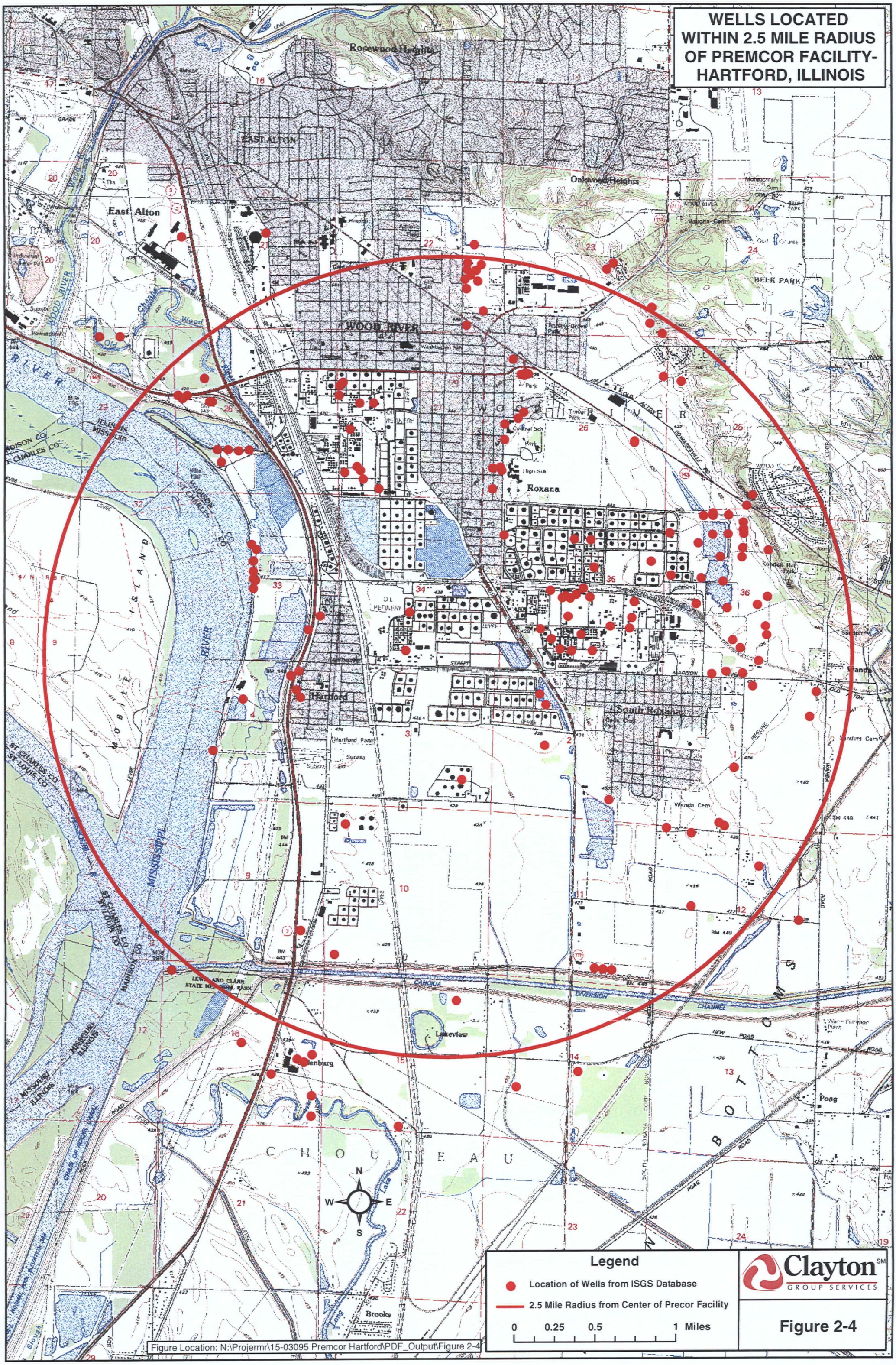
THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

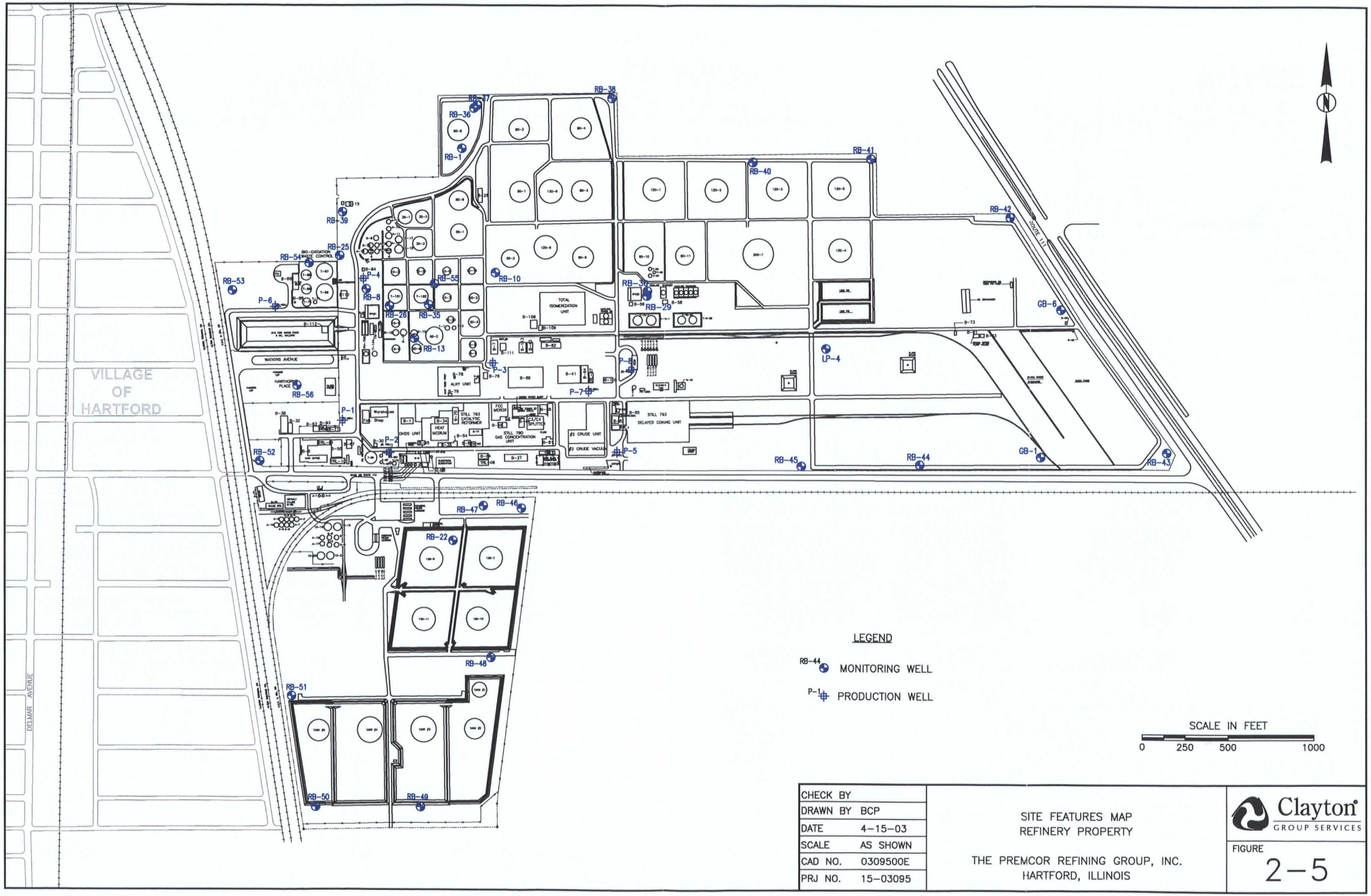
Clayton GROUP SERVICES

FIGURE
2–2


APPROXIMATE LOCATIONS
OF
KNOWN SPILLS OR RELEASES
N
W
E
S
Legend
Known Incidents
Numerous Spills at the River Dock
(Note: See Table 2-2 for additional information)
0
600
1,200
Feet
Clayton
GROUP SERVICES
Figure 2-3
Figure Location: N:\Projermr\15-03095 Premcor Hartford\PDF_Output\Figure 2-3.Pdf

WELLS LOCATED WITHIN 2.5 MILE RADIUS OF PREMCOR FACILITY-HARTFORD, ILLINOIS





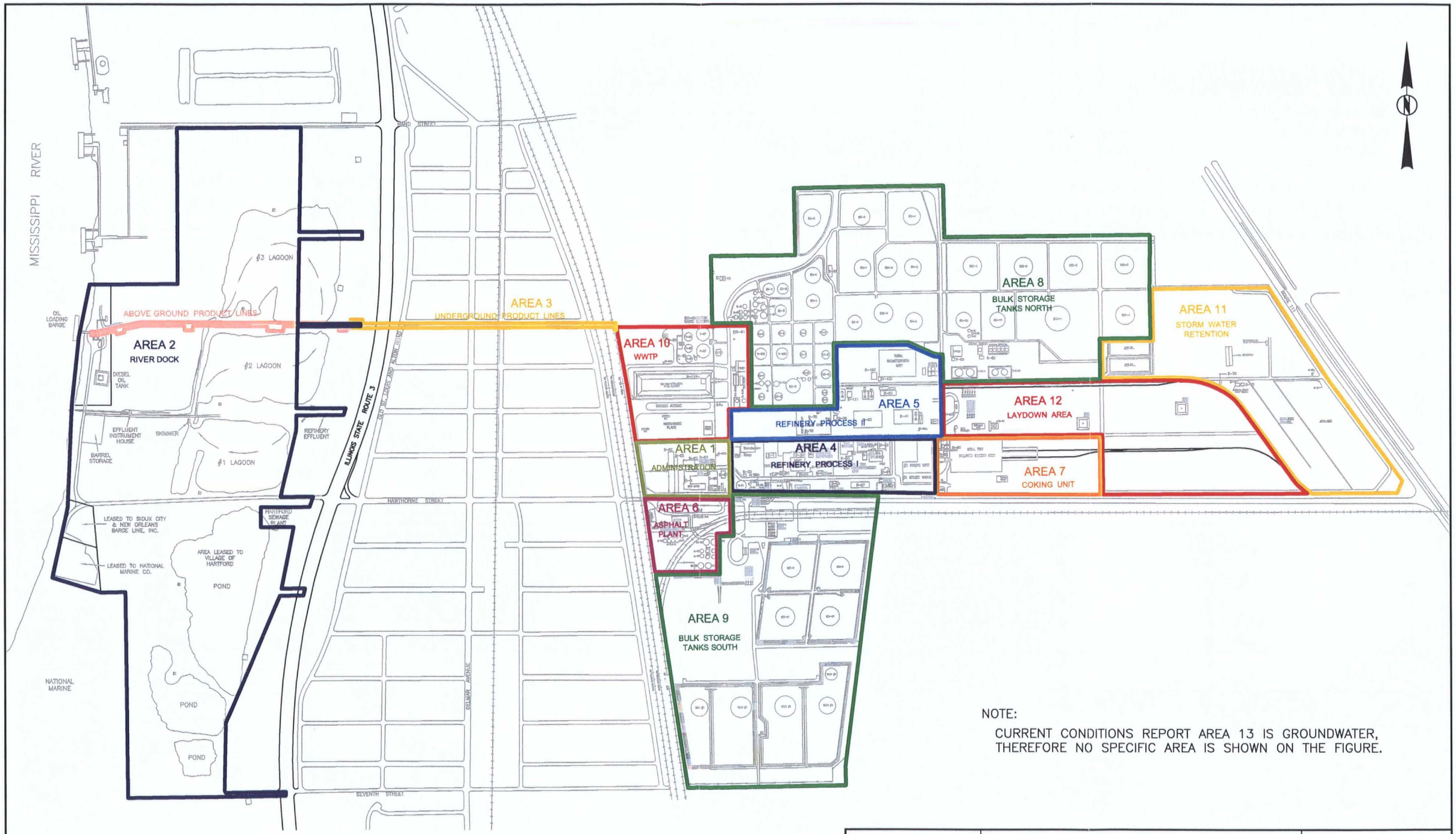
CHECK BY	
DRAWN BY	BCP
DATE	4-15-03
SCALE	AS SHOWN
CAD NO.	0309500E
PRJ NO.	15-03095

SITE FEATURES MAP
REFINERY PROPERTY

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE
2-5



NOTE:

CURRENT CONDITIONS REPORT AREA 13 IS GROUNDWATER, THEREFORE NO SPECIFIC AREA IS SHOWN ON THE FIGURE.

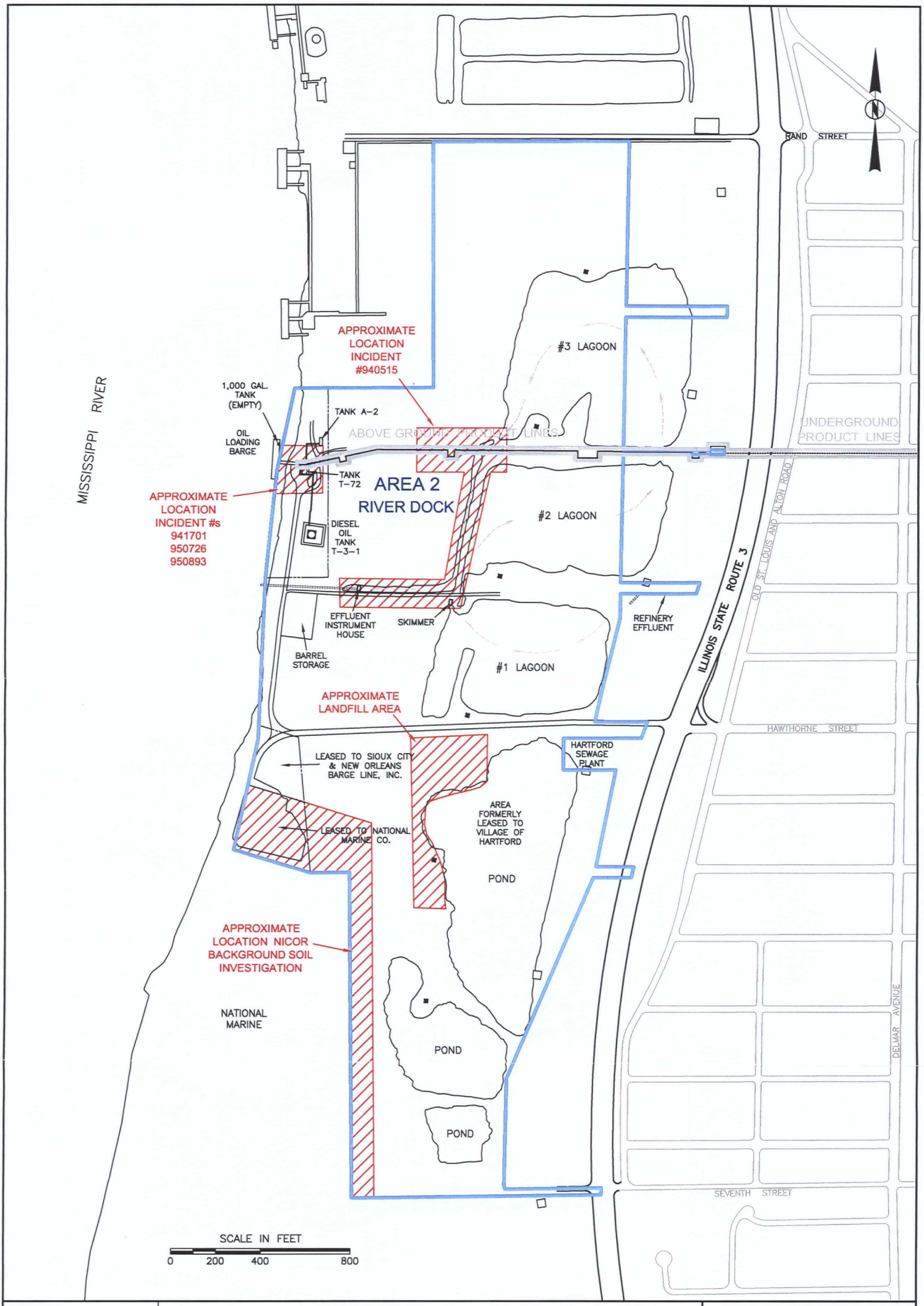
CHECK BY	
DRAWN BY	BCP
DATE	4-15-03
SCALE	N.T.S.
CAD NO.	0309500D
PRJ NO.	15-03095

SITE AREAS REFERENCE MAP

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE 3-1



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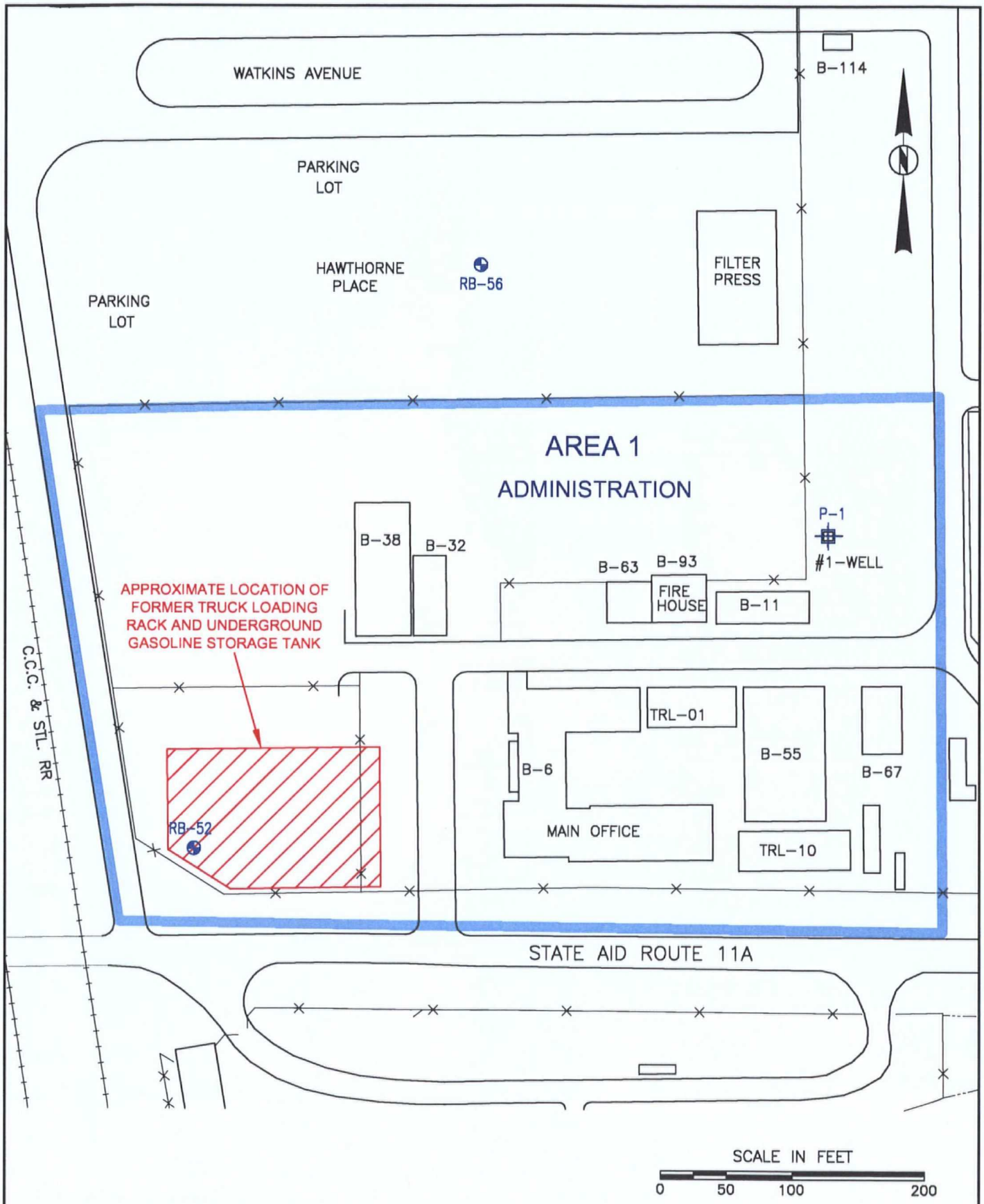
DRAWN BY	BCP
DATE	4-15-03
SCALE	AS SHOWN
CAD NO.	0309500G
PRJ NO.	15-03095.00

AREA 2 – RIVER DOCK

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE 3-3



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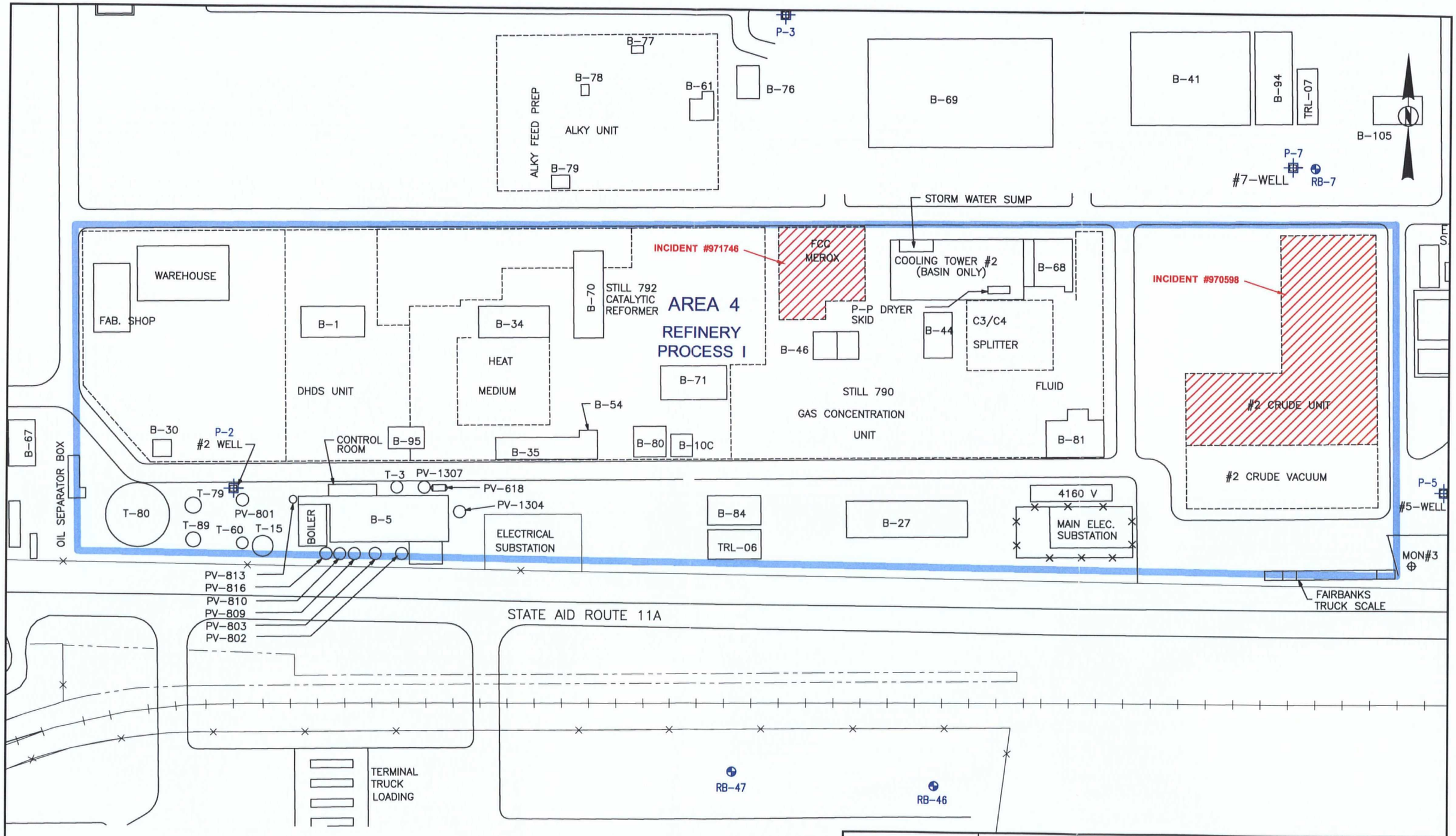
DRAWN BY	BCP	
DATE	4-15-03	
SCALE	AS SHOWN	
CAD NO.	0309500F	
PRJ NO.	15=03095.00	

AREA 1 – ADMINISTRATION

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton® GROUP SERVICES

FIGURE 3-2



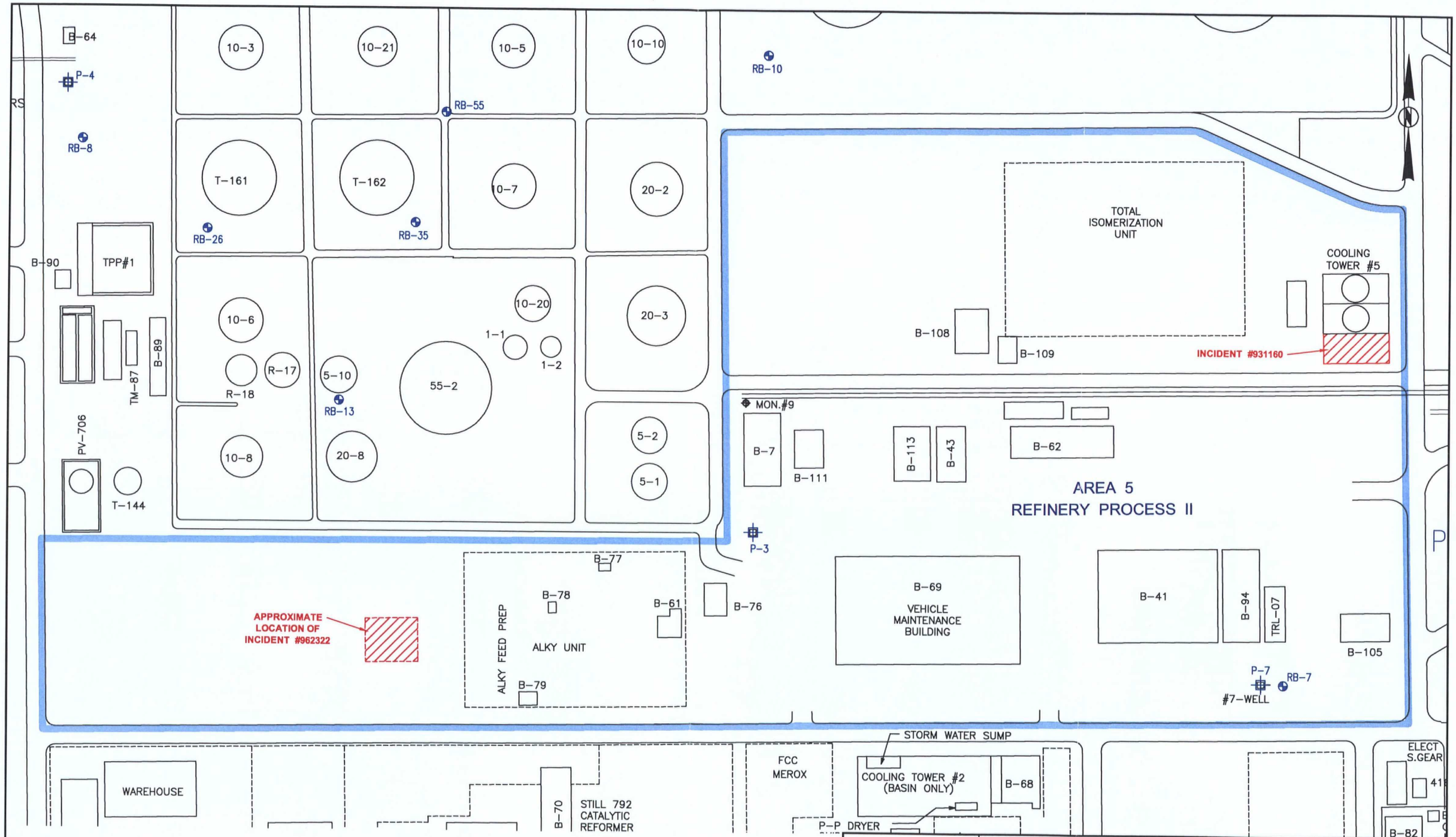
CHECK BY	
DRAWN BY	BCP
DATE	4-15-03
SCALE	AS SHOWN
CAD NO.	0309500H
PRJ NO.	15-03095.00

AREA 4 – REFINERY PROCESS I

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE
3-4



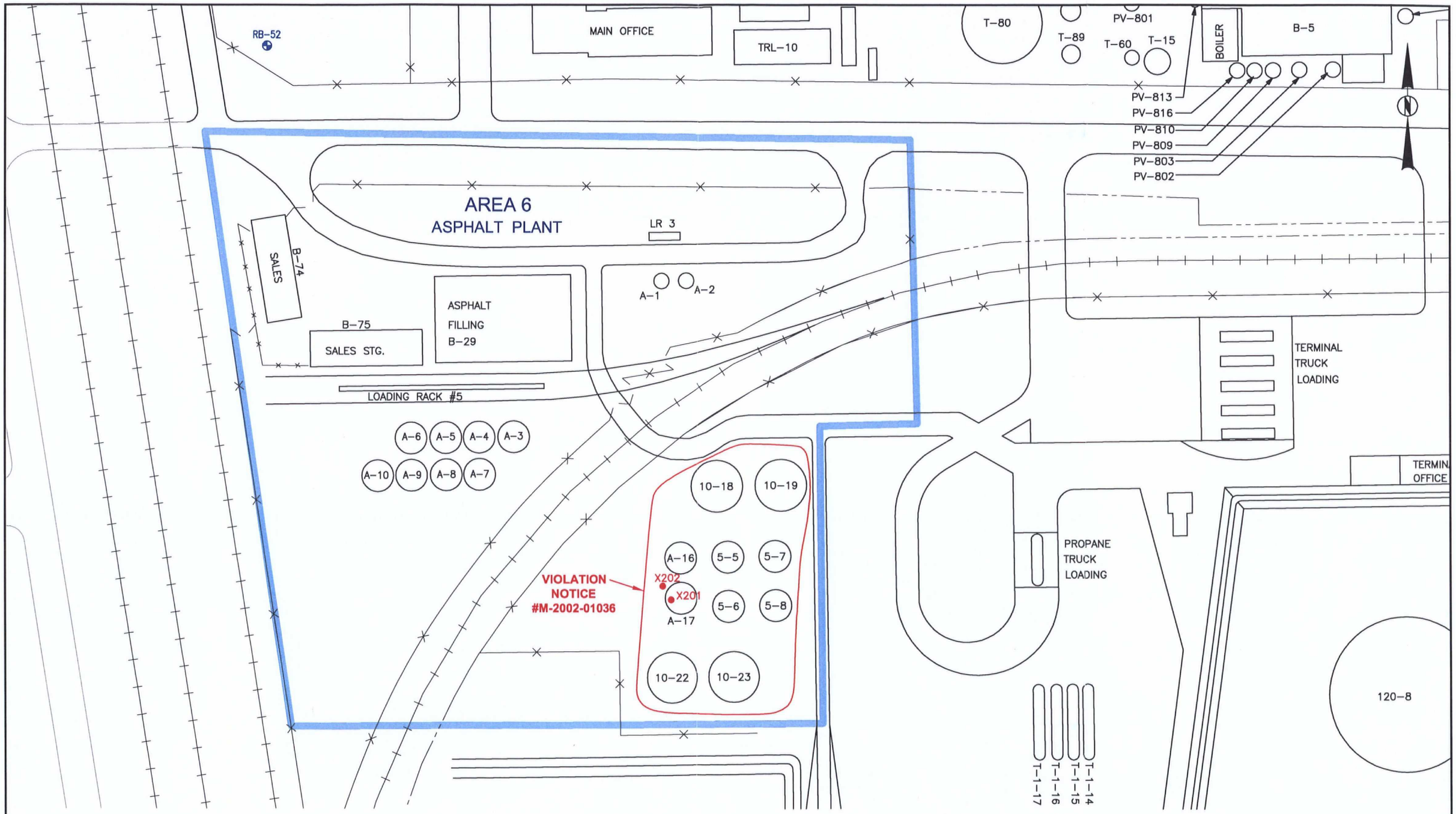
CHECK BY	
DRAWN BY	BCP
DATE	4-15-03
SCALE	AS SHOWN
CAD NO.	0309500i
PRJ NO.	15-03095.00

AREA 5
REFINERY PROCESS II

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE
3-5



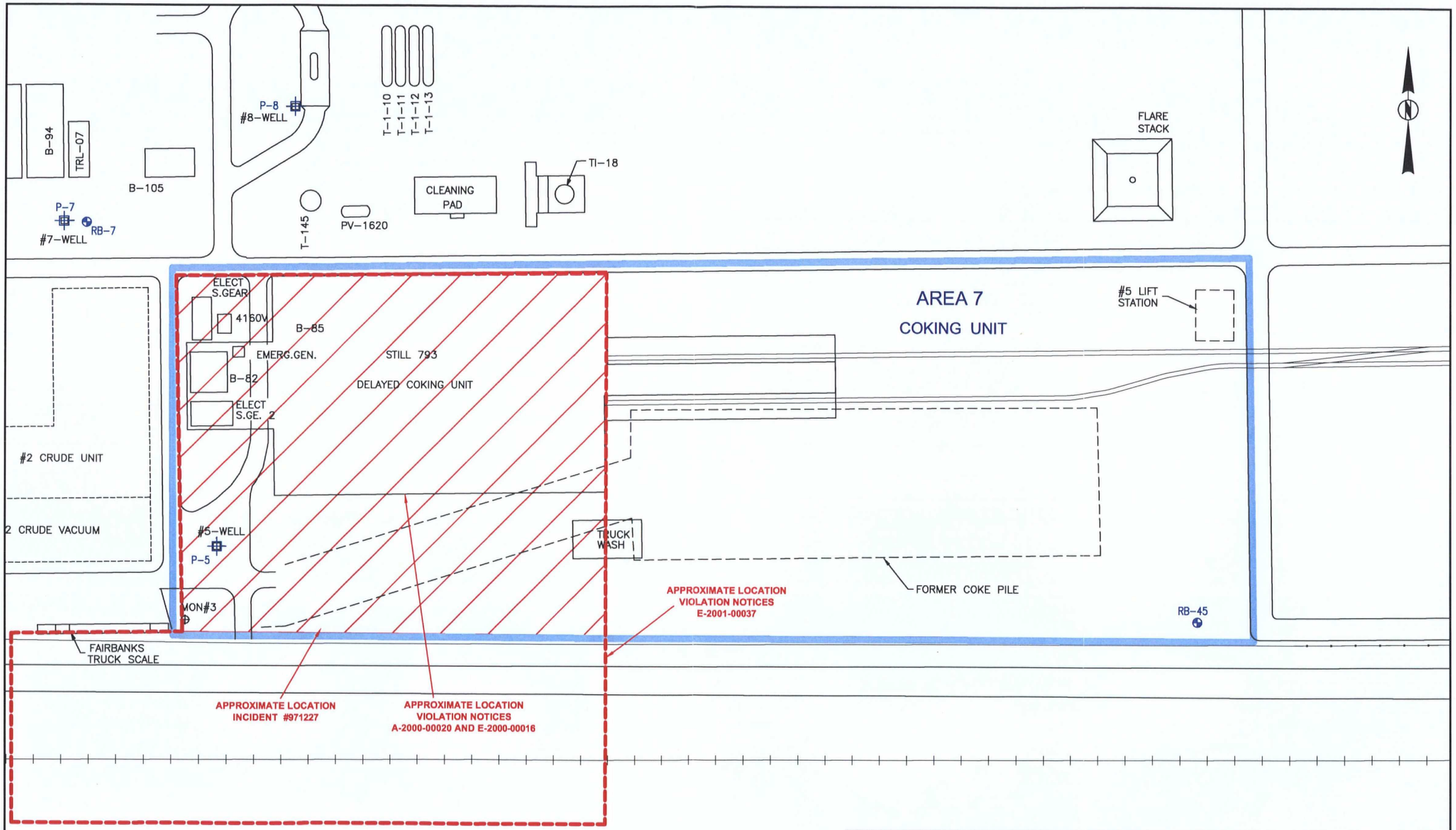
CHECK BY	
DRAWN BY	BCP
DATE	4-15-03
SCALE	AS SHOWN
CAD NO.	0309500J
PRJ NO.	15-03095.00

AREA 6 – ASPHALT PLANT

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE
3-6



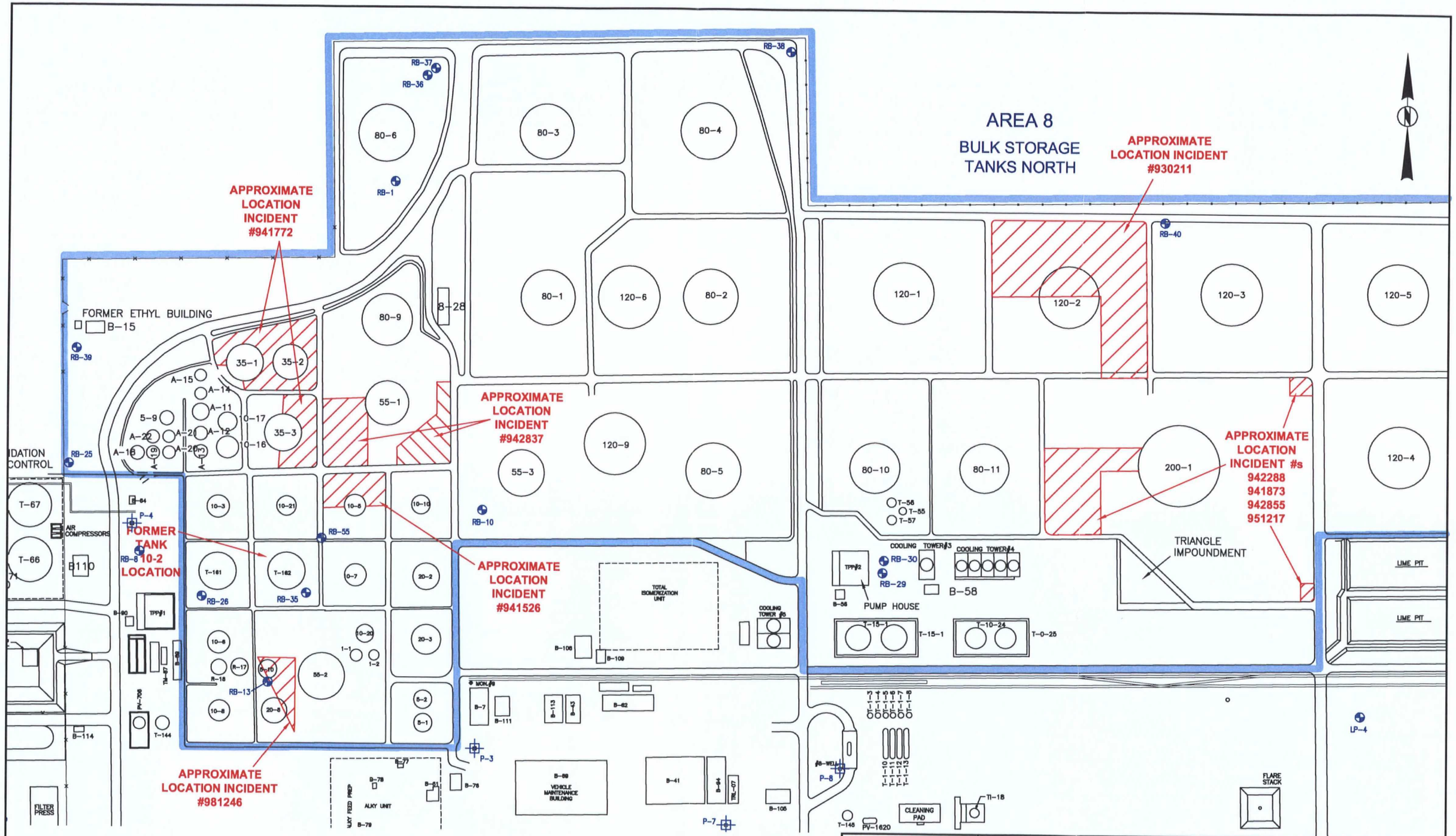
CHECK BY	
DRAWN BY	BCP
DATE	4-15-03
SCALE	AS SHOWN
CAD NO.	0309500K
PRJ NO.	15-03095.00

AREA 7 – COKING UNIT

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE 3-7



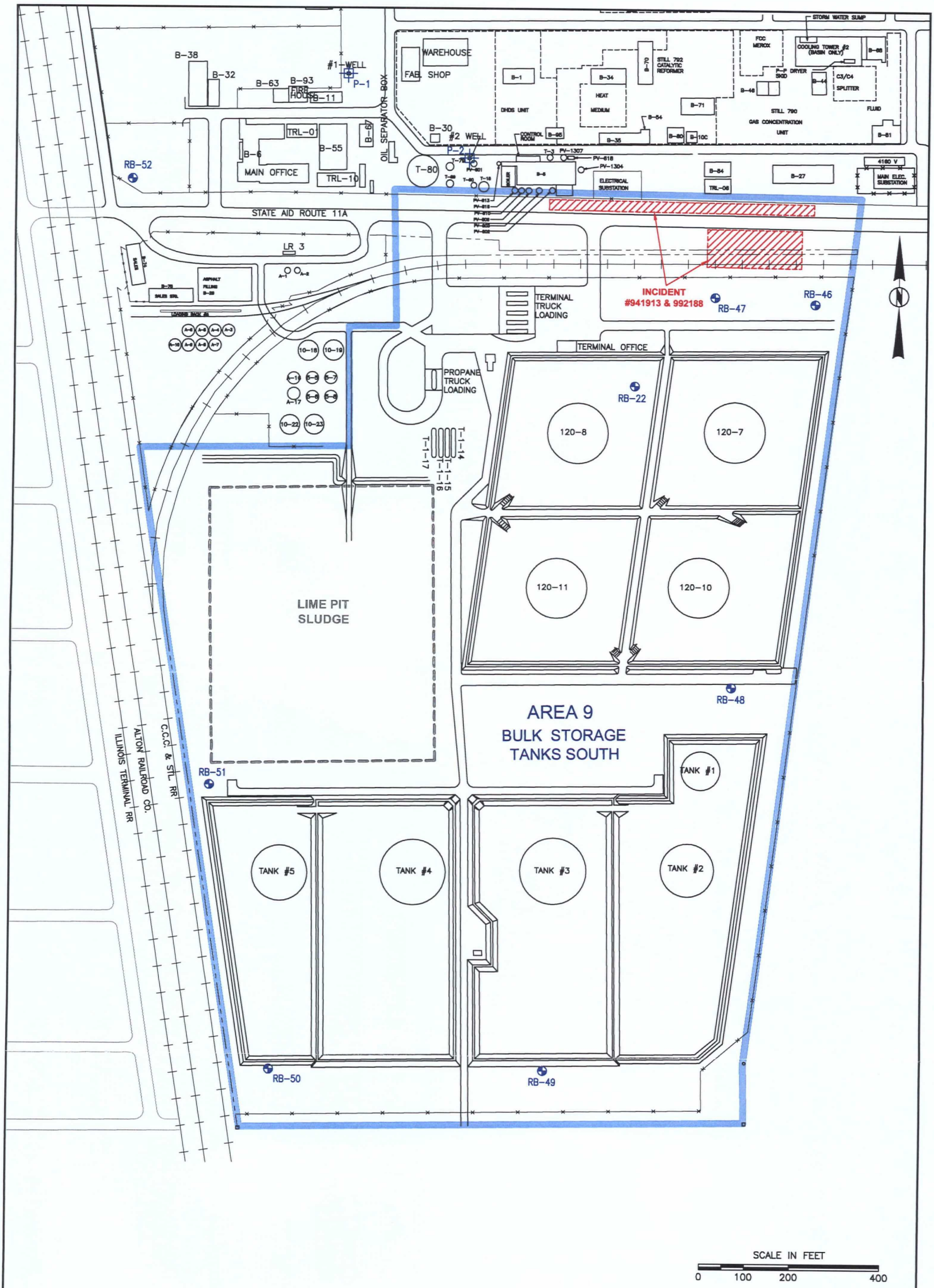
CHECK BY	
DRAWN BY	BCP
DATE	4-15-03
SCALE	AS SHOWN
CAD NO.	0309500L
PRJ NO.	15-03095.00

AREA 8
BULK STORAGE TANKS NORTH

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE 3-8



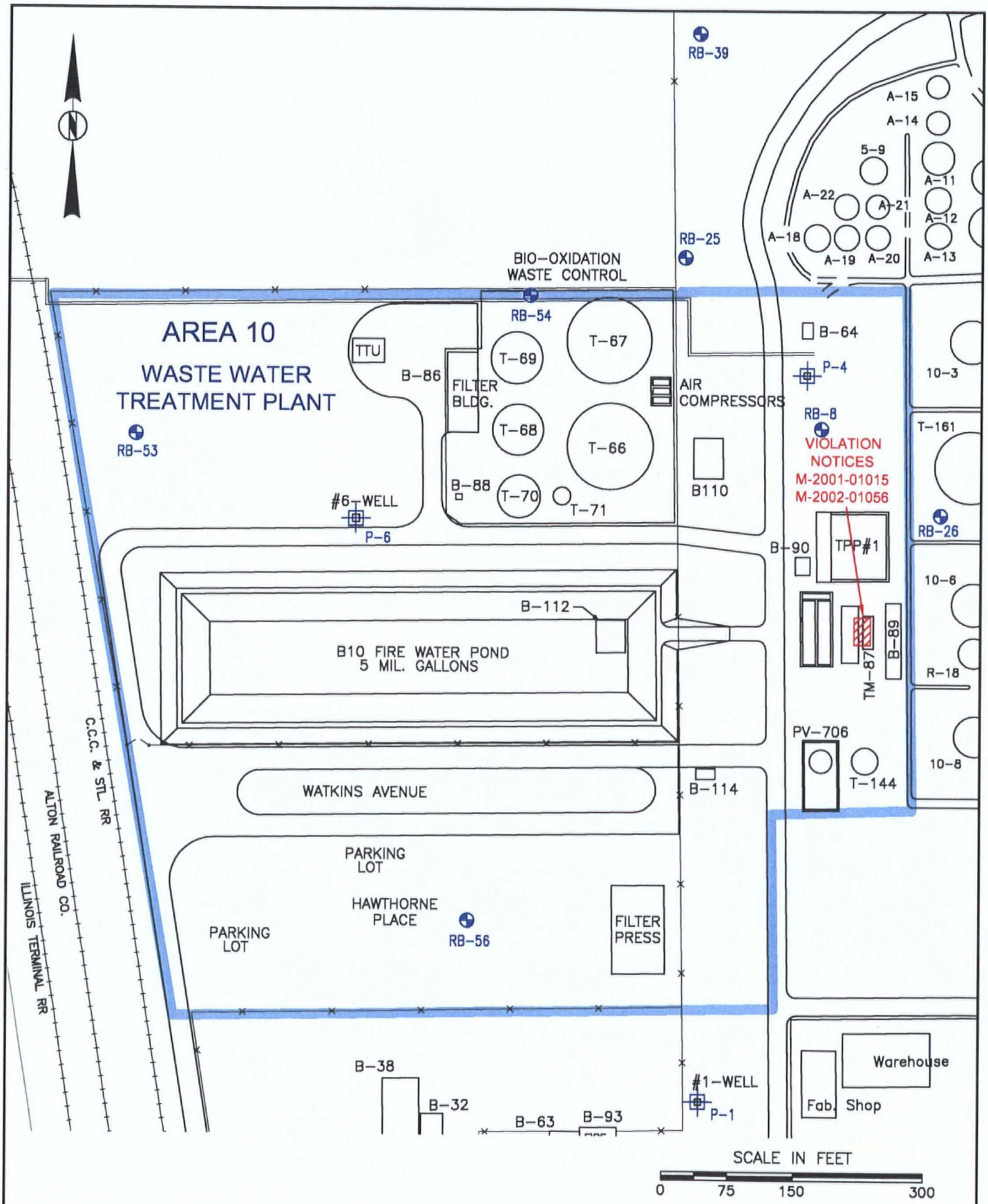
CHECK BY	
DRAWN BY	BCP
DATE	4-15-03
SCALE	AS SHOWN
CAD NO.	0309500M
PRJ NO.	15-03095.00

AREA 9
BULK STORAGE TANKS SOUTH

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton®
GROUP SERVICES

FIGURE 3-9



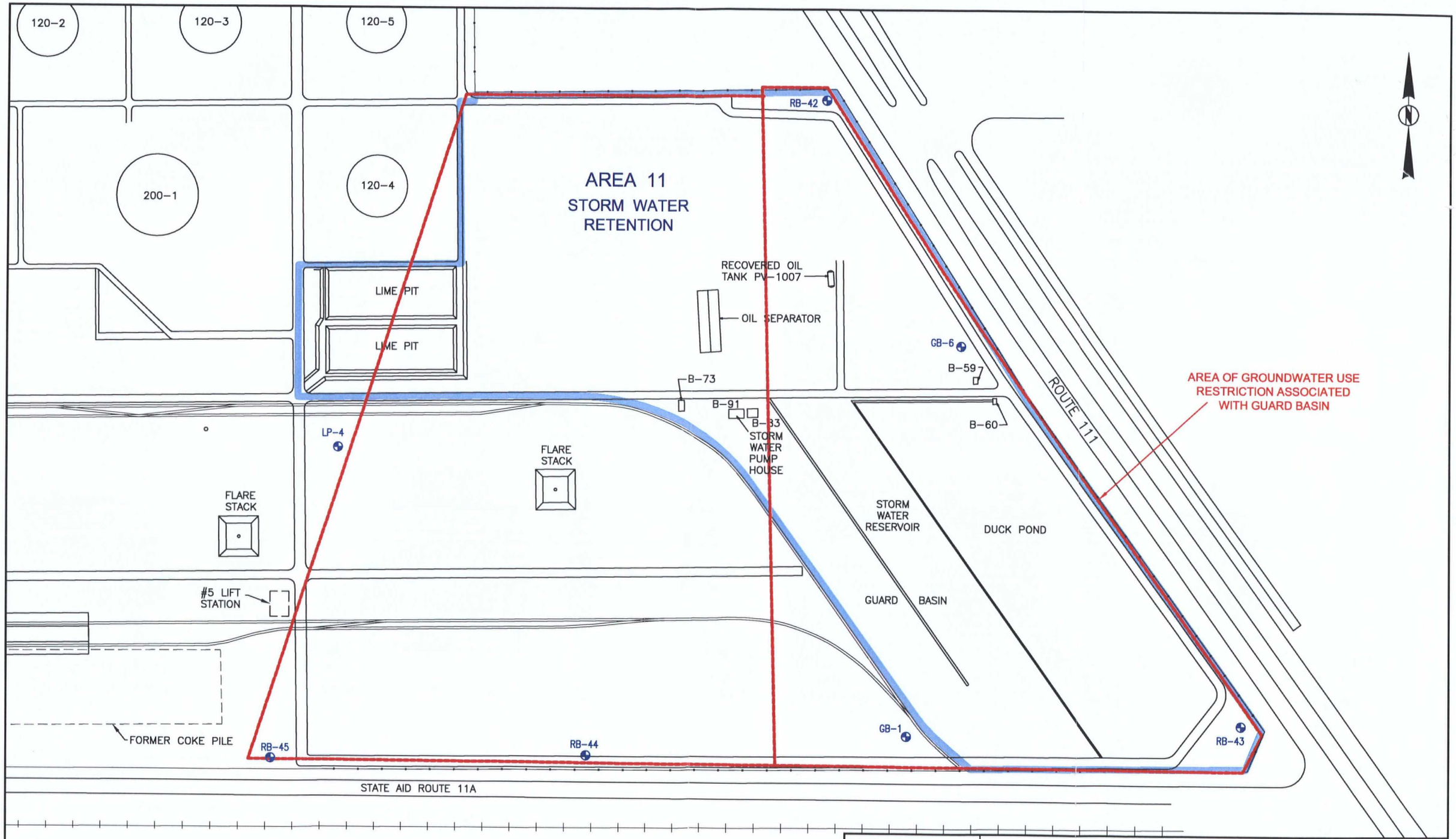
CHECK BY	
DRAWN BY	BCP
DATE	4-15-03
SCALE	AS SHOWN
CAD NO.	0309500N
PRJ NO.	15=03095.00

AREA 10
WASTE WATER TREATMENT PLANT

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton® GROUP SERVICES

FIGURE
3-10



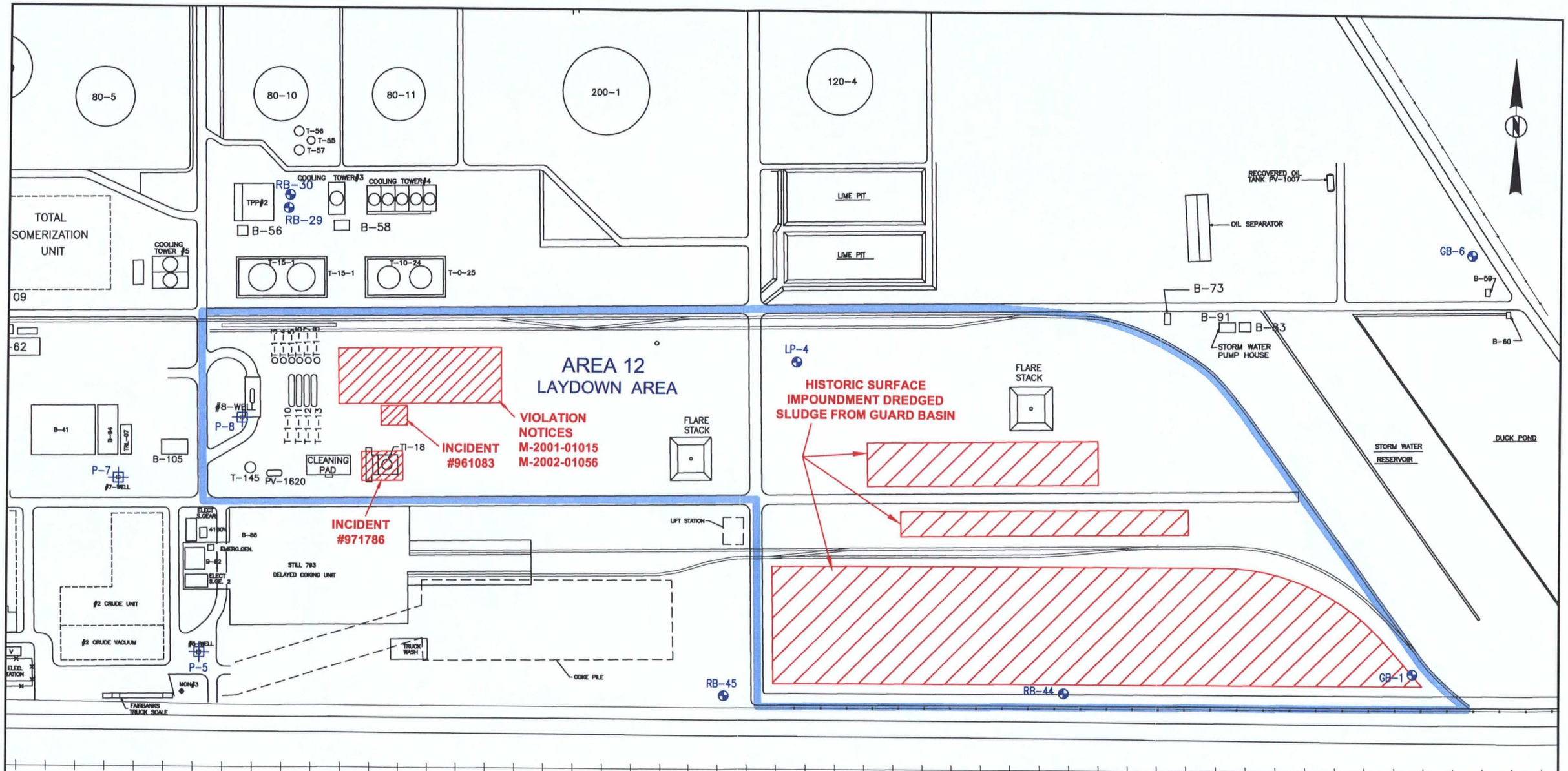
CHECK BY	
DRAWN BY	BCP
DATE	4-15-03
SCALE	AS SHOWN
CAD NO.	0309500o
PRJ NO.	15-03095.00

AREA 11
STORM WATER RETENTION

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE
3-11



CHECK BY	
DRAWN BY	BCP
DATE	4-15-03
SCALE	AS SHOWN
CAD NO.	0309500P
PRJ NO.	15-03095.00

AREA 12 – LAYDOWN AREA

THE PREMCOR REFINING GROUP, INC.
HARTFORD, ILLINOIS

Clayton GROUP SERVICES

FIGURE
3-12

TABLES

TANK 2-1
Summary of Storage Tanks

1190500002--Madison County--ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Tank #	Height (ft)	Diameter (ft)	Capacity	Insulation	STM Coils	Service	Location	Year Built	Remarks	Roof Type	Last Date Inspected	Next Code Inspection	Last Service Date	Active
Tanks														
A-11	12'-0"	36'-9"	2,250 BBL	Yes	Yes	Slop Oil	Bio-Area	1946	Idle out of service	Cone				No
A-12	26'-3"	26'-3"	2,500 BBL	Yes	Yes	Slop Oil	Bio-Area	1941	Idle out of service	Cone				No
A-13	26'-3"	26'-3"	2,500 BBL	Yes	Yes	Slop Oil	Bio-Area	1941	Idle out of service	Cone				No
A-14	19'-3"	24'-0"	1,538 BBL	Yes	Yes	Slop Oil	Bio-Area	1949	Idle out of service	Cone				No
A-15	19'-0"	24'-0"	1,538 BBL	Yes	Yes	Slop Oil	Bio-Area	1950	Idle out of service	Cone				No
A-18	30'-2"	25'-0"	2,620 BBL	Yes	Yes	Slop Oil	Refinery	1954	Idle out of service	Cone				No
A-19	30'-0"	25'-0"	2,620 BBL	Yes	Yes	Slop Oil	Refinery	1954	Idle out of service	Cone				No
A-20	30'-0"	25'-0"	2,620 BBL	Yes	Yes	Slop Oil	Refinery	1954	Idle out of service	Cone				No
A-21	30'-0"	25'-0"	2,620 BBL	Yes	Yes	Slop Oil	Refinery	1954	Idle out of service	Cone				No
A-22	30'-0"	25'-0"	2,620 BBL	Yes	Yes	Slop Oil	Refinery	1954	Idle out of service					No
T-1-1	16'-0"	21'-3"	1,000 BBL	No	No	Sweet napththa	West Refinery	1961	External inspection (1994)	External				
T-1-2	16'-0"	21'-3"	1,000 BBL	No	No	Sweet napththa	West Refinery	1961						
T-3-1	27'-0"	30'-0"	3,000 BBL	No	No	Slop	River	1956	Murphy repaired, & MQS inspected int. & ext. (1994)		1994	2004	In	Yes
T-5-2	26'-6"	36'-9"	5,000 BBL	No	No	Lt cyc oil	West Refinery	1941	Internal inspection by Clark (1992)		1992	2002	Out 12/02	No
T-5-3	26'-6"	36'-6"	5,000 BBL	No	No	Pet chem lt	West Refinery	1941	Scrapped					No
T-5-9	30'-2"	35'-0"	5,140 BBL	Yes	Yes	RD oil	West Refinery	1954	Idle out of service (1992)					No
T-5-10	30'-2"	35'-0"	5,140 BBL	No	No	Treated oil	Refinery	1954	Int 1998	External	1998	2008	Idle	Yes
T-10-3	32'-1"	47'-3"	10,000 BBL	Yes	Yes	Slop oil	West Refinery	1941	Scrapped (1990)	1 free air				No
T-10-5	32'-1"	47'-3"	10,000 BBL	No	No	Xylene	Refinery	1941	MQS inspected ext only (5/94)	Internal	2001	2011	Out 12/02	No
T-10-6	32'-1"	47'-3"	10,000 BBL	Yes	Yes	Slop oil	West Refinery	1941	Scrapped (1962)					No
T-10-7	32'-1"	47'-3"	10,000 BBL	No	No	Xylene	Refinery	1941	Int roof repairs (1998)	Internal	1998	2008	Out 11/02	No
T-10-8	32'-1"	47'-3"	10,000 BBL	Yes	Yes	#6 fuel oil	West Refinery	1941	Ext (1999 & 2000)			2010	Ready	Yes
T-10-10	40'-0"	42'-6"	10,000 BBL	No	No	Lt cyc oil	West Refinery	1941	Tank rebuilt by HMT (1994)	Internal	1994	2004	Out 11/02	No
T-10-16	36'-0"	45'-0"	10,200 BBL	Yes	Yes	Slop oil	West Refinery	1954	Roof caved in					No

TANK 2-1
Summary of Storage Tanks

1190500002--Madison County--ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Tank #	Height (ft)	Diameter (ft)	Capacity	Insulation	STM Coils	Service	Location	Year Built	Remarks	Roof Type	Last Date Inspected	Next Code Inspection	Last Service Date	Active
T-10-17	36'-0"	45'-0"	10,200 BBL	Yes	Yes	Slop oil	West Refinery	1954	Roof caved in					No
T-10-20	40'-0"	42'-6"	10,000 BBL	No	No	Sweet napththa	West Refinery	1961		External			Out 12/02	No
T-10-21	40'-0"	42'-6"	10,000 BBL	No	No	Sweet tip FD	West Refinery	1962	Inspected (10/2001)	Internal	2001	2011	Out 12/02	No
T-20-2	40'-2 1/4"	60'-0"	20,000 BBL	No	No	Coker naphtha	West Refinery	1948	MQS int/ext new int. flt roof & floor (1994)	Internal	1994	2004	Out 12/02	No
T-20-3	40'-2 1/4"	60'-0"	20,000 BBL	No	No	Coker naphtha	West Refinery	1948	Int (12/96)	Internal	1996	2006	Out 12/02	No
T-20-8	48'-0"	55'-0"	20,000 BBL	No	No	Alkylate	West Refinery	1960	Repairs (1985 & 1988) MFE Scan (4/2000)	Internal	2000	2010	Out 12/02	No
T-35-1	40'-0"	80'-0"	35,000 BBL	No	No	Prem Gaso	West Refinery	1957	New flt roof, pri/sec seals new floor (1992)	External	1992	2002		Yes
T-35-2	40'-0"	80'-0"	35,000 BBL	No	No	Prem Gaso	West Refinery	1957	New floor (1992) Int by MQS (1994) Int ext (2001)	External				
T-35-3	40'-0"	80'-0"	35,000 BBL	No	No	Sour Tip FD	West Refinery	1960	Internal, floor scan, pri & sec seals (1992)	External				
T-55-1	42'-3"	96'-6"	55,000 BBL	Yes	Yes	Gas Oil	West Refinery	1941	Int (1998)	Cone				
T-55-2	42'-3"	96'-6"	55,000 BBL	No	No	Lt Cycle	West Refinery	1941	6/98 Int (fire) ext	Cone				
T-55-3	42'-3"	96'-6"	55,000 BBL	No	Yes	#2 fuel oil	At the river	1941	New floor (1992) Int by MQS (1994) Int ext (2001)	Cone				
T-80-1	41'-10"	117'-2"	80,000 BBL	Yes	Yes	Asphalt	North Refinery	1941	Replaced roof (1988) Ext (1996) Insulation	Cone				
T-80-2	41'-10"	117'-2"	80,000 BBL	Yes	Yes	Asphalt	North Refinery	1941	18 rafters, new roof, patched floor (1983) int (2/2000)	Cone				
T-80-3	41'-10"	117'-2"	80,000 BBL	Yes	No	Asphalt	North Refinery	1941	New prv (1994), ext MQS (1993) Insulation	Cone				
T-80-4	40'-0"	120'-0"	80,000 BBL	No	No	Full range	North Refinery	1945	Ext int (8/99) floor scan	External				
T-80-5	40'-3"	120'-0"	80,000 BBL	No	No	Gaso	North Refinery	1949	Hartford floor scan, weld repair sides & floor (1990)	External				
T-80-6	40'-3"	120'-0"	80,000 BBL	No	No	#1 fuel oil	North Refinery	1949	Triad cleaned floor, vac box tested (3/93) (8/97) MFE roof & floor (1998)	External				

TANK 2-1
Summary of Storage Tanks

1190500002--Madison County--ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Tank #	Height (ft)	Diameter (ft)	Capacity	Insulation	STM Coils	Service	Location	Year Built	Remarks	Roof Type	Last Date Inspected	Next Code Inspection	Last Service Date	Active
T-80-9	48'-3"	110'-0"	80,000 BBL	Yes	Yes	Slurry	North Refinery	1952	Ext inst (1994) int (1997)	Cone				
T-80-10	48'-3"	110'-0"	80,000 BBL	No	No	Diesel	North Refinery	1952	Tank inspected (1994/95), Clark installed new floor (1995)	Cone				
T-80-11	48'-0"	110'-0"	80,000 BBL	No	No	Gaso	North Refinery	1953	New pri/sec seals (1993), new fltroof pan by Matrix (1995), weld repairs to shell	External				
T-120-1	48'-3"	134'-0"	120,000 BBL	No	No	Crude	North Refinery	1947	Cleaned, fiberglass floor, new seals, repaired roof (1988) Ext (1996)	External				
T-120-2	48'-3"	134'-0"	120,000 BBL	No	No	Crude	North Refinery	1947	New pontoon flt roof, new pri/sec seals, new floor	External				
T-120-3	48'-3"	134'-0"	120,000 BBL	No	No	Crude	North Refinery	1953	Int / ext (11/96)	External				
T-120-4	48'-3"	134'-0"	120,000 BBL	No	No	Gaso.	North Refinery	1953	New mixers & int. inspection (1995) Int (12/99)	Cone				
T-120-5	48'-3"	134'-0"	120,000 BBL	No	No	Gaso.	North Refinery	1953	New mixers, internal inspection, repairs to floor (1994)	External				
T-120-6	48'-3"	134'-0"	120,000 BBL	No	No	#6 fuel oil *black oil*	North Refinery	1953	Ext roof inspection (9/98)	Cone				
T-120-7	48'-3"	134'-0"	120,000 BBL	No	No	Gas oil	Terminal	1957	Fiberglass floor (7/87)	Cone				
T-120-8	48'-3"	134'-0"	120,000 BBL	No	No	Naphtha	Terminal	1957	MQS new floor (1/98) Ext/Int	External				
T-120-9	48'-3"	134'-0"	120,000 BBL	No	No	Naphtha	Refinery	1975	MQS crawler (1994) int (1987)	Internal				
T-120-10	48'-3"	134'-0"	120,000 BBL	No	No	Gas oil	Terminal	1975	MQS scanned sides & visual inspected welds (1992)	Cone				
T-120-11	48'-3"	134'-0"	120,000 BBL	No	No	Naphtha	Terminal	1975	Cleaned and inspected (2003)	Cone				
T-200-1	52'-0"	168'-0"	200,000 BBL	No	No	Crude	North Refinery	1975	Expoxy floors, new primary & secondary seals (1986), External (1996)	External				
Bio & Boilerhouse Tanks														
T-15						Water/lime	Boiler house	1974	Inspected (1989) internal & external					
T-60	8'3"	12"		No		Spent lime	Boiler house	1974						

TANK 2-1
Summary of Storage Tanks

1190500002--Madison County--ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Tank #	Height (ft)	Diameter (ft)	Capacity	Insulation	STM Coils	Service	Location	Year Built	Remarks	Roof Type	Last Date Inspected	Next Code Inspection	Last Service Date	Active
T-66	19'	100'	23,780 BBL	No		Water	Bio Area reactor	1974	Cleaned, inspected new manway, new aerator, repairs to floor	Open				
T-67	19'	100'	23,780 BBL	No		Water	Bio Area reactor	1974	Cleaned, inspected new manway, new aerator, repairs to floor	Open				
T-68	13'-6"	60'	4,055 BBL	No		Water	Bio-Area	1974	Clarifier	Open				
T-69	13'-6"	60'	4,055 BBL	No		Water	Bio-Area	1974	Clarifier rake to be repaired (2003)	Open				
T-70	16'-6"	50'	5,240 BBL	No		Water	Bio-Area	1974	Digester	Open				
T-71	13'-6"	20'	878 BBL	No		Water	Bio-Area	1974	Thickner new floor (1993)	Open				
T-72			1,559 BBL	No		Water	Bio-Area filter bldg		New floor (1996)					
T-73						Water	Bio-Area filter bldg		New floor (1996)					
T-74						Water	Bio-Area filter bldg		New floor (1996)					
T-75						Water	Bio-Area filter bldg		New floor (1996)					
T-80						Water	Boiler house	1974						
T-88	16'	15'	423 BBL	No		Water/lime	Boiler house	1974	New floor (1990)					
T-89	16'	15'	423 BBL	No			Boiler house	1974						
T-144	24'	30'		No		Spent caustic	Bio-Area	1981						
T-145	24'	18'	2,699 BBL	No		Lt cycle	Coker	1981						
T-161	32'	64'		No		Bio EQ tank	Refinery	1994	Same location as old 10-1 tank	External				
T-162	32'	64'		No		Bio EQ tank	Refinery	1996	Same location as old 10-2 tank	External				
T-164				No		Sulfuric acid	Boiler house	1994						
T-166				No		Caustic	Boiler house	1994	Spare caustic tank					
T-167				No		Water/lime	Boiler house	1994	Spare lime slurry					

TABLE 2-2
Past Spill Release Summary to Land/Groundwater

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Clayton #	Source of Information	Spill Date	NRC Report #	IEMA Incident #	Material	Quantity	Location	Current Conditions Report Area	Response
1	1978 Hartford Police Report	March 10, 1978			Gasoline	Unknown	Rand between Delmar & Olive St.	Area 3 - Underground Product Lines	
2	IEPA/ERU	April 28, 1978			Gasoline	Unknown	Elm St.	Area 3 - Underground Product Lines	
3	IEPA/ERU	October 16, 1978			Gasoline	Unknown	Corner of Olive St and Elm	Area 3 - Underground Product Lines	
4		January 8, 1981		810008	#6 Fuel Oil	400 gallons	Delmar Avenue and Elm Street	Area 3 - Underground Product Lines	Hired Environmental Emergency Services to clean up.
5	1981-1990 Hartford Police Records	November 10, 1982			Diesel Oil	Unknown	N Olive St at E Forest	Area 3 - Underground Product Lines	
6	1981-1990 Hartford Police Records	April 16, 1983			Unknown	Unknown	Date at Olive St	Area 3 - Underground Product Lines	
7	Facility's Waste Material Profile Sheet	1984			Tetraethyl lead (TEL) Contaminated Dirt	Approx 1.1 yds ^{3}(Four 55-gal drums-220 gals)	Unknown	Area 8 - Bulk Storage Tanks North	Leaking pump seal. Soil shipped offsite for disposal.
8	1990 IEPA Report	November 24, 1984			Light Cycle Oil	Unknown	100 Block E Elm	Area 3 - Underground Product Lines	
9	1981-1990 Hartford Police Records	September 26, 1987			Unknown	Unknown	N Olive at E Cherry St	Area 3 - Underground Product Lines	
10	IEPA/ERU	July 13, 1991			Coker Release	Unknown			Majority of spillage recovered by vac trucks
11		December 6, 1991		913533	Asphalt Oil	30 gallons	Underground pipeline on the east side of Route 3	Area 3 - Underground Product Lines	Excavated and replaced 400 ft of piping up to Rte 3 crossing
12	Facility Files-Chemical Spill Reporting Form	September 18, 1992			Unleaded Gasoline	10 gallons	35-1 & 35-2 pump	Area 8 - Bulk Storage Tanks North	Seal failure on pump.
13	Facility Files-Chemical Spill Reporting Form	November 6, 1992			Rich Amine	Not provided	Tank 80-5 Yard / Corroded amine line leak under road	Area 8 - Bulk Storage Tanks North	Yard blowers in, suck truck removed
14		November 12, 1992	144482	923188	Gasoline	5-10 bbl			Used vac truck/sucked material off water
15		November 14, 1992	144901	923238	Diethyl Amine	100+ bbl			Vaccum truck and excavate per regulations
16	Undated Clark O&R Corp. Letter	December 15, 1992			Gasoline	Unknown	Unknown		Skimmed product off the ponded water in diked area with vacuum truck.
17		February 21, 1993		930211	Crude Oil	750 bbl	Tank area 120-2 / Release from aboveground tank failed due to ruptured disk	Area 8 - Bulk Storage Tanks North	Product recovered and contaminated soil removed
18	Facility File	May 6, 1993		931160	Sulfuric Acid	2,000 gallons	AST south of #5 cooling tower	Area 5 - Refinery Process II	
19		December 5, 1993	211014		Gasoline	Unknown			
20		February 13, 1994	221572		Fuel Oil #2	30 gallons			
21		March 10, 1994	229549	940515	Asphalt & Light Oil	4-4,500 bbl*	600 ft east of Mississippi River barge terminal	Area 2 - River Dock	Contaminated soil removed and spill area bioremediated
22		April 19, 1994		940851	Asphalt	25 bbl*	Asphalt spill form #14 black oil river line - NW corner of Bio	Area 10 - WWTP	Contaminated soil removed and spill area bioremediated
23		May 19, 1994	240021		Fuel Oil #2	40-50 gallons	Water	Area 2 - River Dock	
24		May 23, 1994		4DBB	Oil/Diesel	Unknown	Pipeline failure/ Oil sheen on river	Area 2 - River Dock	

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Table based on review of available information found in Premcor and Illinois EPA Bureau of Land and Emergency Response Unit files.

