REDACTED VERSION

5615710

EXPANDED SITE INSPECTION
TASK WORK PLAN

WILCOX OIL COMPANY
BRISTOW, CREEK COUNTY, OK
EPA CERCLA ID NO.: OKD001010917

Prepared for:

U.S. Environmental Protection Agency
Region VI
1445 Ross Avenue
Dallas, TX 75202

Contract No.: 68-W9-0015
Work Assignment No.: 56-6JZZ
Document Control No.: 04606-056-0076

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October 1996

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EXPANDED SITE INSPECTION
TASK WORK PLAN

WILCOX OIL COMPANY
BRISTOW, CREEK COUNTY, OK
EPA CERCLA ID NO.: OKD001010917

OCTOBER 1996

SIGNATURE PAGE

5615711

Lon Biasco
U.S. Environmental Protection Agency
Work Assignment Manager

Date

for John D. DiFilippo, P.E.
Roy F. Weston, Inc.
Zone Program Manager

10/4/96
Date

for Robert B. Beck, P.E.
Roy F. Weston, Inc.
Site Manager

10/4/96
Date

Cecilia H. Shappee, P.E.
Roy F. Weston, Inc.
Quality Assurance Officer

10/4/96
Date

Diane G. Williams
Roy F. Weston, Inc.
Project Team Leader

10/4/96
Date

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SIGNATURE PAGE

Lon Biasco U.S. Environmental Protection Agency Work Assignment Manager	Date
for John D. DiFilippo, P.E. Roy F. Weston, Inc. Zone Program Manager	10/4/96 Date
for Robert B. Beck, P.E. Roy F. Weston, Inc. Site Manager	10/4/96 Date
Cecilia H. Shappee, P.E. Roy F. Weston, Inc. Quality Assurance Officer	10/4/96 Date
Diane G. Williams Roy F. Weston, Inc. Project Team Leader	10/4/96 Date

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EXPANDED SITE INSPECTION
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BRISTOW, CREEK COUNTY, OK
EPA CERCLA ID NO.: OKD001010917

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EXPANDED SITE INSPECTION
TASK WORK PLAN

WILCOX OIL COMPANY
BRISTOW, CREEK COUNTY, OK
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APPENDICES

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APPENDIX	DESCRIPTION
A	Site Access Agreement
B	Health and Safety Plan
C	Sampling Procedures
D	CLP Guidelines

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SECTION 1
INTRODUCTION

Under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the 1986 Superfund Amendments and Reauthorization Act (SARA), Roy F. Weston, Inc. (WESTON®) has been contracted by the U.S. Environmental Protection Agency (EPA) to perform an Expanded Site Inspection (ESI) of the Wilcox Oil Company (Wilcox) site (EPA CERCLA Identification No. OKD001010917) located north of Bristow, Creek County, Oklahoma (Figure 1-1). EPA Region VI retained WESTON to complete this investigation under EPA Contract No. 68-W9-0015 and Work Assignment No. 56-6JZZ.

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WESTON has prepared this Work Plan to describe the activities that will be completed as part of the Wilcox ESI. A summary of the site history and known waste characteristics, previous site investigations, and the ESI sampling activities are provided in this Work Plan. WESTON will follow EPA's Contract Laboratory Program (CLP) and WESTON's Corporate Quality Assurance/Quality Control (QA/QC) guidelines for sample collection, chain-of-custody transfer, and analytical data management during the performance of the Wilcox ESI. A site-specific Health and Safety Plan (HASP), which contains information pertinent to the sampling effort, has been developed. The HASP is provided in Appendix B of the Work Plan.

1.1 PURPOSE AND OBJECTIVE OF THE ESI

The ESI is intended to be the final investigation in an ongoing screening process of known and potentially hazardous waste sites. The purpose of this ESI is to identify immediate or potential threats that hazardous substances attributable to the site may pose to human health and the environment by documenting the existence and migration of hazardous substances related to the site and by identifying the receptors, or targets, potentially exposed to the hazardous substances. EPA will use the information obtained during the ESI to evaluate the site using the Hazard Ranking System (HRS) and to help decide if the site is a potential candidate for inclusion on the National Priorities List (NPL). The intent of the ESI is to provide the documentation necessary to either rank a site on the NPL or assign a "No Further Remedial Action Planned" (NFRAP) status.