TABLE 2-2
Past Spill Release Summary to Land/Groundwater

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Clayton #	Source of Information	Spill Date	NRC Report #	IEMA Incident #	Material	Quantity	Location	Current Conditions Report Area	Response
25	Facility Files-Chemical Spill Reporting Form	May 28, 1994			Gasoline (alkylate & reformer)	50 barrels	Tank 10-5	Area 8 - Bulk Storage Tanks North	Clark vacuumed up product.
26		May 31, 1994		4DBC (related to 940515)	Oily Water	Unknown	Pipeline break/ Oil sheen on river	Area 2 - River Dock	
27		July 1, 1994	247248	941478	#2 Fuel Oil	2 bbl	#2 Oil spill on river	Area 2 - River Dock	Clark personnel utilized absorbent booms to collect product from surface of river
28		July 9, 1994	248380	941526	Naptha	330-1000 bbl	10-5 tank overfill	Area 8 - Bulk Storage Tanks North	Flooded area with 2" of water from the fire pond; water vaccumed and taken to WWTP for treatment; Bio bugs applied
29		August 1, 1994	252895	941701	Unleaded gasoline	200 gallons	AST at the Clark river terminal	Area 2 - River Dock	Absorbant booms cleaned up spill
30		August 9, 1994	254308	941772	Premium Gasoline	2,000 bbl	Tank 35-2 Mixer failure	Area 8 - Bulk Storage Tanks North	Foam applied to blanket area, Bio bug remediation done on total area
31		August 15, 1994	256027	941873	Crude Oil	100 bbl	200-1 Tank yard	Area 8 - Bulk Storage Tanks North	Bio bug remediation was used
32		August 23, 1994	256953	941913	Gasoil	50 bbl	120-7 leak in concrete pit and at culvert on north side of Hawthorne Ave	Area 9 - Bulk Storage Tanks South	Installed geo-guard remediation pump, compressor, catch barrel, & containment area to recover product leaking on south side
33		September 25, 1994	262288	942188	Gasoil	1,826 bbl	Concrete pit on north side of Hawthorne Ave & from tunnel on south side	Area 9 - Bulk Storage Tanks South	Bio bugs were applied several times
34		October 10, 1994	264676	942288	Gasoline	25 bbl	120-4 suction line located at NW corner in 200 1 yard	Area 8 - Bulk Storage Tanks North	Contaminated soil removed and spill area bioremediated
35		October 10, 1994	263773		Black Oil	12 gallons	Barge on Mississippi River	Area 2 - River Dock	Oil was recovered.
36		October 28, 1994		942432	#2 Fuel Oil	6,000 gallons	#2 Fuel; piling driven through line at Rte 3	Area 3 - Underground Product Lines	Contaminated soil removed and spill area bioremediated
37		November 26, 1994	270991		unknown		Water	Area 2 - River Dock	
38		December 16, 1994		942837	Gasoil	40 bbl	Overfill of Tank 55-1	Area 8 - Bulk Storage Tanks North	Oil was floated with water and recovered. Spill area bioremediated
39		December 17, 1994		942855	Crude Oil	1 bbl	NE corner of Tank 200-1 yard	Area 8 - Bulk Storage Tanks North	Contaminated soil removed and spill area bioremediated
40		January 13, 1995	276244		Unknown	Unknown	Water	Area 2 - River Dock	
41		February 18, 1995	280410		Unknown	Unknown	Water	Area 2 - River Dock	
42		March 2, 1995		950356	Gasoline	20 gallons	Mississippi River at Hartford river terminal	Area 2 - River Dock	Absorbant booms collected product from surface of river
43		March 29, 1995	284959		Unknown	Unknown	Water	Area 2 - River Dock	
44		April 11, 1995	286529	950726	#2 Fuel Oil	2 bbl	Pipeline at Hartford river terminal	Area 2 - River Dock	Absorbant boom contained oil on river. Contaminated soil removed
45		May 1, 1995		950893	Petroleum	Unknown	Oil sheen on river in Dock area	Area 2 - River Dock	Absorbant booms cleaned up spill
46		June 7, 1995		951217	Crude Oil	350 bbl	South side of Tank 200-1 tank farm	Area 8 - Bulk Storage Tanks North	Contaminated soil removed and spill area bioremediated
47	Data Room Documentation Log April 2001	July 9, 1995					10-5 Spill	Area 8 - Bulk Storage Tanks North	
48	Data Room Documentation Log April 2001	July 10, 1995			Coker Cold Feed leak			Area 7 - Coker Unit	
49		September 25, 1995	308556		Unknown	Unknown	Water	Area 2 - River Dock	

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TABLE 2-2
Past Spill Release Summary to Land/Groundwater

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Clayton #	Source of Information	Spill Date	NRC Report #	IEMA Incident #	Material	Quantity	Location	Current Conditions Report Area	Response
50	Internal Memo from M. Modarres to B. Irwin (dated 11/13/95)	November 13, 1995			Gasoline	20-30 barrels	Pumphouse	Area 8 - Bulk Storage Tanks North	Failed 10" expansion joint on north side of pumphouse control room. Applied sorbent booms and vaccuumed product.
51		December 16, 1995	317351		Unknown	Unknown	Water	Area 2 - River Dock	
52		June 17, 1996	347575	961083	Liquid spill from Filter Cake F037	5-10 gallons		Area 12 - Laydown	Impacted soils removed for proper disposal
53	Illinois EPA C.E. Insp.	June 17, 1996			F037, F038 and K049	Not provided	Vicinity of Tank 162	Area 8 - Bulk Storage Tanks North	Impacted soils removed for proper disposal
54		September 17, 1996	361372		Unknown	Unknown	Water	Area 2 - River Dock	
55		October 31, 1996	366263		Unknown	Unknown	Water	Area 2 - River Dock	
56		December 13, 1996	370325		Unknown	Unknown	Water	Area 2 - River Dock	
57		December 17, 1996		962322	F037 Waste Oil	82 gallons	West of Alky Unit	Area 4 - Refinery Process I	Water utilized to remove contaminant and vaccum trucks transported water sludge mixture back to original tank (tank 161)
58		January 4, 1997	372209		Unknown	Unknown	Water	Area 2 - River Dock	
59	Premcor File No. 070.17.08	March 19, 1997		970598	Hydrocarbon Mixture	12,240 lbs. (approx 92 lbs benzene)	Atmospheric Overhead Line at Crude Distillation Unit	Area 4 - Refinery Process I	Line was repaired
60	1997 Environmental Events/Excursions	March 25, 1997			Distillate Feed	100 gallons	Line ruptured at Distillate Unit	Area 4 - Refinery Process I	
61		April 23, 1997	384760		Unknown	Unknown	Water	Area 2 - River Dock	
62		July 9, 1997		971227	Coker Release		Coker C-Drum 48 ft LVL	Area 7 - Coker Unit	The fire crew put water on the released vapors while the charge was taken out of the unit and steam was used to purge the vapors out
63	Misc Document	July 17, 1997			Water & Diesel Fuel	<50 gallons	Amoco Bridge over Rand Ave		Material/dryagent/absorbent pads/dirt/gravel, debris removed and the area cleaned
64	Misc Incident Investigation Report	August 5, 1997			Crude Oil	5 barrels	80-3 Tank	Area 8 - Bulk Storage Tanks North	Liquid material recovered by vac truck and placed in refinery recycle system. Contaminated soil was disposed
65		August 20, 1997	400247		Unknown	Unknown	Water	Area 2 - River Dock	
66		September 18, 1997		971746	Spent Catalyst	25 tons	Fluid Catalytical Cracker Unit	Area 4 - Refinery Process I	
67		September 22, 1997	404630	971786	KO48 Waste Spill	10 gallons	South side of Tank T-118	Area 12 - Laydown	
68		October 19, 1997			Oil	20-25 bbl	API	Area 10 - WWTP	
69	Misc E-Mail Document	November 15, 1997			Asphalt		80-2/120-6	Area 8 - Bulk Storage Tanks North	
70		November 19, 1997	412240		Unknown	Unknown	Water	Area 2 - River Dock	
71		May 26, 1998		981246	Unknown	Unknown	Tank 5-10	Area 8 - Bulk Storage Tanks North	Vaccum trucks removed mixture of water and oil form tank yard the same evening for processing in WWTP
72		July 29, 1998	448040		Hydraulic Oil	1.5 gallons	Water	Area 2 - River Dock	
73		August 12, 1998	450268		Unknown	Unknown	Water	Area 2 - River Dock	
74		August 13, 1998	450322		Unknown	Unknown	Water	Area 2 - River Dock	

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TABLE 2-2
Past Spill Release Summary to Land/Groundwater

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Clayton #	Source of Information	Spill Date	NRC Report #	IEMA Incident #	Material	Quantity	Location	Current Conditions Report Area	Response
75		August 13, 1998	450322		Unknown	Unknown	Water	Area 2 - River Dock	
76		August 26, 1998	452356		Bilge Slops	Unknown	Water	Area 2 - River Dock	
77		August 27, 1998	452646		Unknown	Unknown	Water	Area 2 - River Dock	
78	1998 Environmental Incidents/ Excursions	October 29, 1998			Crude Oil	6,000 gallons	T120-3 Blender pump failed	Area 8 - Bulk Storage Tanks North	Completely contained on Clark property
79	1998 Environmental Incidents/ Excursions	November 12, 1998			Gasoline	Unknown	Leaking valve T20-3	Area 8 - Bulk Storage Tanks North	Completely contained on Clark property
80	1998 Environmental Incidents/ Excursions	November 28, 1998			Gasoline	3-4 gallons	Leaking valve released into sump; oil movement (west of #2 pit)		Called for VOC truck
81		December 27, 1998	468873		Gas, Diesel, Water	15 gallons			
82	1999 Environmental Incidents/ Excursions	May 20, 1999			Guardplus 1102	1 gallon	Spilled while unloading a truck at Boiler House	Area 4 - Refinery Process	
83	1999 Environmental Incidents/ Excursions	August 9, 1999			Hydrocarbon	10 gallons	20-8 roof drain valve was open	Area 8 - Bulk Storage Tanks North	
84		September 26, 1999		992199	14" Black Oil Line Leak	5 bbl	112 E. Elm St.	Area 3 - Underground Product Lines	Line repair
85		December 10, 1999	508602		Unknown	Unknown	Water	Area 2 - River Dock	
86		January 1, 2000	515921		Unknown	Unknown	Water	Area 2 - River Dock	
87		February 13, 2000	519750		Coker Oil Overspray	55 gallons	Refinery and E Hawthorne St	Area 7 - Coker Unit	
88		November 8, 2000	547675	20002148	14" Diesel River Line Leak		City storm sewer along Market St & E Elm St	Area 3 - Underground Product Lines	Soil was excavated approximately 10-12 ft bgs to repair the diesel line
89		January 9, 2001	552997		Unknown	Unknown	Water	Area 2 - River Dock	
90		January 23, 2001	554467		Unknown	Unknown	Water	Area 2 - River Dock	
91		February 19, 2001	557157		Fuel Oil No. 2-D	75 gallons	Soil		
92		March 9, 2001	559096		Coker Oil Overspray			Area 7 - Coker Unit	
93		July 17, 2001	573237		Unknown	Unknown	Water	Area 2 - River Dock	
94		October 16, 2001		20011741	Diesel fuel	Unknown	Under roadway at Market and Elm Street	Area 3 - Underground Product Lines	Contractor hired for cleanup
95	Facility Files	November 2001			Black Oil	Unknown	Leak on 14" black oil line found in refinery north of BIO reactor	Area 10 - WWTP	
96	Facility Files	November 2001			Black Oil	Unknown	Leak on 14" black oil line found on West Elm	Area 3 - Underground Product Lines	

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TABLE 2-2
Past Spill Release Summary to Land/Groundwater

1190500002 -- Madison County -- ILD041889023
The Premcor Refining Group, Inc. / Hartford, Illinois

Clayton #	Source of Information	Spill Date	NRC Report #	IEMA Incident #	Material	Quantity	Location	Current Conditions Report Area	Response
97	Facility Files	April 2002			Black Oil	Unknown	Leak on 14" black oil line found in refinery north of BIO filer bldg & Tank T-69	Area 10 - WWTP	
98		May 24, 2002		20020695					
99		August 20, 2002			Asphalt Waste	Unknown	Old asphalt tank farm, most prevalent at tanks A-16, A-17, and 10-18	Area 6 - Asphalt Plant	244 cy of asphalt waste removed from the site. Current violations exist due to non-submittal of a RACR
100		November 15, 2002	629285		Unknown	Unknown	Water	Area 2 - River Dock	

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TABLE 2-3
Well Construction Summary
Groundwater Monitoring Wells

1190500002 -- Madison County -- ILD 041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Well Number	Installation Date	Abandonment Date	Ground Elevation (ft)	Location (1) Northing	Location (1) Easting	Depth of Boring from GS (ft)	Total Well Depth from GS (ft)	Stickup (ft)	Top of Well Casing Elevation (ft) (MP)	Bottom of Well Elevation (Sump) (ft)	Well ID (in.)	Well Material Riser	Well Material Screen	Riser Length (ft)	Screen Length 1st slot to last slot (ft)	Bottom of Screen to End Cap (ft)	Screen Depth Top Slot from GS (ft)	Screen Depth Top Slot Elevation (ft)	Screen Depth Bottom Slot from GS (ft)	Screen Depth Bottom Slot Elevation (ft)	Hydrostratigraphic Information Unit Screened
RB-1			427.71	3930.53	-4298.46			3.24	430.95		2	PVC	PVC								
RB-2		*									2	PVC	PVC								
RB-3		05/08/02	429.69	3587.20	-5020.28						2	PVC	PVC								
RB-4		05/07/02	431.68	3543.26	-4756.94						2	PVC	PVC								
RB-5		*									2	PVC	PVC								
RB-6		05/08/02		3092.96	-5625.87						2	PVC	PVC								
RB-7		*	429.86	2517.56	-3566.29						2	PVC	PVC								
RB-8			431.47	3126.24	-4869.05			2.69	434.16		2	PVC	PVC								
RB-9		05/07/02	432.45	3149.49	-4472.61			2.30	434.75		2	PVC	PVC								
RB-10	10/21/94		428.56	3210.45	-4111.08	47.0	45.0	2.20	430.76	383.56	4	PVC	PVC	27.20	20	NA	25.00	403.56	45.00	383.56	
RB-11		*									2	PVC	PVC								
RB-12		*									2	PVC	PVC								
RB-13			429.54	2830.05	-4592.94			2.64	432.18		2	PVC	PVC								
RB-14		*									2	PVC	PVC								
RB-15		*									2	PVC	PVC								
RB-16		*									2	PVC	PVC								
RB-17		*									2	PVC	PVC								
RB-18		*									2	PVC	PVC								
RB-19		*									2	PVC	PVC								
RB-20		*									2	PVC	PVC								
RB-21		*									2	PVC	PVC								
RB-22			429.25	1659.55	-4375.84			2.49	431.74		2	PVC	PVC								
RB-23		*									2	PVC	PVC								
RB-24		*									2	PVC	PVC								
RB-25			429.26	3318.87	-5021.98			3.58	432.84		2	PVC	PVC								
RB-26			428.10	3024.72	-4733.01			2.66	430.76		2	PVC	PVC								
RB-27		*									2	PVC	PVC								
RB-28																					
RB-29			430.36	3081.67	-3221.96			2.26	432.62												
RB-30			430.30	3092.07	-3220.97			2.32	432.62												
RB-31		*																			
RB-32		*																			
RB-33		*																			
RB-34		*																			
RB-35			427.44	3030.22	-4503.67			3.14	430.58												
RB-36	10/25/94		427.73	4159.92	-4225.63	25.0	25.0	2.16	429.89	402.73	2	PVC	PVC.010	17.16	10	NA	15.00	412.73	25.00	402.73	Silty Clay and Clay
RB-37	10/26/94		427.02	4177.03	-4208.61	62.0	60.0	2.09	429.11	367.02	2	PVC	PVC.010	42.09	20	NA	40.00	387.02	60.00	367.02	Sand
RB-38	01/16/95		431.32	4208.00	-3419.61	50.0	50.0	3.10	434.42	381.32	2	PVC	PVC.010	38.10	15	NA	35.00	396.32	50.00	381.32	Sand
RB-39	08/28/95		429.27	3752.03	-5004.02	44.0	43.0	2.94	432.21	386.27	2	PVC	PVC.010	30.94	15	NA	28.00	401.27	43.00	386.27	Silt, Sand, and Clay
RB-40	08/30/95		431.74	3829.33	-2597.73	46.0	44.5	2.49	434.23	387.24	2	PVC	PVC.010	31.99	15	NA	29.50	402.24	44.50	387.24	Sand
RB-41	08/31/95		431.63	3841.32	-1904.23	45.0	45.0	2.34	433.97	386.63	2	PVC	PVC.010	32.34	15	NA	30.00	401.63	45.00	386.63	Sand
RB-42	09/01/95		426.57	3482.21	-1091.85	45.0	42.0	2.61	429.18	384.57	2	PVC	PVC.010	29.61	15	NA	27.00	399.57	42.00	384.57	Sand
RB-43	09/07/95		426.75	2119.62	-194.04	40.0	35.0	1.93	428.68	391.75	2	PVC	PVC.010	21.93	15	NA	20.00	406.75	35.00	391.75	Silt and Clay
RB-44	09/08/95		430.95	2067.61	-1639.22	42.0	38.0	2.73	433.68	392.95	2	PVC	PVC.010	25.73	15	NA	23.00	407.95	38.00	392.95	Sand
RB-45	09/07/95		430.23	2067.58	-2335.79	45.0	45.0	2.42	432.65	385.23	2	PVC	PVC.010	32.42	15	NA	30.00	400.23	45.00	385.23	Sand
RB-46	09/19/95		428.67	1841.78	-3973.28	44.0	40.0	2.68	431.35	388.67	2	PVC	PVC.010	27.68	15	NA	25.00	403.67	40.00	388.67	Sand and Silt
RB-47	09/11/95		429.28	1859.46	-4197.23	44.0	40.0	2.57	431.85	389.28	2	PVC	PVC.010	27.57	15	NA	25.00	404.28	40.00	389.28	Sand
RB-48	09/19/95		429.48	977.74	-4164.57	45.0	40.0	2.51	431.99	389.48	2	PVC	PVC.010	27.51	15	NA	25.00	404.48	40.00	389.48	Sand
RB-49	09/14/95		427.54	121.89	-4588.32	44.0	42.0	2.50	430.04	385.54	2	PVC	PVC.010	29.50	15	NA	27.00	400.54	42.00	385.54	Clay
RB-50	09/14/95		429.52	130.77	-5202.49	46.0	45.0	2.71	432.23	384.52	2	PVC	PVC.010	12.71	35	NA	10.00	419.52	45.00	384.52	Clay

TABLE 2-3
Well Construction Summary
Groundwater Monitoring Wells

1190500002 -- Madison County -- ILD 041889023
The Premcor Refining Group Inc. / Hartford, Illinois

Well Number	Installation Date	Abandonment Date	Ground Elevation (ft)	Location (1) Northing	Location (1) Easting	Depth of Boring from GS (ft)	Total Well Depth from GS (ft)	Stickup (ft)	Top of Well Casing Elevation (ft) (MP)	Bottom of Well Elevation (Sump) (ft)	Well ID (in.)	Well Material Riser	Well Material Screen	Riser Length (ft)	Screen Length 1st slot to last slot (ft)	Bottom of Screen to End Cap (ft)	Screen Depth Top Slot from GS (ft)	Screen Depth Top Slot Elevation (ft)	Screen Depth Bottom Slot from GS (ft)	Screen Depth Bottom Slot Elevation (ft)	Hydrostratigraphic Information Unit Screened
RB-51	09/13/95		429.74	769.72	-5332.05	44.0	40.0	2.57	432.31	389.74	2	PVC	PVC.010	27.57	15	NA	25.00	404.74	40.00	389.74	Sand
RB-52	09/12/95		430.66	2134.75	-5498.04	42.0	42.0	2.09	432.75	388.66	2	PVC	PVC.010	24.09	20	NA	22.00	408.66	42.00	388.66	Silt, Sand, and Clay
RB-53	09/05/95		431.76	3126.22	-5645.38	42.0	42.0	2.81	434.57	389.76	2	PVC	PVC.010	24.81	20	NA	22.00	409.76	42.00	389.76	Clay and Sand
RB-54	09/06/95		430.00	3277.94	-5198.53	46.0	40.0	2.61	432.61	390.00	2	PVC	PVC.010	22.61	20	NA	20.00	410.00	40.00	390.00	Silt, Sand, and Clay
RB-55	08/31/95		432.33	3151.41	-4468.37	40.0	40.0	2.61	434.94	392.33	2	PVC	PVC.010	22.61	20	NA	20.00	412.33	40.00	392.33	Silt, Sand, and Clay
RB-56	09/18/95		430.08	2570.15	-5276.73	45.0	44.0	2.56	432.64	386.08	2	PVC	PVC.010	26.56	20	NA	24.00	406.08	44.00	386.08	Clay and Sand
GB-1	01/22/93		429.47	2102.95	-928.56	40.0	39.5	2.81	432.28	389.97	2	PVC	SS304	32.31	10	NA	29.50	399.97	39.50	389.97	Sand
GB-2	01/26/93	*	430.72	2442.37	-1168.97	41.0	40.5	2.88	433.60	390.22	2	PVC	SS304	33.38	10	NA	30.50	400.22	40.50	390.22	Sand
GB-3	01/19/93	*	430.76	2659.98	-1324.57	42.0	41.5	2.98	433.74	389.26	2	PVC	SS304	34.48	10	NA	31.50	399.26	41.50	389.26	Sand
GB-4	01/28/93	*	431.23	2959.36	-935.19	43.0	43.0	3.15	434.38	388.23	2	PVC	SS304	36.15	10	NA	33.00	398.23	43.00	388.23	Sand
GB-5		*	432.13	2970.73	-1032.82			2.69	434.82												
GB-6			428.21	2956.38	-801.07			3.05	431.26												
LP-1	02/02/93	*	426.48	3200.54	-1980.51	41.0	40.5	1.89	428.37	385.98	2	PVC	SS304	27.39	15	NA	25.50	400.98	40.50	385.98	Sand
LP-2	01/29/93	*	427.37	3081.56	-2341.39	40.0	40.0	3.01	430.38	387.37	2	PVC	SS304	33.01	10	NA	30.00	397.37	40.00	387.37	Sand
LP-3	02/02/93	*	427.48	2964.88	-2342.65	40.0	40.0	2.22	429.70	387.48	2	PVC	SS304	32.22	10	NA	30.00	397.48	40.00	387.48	Sand
LP-4	02/03/93		430.42	2745.62	-2180.04	42.0	40.0	2.84	433.26	390.42	2	PVC	SS304	27.84	15	NA	25.00	405.42	40.00	390.42	Sand
LP-5		*	426.37	3205.47	-1880.46	42.0		2.86	429.23												
LP-6	08/18/93	*	426.20	3197.90	-2171.84	41.0	39.9	3.12	429.32	386.29	2	PVC	PVC.010	27.68	15	0.35	24.56	401.64	39.56	386.64	
P-1	12/16/66		430.31	2366.77	-5018.01	106.0	104.0	0.00	430.31	326.31	16	SS	SS	84.00	20	NA	84.00	346.31	104.00	326.31	Sand
P-2	04/11/66		430.43	2156.63	-4768.31	114.0	114.0	0.50	430.93	316.43	16	SS	SS	94.50	20	NA	94.00	336.43	114.00	316.43	Sand
P-3	01/31/68	08/10/90	430.27	2693.93	-4129.28	100.7	100.7	0.00	430.27	329.57	16	SS	SS	75.70	25	NA	75.70	354.57	100.70	329.57	Sand
P-4																					
P-5	12/16/69		429.49	2221.60	-3482.05	110.0	110.0	0.00	429.49	319.49	16	SS	SS	90.00	20	NA	90.00	339.49	110.00	319.49	Sand
P-6	02/26/73		430.48	3024.54	-5391.65	115.5	115.5	1.50	431.98	314.98	16	SS	SS	92.00	25	NA	90.50	339.98	115.50	314.98	Sand
P-7			429.42	2515.18	-3578.32																
P-8	10/26/90		429.49	2636.94	-3322.73	114.0	104.0	2.00	431.49	325.49	16	SS	SS	76.00	30	NA	74.00	355.49	104.00	325.49	Sand

NOTES:
MP = Measuring Point
GS = Ground Surface
NA = Not Applicable
ID = Inside Diameter
(1) = Local Plane Coordinates
* = Well Abandonment Date Unknown
Fields left blank indicate that no data was found.

HISTORICAL
AERIAL
PHOTOGRAPHS

HISTORICAL
AERIAL
PHOTOGRAPHS

HISTORICAL AERIAL PHOTOGRAPHS

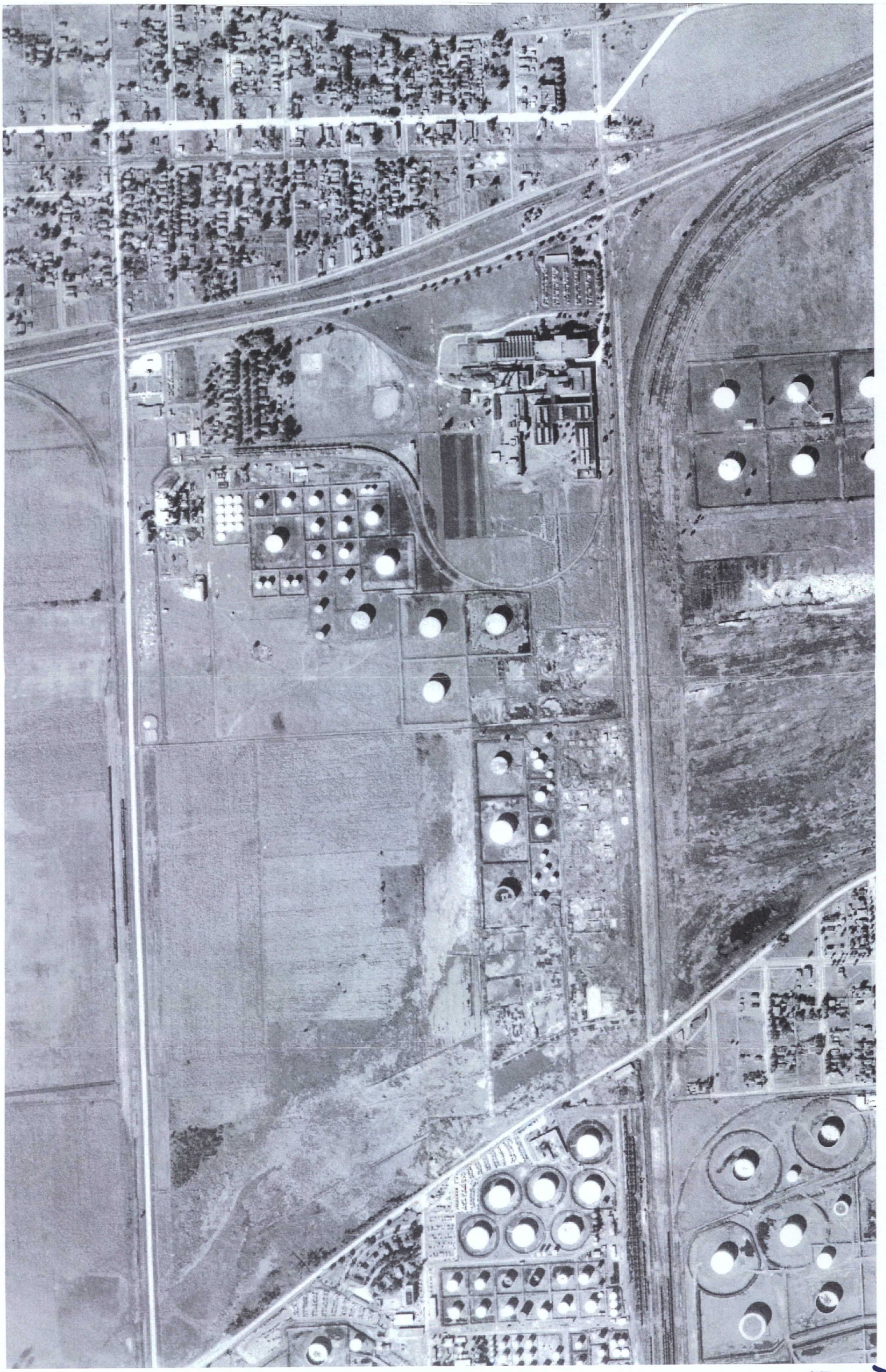
Historical Aerial Photograph Review

Historical aerial photographs were obtained from the United States Department of Agriculture (USDA) and the Illinois State Geological Survey (ISGS). Historical aerial photographs were provided for the period between 1941 and 1998. Photographs reviewed are summarized as follows:

Date	Scale	Comments
1941	No Scale	The subject property was depicted as an apparent oil refinery located in the western part of the refinery property with an apparent small residential area surrounding Watkins Avenue in the vicinity of the current WWTP and Administration Areas. Tanks were present in the northern and central portions of this area. The remaining majority of the refinery property, including south of Hawthorne Street, appeared to be agricultural land. This apparent agricultural area included the current Coking Unit Area, the current Laydown Area, the current Storm Water Retention Area, the Bulk Storage Tanks North Area (east of Tank 80-2), the Asphalt Plant Area, and the Bulk Storage Tanks South Area, although apparent railroad tracks were present on the portion of the refinery property south of Hawthorne Street. Apparent agricultural land and a tank farm, followed by railroad tracks and then another tank farm, were directly north of the refinery property. An industrial complex (location of International Shoe Company's former tannery), apparently unrelated to refinery operations, was immediately to the northwest of the refinery property. Immediately west of the subject property were railroad tracks, followed by an apparent residential area, the River Dock Area and the Mississippi River. East of the property was Route 111 followed by an apparent oil refinery tank farm. The adjoining property to the south of the refinery property consisted of Hawthorne Street followed by railroad tracks (parallel to Hawthorne Street), followed by agricultural land. The River Dock Area appeared to be a mix of agricultural land/forest. A dock was apparent at the location of the current facility dock. An apparent pipeline appeared to be in the approximate location of the existing River Dock Area pipelines. Surrounding properties appeared similar, though an apparent man-made water body was north of Rand Street. Docks were also observed north of the area.

Date	Scale	Comments
1955	No Scale	The majority of the refinery property appeared the same as in the 1941 aerial photograph with the exception of new tanks, primarily to the east and south of Tank 80-2, and structures added to the central portions of the property. Operations in the Refinery Process I Area appeared to have expanded eastward. The Guard Basin was present in the Storm Water Retention Area, though the Duck Pond was not observed nor was the Coking Unit. The ground surface within the Coking Unit Area and Laydown Area appeared disturbed. The Asphalt Plant Area, with several structures and tanks in their current configuration, appeared south of Hawthorne Street, though the majority of the Bulk Storage Tanks South Area still appeared as agricultural land. The adjoining properties to the west of the refinery property were the same as the 1941 aerial photograph. The abutting properties to the north and east appeared relatively unchanged, though a large apparently man-made water body was adjacent to the tank farm north of the railroad tracks. The majority of the adjoining property to the south, the current ConocoPhillips property, contained a storage tank farm. The River Dock Area appeared to contain less wooded land; and apparent water bodies, though in slightly different configurations, were present in the approximate current locations of Lagoons #1 and #2. The ground surface appeared disturbed in the current areas of Lagoon #3 and the ponds south of Hawthorne Street. The facility dock was visible, as were docks immediately to the north and south. The levee appeared to be under construction east of the River Dock Area property. A mix of apparent agricultural land, forested land and disturbed land surrounded the River Dock Area.
1962	No Scale	The majority of the refinery property was the same as the 1955 aerial photograph. Two tanks had been added to the Bulk Storage Tanks South Area, though the majority of this area remained agricultural land. Additional buildings had been added to the Refinery Process II Area. Minor changes were observed in the Bulk Storage Tanks North Area configuration. The Duck Pond was now present in the Storm Water Retention Area. The adjoining properties to the refinery appeared relatively unchanged, with slight increases in development density. The adjoining ConocoPhillips property to the south had added a manmade pond. The River Dock Area contained all three lagoons, and three apparent manmade ponds south of Hawthorne Street were present. The levee, east of the River Dock Area property, appeared to be completed. The properties adjoining the River Dock Area were also relatively unchanged, though additional man-made water bodies were present to the north and more docks were noted along the east bank of the Mississippi River.

Date	Scale	Comments
1974	No Scale	The majority of the refinery property was the same as the 1962 aerial photograph, though operations appeared to have expanded to the east in the Refinery Process I Area and operations were apparent in the west end of the Coking Unit Area. The Lime Pits in the Storm Water Retention Area and the Triangle Impoundment in the Bulk Storage Tanks North Area were now present. The ground surface appeared disturbed in portions of the Laydown Area and the WWTP Area. The Bulk Storage Tanks South Area appeared to be under construction, in its current configuration, though only the two northernmost tanks were present. Apparent residential development, previously observed surrounding Watkins Avenue in the WWTP and Administration Areas, was no longer present. The properties adjoining the refinery property appeared relatively unchanged. The River Dock Area and its adjoining properties also appeared relatively unchanged, with the exception of development on the National Marine property including man-made ponds.
1978	No Scale	The majority of the refinery property was relatively the same as the 1974 aerial photograph, with the exception of new tanks within the WWTP Area and the completion of the Bulk Storage Tanks South Area in its current configuration. The ground surface in the location of the landfill within the Bulk Storage Tank South area also appeared to be disturbed. The adjoining properties to the refinery property appeared relatively unchanged, though with a slightly increased development density. The River Dock Area and its adjoining properties also appeared relatively unchanged.
1988	No Scale	The refinery property appeared relatively the same as the 1978 aerial photograph, though the entire refinery property, both north and south of Hawthorne Streets, now appeared occupied. The ground surface in the location of the landfill within the Bulk Storage Tanks South area contained a number of pits. The adjoining properties to the refinery property were relatively the same as the 1978 aerial photograph, with the exception of the apparent demolition of the former tannery to the northwest of the refinery property. The River Dock Area and its adjoining properties also appeared relatively unchanged, with the exception of larger man-made ponds on the National Marine Service property.
1993	No Scale	The refinery property appeared relatively the same as the 1988 aerial photograph, though the Fire Water Pond in the WWTP Area was now present and vegetation appeared to be developing over the landfill in the Bulk Storage Tanks South Area. Also an apparent small man-made pond now appeared in the Storm Water Retention Area directly north of the northwest corner of the Guard Basin. The adjoining properties to the refinery property also appeared relatively the same as the 1988 aerial photograph. The River Dock Area and its adjoining properties also appeared relatively unchanged.
1998	No Scale	The refinery property appeared relatively the same as the 1993 aerial photograph, though vegetation appeared to have developed over the majority of the landfill in the Bulk Storage Tanks South Area. The adjoining properties to the refinery property also appeared relatively the same as the 1993 aerial photograph. The River Dock Area and its adjoining properties also appeared relatively unchanged.

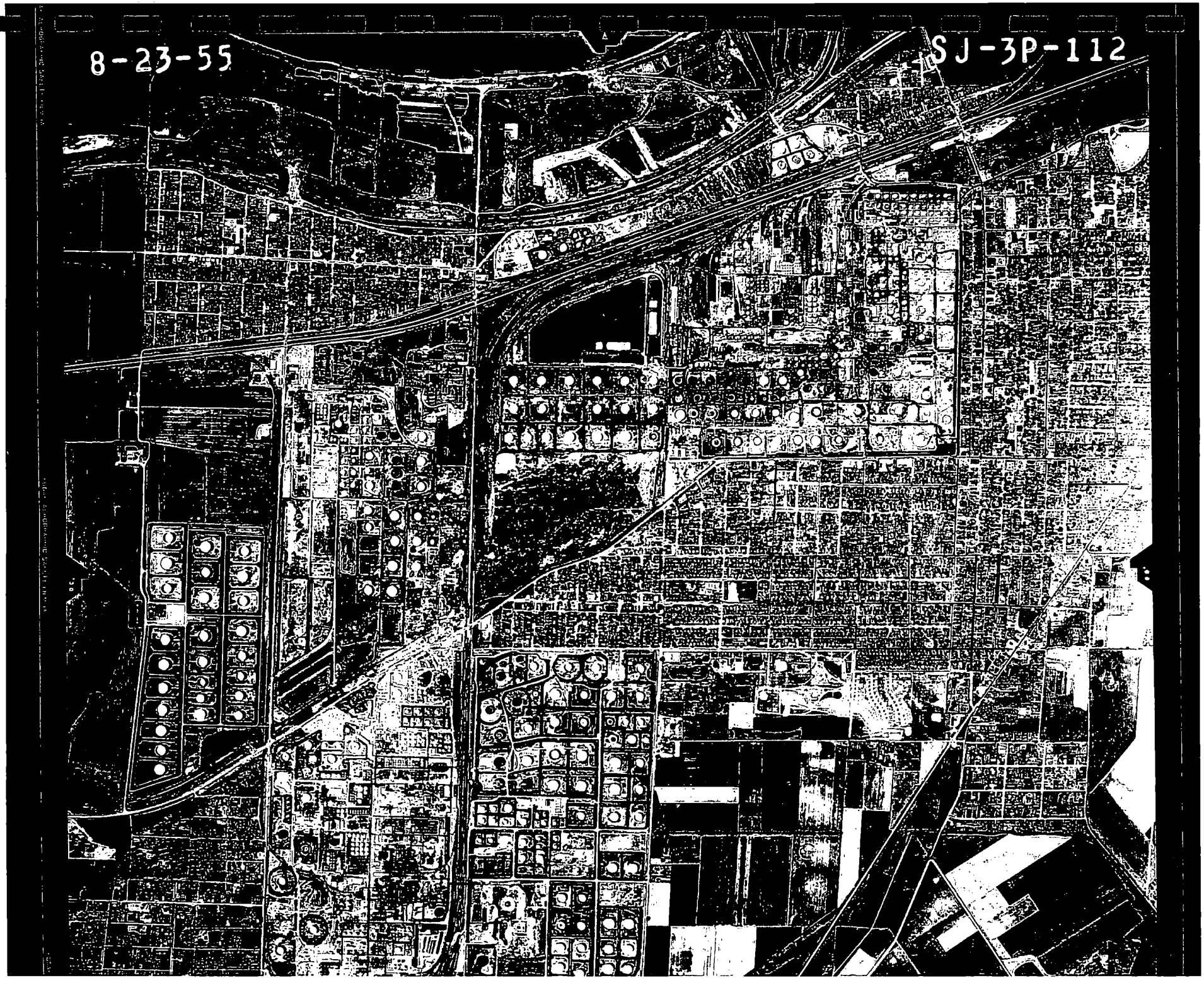


ISGS 1941 REFINERY NO SCALE N

N

No Scale

RIVER DOCK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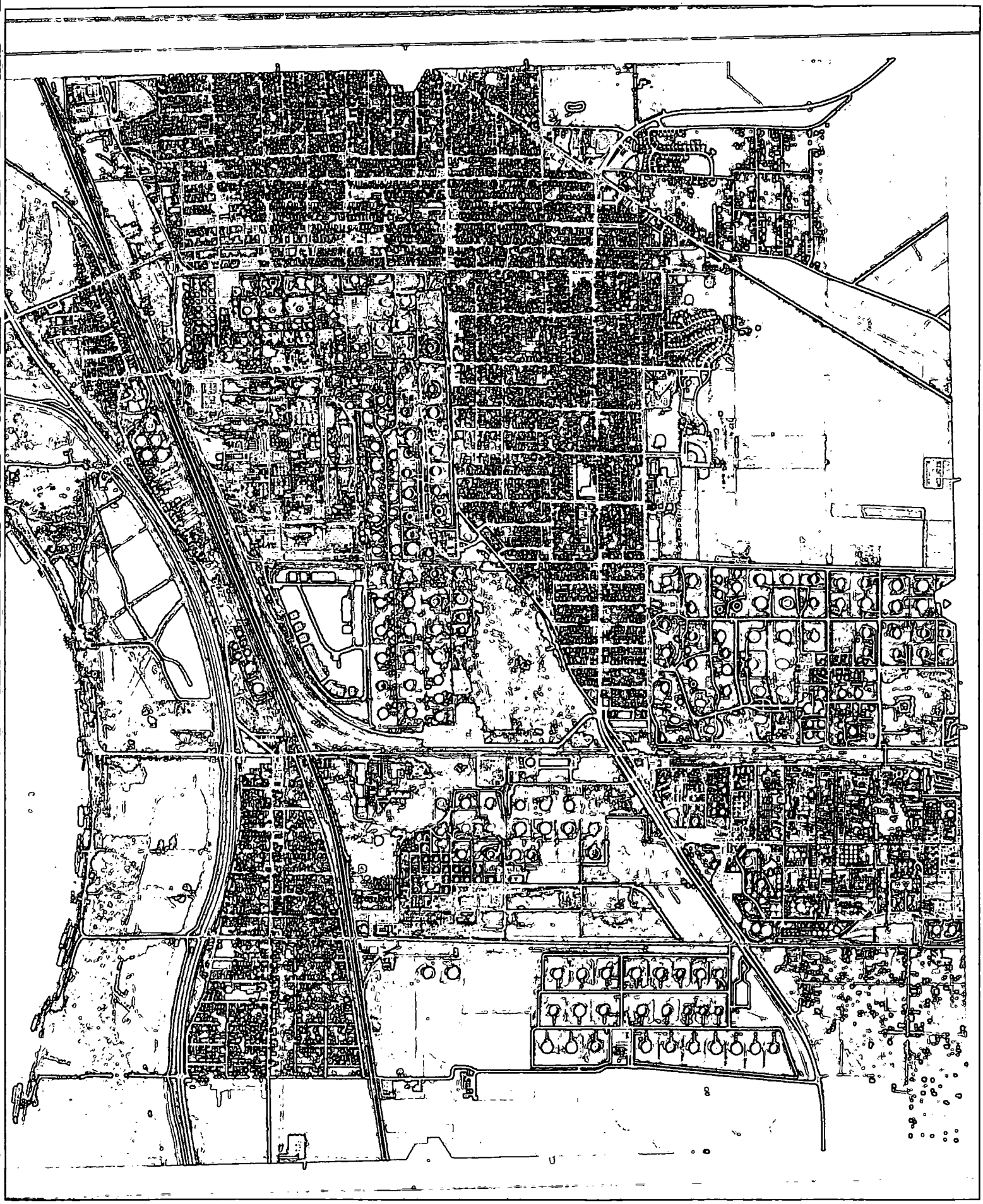
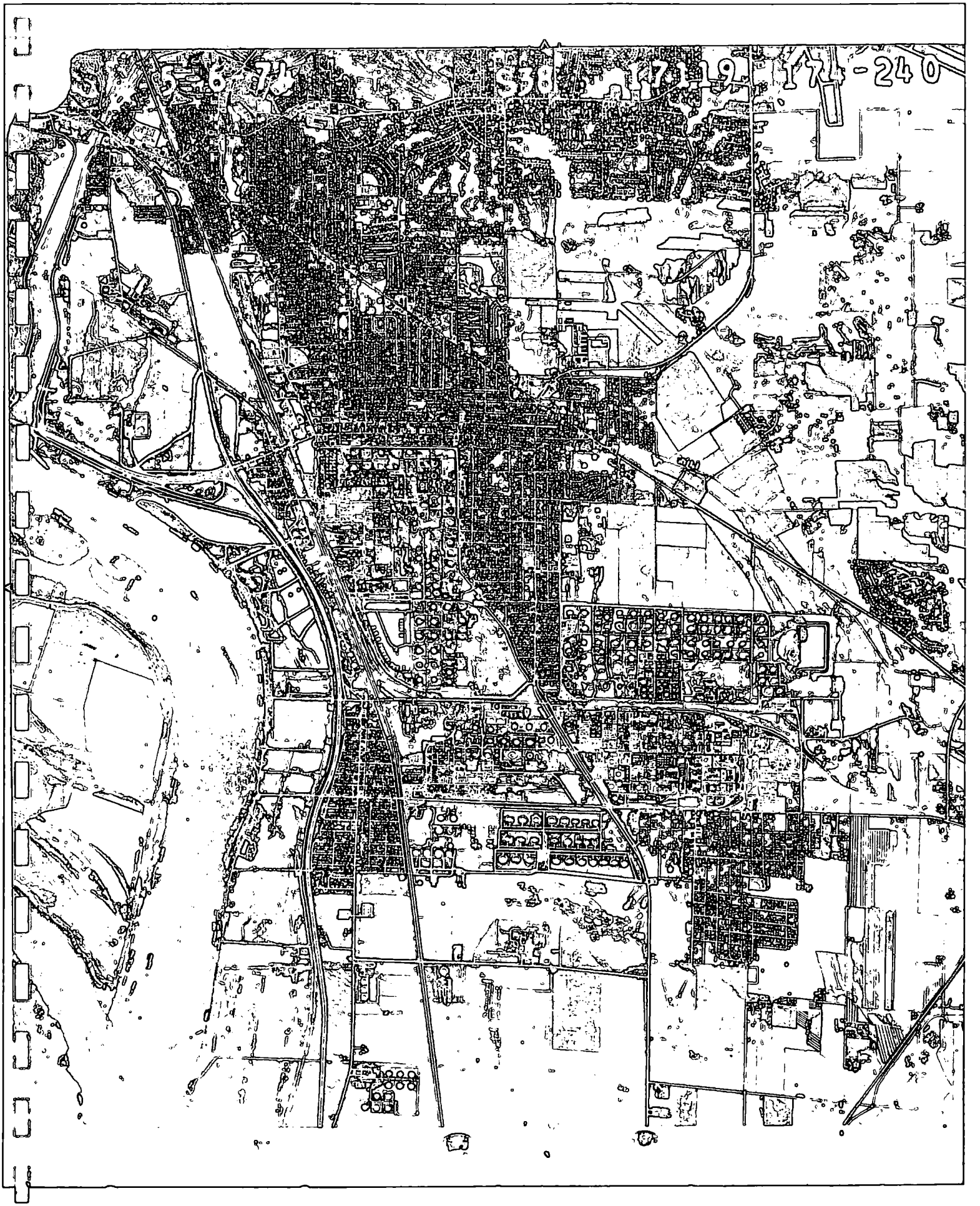
SJ-3P-112

7-14-62

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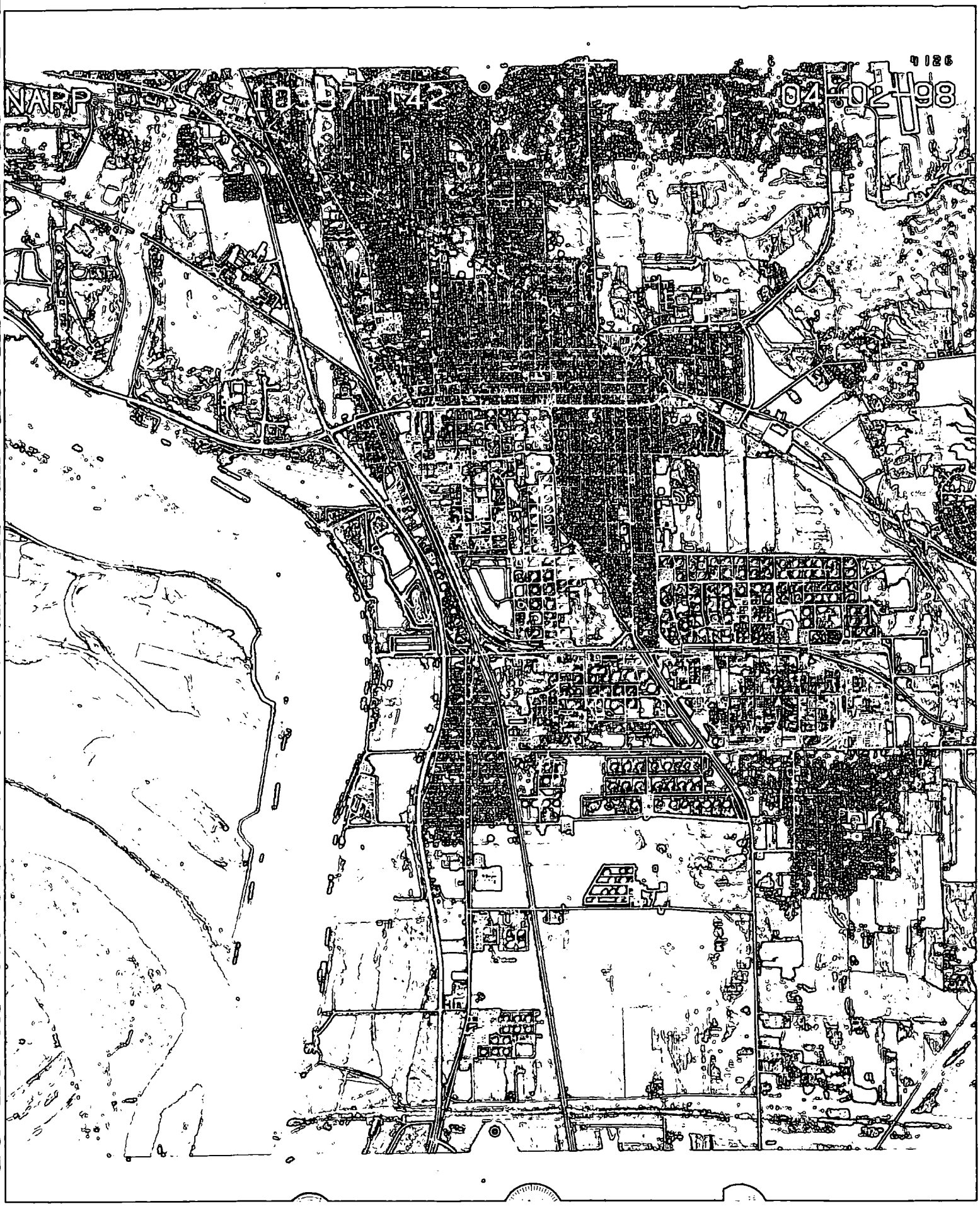
NAPP
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Clayton
GROUP SERVICES

HISTORICAL TOPOGRAPHIC MAPS

The EDR-Historical Topographic Map Report

Premcor Hartford Refinery
201 East Hawthorne
Hartford, IL 62048

March 18, 2003

Inquiry Number: 941970-7

Environmental Data Resources, Inc.

The Source For Environmental Risk Management Data

3530 Post Road
Southport, Connecticut 06490

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802

Environmental Data Resources, Inc.
Historical Topographic Map Report

Environmental Data Resources, Inc.'s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property, and its surrounding area, resulting from past activities. ASTM E 1527-00, Section 7.3 on Historical Use Information, identifies the prior use requirements for a Phase I environmental site assessment. The ASTM standard requires a review of *reasonably ascertainable standard historical sources. Reasonably ascertainable is defined as information that is publicly available, obtainable from a source with reasonable time and cost constraints, and practically reviewable.*

To meet the prior use requirements of ASTM E 1527-00, Section 7.3.2, the following *standard historical sources* may be used: aerial photographs, city directories, fire insurance maps, topographic maps, property tax files, land title records (although these cannot be the sole historical source consulted), building department records, or zoning/and use records. ASTM E 1527-00 requires *"All obvious uses of the property shall be identified from the present, back to the property's obvious first developed use, or back to 1940, whichever is earlier. This task requires reviewing only as many of the standard historical sources as are necessary, and that are reasonably ascertainable and likely to be useful."* (ASTM E 1527-00, Section 7.3.2 page 11.)

EDR's Historical Topographic Map Report includes a search of available public and private color historical topographic map collections.

Topographic Maps

A topographic map (topo) is a color coded line-and-symbol representation of natural and selected artificial features plotted to a scale. Topos show the shape, elevation, and development of the terrain in precise detail by using contour lines and color coded symbols. Many features are shown by lines that may be straight, curved, solid, dashed, dotted, or in any combination. The colors of the lines usually indicate similar classes of information. For example, topographic contours (brown); lakes, streams, irrigation ditches, etc. (blue); land grids and important roads (red); secondary roads and trails, railroads, boundaries, etc. (black); and features that have been updated using aerial photography, but not field verified, such as disturbed land areas (e.g., gravel pits) and newly developed water bodies (purple).

For more than a century, the USGS has been creating and revising topographic maps for the entire country at a variety of scales. There are about 60,000 U.S. Geological Survey (USGS) produced topo maps covering the United States. Each map covers a specific quadrangle (quad) defined as a four-sided area bounded by latitude and longitude. Historical topographic maps are a valuable historical resource for documenting the prior use of a property and its surrounding area, and due to their frequent availability can be particularly helpful when other standard historical sources (such as city directories, fire insurance maps, or aerial photographs) are not reasonably ascertainable.

Please call EDR Nationwide Customer Service at
1-800-352-0050 (8am-8pm ET)
with questions or comments about your report.
Thank you for your business!