1.2 SCOPE OF WORK

The objective of this ESI is to further define the extent and characteristics of hazardous waste at the site through the collection and analyses of soil, sediment, groundwater, and waste samples from locations on and around the Wilcox site. The specific activities that will be performed during the ESI to achieve the objective have been divided into major tasks, as follows:

- Obtain and review available background information concerning the site.
- Research data related to the groundwater, surface water, soil exposure, and air pathways.

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- Conduct a site reconnaissance to document current site conditions, locate hazardous waste sources, identify potential receptors or targets of a release, and select sample locations.

- Prepare a site-specific Task Work Plan (TWP) and HASP describing site reconnaissance activities and appropriate safety protocol.

- Collect and analyze soil, sediment, groundwater, and waste samples to document and characterize hazardous waste sources at the site.

- Prepare an ESI report to document the results of the site reconnaissance, sampling activities, and sample analyses as well as present the background information obtained for the site.

The project tasks are based on WESTON's understanding of the site background information and the generic scope of the ESI Work Assignment. These will be discussed in greater detail in the following sections.

1.3 WORK PLAN FORMAT

The ESI Work Plan has been organized in the following format:

- Section 1—Introduction
- Section 2—Site Background Information
- Section 3—Exposure and Migration Pathway Characteristics
- Section 4—Sampling Activities
- Section 5—Project Information
- Section 6—References

A copy of the site access agreement is provided in Appendix A, the site-specific HASP is provided in Appendix B, sampling procedures are provided in Appendix C, and Contract Laboratory Program (CLP) guidelines are provided in Appendix D. The tables and figures referenced throughout this TWP are provided at the end of each section.