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Inquiry Number: 941970-7

TP Quad [X] Adj Quad [] ↑N

Quad Wood River, IL-MO

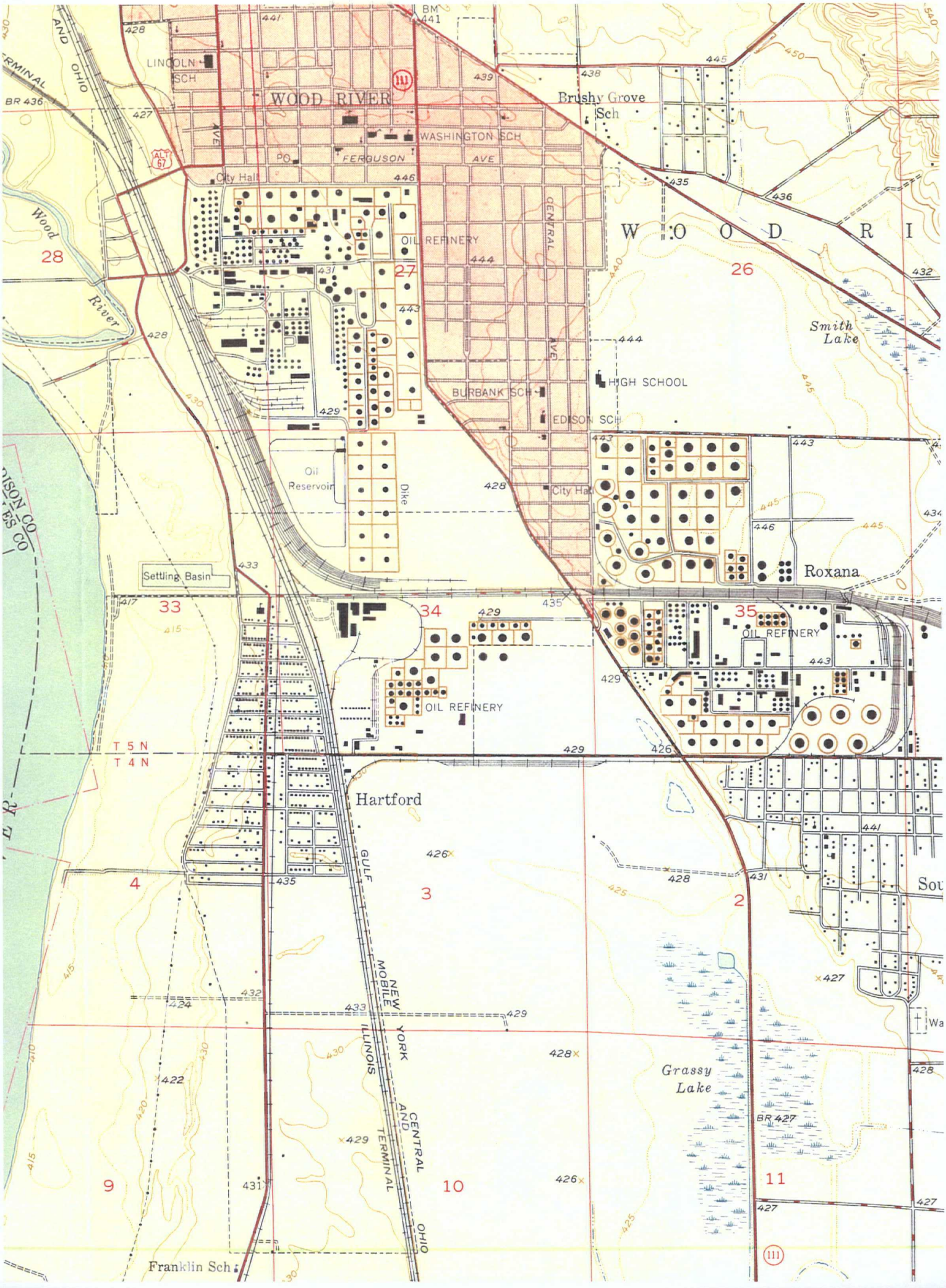
Minute Series [X] 7.5 [] 15 [] 30 [] 30x60

Year 1951 [X] []Provisional Edition []Revised

[]Photorevised []Inspected from _____

[X] 1:24,000 [] 1:25,000 [] 1:31,680 [] 1:50,000

[] 1:62,500 [] 1:100,000 [] 1:125,000



WOOD RIVER
LINCOLN SCH
WASHINGTON SCH
FERGUSON AVE
City Hall
Brushy Grove Sch
OIL REFINERY
CENTRAL AVE
W O O D R I
Smith Lake
HIGH SCHOOL
BURBANK SCH
EDISON SCH
Oil Reservoir
Dike
City Hall
Roxana
Settling Basin
OIL REFINERY
OIL REFINERY
T 5 N
T 4 N
Hartford
GULF MOBILE AND OHIO
NEW YORK CENTRAL
ILLINOIS TERMINAL
Grassy Lake
Franklin Sch
Wood River
28
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Inquiry Number: 941970-7

TP Quad [X] Adj Quad [] ↑N

Quad Wood River, IL-MO

Minute Series [X] 7.5 [] 15 [] 30 [] 30x60

Year 1955 [X] []Provisional Edition []Revised

[]Photorevised []Inspected from _____

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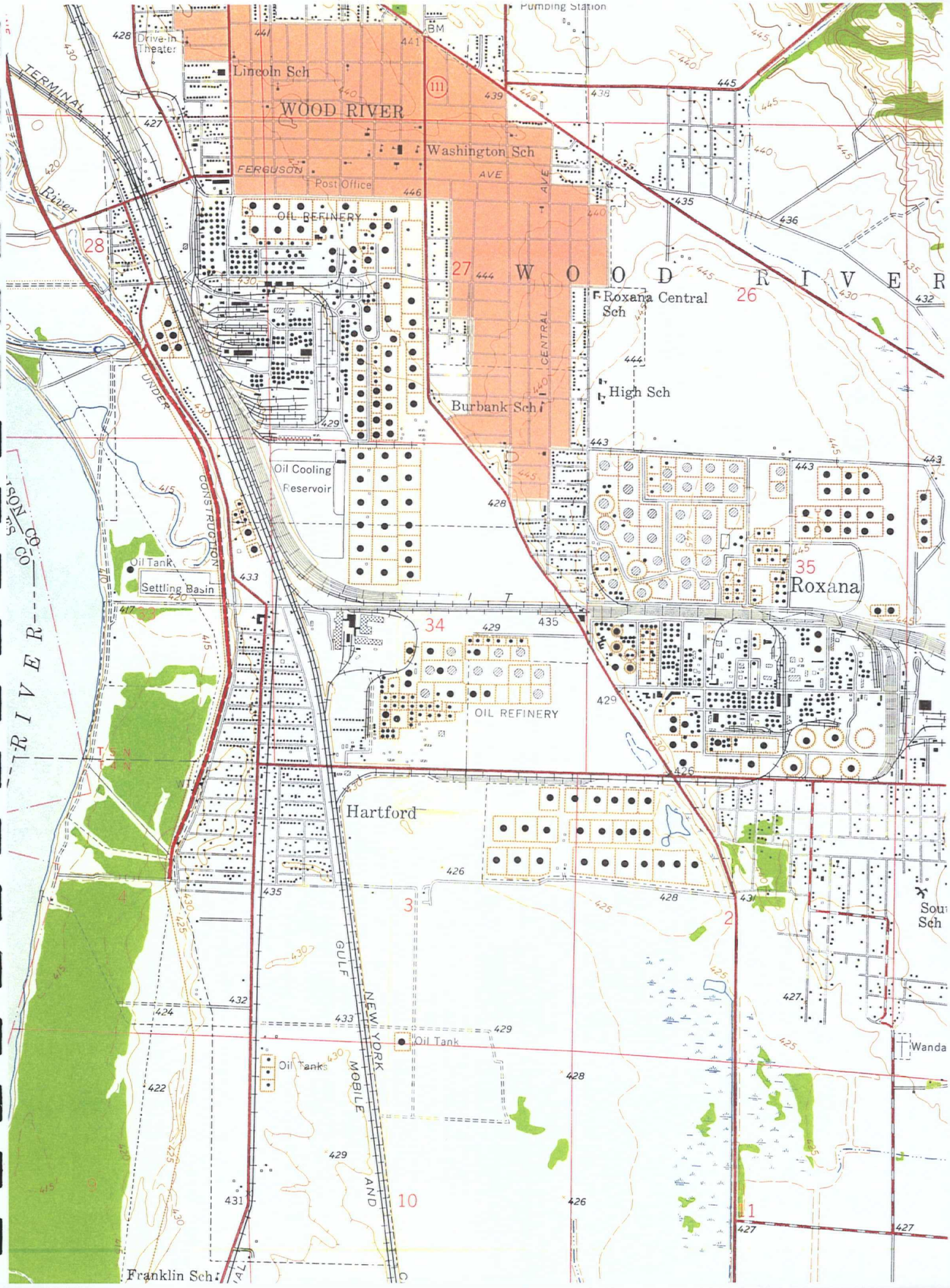
Pumping Station
Drive-in Theater
Lincoln Sch
WOOD RIVER
Washington Sch
FERGUSON AVE
Post Office
TERMINAL
River
OIL REFINERY
W O O D R I V E R
Roxana Central Sch
High Sch
Burbank Sch
CENTRAL AVE
UNDER CONSTRUCTION
Oil Cooling Reservoir
Oil Tank
Settling Basin
Roxana
OIL REFINERY
Hartford
GULF MOBILE AND NEW YORK
Oil Tank
Oil Tanks
Wanda
Franklin Sch
R I V E R

Inquiry Number: 941970-7

TP Quad [X] Adj Quad [] ↑N

Quad Wood River, IL-MO

Minute Series [X] 7.5 [] 15 [] 30 [] 30x60

Year 1968 [X] [] Provisional Edition [] Revised

[X] Photorevised [] Inspected from 1955

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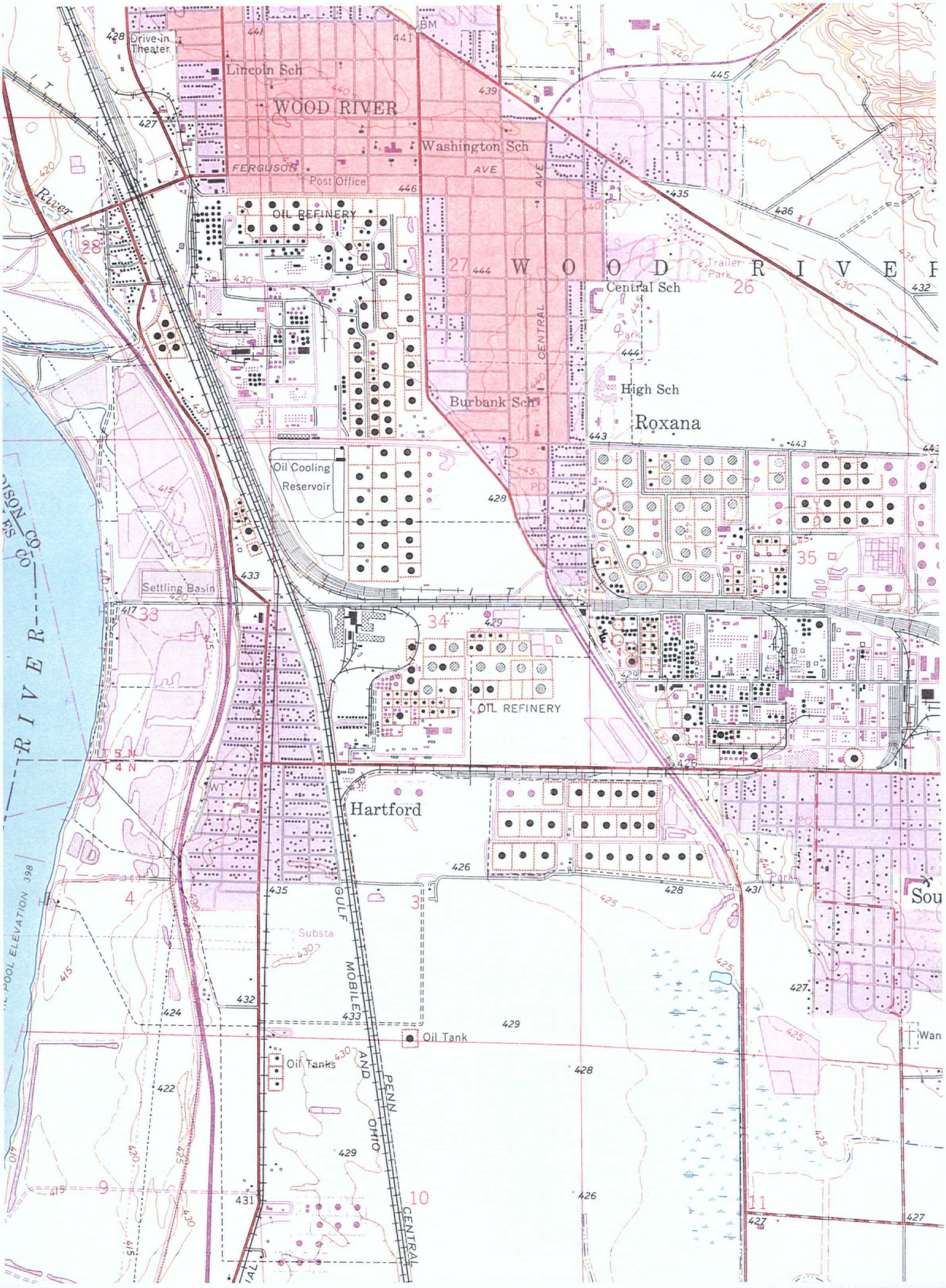
Drive-in Theater
Lincoln Sch
WOOD RIVER
Washington Sch
FERGUSON
AVE
Post Office
OIL REFINERY
River
W O O D R I V E R
Trailer Park
Central Sch
CENTRAL
High Sch
Burbank Sch
Roxana
Oil Cooling Reservoir
Settling Basin
OIL REFINERY
Hartford
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GULF MOBILE AND OHIO
PENN CENTRAL
Oil Tank
Oil Tanks
POOL ELEVATION 398
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Wan

Inquiry Number: 941970-7

TP Quad [X] Adj Quad [] ↑N

Quad Wood River, IL-MO

Minute Series [X] 7.5 [] 15 [] 30 [] 30x60

Year 1974 [] Provisional Edition [] Revised

[X] Photorevised [] Inspected from 1955

[X] 1:24,000 [] 1:25,000 [] 1:31,680 [] 1:50,000

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Drive-in Theater
Lincoln Sch
WOOD RIVER
Washington Sch
AVE
FERGUSON
Post Office
OIL REFINERY
Trailer Park
Central Sch
Park
High Sch
Roxana
Burbank Sch
CENTRAL
Oil Cooling Reservoir
Settling Basin
OIL REFINERY
Hartford
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ILLINOIS
Oil Tank
Oil Tanks
PENN CENTRAL
GULF
CENTRAL
RIVER
POOL ELEVATION

Inquiry Number: 941970-7

TP Quad [X] Adj Quad [] ↑N

Quad Wood River, IL-MO

Minute Series [X] 7.5 [] 15 [] 30 [] 30x60

Year 1994 [X] []Provisional Edition []Revised

[]Photorevised []Inspected from _____

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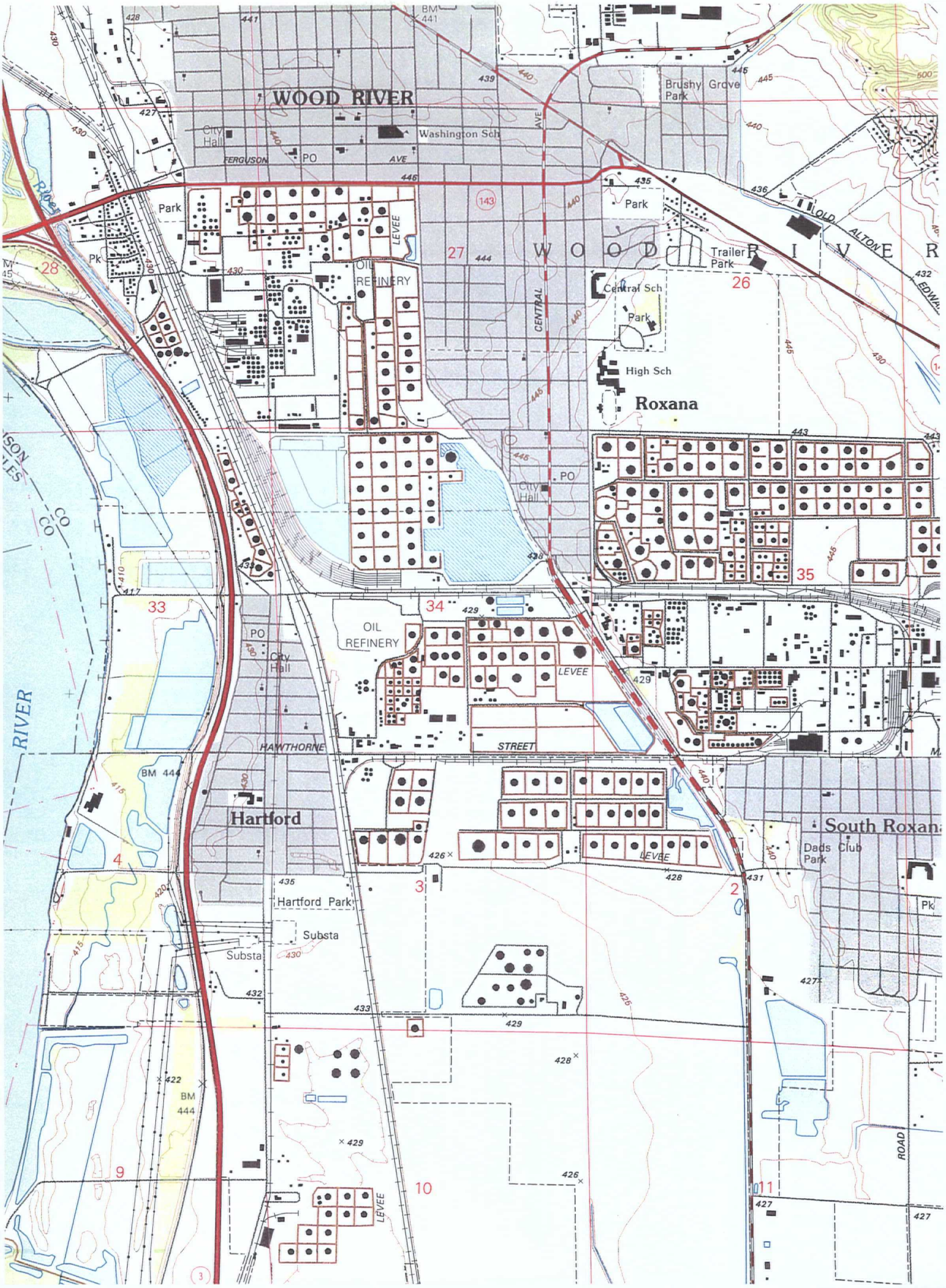
WOOD RIVER
Washington Sch
City Hall
FERGUSON
AVE
PO
Park
Pk
LEVEE
OIL REFINERY
Brushy Grove Park
Park
Trailer Park
Central Sch
Park
High Sch
Roxana
CENTRAL
AVE
W O O D R I V E R
OLD ALTON
EDWA
City Hall
PO
OIL REFINERY
LEVEE
HAWTHORNE
STREET
RIVER
BM 444
Hartford
Hartford Park
Substa
Substa
South Roxana
Dads Club Park
LEVEE
ROAD
BM 444
LEVEE
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Historical Topographic Map Review

Historical topographic maps were obtained from Environmental Data Resources, Inc. (EDR) for the period between 1951 and 1994. The maps depicted the following:

Date	Comments
1951	The property was identified as an oil refinery, with apparent structures, railroad tracks and tanks, located primarily in the western part of the refinery property. The tanks were present in the central and northern portion of this area. An apparent small residential area was depicted in the vicinity of the current WWTP and Administration Area. The remaining majority of the refinery property, including south of Hawthorne Street, appeared to be undeveloped with minor exceptions. This apparent undeveloped land included the current Coking Unit Area, the current Laydown Area, the current Storm Water Retention Area, and the Bulk Storage Tanks North Area east of Tank 80-2. A structure and a railroad spur were depicted on the portion of the refinery south of Hawthorne Street in the current Asphalt Plant and Bulk Storage Tanks South Area. A small pond was depicted in the southeast corner of the refinery property in the current Storm Water Retention Area. Apparent undeveloped land and a tank farm followed by railroad tracks were directly north of the refinery property. An oil reservoir, a tank farm and undeveloped land were depicted beyond these railroad tracks. Immediately to the northwest of the refinery property was an apparent industrial complex (location of International Shoe Company's former tannery.) Immediately west of the refinery property were railroad tracks followed by a residential area, the River Dock Area and the Mississippi River. East of the property was Route 111 followed by an identified an oil refinery. The adjoining property to the south of the refinery property consisted of Hawthorne Street followed by railroad tracks and then apparent undeveloped property. The River Dock Area appeared undeveloped, with the exception of an unimproved road adjacent and parallel to the Mississippi River. The surrounding properties to the River Dock Area also appeared undeveloped, with the exception of an identified Settling Basin north of Rand Street.
1955	The majority of the refinery property appeared the same as the 1951 topographic map, with the exception of new tanks, primarily to the east and south of Tank 80-2, and small apparent structures added to the current Refinery Process I and II Areas and the Administration Area. Three different structures were now depicted in the current Asphalt Plant Area. The adjoining properties to the west appeared relatively unchanged from the 1951 topographic map, though the apparent industrial complex immediately northwest of the refinery (former tannery) appeared to have expanded slightly. The abutting properties to the north and east also appeared relatively unchanged, though the density had increased slightly. The identified Oil Reservoir north of the refinery property was now identified as an Oil Cooling Reservoir. The majority of the adjoining property to the south of Hawthorne Street, the current ConocoPhillips property, contained a tank farm. The River Dock Area and surrounding properties also appeared relatively unchanged, though most of these areas were now depicted as wooded. An apparent pipeline was depicted in the approximate location of the existing River Dock Area pipelines, along with an apparent structure adjacent to the Mississippi River. An oil tank was identified west of the Settling Basin located north of Rand Street. A new road (Illinois State Route 3), east of the River Dock Area, was identified as under construction.

Date	Comments
1968	The majority of the refinery property appeared the same as the 1955 topographic map, with the exception of new tanks primarily in the western portion of the North Bulk Storage Tanks Area and apparent structures added to the current Refinery Process I and II Areas and the Administration Area. The apparent natural pond in the southeast portion of the current Storm Water Retention Area has apparently been replaced by the Guard Basin and the Duck Pond. The structures in the Asphalt Plant Area were now joined by two small apparent tank farms. Two tanks were now depicted in the Bulk Storage Tanks South Area, though the remainder still appeared as undeveloped land. The abutting properties to the refinery property appeared relatively unchanged, though the density had increased slightly with previously undeveloped land now containing apparent structures, a new tank and apparent man-made water bodies. The River Dock Area now appeared to contain at least six apparent manmade ponds and apparent undeveloped land was no longer depicted as wooded. An apparent tank was now depicted south of the facility pipeline and adjacent to the Mississippi River. Properties to the north and south of the River Dock Area also appeared to contain several new man-made ponds with the remaining surrounding properties relatively unchanged. The levee, east of the River Dock Area property, appeared to be completed as was Illinois State Route 3.
1974	The majority of the refinery property appeared the same as the 1968 topographic map, with the exception of apparent structures added to the current Refinery Process I and II Areas, the Coking Unit Area, the Asphalt Plant Area and the WWTP Area. A small apparent structure was also now present in the northeast portion of the Laydown Area. Several of the apparent residential buildings in the current WWTP Area were no longer present. The adjoining properties to the refinery property appeared relatively unchanged. The River Dock Area and surrounding properties also appeared relatively unchanged, though apparent undeveloped areas were now depicted as wooded.
1994	The majority of the refinery property appeared the same as the 1974 topographic map, with the exception of new tanks and apparent structures in the current WWTP Area. The tank farm in the Bulk Storage Tanks South Area now also appeared in its current configuration. Numerous apparent structures, previously depicted in the Refinery Process I and II Areas and the Coking Unit Area, were no longer shown. The remaining apparent residential buildings in the current Administration Area were also no longer present. The density of the North Bulk Storage Tanks Area was also depicted as decreasing slightly. One of the tank farms in the Asphalt Plant Area was also not depicted and the other had changed in configuration. The adjoining properties to the refinery property appeared relatively unchanged, though the Oil Cooling Reservoir beyond the railroad tracks to the north of the refinery property now appeared as an unidentified apparent water body. A new unidentified apparent water body now also adjoined the tank farm north of the refinery property. The apparent industrial complex (former tannery) immediately to the northwest of the refinery property was no longer depicted. In general, the density of development in the surrounding properties to the refinery property was depicted as slightly decreasing. The River Dock Area and surrounding properties also appeared relatively unchanged, though the configuration of the water bodies had changed slightly.

APPENDIX A

APPENDIX A

SUMMARY OF NRC REPORTED RELEASES, 1990 – 2002
BURNS & MC DONNELL
DECEMBER 2002

Table 1
Summary of NRC Reported Releases - 1990 through 2002
The Premcor Refining Group, Inc.
Hartford, Illinois

Spill No	Date	Suspected Responsible Party	City/State	Released Materials	Quantity	Affected Medium
10103	02/27/90	Shell Oil Co	Roxana, IL	Benzene	Unknown	Soil
15537	04/02/90	Amoco Petroleum Add Co	Wood River, IL	Sulfuric Acid	1000 Gallons	Soil
16604	04/10/90	Coastwise Trading Co	Wood River, IL	Gasoline	2 Gallons	Water
16803	04/11/90	Coastwise Trading Co	Wood River, IL	Gasoline	.99 Gallons	Water
35243	08/13/90	Enrac Field Trailer	Wood River, IL	Sludge Oil Water	750 Gallons	Soil
35479	08/15/90	Unknown	Wood River, IL	Unknown	Unknown	Water
36311	08/21/90	Shell Oil Co	Roxana, IL	Sodium Hydroxide	2000 Pounds	Soil
40227	09/21/90	Shell Oil Co	Roxana, IL	Unknown	Unknown	Unknown
40697	09/24/90	Shell Oil Co	Wood River, IL	Unknown	Unknown	Unknown
44778	10/22/90	Amoco Petroleum Add Co	Wood River, IL	Fuel Oil No. 2	6000 Gallons	Soil
47777	11/15/90	Amoco Petroleum Add Co	Wood River, IL	Benzene	50 Gallons	Soil
53330	12/28/90	Amoco Petroleum Add Co	Wood River, IL	Benzene Ground Water	31000 Gallons	Soil
54448	01/10/91	Amoco Petroleum Add Co	Wood River, IL	Gasoline	10500 Gallons	Soil
54448	01/14/91	Marathon Pipeline	Wood River, IL	Butane	20 Barrels	Soil
63821	03/16/91	Oil Transport Co	Hartford, IL	Fuel Oil No. 6	60 Barrels	Water
71317	05/09/91	American Boat Co	Wood River, IL	Lubricating Oil	10 Gallons	Water
71543	05/10/91	Shell Oil Co	Roxana, IL	Sulfuric Acid	5000 Pounds	Soil
75167	06/11/91	Amoco Petroleum Add Co	Wood River, IL	Sulfuric Acid	2000 Pounds	Water
84728	08/21/91	Chotin Transportation	Wood River, IL	Diesel Oil	1 Gallon	Water
85819	08/27/91	Ingram Barge Co	Wood River, IL	Fuel Oil No. 6	3 Barrels	Water
92669	10/17/91	Sabine Trans and Towing	Wood River, IL	Gasoline	1 Gallon	Water
97929	11/30/91	Chotin Transportation	Wood River, IL	Waste Oil/Lubricants	1 Gallon	Water
98776	12/07/91	Shell Oil Co	Wood River, IL	Gasoline	Unknown	Water
101665	01/05/92	Shell Oil Co	Wood River, IL	Gasoline	Unknown	Water
106876	02/10/92	Amoco Petroleum Add Co	Wood River, IL	Hazardous Waste	Unknown	Soil
107857	02/24/92	RRS Transportation	Wood River, IL	Waste Oil/Lubricants	8 Gallons	Water
110893	03/18/92	National Marine	Wood River, IL	Oil Diesel	3 Gallons	Water
130845	08/07/92	Amoco Petroleum Add Co	Wood River, IL	Waste Water	Unknown	Soil
144482	11/12/92	Clark Oil and Refinery	Hartford, IL	Gasoline	10 Barrels	Soil
144901	11/14/92	Clark Oil and Refinery	Hartford, IL	Diethylamine	200 Gallons	Soil
148500	12/10/92	Mikes Marine Service	Wood River, IL	Hydraulic Oil	Unknown	Water
159626	02/25/93	Unknown	Wood River, IL	Unknown	Unknown	Rail Report
165633	04/04/93	Shell Oil Co	Wood River, IL	Fuel Oil No. 2-D	Unknown	Water
190061	08/01/93	Amoco Petroleum Add Co	Wood River, IL	Gasoline	50 Gallons	Water
200390	09/30/93	National Marine	Wood River, IL	Fuel Oil No. 2-D	10 Gallons	Water
202654	10/12/93	IL Power Co.	Wood River, IL	Polychlorinated Biphenyls	3.5 Gallons	Soil
202822	10/14/93	IL Power Co.	Wood River, IL	Polychlorinated Biphenyls	3.5 Gallons	Soil

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Spill No	Date	Suspected Responsible Party	City/State	Released Materials	Quantity	Affected Medium
265519	10/15/93	Unknown	Roxana, IL	Unknown	Unknown	Unknown
205583	10/31/93	Unknown	Wood River, IL	Unknown	Unknown	Water
206143	11/03/93	Canal Barge Co.	Wood River, IL	Diesel Oil	Unknown	Water
211014	12/05/93	Clark Oil and Refinery	Hartford, IL	Gasoline	Unknown	Water
221572	02/13/94	Clark Oil and Refinery	Hartford, IL	Fuel Oil No. 2	30 Gallons	Soil
224191	03/03/94	Arkansas River Co.	Wood River, IL	Fuel Oil No. 2	Unknown	Water
229294	03/10/94	Tolen Marine	Wood River, IL	Fuel Oil No. 2-D	20 Gallons	Water
229549	03/11/94	Clark Oil and Refinery	Hartford, IL	Light Oil and Asphalt Mix	63000 Gallons	Soil
231565	03/24/94	Arkansas River Co.	Wood River, IL	Unknown	.5 Gallons	Water
233860	04/08/94	Magnolia Marine Trans	Wood River, IL	Fuel Oil No. 2	5 Gallons	Water
235264	04/16/94	Ingram Towing Co.	Wood River, IL	Other Oil / Thermanol	25 Gallons	Water
240021	05/19/94	Unknown	Hartford, IL	Fuel Oil No. 2	40 Gallons	Water
245550	06/22/94	Shell Oil Co	Wood River, IL	Gasoline	Unknown	Water
247248	07/02/94	Unknown	Hartford, IL	Fuel Oil No. 2-D	Unknown	Water
248380	07/09/94	Clark Oil and Refinery	Hartford, IL	Petroleum Naphtha	1000 Barrels	Soil
252857	08/01/94	Clark Oil and Refinery	Hartford, IL	Gasoline	3 Barrels	Water
252895	08/01/94	Clark Oil and Refinery	Hartford, IL	Gasoline	Unknown	Water
254308	08/09/94	Clark Oil and Refinery	Hartford, IL	Gasoline	Unknown	Soil
256027	08/18/94	Clark Oil and Refinery	Hartford, IL	Crude Oil	40 Barrels	Soil
256953	08/23/94	Clark Oil and Refinery	Hartford, IL	Fuel Oil No. 6	Unknown	Soil
260068	09/11/94	Brent Towing	Wood River, IL	Fuel Oil No. 2-D	10 Gallons	Water
260078	09/11/94	Brent Transportation	Wood River, IL	Fuel Oil No. 2-D	10 Gallons	Water
260195	09/12/94	Magnolia Marine Trans	Wood River, IL	Fuel Oil No. 2-D	1 Pint	Water
260199	09/12/94	Magnolia Marine Trans	Wood River, IL	Fuel Oil No. 2-D	1 Pint	Water
262288	09/25/94	Clark Oil and Refinery	Hartford, IL	Gas Oil	Unknown	Soil
264676	10/10/94	Clark Oil and Refinery	Hartford, IL	Gasoline	1000 Gallons	Soil
264773	10/10/94	Clark Oil and Refinery	Hartford, IL	Black Oil	12 Gallons	Water
268488	11/06/94	Unknown	Wood River, IL	Unknown	Unknown	Water
269163	11/09/94	Usher Transport Inc.	Wood River, IL	Motor Oil	10 Gallons	Soil
269136	11/10/94	Usher Transport Inc.	Wood River, IL	Lubricating Oil	10 Gallons	Soil
270991	11/26/94	Unknown	Hartford, IL	Unknown	Unknown	Water
273830	12/20/94	Unknown	Wood River, IL	Unknown	Unknown	Water
274788	12/31/94	Magnolia Marine Trans	Wood River, IL	Diesel Oil	1 Gallon	Water
276244	01/13/95	Unknown	Hartford, IL	Unknown	Unknown	Water
280207	02/17/95	M/V Ray Waxler	Wood River, IL	Unknown	Unknown	Water
280410	02/18/95	Unknown	Hartford, IL	Unknown	Unknown	Water
280413	02/18/95	Waxler Towing Co.	Hartford, IL	Unknown	Unknown	Water

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Spill No	Date	Suspected Responsible Party	City/State	Released Materials	Quantity	Affected Medium
281968	03/04/95	Mikes Marine Service	Wood River, IL	Waste Oil	15 Gallons	Water
284534	03/25/95	Koch Pipeline	Hartford, IL	Crude Oil	1 Gallon	Water
284959	03/29/95	Unknown	Hartford, IL	Unknown	Unknown	Water
286529	04/11/95	Clark Oil and Refinery	Hartford, IL	Fuel Oil No. 2	Unknown	Water
287238	04/17/95	Ohio River Co.	Wood River, IL	Fuel Oil No. 2-D	150 Gallons	Water
288263	04/22/95	Waxler Towing Co.	Wood River, IL	Diesel Oil	1 Gallon	Water
290172	05/05/95	Apex Towing co.	Wood River, IL	Unknown	Unknown	Water
292214	05/19/95	Amoco Petroleum Add Co	Wood River, IL	Fuel Oil No. 2-D	50 Gallons	Water
292530	05/22/95	Unknown	Wood River, IL	Unknown	Unknown	Water
295019	06/10/95	American Commercial Bargs	Wood River, IL	Waste Oil	10 Gallons	Water
301907	07/28/95	Lewis and Clark Marine	Wood River, IL	Fuel Oil No. 2-D	3000 Gallons	Water
306634	09/06/95	American Commercial Bargs	Wood River, IL	Fuel Oil No. 2-D	30 Gallons	Water
308556	09/25/95	Unknown	Hartford, IL	Unknown	Unknown	Water
308703	09/25/95	Norfolk Southern	Roxana, IL	Petroleum Asphalt	.5 Pint	Unknown
313974	11/13/95	Shell Oil Co	Roxana, IL	Benzene	10 Pounds	Soil
316687	12/10/95	M/V Austingolding	Wood River, IL	Fuel Oil No. 2-D	1 Gallon	Water
316689	12/10/95	Ole Man River Trans	Wood River, IL	Fuel Oil No. 2	1 Gallon	Water
317351	12/16/95	Unknown	Hartford, IL	Unknown	Unknown	Water
318518	12/30/95	Economy Boat	Hartford, IL	Diesel Oil	50 Gallons	Water
324464	02/06/96	Marquette	Wood River, IL	Diesel Oil	5 Gallons	Water
327914	02/24/96	Shell Oil Co	Roxana, IL	Diesel Oil	1 Quart	Soil
338859	04/29/96	Shell Oil Co	Roxana, IL	Unknown	Unknown	Unknown
341309	05/14/96	Shell Oil Co	Wood River, IL	Unknown	Unknown	Unknown
342601	05/18/96	Shell Oil Co	Roxana, IL	Benzene	2 Barrels	Soil
343540	05/23/96	National Maintenance	Hartford, IL	Lubricating Oil	100 Gallons	Water
344435	05/30/96	Memphis Barge Line	Wood River, IL	Diesel Oil	Unknown	Water
344724	05/31/96	Amoco Petroleum Add Co	Wood River, IL	Unknown	1 Quart	Water
350276	07/03/96	American Commercial Bargs	Wood River, IL	Fuel Oil No. 2-D	15 Gallons	Water
350640	07/05/96	Coastal Towing Co.	Wood River, IL	Asphalt	2 Barrels	Water
350608	07/05/96	Unknown	Wood River, IL	Asphalt	1 Quart	Water
351979	07/16/96	Winterville Marine Svcs.	Wood River, IL	Diesel Oil	5 Gallons	Water
361372	09/17/96	Unknown	Hartford, IL	Unknown	Unknown	Water
361330	09/17/96	Unknown	Roxana, IL	Unknown	Unknown	Water
364555	10/16/96	Coastal Towing Co.	Wood River, IL	Diesel Oil	Unknown	Water
365185	10/22/96	Shell Oil Co	Roxana, IL	Sulfuric Acid	11.4 Barrels	Soil
366068	10/29/96	Magnolia Marine Trans	Roxana, IL	Thermalane 550 and Asphalt	2 Barrels	Water
366263	10/31/96	Unknown	Hartford, IL	Unknown	Unknown	Water

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The Premcor Refining Group, Inc.
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Spill No	Date	Suspected Responsible Party	City/State	Released Materials	Quantity	Affected Medium
367556	11/14/96	Mers - Economy	Hartford, IL	Fuel Oil No. 2	1 Gallon	Water
368448	11/23/96	Shell Oil Co	Roxana, IL	Benzene	1 Barrel	Soil
368746	11/25/96	Mikes Marine Service	Wood River, IL	Motor Oil	Unknown	Water
369749	12/08/96	American Comm Barge Lines	Wood River, IL	Fuel Oil No. 2-D	1 Gallon	Water
370325	12/13/96	Unknown	Hartford, IL	Unknown	Unknown	Water
370331	12/13/96	American Milling Co.	Wood River, IL	Fuel Oil No. 2-D	Unknown	Water
371183	12/22/96	Shell Oil Co	Roxana, IL	Dieseline Water Mix	5 Gallons	Water
371536	12/27/96	Shell Oil Co	Roxana, IL	Lubricating Oil	1 Gallon	Water
371788	12/30/96	Unknown	Hartford, IL	Unknown	Unknown	Water
372209	01/04/97	Unknown	Hartford, IL	Unknown	Unknown	Water
377296	02/19/97	OMR Transportation Com	Wood River, IL	Fuel Oil No. 2-D	1 Teaspoon	Water
380784	03/19/97	Louis and Clark Marine	Wood River, IL	Diesel Oil	10 Gallons	Water
384760	04/23/97	Unknown	Hartford, IL	Unknown	Unknown	Water
385508	04/30/97	Unknown	Wood River, IL	Diesel Oil	15 Barrels	Water
390740	06/11/97	Unknown	Wood River, IL	Fuel Oil No. 2-D	15 Gallons	Water
393721	07/03/97	Magnolia Marine Trans	Wood River, IL	Fuel Oil No. 2-D	3 Gallons	Water
400247	08/20/97	Unknown	Hartford, IL	Unknown	Unknown	Water
404630	09/22/97	Clark Oil and Refinery	Hartford, IL	Hazardous Waste	10 Gallons	Soil
404906	09/24/97	National Maintenance	Hartford, IL	Other Oil	25 Gallons	Water
408068	10/19/97	Excel Marine	Wood River, IL	Fuel Oil No. 2-D	Unknown	Water
410935	11/10/97	Norfolk Southern	Roxana, IL	Fuel Oil No. 2-D	1000 Gallons	Soil
412240	11/19/97	Unknown	Hartford, IL	Unknown	Unknown	Water
412536	11/20/97	Shell Oil Co	Roxana, IL	Hydrogen Sulfide	100 Pounds	Soil
412908	11/22/97	Marine Transportation	Wood River, IL	Diesel Oil	35 Gallons	Water
414182	12/03/97	Canal Barge Co.	Wood River, IL	Diesel Oil	Unknown	Water
425183	02/19/98	Shell Oil Co	Roxana, IL	Sodium Hydroxide	6 Barrels	Soil
430313	03/30/98	Marathon Ashland Petroleum	Roxana, IL	Asphalt	53 Gallons	Soil
430329	03/30/98	Marathon Ashland Petroleum	Roxana, IL	Asphalt	50 Gallons	Soil
433912	04/24/98	Shell Oil Co	Roxana, IL	Liquid Asphalt	1 Quart	Water
436549	05/12/98	Economy Boat Store	Wood River, IL	Hydraulic Oil	2 Gallons	Water
441837	06/16/98	Waxler Towing Co.	Hartford, IL	Gasoline	3 Gallons	Water
441836	06/16/98	Waxler Towing Co.	Wood River, IL	Gasoline	10 Gallons	Water
446022	07/15/98	WFN Communication	Wood River, IL	Other Oil	10 Gallons	Water
448040	07/29/98	Unknown	Hartford, IL	Hydraulic Oil	1.5 Gallons	Water
450268	08/12/98	Unknown	Hartford, IL	Unknown	Unknown	Water
450322	08/13/98	Unknown	Hartford, IL	Unknown	Unknown	Water
451255	08/19/98	Phoenix	Wood River, IL	Fuel Oil No. 4	5 Gallons	Water

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Summary of NRC Reported Releases - 1990 through 2002
The Premcor Refining Group, Inc.
Hartford, Illinois

Spill No	Date	Suspected Responsible Party	City/State	Released Materials	Quantity	Affected Medium
452356	08/26/98	Unknown	Hartford, IL	Bilge Slops	Unknown	Water
452646	08/27/98	Unknown	Hartford, IL	Unknown	Unknown	Water
452605	08/27/98	Unknown	Wood River, IL	Fuel Oil No. 2-D	3 Gallons	Water
457523	09/28/98	National Maintenance	Hartford, IL	Bilge Slops	1 Barrel	Water
461619	10/28/98	Equilon Pipeline	Wood River, IL	Crude Oil	38 Barrels	Soil
465986	12/01/98	National Maintenance	Hartford, IL	Waste Oil	10 Gallons	Water
466663	12/07/98	Unknown	Hartford, IL	Unknown	Unknown	Water
466656	12/07/98	Unknown	Wood River, IL	Unknown	Unknown	Water
467640	12/15/98	Unknown	Wood River, IL	Unknown	Unknown	Water
468245	12/19/98	Unknown	Hartford, IL	Unknown	Unknown	Water
468873	12/27/98	Clark Oil and Refinery	Hartford, IL	Gas, Diesel & Water	15 Gallons	Water
470173	01/11/99	Unknown	Wood River, IL	Unknown	Unknown	Water
470400	01/13/99	Unknown	Hartford, IL	Unknown	Unknown	Water
470888	01/18/99	Equilon	Roxana, IL	Fuel Oil No. 2-D	1 Cup	Water
479566	04/07/99	Unknown	Wood River, IL	Unknown	Unknown	Water
480182	04/13/99	Unknown	Wood River, IL	Unknown	Unknown	Water
480181	04/13/99	Unknown	Roxana, IL	Unknown	Unknown	Water
480312	04/14/99	Marquette	Hartford, IL	Diesel Oil	50 Gallons	Water
482607	05/04/99	Unknown	Wood River, IL	6422 Higher Base Asphalt	12 Barrels	Water
483464	05/12/99	Unknown	Hartford, IL	Unknown	Unknown	Water
484718	05/22/99	Egan Marine Corporation	Wood River, IL	Diesel Oil	30 Gallons	Water
488405	06/22/99	Unknown	Hartford, IL	Unknown	Unknown	Water
493174	07/29/99	Equilon	Roxana, IL	Benzene	Unknown	Water
493174	07/29/99	Equilon	Roxana, IL	Toluene	Unknown	Water
494319	08/08/99	Magnolia Marine Trans	Wood River, IL	Asphalt	1 Barrel	Unknown
496996	08/23/99	Unknown	Hartford, IL	Foam	Unknown	Water
498922	09/16/99	National Maintenance	Hartford, IL	Hydraulic Oil	1 Gallon	Water
500277	09/27/99	Equilon	Roxana, IL	Unknown	Unknown	Unknown
501677	10/08/99	Economy Boat Store	Wood River, IL	Fuel Oil No. 2-D	Unknown	Water
505780	11/15/99	Mikes Marine Service	Wood River, IL	Diesel Oil	5 Gallons	Water
506958	11/26/99	Equilon	Roxana, IL	Heavy Lube Oil Based Material	5 Gallons	Water
508258	12/08/99	Unknown	Wood River, IL	Diesel Oil	20 Gallons	Water
508602	12/10/99	Unknown	Hartford, IL	Unknown	Unknown	Water
515037	12/21/99	Equilon	Roxana, IL	Fuel Oil No. 2-D	Unknown	Water
515037	12/21/99	Equilon	Roxana, IL	Other Oil	Unknown	Water
468141	01/01/00	Amoco Corp	Wood River, IL	Hydrocarbons	5 Gallons	Water
515921	01/01/00	Unknown	Hartford, IL	Unknown	Unknown	Water

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Hartford, Illinois

Spill No	Date	Suspected Responsible Party	City/State	Released Materials	Quantity	Affected Medium
516296	01/06/00	Amoco Oil	Wood River, IL	Gasoline	Unknown	Water
516342	01/06/00	Unknown	Roxana, IL	Unknown	Unknown	Water
519750	02/13/00	Clark Oil and Refinery	Hartford, IL	Other Oil	Unknown	Soil
523105	03/16/00	Marquette	Wood River, IL	Fuel Oil No. 2-D	Unknown	Water
524201	03/27/00	Economy Boat Store	Roxana, IL	Diesel Oil	1 Gallon	Water
525797	04/12/00	Marquette	Wood River, IL	Fuel Oil No. 2-D	50 Gallons	Water
529024	05/15/00	Hannah Marine	Wood River, IL	Hydraulic Oil	1 Cup	Water
529018	05/15/00	Egan Marine	Roxana, IL	Hydraulic Oil	Unknown	Water
529821	05/23/00	Cenac Towing	Wood River, IL	Diesel Oil	10 Gallons	Water
533345	06/24/00	Tosco Refining Co.	Roxana, IL	NC Flux	1 Gallon	Water
534763	07/08/00	Phoenix	Wood River, IL	Diesel Oil	20 Gallons	Water
541172	09/06/00	National Maintenance	Hartford, IL	Hydraulic Oil	3 Gallons	Water
544774	10/11/00	Coastal Towing Co.	Wood River, IL	Other Oil	5 Gallons	Water
554776	10/11/00	Coastal Towing Co.	Wood River, IL	Heat Transfer Oil	10 Gallons	Water
545085	10/13/00	British Petroleum	Wood River, IL	Gasoline	1000 Gallons	Soil
545815	10/20/00	North Star Navigation	Wood River, IL	Diesel Oil	25 Gallons	Water
545816	10/20/00	North Star Navigation	Wood River, IL	Diesel Oil	25 Gallons	Water
546553	10/27/00	Conoco Inc.	Hartford, IL	Unknown	Unknown	Unknown
546661	10/28/00	Britton Kiesler	Wood River, IL	Fuel Oil No. 2	5 Gallons	Water
547751	11/09/00	Tosco Refining Co.	Roxana, IL	Unknown	Unknown	Unknown
547752	11/09/00	Tosco Refining Co.	Roxana, IL	Unknown	Unknown	Unknown
552501	01/03/01	Louis and Clark Marine	Wood River, IL	Diesel Oil	Unknown	Water
552506	01/03/01	Lewis and Clark Marine	Wood River, IL	Fuel Oil No. 2-D	624 Gallons	Water
552539	01/04/01	Unknown	Roxana, IL	Unknown	Unknown	Water
552997	01/09/01	Unknown	Hartford, IL	Unknown	Unknown	Water
554467	01/23/01	Unknown	Hartford, IL	Unknown	Unknown	Water
555988	02/07/01	British Petroleum	Wood River, IL	Gasoline	500 Gallons	Soil
556191	02/08/01	Tosco Refining Co.	Roxana, IL	Benzene	10 Pounds	Water, Soil
557157	02/19/01	Unknown	Hartford, IL	Fuel Oil No. 2-D	75 Gallons	Soil
559096	03/09/01	Premcor Refining Group	Hartford, IL	Gas Oil	Unknown	Water
560124	03/20/01	Marquette	Wood River, IL	Fuel Oil No. 2-D	10 Gallons	Water
561725	04/04/01	National Maintenance	Hartford, IL	Fuel Oil No. 2-D	10 Gallons	Water
565605	05/10/01	National Maintenance	Hartford, IL	Lubricating Oil	3 tablespoons	Water
566597	05/18/01	Tosco Refining Co.	Roxana, IL	Fuel Oil No. 6	Unknown	Water
569231	06/11/01	PB Amoco Corp	Wood River, IL	Weathered Distillate	40 Gallons	Water
571125	06/27/01	Kansas City Southern Railroad	Wood River, IL	Unknown	Unknown	Unknown
572935	07/14/01	Tosco Refining Co.	Roxana, IL	Benzene	Unknown	Soil

Table 1
Summary of NRC Reported Releases - 1990 through 2002
The Premcor Refining Group, Inc.
Hartford, Illinois

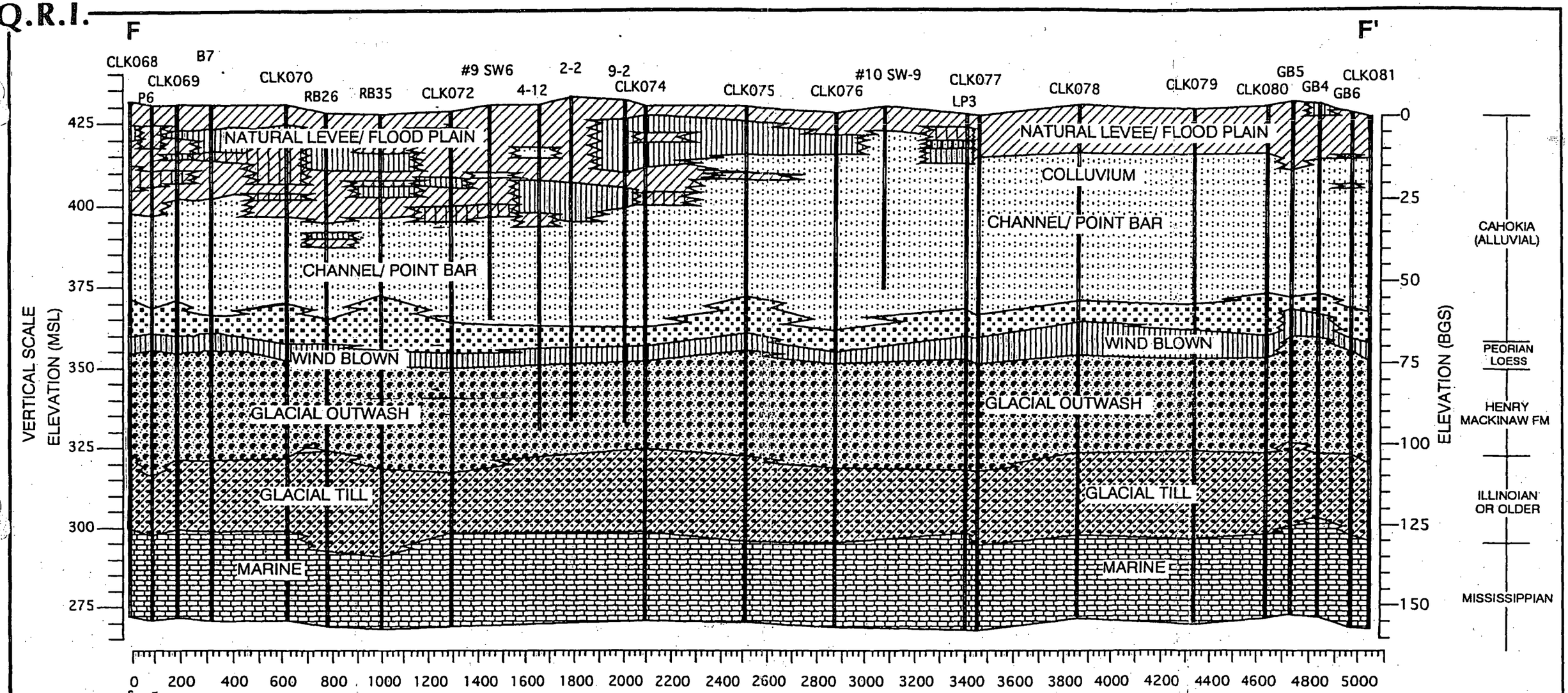
Spill No	Date	Suspected Responsible Party	City/State	Released Materials	Quantity	Affected Medium
573237	07/17/01	Unknown	Hartford, IL	Unknown	Unknown	Water
586583	11/21/01	Magnolia Marine Trans	Wood River, IL	Diesel Oil	50 Gallons	Water
588775	12/15/01	BP Amoco	Wood River, IL	Diesel Oil	150 Barrels	Soil
591051	01/13/02	Magnolia Marine Trans	Wood River, IL	Thermal Oil	1 Gallon	Water
591052	01/13/02	Magnolia Marine Trans	Wood River, IL	Heating Oil	2 Gallons	Water
592406	01/28/02	Upper River Services Inc.	Wood River, IL	Fuel Oil No. 2-D	2 Ounces	Water
598620	04/05/02	Phillips Refining Co.	Roxana, IL	Sulfuric Acid	2.5 Barrels	Soil
599991	04/18/02	Waxler Towing Co.	Hartford, IL	Reformulated Gasoline	2 Gallons	Water
601235	04/29/02	Marathon Ashland Petroleum	Roxana, IL	Crude Oil	1100 Barrels	Soil
601402	04/29/02	Marathon Ashland Petroleum	Roxana, IL	Crude Oil	3000 Barrels	Water, Soil
616230	07/10/02	Phillips Refining Co.	Roxana, IL	Perchloroethylene	100 Pounds	Soil
618079	07/28/02	M/V Senator Sam	Wood River, IL	Fuel Oil No. 2-D	20 Gallons	Water
627542	10/29/02	Conoco Inc.	Hartford, IL	Transmix-Gas and Diesel	2 Barrels	Soil
627959	11/01/02	Magnolia Marine Trans	Wood River, IL	Bilge Slops	1 Gallon	Water
629285	11/15/02	Unknown	Hartford, IL	Unknown	Unknown	Water

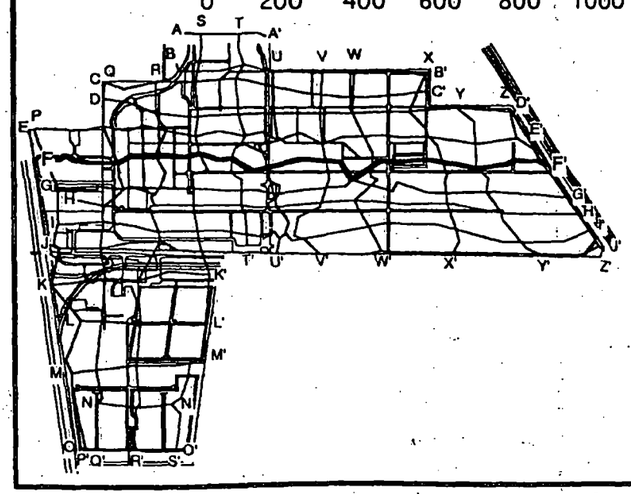
APPENDIX B

APPENDIX B

SELECTED CROSS SECTIONS
QUATERNARY RESOURCE INVESTIGATIONS, INC.
1996

Q.R.I.





HORIZONTAL SCALE

LEGEND

- GP/GW - Dense Sand with Pea Gravels and Layers of Sand
- CL/CH/FILL - Silty Clay/Fat Clay/Clay Fill
- CL/ML - Interbedded Silty Clay/Clayey Silt
- ML - Clayey Silt or Silt
- CL/SM - Interbedded Silty Clay/ Silty Sand
- ML/SM - Interbedded Silt or Clayey Silt/Silty Sand
- SP/SM/SW - Poorly Sorted/Silty Sand/Well Sorted Sand with Occasional Layers of Gravel and/or Clay
- SC - Clayey Sand
- SP/GP/GW - Poorly Sorted Sand/ Sand with Pea Gravel/Gravel with Sand with Clay
- TILL - Glacial Till
- LMST - Limestone Bedrock

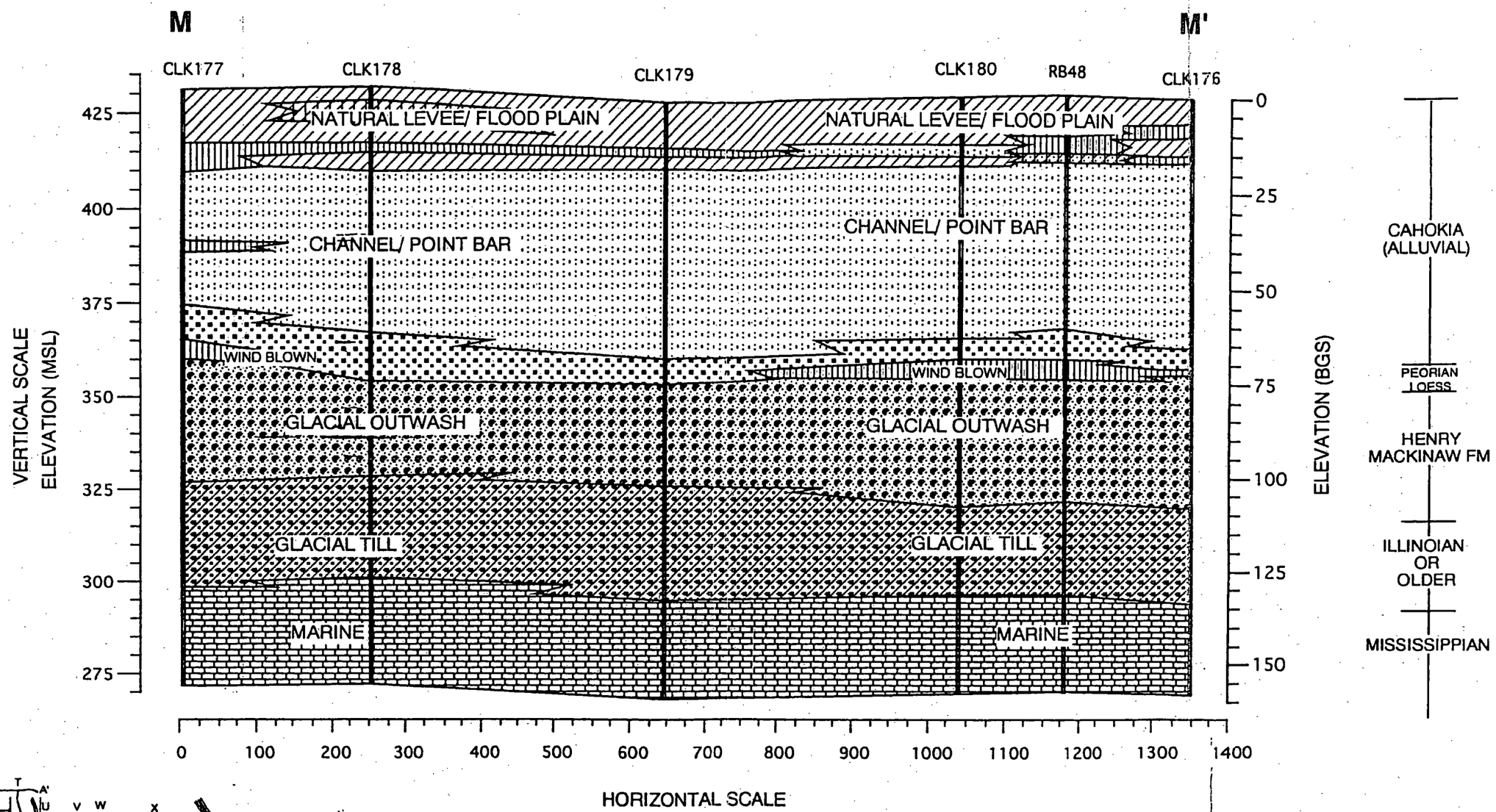
NOTE: For explanation of terms see the cross section key.

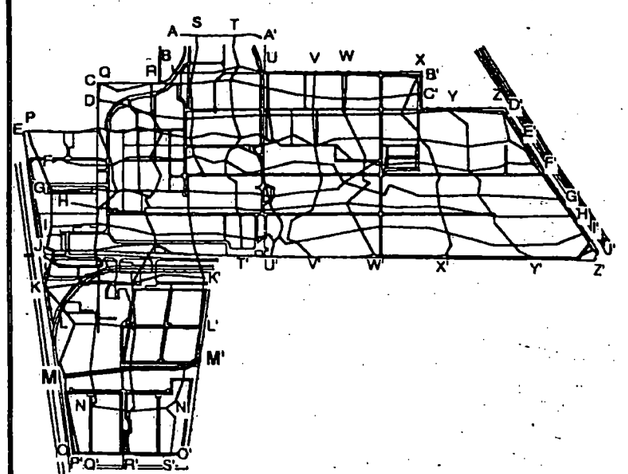
QUATERNARY RESOURCE INVESTIGATIONS, INC.
4117 Rhoda Drive
Baton Rouge, Louisiana 70816
PH (504) 292-5119; FAX (504) 292-0318

DATE: 5/17/96	APPROVED BY: QRI	DRAWN BY: QRI

FIGURE 13 - SEDIMENT CROSS SECTION F-F'

Q.R.I.





LEGEND

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4117 Rhoda Drive
Baton Rouge, Louisiana 70816
PH (504) 292-5119; FAX (504) 292-0318

DATE: 5/17/96	APPROVED BY: QRI	DRAWN BY: QRI

FIGURE 20 - SEDIMENT CROSS SECTION M-M'

Q.R.I.

Q

Q'

RB39 RB3 RB25 CLK070 CLK082 6-1 B19 B24 B21 P1 CLK147 CLK168 CLK172 CLK178 CLK181 10 CLK184

NATURAL LEVEE/ FLOOD PLAIN

NATURAL LEVEE/ FLOOD PLAIN

CHANNEL/ POINT BAR

CHANNEL/ POINT BAR

CHANNEL PLUG

WIND BLOWN

WIND BLOWN

GLACIAL OUTWASH

GLACIAL OUTWASH

GLACIAL TILL

GLACIAL TILL

MARINE

MARINE

VERTICAL SCALE
ELEVATION (MSL)

425 400 375 350 325 300 275

ELEVATION (BGS)

0 25 50 75 100 125 150

CAHOKIA (ALLUVIAL)

PEORIAN LOESS

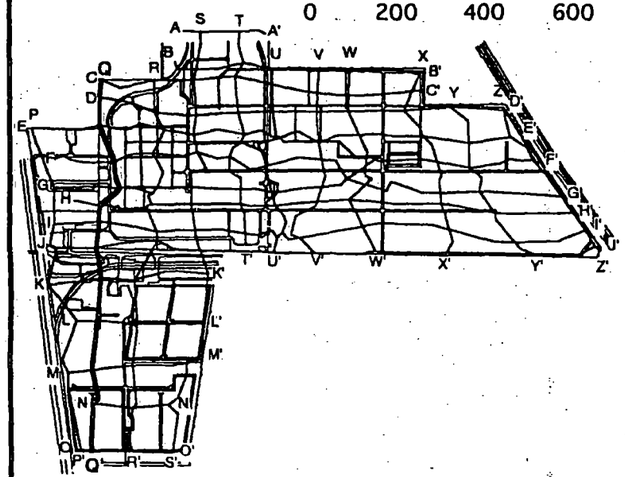
HENRY MACKINAW FM

ILLINOIAN OR OLDER

MISSISSIPPIAN

0 200 400 600 800 1000 1200 1400 1600 1800 2000 2200 2400 2600 2800 3000 3200 3400 3600 3800

HORIZONTAL SCALE



LEGEND

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- CL/ML - Interbedded Silty Clay/Clayey Silt
- ML - Clayey Silt or Silt
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- ML/SM - Interbedded Silt or Clayey Silt/Silty Sand
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- TILL - Glacial Till
- LMST - Limestone Bedrock

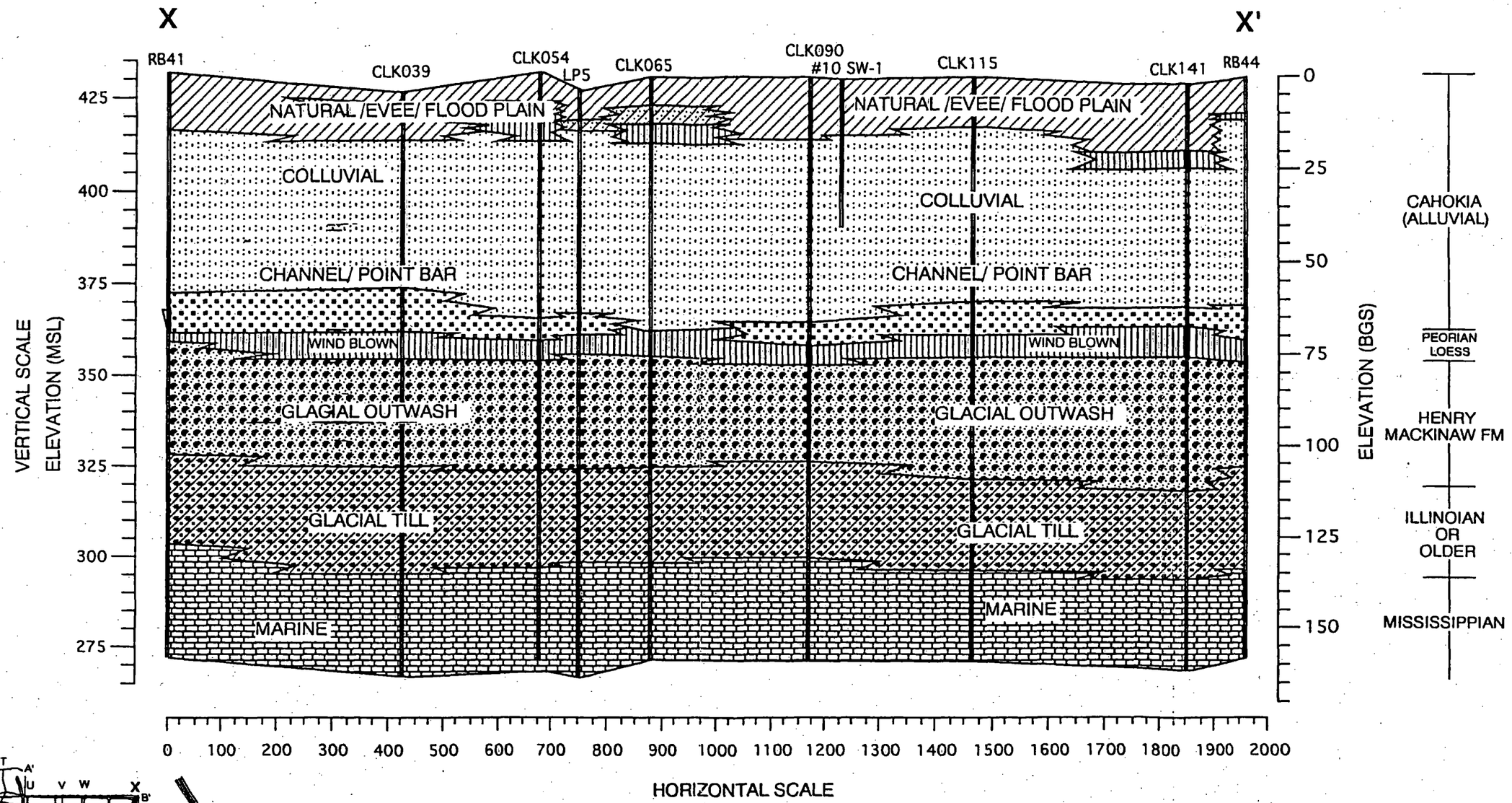
NOTE: For explanation of terms see the cross section key.

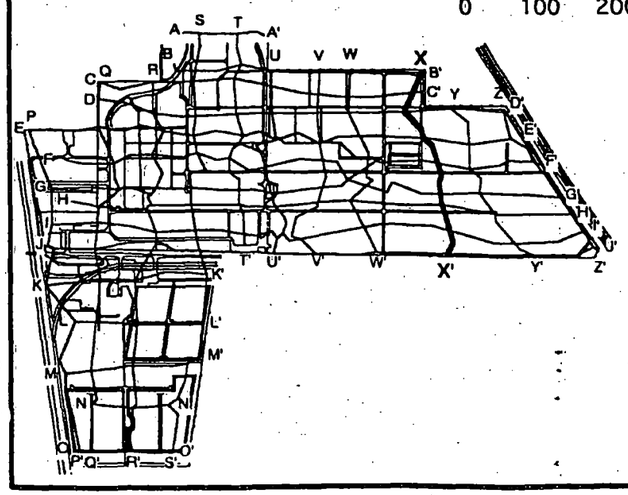
QUATERNARY RESOURCE INVESTIGATIONS, INC.
4117 Rhoda Drive
Baton Rouge, Louisiana 70816
PH (504) 292-5119; FAX (504) 292-0318

DATE: 5/17/96	APPROVED BY: QRI	DRAWN BY: QRI

FIGURE 24 - SEDIMENT CROSS SECTION Q-Q'

Q.R.I.





LEGEND

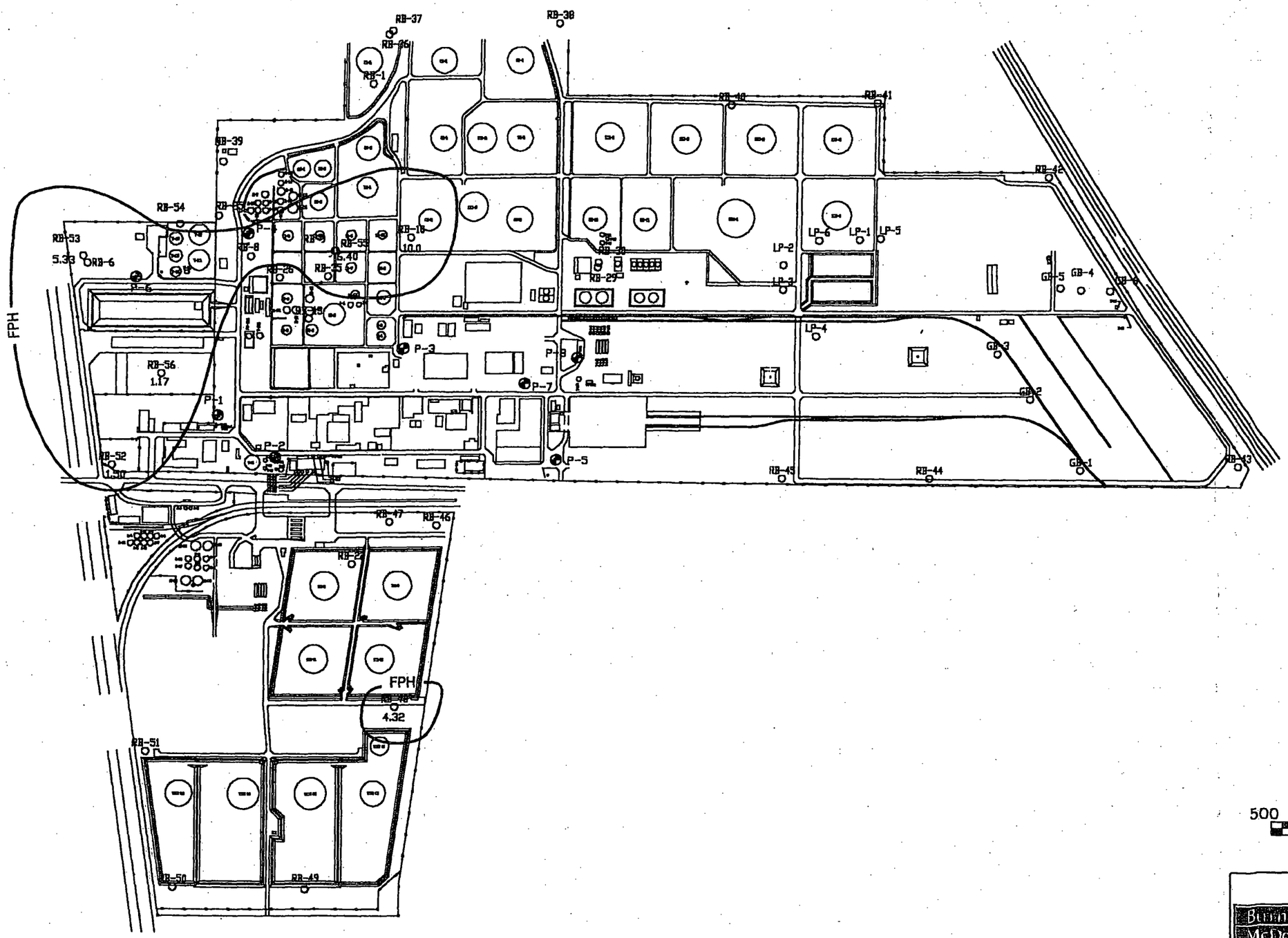
- GP/GW - Dense Sand with Pea Gravels and Layers of Sand
- CL/CH/FILL - Silty Clay/Fat Clay/Clay Fill
- CL/ML - Interbedded Silty Clay/Clayey Silt
- ML - Clayey Silt or Silt
- CL/SM - Interbedded Silty Clay/ Silty Sand
- ML/SM - Interbedded Silt or Clayey Silt/Silty Sand
- SP/SM/SW - Poorly Sorted/Silty Sand/Well Sorted Sand with Occasional Layers of Gravel and/or Clay
- SC - Clayey Sand
- SP/GP/GW - Poorly Sorted Sand/ Sand with Pea Gravel/Gravel with Sand with Clay
- TILL - Glacial Till
- LMST - Limestone Bedrock

NOTE: For explanation of terms see the cross section key.

QUATERNARY RESOURCE INVESTIGATIONS, INC.
4117 Rhoda Drive
Baton Rouge, Louisiana 70816
PH (504) 292-5119; FAX (504) 292-0318

DATE: 5/17/96	APPROVED BY: QRI	DRAWN BY: QRI

FIGURE 31 - SEDIMENT CROSS SECTION X-X'



LEGEND

RB-10 / 10.0	MONITORING WELL WITH FPH THICKNESS (FT)
FPH	FREE PHASE HYDROCARBON
	FPH CONTOUR

NORTH

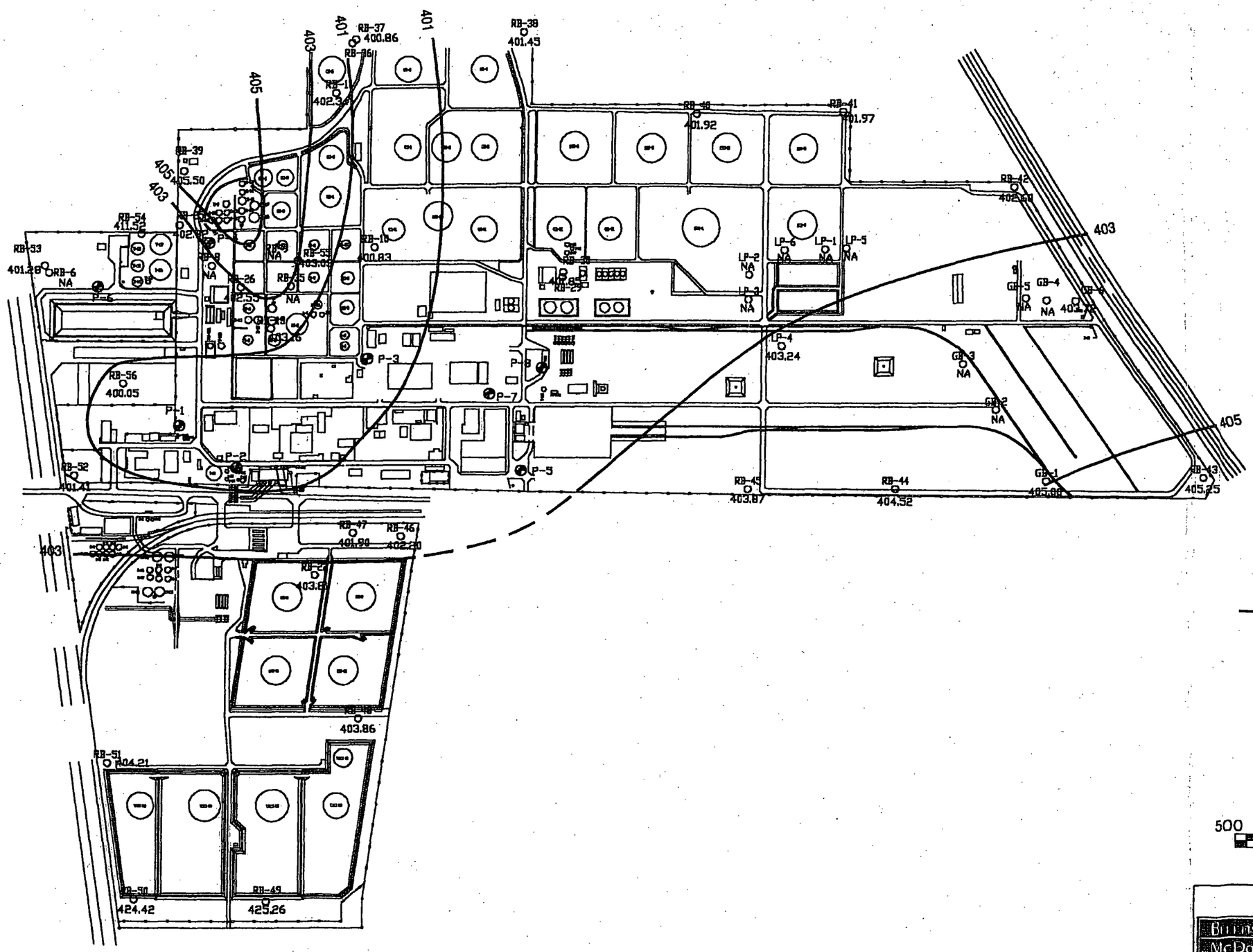
500 0 500 1000

SCALE IN FEET

Burns & McDonnell

Figure 12

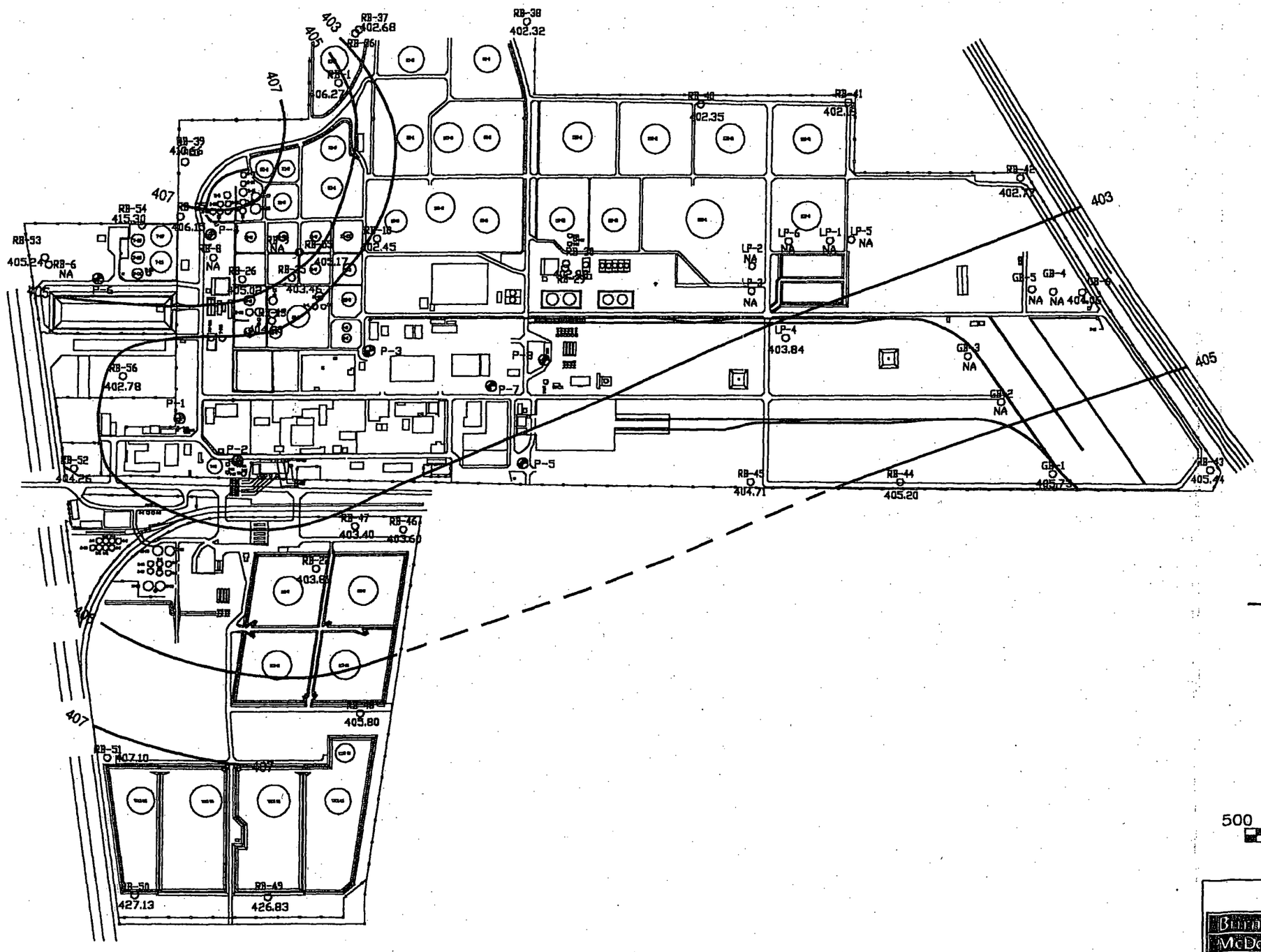
FREE PHASE HYDROCARBON CONTOUR MAP 7/30/02
PREMCOR REFINING GROUP
HARTFORD, ILLINOIS



Burns & McDonnell

Figure 11

GROUNDWATER CONTOUR MAP 7/30/02
PREMCOR REFINING GROUP
HARTFORD, ILLINOIS



LEGEND

RB-38 / 402.32	MONITORING WELL WITH GROUNDWATER ELEVATION (MSL)
P-5	PRODUCTION WELL
NA	NOT APPLICABLE
—403—	GROUNDWATER CONTOUR

NORTH

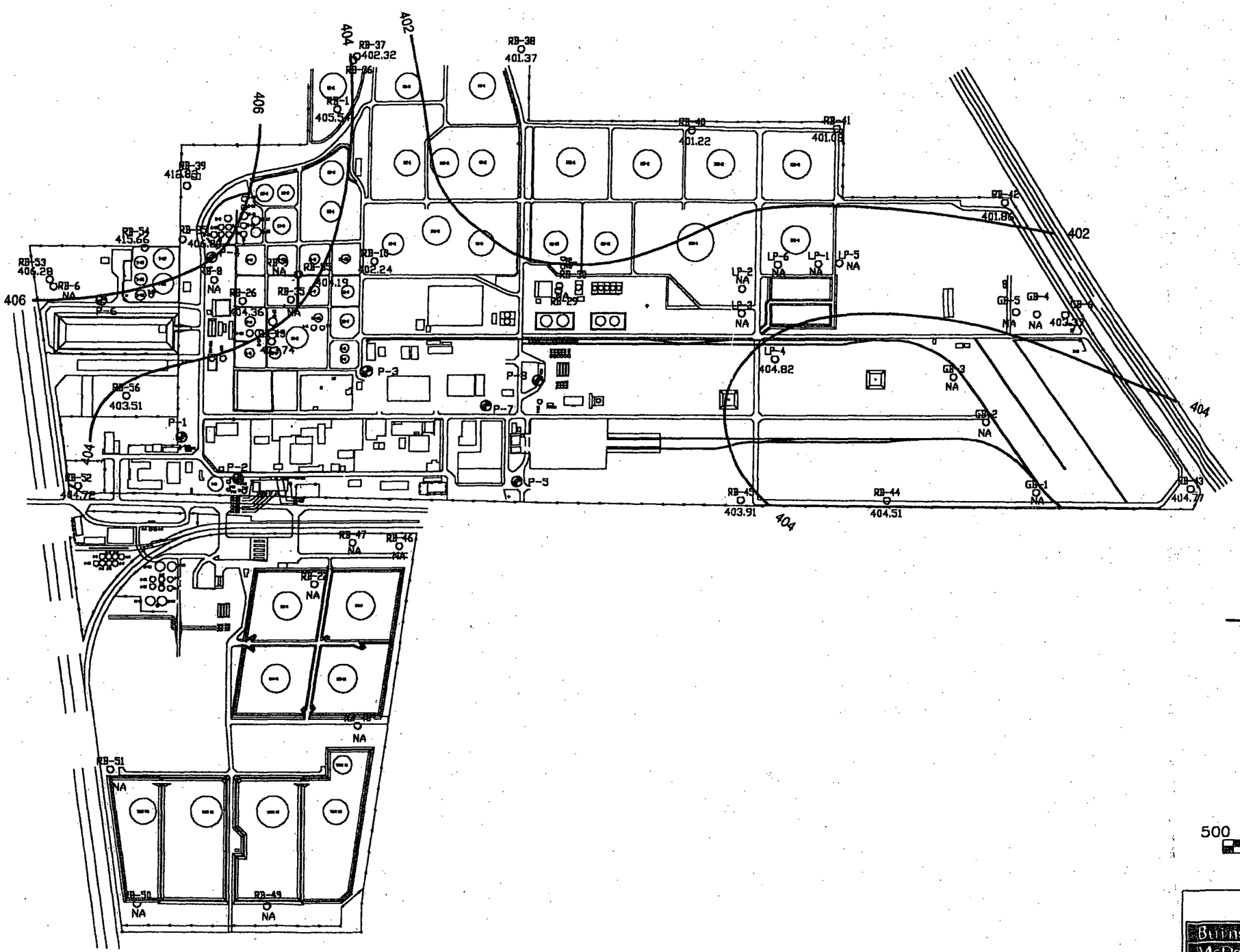
500 0 500 1000

SCALE IN FEET

Burns & McDonnell

Figure 10

GROUNDWATER CONTOUR MAP 6/26/02
PREMCOR REFINING GROUP
HARTFORD, ILLINOIS



LEGEND

RB-38 / 401.37	MONITORING WELL WITH GROUNDWATER ELEVATION (MSL)
P-5	PRODUCTION WELL
NA	NOT APPLICABLE
—403—	GROUNDWATER CONTOUR

NORTH

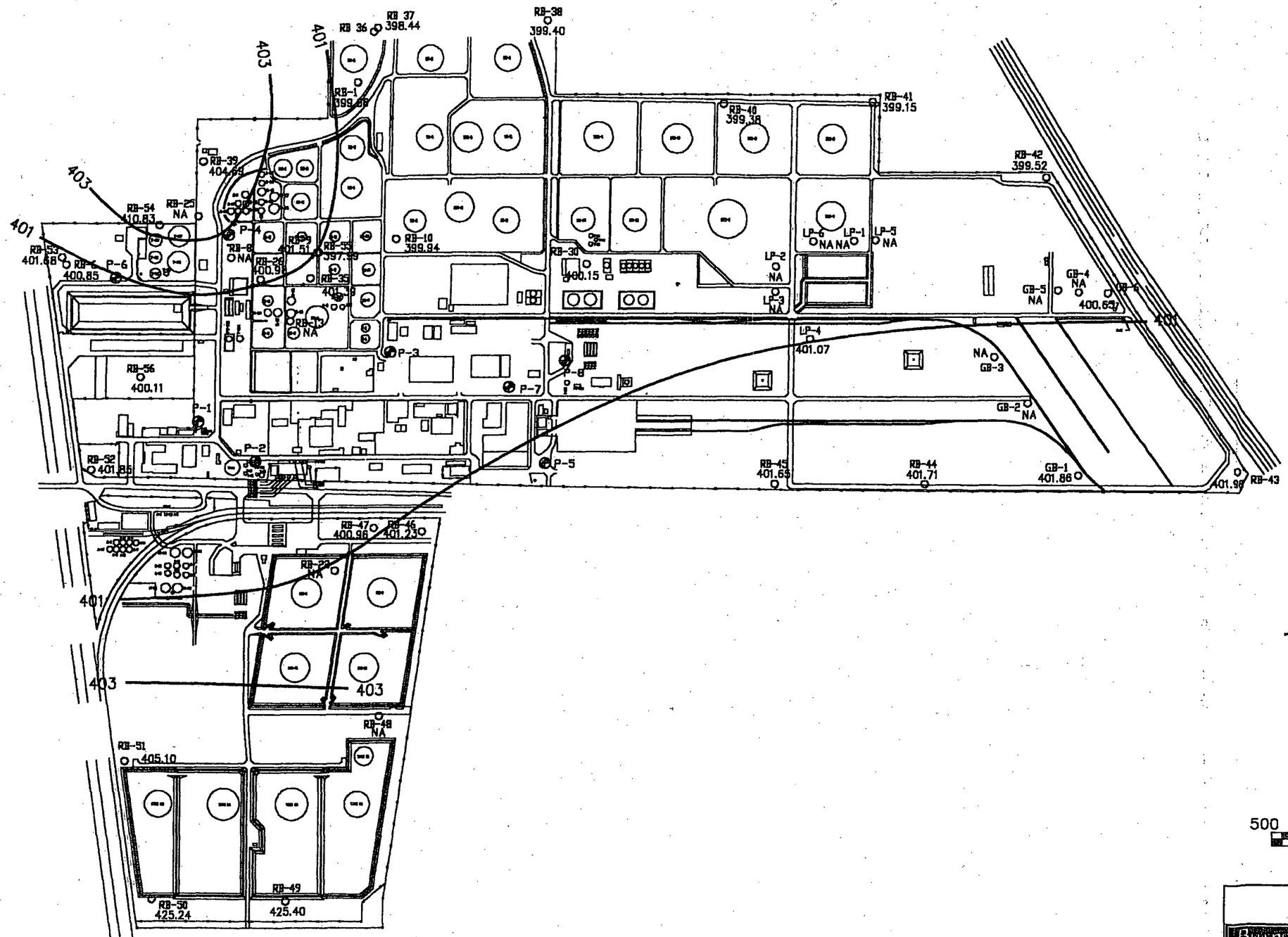
500 0 500 1000

SCALE IN FEET

Burns & McDonnell SINCE 1898

Figure 9

GROUNDWATER CONTOUR MAP 5/29/02
PREMCOR REFINING GROUP
HARTFORD, ILLINOIS



LEGEND

RB-38 399.40	MONITORING WELL WITH GROUNDWATER ELEVATION (MSL)
P-5	PRODUCTION WELL
NA	NOT APPLICABLE
— 401 —	GROUNDWATER CONTOUR

NORTH

500 0 500 1000

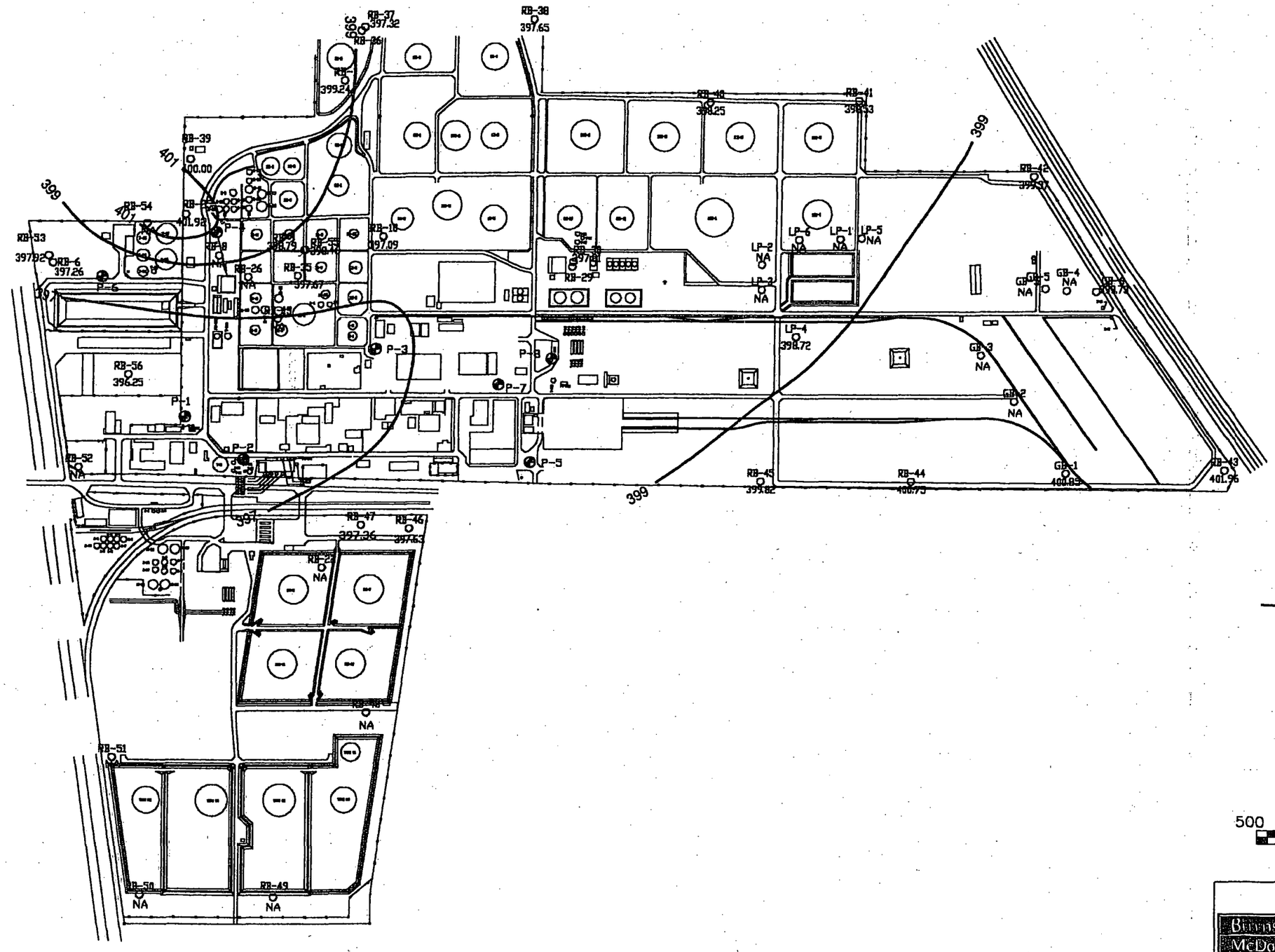
SCALE IN FEET

Burns & McDonnell since 1965

Figure 8

GROUNDWATER CONTOUR MAP - 5/15/00 AND 5/16/00
PREMCOR REFINING GROUP
HARTFORD, ILLINOIS

K:\Premcor\94155\EPAwl.dwg



LEGEND

RB-38 397.65	MONITORING WELL WITH GROUNDWATER ELEVATION (MSL)
P-5	PRODUCTION WELL
NA	NOT APPLICABLE
—403—	GROUNDWATER CONTOUR

NORTH

500 0 500 1000

SCALE IN FEET

Burns & McDonnell

Figure 7

GROUNDWATER CONTOUR MAP 03/22/00
PREMCOR REFINING GROUP
HARTFORD, ILLINOIS

K:\PREMCOR\94155\4090\CAD\GWCONT13.DWG 11/11/02

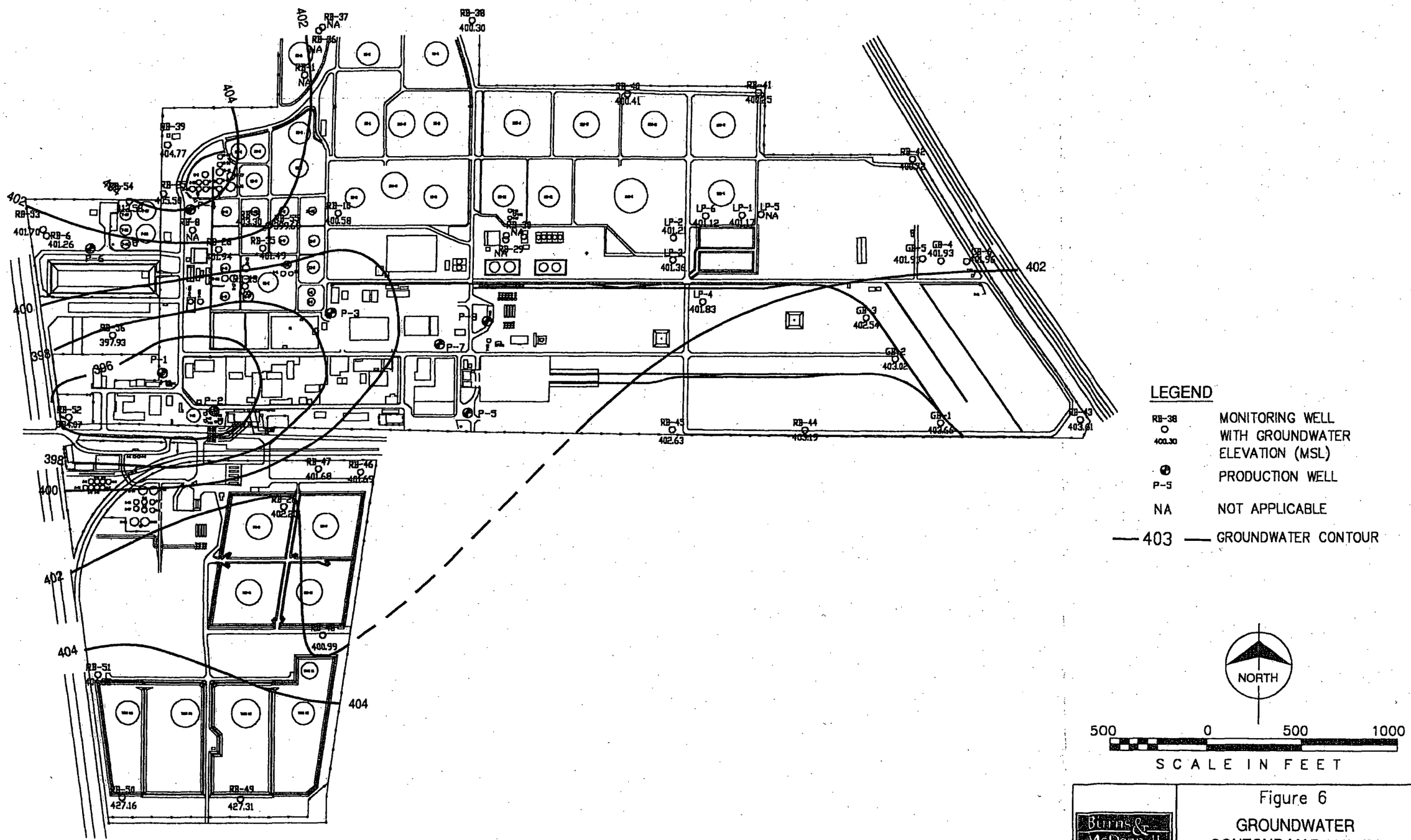
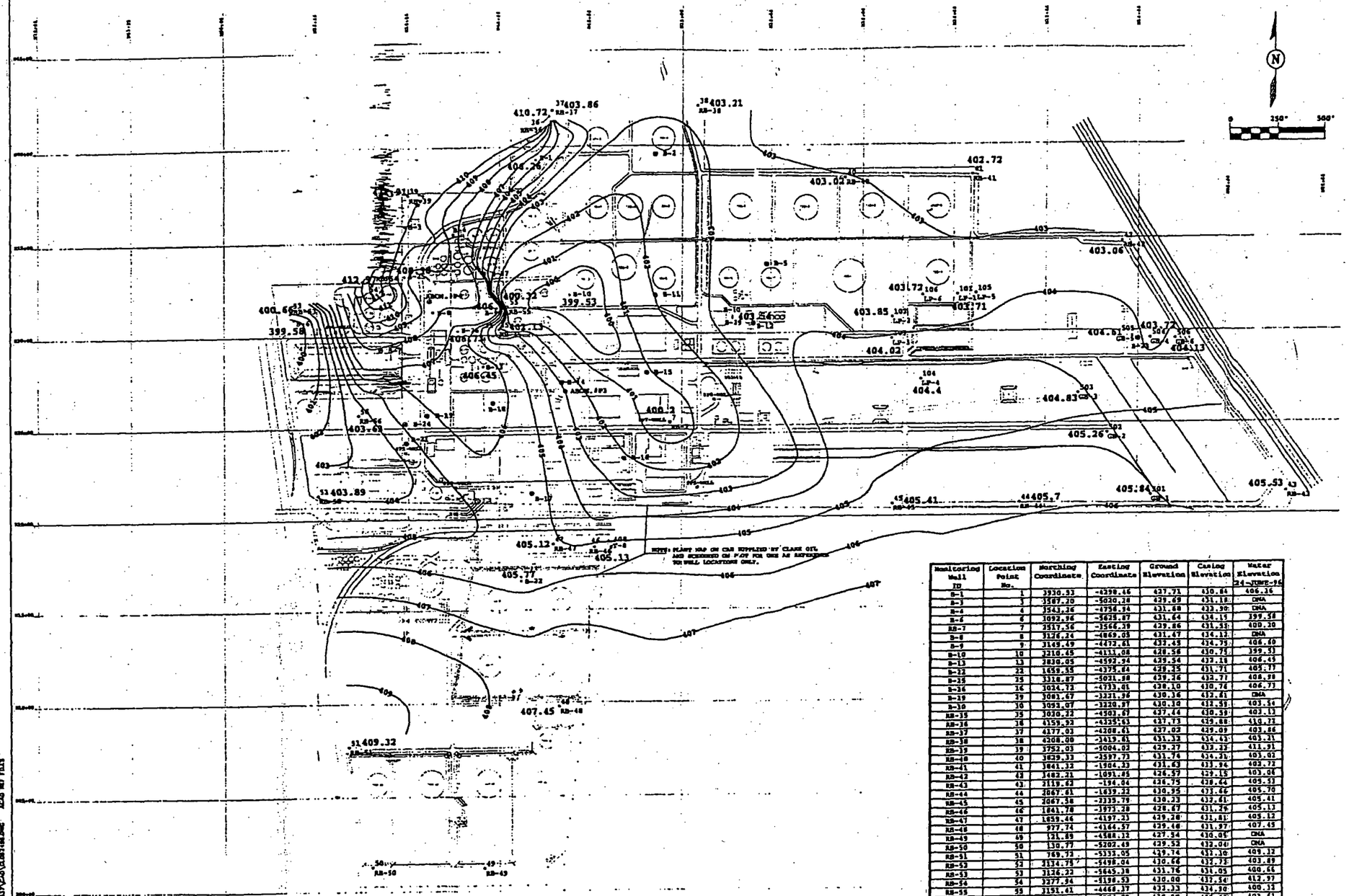


Figure 6

GROUNDWATER CONTOUR MAP 11/11/98
PREMCOR REFINING GROUP
HARTFORD, ILLINOIS

Burns & McDonnell



Monitoring Well ID	Location Point No.	Northing Coordinate	Easting Coordinate	Ground Elevation	Casing Elevation	Water Elevation 24-JUNE-96
B-1	1	3930.53	-4298.46	427.71	430.84	406.26
B-3	3	3587.20	-5030.28	429.69	431.18	DNA
B-4	4	3541.26	-4756.94	431.68	433.90	DNA
B-6	6	3092.96	-5625.87	431.64	434.15	399.58
RB-7	7	2517.56	-3566.39	429.86	431.53	400.30
B-8	8	3126.24	-4869.05	431.47	434.12	DNA
B-9	9	3149.49	-4472.61	432.45	434.75	406.20
B-10	10	3210.45	-4131.08	428.58	430.75	399.53
B-13	13	3830.05	-4592.94	429.54	432.18	404.45
B-22	22	3459.53	-4375.84	429.25	431.71	405.77
B-25	25	3318.87	-5021.58	429.26	432.77	406.98
B-26	26	3024.72	-4733.01	428.10	430.76	406.73
B-29	29	3081.67	-3221.96	430.36	432.81	DNA
B-30	30	3093.07	-3220.97	430.10	432.58	403.54
RB-35	35	3030.22	-4503.67	427.44	430.58	403.13
RB-36	36	4159.52	-4325.63	431.73	439.88	410.21
RB-37	37	4177.03	-4208.61	427.03	429.09	403.86
RB-38	38	4208.08	-3419.81	431.32	434.43	403.21
RB-39	39	3752.03	-5004.03	429.27	432.22	411.91
RB-40	40	3829.33	-3597.73	431.74	434.31	403.03
RB-41	41	3841.32	-1904.23	431.63	433.96	402.72
RB-42	42	3482.21	-1091.85	426.57	429.15	403.06
RB-43	43	2119.62	-194.86	434.75	438.44	405.53
RB-44	44	2067.61	-1639.22	430.95	433.46	405.70
RB-45	45	2067.58	-2335.79	430.23	432.81	405.41
RB-46	46	1841.78	-3973.28	428.67	431.26	405.13
RB-47	47	1859.46	-4197.23	429.28	431.81	405.12
RB-48	48	977.74	-4164.57	429.48	431.97	407.45
RB-49	49	131.89	-4588.12	427.34	430.05	DNA
RB-50	50	130.77	-5202.49	429.52	432.06	DNA
RB-51	51	769.73	-5333.05	428.74	431.30	409.32
RB-52	52	3134.73	-5498.04	430.66	432.73	403.89
RB-53	53	3126.22	-5645.38	431.76	434.05	400.66
RB-54	54	3277.34	-5198.53	430.00	432.54	412.97
RB-55	55	3151.41	-4468.37	433.33	434.90	400.32
RB-56	56	3578.15	-5276.73	430.08	432.62	403.61
GB-1	501	3102.98	-928.56	429.47	433.37	405.84
GB-2	502	2442.37	-1168.97	430.72	433.40	405.28
GB-3	503	2659.98	-1334.57	430.76	433.20	404.83
GB-4	504	2559.36	-835.19	431.22	434.38	403.72
GB-5	505	2970.73	-1032.82	432.13	434.82	404.61
GB-6	506	3956.38	-801.07	428.21	431.21	404.13
T-6	408	1842.24	-3882.47	428.87	429.84	DNA
LP-1	101	3200.54	-1980.55	426.48	429.37	403.71
LP-2	102	3081.56	-2341.39	427.37	430.38	403.85
LP-3	103	2964.88	-2342.65	427.18	429.70	404.02
LP-4	104	2745.62	-2180.04	430.42	431.23	404.40
LP-5	105	3205.47	-1880.46	426.37	429.23	DNA
LP-6	106	3197.90	-2171.64	426.20	429.84	403.72

DNA = Data Not Available or Suspect

DATE: 07/11/96	
DESCRIPTION: ISSUED FOR CLIENT REVIEW	
A	
CLIENT APPROVAL:	

PROJECT NO.	73337
DRAWN	RLJ
PROJECT ENG.	DPK
CHECKED	
RUST APPROVED	

PROJECT TITLE

CLARK REFINERY
HARTFORD, ILLINOIS

RUST ENVIRONMENT & INFRASTRUCTURE

DRAWING TITLE

GROUNDWATER CONTOURS
JUNE 24,1996

RUST DRAWING NUMBER

73337-C-01

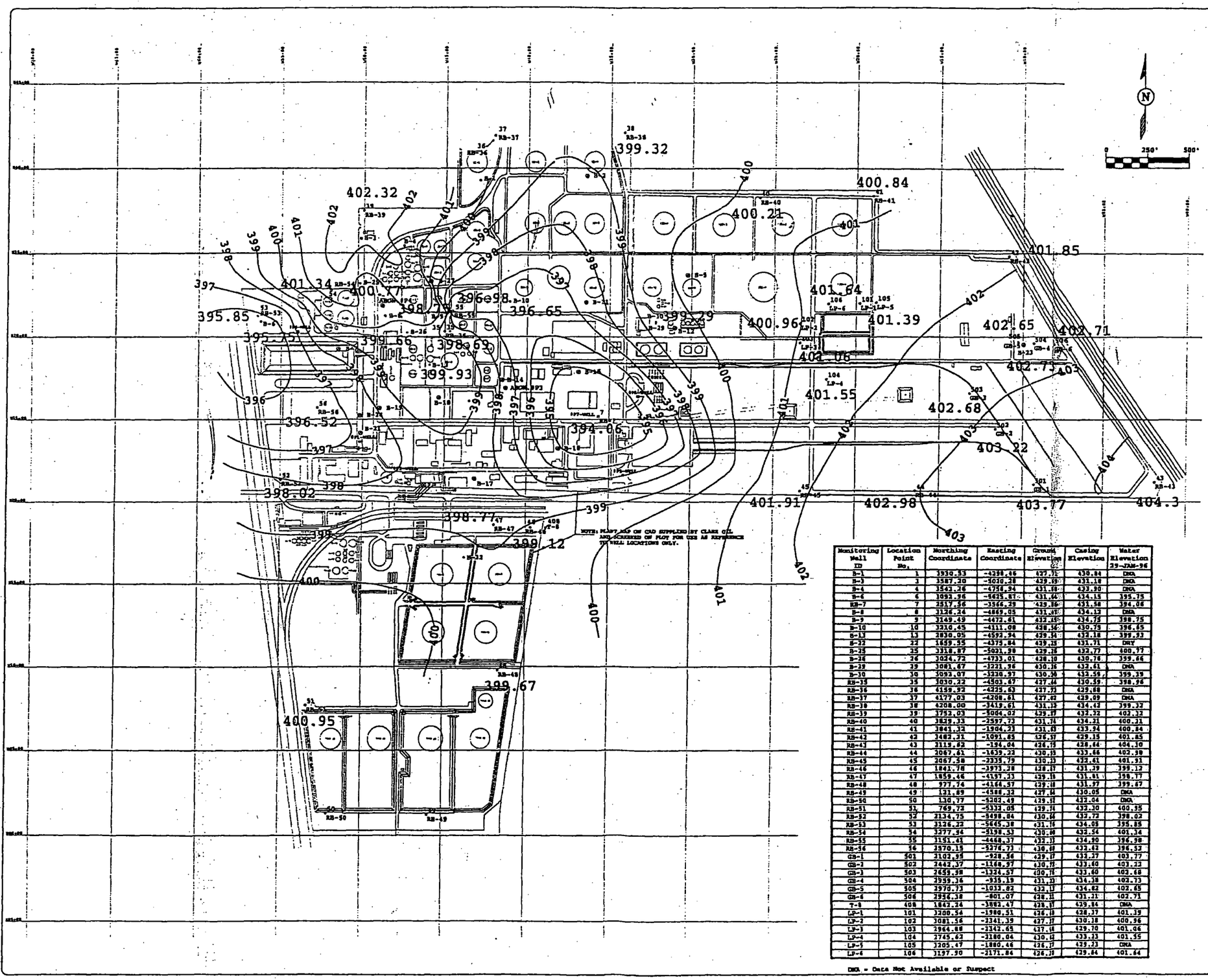
CLIENT DRAWING NUMBER

REV. NO.

A

PLOT SCALE: 1"=60'
PEN TABLE: 07_ACAD
PLOT DATE: 07/11/96

DWG SIZE: 17x11
RUST OFFICE: NAPERVILLE
FILENAME: 73337\CAD\GW1206.DWG



Monitoring Well ID	Location Point No.	Northing Coordinate	Easting Coordinate	Ground Elevation	Casing Elevation	Water Elevation 29-JAN-96
B-1	1	3930.53	-4298.46	427.71	430.84	DNA
B-3	3	3587.20	-5030.28	429.69	431.18	DNA
B-4	4	3543.26	-4706.94	431.68	433.90	DNA
B-6	6	3093.96	-5425.87	431.44	434.15	395.75
RB-7	7	2517.56	-3566.29	429.86	431.58	394.06
B-8	8	3126.24	-4869.05	431.49	434.12	DNA
B-9	9	3149.49	-4472.41	432.15	434.75	398.75
B-10	10	3210.45	-4111.08	428.56	430.75	396.65
B-13	13	2830.05	-4593.94	429.34	432.18	399.93
B-22	22	1659.55	-4375.84	429.25	431.71	DNA
B-25	25	3318.87	-5021.38	429.16	432.77	400.77
B-26	26	3024.72	-4733.01	428.10	430.76	399.66
B-29	29	3081.67	-3221.96	430.16	432.61	DNA
B-30	30	3093.07	-3220.97	430.36	432.59	399.29
RB-35	35	3030.22	-4503.47	427.44	430.59	398.96
RB-36	36	4159.92	-4235.63	427.73	429.88	DNA
RB-37	37	4177.03	-4208.61	427.02	429.09	DNA
RB-38	38	4208.00	-3419.61	431.12	434.42	399.32
RB-39	39	3753.03	-5004.02	429.17	432.32	402.32
RB-40	40	3829.33	-2597.73	431.74	434.21	400.21
RB-41	41	3841.32	-1904.23	431.83	433.94	400.84
RB-42	42	3482.31	-1091.85	426.57	429.15	401.85
RB-43	43	3119.82	-194.04	426.75	428.66	404.30
RB-44	44	2067.61	-1639.23	430.15	433.66	403.98
RB-45	45	2067.58	-2335.75	430.13	432.61	401.91
RB-46	46	1842.78	-3973.28	428.27	431.29	399.12
RB-47	47	1859.46	-4157.23	429.15	431.81	398.77
RB-48	48	977.74	-4164.57	429.18	431.97	399.67
RB-49	49	121.89	-4588.32	427.84	430.05	DNA
RB-50	50	130.77	-5202.49	429.11	433.04	DNA
RB-51	51	769.72	-5332.08	429.74	432.30	400.95
RB-52	52	2134.75	-5498.84	430.46	432.72	398.02
RB-53	53	3126.22	-5645.38	431.16	434.08	395.85
RB-54	54	3277.84	-5198.53	430.80	432.54	401.34
RB-55	55	3151.41	-4468.37	432.13	434.90	396.98
RB-56	56	2570.15	-5276.73	430.48	432.62	396.52
GB-1	501	2102.95	-928.56	429.17	432.27	403.77
GB-2	502	2442.37	-1148.97	430.75	433.60	403.22
GB-3	503	2659.98	-1324.57	430.76	433.60	402.68
GB-4	504	2959.36	-935.19	431.13	434.38	402.73
GB-5	505	2970.73	-1031.82	432.13	434.62	402.65
GB-6	506	2956.38	-801.07	428.31	431.21	402.71
T-8	408	1847.24	-3892.47	428.17	429.84	DNA
LP-1	101	3200.54	-1980.51	426.18	428.37	401.39
LP-2	102	3081.56	-2341.39	427.17	430.18	400.96
LP-3	103	2964.88	-2342.65	427.18	429.70	401.06
LP-4	104	2745.63	-2180.04	430.12	433.23	401.55
LP-5	105	3205.47	-1880.46	426.17	429.23	DNA
LP-6	106	3197.90	-2171.84	426.18	429.84	401.64

DNA = Data Not Available or Suspect

PLOT SCALE: 1"=250'
PLOT DATE: 02/07/96
PLOT DATE: 02/07/96

DWG SIZE: 24x36
DWG NAME: 73337GWCONTOURS
FILENAME: 73337CAD\CLO2376A.DWG

XREF REF FILES

DATE: 02/08/96	
DESCRIPTION: ISSUED FOR CLIENT REVIEW	
A	
CLIENT APPROVAL:	
PROJECT NO.	73337
DRAWN	RLJ
PROJECT ENG.	DPK
CHECKED	
RUST APPROVED	

PROJECT TITLE

CLARK REFINERY
HARTFORD, ILLINOIS

RUST ENVIRONMENT & INFRASTRUCTURE

DRAWING TITLE

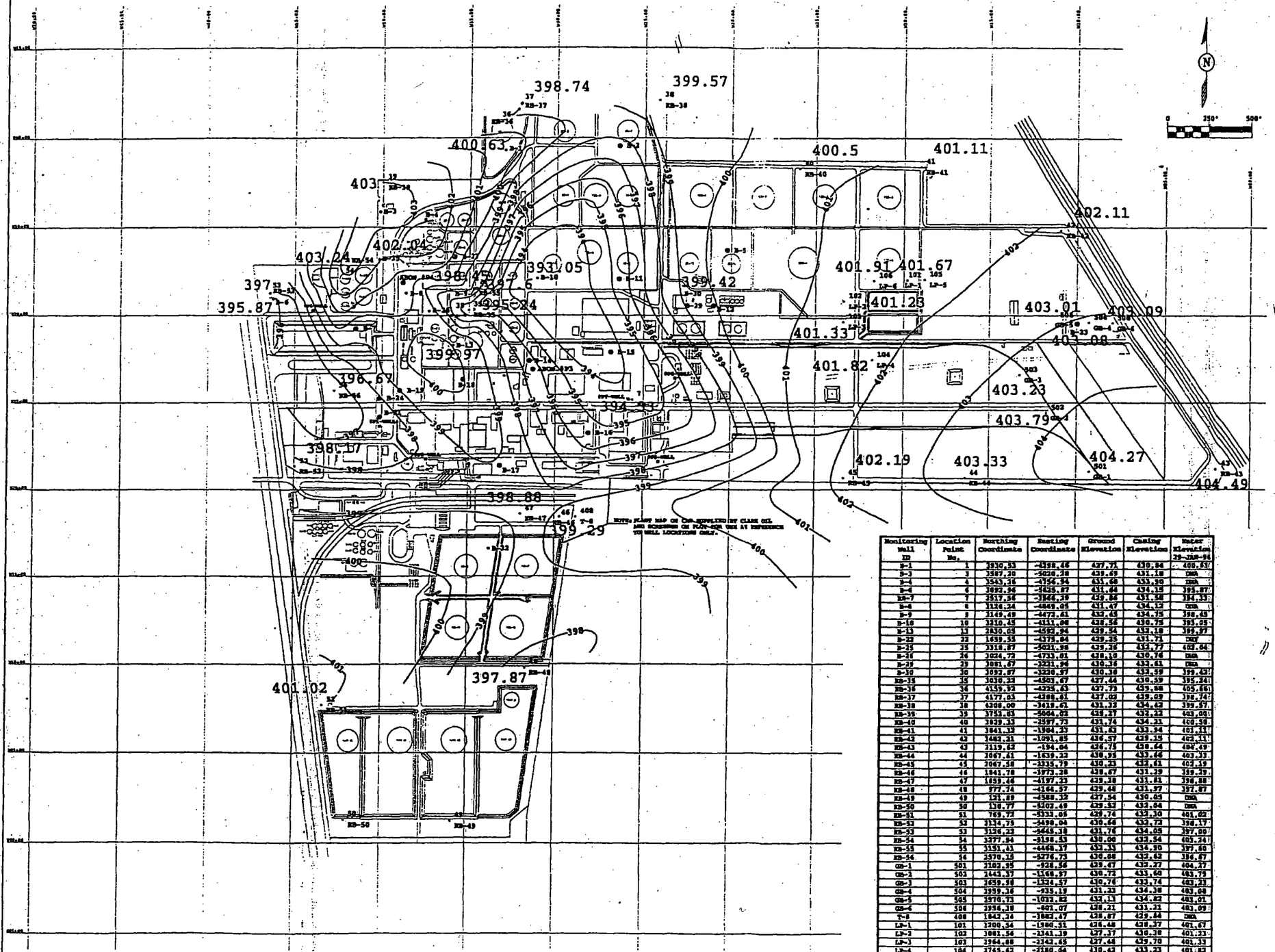
GROUNDWATER CONTOURS
FEBRUARY 27, 1996

RUST DRAWING NUMBER

73337-C-01

CLIENT DRAWING NUMBER

REV. NO.
A



Monitoring Well ID	Location Point No.	Northing Coordinate	Easting Coordinate	Ground Elevation	Casing Elevation	Water Elevation 29-JAN-96
B-1	1	3930.53	-4298.46	427.71	430.84	400.63
B-3	3	3587.20	-5020.28	429.69	431.18	DRY
B-4	4	3543.26	-4756.54	431.68	431.90	DRY
B-6	6	3892.56	-3625.87	431.64	434.15	395.87
RB-7	7	2517.56	-3846.29	429.84	431.58	394.33
B-8	8	3126.24	-4849.05	431.47	434.12	DRY
B-9	9	3149.49	-4472.61	432.45	434.75	398.49
B-10	10	3210.45	-4111.08	428.56	430.75	393.05
B-13	13	2830.05	-4595.94	429.54	432.18	399.97
B-22	22	1659.53	-4375.84	429.25	431.71	DRY
B-25	25	3318.87	-3021.98	429.26	432.77	402.04
B-26	26	3024.72	-4733.01	428.10	430.76	DRY
B-29	29	3081.67	-3221.94	430.36	433.61	DRY
B-30	30	3092.87	-3220.97	430.36	433.59	399.43
RB-35	35	3030.22	-4501.67	427.44	430.59	395.24
RB-36	36	4155.57	-4225.23	427.73	429.88	405.86
RB-37	37	4177.63	-4368.61	427.02	429.69	398.74
RB-38	38	4208.00	-3619.61	431.32	434.42	399.57
RB-39	39	3752.83	-5064.02	428.27	432.22	403.08
RB-40	40	3029.33	-2597.73	431.74	434.21	400.50
RB-41	41	3841.32	-1984.25	431.82	433.34	401.11
RB-42	42	3482.31	-1091.85	426.57	429.15	402.11
RB-43	43	2119.62	-194.04	426.75	430.64	404.49
RB-44	44	3067.42	-1639.22	430.95	433.46	403.33
RB-45	45	3067.58	-3335.79	430.23	432.61	402.19
RB-46	46	1841.78	-1973.28	428.67	431.29	399.29
RB-47	47	1859.46	-4197.23	429.28	431.81	398.88
RB-48	48	977.74	-4164.57	429.48	431.97	397.87
RB-49	49	131.89	-4588.32	427.54	430.85	DRY
RB-50	50	138.77	-5207.49	429.82	432.04	DRY
RB-51	51	769.72	-5533.85	429.74	432.30	401.02
RB-52	52	3134.73	-3498.04	430.46	432.72	398.17
RB-53	53	3136.22	-5645.18	431.76	434.65	397.80
RB-54	54	3277.84	-5158.53	430.00	432.54	403.24
RB-55	55	3151.43	-4468.37	432.33	434.90	397.60
RB-56	56	2570.15	-5276.73	430.08	432.62	396.67
GB-1	501	3102.95	-928.56	429.47	432.27	404.27
GB-2	502	3443.37	-1148.57	430.72	433.60	403.79
GB-3	503	3659.38	-1324.57	430.76	433.74	403.23
GB-4	504	3959.36	-935.19	431.23	434.38	403.08
GB-5	505	3970.73	-1023.82	432.13	434.62	403.01
GB-6	506	3956.38	-801.07	428.21	431.21	403.09
T-8	408	1842.24	-1982.47	428.87	429.84	DRY
LP-1	101	1200.54	-1980.31	426.48	428.37	401.67
LP-2	102	3081.54	-2341.39	427.37	430.38	401.33
LP-3	103	2964.88	-2142.65	427.44	429.70	401.33
LP-4	104	2745.62	-2180.04	430.43	433.23	401.82
LP-5	105	2205.47	-1880.46	426.37	429.23	DRY
LP-6	106	2197.90	-2171.84	426.20	429.32	401.91

DRY = Data Not Available or Suspect

A	DATE: 02/06/96 DESCRIPTION: ISSUED FOR CLIENT REVIEW
	CLIENT APPROVAL:

PROJECT NO.	73337
DRAWN	MLJ
PROJECT ENG.	DPK
CHECKED	
RUST APPROVED	

PROJECT TITLE

CLARK REFINERY
HARTFORD, ILLINOIS

RUST ENVIRONMENT & INFRASTRUCTURE

DRAWING TITLE

GROUNDWATER CONTOURS
JANUARY 29, 1996

RUST DRAWING NUMBER

73337-C-01

CLIENT DRAWING NUMBER

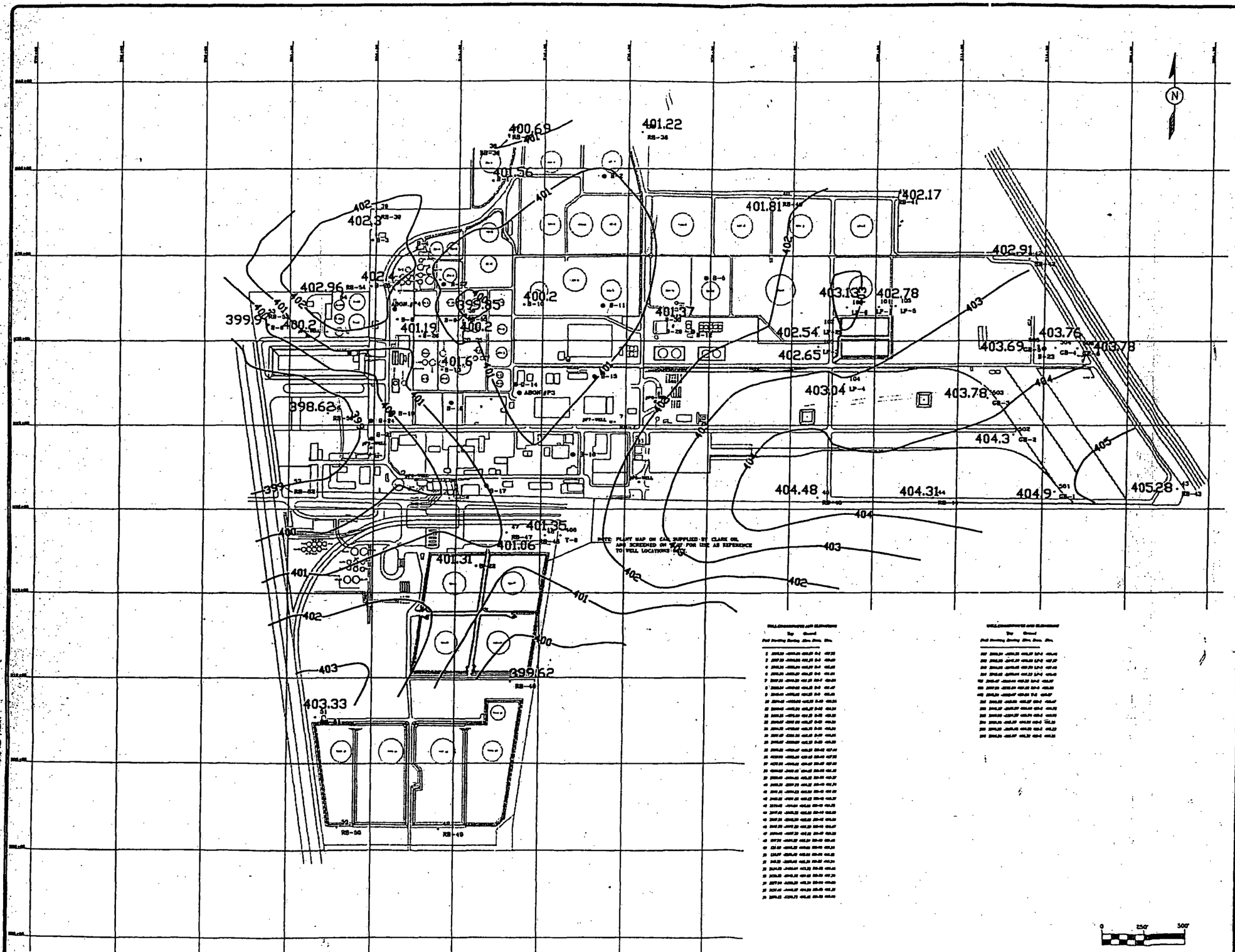
REV. NO.

A

PLOT SCALE: 1"=250'
PLOT MODE: 1:1 (FULL)
PLOT DATE: 02/06/96

DWG SIZE: 36x24
DWG STYLE: RUST-HOUSTON
FILENAME: 73337LCAVYCL01PRM.DWG

TEXT NOT TITLE



PROJECT NO.	73337
DRAWN	BLJ
PROJECT ENG.	
CHECKED	
RUST APPROVED	

PROJECT TITLE

CLARK REFINERY
HARTFORD, ILLINOIS

RUST ENVIRONMENT & INFRASTRUCTURE

DRAWING TITLE

GROUNDWATER CONTOURS
NOVEMBER 21, 1995

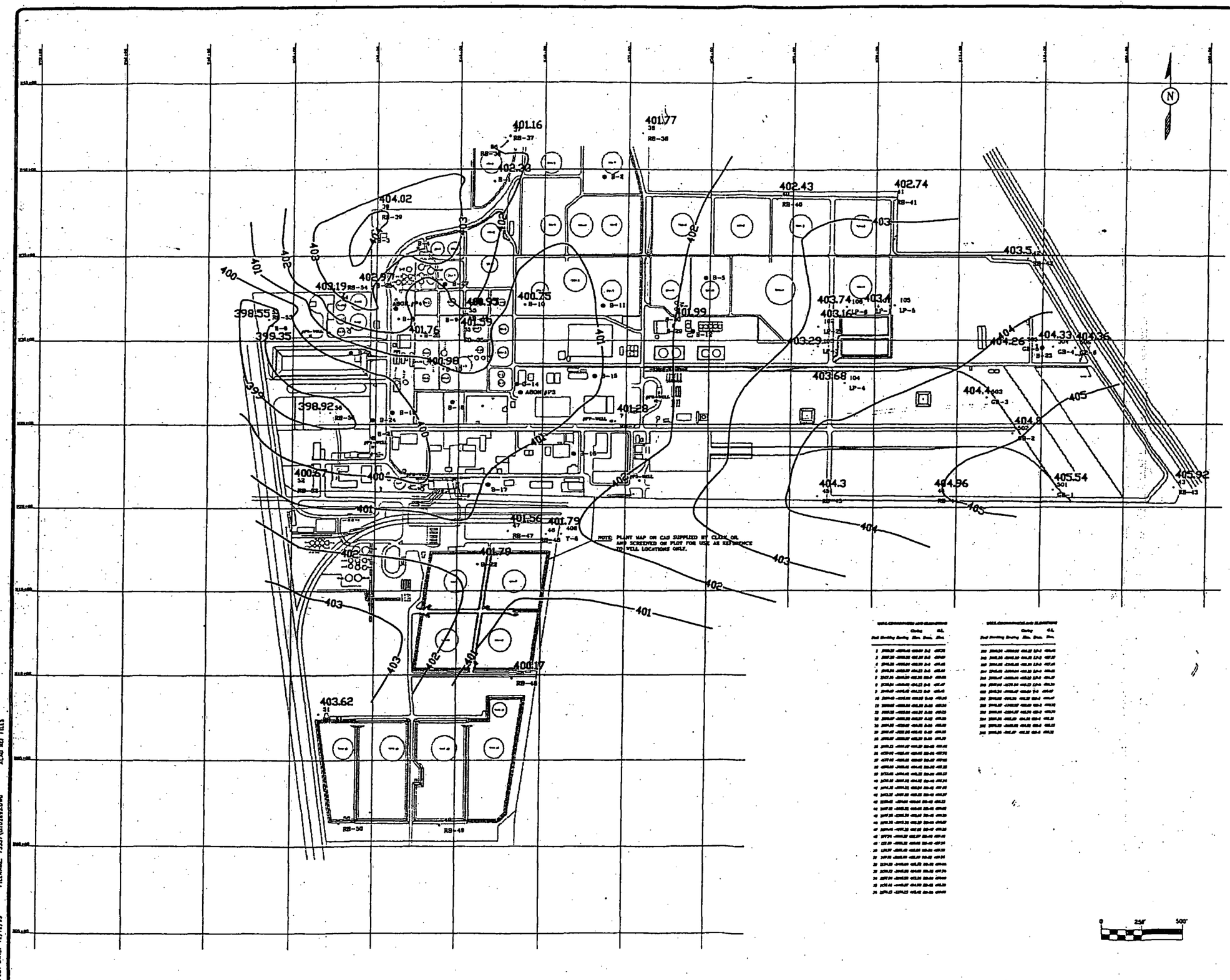
RUST DRAWING NUMBER

73337-C-01

CLIENT DRAWING NUMBER

REV. NO.

A



PROJECT NO. 73337
DRAWN BLJ
PROJECT ENG.
CHECKED
RUST APPROVED

PROJECT TITLE

CLARK REFINERY
HARTFORD, ILLINOIS

RUST ENVIRONMENT & INFRASTRUCTURE

DRAWING TITLE

GROUNDWATER CONTOURS
OCTOBER 26, 1995

RUST DRAWING NUMBER

73337-C-01

CLIENT DRAWING NUMBER

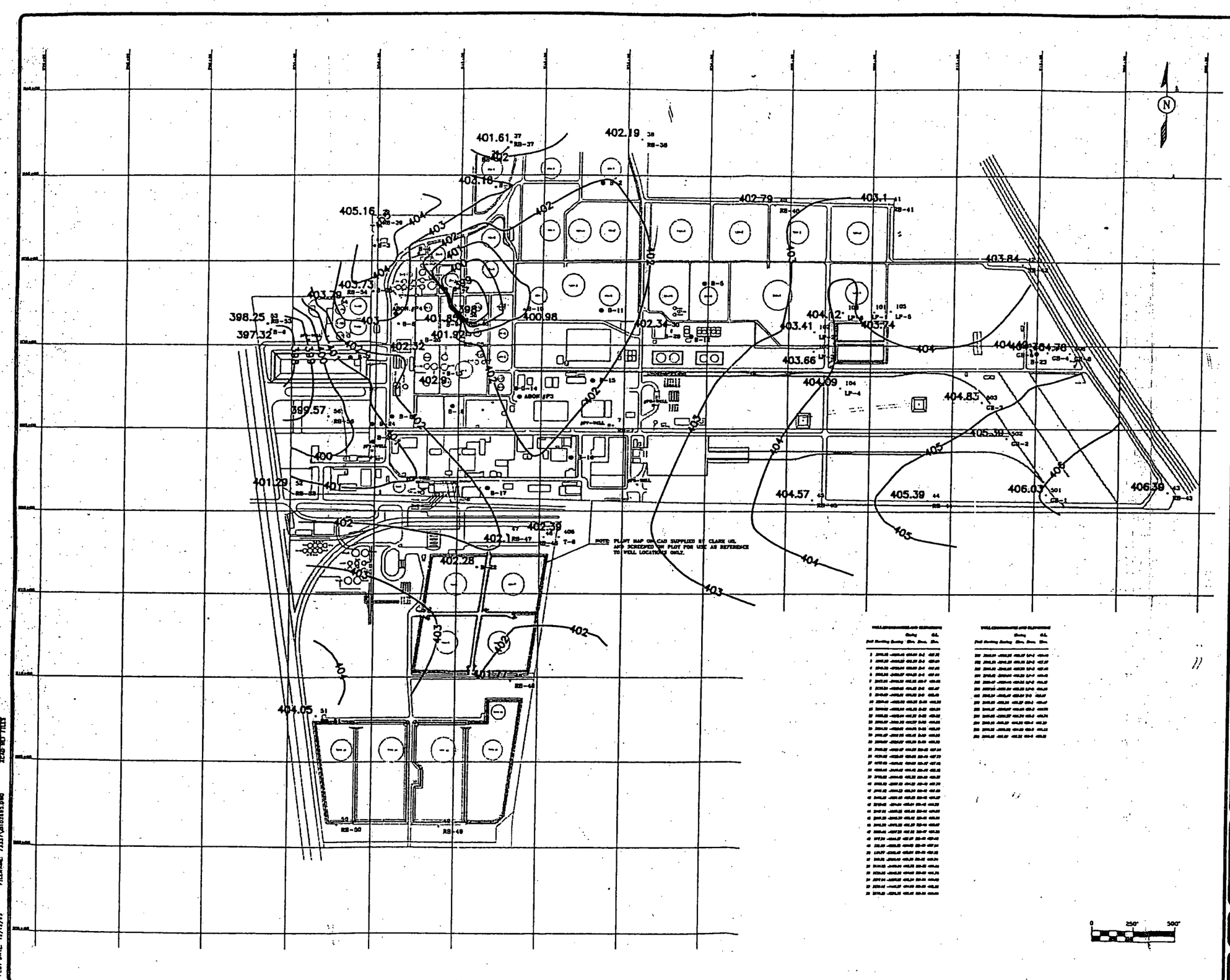
REV. NO.

A

PLOT SCALE: 1"=250'
PEN TABLE: 043_ACAD
PLOT DATE: 12/12/95

DWG SIZE: 36x24
RUST OFFICE: NAPERVILLE
FILENAME: 73337\G102695.DWG

XREF REF FILES



PROJECT NO.	73337
DRAWN	BLJ
PROJECT ENG.	
CHECKED	
RUST APPROVED	

PROJECT TITLE

CLARK REFINERY
HARTFORD, ILLINOIS

RUST ENVIRONMENT & INFRASTRUCTURE

DRAWING TITLE

GROUNDWATER CONTOURS

October 4, 1995

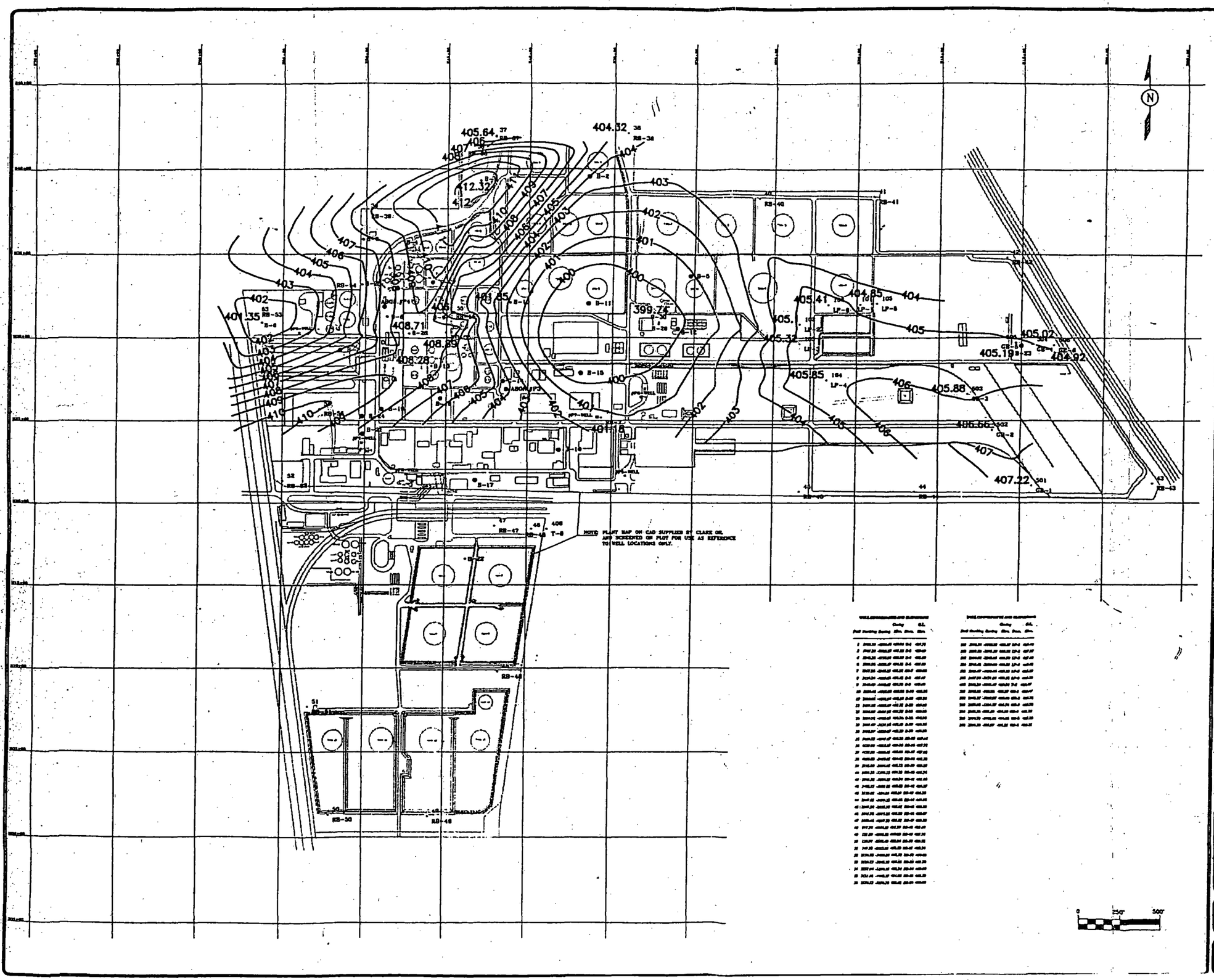
RUST DRAWING NUMBER

73337-C-01

CLIENT DRAWING NUMBER

REV. NO.

A



PROJECT NO.	73337
DRAWN	BLJ
PROJECT ENG.	
CHECKED	
RUST APPROVED	

PROJECT TITLE

CLARK REFINERY
HARTFORD, ILLINOIS

RUST ENVIRONMENT & INFRASTRUCTURE

DRAWING TITLE

GROUNDWATER CONTOURS

June 19, 1995

RUST DRAWING NUMBER

73337-C-01

CLIENT DRAWING NUMBER	REV. NO.
	A

PLOT SCALE: 1"=250'
PEN TABLE: 042_ACAD
PLOT DATE: 12/12/95

DWG SIZE: 36x24
RUST OFFICE: HAPERVILLE
FILENAME: 73337\d102695.DWG

ZEAD REF FILES

Table 4
Hartford Refinery Piezometers
The Premcor Refining Group, Inc.
Hartford, Illinois Refinery

WELL	DATE	(A) Casing Rim Elevation (feet)	Total Well Depth (TOC) (feet)	Top of Well Screen Elevation (ft)	Bottom of Well Screen Elevation (ft)	Screened Formation	(B) Depth to Hydrocarbon (feet)	(C) Depth to Water (feet)	(A)-(B) Hydrocarbon Surf. Elevation (feet)	(A)-(C) Water Surface Elevation (feet)	(C)-(B) Hydrocarbon Thickness (feet)	Piezometric Surface Elevation* (feet)
RB-56	11/11/1998	432.64	46.54	406.08	386.08	CH (24-29)	34.71	34.71	397.93	397.93	0	397.93
	3/22/2000	432.64				SC (29-31)	35.90	37.80	396.74	394.84	1.9	396.25
	5/16/2001	432.64				SP (31-41)	32.52	32.55	400.12	400.09	0.03	400.11
	5/30/2002	432.64				CH (41-42)	28.91	29.77	403.73	402.87	0.86	403.51
	6/26/2002	432.64				SP (42-44)	29.70	30.30	402.94	402.34	0.6	402.78
	7/30/2002	432.64					32.29	33.46	400.35	399.18	1.17	400.05
GB-1	11/11/1998	432.28					NA	28.62	NA	403.66	0	403.66
	3/22/2000	432.28					NA	31.43	NA	400.85	0	400.85
	5/16/2001	432.28					NA	30.42	NA	401.86	0	401.86
	6/26/2002	432.28					NA	26.55	NA	405.73	0	405.73
	7/30/2002	432.28					NA	27.28	NA	405.00	0	405.00
GB-2	11/11/1998	433.60					NA	30.58	NA	403.02	0	403.02
GB-3	11/11/1998	433.74					NA	31.20	NA	402.54	0	402.54
GB-4	11/11/1998	434.38					NA	32.45	NA	401.93	0	401.93
GB-5	11/11/1998	434.82					NA	32.91	NA	401.91	0	401.91
GB-6	11/11/1998	431.26					NA	29.30	NA	401.96	0	401.96
	3/22/2000	431.26					NA	31.53	NA	399.73	0	399.73
	5/15/2001	431.26					NA	30.63	NA	400.63	0	400.63
	5/29/2002	431.26					NA	27.89	NA	403.37	0	403.37
	6/26/2002	431.26					NA	27.20	NA	404.06	0	404.06
	7/30/2002	431.26					NA	27.54	NA	403.72	0	403.72
LP-1	11/11/1998	428.37					NA	27.20	NA	401.17	0	401.17
LP-2	11/11/1998	430.38					NA	29.17	NA	401.21	0	401.21
LP-3	11/11/1998	429.70					NA	28.34	NA	401.36	0	401.36
LP-4	11/11/1998	433.26					NA	31.43	NA	401.83	0	401.83
	3/22/2000	433.26					NA	34.54	NA	398.72	0	398.72
	5/15/2001	433.26					NA	32.19	NA	401.07	0	401.07
	5/29/2002	433.26					NA	28.44	NA	404.82	0	404.82
	6/26/2002	433.26					NA	29.42	NA	403.84	0	403.84
	7/30/2002	433.26					NA	30.02	NA	403.24	0	403.24
LP-6	11/11/1998	429.32					NA	28.20	NA	401.12	0	401.12
P-1												
P-2												
P-5												
P-6												

Notes:
RB-1 - Bold represents piezometers to be sampled.
RB-30 had a product sheen on the water surface.
Piezometric surface elevation = [(A)-(C)]+S.G.[(C)-(B)]

SG - Specific gravity of product, assumed to be 0.74
NA - Not Applicable
NM - Previously Not Measured
P-1, P-2, P-5, P-6 are Production wells, no water level data will be collected

Table 4
Hartford Refinery Piezometers
The Premcor Refining Group, Inc.
Hartford, Illinois Refinery

WELL	DATE	(A) Casing Rim Elevation (feet)	Total Well Depth (TOC) (feet)	Top of Well Screen Elevation (ft)	Bottom of Well Screen Elevation (ft)	Screened Formation	(B) Depth to Hydrocarbon (feet)	(C) Depth to Water (feet)	(A)-(B) Hydrocarbon Surf. Elevation (feet)	(A)-(C) Water Surface Elevation (feet)	(C)-(B) Hydrocarbon Thickness (feet)	Piezometric Surface Elevation* (feet)
RB-50	11/11/1998	432.23	47.52	419.52	384.52	CH (10-45)	NA	5.07	NA	427.16	0	427.16
	3/22/2000	432.23					NM	NM	NA	NA	NA	NA
	5/15/2001	432.23					NA	6.99	NA	425.24	0	425.24
	5/29/2002	432.23					NM	NM	NA	NA	NA	NA
	6/26/2002	432.23					NA	5.10	NA	427.13	0	427.13
	7/30/2002	432.23					NA	7.81	NA	424.42	0	424.42
RB-51	11/11/1998	432.31	42.56	404.74	389.74	SP (25-40)	NA	27.46	NA	404.85	0	404.85
	3/22/2000	432.31					NM	NM	NA	NA	NA	NA
	5/15/2001	432.31					NA	27.21	NA	405.10	0	405.10
	5/29/2002	432.31					NM	NM	NA	NA	NA	NA
	6/26/2002	432.31					NA	25.21	NA	407.10	0	407.10
	7/30/2002	432.31					NA	28.10	NA	404.21	0	404.21
RB-52	11/11/1998	432.75	44.06	408.66	388.66	CL (22-27)	38.68	38.68	NA	394.07	0	394.07
	3/22/2000	432.75				SM (28-30)	NM	NM	NA	NA	NA	NA
	5/16/2001	432.75				ML (30-33)	30.11	33.16	NA	399.59	3.05	401.85
	5/30/2002	432.75				SP (33-37)	26.81	31.50	NA	401.25	4.69	404.72
	6/26/2002	432.75				SM (37-38)	28.40	28.75	NA	404.00	0.35	404.26
	7/30/2002	432.75				SP (38-42)	30.95	32.45	NA	400.30	1.5	401.41
RB-53	11/11/1998	434.57	44.29	409.76	389.76	CH (22-27)	32.87	32.87	401.7	401.70	0	401.70
	3/22/2000	434.57				SC (27-28)	36.51	37.03	398.06	397.54	0.52	397.92
	5/16/2001	434.57				SM (28-30)	32.88	32.90	401.69	401.67	0.02	401.68
	5/29/2002	434.57				SP (30-42)	26.48	33.45	408.09	401.12	6.97	406.28
	6/26/2002	434.57					29.20	29.70	405.37	404.87	0.5	405.24
	7/30/2002	434.57					31.90	37.23	402.67	397.34	5.33	401.28
RB-54	11/11/1998	432.61	42.54	410.00	390.00	CL (20-22)	NA	19.03	NA	413.58	0	413.58
	3/22/2000	432.61				CH (22-34)	NM	NM	NA	NA	NA	NA
	5/15/2001	432.61				SP (34-37)	NA	21.78	NA	410.83	0	410.83
	5/29/2002	432.61				ML (37-38)	NA	16.95	NA	415.66	0	415.66
	6/26/2002	432.61				CL (38-40)	NA	17.31	NA	415.30	0	415.30
	7/30/2002	432.61					NA	21.09	NA	411.52	0	411.52
RB-55	11/11/1998	434.94	42.57	412.33	392.33	CH (20-31)	35.25	35.25	399.69	399.69	0	399.69
	3/22/2000	434.94				MH (31-32	35.91	38.09	399.03	396.85	2.18	398.46
	5/16/2001	434.94				SP (32-40)	NA	36.95	NA	397.99	0	397.99
	5/29/2002	434.94					29.72	33.68	405.22	401.26	3.96	404.19
	6/26/2002	434.94					29.60	30.25	405.34	404.69	0.65	405.17
	7/30/2002	434.94					30.25	36.65	404.69	398.29	6.4	403.03

Table 4
Hartford Refinery Piezometers
The Premcor Refining Group, Inc.
Hartford, Illinois Refinery

WELL	DATE	(A) Casing Rim Elevation (feet)	Total Well Depth (TOC) (feet)	Top of Well Screen Elevation (ft)	Bottom of Well Screen Elevation (ft)	Screened Formation	(B) Depth to Hydrocarbon (feet)	(C) Depth to Water (feet)	(A)-(B) Hydrocarbon Surf. Elevation (feet)	(A)-(C) Water Surface Elevation (feet)	(C)-(B) Hydrocarbon Thickness (feet)	Piezometric Surface Elevation* (feet)
RB-44	11/11/1998	433.68	40.71	407.95	392.95	SP (23-38)	NA	30.49	NA	403.19	0	403.19
	3/22/2000	433.68					NA	32.93	NA	400.75	0	400.75
	5/15/2001	433.68					NA	31.97	NA	401.71	0	401.71
	5/29/2002	433.68					NA	29.17	NA	404.51	0	404.51
	6/26/2002	433.68					NA	28.48	NA	405.20	0	405.20
	7/30/2002	433.68					NA	29.16	NA	404.52	0	404.52
RB-45	11/11/1998	432.65	47.38	400.23	385.23	SP (30-45)	NA	30.02	NA	402.63	0	402.63
	3/22/2000	432.65					NA	32.83	NA	399.82	0	399.82
	5/15/2001	432.65					NA	31.00	NA	401.65	0	401.65
	5/29/2002	432.65					NA	28.74	NA	403.91	0	403.91
	6/26/2002	432.65					NA	27.94	NA	404.71	0	404.71
	7/30/2002	432.65					NA	28.78	NA	403.87	0	403.87
RB-46	11/11/1998	431.35	42.62	403.67	388.67	ML (25-26)	NA	29.66	NA	401.69	0	401.69
	3/22/2000	431.35				SP (26-40)	NA	33.72	NA	397.63	0	397.63
	5/15/2001	431.35					NA	30.12	NA	401.23	0	401.23
	5/29/2002	431.35					NM	NM	NA	NA	NA	NA
	6/26/2002	431.35					NA	27.75	NA	403.60	0	403.60
	7/30/2002	431.35					NA	29.15	NA	402.20	0	402.20
RB-47	11/11/1998	431.85	42.53	404.28	389.28	SM (25-29)	NA	30.17	NA	401.68	0	401.68
	3/22/2000	431.85				SP (29-44)	NA	34.49	NA	397.36	0	397.36
	5/15/2001	431.85					NA	30.89	NA	400.96	0	400.96
	5/29/2002	431.85					NM	NM	NA	NA	NA	NA
	6/26/2002	431.85					NA	28.45	NA	403.40	0	403.40
	7/30/2002	431.85					NA	29.95	NA	401.90	0	401.90
RB-48	11/11/1998	431.99	42.49	404.48	389.48	SM (25-29)	NA	31.00	NA	400.99	0	400.99
	3/22/2000	431.99				SP (29-33)	NM	NM	NA	NA	NA	NA
	5/15/2001	431.99				SM (33-38)	NM	NM	NA	NA	NA	NA
	5/29/2002	431.99				SP (38-40)	NM	NM	NA	NA	NA	NA
	6/26/2002	431.99					26.00	26.75	405.99	405.24	0.75	405.80
	7/30/2002	431.99					27.01	31.33	404.98	400.66	4.32	403.86
RB-49	11/11/1998	430.04	44.51	400.54	385.54	CH (27-42)	NA	2.73	NA	427.31	0	427.31
	3/22/2000	430.04					NM	NM	NA	NA	NA	NA
	5/15/2001	430.04					NA	4.64	NA	425.40	0	425.40
	5/29/2002	430.04					NM	NM	NA	NA	NA	NA
	6/26/2002	430.04					NA	3.21	NA	426.83	0	426.83
	7/30/2002	430.04					NA	4.78	NA	425.26	0	425.26

Table 4
Hartford Refinery Piezometers
The Premcor Refining Group, Inc.
Hartford, Illinois Refinery

WELL	DATE	(A) Casing Rim Elevation (feet)	Total Well Depth (TOC) (feet)	Top of Well Screen Elevation (ft)	Bottom of Well Screen Elevation (ft)	Screened Formation	(B) Depth to Hydrocarbon (feet)	(C) Depth to Water (feet)	(A)-(B) Hydrocarbon Surf. Elevation (feet)	(A)-(C) Water Surface Elevation (feet)	(C)-(B) Hydrocarbon Thickness (feet)	Piezometric Surface Elevation* (feet)
RB-38	11/11/1998	434.42					NA	34.12	NA	400.30	0	400.30
	3/22/2000	434.42					NA	36.77	NA	397.65	0	397.65
	5/15/2001	434.42					NA	35.02	NA	399.40	0	399.40
	5/29/2002	434.42					NA	33.05	NA	401.37	0	401.37
	6/26/2002	434.42					NA	32.10	NA	402.32	0	402.32
	7/30/2002	434.42					NA	32.97	NA	401.45	0	401.45
RB-39	11/11/1998	432.21	45.95	401.27	386.27	SM (28-32)	NA	27.44	NA	404.77	0	404.77
	3/22/2000	432.21				SP (32-38)	NA	32.21	NA	400.00	0	400.00
	5/15/2001	432.21				ML (38-40)	NA	27.52	NA	404.69	0	404.69
	5/29/2002	432.21				CH (40-42)	NA	19.38	NA	412.83	0	412.83
	6/26/2002	432.21					NA	21.55	NA	410.66	0	410.66
	7/30/2002	432.21					NA	26.71	NA	405.50	0	405.50
RB-40	11/11/1998	434.23	46.97	402.24	387.24	SP (29.5-44.5)	NA	33.82	NA	400.41	0	400.41
	3/22/2000	434.23					NA	35.98	NA	398.25	0	398.25
	5/15/2001	434.23					NA	34.85	NA	399.38	0	399.38
	5/29/2002	434.23					NA	33.01	NA	401.22	0	401.22
	6/26/2002	434.23					NA	31.88	NA	402.35	0	402.35
	7/30/2002	434.23					NA	32.31	NA	401.92	0	401.92
RB-41	11/11/1998	433.97	47.41	401.63	386.63	SP (30-45)	NA	33.72	NA	400.25	0	400.25
	3/22/2000	433.97					NA	35.44	NA	398.53	0	398.53
	5/15/2001	433.97					NA	34.82	NA	399.15	0	399.15
	5/29/2002	433.97					NA	32.94	NA	401.03	0	401.03
	6/26/2002	433.97					NA	31.78	NA	402.19	0	402.19
	7/30/2002	433.97					NA	32.00	NA	401.97	0	401.97
RB-42	11/11/1998	429.18	44.58	399.57	384.57	SP (27-42)	NA	28.46	NA	400.72	0	400.72
	3/22/2000	429.18					NA	29.81	NA	399.37	0	399.37
	5/15/2001	429.18					NA	29.66	NA	399.52	0	399.52
	5/29/2002	429.18					NA	27.32	NA	401.86	0	401.86
	6/26/2002	429.18					NA	26.41	NA	402.77	0	402.77
	7/30/2002	429.18					NA	26.58	NA	402.60	0	402.60
RB-43	11/11/1998	428.68	36.89	406.75	391.75	CL (20-32)	NA	25.07	NA	403.61	0	403.61
	3/22/2000	428.68				SM (32-35)	NA	26.72	NA	401.96	0	401.96
	5/15/2001	428.68					NA	26.72	NA	401.96	0	401.96
	5/29/2002	428.68					NA	23.91	NA	404.77	0	404.77
	6/26/2002	428.68					NA	23.24	NA	405.44	0	405.44
	7/30/2002	428.68					NA	23.43	NA	405.25	0	405.25

Table 4
Hartford Refinery Piezometers
The Premcor Refining Group, Inc.
Hartford, Illinois Refinery

WELL	DATE	(A) Casing Rim Elevation (feet)	Total Well Depth (TOC) (feet)	Top of Well Screen Elevation (ft)	Bottom of Well Screen Elevation (ft)	Screened Formation	(B) Depth to Hydrocarbon (feet)	(C) Depth to Water (feet)	(A)-(B) Hydrocarbon Surf. Elevation (feet)	(A)-(C) Water Surface Elevation (feet)	(C)-(B) Hydrocarbon Thickness (feet)	Piezometric Surface Elevation* (feet)
RB-26	11/11/1998	430.76					NA	28.82	NA	401.94	0	401.94
	3/22/2000	430.76					NA	NM	NA	NA	NA	NA
	5/15/2001	430.76					NA	29.78	NA	400.98	0	400.98
	5/29/2002	430.76					NA	26.40	NA	404.36	0	404.36
	6/26/2002	430.76					NA	25.74	NA	405.02	0	405.02
	7/30/2002	430.76					NA	28.21	NA	402.55	0	402.55
RB-29	11/11/1998	432.62					NM	NM	NA	NA	NA	NA
	3/22/2000	432.62					NA	15.65	NA	416.97	0	416.97
	5/16/2001	432.62					14.21	14.71	418.41	417.91	0.5	418.28
	5/29/2002	432.62					NA	NM	NA	NA	NA	NA
	6/26/2002	432.62					12.68	13.00	419.94	419.62	0.32	419.86
	7/30/2002	432.62					13.75	14.19	418.87	418.43	0.44	418.76
RB-30	11/11/1998	432.62					NA	NM	NA	NA	NA	NA
	3/22/2000	432.62					NA	34.81	NA	397.81	0	397.81
	5/16/2001	432.62					NA	32.47	NA	400.15	0	400.15
	5/29/2002	432.62					NA	NM	NA	NA	NA	NA
	6/26/2002	432.62					NA	29.64	NA	402.98	0	402.98
	7/30/2002	432.62					NA	30.77	NA	401.85	0	401.85
RB-35	11/11/1998	430.58					27.44	33.78	403.14	396.80	6.34	401.49
	3/22/2000	430.58					31.90	35.77	398.68	394.81	3.87	397.67
	5/16/2001	430.58					29.19	29.20	401.39	401.38	0.01	401.39
	5/29/2002	430.58					NA	NM	NA	NA	NA	NA
	6/26/2002	430.58					25.08	32.94	405.50	397.64	7.86	403.46
	7/30/2002	430.58					NA	NM	NA	NA	NA	NA
RB-36	11/11/1998	429.89	25	412.89	404.89	CL(15-19)	NM	NM	NA	NA	NA	NA
	3/22/2000	429.89				CH(19-25)	NA	25.20	NA	404.69	0	404.69
	5/15/2001	429.89					NA	23.12	NA	406.77	0	406.77
	5/29/2002	429.89					NA	20.22	NA	409.67	0	409.67
	6/26/2002	429.89					NA	20.03	NA	409.86	0	409.86
	7/30/2002	429.89					NA	20.58	NA	409.31	0	409.31
RB-37	11/11/1998	429.11	62	387.11	367.11	SW(42-54)	NM	NM	NA	NA	NA	NA
	3/22/2000	429.11				SP(54-62)	31.18	33.54	397.93	395.57	2.36	397.32
	5/15/2001	429.11					NA	30.67	NA	398.44	0	398.44
	5/29/2002	429.11					26.19	28.48	NA	400.63	2.29	402.32
	6/26/2002	429.11					25.80	28.23	NA	400.88	2.43	402.68
	7/30/2002	429.11					27.10	31.54	NA	397.57	4.44	400.86

Table 4
Hartford Refinery Piezometers
The Premcor Refining Group, Inc.
Hartford, Illinois Refinery

WELL	DATE	(A) Casing Rim Elevation (feet)	Total Well Depth (TOC) (feet)	Top of Well Screen Elevation (ft)	Bottom of Well Screen Elevation (ft)	Screened Formation	(B) Depth to Hydrocarbon (feet)	(C) Depth to Water (feet)	(A)-(B) Hydrocarbon Surf. Elevation (feet)	(A)-(C) Water Surface Elevation (feet)	(C)-(B) Hydrocarbon Thickness (feet)	Piezometric Surface Elevation* (feet)
RB-1	11/11/1998	430.95					NM	NM	NA	NA	NA	NA
	3/22/2000	430.95					NA	31.71	NA	399.24	0	399.24
	5/15/2001	430.95					NA	31.29	NA	399.66	0	399.66
	5/29/2002	430.95					NA	25.41	NA	405.54	0	405.54
	6/26/2002	430.95					NA	24.68	NA	406.27	0	406.27
	7/30/2002	430.95					NA	28.61	NA	402.34	0	402.34
RB-6	11/11/1998	434.15					32.38	34.34	401.77	399.81	1.96	401.26
	3/22/2000	434.15					36.45	38.15	397.7	396.00	1.7	397.26
	5/16/2001	434.15					NA	33.30	NA	400.85	0	400.85
RB-7												
RB-8	5/29/2002	434.16					21.15	28.35	413.01	405.81	7.2	411.14
RB-9	11/11/1998	434.75					30.41	34.40	404.34	400.35	3.99	403.30
	3/22/2000	434.75					35.43	37.45	399.32	397.30	2.02	398.79
	5/16/2001	434.75					32.92	34.14	401.83	400.61	1.22	401.51
	5/29/2002	434.75					NM	NM	NA	NA	NA	NA
	6/26/2002	434.75					NM	NM	NA	NA	NA	NA
	7/30/2002	434.75					NM	NM	NA	NA	NA	NA
RB-10	11/11/1998	430.76	47	413.76	383.76	SP(27-47)	30.12	30.35	400.64	400.41	0.23	400.58
	3/22/2000	430.76					32.20	37.85	398.56	392.91	5.65	397.09
	5/16/2001	430.76					29.29	35.18	401.47	395.58	5.89	399.94
	5/29/2002	430.76					28.35	29.00	402.41	401.76	0.65	402.24
	6/26/2002	430.76					25.10	37.45	405.66	393.31	12.35	402.45
	7/30/2002	430.76					27.33	37.33	403.43	393.43	10	400.83
RB-13	5/29/2002	432.18					NA	28.44	NA	403.74	0	403.74
	6/26/2002	432.18					NA	27.28	NA	404.90	0	404.90
	7/30/2002	432.18					NA	29.02	NA	403.16	0	403.16
RB-22	11/11/1998	431.74					NA	29.54	NA	402.20	0	402.20
	3/22/2000	431.74					NA	DRY	NA	NA	NA	NA
	5/16/2001	431.74					NM	NM	NA	NA	NA	NA
	5/29/2002	431.74					NM	NM	NA	NA	NA	NA
	6/26/2002	431.74					NA	27.93	NA	403.81	0	403.81
	7/30/2002	431.74					NA	27.93	NA	403.81	0	403.81
RB-25	11/11/1998	432.84					NA	27.34	NA	405.50	0	405.50
	3/22/2000	432.84					NA	30.92	NA	401.92	0	401.92
	5/16/2001	432.84					NM	NM	NA	NA	NA	NA
	5/29/2002	432.84					NA	26.04	NA	406.80	0	406.80
	6/26/2002	432.84					NA	26.69	NA	406.15	0	406.15
	7/30/2002	432.84					NA	29.92	NA	402.92	0	402.92

Clayton GROUP SERVICES

APPENDIX C

HARTFORD REFINERY PIEZOMETER DATA
BURNS & MCDONNELL
DECEMBER 2002

APPENDIX C

Table 2
March 22, 2000 Groundwater Sampling Analytical Results
The Premcor Refining Group, Inc.
Hartford, Illinois

Laboratory Analysis: Sample Date: Material Sampled: Sample ID	MTBE 3/13/2000 groundwater	MTBE 3/22/2000 groundwater	Units	Proposed IEPA Guideline
RB-38	6630*	6070*	µg/L	70
RB-47	136*	154*	µg/L	70
PW 2&7 (combined)	280*	NS	µg/L	70
PW-2	NS	300*	µg/L	70
PW-5	NS	98.1*	µg/L	70
PW-7	NS	195*	µg/L	70
RB-46	ND(2.0)	NS	µg/L	70
RB-45	ND(2.0)	NS	µg/L	70
RB-39	ND(2.0)	NS	µg/L	70
RB-44	ND(2.0)	NS	µg/L	70
RB-43	ND(2.0)	NS	µg/L	70
RB-42	ND(2.0)	NS	µg/L	70
RB-41	ND(2.0)	NS	µg/L	70
RB-40	ND(2.0)	NS	µg/L	70

µg/L - Micorgrams per Liter
NS = Not Sampled
PW = Production Well
ND(2.0) = Not detected (detection limit)
* - Detected above IEPA Guideline

APPENDIX E

MARCH 22, 2000 GROUNDWATER SAMPLING ANALYTICAL RESULTS TABLE FROM BURNS & MCDONNELL, DECEMBER 2002

APPENDIX E

Clayton
GROUP SERVICES

APPENDIX D

GROUNDWATER CONTOUR MAP
RUST ENVIRONMENT & INFRASTRUCTURE
JUNE 1995 - JUNE 1996

BURNS & MCDONNELL
NOVEMBER 1998 - JULY 2002

FREE PHASE HYDROCARBON CONTOUR MAP
BURNS & MCDONNELL
JULY 2002

APPENDIX D

APPENDIX D

In addition, Mr. Schobernd was instructed to remediate impacted soil within the excavation east of Route 3. In order to replace the 14 inch asphalt pipeline, soil was excavated at the intersection of Elm Avenue and Old St. Louis Road in Hartford. Now that the asphalt pipe is in place, minor contamination remains within the excavation. Mr. Schobernd stated that the contaminated areas within the excavation will be addressed.

The 14 inch asphalt pipeline is now in place. New piping has been installed from Old St. Louis Road in Hartford to the Clark River terminal. Hydrostatic pressure testing reportedly took place on December 1, 1994. Steam tracing lines were being installed during this visit.

TEP:jlr/0371E

cc: BOW - Collinsville
cc: OCS - Collinsville
cc: John Waligore - Legal Counsel

Source: IEPA B

M E M O R A N D U M

Copy to: BOW - FOS/RU
DLC - Julia Gentil

DATE: December 5, 1994

TO: OCS/ERU File

FROM: Tom Powell - Collinsville OCS

SUBJECT: Madison County - Hartford/[redacted]
IEMA 940515/942432

On December 1, 1994, a site visit was conducted at the request of facility personnel. During the visit, I was accompanied by Massood Modarres and Dean Johnson of Clark. The site visit was conducted to point out the remediation efforts that have recently taken place. The following is a brief description of the sites that were observed.

1) Old NPDES effluent pipe - This subsurface pipeline, constructed of cast concrete, 24 inches in diameter was utilized as Clark's effluent to the Mississippi River, until the asphalt spill (IEMA 940515) occurred on March 11, 1994. Since that time, a temporary pipe has been utilized. On or about November 1, 1994, Clark had a contractor - Rust Co., a division of Waste Management - steam and pressure wash this old effluent pipe. As of the site visit of 12/01/94, several sections of this pipe have been replaced with 24 inch diameter clay tile. Clark wishes to resume using this 24 inch pipe to discharge their effluent to the river. Mr. Modarres was told that before the effluent pipe could be reused, approval should be requested of the Bureau of Water Pollution. Mr. Modarres understood, and stated that Clark's WWTP operator would be in contact for guidance.

2) The Northeast lagoon, once an active wastewater settling basin, was observed. This lagoon was slightly impacted during the March 11, 1994 asphalt spill. The impact to the lagoon occurred at the southwest corner where an unknown amount of asphalt seeped into the lagoon. Upon subsequent inspections of the lagoon, thick oily, tar-like residue has been observed upon the northern banks. It was also observed that stratified bottom sediment within the lagoon, exhibit an oily, sludge-like characteristic. This oily layer appears to be a result of years of use as a settling lagoon. Clark has conducted remediation to the banks of this lagoon by excavating visible oily soil. This excavation has reportedly taken place on two occasions.

3) The Route 3 spill site (IEMA 942432) where sheet piling was accidentally driven through a 10" product line was observed. Bob Schobernd, a contract employee overseeing the asphalt line replacement, was interviewed. Mr. Schobernd was told that there exists areas in need of soil remediation. Specifically, two areas, west of the river levee, where subsurface pipe casing sleeves are exposed, are in need of cleanup. These areas are where oil or oily residue leaked from the pipe sleeves to the environment. (The sleeves are used beneath roadways to protect the pipelines.) It was recommended that Clark obtain post cleanup samples when excavation in this area is complete.

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)K 724 PAGE 67

M. B. CORLEW & ASSOCIATES, INC.
ENGINEERS & SURVEYORS
EDWARDSVILLE , ILLINOIS
PHONE 618-656-0470
TIE IN MONITORING WELLS

CA 628E

DATE : 4/11/94

NOT PLANT COORDINATES

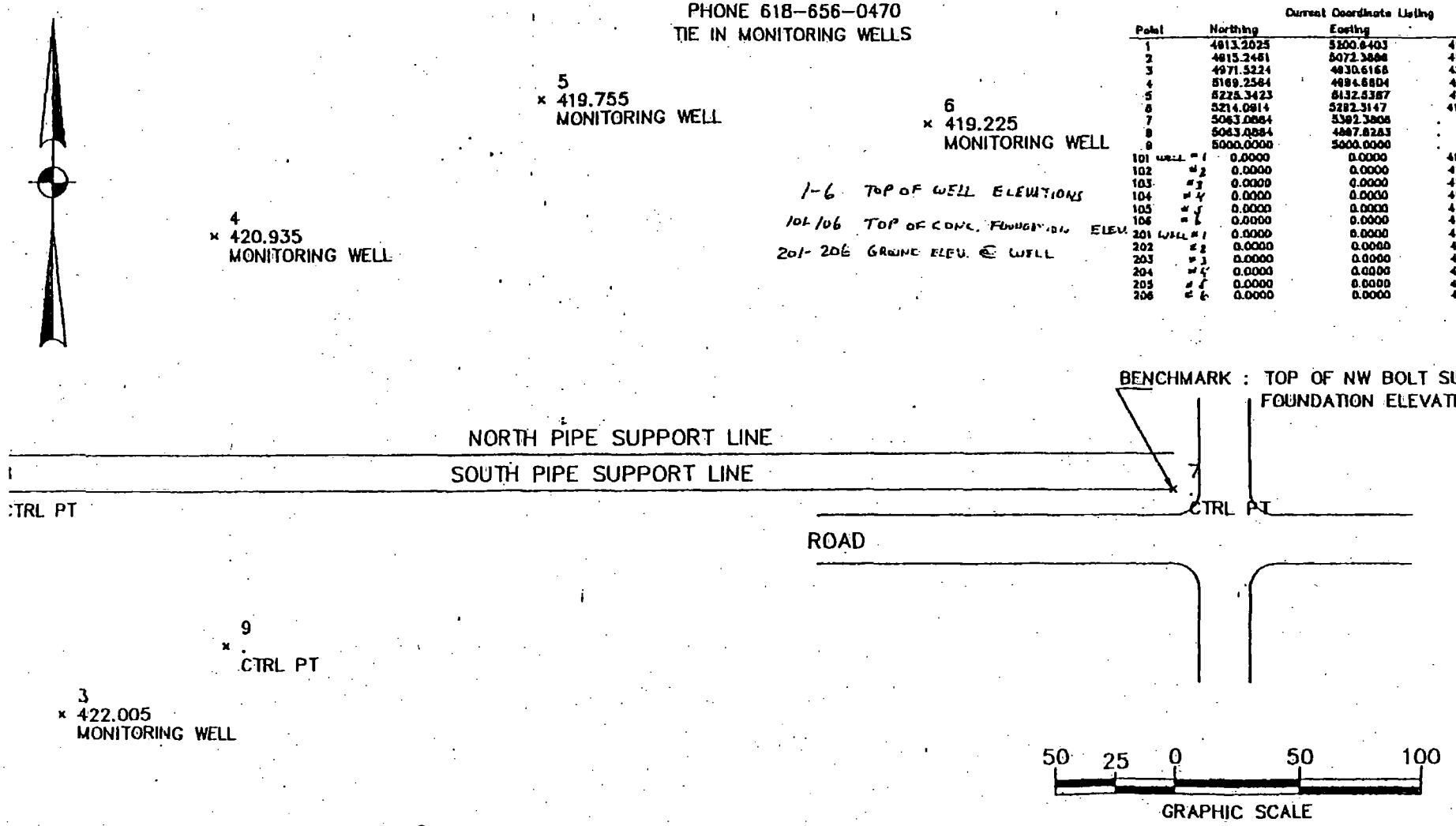
Current Coordinate Listing

Point	Northing	Easting	Elevation	Description
1	4813.2025	5200.6403	419.710	MONITORING
2	4815.2461	5072.3886	419.865	MONITORING
3	4971.5224	4830.6168	422.005	MONITORING
4	5169.2564	4984.6804	420.935	MONITORING
5	5225.3423	5132.5387	419.755	MONITORING
6	5214.0814	5282.3147	419.225	MONITORING
7	5063.0884	5302.3806	.	C
8	5063.0884	4867.8283	.	C
9	5000.0000	5000.0000	.	C
101 WELL # 1	0.0000	0.0000	418.725	TOP OF
102 # 2	0.0000	0.0000	417.105	TOP OF
103 # 3	0.0000	0.0000	418.105	TOP OF
104 # 4	0.0000	0.0000	418.335	TOP OF
105 # 5	0.0000	0.0000	417.865	TOP OF
106 # 6	0.0000	0.0000	417.118	TOP OF
201 WELL # 1	0.0000	0.0000	418.185	GROUND
202 # 2	0.0000	0.0000	416.815	GROUND
203 # 3	0.0000	0.0000	417.655	GROUND
204 # 4	0.0000	0.0000	417.815	GROUND
205 # 5	0.0000	0.0000	417.455	GROUND
206 # 6	0.0000	0.0000	418.635	GROUND

1-6 TOP OF WELL ELEVATIONS

101/106 TOP OF CONC. FOUNDATION ELEV.

201-206 GROUND ELEV. @ WELL



MAY-12-1994 09:12 CORLEW & ASSOC FAX 618-656-0922 P.2/2

Burns & McDonnell

Client: CLARK

Page 1 Of 2

Project No.: 94-106-4 Date: 4/5/94 Made By: [illegible]

Checked By: _____

080692 Form GCO-28

Preliminary: X Final: ___

SUMMARY OF DITCH SAMPLES - COLLECTED 4/1/94

COMPOUND	Units	LUST OBJECTIVE	DS-1B	DS-1N	DS-2B	DS-2S	DS-3B	DS-3N	DS-4B	DS-4S	DS-5B	DS-5N
BTEX												
Benzene	µg/Kg	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	µg/Kg	NA	ND	↓	ND	↓	↓	↓	ND	↓	3.1	↓
Ethylbenzene	µg/Kg	NA	ND	↓	ND	↓	↓	↓	ND	↓	ND	↓
Xylenes (Total)	µg/Kg	NA	4.2	↓	2.5	↓	↓	↓	4.7	↓	12.3	↓
Total BTEX	µg/Kg	11,705	4.2	↓	2.5	↓	↓	↓	4.7	↓	15.4	↓
Non-Carcinogenic PNAs												
Naphthalene	mg/Kg	0.025	ND	ND	ND	0.02	0.01	ND	0.02	ND	0.03	ND
Acenaphthene	mg/Kg	8.4	↓	↓	↓	ND	ND	0.02	ND	↓	ND	ND
Anthracene	mg/Kg	42.0	↓	↓	↓	ND	ND	ND	↓	↓	ND	ND
Fluoranthene	mg/Kg	5.6	↓	↓	↓	0.02	ND	ND	↓	↓	0.57	ND
Fluorene	mg/Kg	5.6	↓	↓	↓	ND	ND	ND	↓	↓	0.04	ND
Pyrene	mg/Kg	4.2	↓	↓	↓	ND	0.01	ND	↓	↓	1.3	ND
Others (Total)	mg/Kg	4.2	↓	↓	↓	0.01	0.02	ND	↓	↓	0.08	ND
Carcinogenic PNAs												
Benzo(a)anthracene	mg/Kg	0.0087	ND	ND	ND	ND	ND	ND	ND	ND	0.88	ND
Benzo(a) pyrene	mg/Kg	0.015	↓	↓	↓	0.01	ND	ND	↓	0.34	ND	0.01
Benzo(b) fluoranthene	mg/Kg	0.012	↓	↓	↓	ND	ND	ND	↓	ND	ND	ND
Benzo(k)fluoranthene	mg/Kg	0.011	↓	↓	↓	0.02	ND	ND	↓	ND	ND	~~ND~~ 0.04
Chrysene	mg/Kg	0.1	↓	↓	↓	0.02	0.03	ND	↓	ND	0.79	0.07
Dibenzo(a,h)anthracene	mg/Kg	0.02	↓	↓	↓	ND	ND	0.01	↓	0.30	0.54	ND
Indeno(1,2,3-cd) pyrene	mg/Kg	0.029	↓	↓	↓	ND	ND	ND	↓	ND	ND	ND

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Project No. 94-106-4 Date 4/5/94 Made By Slattery

Checked By

080692 Form GCO-28

Preliminary X Final

DS-6B	DS-6S	DS-7B	DS-7W	DS-8B	DS-8E	DS-9B	DS-9W	DS-10B	DS-10E	DS-11B	DS-11W	DS-12B	DS-12E	DS-13B
ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	325
ND	ND	↓	↓	ND	↓	↓	↓	↓	↓	↓	↓	4.0	↓	199.1
ND	ND	↓	↓	ND	↓	↓	↓	↓	↓	↓	↓	ND	↓	66.1
4.6	2.0	↓	↓	3.3	2.4	3.8	↓	↓	↓	3.4	↓	11.7	↓	374.4
4.6	2.0	↓	↓	3.3	2.4	3.8	↓	↓	↓	3.4	↓	15.7	↓	679.6
ND	ND	0.02	ND	ND	ND	0.02	ND	ND	0.01	0.02	ND	ND	ND	0.06
↓	↓	0.06	↓	↓	ND	0.08	↓	↓	ND	0.02	↓	↓	↓	ND
↓	↓	ND	↓	↓	0.04	ND	↓	↓	ND	0.01	↓	↓	↓	ND
0.06	↓	↓	↓	0.19	ND	0.02	↓	↓	0.02	0.06	0.02	0.04	0.01	0.40
0.05	↓	↓	↓	0.08	0.04	ND	↓	↓	ND	ND	ND	ND	ND	0.08
ND	↓	↓	↓	ND	ND	ND	↓	↓	↓	0.02	ND	0.50	↓	ND
0.02	0.03	↓	↓	0.08	0.05	0.01	0.01	0.01	↓	0.03	0.02	ND	↓	0.13
ND	ND	ND	ND	ND	4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND
↓	0.05	↓	↓	↓	ND	↓	↓	↓	↓	0.08	↓	↓	↓	ND
↓	ND	↓	↓	↓	ND	↓	↓	↓	↓	ND	↓	↓	↓	0.81
↓	↓	↓	↓	↓	ND	↓	↓	↓	↓	ND	↓	↓	↓	ND
↓	↓	↓	↓	↓	0.43	↓	0.02	↓	↓	0.21	↓	↓	0.03	1.8
↓	↓	↓	↓	↓	ND	↓	ND	↓	↓	ND	↓	↓	ND	ND
↓	↓	↓	↓	↓	ND	↓	ND	↓	↓	ND	↓	↓	ND	ND

Burns & McDonnell

Client CLARK

Page 1 Of 1

Project No. 94-106-4 Date 4/5/94 Made By [illegible]

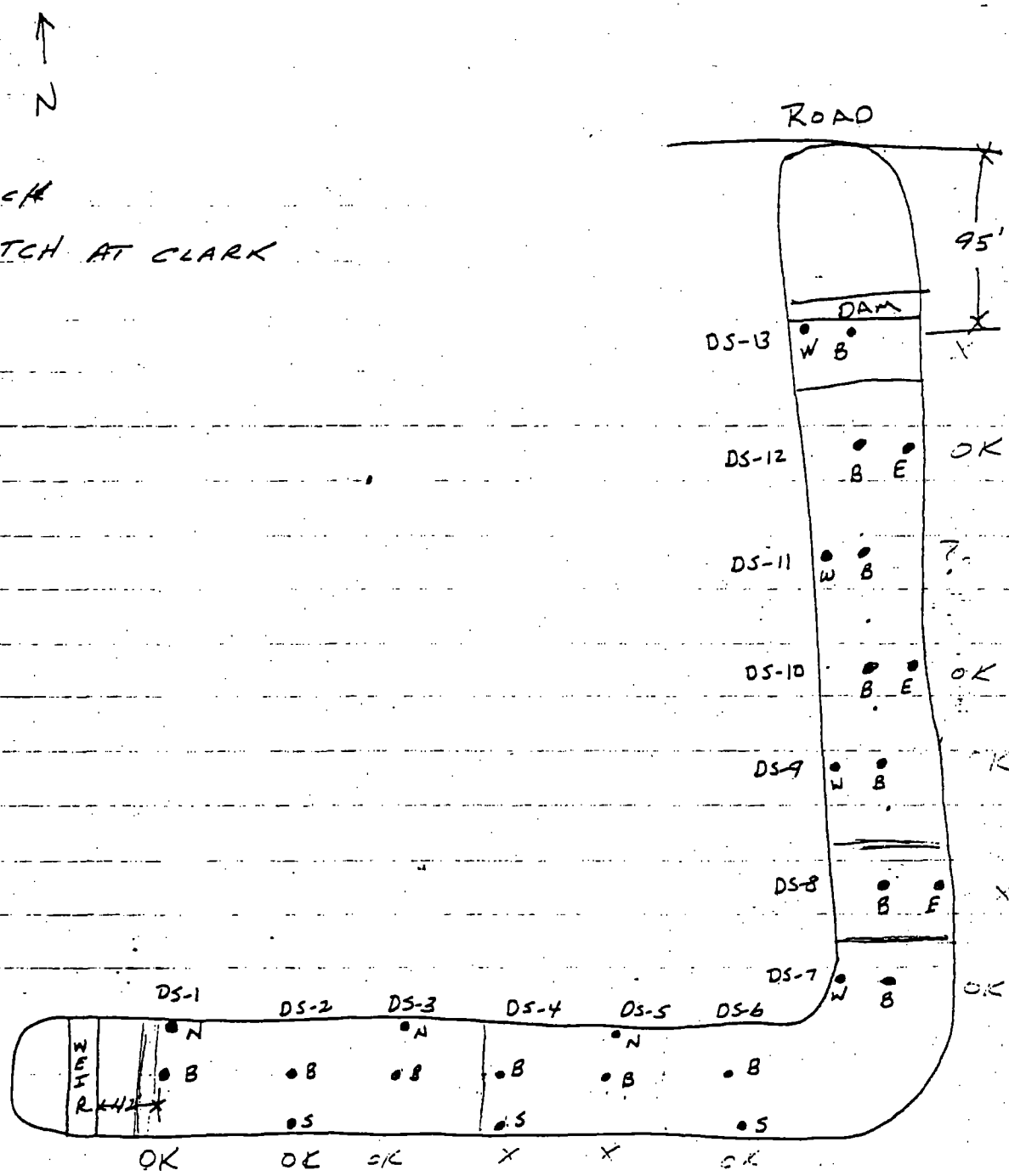
Checked By

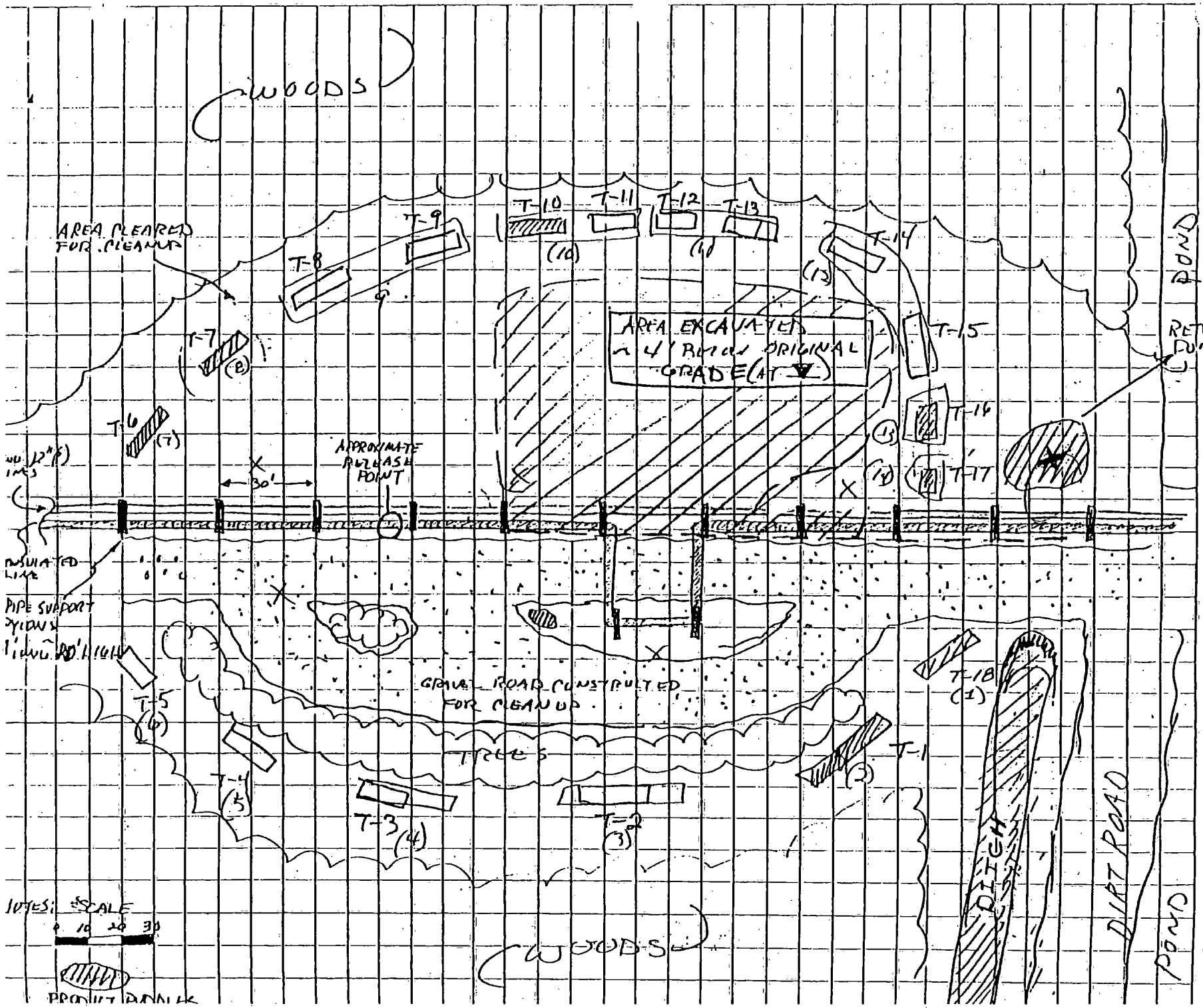
080692 Form CCO-28

Preliminary X Final

FIELD SKETCH

DITCH AT CLARK





Burns & McDonnell

692 Form CCO-29

Client CLARK REFINERY

Project No. _____ Date 3/16/94

Page _____ Of _____

Made By GLENN SCHERER

Checked By _____

Preliminary _____ Final _____

SITE MAP OF SPILL SITE

LC CKW
18-799-8204
799-8160

Burns & McDonnell

080692 Form GCO-29

Client CLARK REFINERY

Page 1 Of 2

Project No.

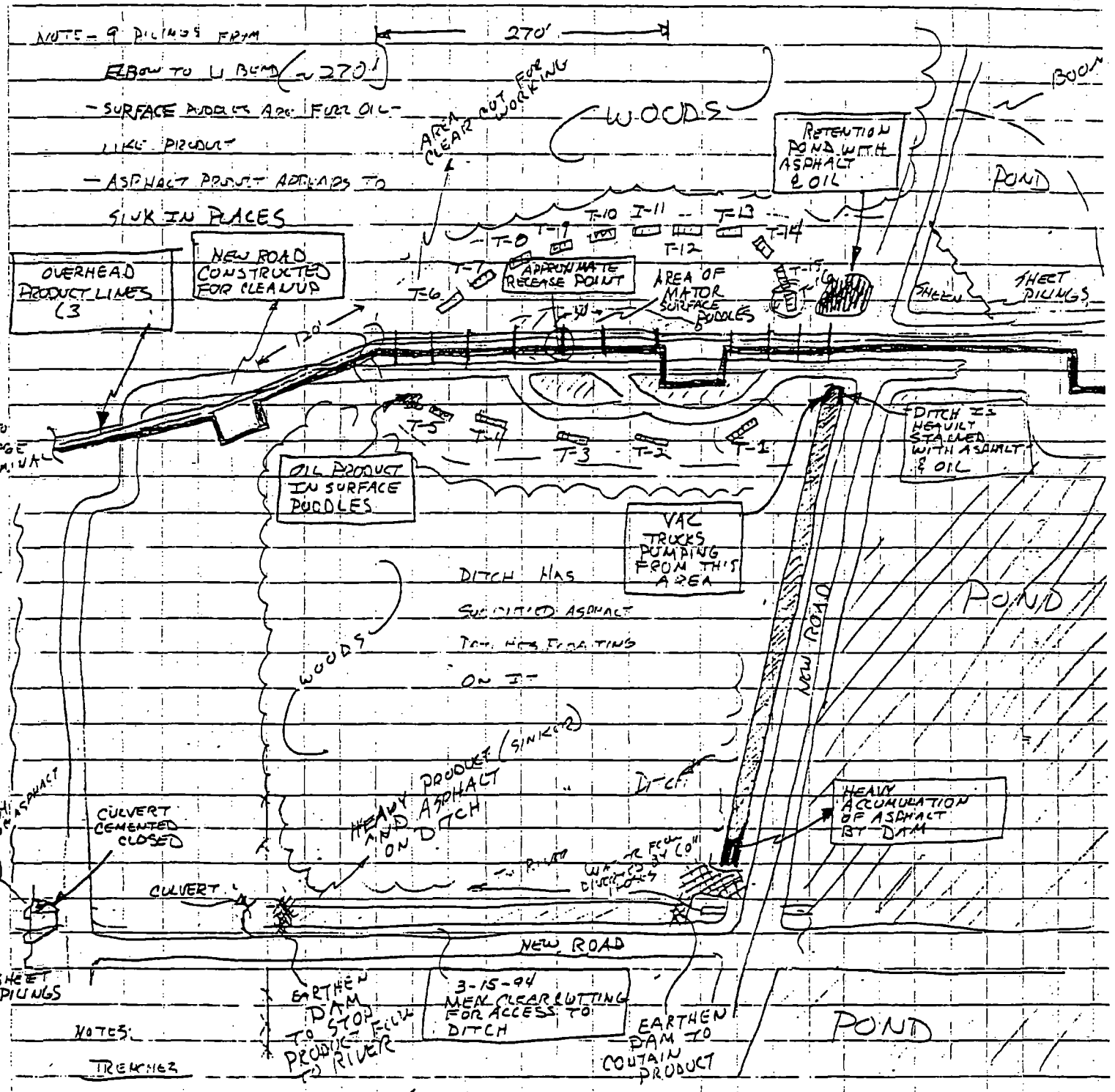
Date 3-15-94

Made By GLENN SCHER

SITE MAP

Checked By

Preliminary Final



NOTES:

TRENCHES

T-1 - PRODUCT DARK FUEL OIL (VISUAL)
SMELLS LIKE FUEL OIL (BLACK)

T-2 - SLIGHT SHEEN

T-3 - NO SHEEN; NO PRODUCT

T-4 - NO SHEEN; NO PRODUCT

T-5 NO SHEEN; NO PRODUCT

T-6 - HAS PRODUCT SEEPING IN AT ~3.5' bgs

T-7 - PRODUCT RUNNING IN FROM HERE (CONDUIT FLOW)

T-8 - NO PRODUCT; SHEEN IN PLACES

T-9 - NO PRODUCT; HEAVIER SHEEN

T-10 - JUST DUG AT 3.40 ft - HEAVY SHEEN ON WATER SO FAR

T-11 - SHEEN

Source: IEPA ERW

940515

Rupture of the 14" Black Oil River Line
March 11, 1994

During the day of March 11, 1994, the 14" Black Oil line from the refinery to the river developed a sever break in the line. The exact time of the break is not known. The estimated volume of asphalt spilled was calculated to be 4,000 to 4,500 barrels. We were able to recover only 1800 barrels of product for recycling through the refinery. The initial response consisted of stopping the flow of material to the river, damming the North-South ditch at the south end and the East-West ditch at both ends. Boom was deployed on the river even though we did not believe that material had reached the river. Water and asphalt was removed from the two sections of ditch. Total volume removed was 17, 345 barrels. The asphalt and dirt mixture was tested and determined to be non hazardous. We were able to dispose of this material at the Laidlaw landfill located in Roxana, Illinois. Total volume disposed of was 16,752 cubic yards. Clark installed six four inch monitoring wells around the area of the spill. We also installed two large sumps in the area to help insure that any remaining contamination would be collected in the sumped area.

We cleaned 1500 linear feet of river bank and 2400 square feet of river bottom. Boom was placed in the river to help contain the material which may have gotten into the river during this incident. This boom then allowed us to place oil sorbing boom inside it to "capture" the oil floating to the surface.

The North pond area was cleaned and sorbent boom was spread across the length of the pond. Throughout the summer, additional boom was placed in the pond, and additional material was removed from the banks of this impoundment. These impoundments were used by "old" Clark and APEX. They have not been used by the current Clark group. The material on the bottom of the impoundments has been there since before we took over.

Total cost of the cleanup and remediation is $2,850,000. The replacement of the river line will cost us an additional $2,600,000 dollars and this will be completed by the middle of December.

Clark will continue to monitor the sumps and the six monitoring wells on a quarterly basis.

off the Black Oil river line, alerted their internal hazardous materials (hazmat) team, and notified the Illinois Environmental Protection Agency (IEPA) emergency response unit. Mr. Tom Powell from the IEPA arrived on the Site at approximately 6:00 p.m. on March 11, 1994. A remediation contractor, Barton Contracting, Inc., was also notified to assist with product recovery. The released product was a combination of asphalt, light cycle oil (No. 6 fuel oil), and a slurry (similar to No. 6 oil, used as fuel in the crude unit of the refinery).

A detailed description of the remediation actions taken by Clark is contained in the Burns & McDonnell Waste Consultants, Inc. (BMWCI) report SITE ASSESSMENT OF BLACK OIL RIVER LINE RELEASE AREA FOR CLARK REFINING AND MARKETING, INC. Dated December 1994.

2.4 SPILL #940851 - ASPHALT SPILL NORTHWEST OF BIO UNIT

2.4.1 Incident Summary

On April 19, 1994, Clark had a release of approximately 25 barrels of Asphalt due to leaking gasket on the 14" Black Oil River Line in the northwest corner of their Bio Unit. The released product was contained in a ditch along railroad tracks and between the Clark Refinery and Shell Oil property. Figure 1 of this section shows the approximate location of the release. Clark personnel immediately notified the proper agencies, and contacted the railroad to reduce locomotive speeds in the area of the spill.

2.4.1 Remediation Effort

Clark personnel utilized vacuum trucks to recover approximately 20 barrels of liquid which was transported back to the Hartford refinery to be reprocessed. The visually affected area was then excavated to a depth of 1 foot and placed in roll-off containers. Approximately 60 cubic yards of soil was transported to Laidlaw Landfill, in Roxana, Illinois for disposal (copies of manifests area attached Appendix A). One composite soil sample was collected prior to backfilling by Clark personnel from the locations indicated in Figure 2 of this section. A summary of laboratory analysis is presented in Table 1 of this section. The IEPA representative also collected a soil sample from the excavation. The area was backfilled with soil and rock. Due to the quantity

2.0 SUMMARY OF SPILLS

2.1 SPILL #913533 - ASPHALT RELEASE

2.1.1 Incident Summary

On December 6, 1991, Clark had a release of approximately 30 gallons of asphalt from an underground pipeline. The spill occurred along the pipeline on the east side of Illinois Route 3 in Hartford, Illinois. External corrosion of the pipeline resulted in this release. Clark personnel recovered the lost product and removed the visually affected soil. Due to the small quantity of the spill, additional soil or groundwater remediation or sampling was not conducted. At the time of this report, soil disposal certification was not available.

To prevent future releases from this pipeline, Clark excavated and replaced approximately 400 feet of piping up to the Route 3 crossing. Inspection by Clark of the pipeline east of this area indicated the piping was in good condition with no corrosion.

2.2 SPILL #931160 - SULFURIC ACID

2.2.1 Incident Summary

On May 6, 1993, Clark had a release of approximately 2000 gallons of Sulfuric Acid from an above ground storage tank south of the #5 cooling tower at the Hartford refinery. Clark personnel neutralized the acid with approximately 900 pounds of soda ash. The soda ash and affected soil was then removed and disposed of at an off site landfill facility. At the time of this report, soil disposal certification was not available.

2.3 SPILL #940515 - BLACK OIL RIVER LINE

2.3.1 Incident Summary

On March 10, 1994, Clark had a release from the Black Oil river line approximately 600 feet east of their Mississippi River barge terminal (Site). The Site is located west of Hartford, Illinois, between the Hartford levee and the Mississippi River, and north of Hawthorne Avenue. Approximately 4071 barrels of product were released from the pipeline. Clark immediately blocked

- at the river, we had approximately 1,500' of heavy boom in place
- inside the exterior boom, we had 7 layers of absorbent boom, maintained by Barton laborers on a daily basis for about 3 months
- contaminated booms were disposed of by Laidlaw
- effluent culvert was concreted originally to prevent further contamination; presently steamcleaned
- soil has been removed from the bank area around the north pond; total amount of soil removal is estimated at 285 yards
- track hoe was used to clean up the contaminated area of the river bottom; cleaned 2400 ft^2 of river bottom
- approximately 1,500' of river bank was cleaned
- ponds were sampled during the flood for oil and grease
- monitoring wells have been sampled April and October of 1994
- we constructed a sump area on the south side of the spill to draw contamination, if present, back towards the middle, with 2 sumps interconnected
- north-south ditch has been completely back-filled with dirt
- the south and middle pond contamination was minimal
- used absorbent booms for the north pond only; booms were maintained daily
- a diver was hired to investigate river and north pond; the report of his investigation is available through BCI
- all soil was replaced with clean soil from Vera Barton Construction
- We ultrasonically tested the entire 14" river line at 10" intervals. Based on the thickness of the ultrasonic probe at 0.07 square inches, 77 square inches of line was measured for thickness; out of a possible 950,000 square inches of line or approximately .008% of the line
- initially, we replaced 60' of the 14" river line
- presently (11/94), we are in the process of replacing 2,100' of 14" line
- during loading prior to complete line replacement, area was illuminated and checked on an hourly basis when line was in service

940851 Asphalt spill from 14" black oil river line - northwest corner of the Bio 4/19/94

- volume estimated to be 25 barrels
- removed 4 roll-offs of contaminated soil using Clark backhoe and Clark laborers
- notified the railroad and had them reduce speed while work was being done in this area
- contaminated material was taken to Laidlaw
- some of the liquid was removed by vacuum truck; volume was approximately 20 barrels
- area of contamination was 6' x 100'; contained in a ditch
- dug about 1.5' deep; were concerned about the integrity of the railroad bed
- IEPA was present; pictures were taken
- no Bio bug application occurred
- fresh dirt and rocks were placed in area to replace removed contaminated soil
- sample of soil was taken by IEPA

941526 Overfill of tank 10-5 mixture of naphtha and toluene 7/9/94

- we used Clark vacuum trucks
- flooded area with 2' of water from the fire pond; water was vacuumed and taken to WWTP for treatment; Bio bugs were applied
- total recovery was 990 barrels
- spill reported to EPA
- 310 barrels of product
- no sampling has been done as of 11/20/94
- Bio bugs will be applied during the year

INDEX

940515	3/11/94	Rupture of the 14" black oil river line
940851	4/19/94	asphalt spill from 14" black oil river line - NW corner of the Bio
941526	7/9/94	overfill of tank 10-5 mixture of naphtha and toluene
941701	7/2/94	Fuel oil at the river
941772	8/9/94	gasket mixer rupture tank 35-2
941873	8/15/94	crude oil leak from Shell transfer line; NE corner 200-1 tank yard
941913	8/23/94	gas oil south property - 6" pumpout
942188	9/25/94	major rupture of the 10"
942288	10/10/94	gasoline leak in the 124 suction line located at NW corner 200-1 tank yard near the crude booster pump
942432	10/28/94	#2 fuel; piling driven through line at Rt 3

DETAILS

940515 Rupture of the 14" Black Oil River Line 3/11/94

- We estimated that we lost 4,000-4,500 barrels
- Volume of liquid recovery was estimated at 1800 barrels. (all asphalt)
- Equipment used:
- Suck trucks provided by:
- Triad
- Odesco
- Rust
- EnCLEAN
- One Cat front-end loader was used.
- 18 dump trucks x 22 yd = 396 yd^3
- 4 tandems x 17 = 68 yd^3
- 2 frac tanks provided by Fishburn.
- Liquid recovery consisted of asphalt and water.
- The water was taken to the Bio treatment plant at the Hartford Refinery. Volume of this water/oil was 17,345 barrels
- Hydrocarbon recovered was taken to a frac tank. This consisted of water and asphalt.
- After the flood, pumps were used to pump river water to back to the river. Size/type of pump:_____
- For the soil removal: BCI Construction was employed. At the peak of cleanup, 3 track hoes were in service.
- man-power:
  almost every track hoe had a swamper
  all of the trucks were lined with plastic
  2 stations set up for lining of the trucks with plastic
  initially, 24 hours a day were worked (for about 2 weeks); followed by 5:00AM to 8:00PM work hours
- all material was taken to Laidlaw; approximate total load was 16,752 yd^3
- a brush-clearing company was present
- removed approximately 400-foot diameter of woods
- also removed all brush and woods along the ditch areas in all directions away from spill
- total area remediated was 400 feet in diameter at a depth of 4' to 18'
- constructed 4 access roads to the area to facilitate cleanup
- *Burns & McDonnell was brought in as remediation consultants*
- Burns &McDonnell, along with TekLab, conducted our sampling grid based on IEPA's sampling grid
- Layne Western constructed 6 4" monitoring wells. These wells are 20' deep
- IEPA visited the site on a regular basis

Clayton
GROUP SERVICES

APPENDIX J-1

MAJOR DOCUMENTATION RELATED TO INCIDENT NO. 940515

Clayton
GROUP SERVICES

APPENDIX J

DOCUMENTS RELATED TO THE RIVER DOCK AREA

APPENDIX J

DOCUMENTS RELATED TO THE RIVER DOCK AREA

APPENDIX J

2002

TTU2002.xls

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
TOTAL DAYS PER MONTH	31	28	31	30	31	30
TOTAL HOURS PER MONTH	744	672	744	720	744	720
ACTUAL HOURS PER MONTH	560	660	744	720	744	716
% OPERATION FOR MONTH	75.27%	98.21%	100.00%	100.00%	100.00%	99.44%
% OPERATION FOR YEAR	75.27%	86.16%	90.93%	93.19%	94.59%	95.40%
TTU GALLONS REMOVED	7,363	2,249	26,762	3,064	394	206
WELL RECOVERY GALLONS	77	0	204	0	612	476

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
TOTAL DAYS PER MONTH	31	31	30	31	30	31
TOTAL HOURS PER MONTH	744	744	720	744	720	744
ACTUAL HOURS PER MONTH	744	720	720			
% OPERATION FOR MONTH	100.00%	96.77%	100.00%	0.00%	0.00%	0.00%
% OPERATION FOR YEAR	96.07%	96.16%	96.58%	86.73%	78.94%	72.24%
TTU GALLONS REMOVED	142	1,505	1,153			
WELL RECOVERY GALLONS	424	221	72			

2001

TTU2001.XLS

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
TOTAL DAYS PER MONTH	31	28	31	30	31	30
TOTAL HOURS PER MONTH	744	672	744	720	744	720
ACTUAL HOURS PER MONTH	588	640	636	702	700	537
% OPERATION FOR MONTH	79.03%	95.24%	85.48%	97.50%	94.09%	74.58%
% OPERATION FOR YEAR	79.03%	86.72%	86.30%	89.10%	90.12%	87.55%
TTU GALLONS REMOVED	13,656	18,345	9,667	3,653	329	0
WELL RECOVERY GALLONS	635	359	215	245	468	144

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
TOTAL DAYS PER MONTH	31	31	30	31	30	31
TOTAL HOURS PER MONTH	744	744	720	744	720	744
ACTUAL HOURS PER MONTH	744	740	715	720	685	440
% OPERATION FOR MONTH	100.00%	99.46%	99.31%	96.77%	95.14%	59.14%
% OPERATION FOR YEAR	89.37%	90.66%	91.61%	92.13%	92.40%	81.76%
TTU GALLONS REMOVED	13,903	1,650	4,699	4,833	0	2,380
WELL RECOVERY GALLONS	144	72	576	720	936	792

2000

TTU2000.XLS

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
TOTAL DAYS PER MONTH	31	29	31	30	31	30
TOTAL HOURS PER MONTH	744	696	744	720	744	720
ACTUAL HOURS PER MONTH	744	696	730	651	585	608
% OPERATION FOR MONTH	100.00%	100.00%	98.12%	90.42%	78.63%	84.44%
% OPERATION FOR YEAR	100.00%	100.00%	99.36%	97.14%	93.37%	91.90%
TTU GALLONS REMOVED	8,866	13,335	7,494	7,966	9,918	6,272
WELL RECOVERY GALLONS	0	105	206	0	762	130

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
TOTAL DAYS PER MONTH	31	31	30	31	30	31
TOTAL HOURS PER MONTH	744	744	720	744	720	744
ACTUAL HOURS PER MONTH	700	743	720	736	720	682.5
% OPERATION FOR MONTH	94.09%	99.87%	100.00%	98.92%	100.00%	91.73%
% OPERATION FOR YEAR	92.21%	93.19%	93.93%	94.44%	94.94%	86.47%
TTU GALLONS REMOVED	5,036	5,651	3,571	7,261	9,143	9,057
WELL RECOVERY GALLONS	0	0	0	0	0	0

HAUGTTU6.XLS 1999

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
TOTAL DAYS PER MONTH	31	28	31	30	31	30
TOTAL HOURS PER MONTH	744	672	744	720	744	720
ACTUAL HOURS PER MONTH	620	672	743	700	729	714
% OPERATION FOR MONTH	83.33%	100.00%	99.87%	97.22%	97.98%	99.16%
% OPERATION FOR YEAR	83.33%	91.24%	94.21%	95.62%	96.11%	96.62%
TTU GALLONS REMOVED	5,974	2,873	668	765	7,132	1,320
WELL RECOVERY GALLONS	219	574	578	844	591	577

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
TOTAL DAYS PER MONTH	31	31	30	31	30	31
TOTAL HOURS PER MONTH	744	744	720	744	720	744
						8740
ACTUAL HOURS PER MONTH	736	712	702	744	720	744
						8544
% OPERATION FOR MONTH	98.92%	95.69%	97.50%	100.00%	100.00%	100.00%
% OPERATION FOR YEAR	97.11%	96.93%	96.99%	96.92%	97.54%	97.76%
TTU GALLONS REMOVED	1,012	3,956	2,665	6,329	8,468	9,890
WELL RECOVERY GALLONS	572	542	150	236	10	31

1918

HAUGTTU6.XLS

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
TOTAL DAYS PER MONTH	31	28	31	30	31	30
TOTAL HOURS PER MONTH	744	672	744	720	744	720
ACTUAL HOURS PER MONTH	620	672	743	700	729	714
% OPERATION FOR MONTH	83.33%	100.00%	99.87%	97.22%	97.98%	99.16%
% OPERATION FOR YEAR	83.33%	91.24%	94.21%	95.62%	96.11%	96.62%
TTU GALLONS REMOVED	5,974	2,873	668	765	7,132	1,320
WELL RECOVERY GALLONS	219	574	578	844	591	577

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
TOTAL DAYS PER MONTH	31	31	30	31	30	31
TOTAL HOURS PER MONTH	744	744	720	744	720	744
						8740
ACTUAL HOURS PER MONTH	736	712	702	744	720	744
						8544
% OPERATION FOR MONTH	98.92%	95.69%	97.50%	100.00%	100.00%	100.00%
% OPERATION FOR YEAR	97.11%	96.93%	96.99%	96.92%	97.54%	97.76%
TTU GALLONS REMOVED	1,012	3,956	2,665	6,329	8,468	9,890
WELL RECOVERY GALLONS	572	542	150	236	10	31

1997

HAUGTTU4.XLS

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
TOTAL DAYS PER MONTH	31	28	31	30	31	30
TOTAL HOURS PER MONTH	744	672	744	720	744	720
ACTUAL HOURS PER MONTH	744	672	741	632	743	708.5
% OPERATION FOR MONTH	100.00%	100.00%	99.60%	87.80%	99.86%	98.40%
% OPERATION FOR YEAR	100.00%	100.00%	99.86%	96.84%	97.46%	97.61%
TTU GALLONS REMOVED	8,609	8,793	7,342	5,075	4,795	1,314
WELL RECOVERY GALLONS	1,492	1,422	1,138	1,049	1159	462

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
TOTAL DAYS PER MONTH	31	31	30	31	30	31
TOTAL HOURS PER MONTH	744	744	720	744	720	744
						8760
ACTUAL HOURS PER MONTH	744	743	720	744	718	671
						8580.5
% OPERATION FOR MONTH	100.00%	99.86%	100.00%	100.00%	99.70%	90.18%
% OPERATION FOR YEAR	97.96%	98.20%	98.40%	98.56%	98.67%	97.95%
TTU GALLONS REMOVED	2,022	3,882	8,651	5,787	573	2,249
WELL RECOVERY GALLONS	1,318	2,197	703	413	461	630

1996

HAUGTTU3.XLS

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
TOTAL DAYS PER MONTH	31	28	31	30	31	30
TOTAL HOURS PER MONTH	744	672	744	720	744	720
ACTUAL HOURS PER MONTH	726	672	724	716	741	667
% OPERATION FOR MONTH	97.60%	100.00%	97.30%	99.40%	99.60%	92.60%
% OPERATION FOR YEAR	97.60%	98.72%	98.24%	98.54%	98.75%	97.74%
TTU GALLONS REMOVED	13,405	12,034	2,199	5,072	435	469
WELL RECOVERY GALLONS	168	336	1050	1466	508	1143

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
TOTAL DAYS PER MONTH	31	31	30	31	30	31
TOTAL HOURS PER MONTH	744	744	720	744	720	744
ACTUAL HOURS PER MONTH	717	736	720	737	707	744
% OPERATION FOR MONTH	96.40%	98.90%	100.00%	99.10%	98.20%	100.00%
% OPERATION FOR YEAR	97.54%	97.71%	97.97%	98.08%	98.09%	98.25%
TTU GALLONS REMOVED	1,634	5,103	8,651	11,980	14,037	14,377
WELL RECOVERY GALLONS	1,165	1,388	756	1,383	1,714	1515

1995

HAUGTTU2.XLS

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
TOTAL DAYS PER MONTH	31	29	31	30	31	30
TOTAL HOURS PER MONTH	744	696	744	720	744	720
ACTUAL HOURS PER MONTH	696	665.5	741.5	717	604	716.5
% OPERATION FOR MONTH	93.54%	95.60%	99.70%	99.60%	80.60%	99.50%
% OPERATION FOR YEAR	93.54%	94.54%	96.24%	97.27%	93.83%	94.76%
TTU GALLONS REMOVED	27,481	31,857	33,714	27,872	3,836	653
WELL RECOVERY GALLONS	574	1082	1707	997	2317	1588

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
TOTAL DAYS PER MONTH	31	31	30	31	30	31
TOTAL HOURS PER MONTH	744	744	720	744	720	744
						8784
ACTUAL HOURS PER MONTH	742	729	718	728	719	730
						8506
% OPERATION FOR MONTH	99.70%	97.98%	99.70%	97.80%	99.86%	98.10%
% OPERATION FOR YEAR	95.50%	95.81%	96.24%	96.40%	96.71%	96.83%
TTU GALLONS REMOVED	345	1,878	8,056	10,841	11,588	7,033
						165,154
WELL RECOVERY GALLONS						
	2300	1429	919	383	84	656
						14,036

City of Hartford
TTU plus
Recovery wells

1994

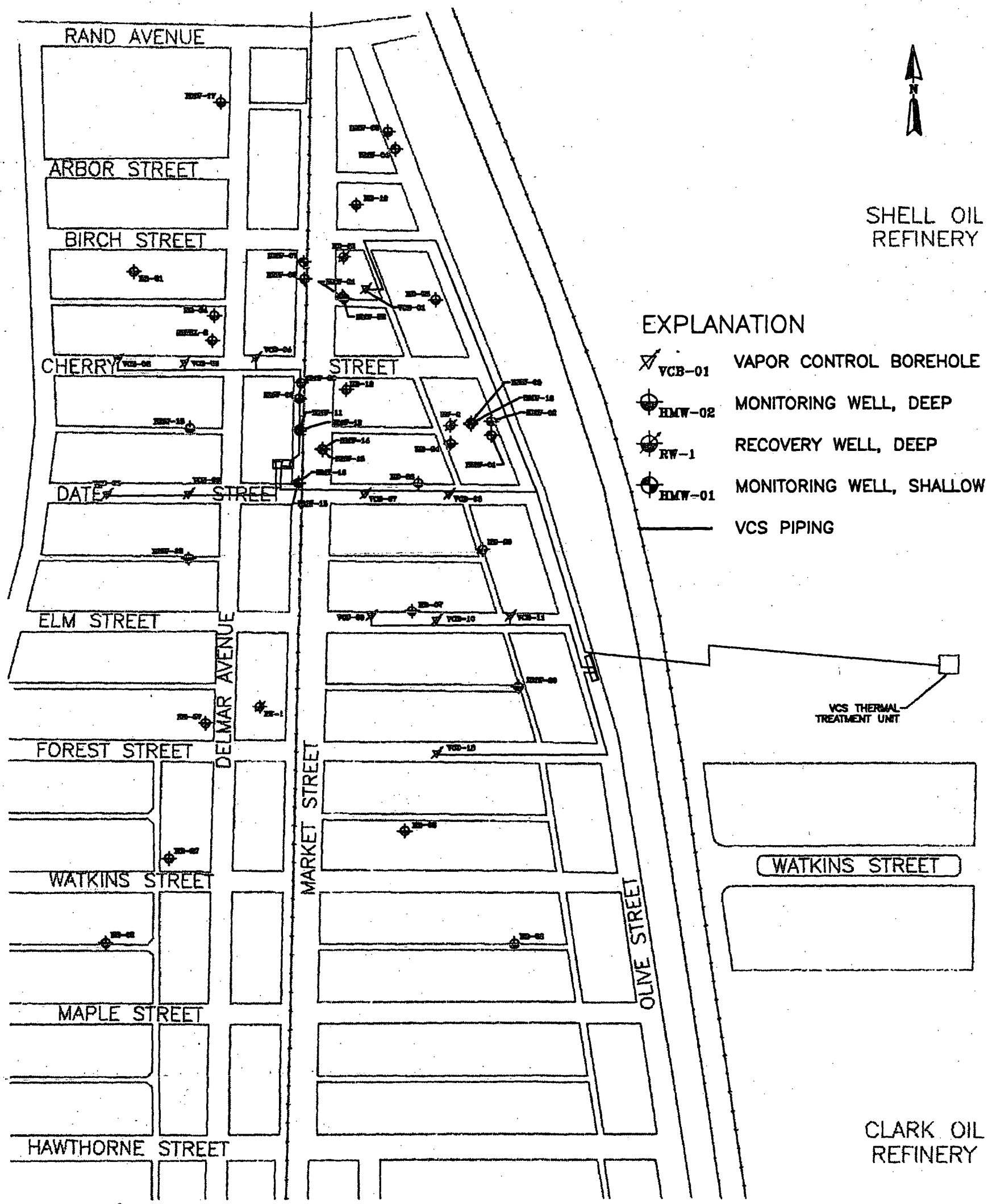
HAUGTTU1.XLS

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
TOTAL DAYS PER MONTH	31	28	31	30	31	30
TOTAL HOURS PER MONTH	744	672	744	720	744	720
ACTUAL HOURS PER MONTH	667.5	672	744	710	668	707
% OPERATION FOR MONTH	89.71%	100%	100%	98.61%	89.80%	98.20%
% OPERATION FOR YEAR	89.71%	94.59%	96.45%	96.99%	95.51%	95.95%
TTU GALLONS REMOVED	29,153	30,180	30,192	15,082	3,300	1,160
WELL RECOVERY GALLONS	491	891	2637	3076.5	3416	3740.7

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
TOTAL DAYS PER MONTH	31	31	30	31	30	31
TOTAL HOURS PER MONTH	744	744	720	744	720	744
ACTUAL HOURS PER MONTH	665	724.5	720	744	708.5	743.5
% OPERATION FOR MONTH	89.40%	97.40%	100.00%	100.00%	98.40%	99.93%
% OPERATION FOR YEAR	94.99%	95.30%	95.80%	96.24%	96.43%	96.73%
TTU GALLONS REMOVED	1,552	3,363	2,589	9,483	8,521	18,531
WELL RECOVERY GALLONS	2,201	3,577	2,319	1,470	1,166	252

APPENDIX I

SUMMARY TABLE OF HYDROCARBON RECOVERY
1994 - 2002



BURLINGTON ENVIRONMENTAL	TITLE: Hartford Hydrocarbon Remediation Project Base Map	DWN: KDM	DES.: DLB	PROJECT NO.: 122489
		CHKD:	APPD:	FIGURE NO.: 93-09-BMP2
		DATE: 09/08/93	REV.: B	

APPENDIX H

APPENDIX H

HYDROCARBON RECOVERY YEAR 2002

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
RB-8 GAL/MONTH	0	0	0	0	0	623
RB-10 GAL/MONTH	0	10	4	0	173	339
RB-35 GAL/MONTH	2134	2003	1929	2262	3207	3225
T-1 GAL/MONTH	0	0	0		0	0
RB-56 GAL/MONTH	0	0	0	0	0	0
RB-53 GALMONTH	249	502	464	384	508	1367
RB-48 GAL/MONTH	0				0	0
TOTAL REFINERY PRODUCTION	2383	2515	2397	2646	3888	5554
CITY OF HARTFORD PRODUCTION	77	0	204	0	612	476

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
RB-8 GAL/MONTH	0	0	0	0	0	0
RB-10 GAL/MONTH	324	609	52	0	0	0
RB-35 GAL/MONTH	1348	314	1262	0	0	0
T-1 GAL/MONTH	0	0	0	0	0	0
RB-56 GAL/MONTH	0	0	0	0	0	0
RB-53 GAL/MONTH	70	185	63	0	0	0
RB-48 GAL/MONTH	0	0	0	0	0	0
TOTAL REFINERY PRODUCTION	1742	1108	1377	0	0	0
CITY OF HARTFORD PRODUCTION	424	221	72	0	0	0

*** Combination of RB-35 and RB-55

APPENDIX H

VILLAGE OF HARTFORD MAP
BURLINGTON ENVIRONMENTAL
SEPTEMBER 1993

HYDRO CARBON RECOVERY YEAR 2001

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
RB-8						
GAL/MONTH	0	0	0	0	0	0
RB-10						
GAL/MONTH	0	0	0	3	41	6
RB-35						
GAL/MONTH	2546	1900	2238	2039	3176	2871
T-1						
GAL./MONTH	0	0	0		0	0
RB-56						
GAL/MONTH	0	0	0	0	0	6
RB-53						
GAL.MONTH	367	318	181	8	225	0
RB-48						
GAL/MONTH	560	168	126	0	0	0
TOTAL						
REFINERY						
PRODUCTION	3473	2386	2545	2050	3442	2883
CITY OF						
HARTFORD						
PRODUCTION	635	359	215	245	468	144

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
RB-8						
GAL/MONTH	0	0	0	0	0	0
RB-10						
GAL/MONTH	8	0	0	0	29	0
RB-35						
GAL/MONTH	2838	2376	3203	1348	3524	3533
T-1						
GAL./MONTH	0	0	0	0	0	0
RB-56						
GAL/MONTH	0	0	0	0	0	0
RB-53						
GAL./MONTH	267	193	1169	964	767	110
RB-48						
GAL/MONTH	0	0	0	0	0	0
TOTAL						
REFINERY						
PRODUCTION	3113	2569	4372	2312	4320	3643
CITY OF						
HARTFORD						
PRODUCTION	144	72	576	720	936	792

*** Combination of RB-35 and RB-55

HYDROCARBON RECOVERY YEAR 2000

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
RB-8						
GAL/MONTH	0	0	0	0	0	0
RB-10						
GAL/MONTH	116	116	17	40	40	9
RB-35						
GAL/MONTH	2228	2181	2744	2469	2937	2347
T-1						
GAL/MONTH	0	0	0	0	0	0
RB-56						
GAL/MONTH	0	0	0	0	0	0
RB-53						
GALMONTH	346	273	270	212	443	333
RB-48						
GAL./MONTH	0	0	0	0	0	0
TOTAL						
REFINERY						
PRODUCTION	2690	2570	3031	2721	3420	2689
CITY OF						
HARTFORD						
PRODUCTION	0	105	206	0	762	130

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
RB-8						
GAL/MONTH	0	0	0	0	0	0
RB-10						
GAL/MONTH	0	18	0	0	0	0
RB-35						
GAL/MONTH	2501	2698	2846	2458	2532	1734
T-1						
GAL/MONTH	0	0	0	0	0	0
RB-56						
GAL/MONTH	0	0	0	0	0	0
RB-53						
GAL/MONTH	741	1002	434	203	714	170
RB-48						
GAL/MONTH	0	0	0	0	100	120
TOTAL						
REFINERY						
PRODUCTION	3242	3718	3280	2661	3346	2024
CITY OF						
HARTFORD						
PRODUCTION	1469	923	1493	1314	653	2164

*** Combination of RB-35 and RB-55

HYDROCARBON RECOVERY 1999

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
RB-8 GAL/MONTH						
RB-10 GAL/MONTH	62	84	119		395	575
RB-35 GAL/MONTH	1327	3239	3621	3398	3237	2214
T-1 GAL/MONTH						
RB-56 GAL/MONTH						400
RB-53 GALMONTH	250	126	339	936	1059	3115
RB-48 GAL/MONTH						
TOTAL REFINERY PRODUCTION	1639	3449	4079	4334	4691	6304
CITY OF HARTFORD PRODUCTION	219	574	578	844	591	577

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
RB-8 GAL/MONTH	51	694	9	0		
RB-10 GAL/MONTH	345	178	84	220	25	9
RB-35 GAL/MONTH	2615	2509	2528	2020	245	1273
T-1 GAL/MONTH						
RB-56 GAL/MONTH	90	18	62	34		
RB-53 GAL/MONTH	2297	1503	947	126	89	206
RB-48 GAL/MONTH						
TOTAL REFINERY PRODUCTION	5398	4902	3630	2400	359	1488
CITY OF HARTFORD PRODUCTION	572	542	150	236	10	31

*** Combination of RB-35 and RB-55

HYDROCARBON RECOVERY 1998

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
RB-8 GAL/MONTH						
RB-10 GAL/MONTH	62	84	119		395	575
RB-35 GAL/MONTH	1327	3239	3621	3398	3237	2214
T-1 GAL/MONTH						
RB-56 GAL/MONTH						400
RB-53 GALMONTH	250	126	339	936	1059	3115
RB-48 GAL/MONTH						
TOTAL REFINERY PRODUCTION	1639	3449	4079	4334	4691	6304
CITY OF HARTFORD PRODUCTION	219	574	578	844	591	577

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
RB-8 GAL/MONTH	51	694	9	0		
RB-10 GAL/MONTH	345	178	84	220	25	9
RB-35 GAL/MONTH	2615	2509	2528	2020	245	1273
T-1 GAL/MONTH						
RB-56 GAL/MONTH	90	18	62	34		
RB-53 GAL/MONTH	2297	1503	947	126	89	206
RB-48 GAL/MONTH						
TOTAL REFINERY PRODUCTION	5398	4902	3630	2400	359	1488
CITY OF HARTFORD PRODUCTION	572	542	150	236	10	31

*** Combination of RB-35 and RB-55

HYDROCARBON RECOVERY1997

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
RB-8 GAL/MONTH						
RB-10 GAL/MONTH	23	62	63	466	669	213
RB-35 GAL/MONTH	2694	2483	3108	4219	3036	352
T-1 GAL/MONTH						
RB-56 GAL/MONTH						
RB-53 GALMONTH	373	73		24	1537	123
RB-48 GAL/MONTH						
TOTAL REFINERY PRODUCTION	3090	2618	3171	4709	5242	688
CITY OF HARTFORD PRODUCTION	1492	1422	1138	1049	1159	462

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
RB-8 GAL/MONTH						
RB-10 GAL/MONTH	452	215	495	169	128	129
RB-35 GAL/MONTH	2667	2803	3627	3036	2768	2320
T-1 GAL/MONTH						
RB-56 GAL/MONTH						
RB-53 GAL/MONTH	2040	809	252	167	583	539
RB-48 GAL/MONTH						
TOTAL REFINERY PRODUCTION	5159	3827	4374	3372	3479	2988
CITY OF HARTFORD PRODUCTION	1318	2197	703	413	461	630

*** Combination of RB-35 and RB-55

HYDROCARBON RECOVERY 1996

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
RB-8 GAL/MONTH						
RB-10 GAL/MONTH	216	819	728	525	464	528
RB-35 GAL/MONTH	1663	2487	4008	3183	2862	2363
T-1 GAL/MONTH						590
RB-56 GAL/MONTH					168	
RB-53 GALMONTH	151			274	1175	493
RB-48 GAL/MONTH	172					
TOTAL REFINERY PRODUCTION	2202	3306	4736	3982	4669	3974
CITY OF HARTFORD PRODUCTION	168	336	1050	1466	508	1143

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
RB-8 GAL/MONTH						
RB-10 GAL/MONTH	413	883	259	28	312	49
RB-35 GAL/MONTH	1913	2267	1998	2736	2280	2805
T-1 GAL/MONTH	1289	1493	313	199		
RB-56 GAL/MONTH	84	252				
RB-53 GAL/MONTH	257	85	306	165	179	23
RB-48 GAL/MONTH						
TOTAL REFINERY PRODUCTION	3956	4980	2876	3128	2771	2877
CITY OF HARTFORD PRODUCTION	1165	1388	756	1383	1714	1515

*** Combination of RB-35 and RB-55

HYDROCARBON RECOVERY 1995

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
RB-8 GAL/MONTH					241	
RB-10 GAL/MONTH	289	758	496	382	854	1423
RB-35 GAL/MONTH	3075	3856	3855	4676	5499	3898
RB-9 GAL/MONTH						
RB-56 GAL/MONTH						
RB-53 GALMONTH	276	290	73	73	0	692
RB-48 GAL/MONTH		274	559	247	590	
TOTAL REFINERY PRODUCTION	3640	5178	4983	5378	7184	6013
CITY OF HARTFORD PRODUCTION	574	1082	1707	997	2317	1588

MONTH	JUL.	AUG.	SEPT.	OCT.	NOV.	DEC.
RB-8 GAL/MONTH				21		
RB-10 GAL/MONTH	543	827	565	396	439	471
RB-35 GAL/MONTH	2506	2306	2204	2215	1795	2802
RB-9 GAL/MONTH						
RB-56 GAL/MONTH		336				
RB-53 GAL/MONTH	873	312	31	142		228
RB-48 GAL/MONTH					462	
TOTAL REFINERY PRODUCTION	3922	3781	2800	2774	2696	3501
CITY OF HARTFORD PRODUCTION	2300	1429	919	383	84	656

*** Combination of RB-35 and RB-55

Refinery Property Recovery wells

HYDROCARBON RECOVERY 1994

MONTH	JAN.	FEB.	MAR.	APR.	MAY.	JUN.
RB-8 GAL/MONTH	0	156	51.5	62.1	25.6	9.2
RB-10 GAL/MONTH	627	765	977	1462	1998.5	3463
RB-35 GAL/MONTH	0	301	557	532	558	940.2
RB-9 GAL/MONTH	0	0	0	0	0	0
TOTAL REFINERY PRODUCTION	627	1222	1585.5	2056.1	2582.1	4412.4
CITY OF HARTFORD PRODUCTION	491	891	2637	3076.5	3416	3740.7

MONTH	JUL	AUG.	SEPT.	OCT.	NOV.	DEC.
RB-8 GAL/MONTH	0	84.4	0	43	0	0
RB-10 GAL/MONTH	1773	1724	1305	460	404	352
RB-35 GAL/MONTH	446	526	*** 1240	*** 4826	*** 4657	*** 3640
RB-9 GAL/MONTH	0	0	0	0	0	0
TOTAL REFINERY PRODUCTION	2219	2334.4	2545	5329	5061	3992
CITY OF HARTFORD PRODUCTION	2201	3577	2319	1470	1166	252

*** Combination of RB-35 and RB-55

APPENDIX G

SUMMARY TABLE OF HYDROCARBON RECOVERY
1994 - 2002

APPENDIX G

Table 3
May 2001 IEPA Split Groundwater Sampling Analytical Results
IEPA Groundwater Sampling Event
The Premcor Refining Group, Inc.
Hartford, Illinois

Laboratory Number		0105494-06	0105494-07	IEPA
Sample Point		RB-53	RB-36	TACO
Sample ID		G153	G136	Guidelines*
Sample Date		5/23/2001	5/23/2001	
Material Sampled		Groundwater	Groundwater	
Laboratory Analysis	Units			
VOCs				
1,2,4-Trimethylbenzene	µg/L	384	NS	–
1,3,5-Trimethylbenzene	µg/L	143	NS	–
Benzene	µg/L	3,830	NS	5
Ethylbenzene	µg/L	387	NS	700
m,p-Xylenes	µg/L	1,490	NS	10,000**
o-Xylene	µg/L	664	NS	10,000**
Toluene	µg/L	1,920	NS	1,000
SVOCs				
2-Methylnaphthalene	mg/L	0.089	0.010	–
Naphthalene	mg/L	0.108	ND	0.025
Phenol	mg/L	0.010	ND	0.1
TOTAL METALS				
Arsenic	mg/L	ND	0.051	0.05
Barium	mg/L	0.271	0.763	2.0
Chromium	mg/L	0.015	0.051	0.1

Notes:
Only detected compounds are listed in Table
VOCs - Volatile organic hydrocarbons
SVOCs - Semi-volatile organic hydrocarbons
PCBs - Polychlorinated biphenols
µg/L - micrograms per liter
NS - not sampled
** - Xylenes (total)
mg/L - milligrams per liter
ND - not detected, below laboratory detection limit
* - 35 IAC Section 742.Appenbix B.Table B; Tier 1 Soil Remediation Objectives for Industrial/ Commercial Properties

Table 3
May 2001 IEPA Split Groundwater Sampling Analytical results
IEPA Groundwater Sampling Event
The Premcor Refining Group, Inc.
Hartford, Illinois

	Laboratory Number	0105494-01	0105494-02	0105494-03	0105494-04	0105494-05	IEPA
	Sample Point	Production Well	RB-55	RB-10	RB-54	RB-8	TACO
	Sample ID	G102P	G155	G110	G154	G108A	Guidelines*
	Sample Date	5/23/2001	5/23/2001	5/23/2001	5/23/2001	5/23/2001	
	Material Sampled	Groundwater	Product	Product	Groundwater	Product	
Laboratory Analysis	Units						
VOCs							
1,2,3-Trimethylbenzene	µg/L	23.1	2,670,000	2,670,000	ND	2,440,000	–
1,2,4-Trimethylbenzene	µg/L	70.1	10,700,000	10,900,000	ND	11,800,000	–
1,3,5-Trimethylbenzene	µg/L	22.6	4,550,000	3,700,000	ND	4,010,000	–
Acetone	µg/L	ND	ND	ND	ND	12,000,000	700
Benzene	µg/L	193	5,240,000	3,130,000	ND	3,130,000	5
Bromobenzene	µg/L	ND	ND	2,210,000	ND	ND	–
Ethylbenzene	µg/L	33.3	6,880,000	4,700,000	ND	4,400,000	700
Heptane	µg/L	ND	11,300,000	13,500,000	ND	11,000,000	–
Hexane	µg/L	ND	17,200,000	16,900,000	ND	14,800,000	–
Isopropylbenzene	µg/L	5.1	ND	ND	ND	ND	–
m,p-Xylenes	µg/L	76.3	26,200,000	18,200,000	ND	13,000,000	10,000**
Methyl tert-butyl ether	µg/L	500	19,100,000	943,000	ND	882,000	700
Methylene Chloride	µg/L	ND	9,430,000	2,870,000	ND	1,560,000	5
n-Butylbenzene	µg/L	ND	ND	1,290,000	ND	1,150,000	–
n-Propylbenzene	µg/L	12.6	2,140,000	1,730,000	ND	1,970,000	–
Naphthalene	µg/L	24.3	ND	1,670,000	ND	1,440,000	25
o-Xylene	µg/L	ND	9,920,000	6,040,000	ND	1,980,000	10,000**
p-Isopropyltoluene	µg/L	ND	ND	643,000	ND	ND	–
Tetrahydrofuran	µg/L	ND	ND	17,700,000	ND	ND	–
Toluene	µg/L	5.1	27,100,000	2,790,000	ND	842,000	1,000
Vinyl acetate	µg/L	ND	14,200,000	ND	ND	ND	7,000
SVOCs							
2-Methylnaphthalene	mg/L	0.049	2,380	3,930	ND	4,610	–
Naphthalene	mg/L	0.024	2,110	2,800	ND	3,380	0.025
TOTAL METALS							
Arsenic	mg/L	ND	3.0	7.8	0.288	16	0.05
Barium	mg/L	0.445	ND	ND	4.65	ND	2.0
Cadmium	mg/L	ND	ND	ND	0.006	ND	0.005
Chromium	mg/L	0.015	ND	ND	0.495	ND	0.1
Lead	mg/L	0.015	200	420	ND	170	0.0075
TPH (OA-2)							
Kerosene	mg/L	ND	188,000	260,000	NS	184,000	–
Mineral Spirits	mg/L	ND	193,000	235,000	NS	168,000	–

Table 3
May 2001 IEPA Split Groundwater Sampling Analytical results
IEPA Groundwater Sampling Event
The Premcor Refining Group, Inc.
Hartford, Illinois

	Laboratory Number	0105464-07	0105464-08	0105464-09	IEPA
	Sample Point	RB-47	RB-51	RB-50	TACO
	Sample ID	G147	G151	G150	Guidelines*
	Sample Date	5/22/2001	5/22/2001	5/22/2001	
	Material Sampled	Groundwater	Groundwater	Groundwater	
Laboratory Analysis	Units				
VOCs					
Ethyl ether	µg/L	10.9	ND	ND	–
Methyl tert-butyl ether	µg/L	876	ND	ND	700
TOTAL METALS					
Arsenic	mg/L	ND	ND	0.056	0.05
Barium	mg/L	0.515	0.135	0.136	2.0

Table 3
May 2001 IEPA Split Groundwater Sampling Analytical results
IEPA Groundwater Sampling Event
The Premcor Refining Group, Inc.
Hartford, Illinois

Laboratory Number		0105464-01	0105464-02	0105464-03	0105464-04	0105464-05	0105464-06	IEPA TACO Guidelines*
Sample Point		RB-43	GB-1	RB-44	RB-45	LP-4	RB-46	
Sample ID		G143	G101G	G144	G145	G104	G146	
Sample Date		5/22/2001	5/22/2001	5/22/2001	5/22/2001	5/22/2001	5/22/2001	
Material Sampled		Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	
Laboratory Analysis	Units							
VOCs								
Methyl tert-butyl ether	µg/L	ND	ND	ND	ND	ND	7.1	700
TOTAL METALS								
Arsenic	mg/L	0.078	0.128	0.042	0.090	0.088	ND	0.05
Barium	mg/L	0.685	0.465	0.423	1.16	0.362	0.231	2.0
Cadmium	mg/L	ND	0.004	0.004	0.051	0.004	ND	0.005
Chromium	mg/L	0.094	ND	0.126	0.057	0.019	0.012	0.1
Lead	mg/L	ND	ND	0.058	ND	ND	ND	0.0075
Mercury	mg/L	0.0002	ND	0.0002	ND	ND	ND	0.002

Table 3
May 2001 IEPA Split Groundwater Sampling Analytical results
IEPA Groundwater Sampling Event
The Premcor Refining Group, Inc.
Hartford, Illinois

	Laboratory Number	0105442-07	0105442-08	0105442-09	IEPA
	Sample Point	RB-41	RB-42	GB-6	TACO
	Sample ID	G141	G142	G106	Guidelines*
	Sample Date	5/21/2001	5/21/2001	5/21/2001	
	Material Sampled	Groundwater	Groundwater	Groundwater	
Laboratory Analysis	Units				
VOCs					
m,p-Xylenes	µg/L	ND	ND	53.1	10,000**
o-Xylenes	µg/L	ND	ND	41.2	10,000**
SVOCs					
	mg/L	ND	ND	ND	–
TOTAL METALS					
Arsenic	mg/L	0.069	0.062	0.557	0.05
Barium	mg/L	0.295	0.564	0.568	2.0
Cadmium	mg/L	ND	0.003	ND	0.005
Chromium	mg/L	ND	0.038	ND	0.1

Table 3
May 2001 IEPA Split Groundwater Sampling Analytical results
IEPA Groundwater Sampling Event
The Premcor Refining Group, Inc.
Hartford, Illinois

	Laboratory Number	0105442-01	0105442-02	0105442-03	0105442-04	0105442-05	0105442-06	IEPA
	Sample Point	RB-1	RB-37	RB-36	RB-38	RB-39	RB-40	TACO
	Sample ID	G101	G137	G136	G138	G139	G140	Guidelines*
	Sample Date	5/21/2001	5/21/2001	5/21/2001	5/21/2001	5/21/2001	5/21/2001	
	Material Sampled	Groundwater	Product	Groundwater	Groundwater	Groundwater	Groundwater	
Laboratory Analysis	Units							
VOCs								
1,2,3-Trimethylbenzene	µg/L	ND	NS	850	ND	ND	ND	–
1,2,4-Trimethylbenzene	µg/L	ND	NS	1,560	ND	ND	ND	–
1,3,5-Trimethylbenzene	µg/L	ND	NS	948	ND	ND	ND	–
Benzene	µg/L	ND	NS	22,600	18,800	ND	ND	5
Ethylbenzene	µg/L	ND	NS	2,880	ND	ND	ND	700
Heptane	µg/L	ND	NS	888	ND	ND	ND	–
Hexane	µg/L	ND	NS	801	ND	ND	ND	–
Isopropylbenzene	µg/L	ND	NS	191	ND	ND	ND	–
m,p-Xylenes	µg/L	ND	NS	9,370	363	ND	ND	10,000**
Methyl tert-butyl ether	µg/L	ND	NS	138	8,250	ND	4.6	700
n-Butylbenzene	µg/L	ND	NS	484	ND	ND	ND	–
n-Propylbenzene	µg/L	ND	NS	548	ND	ND	ND	–
Naphthalene	µg/L	ND	NS	994	ND	ND	ND	25
o-Xylenes	µg/L	ND	NS	4,260	ND	ND	ND	10,000**
Toluene	µg/L	ND	NS	28,600	265	ND	ND	1,000
SVOCs								
2-Methylnaphthalene	mg/L	NS	NS	NS	0.012	ND	ND	–
Phenol	mg/L	NS	NS	NS	0.050	ND	ND	0.1
TOTAL METALS								
Arsenic	mg/L	NS	NS	NS	0.040	ND	0.069	0.05
Barium	mg/L	NS	NS	NS	0.242	0.131	0.295	2.0

APPENDIX F

MAY 2001 ILLINOIS EPA SPLIT GROUNDWATER ANALYTICAL RESULTS
BURNS & MCDONNELL
DECEMBER 2002

SITE ASSESSMENT
OF
BLACK OIL RIVER LINE RELEASE AREA
FOR
CLARK REFINING AND MARKETING, INC.
HARTFORD REFINERY
HARTFORD, ILLINOIS

DECEMBER 1994

Project No. 94-106-4

Burns & McDonnell Waste Consultants, Inc.
Engineers-Geologists-Scientists
St. Louis, Missouri

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* * * * *

1.0 INTRODUCTION

On March 10, 1994, the Clark Refining and Marketing, Inc.'s (Clark), Hartford Refinery, located in Hartford, Illinois, had a release from the Black Oil river line approximately 600 feet east of their Mississippi River barge terminal (Site). The Site is located west of Hartford, Illinois, between the Hartford levee and the Mississippi River, and north of Hawthorne Avenue (see Figure 1). Figure 2 illustrates the Site's vicinity with the approximate release point along the Black Oil river line. Approximately 4071 barrels of product were released from the pipeline. Clark immediately blocked off the Black Oil river line, alerted their internal hazardous materials (hazmat) team, and notified the Illinois Environmental Protection Agency (IEPA) emergency response unit. Mr. Tom Powell from the IEPA arrived on the Site at approximately 6:00 p.m. on March 11, 1994. A remediation contractor, Barton Contracting, Inc., was also notified to assist with product recovery.

The released product was a combination of asphalt, light cycle oil (No. 6 fuel oil), and a slurry (similar to No. 6 oil, used as fuel in the crude unit of the refinery). The product was released from the pipeline (approximately 20 feet above the ground) and flowed east, along grade, to a north-south ditch. The product then flowed in a southerly direction down the ditch approximately 500 feet to an east-west ditch, where then it began flowing west toward the Mississippi River. The majority of product was halted by a concrete weir 450 feet west of the north-south ditch. The impacted area (as of March 16, 1994) is illustrated in Figure 2.

The spill area is frequently covered with flood water, which increased the urgency of the cleanup effort. Past floods may have also contributed to the presence of petroleum hydrocarbon contamination known to exist in the soil of this area. A series of five ponds east of the Site were previously used as wastewater discharge and oil separator lagoons for industrial facilities. These ponds are probable contributors to the presence of petroleum hydrocarbons prior to this release.

This report presents the data obtained as a result of soil excavation, subsurface drilling and monitoring well installation, soil and groundwater

sample collection, and monitoring well gauging conducted as part of Clark's efforts to remediate the area. In addition, these activities determined the approximate horizontal and vertical extent of hydrocarbon contamination in the subsurface. This site assessment was conducted concurrently with petroleum contaminated soil removal and free product recovery.

* * * * *

2.0 HYDROGEOLOGY

2.1 REGIONAL HYDROGEOLOGY

Clark's Hartford Refinery is located in Hartford, Illinois, approximately 10 miles north of St. Louis, Missouri. The Black Oil river line is a pipeline connecting the refinery to the barge terminal. The area impacted by the release is approximately 600 feet east of the Mississippi River, along the Black Oil river line.

The Site lies within the Alluvial Valleys Region as defined in Geological Survey Water-Supply Paper 2242, 1984. The Alluvial Valleys region is commonly underlain by sand and gravel as well as silt and clay. The surficial deposit of sand and gravel is commonly underlain by interbedded silt and clay in turn underlain by a basal layer of sand and gravel. Locally, these units are known as Cahokia Alluvium. The subsurface material in the Site area consists of Quarternary alluvium, which consists of modern river floodplain deposits of poorly-sorted sands, silts, and clays with some sandy gravel locally. The alluvium ranges in thickness from 50 to 200 feet below the ground surface (bgs).

The sequence of deposits in the alluvial valleys is dependant on the depositional history. The sand and gravel in the valley of major streams, such as the Mississippi River, are commonly overlain by deposits of clay and other fine-grained alluvium deposited during floods since the end of the glacial period. The soil borings conducted at this Site encountered clay to the bottom of each boring, approximately 17 feet bgs.

The alluvial deposits are recharged by precipitation on the valleys, groundwater moving from the adjacent and underlying aquifers, and overbank flooding of the streams. Water in the alluvial deposits discharges to the streams in the valleys.

The underlying bedrock in the Hartford area is composed of Mississippian age interbedded limestones, sandstones, and shales of the lower Chesterian Series.

Regionally, these units dip east toward the center of the Illinois Basin. The Illinois Basin is the major geologic structure in the region.

2.2 LOCAL HYDROGEOLOGY

Soil borings drilled for this project penetrated unconsolidated materials to a depth of 17.5 feet bgs. The subsurface materials encountered were predominantly clay with traces of silt. A dark gray to olive gray clay containing trace amounts of organic material (sticks and leaves) was encountered within the upper 6 feet of each boring. A greenish gray to olive gray clay was predominant at depths of 6 to 10 feet bgs, grading back to a darker gray clay at depths of 10.0 to 17.5 feet bgs. The clay was characterized as having medium plasticity, medium consistency, the occurrence of peat, and traces of iron oxide staining. Soil boring logs are included in Appendix A of this report.

Saturated materials were encountered at approximately 15 feet bgs during drilling, with groundwater rising to approximately 4 feet bgs in the wells after an approximate 24 hour period. Monitoring wells were screened from 2.5 feet bgs to the bottom of each well (see Appendix B). Wells were placed to determine the approximate horizontal and vertical extent of petroleum hydrocarbons in the subsurface and the possible presence of background contamination. Figure 3 illustrates the locations of monitoring wells at the Site.

Monitoring wells were gauged with an oil/water interface probe on March 28; April 9; June 16; and July 29, 1994. Appendix C contains water/hydrocarbon level data sheets, and Figures 3 through 6 are piezometric surface maps illustrating the measurements recorded for these four dates respectively. The piezometric surface maps constructed from the March 28 and April 9 water level data indicate that the groundwater flow is generally southeast (see Figures 3 and 4). However, the piezometric surface maps constructed from the June 16 and July 29 water level data indicates a westerly groundwater flow direction (see Figures 5 and 6). The local groundwater flow direction is influenced by river stage fluctuations and possibly by excavation activities.

* * * * *

3.0 FIELD INVESTIGATION

A total of six soil borings were drilled by United Geosciences of St. Louis, Missouri, on March 25 and 26, 1994, in the vicinity of the spill area. All six soil borings were converted to monitoring wells. The depth of each soil boring was 17.5 feet.

Excavation was conducted in three areas of the Site: north of the pipeline, south of the pipeline, the east-west ditch, and north-south ditch. Each area was excavated to depths at which visually contaminated soils were removed or groundwater was encountered. Following excavation, a sampling grid interval was established based on the total area of each excavation, and soil samples were collected according to this calculated interval. Soil samples were collected from the bottom of the excavation as confirmation samples prior to backfilling. Boring locations and surface sample locations were selected to delineate the approximate extent of horizontal and vertical extent of contamination.

3.1 DRILLING AND SUBSURFACE SOIL SAMPLING

A description of subsurface materials encountered in each boring was logged in the field by Burns & McDonnell Waste Consultants, Inc. (BMWCI) personnel. Drilling logs containing descriptions of subsurface materials, sample depths, and other drilling information are presented in Appendix A. Soil borings were drilled with a CME 85 all-terrain-vehicle rig equipped with hollow stem augers. Borings completed as 4-inch diameter monitoring wells were drilled with a 10.25-inch outside diameter (O.D.) hollow stem auger. Continuous soil samples were obtained using 2-foot split spoon samplers. All drill cuttings, excess soil samples, and soil excavated from the spill area were transported off the Site for disposal as special waste at Laidlaw Waste Systems, Inc.'s Roxana Landfill.

A portion of each subsurface soil sample was screened for volatile organic compounds (VOCs) using an OVM photoionization detector (PID) equipped with a 10.6-electron volt lamp. Several minutes were allowed for VOCs to volatize and reach equilibrium within a plastic bag before a headspace reading was

obtained. The headspace PID readings were recorded on the drilling logs and used to select samples for chemical analyses.

Soil samples were obtained from the upper two-foot interval of the boring, the zone with the highest PID readings, or at the approximate groundwater interface depth. If the PID detected relatively high readings, a sample was collected from the depth of the highest reading and from the approximate groundwater interface. A representative portion of selected subsurface soil samples was placed in laboratory-cleansed sampling jars, labeled, and cooled for subsequent chemical analysis. Soil boring samples were analyzed by Environmetrics of Maryland Heights, Missouri. The chemical analyses parameters for soil samples included polynuclear aromatic hydrocarbons (PNAs) by Environmental Protection Agency (EPA) method 8310 and benzene, toluene, ethylbenzene, and xylenes (BTEX) by EPA method 8020. The analytical results for the soil boring samples are summarized in Table 1. Laboratory reports and chain-of-custody forms are included in Appendix D.

3.2 SURFACE SOIL SAMPLING

The close proximity of the Mississippi River to the Site posed an imminent threat of flooding to occur over the spill area. Due to this threat, it was deemed essential for expeditious backfilling of excavated areas. Confirmation soil samples were obtained prior to backfilling and analyzed for BTEX and PNAs following leaking underground storage tank (LUST) guidelines. Soil cleanup objectives were obtained from the "Leaking Underground Storage Tank Soil Sampling Requirements" (February 1993), included in Appendix E.

The sample locations, as well as the number of samples collected, were determined by a grid pattern based upon the area excavated. Grid patterns were calculated using equations from 35 Illinois Administrative Code (IAC) 725.211 received from the IEPA on March 23, 1994 (see Appendix F). The following equation was used for grid pattern calculations:

$$\text{Grid Interval} = GI = [(\text{Area}/3.14)^{0.5}]/2$$

The spill area was divided into three separate areas for the purpose of establishing sampling grids. Grid interval calculations were applied to each area of the Site (see Table 2). Sampling grids were established for the north excavation (Figure 8), the south excavation (Figure 9), and the ditch excavation (Figure 10).

Confirmation sample analytical results for the north, south, and ditch excavations are summarized in Tables 3, 4, and 5, respectively. A timetable, including a chronological summary of the sampling, excavation, and resampling events, is included in Appendix G. The surface soil samples were analyzed by Teklab, Inc. of Collinsville, Illinois.

3.3 GROUNDWATER MONITORING WELL INSTALLATION

Monitoring Wells MW-1 through MW-6 were installed by United Geosciences on March 25, 1994. Each well was installed with 4-inch diameter, stainless steel well screen with 0.010-inch slots from the total depth to 2.5 feet bgs. The upper portion of the well was constructed of 4-inch diameter, solid stainless steel casing. Each monitoring well was set at 17.5 feet bgs. The annular space was filled with clean, coarse, silica sand to 1 foot above the top of the well screen. A 1-foot bentonite seal was placed above the sand. The remaining annular space was sealed with a cement/bentonite grout. A locking, watertight cap covers the top of each well casing, and a steel protective outer casing was set 3 feet above the ground surface in concrete.

Interceptor trenches were excavated to depths of approximately 3 feet below the bottom of the excavation and widths of approximately 3 feet to observe and intercept free product moving with groundwater through the soil. Free product was not observed in the trenches, although a slight sheen was observed in the east-west trench of the north excavation. Two 10-inch passive recovery wells, PRW-1 and PRW-2, were installed at locations within the trenches and backfilled with 2-inch clean gravel to 1 foot above the screen. A synthetic membrane was placed over the gravel prior to backfilling with soil to prevent migration of fine soils into the gravel. Soil was then backfilled to the original grade around the wells. The interceptor trenches were also filled with 2-inch clean gravel and covered with the synthetic membrane before

backfilling, to promote migration of product to the passive recovery wells. Interceptor trench and passive recovery well locations are illustrated in Figure 7. Monitoring well and passive recovery well construction diagrams are included in Appendix B.

3.4 GROUNDWATER SAMPLE COLLECTION

After the installation of each monitoring well, the static fluid level and total depth were measured to determine well casing fluid volumes. Each well was then developed by removing at least three casing volumes using a Grundfos Redi-Flo2 2-inch submersible pump with dedicated vinyl hoses. On April 9, 1994, BMWCI personnel again removed three casing volumes (using clean, disposable, polyethylene bailers) and collected groundwater samples. Free product was not observed in any of the monitoring wells. Water levels were recorded and are included on water/hydrocarbon level data sheets in Appendix C.

Groundwater samples were analyzed for BTEX by EPA Method 8020, PNAs by EPA Method 8310, and total petroleum hydrocarbons (TPH) by EPA Method(modified) 8015 (gasoline and diesel range). A summary of the groundwater sample results is presented in Table 6.

3.5 SAMPLE COLLECTION PROTOCOL

Personnel responsible for activities associated with sample collection of soil and groundwater followed standard procedures to reduce the possibility of contamination and cross-contamination of the samples prior to delivery to the laboratory. Drilling equipment was steam cleaned prior to the advancement of each soil boring. Split spoons, sampling knives, and groundwater sampling equipment were washed with an Alconox (detergent) solution between each sample. Disposable, nitrile gloves were used in handling samples to avoid possible cross-contamination. Soil and groundwater samples were cooled to approximately 4 degrees Celsius (°C) and promptly shipped to the analytical laboratory using chain-of-custody procedures. All laboratory analyses were performed in accordance with EPA methodology. Soil boring and groundwater samples were analyzed by Environmetrics. Confirmation surface soil samples

were analyzed by Teklab, Inc. The laboratory results and chain-of-custody forms are included in Appendix D.

* * * * *

4.0 CONTAMINANT OCCURRENCE

Vacuum trucks and construction equipment were utilized to recover free product from the ground surface immediately following the identification of the release. Following the removal of free product from the soil surface, the area was excavated where tree roots appeared to produce a potential pathway for product to travel deeper into the soil. Confirmation soil samples were then collected and analyzed by IEPA guidelines before backfilling. Backfill material was a wind blown silt (loess) transported to the Site from a borrow pit along the Mississippi River bluffs.

Monitoring wells were installed and soil and groundwater samples collected and analyzed to determine the approximate extent of contaminant occurrence in the subsurface. Due to the industrial history of the Site and periodic soil deposits due to flooding, the potential for prior contamination at the Site exists.

Periodic gauging of monitoring wells with an oil/water interface probe was utilized to determine the presence of free product on the water table. Free product was not detected in any monitoring wells or passive recovery wells. Groundwater sample collection and analysis was used to determine the presence of the dissolved phase hydrocarbons in groundwater.

4.1 BACKGROUND CONTAMINATION

Analyses of soil samples collected during the drilling of the soil borings indicated low levels of petroleum hydrocarbon constituents in Soil Borings MW-1, MW-2, and MW-3. Due to the distance from the Site to the soil borings and the depths where this contamination occurred, it is unlikely that the low levels of contamination in the soil borings were caused by this release.

Soil samples from Monitoring Well MW-1 had PID readings of 0 parts per million (ppm) from 0 to 6 feet bgs and readings between 39.0 and 66.5 ppm from 6 to 8 feet bgs. The soil sample taken from the 0 to 1-foot interval of Monitoring Well MW-1 was non detect for BTEX and PNAs; however, the soil sample taken at 10 to 12 feet bgs had levels of 0.2, 0.5, and 2.5 milligram per kilogram

(mg/kg) for toluene, ethylbenzene, and xylenes, respectively. These levels are below IEPA LUST cleanup objectives for total BTEX. Groundwater levels in Monitoring Well MW-1 ranged from 5.4 to 6.7 feet bgs during the cleanup. Groundwater sample results for Monitoring Well MW-1 were non detect for BTEX and PNAs, indicating that contamination was present in the soil below the water table, but non-detect in the groundwater.

Monitoring Well MW-2 exhibited similar PID readings to Monitoring Well MW-1, but had only low levels of PNAs upon laboratory analysis of the soil samples. Monitoring Well MW-3 contained similar levels of PNAs to Monitoring Well MW-2. Tables 1 and 6 contain summaries of soil boring and groundwater sample analytical results, respectively.

One potential source of prior contamination is the series of ponds located to the east of the Site. These ponds were previously used as industrial wastewater discharge lagoons. Elevated levels of BTEX and PNAs in the excavations near the ponds may have been caused by the leaching of compounds beneath the ponds. Petroleum hydrocarbon contamination in the soil at different elevations across the Site also may have been deposited over many years during overbank flooding of the ponds and the Mississippi River.

4.2 CONTAMINANT OCCURRENCE IN THE PIPELINE VICINITY

4.2.1 Soil Excavation

Petroleum-contaminated soil excavation began on March 12, 1994. Soil was first excavated and transported by Barton Contractors, Inc. to Clark's Hartford Refinery where it was stockpiled until an appropriate disposal facility could be chosen. BMWCI personnel observed the excavation and conversed with Mr. Powell. Soil was excavated 24 hours a day, transported, and stockpiled at the refinery until March 15, 1994. The soil was then transported by Barton Contractors, Inc. to Laidlaw Waste Systems, Inc.'s Roxana Landfill.

Initially, excavation activities focused on scraping the surface of the spill area and removing the product from the east-west ditch nearest the river.

Following the removal of the contaminated surface soil, visual contamination was still present in the soil, therefore, excavation continued until the water table (approximately 4 feet bgs) was encountered.

4.2.1.1 North Excavation

On March 26, 1994, excavation was completed in the north excavation. Confirmation Samples GS-1 through GS-7 were collected at random locations to determine contaminant levels in the bottom of the excavation. Figure 7 illustrates the preliminary sampling locations. The analytical results indicated benzene levels in Soil Samples GS-5 and GS-7 of 0.0255 and 0.0159 mg/kg, respectively. These levels are above the IEPA LUST cleanup objective of 0.005 mg/kg for benzene. Tables 3 through 5 contain summaries of soil sample confirmation analytical results.

The areas surrounding the locations of Soil Samples GS-5 and GS-7 were then excavated an additional 2 feet, and a complete grid pattern of sampling was calculated for sample collection (see Table 2). Figure 8 illustrates the grid sampling locations for the north excavation. Soil Sample SS-12 indicated benzene levels of 0.0078 mg/kg, above the LUST cleanup objective. Soil Sample SS-12(A) was collected from Sampling Point SS-12 after additional soil was excavated from the area. Soil Sample SS-12(A) had non detect levels of benzene; however, this sample had a level of 0.14 mg/kg for naphthalene, between 0.025 (IEPA LUST cleanup objective) and 0.660 mg/kg (IEPA LUST acceptable detection limit for soil). Mr. Powell visited the Site on April 8, 1994, and determined that additional excavation would not be required in the area of Soil Sample SS-12.

4.2.1.2 Ditch Excavation

The soil excavation of the north-south and east-west ditches was completed on April 1, 1994. Confirmation Samples DS-1 through DS-13 were collected in the grid pattern calculated and presented in Table 2. Ditch sampling locations are illustrated in Figure 10, and analytical results are presented in Table 5. Soil Sample DS-4 had levels greater than the IEPA LUST cleanup objective for naphthalene and benzo(a)pyrene. Soil Sample DS-5 had levels greater than the IEPA LUST cleanup objective for naphthalene, benzo(a)anthracene, chrysene, and

dibenzo(a,h)anthracene. The area between Soil Samples DS-4 and DS-5 was reexcavated and Soil Samples DS-4S(A), DS-5B(A), and DS-5N(A) were collected. Soil Samples DS-4B(A) and DS-13B had levels of naphthalene between the IEPA LUST cleanup objective and the IEPA acceptable detection limit (ADL), while DS-8 had slightly elevated levels of benzo(a)anthracene and chrysene. Mr. Powell determined that further excavation would not be required in the DS-4 and DS-13 areas, and the DS-8 area would be acceptable following the removal of four tree stumps. The tree stumps were removed on April 8, 1994. Backfilling of the ditch excavation began on April 9, 1994.

On April 9 and 10, 1994, heavy rain caused the Mississippi River to rise to dangerous levels. Remediation activities were ceased and all equipment was transported out of the area. On April 12, 1994, the Site was covered with flood-water. The north-south ditch and north excavation were backfilled prior to flooding, but the east-west ditch was not backfilled.

4.2.1.3 South Excavation

The south excavation and gravel road parallel to the pipeline had not been completely excavated prior to the flood. On May 24, 1994, Barton Contractors, Inc. began reexcavating in the south excavation after flood waters receded. Areas in the south excavation which were excavated but not backfilled prior to the flood were excavated an additional 1 to 2 feet. Soil was then removed around the pipeline foundations and under the gravel road. Due to concern about the stability of the foundations, soil was excavated only to the base of the foundation footing under the pipeline. Figure 9 illustrates the final extent of the south excavation.

Soil samples were collected in all areas based upon the grid interval calculations presented in Table 2. Sample locations are illustrated in Figure 9. Soil Sample SE-1, collected on May 31, 1994, indicated a level of 0.28 mg/kg which is above the LUST objective for naphthalene, but below the ADL. Soil Samples SW-1, SW-2, and SW-3 were above the LUST objective for naphthalene, and Soil Sample SW-1 indicated a level of 20.7 micrograms per kilogram (ug/kg) for benzene which was above the LUST objective of 5 ug/kg. The soil surrounding Soil Sample SW-1 was excavated an additional 2 feet,

while an additional foot of soil was excavated around Soil Samples SW-2 and SW-3. Soil Samples S-1, S-2, and S-3 were collected in these areas following the additional excavation. These samples were below the LUST objectives, with the exception of Soil Sample S-2, which was above the LUST objective for naphthalene, but below the ADL. A chronological summary of Site activities, including sampling dates and daily quantities of soil transported off the Site, is included in Appendix G of this report.

4.2.2 Surface Water Contamination

During the initial visual inspection of the release area, it was believed that little or no product had reached the surface water surrounding the Site. On March 11, 1994, containment and absorbent booms were placed on the Mississippi River and the pond at the northeast end of the spill area. Booms were checked and maintained daily to determine the presence of free product in these bodies of water. The booms received only trace amounts of product, but continued to be maintained until April 12, 1994, when river levels became too high to continue. At this time, the booms were taken out of the water and placed in plastic bags for proper disposal.

On May 24, 1994, Clark personnel discovered a sheen developing on the pond at the northeast end of the excavation and small pieces of asphaltic material that appeared to be floating on the water. Containment and absorbent booms were immediately placed on the pond to contain the sheen in the southwest corner of the pond. Clark personnel soon discovered the presence of a sheen and asphalt material along the south, west, and north banks of the pond. Additional booms were placed in the pond and changed daily, but product continued to accumulate. On July 5, 1994, Clark enlisted the services of a scuba diver to investigate the bottom of the pond for the presence of free product. A summary of the diver's report is included in Appendix H.

A slight sheen was also noticed on the river following the receding floodwater. Containment and absorbent booms were placed on the river to contain the sheen in an area along the bank. The continued presence of a sheen on the river prompted an investigation of the river bottom by scuba divers. Initial findings indicated the presence of a layer of asphalt along

the bottom of the river originating from the culvert outlet which spread outward approximately 100 feet. A summary of the divers report is included in Appendix H.

4.2.3 Free Product Recovery

Clark began recovering free product on March 11, 1994, immediately following the identification of the release. Vacuum trucks were utilized to pump the free product from the ditches. Due to the high viscosity of the asphalt, the vacuum trucks could not pump the bulk free product. This thicker asphalt was mixed with soil to solidify the material for excavation and transportation. Appendix G contains a daily summary of quantities of soil and liquid transported off the Site. Liquid recovery included the recovery of free product from the ditches, excavation trenches and sumps, and northeast pond. The liquid recovery did not include the removal of free product from the surface of the river and ponds with absorbent booms.

* * * * *

5.0 CONCLUSIONS

Clark has utilized its resources to control and mitigate the spread of contamination due to the release from their above-ground pipeline. The daily collection of free product and excavation of contaminated soils continued until uncontrollable weather factors and flooding forced the cessation of remedial activities at the Site on April 12, 1994. Soil removal in the north excavation and along the ditches was completed, confirmation samples were obtained, and some soil was backfilled before the flooding occurred. The two areas that did not reach completion before the flood were the south excavation, which was excavated but not sampled, and the gravel road under the pipeline, which had not yet been excavated. Soil excavation and free product removal in these areas were resumed on May 24, 1994, following the recedence of floodwater. Soil was excavated and confirmation samples collected and analyzed prior to backfilling and final grading.

The pond at the northeast end of the excavation and the Mississippi River were found to be impacted by the release. Scuba divers discovered free product which appeared to be a heavy asphalt material in the bottoms of these areas. Containment and absorbent booms are currently being utilized to contain and remove free product from the surface of these waters.

* * * * *

6.0 RECOMMENDATIONS

- Monthly gauging of monitoring wells and passive recovery wells with an interface probe to determine the groundwater flow direction and presence of free product (if any) on the water table

- Quarterly sampling of the six perimeter monitoring wells, Monitoring Wells MW-1 through MW-6, for a period of 2 years

- A detailed investigation of the pond bottom, feasibility study

- Continued maintenance of the river and pond booms

- Utilization of a dredge or underwater vacuum system to remove free product from the bottom of the river and pond

- Utilization of an oil skimmer to remove floating product and the sheen from areas on the pond and river

* * * * *

TABLES

Table 1
Summary of Soil Boring Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Soil Boring No.:	MW-1	MW-1	MW-2	MW-2	MW-3	MW-3	MW-4	MW-4
		Soil Sample Interval:	0' - 2'	10' - 12'	0' - 2'	4' - 6'	0' - 2'	6' - 8'	0' - 2'	4' - 6'
		Date Collected:	03/25/94	03/25/94	03/25/94	03/25/94	03/26/94	03/26/94	03/26/94	03/26/94
PARAMETER	Units	LUST Objective*								
BTEX CONSTITUENTS										
Benzene	**µg/kg**	**6**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Toluene	**µg/kg**	**NA**	**ND**	**200**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Ethylbenzene	**µg/kg**	**NA**	**ND**	**500**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Xylenes (total)	µg/kg	NA	ND	2500	ND	ND	ND	ND	ND	ND
Total BTEX	µg/kg	11705	ND	3200	ND	ND	ND	ND	ND	ND
Non-Carcinogenic PNA's										
Naphthalene	mg/kg	0.025	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	**mg/kg**	**8.4**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Anthracene	**mg/kg**	**42.0**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Fluoranthene	**mg/kg**	**5.6**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Fluorene	mg/kg	5.6	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	mg/kg	4.2	ND	ND	ND	0.074 J	ND	ND	ND	ND
Others (total)	mg/kg	4.2	ND	ND	ND	0.026 J	ND	ND	ND	ND
Carcinogenic PNA's										
Benzo (a) anthracene	**mg/kg**	**0.0087**	**ND**	**ND**	**ND**	**ND**	**0.020**	**ND**	**ND**	**ND**
Benzo (a) pyrene	**mg/kg**	**0.015**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Benzo (b) fluoranthene	**mg/kg**	**0.012**	**ND**	**ND**	**ND**	**0.022**	**0.017**	**ND**	**ND**	**ND**
Benzo (k) fluoranthene	mg/kg	0.011	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	mg/kg	0.1	ND	ND	ND	ND	0.024 J	ND	ND	ND
Dibenzo (a,h) anthracene	mg/kg	0.02	ND	ND	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	**mg/kg**	**0.029**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993
µg/kg - Micrograms per kilogram
ND - Non-Detect
NA - Not applicable
Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes
PNA's - Polynuclear aromatic hydrocarbons
mg/kg - Milligrams per kilogram
Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene
J - Detected, but below practical quantitation limit

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Table 1 (continued)
Summary of Soil Boring Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Soil Boring No.:	MW-5	MW-5	MW-6	MW-6	MW-6
		Soil Sample Interval:	0' TO 1'	4' TO 6'	0' TO 1'	4' TO 6'	6' TO 8'
		Date Collected:	3-26-94	3-26-94	3-26-94	3-26-94	3-26-94
PARAMETER	Units	LUST Objective*					
BTEX CONSTITUENTS							
Benzene	µg/kg	5	ND	ND	ND	ND	ND
Toluene	µg/kg	NA	ND	ND	ND	ND	ND
Ethylbenzene	µg/kg	NA	ND	ND	ND	ND	ND
Xylenes (total)	µg/kg	NA	ND	ND	ND	ND	ND
Total BTEX	µg/kg	11705	ND	ND	ND	ND	ND
Non-Carcinogenic PNA's							
Naphthalene	mg/kg	0.025	ND	ND	ND	ND	ND
Acenaphthene	mg/kg	8.4	ND	ND	ND	ND	ND
Anthracene	mg/kg	42.0	ND	ND	ND	ND	ND
Fluoranthene	mg/kg	5.6	ND	ND	ND	ND	ND
Fluorene	mg/kg	5.6	ND	ND	ND	ND	ND
Pyrene	mg/kg	4.2	ND	ND	ND	ND	ND
Others (total)	mg/kg	4.2	ND	ND	ND	ND	ND
Carcinogenic PNA's							
Benzo (a) anthracene	mg/kg	0.0087	ND	ND	ND	ND	ND
Benzo (a) pyrene	mg/kg	0.015	ND	ND	ND	ND	ND
Benzo (b) fluoranthene	mg/kg	0.012	ND	ND	ND	ND	ND
Benzo (k) fluoranthene	mg/kg	0.011	ND	ND	ND	ND	ND
Chrysene	mg/kg	0.1	ND	ND	ND	ND	ND
Dibenzo (a,h) anthracene	mg/kg	0.02	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	mg/kg	0.029	ND	ND	ND	ND	ND

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993
µg/kg - Micrograms per kilogram
ND - Non-Detect
NA - Not applicable
Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes
PNA's - Polynuclear aromatic hydrocarbons
mg/kg - Milligrams per kilogram
Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene

Table 2
Summary of Grid Interval Calculations
Clark Refining and Marketing
Hartford Refinery

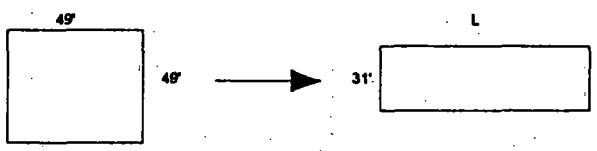
Location	Length (ft)	Width (ft)	Area (ft²)	Grid[1] Interval (ft)
North Excavation	315	50	15750	35.40
South Excavation	182	80	14560	34.04
Ditch Excavation[2]	990	31	30690	49.5[3]

[1] Grid Interval from 35 IAC 725.211 = GI = [(A/3.14)^0.5]/2

[2] Ditch excavation length includes both east-west and north-south ditches

[3] Ditch excavation grid interval calculations:

The grid interval equation above is for a square area, since the ditch has a smaller width than the grid interval, the grid interval was modified for a rectangular area.



Area of 49.5 foot grid interval = 49.5' x 49.5' = 2450 ft²

To change grid to fit a rectangular area, the area and width were held constant and the length of the grid interval was calculated as follows:

Area = 2450 ft² = 31' x L

L = 79'

Hence, the grid interval is 79' along the ditch line and 31' width across the ditch.

Through conversations with Tom Powell (IEPA), it was decided to alternate taking samples from the bottom and sides of the ditch excavation as shown in Figure 8 of this report.

NOTE: Site was divided into the major sections for grid interval calculations so that sampling could occur at different times and so that the grid interval would be fully inclusive.

Table 3
Summary of North Excavation Soil Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Soil Sample No.:	GS-1	GS-2	GS-3	GS-4	GS-5	GS-7
		Date Collected:	03/26/94	03/26/94	03/26/94	03/26/94	03/26/94	03/26/94
PARAMETER	Units	LUST Objective*						
BTEX CONSTITUENTS								
Benzene	µg/kg	5	ND	ND	ND	ND	25.5	15.9
Toluene	µg/kg	NA	ND	ND	ND	ND	307.2	258.1
Ethylbenzene	µg/kg	NA	ND	ND	ND	ND	173.6	154.6
Xylenes (total)	µg/kg	NA	ND	ND	ND	ND	757.3	696.2
Total BTEX	µg/kg	11705	ND	ND	ND	ND	1263.6	1122.8
Non-Carcinogenic PNA's								
Naphthalene	mg/kg	0.025	ND	ND	ND	ND	0.72	0.09
Acenaphthene	mg/kg	8.4	ND	ND	ND	ND	0.15	ND
Anthracene	mg/kg	42.0	ND	ND	ND	ND	0.03	ND
Fluoranthene	mg/kg	5.6	ND	ND	ND	ND	ND	0.04
Fluorene	mg/kg	5.6	ND	ND	ND	ND	ND	ND
Pyrene	mg/kg	4.2	ND	ND	ND	ND	ND	ND
Others (total)	mg/kg	4.2	ND	ND	ND	ND	ND	0.02
Carcinogenic PNA's								
Benzo (a) anthracene	mg/kg	0.0087	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	mg/kg	0.015	ND	ND	ND	ND	ND	ND
Benzo (b) fluoranthene	mg/kg	0.012	ND	ND	ND	ND	ND	ND
Benzo (k) fluoranthene	mg/kg	0.011	ND	ND	ND	ND	0.02	ND
Chrysene	mg/kg	0.1	ND	ND	ND	ND	ND	0.01
Dibenzo (a,h) anthracene	mg/kg	0.02	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	mg/kg	0.029	ND	ND	ND	ND	ND	ND

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993
µg/kg - Micrograms per kilogram
ND - Non-Detect
NA - Not applicable
Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes
PNA's - Polynuclear aromatic hydrocarbons
mg/kg - Milligrams per kilogram
Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene

Table 3 (continued)
Summary of North Excavation Soil Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Soil Sample No.:	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8	SS-9	SS-10	SS-11	SS-12	SS-12(A)
		Date Collected:	03/30/94	03/30/94	03/30/94	03/30/94	03/30/94	03/31/94	03/31/94	03/31/94	03/31/94	04/04/94	04/04/94	04/06/94
PARAMETER	Units	LUST Objective*												
BTEX CONSTITUENTS														
Benzene	µg/kg	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.8	ND
Toluene	µg/kg	NA	4.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	146.4	4.7
Ethylbenzene	µg/kg	NA	5.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	164.3	4.8
Xylenes (total)	µg/kg	NA	24.4	ND	ND	ND	ND	4.0	ND	3.6	ND	7.9	800.8	24.5
Total BTEX	µg/kg	11705	34.4	ND	ND	ND	ND	4.0	ND	3.6	ND	7.9	1119.3	34
Non-Carcinogenic PNA's														
Naphthalene	mg/kg	0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14
Acenaphthene	mg/kg	8.4	ND	ND	ND	ND	ND	ND	ND	ND	0.04	ND	ND	ND
Anthracene	mg/kg	42.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.06
Fluoranthene	mg/kg	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.8	0.29
Fluorene	mg/kg	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	mg/kg	4.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.28
Others (total)	mg/kg	4.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.9	0.21
Carcinogenic PNA's														
Benzo (a) anthracene	mg/kg	0.0087	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	mg/kg	0.015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (b) fluoranthene	mg/kg	0.012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (k) fluoranthene	mg/kg	0.011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	mg/kg	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo (a,h) anthracene	mg/kg	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	mg/kg	0.029	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993

µg/kg - Micrograms per kilogram

ND - Non-Detect

NA - Not applicable

Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes

PNA's - Polynuclear aromatic hydrocarbons

mg/kg - Milligrams per kilogram

Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene

Table 3 (continued)
Summary of North Excavation Soil Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Soil Sample No.:	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21	SS-22
		Date Collected:	04/04/94	04/04/94	04/04/94	04/04/94	04/08/94	04/08/94	04/08/94	04/08/94	04/09/94	04/09/94
PARAMETER	Units	LUST Objective*										
BTEX CONSTITUENTS												
Benzene	µg/kg	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	µg/kg	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	µg/kg	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	µg/kg	NA	8.3	2.5	2.1	2.2	ND	ND	ND	ND	ND	ND
Total BTEX	µg/kg	11705	8.3	2.5	2.1	2.2	ND	ND	ND	ND	ND	ND
Non-Carcinogenic PNA's												
Naphthalene	mg/kg	0.025	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	mg/kg	8.4	ND	ND	0.02	ND	ND	ND	ND	ND	ND	0.03
Anthracene	mg/kg	42.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	mg/kg	5.6	ND	0.02	0.07	ND	ND	ND	ND	ND	ND	ND
Fluorene	mg/kg	5.6	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	mg/kg	4.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Others (total)	mg/kg	4.2	ND	0.01	0.05	ND	0.01	ND	ND	ND	ND	ND
Carcinogenic PNA's												
Benzo (a) anthracene	mg/kg	0.0087	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	mg/kg	0.015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (b) fluoranthene	mg/kg	0.012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (k) fluoranthene	mg/kg	0.011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	mg/kg	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo (a,h) anthracene	mg/kg	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	mg/kg	0.029	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993
µg/kg - Micrograms per kilogram
ND - Non-Detect
NA - Not applicable
Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes
PNA's - Polynuclear aromatic hydrocarbons
mg/kg - Milligrams per kilogram
Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene

Table 4
Summary of South Excavation Soil Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Soil Sample No.:	AREA 1 WEST	AREA 2 EAST	SE-1	SE-2	R1 WEST	R2 EAST	SE-3	SE-4	SW NEAR LINE
		Date Collected:	05/27/94	05/27/94	05/31/94	05/31/94	06/01/94	06/01/94	06/01/94	06/01/94	06/06/94
PARAMETER	Units	LUST Objective*									
BTEX CONSTITUENTS											
Benzene	µg/kg	5	ND	ND	4.2	ND	ND	ND	ND	ND	ND
Toluene	µg/kg	NA	ND	ND	3.0	ND	ND	ND	ND	ND	ND
Ethylbenzene	µg/kg	NA	ND	ND	15.4	ND	ND	2.6	ND	ND	ND
Xylenes (total)	µg/kg	NA	ND	ND	58.1	ND	ND	13.1	ND	ND	6.4
Total BTEX	µg/kg	11705	ND	ND	80.7	ND	ND	15.7	ND	ND	6.4
Non-Carcinogenic PNA's											
Naphthalene	mg/kg	0.025	0.02	ND	0.28	ND	ND	0.04	ND	ND	ND
Acenaphthene	mg/kg	8.4	0.03	ND	ND	0.02	ND	ND	ND	ND	ND
Anthracene	mg/kg	42.0	ND	ND	0.12	ND	0.05	ND	ND	ND	ND
Fluoranthene	mg/kg	5.6	0.01	ND	ND	0.02	0.64	ND	ND	ND	ND
Fluorene	mg/kg	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	mg/kg	4.2	ND	ND	1.4	ND	0.13	0.07	ND	ND	ND
Others (total)	mg/kg	4.2	0.03	ND	0.54	0.02	0.32	0.05	0.01	ND	ND
Carcinogenic PNA's											
Benzo (a) anthracene	mg/kg	0.0087	ND	ND	ND	ND	0.122	0.02	ND	ND	ND
Benzo (a) pyrene	mg/kg	0.015	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (b) fluoranthene	mg/kg	0.012	ND	ND	ND	ND	ND	0.02	ND	ND	ND
Benzo (k) fluoranthene	mg/kg	0.011	ND	ND	ND	ND	ND	0.01	ND	ND	ND
Chrysene	mg/kg	0.1	ND	ND	ND	ND	0.1	ND	ND	ND	ND
Dibenzo (a,h) anthracene	mg/kg	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	mg/kg	0.029	ND	ND	ND	ND	ND	ND	ND	ND	ND

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993

µg/kg - Micrograms per kilogram

ND - Non-Detect

NA - Not applicable

Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes

PNA's - Polynuclear aromatic hydrocarbons

mg/kg - Milligrams per kilogram

Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene

Table 4 (continued)
Summary of South Excavation Soil Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Soil Sample No.:	SW-1	SW-2	SW-3	S1	S2	S3	SW-4	SW-5	SW-6	SW-7
		Date Collected:	06/07/94	06/07/94	06/07/94	06/10/94	06/10/94	06/10/94	06/13/94	06/13/94	06/13/94	06/13/94
PARAMETER	Units	LUST Objective*										
BTEX CONSTITUENTS												
Benzene	µg/kg	5	20.7	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	µg/kg	NA	107.2	3.2	ND	ND	11.6	ND	ND	ND	ND	ND
Ethylbenzene	µg/kg	NA	87.2	4.4	ND	ND	22.6	ND	ND	ND	ND	ND
Xylenes (total)	µg/kg	NA	505.2	18.1	ND	ND	164.8	4.5	3.7	ND	3.0	12.6
Total BTEX	µg/kg	11705	720.3	25.7	ND	ND	199.0	4.5	3.7	ND	3.0	12.6
Non-Carcinogenic PNA's												
Naphthalene	mg/kg	0.025	2.0	0.18	ND	ND	0.26	ND	0.07	ND	ND	ND
Acenaphthene	mg/kg	8.4	0.8	0.25	ND	ND	0.18	ND	ND	ND	ND	ND
Anthracene	mg/kg	42.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.06
Fluoranthene	mg/kg	5.6	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND
Fluorene	mg/kg	5.6	0.72	ND	0.02	ND	0.20	ND	ND	ND	ND	0.05
Pyrene	mg/kg	4.2	0.75	ND	ND	ND	ND	ND	0.26	ND	ND	ND
Others (total)	mg/kg	4.2	1.9	0.27	0.02	ND	0.55	ND	0.13	ND	ND	0.30
Carcinogenic PNA's												
Benzo (a) anthracene	mg/kg	0.0087	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	mg/kg	0.015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (b) fluoranthene	mg/kg	0.012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (k) fluoranthene	mg/kg	0.011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	mg/kg	0.1	0.57	0.14	ND	ND	ND	ND	0.07	ND	ND	ND
Dibenzo (a,h) anthracene	mg/kg	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	mg/kg	0.029	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993
µg/kg - Micrograms per kilogram
ND - Non-Detect
NA - Not applicable
Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes
PNA's - Polynuclear aromatic hydrocarbons
mg/kg - Milligrams per kilogram
Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene

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Table 4 (continued)
Summary of South Excavation Soil Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Soil Sample No.:	SW-8	SW-9	SW-10	SW-11	SW-12	SW-13	SW-14	SW-15	SW-16	SW-17
		Date Collected:	06/13/94	06/13/94	06/14/94	06/14/94	06/15/94	06/15/94	06/15/94	06/15/94	06/15/94	06/15/94
PARAMETER	Units	LUST Objective*										
BTEX CONSTITUENTS												
Benzene	µg/kg	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	µg/kg	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	µg/kg	NA	ND	ND	4.6	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	µg/kg	NA	ND	3.3	6.4	11.4	ND	ND	ND	ND	ND	ND
Total BTEX	µg/kg	11705	ND	3.3	11.0	11.4	ND	ND	ND	ND	ND	ND
Non-Carcinogenic PNA's												
Naphthalene	mg/kg	0.025	ND	ND	0.06	0.55	ND	0.01	ND	ND	ND	0.04
Acenaphthene	mg/kg	8.4	ND	ND	0.11	0.28	ND	ND	ND	0.07	0.42	0.03
Anthracene	mg/kg	42.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	mg/kg	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	mg/kg	5.6	ND	ND	0.25	0.30	0.06	0.06	ND	0.19	0.32	0.04
Pyrene	mg/kg	4.2	ND	ND	ND	0.14	ND	ND	ND	ND	ND	0.03
Others (total)	mg/kg	4.2	ND	0.02	0.55	0.66	0.08	0.06	0.02	0.33	0.59	0.06
Carcinogenic PNA's												
Benzo (a) anthracene	mg/kg	0.0067	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	mg/kg	0.015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (b) fluoranthene	mg/kg	0.012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (k) fluoranthene	mg/kg	0.011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	mg/kg	0.1	ND	ND	ND	0.10	ND	ND	ND	ND	ND	0.03
Dibenzo (a,h) anthracene	mg/kg	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	mg/kg	0.028	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993

µg/kg - Micrograms per kilogram

ND - Non-Detect

NA - Not applicable

Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes

PNA's - Polynuclear aromatic hydrocarbons

mg/kg - Milligrams per kilogram

Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene

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Table 4 (continued)
Summary of South Excavation Soil Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Soil Sample No.:	SW-18	SW-19	SW-20	SW-21	SW-22	SW-23	SW-24	SW-25
		Date Collected:	06/15/94	06/16/94	06/16/94	06/16/94	06/17/94	06/18/94	06/18/94	06/18/94
PARAMETER	Units	LUST Objective*								
BTEX CONSTITUENTS										
Benzene	µg/kg	6	ND	ND	ND	ND	ND	ND	ND	4.2
Toluene	µg/kg	NA	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	µg/kg	NA	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	µg/kg	NA	4.4	ND	ND	ND	ND	ND	ND	4.1
Total BTEX	µg/kg	11705	4.4	ND	ND	ND	ND	ND	ND	8.3
Non-Carcinogenic PNA's										
Naphthalene	mg/kg	0.025	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	mg/kg	8.4	ND	ND	0.06	0.22	ND	0.09	0.01	ND
Anthracene	mg/kg	42.0	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	mg/kg	5.6	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	mg/kg	5.6	ND	ND	0.20	0.36	0.07	0.15	0.02	ND
Pyrene	mg/kg	4.2	ND	ND	ND	ND	ND	ND	ND	ND
Others (total)	mg/kg	4.2	ND	ND	0.58	0.22	0.09	0.26	0.03	ND
Carcinogenic PNA's										
Benzo (a) anthracene	mg/kg	0.0087	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	mg/kg	0.015	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (b) fluoranthene	mg/kg	0.012	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (k) fluoranthene	mg/kg	0.011	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	mg/kg	0.1	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzo (a,h) anthracene	mg/kg	0.02	ND	ND	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	mg/kg	0.029	ND	ND	ND	ND	ND	ND	ND	ND

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993
µg/kg - Micrograms per kilogram
ND - Non-Detect
NA - Not applicable
Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes
PNA's - Polynuclear aromatic hydrocarbons
mg/kg - Milligrams per kilogram
Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene

Table 5
Summary of Ditch Soil Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Soil Sample No.:	DS-0S	DS-0B	DS-1N	DS-1B	DS-2S	DS-2B	DS-3N	DS-3B	DS-4S	DS-4B
		Date Collected:	04/07/94	04/07/94	04/01/94	04/01/94	04/01/94	04/01/94	04/01/94	04/01/94	04/01/94	04/01/94
PARAMETER	Units	LUST Objective*										
BTEX CONSTITUENTS												
Benzene	µg/kg	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	µg/kg	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	µg/kg	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	µg/kg	NA	ND	ND	ND	4.2	ND	2.5	ND	ND	ND	4.7
Total BTEX	µg/kg	11705	ND	ND	ND	4.2	ND	2.5	ND	ND	ND	4.7
Non-Carcinogenic PNA's												
Naphthalene	mg/kg	0.025	ND	ND	ND	ND	0.02	ND	ND	0.01	ND	0.02
Acenaphthene	mg/kg	8.4	ND	ND	ND	ND	ND	ND	0.02	ND	ND	ND
Anthracene	mg/kg	42.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	mg/kg	5.6	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND
Fluorene	mg/kg	5.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pyrene	mg/kg	4.2	0.03	ND	ND	ND	ND	ND	ND	0.01	ND	ND
Others (total)	mg/kg	4.2	ND	ND	ND	ND	0.01	ND	ND	0.02	ND	ND
Carcinogenic PNA's												
Benzo (a) anthracene	mg/kg	0.0087	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	mg/kg	0.015	ND	ND	ND	ND	0.01	ND	ND	ND	0.34	ND
Benzo (b) fluoranthene	mg/kg	0.012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (k) fluoranthene	mg/kg	0.011	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND
Chrysene	mg/kg	0.1	ND	ND	ND	ND	0.02	ND	ND	0.03	ND	ND
Dibenzo (a,h) anthracene	mg/kg	0.02	ND	ND	ND	ND	ND	ND	0.01	ND	0.30	ND
Indeno (1,2,3-cd) pyrene	mg/kg	0.029	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993
µg/kg - Micrograms per kilogram
ND - Non-Detect
NA - Not applicable
Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes
PNA's - Polynuclear aromatic hydrocarbons
mg/kg - Milligrams per kilogram
Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene

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Table 5 (continued)
Summary of Ditch Soil Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Soil Sample No.:	DS-4S(A)	DS-5B	DS-5B(A)	DS-5N	DS-5N(A)	DS-6B	DS-6S	DS-7B	DS-7W	DS-8B
		Date Collected:	04/06/94	04/01/94	04/07/94	04/01/94	04/07/94	04/01/94	04/01/94	04/01/94	04/01/94	04/01/94
PARAMETER	Units	LUST Objective*										
BTEX CONSTITUENTS												
Benzene	µg/kg	5	ND[a]	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	µg/kg	NA	ND	8.1	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	µg/kg	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	µg/kg	NA	2.5	12.3	ND	ND	ND	4.6	2.0	ND	ND	3.3
Total BTEX	µg/kg	11705	2.5	15.4	ND	ND	ND	4.6	2.0	ND	ND	3.3
Non-Carcinogenic PNA's												
Naphthalene	mg/kg	0.025	0.06	0.03	ND	ND	ND	ND	ND	0.02	ND	ND
Acenaphthene	mg/kg	8.4	ND	ND	ND	ND	ND	ND	ND	0.06	ND	ND
Anthracene	mg/kg	42.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	mg/kg	5.6	ND	0.57	ND	ND	0.03	0.06	ND	ND	ND	0.19
Fluorene	mg/kg	5.6	ND	0.04	ND	ND	ND	0.05	ND	ND	ND	0.06
Pyrene	mg/kg	4.2	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND
Others (total)	mg/kg	4.2	ND	0.08	ND	ND	ND	0.02	0.03	ND	ND	0.08
Carcinogenic PNA's												
Benzo (a) anthracene	mg/kg	0.0087	ND	0.88	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	mg/kg	0.015	ND	ND	ND	0.01	ND	ND	0.06	ND	ND	ND
Benzo (b) fluoranthene	mg/kg	0.012	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (k) fluoranthene	mg/kg	0.011	ND	ND	ND	0.04	ND	ND	ND	ND	ND	ND
Chrysene	mg/kg	0.1	ND	0.79	ND	0.07	ND	ND	ND	ND	ND	ND
Dibenzo (a,h) anthracene	mg/kg	0.02	ND	0.54	ND	ND	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	mg/kg	0.029	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993

µg/kg - Micrograms per kilogram

ND - Non-Detect

NA - Not applicable

Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes

PNA's - Polynuclear aromatic hydrocarbons

mg/kg - Milligrams per kilogram

Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene

Table 5 (continued)
Summary of Ditch Soil Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Soil Sample No.:	DS-8E	DS-9B	DS-9W	DS-10B	DS-10E	DS-11B	DS-11W	DS-12B	DS-12E	DS-13B	DS-13W
		Date Collected:	04/01/94	04/01/94	04/01/94	04/01/94	04/01/94	04/01/94	04/01/94	04/01/94	04/01/94	04/01/94	04/01/94
PARAMETER	Units	LUST Objective*											
BTEX CONSTITUENTS													
Benzene	µg/kg	5	ND*	ND	ND	ND	ND	ND	ND	ND	ND	39.5	ND
Toluene	µg/kg	NA	ND	ND	ND	ND	ND	ND	ND	4.0	ND	199.1	ND
Ethylbenzene	µg/kg	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	66.6	ND
Xylenes (total)	µg/kg	NA	2.4	3.8	ND	ND	ND	3.4	ND	11.7	ND	374.4	3.5
Total BTEX	µg/kg	11705	2.4	3.8	ND	ND	ND	3.4	ND	15.7	ND	679.6	3.5
Non-Carcinogenic PNA's													
Naphthalene	mg/kg	0.025	ND	0.02	ND	ND	0.01	0.02	ND	ND	ND	0.06	ND
Acenaphthene	mg/kg	8.4	ND	0.08	ND	ND	ND	0.02	ND	ND	ND	ND	ND
Anthracene	mg/kg	42.0	0.04	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND
Fluoranthene	mg/kg	5.6	ND	0.02	ND	ND	0.02	0.06	0.02	0.04	0.01	0.40	ND
Fluorene	mg/kg	5.6	0.04	ND	ND	ND	ND	ND	ND	ND	ND	0.08	ND
Pyrene	mg/kg	4.2	ND	ND	ND	ND	ND	ND	ND	0.50	ND	ND	ND
Others (total)	mg/kg	4.2	0.05	0.01	0.01	0.01	ND	0.03	0.02	ND	ND	0.13	ND
Carcinogenic PNA's													
Benzo (a) anthracene	mg/kg	0.0087	4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	mg/kg	0.016	ND	ND	ND	ND	ND	0.08	ND	ND	ND	ND	ND
Benzo (b) fluoranthene	mg/kg	0.012	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.81	ND
Benzo (k) fluoranthene	mg/kg	0.011	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	mg/kg	0.1	0.43	ND	0.02	ND	ND	0.21	ND	ND	0.03	1.8	ND
Dibenzo (a,h) anthracene	mg/kg	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	mg/kg	0.029	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993

µg/kg - Micrograms per kilogram

ND - Non-Detect

NA - Not applicable

Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes

PNA's - Polynuclear aromatic hydrocarbons

mg/kg - Milligrams per kilogram

Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene

Table 6
Summary of Groundwater Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

		Monitoring Well:	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7
		Date Collected:	04/09/94	04/09/94	04/09/94	04/09/94	04/09/94	04/09/94	04/09/94
PARAMETER	Units	LUST Objective*							
BTEX CONSTITUENTS									
Benzene	µg/l	5	ND	ND	ND	ND	ND	ND	ND
Toluene	µg/l	NA	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	µg/l	NA	ND	ND	ND	ND	ND	ND	ND
Xylenes (total)	µg/l	NA	ND	8	ND	ND	ND	ND	6
Total BTEX	µg/l	11705	ND	8	ND	ND	ND	ND	6
Non-Carcinogenic PNA's									
Naphthalene	mg/l	0.025	ND	ND	ND	ND	ND	ND	ND
Acenaphthene	mg/l	0.42	ND	ND	ND	ND	ND	ND	ND
Anthracene	mg/l	2.1	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	mg/l	0.28	ND	ND	ND	ND	ND	ND	ND
Fluorene	mg/l	0.28	ND	ND	ND	ND	ND	ND	ND
Pyrene	mg/l	0.21	ND	ND	ND	ND	ND	ND	ND
Others (total)	mg/l	0.21	ND	ND	ND	ND	ND	ND	0.0002
Carcinogenic PNA's									
Benzo (a) anthracene	mg/l	**	ND	ND	ND	ND	ND	ND	ND
Benzo (a) pyrene	mg/l	**	ND	ND	ND	ND	ND	ND	ND
Benzo (b) fluoranthene	mg/l	**	ND	ND	ND	ND	ND	ND	ND
Benzo (k) fluoranthene	mg/l	**	ND	ND	ND	ND	ND	ND	ND
Chrysene	mg/l	**	ND	ND	ND	ND	ND	ND	ND
Dibenzo (a,h) anthracene	mg/l	**	ND	ND	ND	ND	ND	ND	ND
Indeno (1,2,3-cd) pyrene	mg/l	**	ND	ND	ND	ND	ND	ND	ND

* - Lust Objective from IEPA's "Leaking Underground Storage Tank Soil Sampling Requirements", February 1993

MW-7 - Duplicate sample from MW-1

µg/l - Micrograms per kilogram

ND - Non-Detect

NA - Not applicable

Total BTEX - Sum of benzene, toluene, ethylbenzene, and total xylenes

PNA's - Polynuclear aromatic hydrocarbons

mg/l - Milligrams per kilogram

Others (total) - Sum of acenaphthylene, benzo (g,h,i) perylene, and phenanthrene

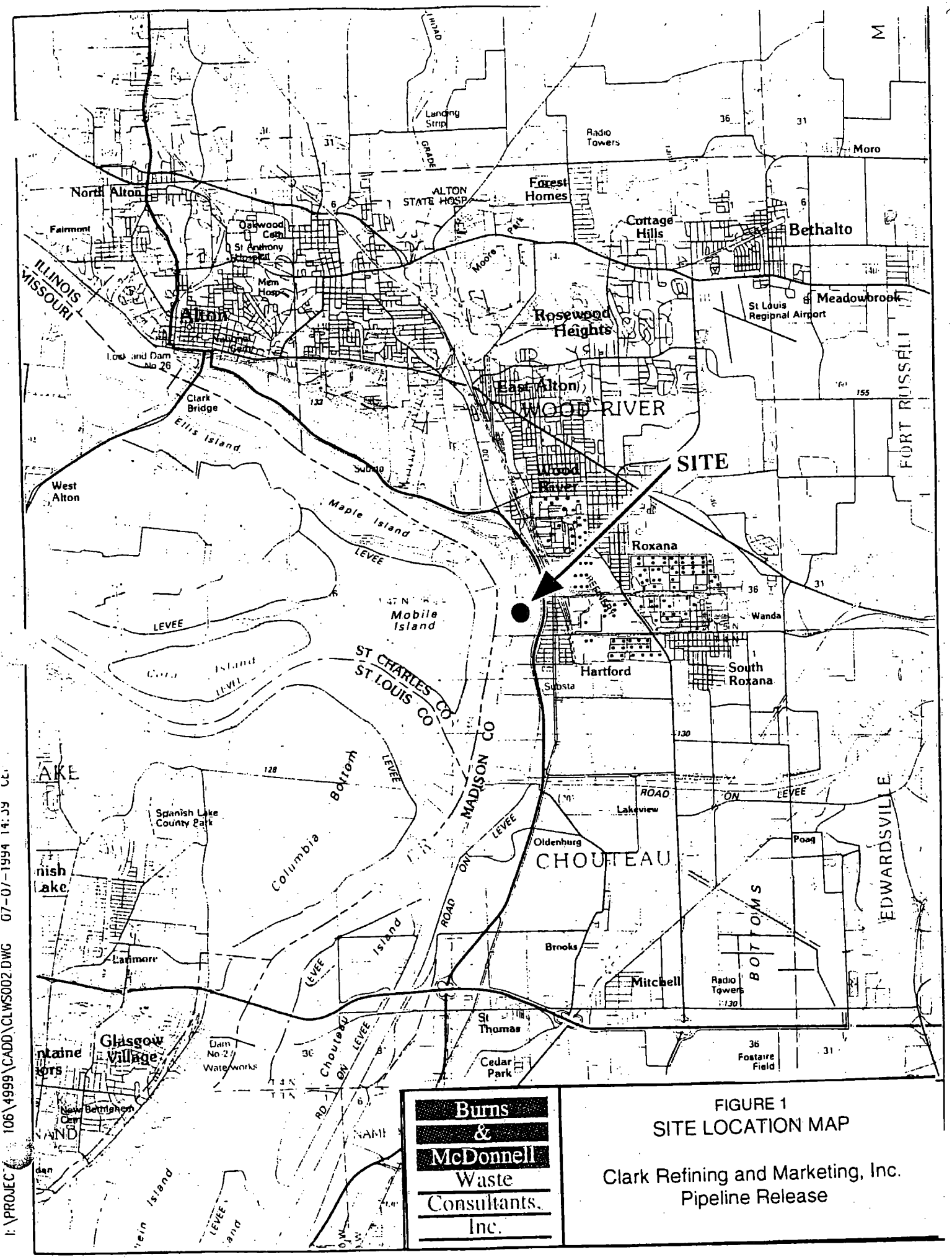
** - Sum of total carcinogenic pna's must be below 0.0002 mg/l.

Table 6 (continued)
Summary of Groundwater Sample Results
Clark Refining and Marketing, Inc.
Hartford Refinery

	Units	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7*
Sample Date:		04/09/94	04/09/94	04/09/94	04/09/94	04/09/94	04/09/94	04/09/94
Compound								
Total Petroleum Hydrocarbons								
As Gasoline	mg/l	ND	ND	ND	ND	ND	ND	ND
As Diesel	mg/l	2.07	1.41	ND	ND	ND	ND	2.66
As Jet Fuel	mg/l	ND	ND	ND	ND	ND	ND	ND
As Unidentified Hydrocarbon	mg/l	ND	ND	ND	ND	ND	ND	ND
As Motor Oil	mg/l	ND	ND	ND	ND	ND	ND	ND
As Mineral Spirits	mg/l	ND	ND	ND	ND	ND	ND	ND

MW-7* - Duplicate sample of MW-1
mg/l - Milligrams per liter
ND - Non-Detect

FIGURES



Burns & McDonnell Waste Consultants, Inc.

FIGURE 1
SITE LOCATION MAP

Clark Refining and Marketing, Inc.
Pipeline Release

I:\PROJECT\106\4999\CADD\CLWS002.DWG 07-07-1994 14:39

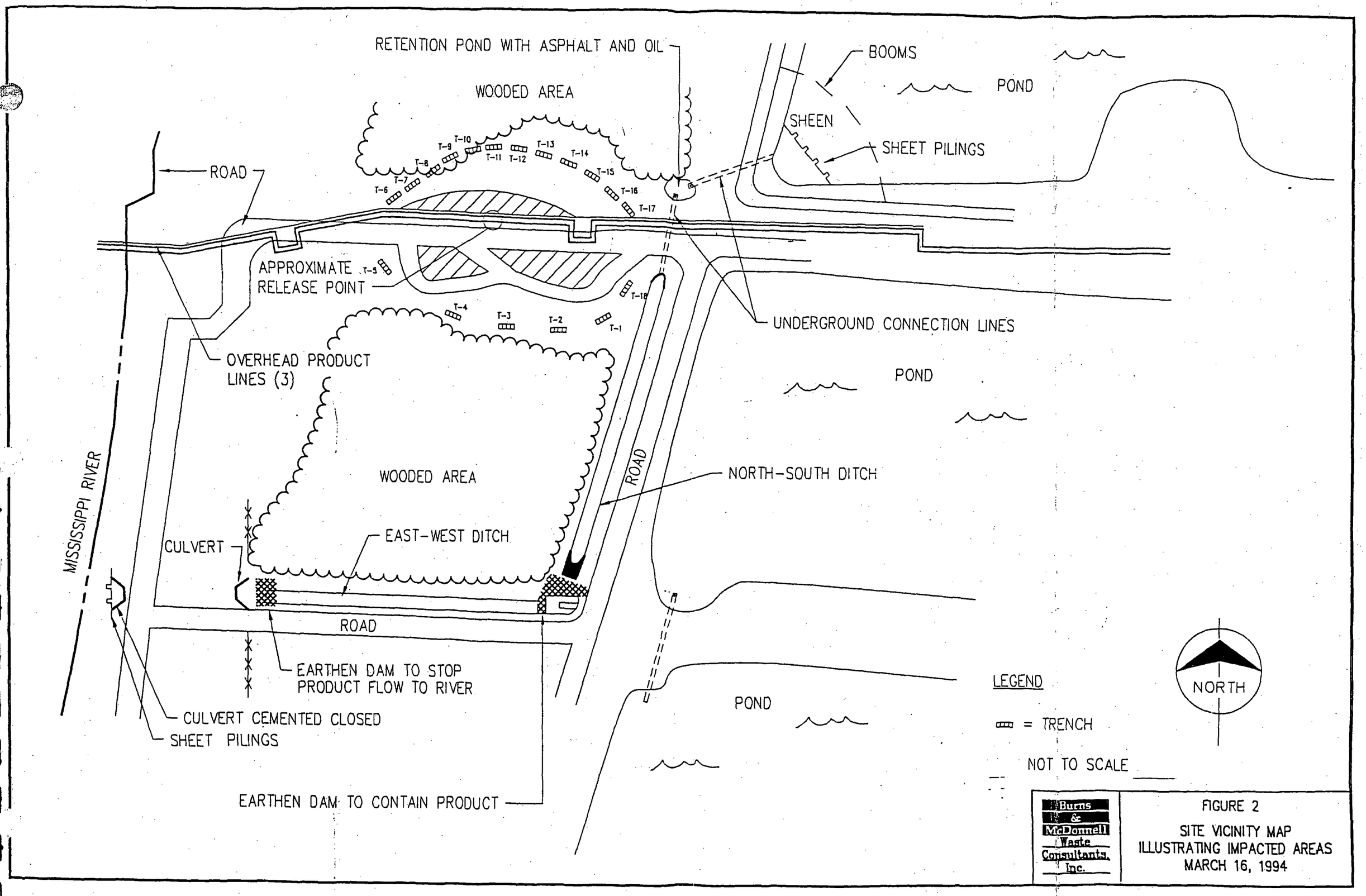


FIGURE 2

SITE VICINITY MAP
ILLUSTRATING IMPACTED AREAS
MARCH 16, 1994

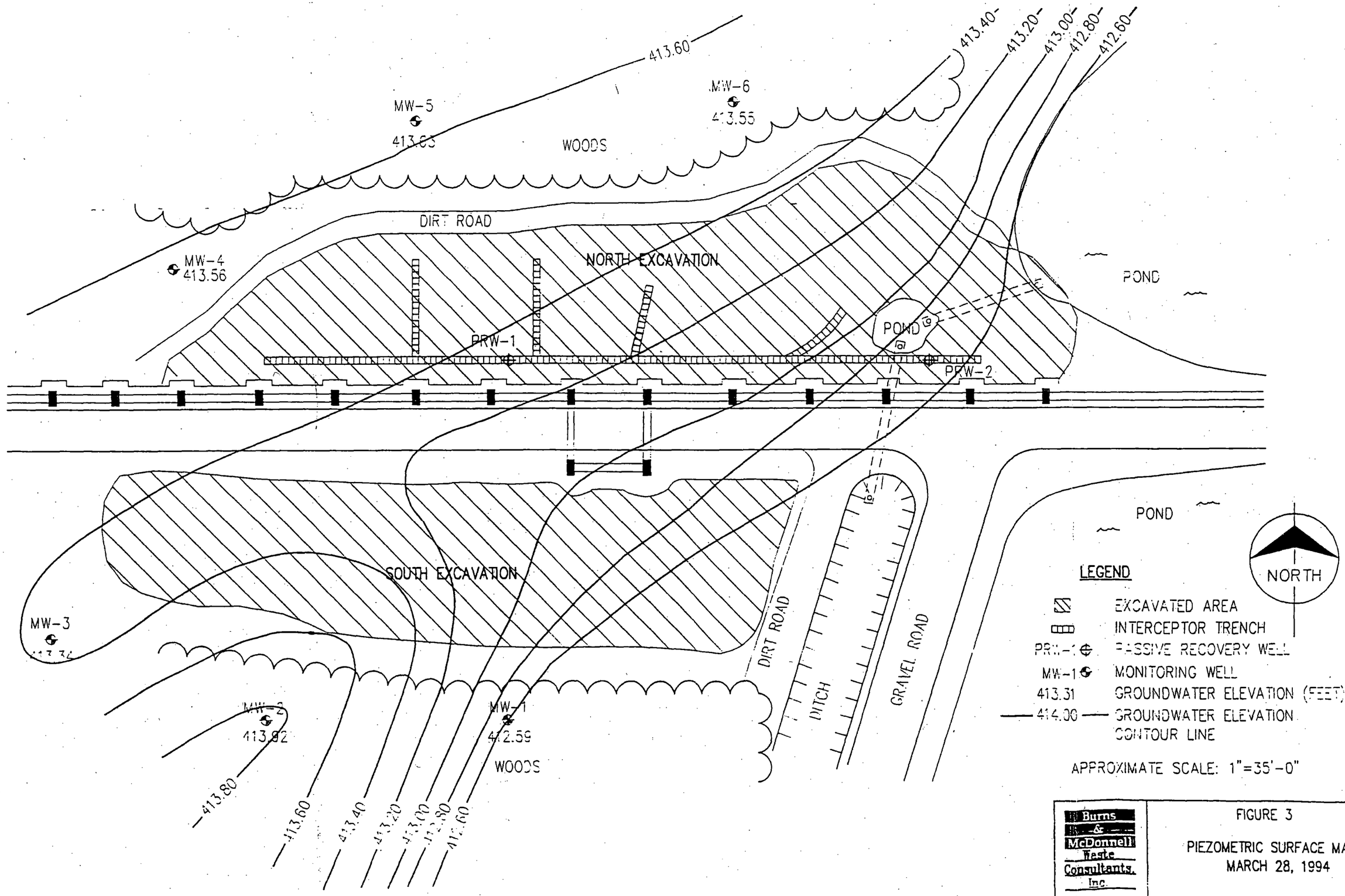


FIGURE 3

PIEZOMETRIC SURFACE MAP
MARCH 28, 1994

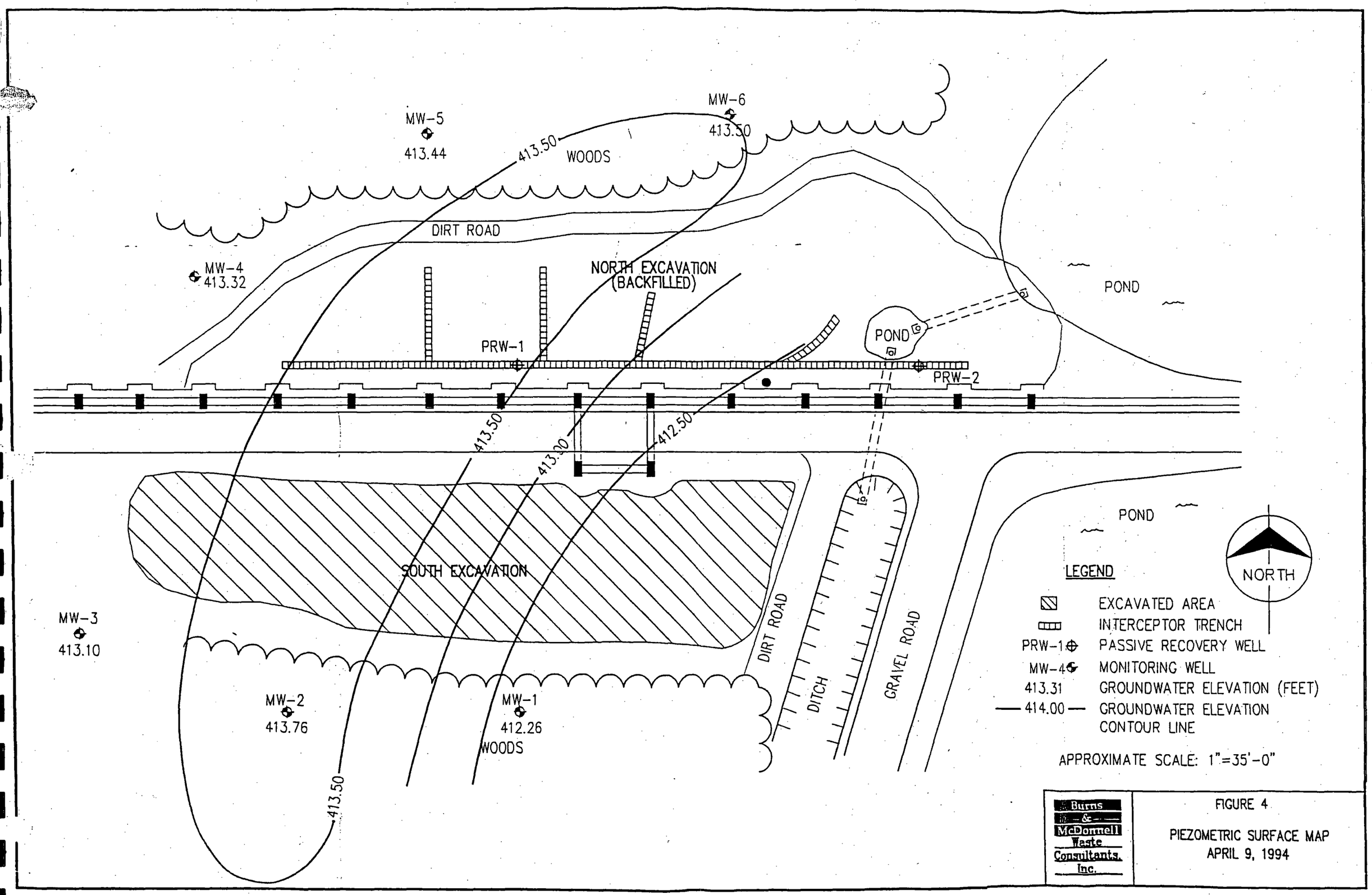


FIGURE 4

PIEZOMETRIC SURFACE MAP
APRIL 9, 1994

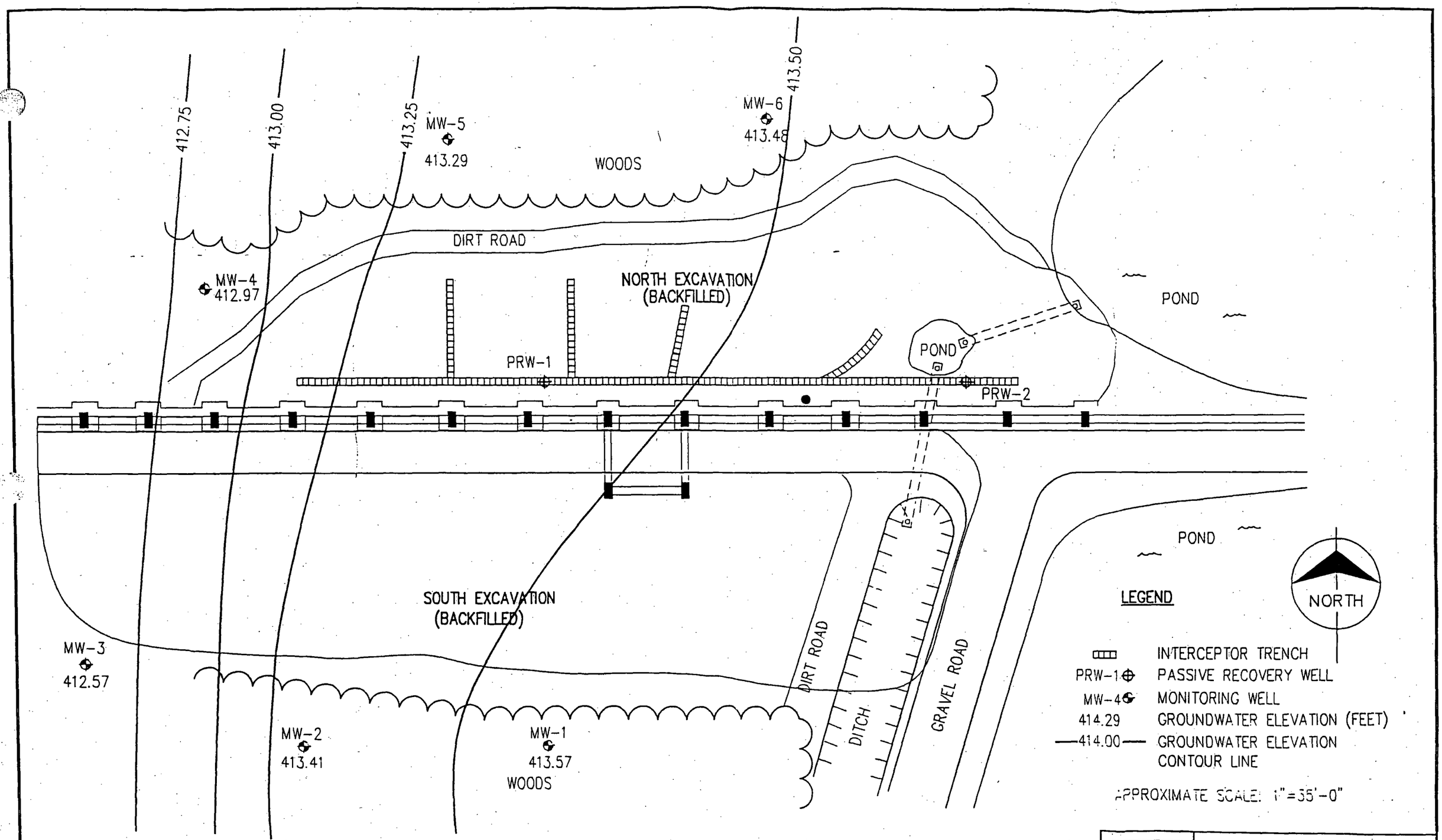


FIGURE 5

PIEZOMETRIC SURFACE MAP
JUNE 16, 1994

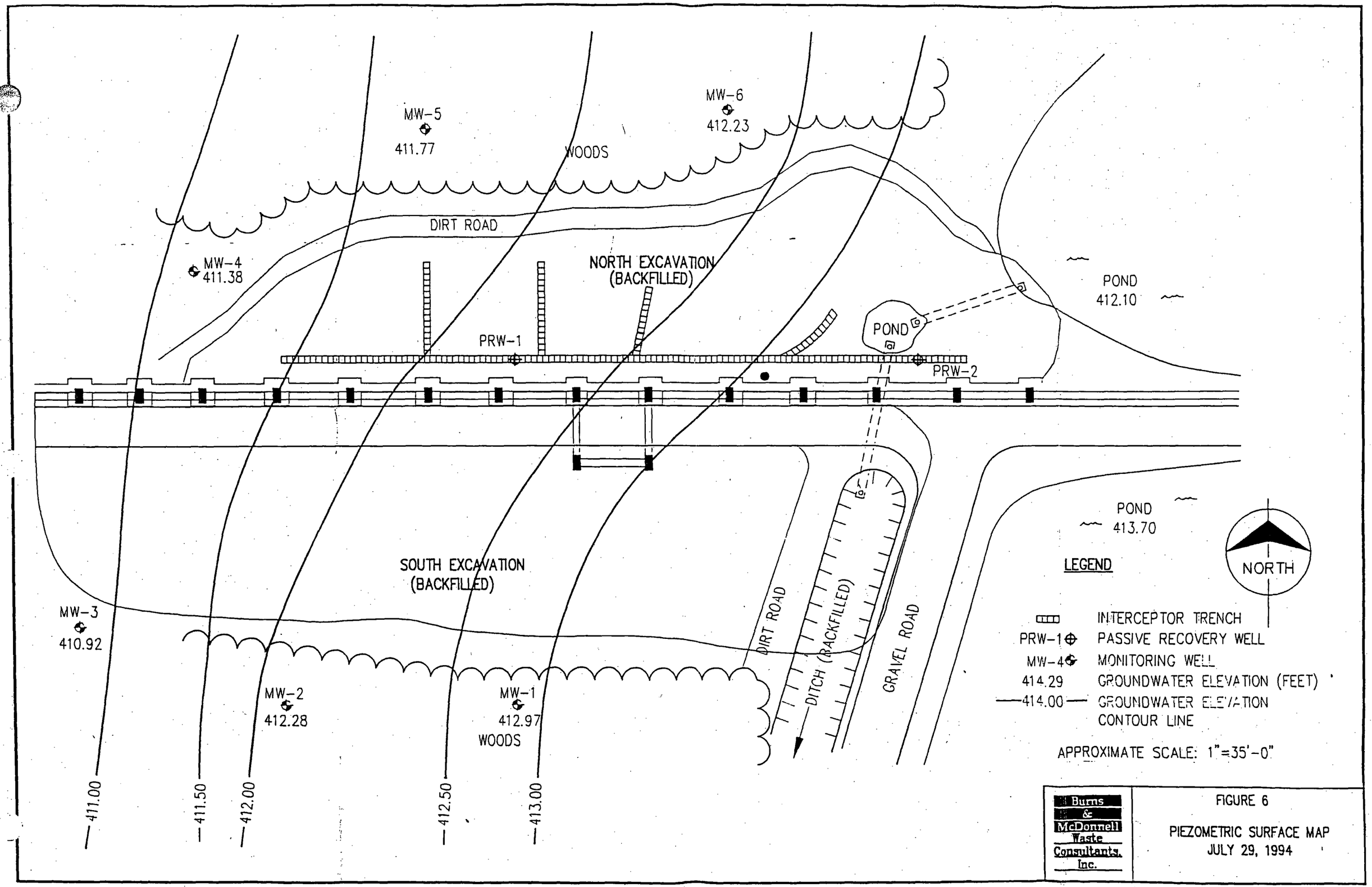
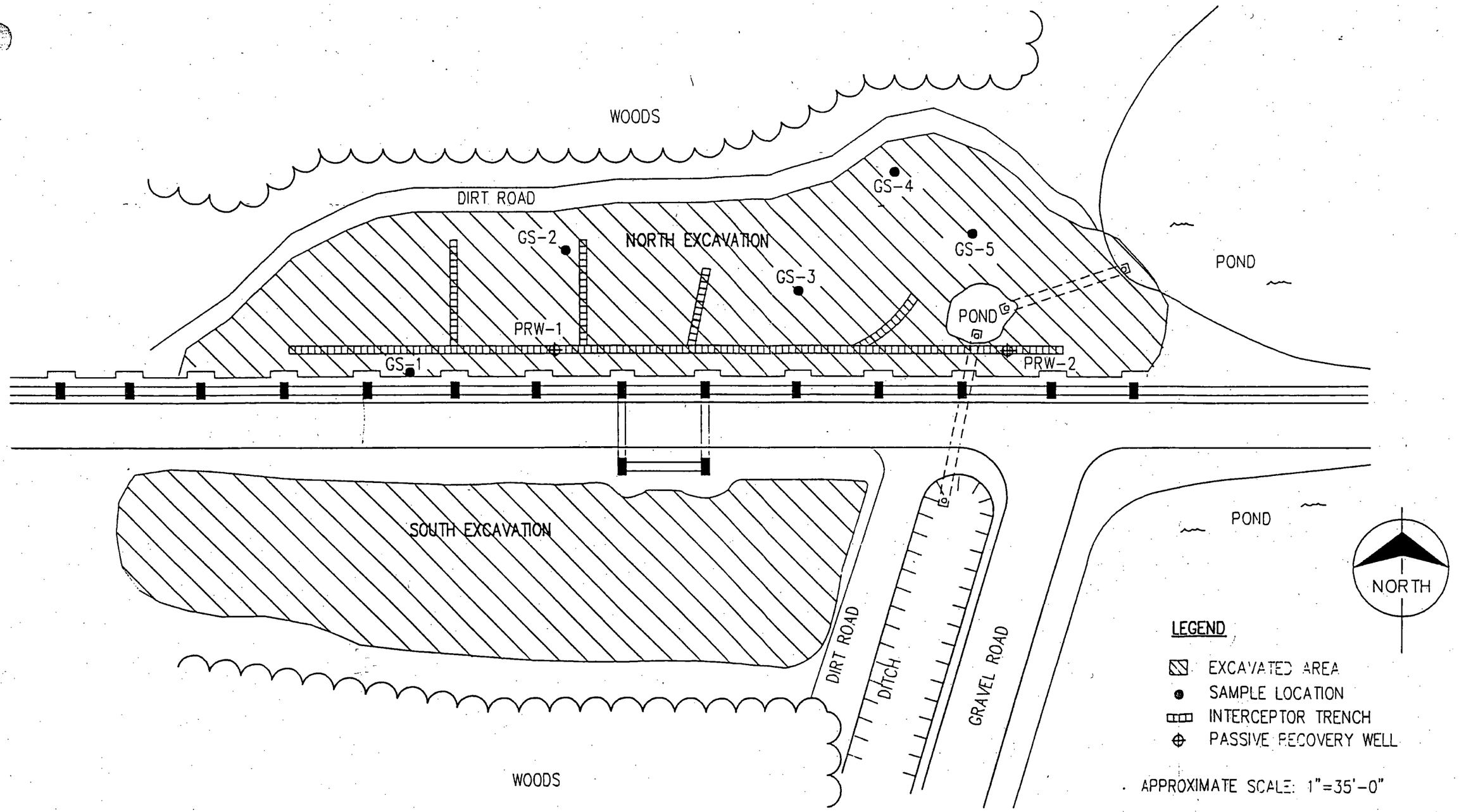


FIGURE 6

PIEZOMETRIC SURFACE MAP
JULY 29, 1994



Burns & McDonnell Waste Consultants, Inc.

FIGURE 7

PRELIMINARY SOIL SAMPLE AND INTERCEPTOR TRENCH LOCATIONS

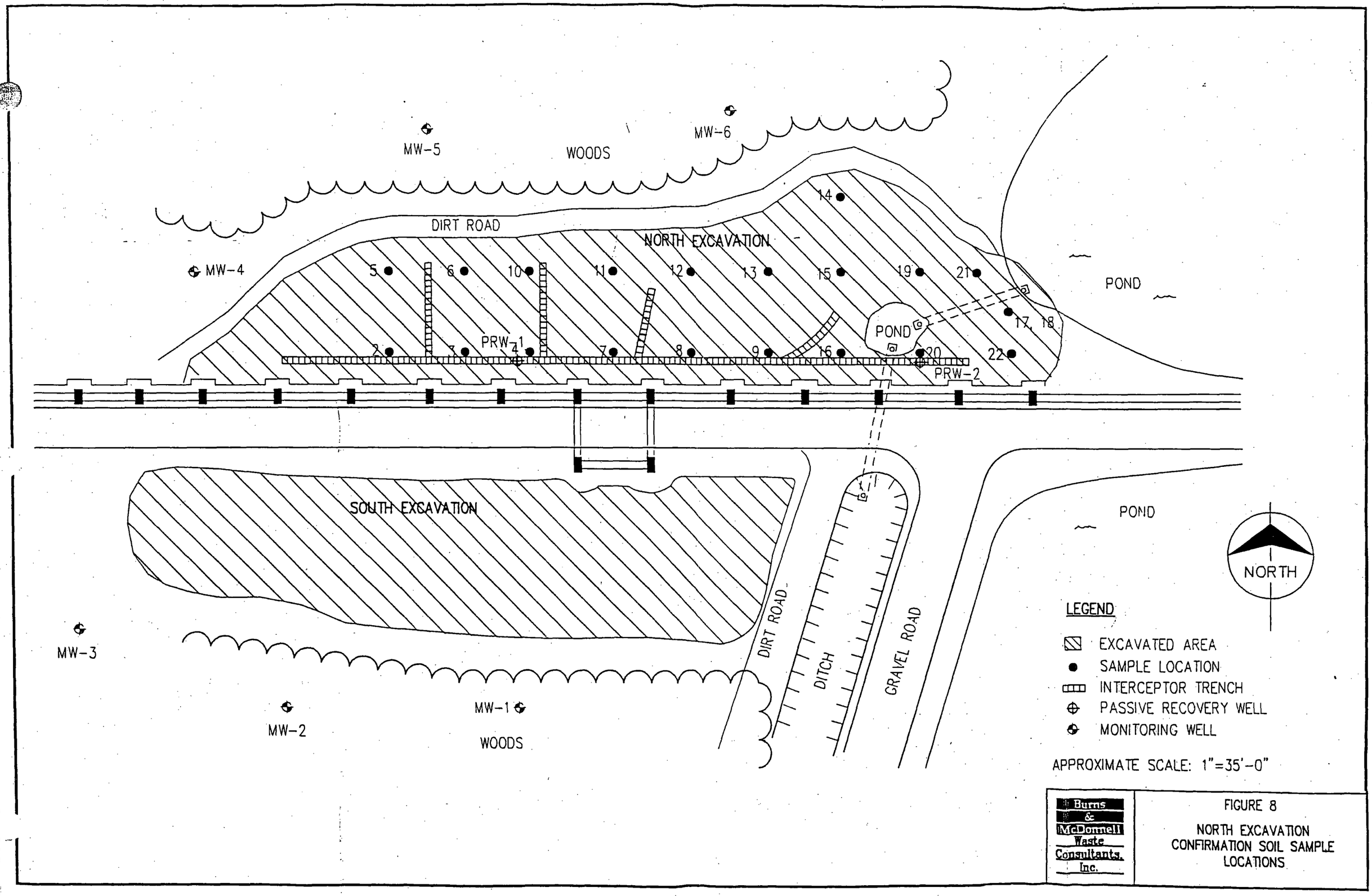


FIGURE 8

NORTH EXCAVATION CONFIRMATION SOIL SAMPLE LOCATIONS

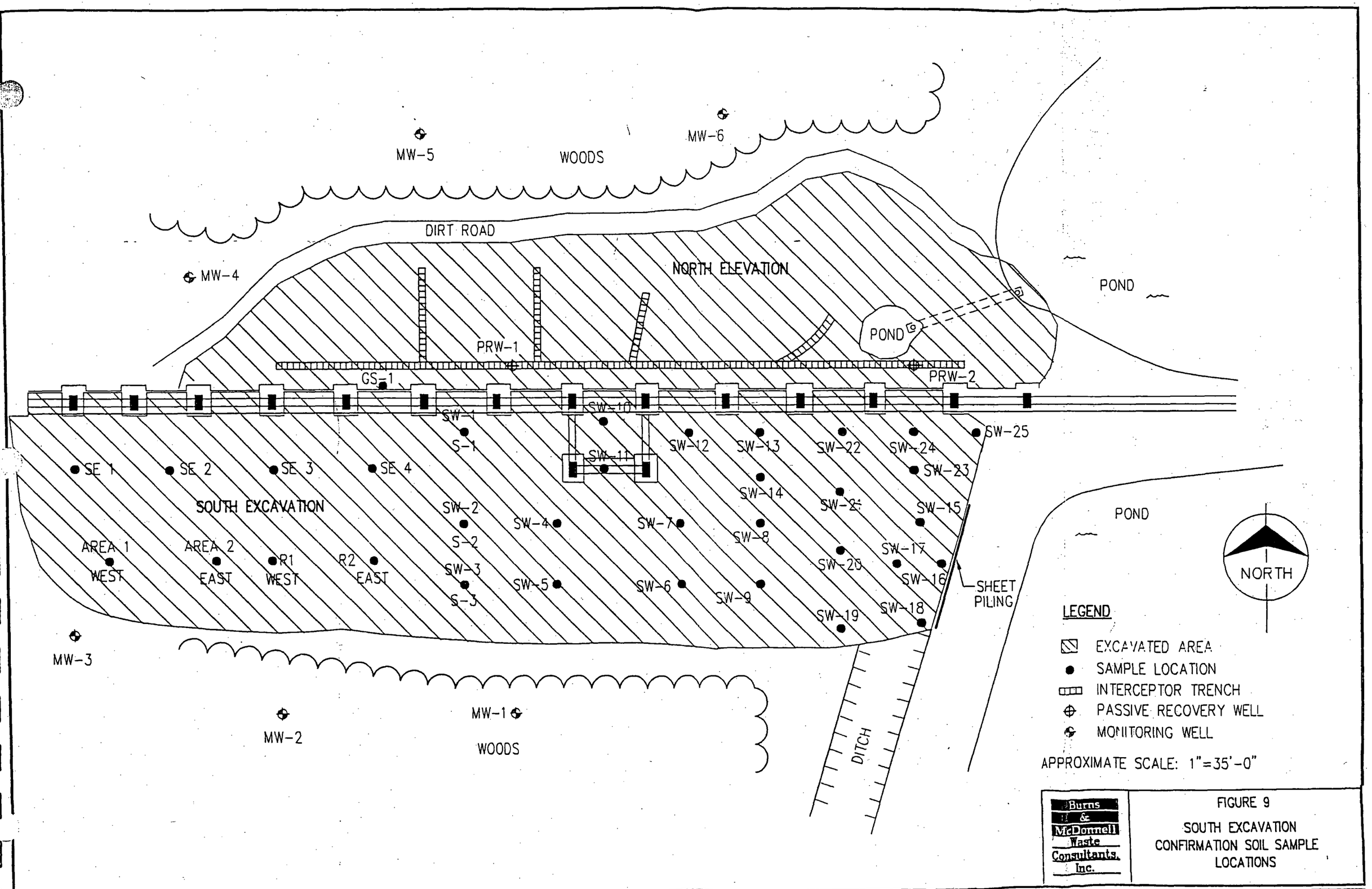


FIGURE 9

SOUTH EXCAVATION CONFIRMATION SOIL SAMPLE LOCATIONS

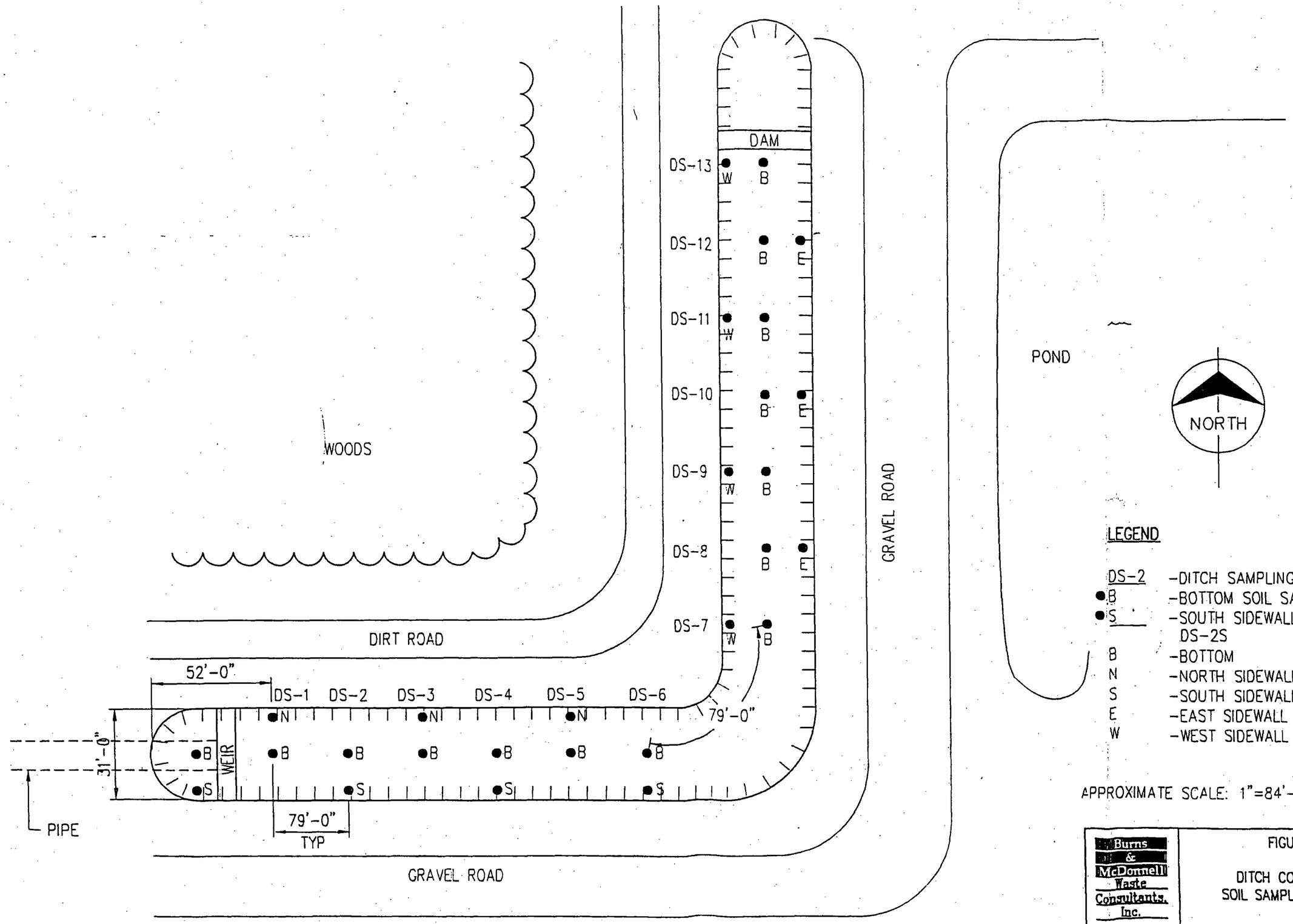


FIGURE 10

DITCH CONFIRMATION SOIL SAMPLE LOCATIONS

95-889

1190500002
Clark Oil
SF/Tech
Source: IEPA BOL

August 29, 1995

From
Bill Irwin
Clark Refining and Marketing, Inc.
Hartford Refinery
201 E. Hawthorne Street
Hartford, IL 62048
(618) 254-7301 x 266

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Site Assessment
of
Black Oil River Line Release Area
for
Clark Refining and Marketing, Inc.
Hartford Refinery
Hartford, Illinois
December 1994
Project No. 94-106-4
Burns & McDonnell Waste Consultants, Inc.
Engineers-Geologists-Scientists
St. Louis, Missouri

ORIGINAL

SEP - 5 1995

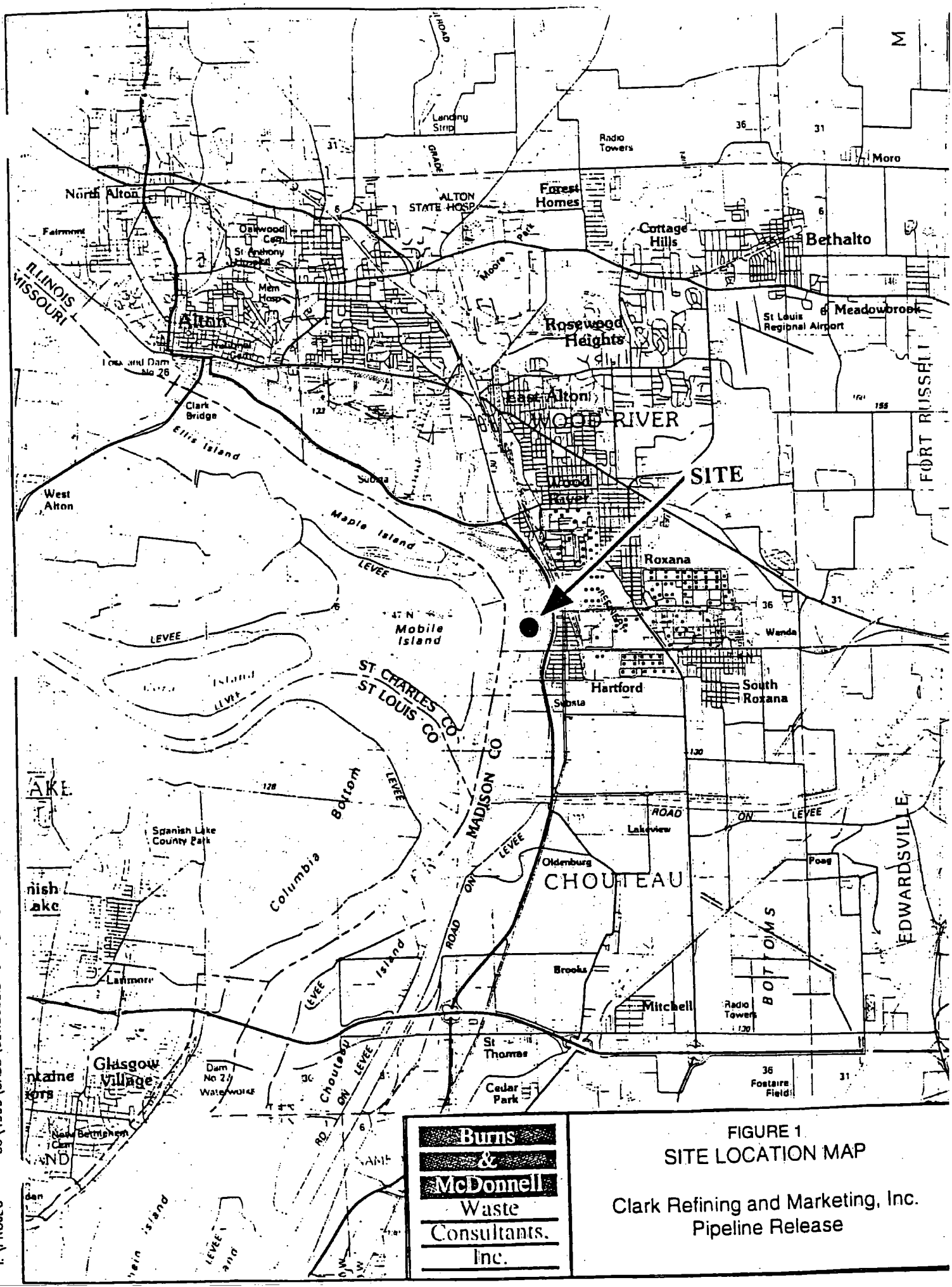


FIGURE 1
SITE LOCATION MAP

Clark Refining and Marketing, Inc.
Pipeline Release

I:\PROJEC' '06\4999\CADD\CLWS002.DWG 07-07-1994 14:39 CFP

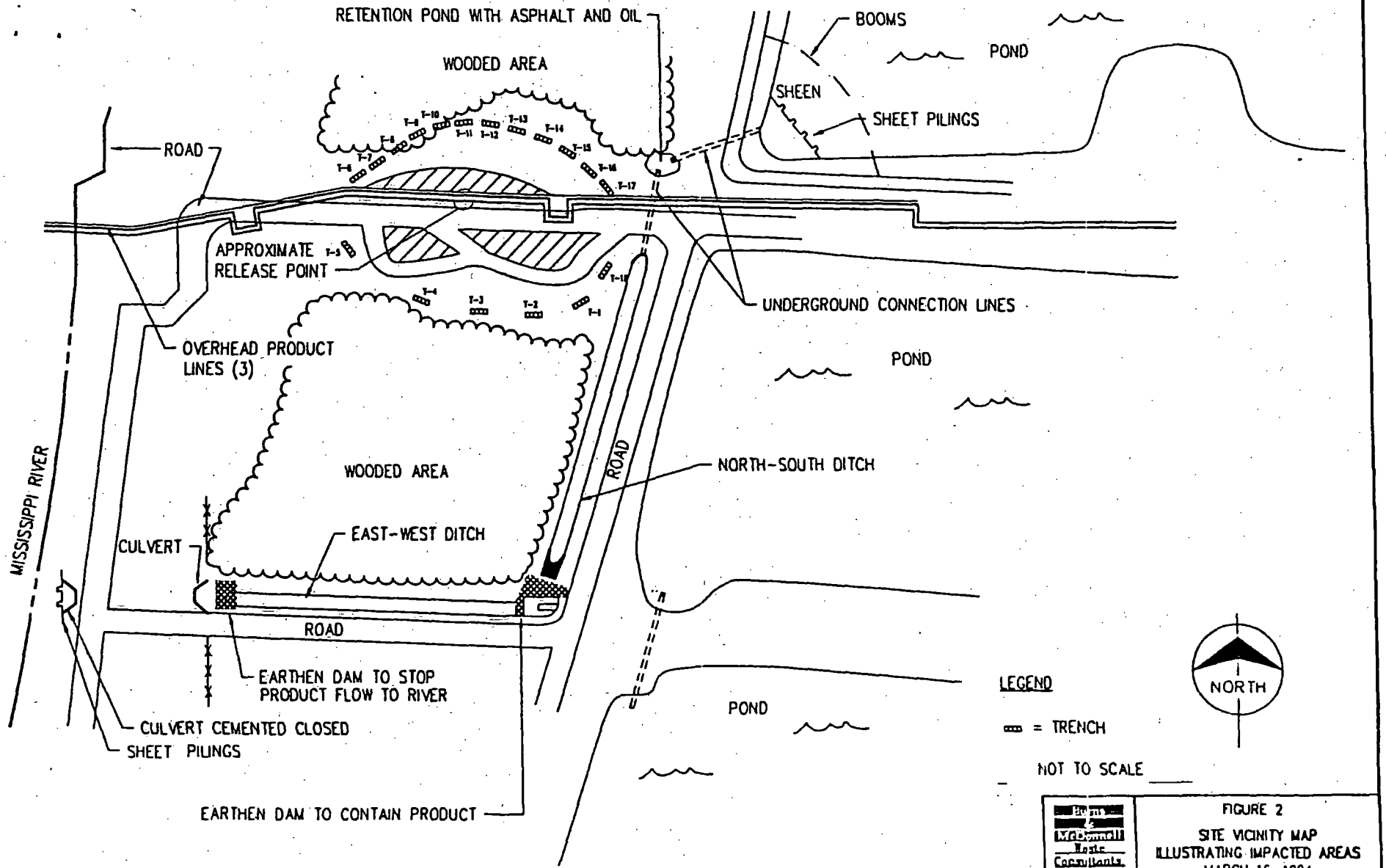


FIGURE 2
SITE VICINITY MAP
ILLUSTRATING IMPACTED AREAS
MARCH 16, 1994

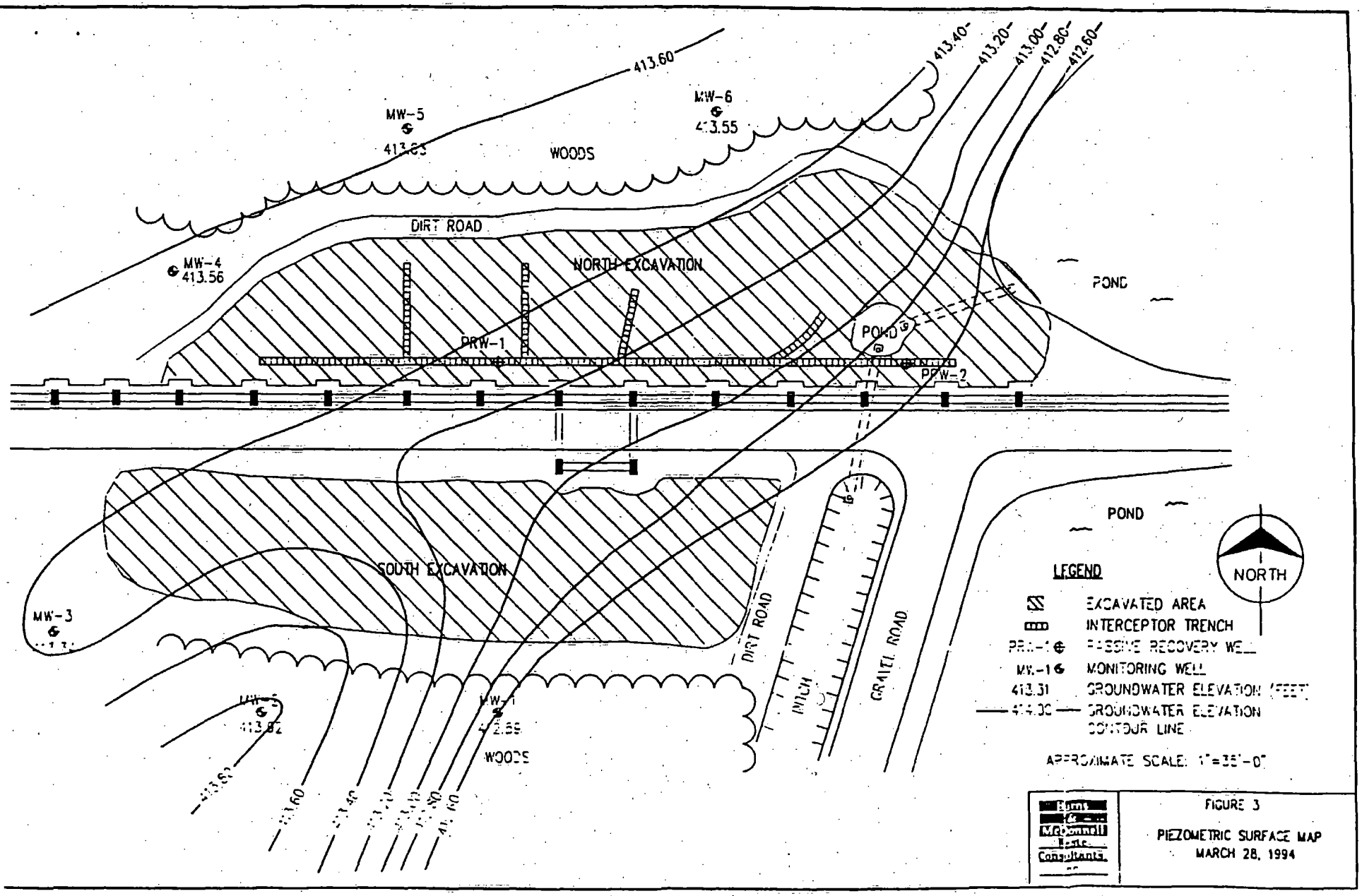
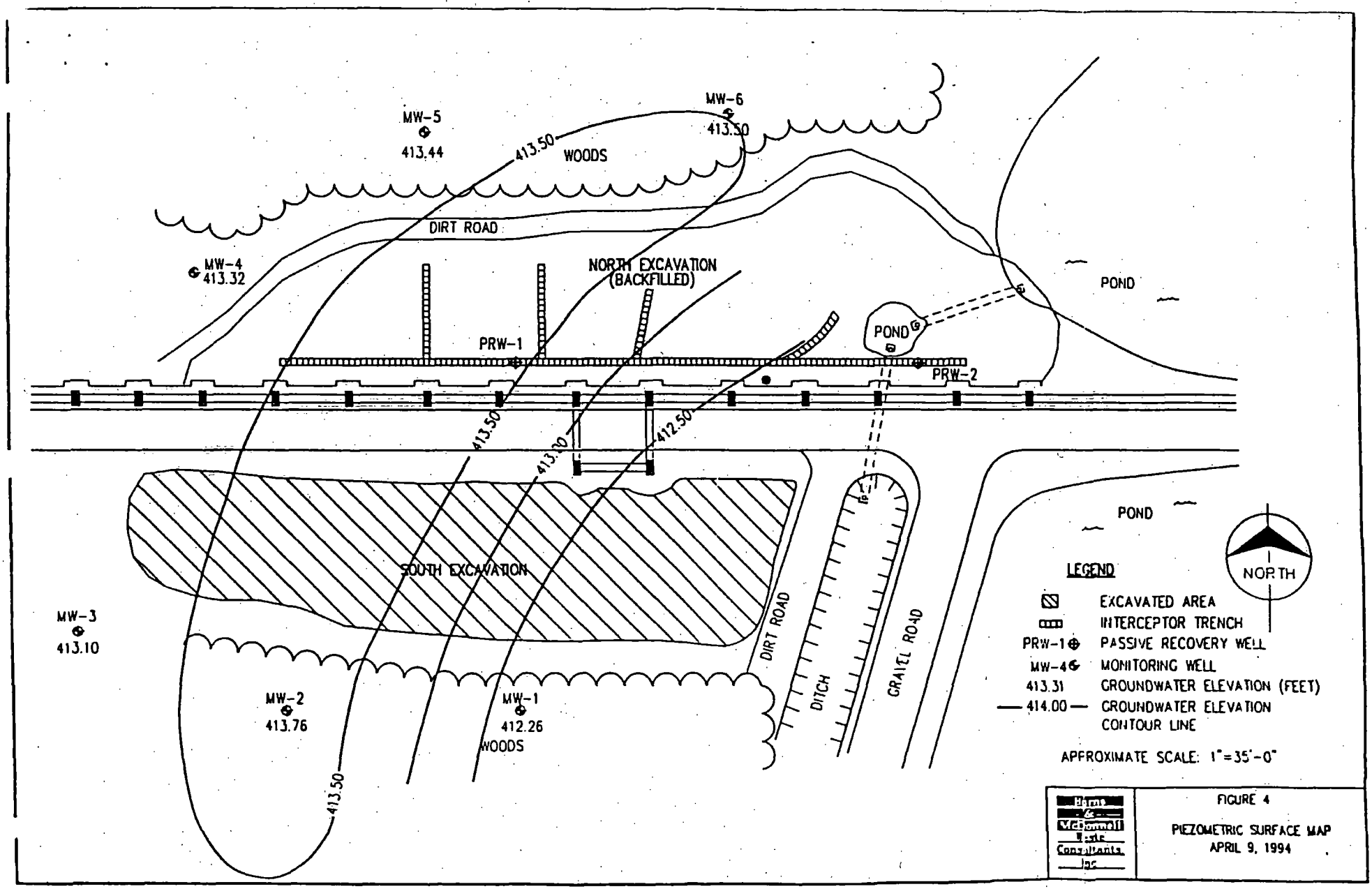


FIGURE 3

PIEZOMETRIC SURFACE MAP
MARCH 28, 1994


MW-5
413.44
MW-6
413.50
413.50
WOODS
DIRT ROAD
MW-4
413.32
NORTH EXCAVATION
(BACKFILLED)
POND
POND
PRW-1
PRW-2
413.50
413.50
412.50
SOUTH EXCAVATION
POND
MW-3
413.10
DIRT ROAD
DITCH
GRAVEL ROAD
MW-2
413.76
MW-1
412.26
WOODS
413.50
NORTH
LEGEND
EXCAVATED AREA
INTERCEPTOR TRENCH
PRW-1 PASSIVE RECOVERY WELL
MW-4 MONITORING WELL
413.31 GROUNDWATER ELEVATION (FEET)
414.00 GROUNDWATER ELEVATION CONTOUR LINE
APPROXIMATE SCALE: 1"=35'-0"
Harris & McDonnell Waste Consultants Inc
FIGURE 4
PIEZOMETRIC SURFACE MAP
APRIL 9, 1994

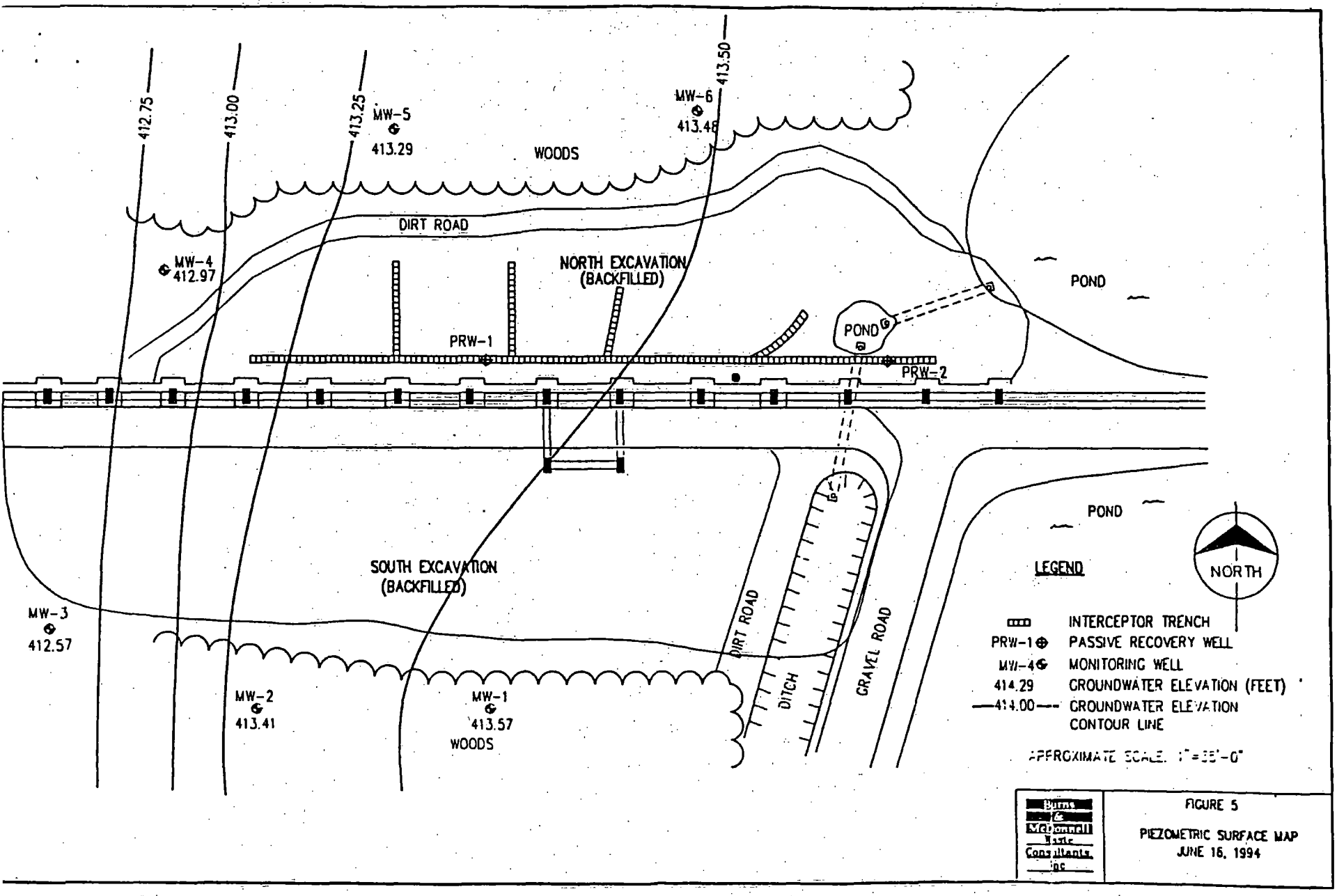


FIGURE 5

PIEZOMETRIC SURFACE MAP
JUNE 16, 1994

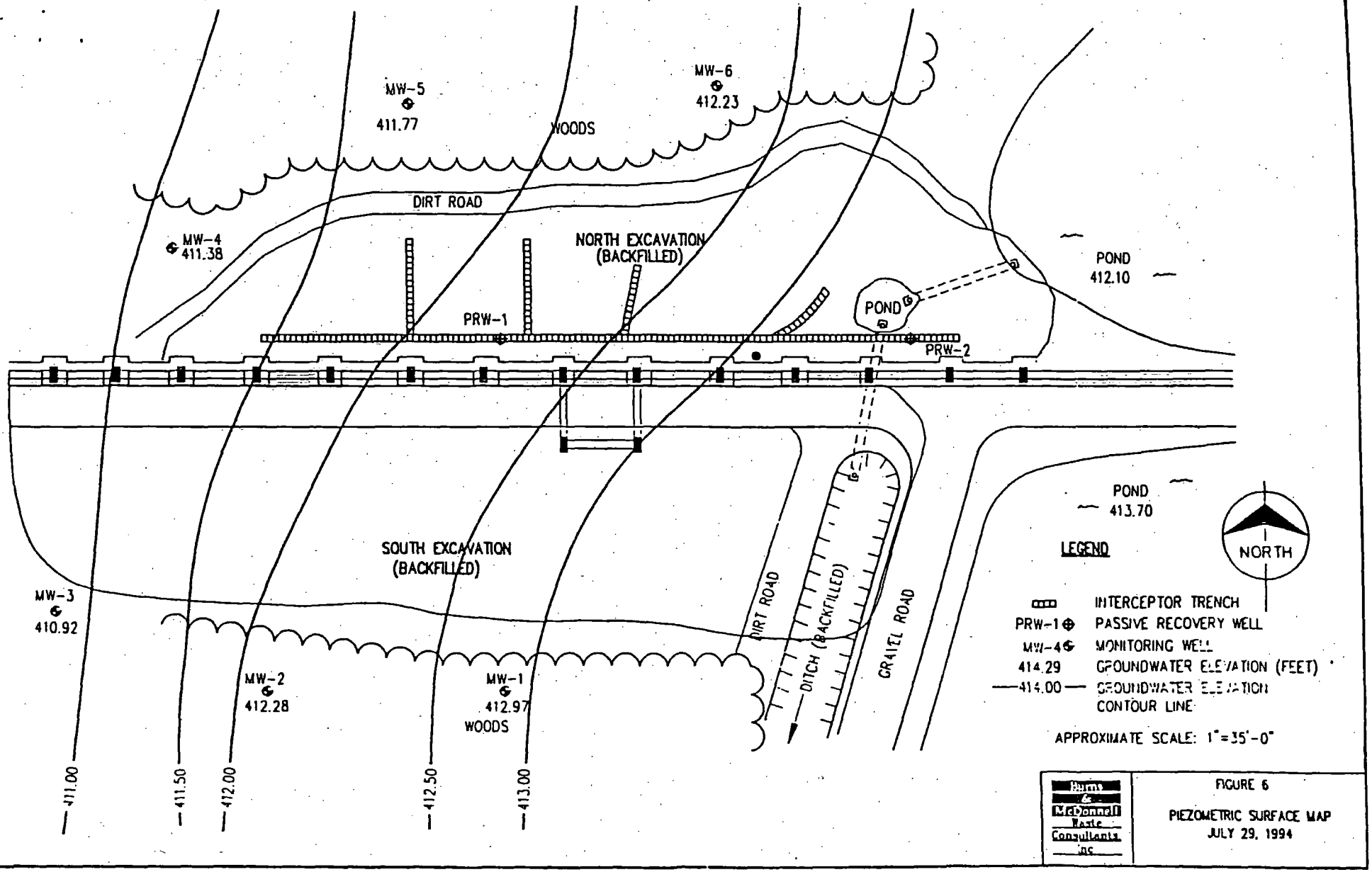
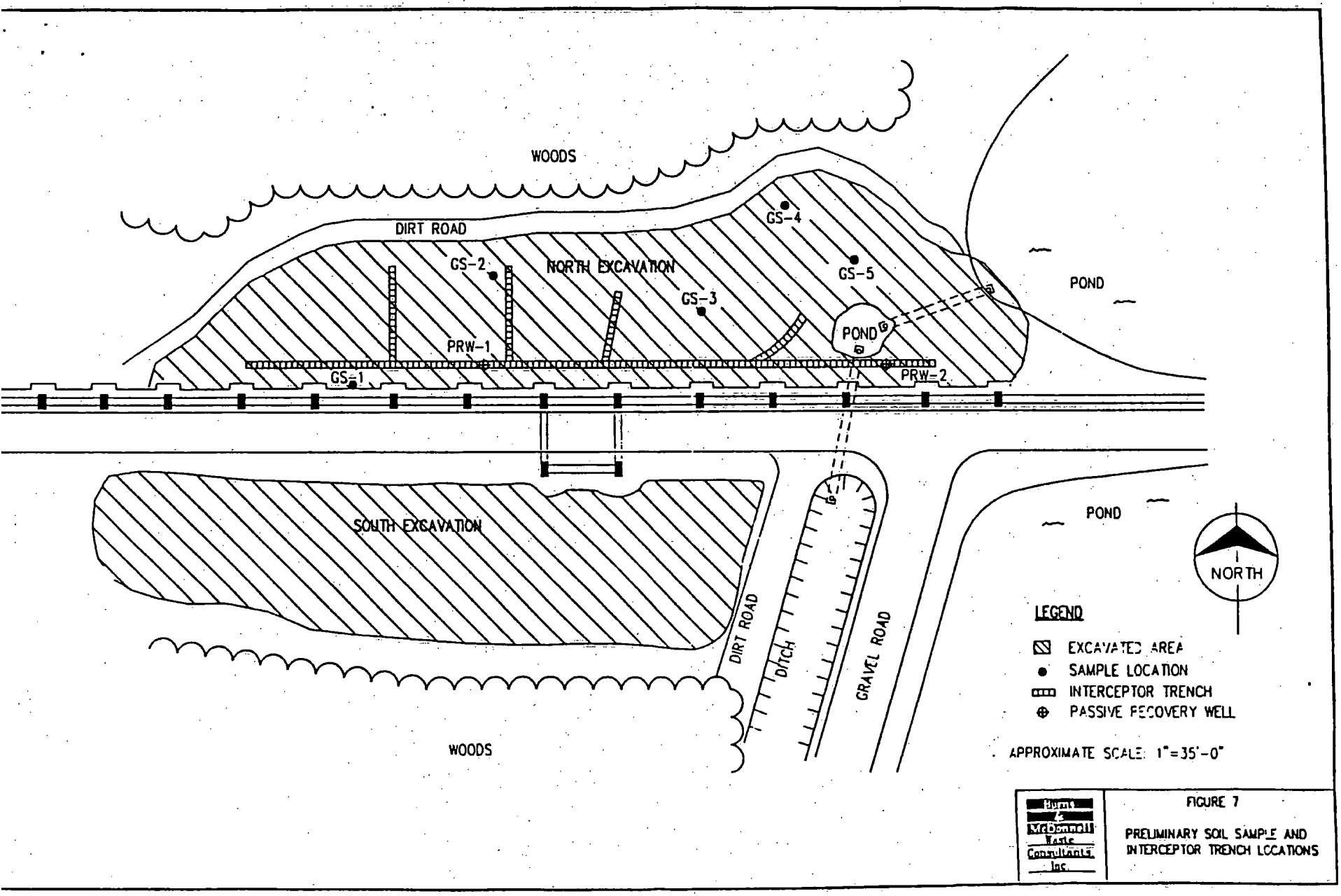


FIGURE 6

PIEZOMETRIC SURFACE MAP
JULY 29, 1994



Burns & McDonnell Waste Consultants, Inc.

FIGURE 7

PRELIMINARY SOIL SAMPLE AND INTERCEPTOR TRENCH LOCATIONS

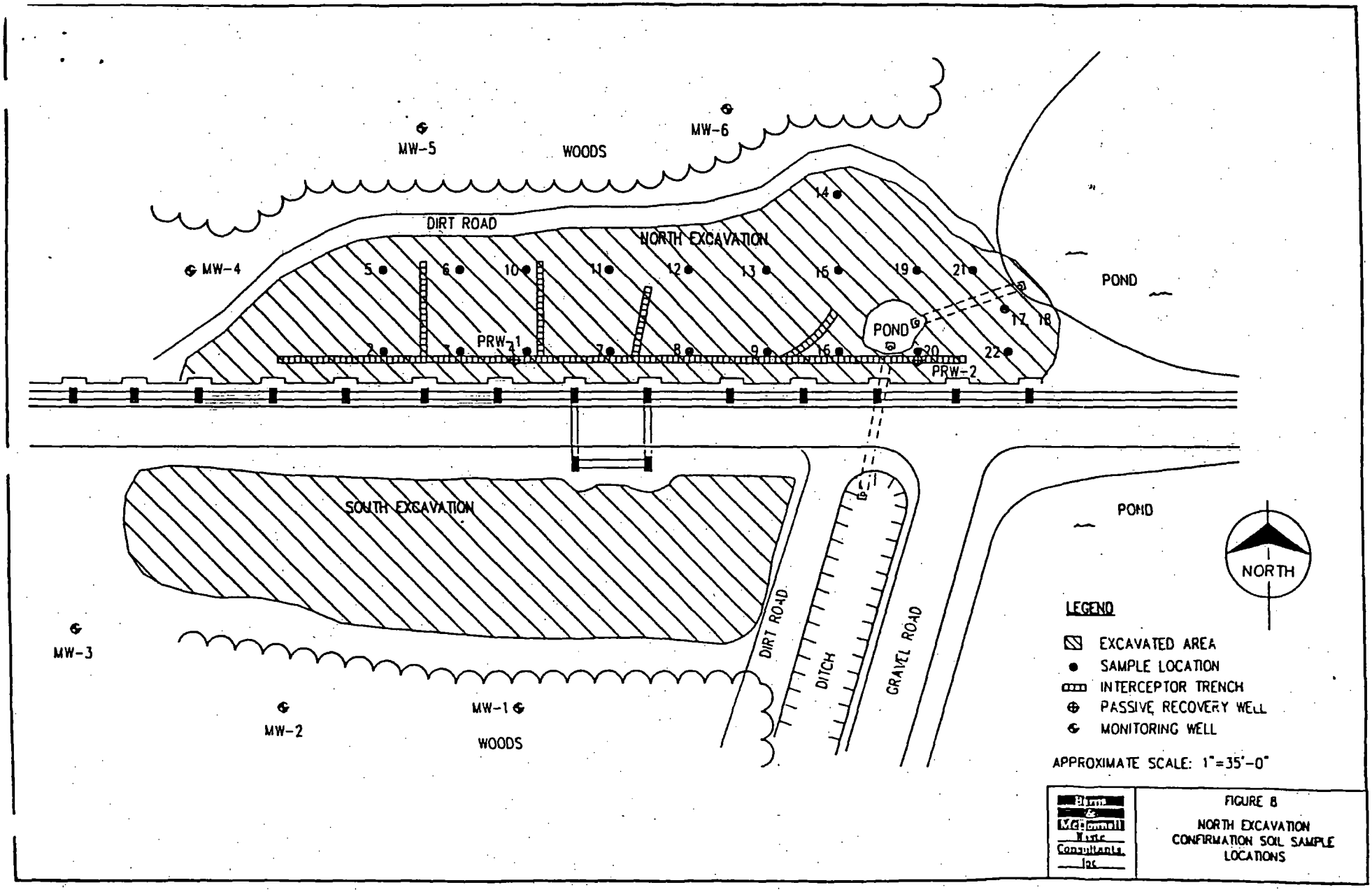


FIGURE 8

NORTH EXCAVATION CONFIRMATION SOIL SAMPLE LOCATIONS

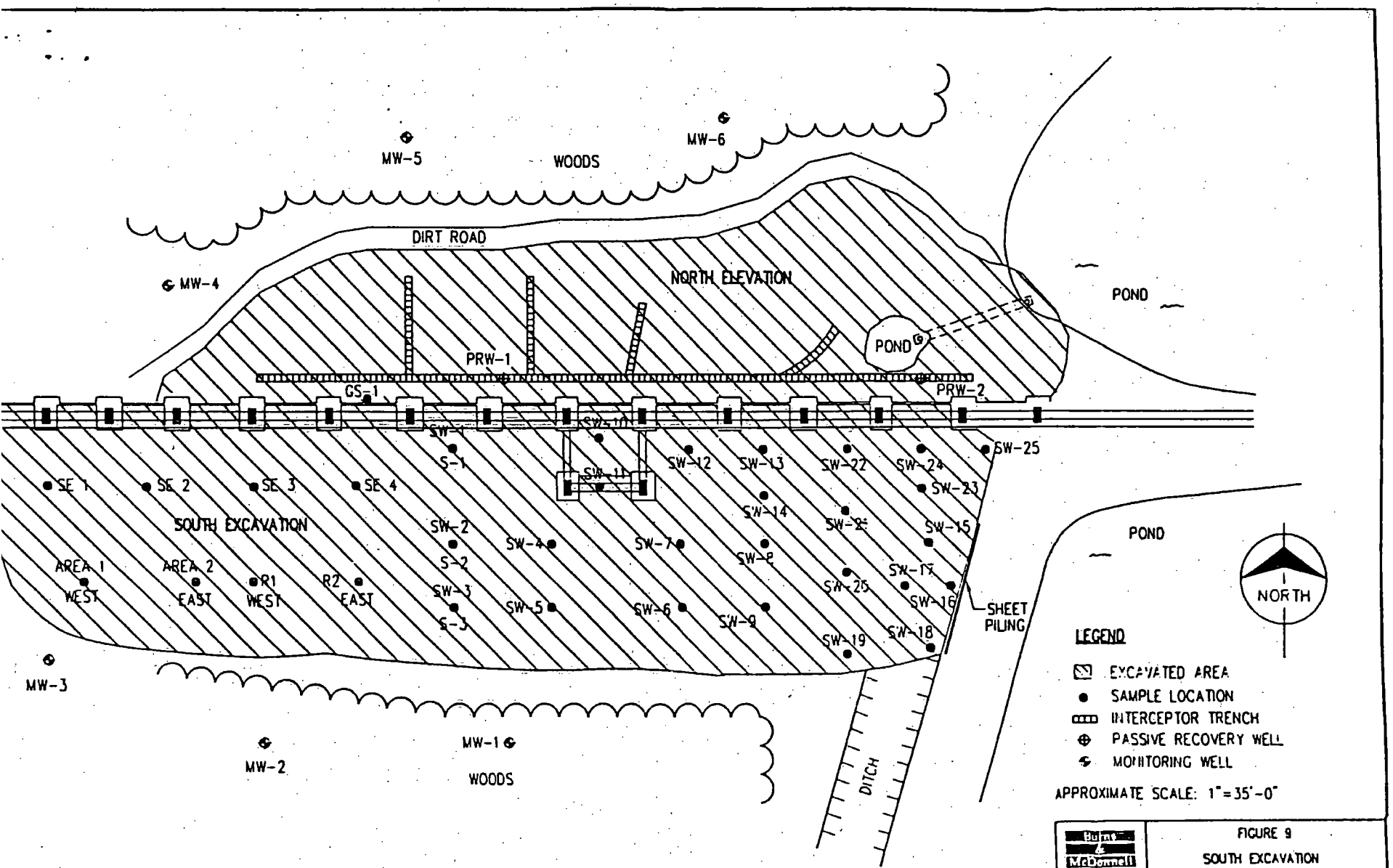


FIGURE 9

SOUTH EXCAVATION CONFIRMATION SOIL SAMPLE LOCATIONS

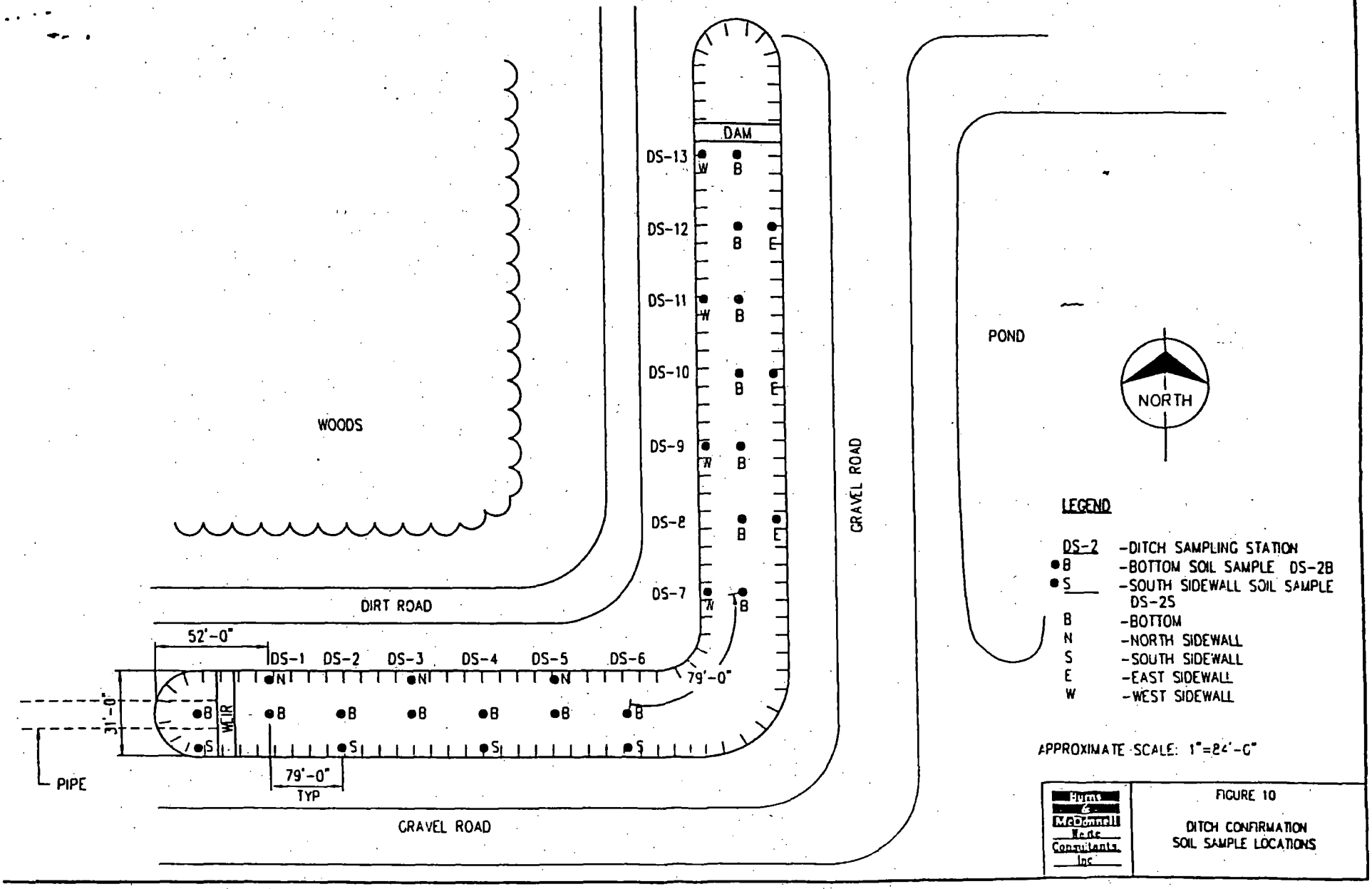


FIGURE 10

DITCH CONFIRMATION SOIL SAMPLE LOCATIONS

Source: IEPA ERW

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276

THOMAS V. SKINNER, DIRECTOR

217/785-0830
TDD 217/782-9143

October 5, 1999

Mr. Bill R. Irwin
Environmental Manager
Clark Refining & Marketing, Inc.
201 East Hawthorne
Hartford, IL 62048-0007

Re: Madison County - Hartford/Clark Oil
IEMA 940515 Black Oil River Line (Area K)
PCB #95-163

Dear Bill:

Illinois EPA is in receipt of your letter and attached report on the final groundwater monitoring event for incident 940515 (Black Oil River Line - Area K) dated September 10, 1999 and received in our office on September 16, 1999. The Agency accepts Clark Refining & Marketing, Inc.'s submission and approves abandoning monitor wells, MW1, MW2, MW3, MW4, MW5, and MW6 in accordance with Section 920.120 of the Illinois Department of Public Health's Water Well Construction code.

Should you have any questions, please call.

Sincerely,

James Patrick O'Brien
Manager, Office of Chemical Safety

cc: Jim Morgan
John Waligore
Tom Powell

Source: IEPA ERW

CLARK

RECEIVED

SEP 16 1999

IEPA
Office of Chemical Safety

REFINING & MARKETING, INC.

201 East Hawthorne
Hartford, Illinois 62048-0007
ph 618-254-7301 fx 618-254-6064

Project 40801.100
September 10, 1999

Mr. James Patrick O'Brien
Manager Office of Chemical Safety
Illinois EPA
P.O Box 19276
Springfield, Illinois 62794-9276

Subject: Black Oil River Line: Incident No. 940515

Dear Mr. O'Brien:

This letter is in response to ground water monitoring requirements associated with the March 1994 release of product from the Black Oil River Line at the Clark Refining & Marketing (Clark) Mississippi River terminal located in Hartford, Illinois. To monitor any impact that the release of product may have had on ground water, Clark agreed to conduct a ground water monitoring program that extended September 1996 through August 1999. The program Clark agreed to included quarterly ground water sampling of the monitoring wells during the first 12 month period, semi-annual sampling during the second 12 month period, and annual sampling during the third 12 month period. The enclosed table presents ground water analytical results of each sampling event as compared to IEPA ground water remediation objectives for Class I (potable) ground water. The majority of analytes were consistently below limits of detection for the duration of the ground water monitoring program and analytes that were detected were all well below the IEPA remediation objectives for Class I ground water use.

Based on analytical results presented on the attached table of ground water samples collected during various seasons between September 1996 and August 1999, it is evident that the March 1994 release of product from the Black Oil River Line has had no impact to ground water at the site. For this reason, Clark requests approval from IEPA to abandon monitoring wells MW1, MW2, MW3, MW4, MW5, and MW6 in accordance with Section 920.120 of the Illinois Department of Public Health Water Well Construction Code.

CLARK

Mr. Jim O'Brien

B&V Project 40801.100
September 10, 1999

Please call me at (618) 254-7301 ext. 266 should you have any questions concerning this request.

Sincerely,

Clark Refining & Marketing, Inc.

Bill R. Irwin

Bill R. Irwin, CHMM, REM
Environmental Manager

cc: Mr. Thomas Powell, IEPA

Ground Water Monitoring Program
Black Oil River Line

August 1999

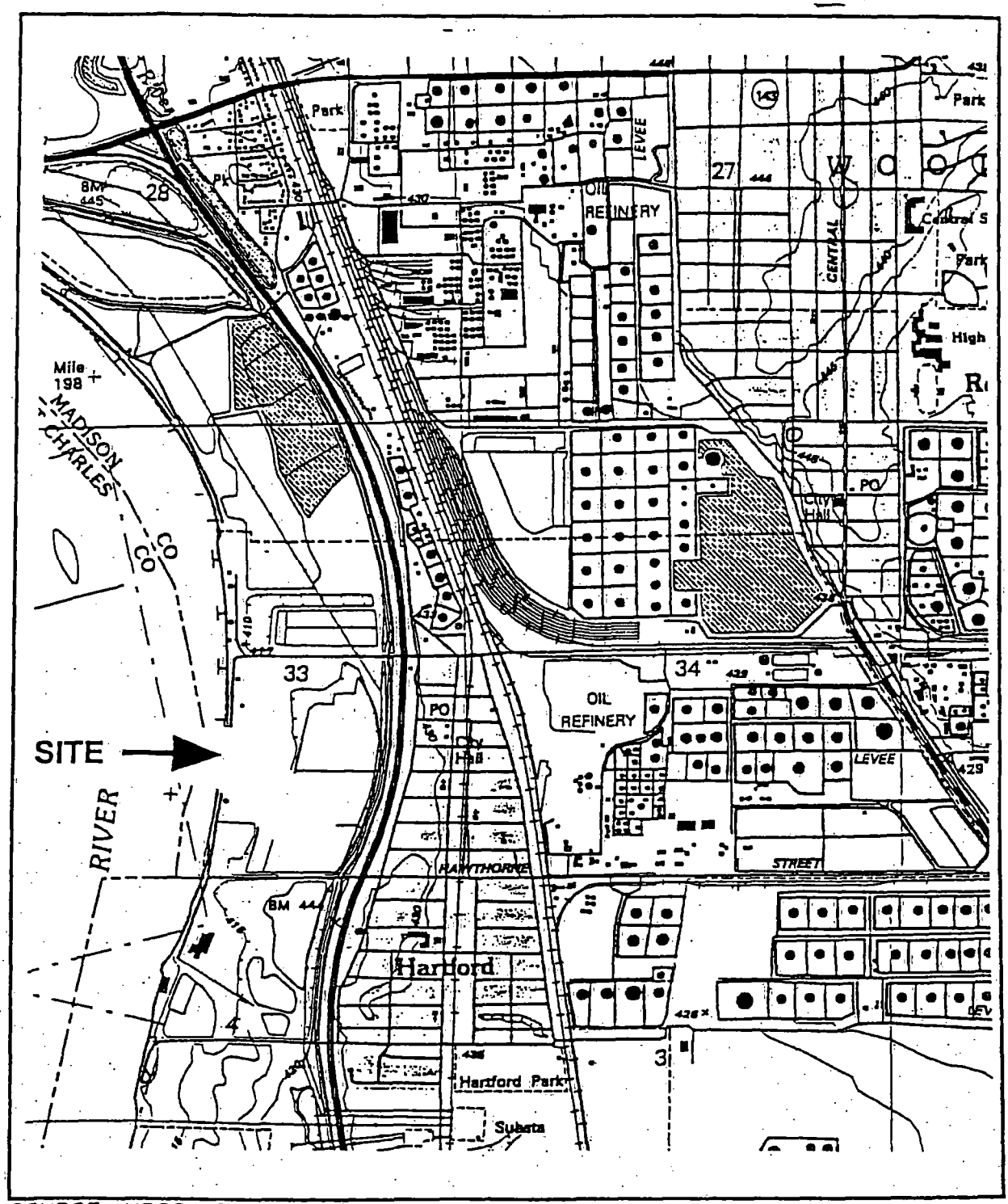
Clark Refining & Marketing, Inc.
Ground Water Sampling Event Report
August 1999

Site Description

The Clark Refining & Marketing, Inc. (Clark) site is located 0.8 miles east of the Mississippi River in an urban, industrialized area in the City of Hartford, Illinois. The site location is shown on Figure 1. Currently, the site is a Mississippi River terminal, where barges are loaded and unloaded with petroleum products to and from the refinery.

In March 1994, an unexpected release of approximately 4,071 barrels of product from the Black Oil River line, an overhead distribution pipeline, was reported. The release occurred over a wooded area on the riverside of a flood wall, which protects the City of Hartford, Illinois, approximately 600 feet east of the Mississippi River barge terminal. Corrective action performed by Clark included immediate recovery of free product followed by excavation and disposal of contaminated soil. In December 1994, Burns & McDonnell Waste Consultants submitted a report titled, *Site Assessment of Black Oil River Line Release Area For Clark Refining and Marketing, Inc. Hartford Refinery, Hartford, Illinois.* This report described the cleanup efforts and presented a recommendation of quarterly ground water sampling from six monitoring wells installed at the perimeter of the area of the release.

Clark agreed to perform quarterly ground water sampling of the monitoring wells during the first 12 month period, semi-annual sampling during the second 12 month period, and annual sampling during the third 12 month period. Ground water sampling protocol required analyses of polyaromatic hydrocarbons (PAHs) by Method SW-846 8310 and volatile organic analysis (VOA) by Method SW-846 8020. This report presents the results of the seventh, and last, sampling event. Due to flooding conditions at the site ground water sampling activities were conducted August 3, 1999, instead of the scheduled June 1999. Mr. Tom Powell of the Illinois Environmental Protection Agency (IEPA), Bureau of Land was notified 10 days prior to the sampling event to comply with requirement (C) (3) (n) of the Partial Stipulation and Proposal for Settlement between Illinois Environmental Protection Agency and Clark Refining & Marketing, Inc..



SOURCE: USGS 1994

2000 2000 FEET

0 4000

SCALE: 1" = 2000'

Black & Veatch

PROJECT 40801.100

FIGURE 1
CLARK REFINING & MARKETING
SITE LOCATION MAP

Laboratory Data

Ground water samples were analyzed by American Technical & Analytical Services, Inc., in Maryland Heights, Missouri, by Methods SW-846 8020 and SW-846 8310. Data validation was performed by Heartland Environmental Services, Inc., in St. Charles, Missouri, in accordance with SW-846 data review guidelines. The following criteria were checked in the validation: holding times, blank analysis results, and surrogate and matrix spike recoveries. Ground water sample analysis holding times were determined based on the dates of sampling and analysis. All ground water sample analyses were within required holding times, no target analytes were detected in the method blanks, and surrogate recoveries were within quality assurance/quality control limits. No qualification of the data is required. Validated data is included as Attachment A to this report.

Field Activities and Analytical Results

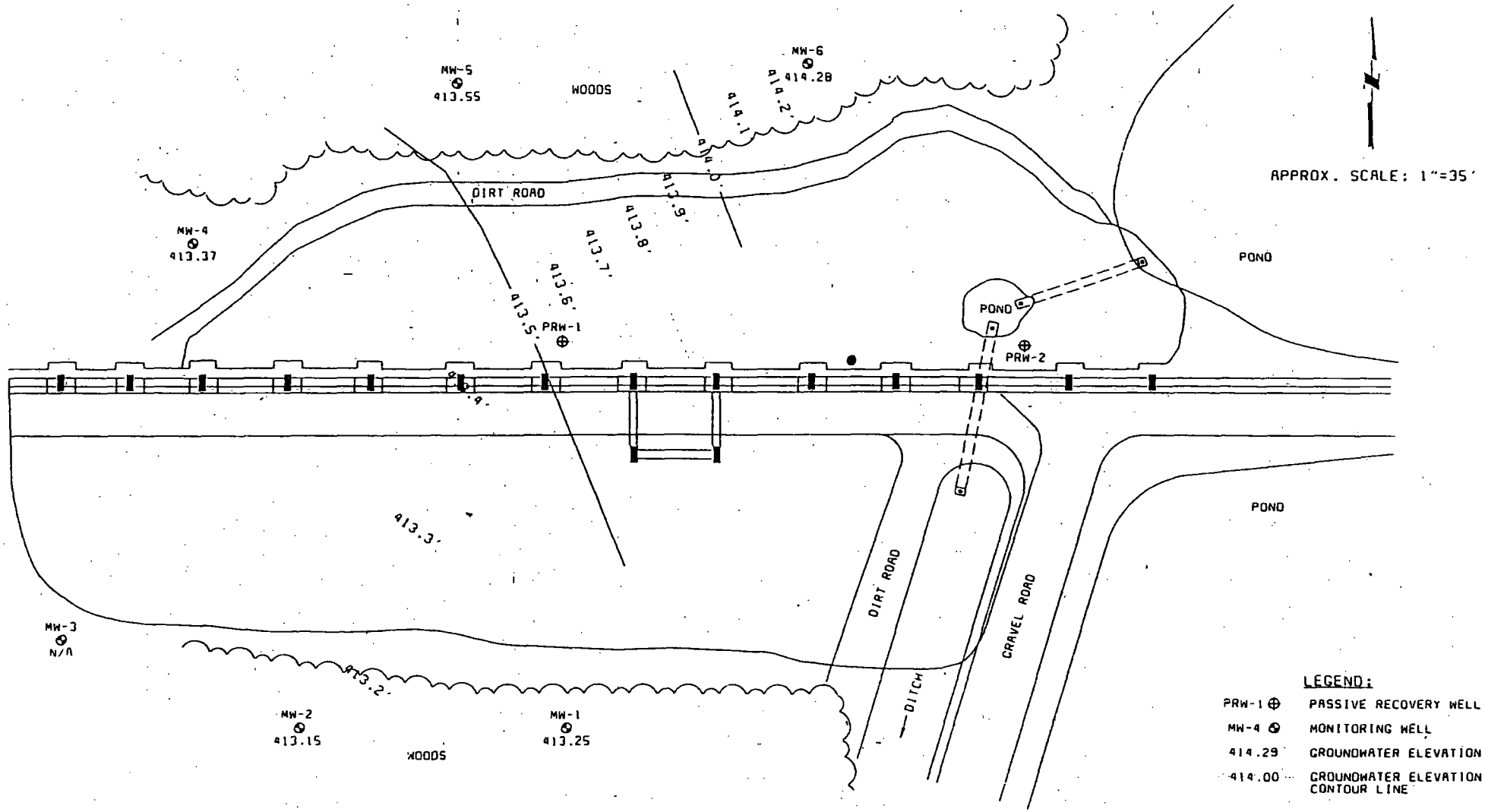
The initial quarterly ground water sampling event of the six monitoring wells associated with the March 1994 release of product from the Black Oil River Line began Friday, September 6, 1996. The following steps were followed for each monitoring well during each ground water sampling event:

- unlocked and removed well covers,
- recorded the depth to ground water,
- purged three well volumes of ground water (water depth measurements and corresponding well volumes are shown in Table 1),
- measured and recorded temperature, specific conductivity, pH, and turbidity in each well (results from each well are presented in Table 2),
- collected ground water sample for VOA,
- collected ground water sample for PAHs, and
- placed samples in cooler for delivery to laboratory, including chain of custody.

Analytical results of ground water samples collected during this sampling event indicate VOA and PAH compounds below limits of detection in samples collected from five of the six monitoring wells. Monitoring well (MW) 3 was dry and therefor not sampled. It appears that MW3 may have been damaged by equipment used to clear brush prior to ground water sampling activities. Monitoring well locations are shown on Figure 2.

Table 1 Recorded Depths and Volumes				
Monitoring Well	Water level below top of casing	Total depth of well	Well volume @ 0.65 gal/ft	3 x Well volume
	(feet)	(feet)	(gallons)	(gallons)
1	5.75	19.80	9.13	27
2	6.32	19.23	8.39	25
3	Dry	4.91	NA	NA
4	7.58	19.68	7.86	24
5	6.21	19.40	8.57	29
6	5.05	19.85	9.62	29

Table 2 Temperature, Specific Conductivity, pH, and Turbidity				
Monitoring Well	Temperature	Specific Conductivity	pH	Turbidity
	(°F)	(µs/cm)		(NTU)
1	65.6	1500	6.8	38
2	63.1	2250	7.0	999
3	NA	NA	NA	NA
4	66.2	1270	7.4	22
5	64.0	1910	7.4	56
6	62.6	7.6	1490	54



REFERENCES:

BASE MAP SOURCE:
BURNS & MCDONNEL, 1994

Black & Veatch PROJECT 40901.100	CLARK REFINING & MARKETING	DATE: AUG 1999
	MONITORING WELL LOCATIONS	FIGURE: 2

Conclusion

To monitor any impact that the March 1994 release of product from the Black Oil River Line may have had on the ground water, Clark agreed to perform a ground water monitoring program beginning September 1996. The program Clark agreed to included quarterly ground water sampling of the monitoring wells during the first 12 month period, semi-annual sampling during the second 12 month period, and annual sampling during the third 12 month period. Table 3 presents ground water analytical results of each sampling event as compared to IEPA ground water remediation objectives for Class I (potable) ground water. The majority of analytes were consistently below limits of detection for the duration of the ground water monitoring program and analytes that were detected were all well below the IEPA remediation objectives for Class I ground water use.

Based on ground water analytical data collected at various times of the year between September 1996 and August 1999, it appears that the March 1994 release of product from the Black Oil River Line has had no impact to ground water at the site. For this reason, Black & Veatch recommends Clark request from IEPA an approval to abandon MW1-MW6 in accordance with Section 920.120 of the Illinois Department of Public Health Water Well Construction Code.

Table 3
Black Oil River Line: Incident No. 940515
Analytical Results of Ground Water Monitoring Program

PARAMETER	IEPA Class I Ground Water Remediation Objective (ppb)	MW1 (ppb)							MW2 (ppb)							MW3 (ppb)							MW4 (ppb)							MW5 (ppb)							MW6 (ppb)						
		September 1996	December 1996	April 1997	June 1997	December 1997	June 1998	August 1999	September 1996	December 1996	April 1997	June 1997	December 1997	June 1998	August 1999	September 1996	December 1996	April 1997	June 1997	December 1997	June 1998	August 1999	September 1996	December 1996	April 1997	June 1997	December 1997	June 1998	August 1999	September 1996	December 1996	April 1997	June 1997	December 1997	June 1998	August 1999	September 1996	December 1996	April 1997	June 1997	December 1997	June 1998	August 1999
BTEXs																																											
Benzene	5	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	1	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Toluene	1,000	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	2	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Ethylbenzene	700	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	—
Xylene	10,000	1	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	3	ND	ND	NT	ND	2	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	2	ND	ND	
PAHs																																											
Naphthalene	25	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Acenaphthylene	NL	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Acenaphthene	420	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Fluorene	280	ND	ND	ND	ND	ND	ND		2.41	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Phenanthrene	NL	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Anthracene	2,100	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Fluoranthene	280	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Pyrene	210	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Benzo(a)anthracene	0.13	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Chrysene	1.5	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Benzo(b)fluoranthene	0.18	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Benzo(k)fluoranthene	0.17	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Benzo(a)pyrene	0.2	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Dibenzo(a,h)anthracen	0.3	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Benzo(g,h,i)perylene	NL	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	
Indeno(1,2,3-CD)pyren	0.43	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	NT	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND	ND	

Class I Ground Water - Potable Resource Ground Water
ppb - parts per billion (ug/L)
ND - Not Detected
NL - Not Listed
NT - Not Tested (dry well)

Burns & McDonnell
SINCE 1898

February 28, 2000

Steve Haug
Environmental Engineer
Clark Refining and Marketing, Inc.
Hartford Refinery
201 East Hawthorne, P.O. Box 7
Hartford, Illinois 62048-0007

Well Abandonment Summary
Clark Refining and Marketing, Inc.
Hartford, Illinois Refinery-Black Oil River Line Area

Dear Mr. Haug:

Burns & McDonnell Engineering Company, Inc. (BMcD) is pleased to present this Well Abandonment Summary for the Clark Hartford Refinery and Black Oil River Line Area (BORL) located in Hartford, Illinois. BMcD personnel visited the Site on February 22 and 23, 2000 to provide oversight of well abandonment activities conducted by Roberts Environmental Drilling, Inc. of Millstadt, Illionois (Roberts). Wells were abandoned at the BORL on February 22 and at the Refinery on February 23. The results of the Site visits and a list of the wells abandoned are discussed below.

ABANDONMENT PROCEDURES

During the February 2000 abandonment activities a final water level and total depth was measured in each monitoring well. The protective casing, concrete pad, and bumper posts were then removed, if necessary. The well casing was then extraced, if possible, and the remaining hole was backfilled with bentonite chips. If the well casing could not be extracted, the casing was cut off three feet below ground surface (bgs) and the remaining casing was backfilled with bentonite chips. The following table summarizes the February 2000 well abandonment data.

17 Cassens Court
Fenton, Missouri 63026
Tel: 636 305-0077
Fax: 636 326-8295

Burns & McDonnell
SINCE 1898

Well	Final Water Level (bgs)	Final Total Depth (bgs)	Method of Abandonment	Date and Time
PRW-1	5.17	14.67	Cut-off Casing	2/22/00 1030
PRW-2	4.50	17.08	Extracted Casing	2/22/00 1115
MW-1	1.08	17.58	Extracted Casing	2/22/00 1340
MW-2	2.58	16.08	Extracted Casing	2/22/00 1330
MW-3	6.25	17.25	Extracted Casing	2/22/00 1315
MW-4	6.67	17.08	Extracted Casing	2/22/00 1255
MW-5	6.50	17.08	Extracted Casing	2/22/00 1155
MW-6	4.50	17.08	Cut-off Casing	2/22/00 1130
B-2	31.70	31.75	Cut-off Casing	2/23/00 1145
B-3	31.58	42.00	Cut-off Casing	2/23/00 1056
B-4	38.60	40.42	Cut-off Casing	2/23/00 1030
B-5	33.30	41.00	Cut-off Casing	2/23/00 1000
LP-1	27.60	39.10	Cut-off Casing	2/23/00 1454
LP-2	30.00	38.00	Cut-off Casing	2/23/00 1430
LP-3	30.42	40.58	Cut-off Casing	2/23/00 1405
LP-6	30.00	37.70	Cut-off Casing	2/23/00 1550

Well Abandonment Forms will be completed and sent to the Illinois Environmental Protection Agency by Roberts. All well casings and demolished well protection materials were left on-site for disposal by Clark Refining and Marketing, Inc.

If you have any questions concerning the information presented in this report, please contact me at (636) 305-0077, ext. 226.

Sincerely,

Paul Christian
Project Manager