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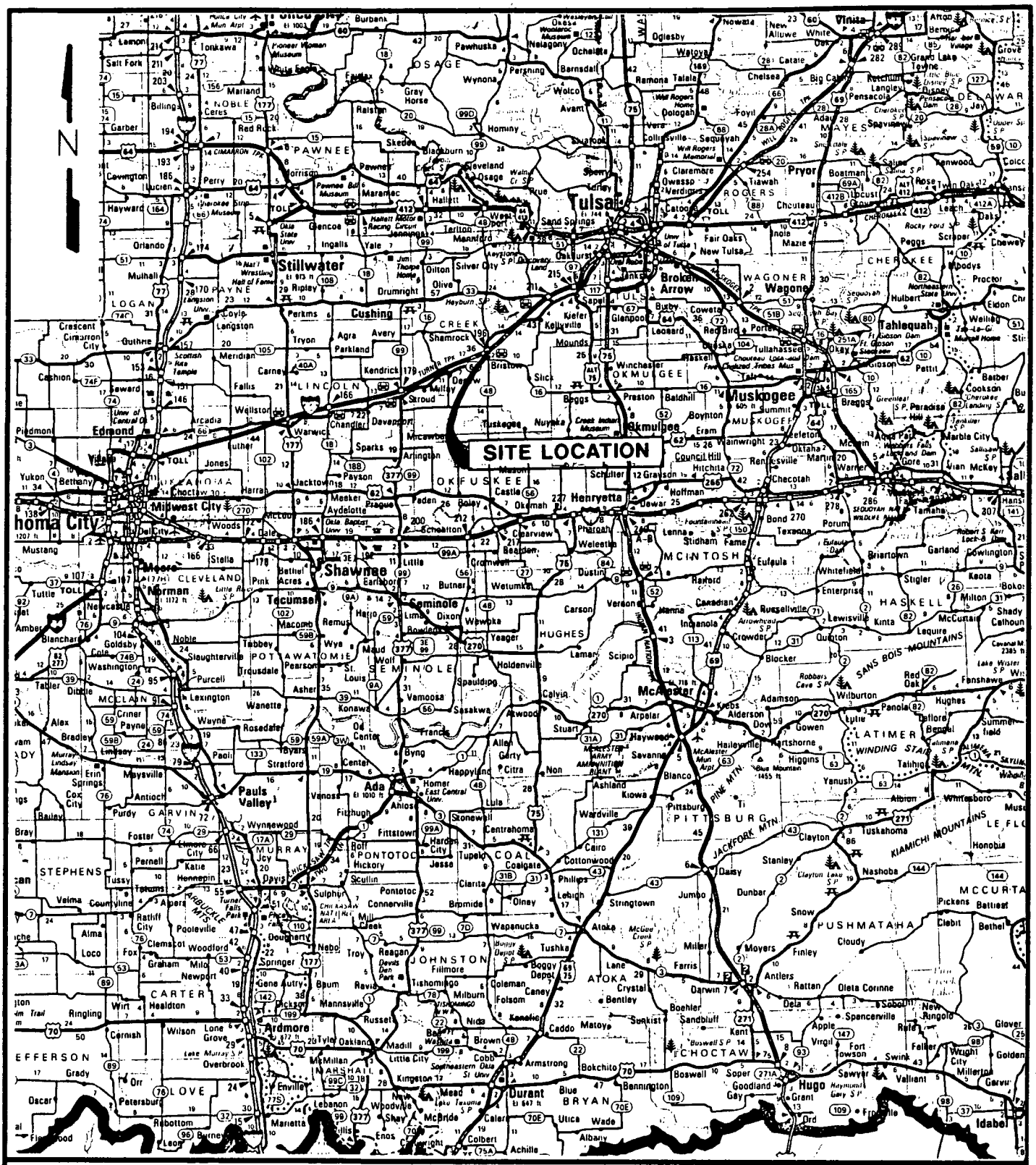
SITE LOCATION
N
Tulsa
Broken Arrow
Muskogee
Bixby
Stillwater
Cushing
Edmond
Midwest City
Norman
Shawnee
Tecumseh
Seminole
Henryetta
McAlester
Pauls Valley
Ada
Ardmore
Durant
Hugo
Pryor
Wagoner
Tahlequah
Sapulpa
Bristow
Okmulgee
Moore
Yukon
Bethany
Choctaw
Mustang
Newcastle
Blanchard
Purcell
Lexington
Noble
Chandler
Davenport
Stroud
Kiefer
Mounds
Haskell
Checotah
Eufaula
Stigler
Poteau
Idabel
Valliant
Antlers
Atoka
Durant
Madill
Marietta
Ada
Sulphur
Tishomingo
Calera
Colbert
Achille
Albany
Wade
Bennington
Boswell
Soper
Goodland
Gay
Grant
Sawyer
Swink
Fort Towson
Hugo
Valliant
Idabel
Broken Arrow
Tulsa
Sand Springs
Jenks
Bixby
Coweta
Leonard
Red Bird
Porter
Tullahassee
Haskell
Checotah
Eufaula
Stigler
Poteau
Wilburton
Hartshorne
Krebs
Alderson
Haywood
Arpelar
McAlester
Savanna
Haileyville
Kiowa
Ashland
Wardville
Pittsburg
Stonewall
Centrahoma
Coalgate
Tupelo
Atoka
Caddo
Bokchito
Armstrong
Durant
Blue
Bennington
Boswell
Soper
Goodland
Gay
Grant
Sawyer
Swink
Fort Towson
Hugo
Valliant
Idabel
Antlers
Atoka
Durant
Madill
Marietta
Ada
Sulphur
Tishomingo
Calera
Colbert
Achille
Albany
Wade

SECTION 2
SITE BACKGROUND INFORMATION

A summary of the location, description, operational history, source characteristics, and other concerns at the site is presented in this section. The site background information has been acquired from reports previously completed for the site, as well as from WESTON's site reconnaissance.

2.1 SITE LOCATION AND DESCRIPTION

The Wilcox site is located to the immediate north of Bristow, Creek County, Oklahoma. The geographic coordinates of the site are approximately 35°50'31" North latitude and 96°23'02" West longitude (Reference 1). The site covers approximately 300 acres and includes at least two abandoned and demolished oil refineries and associated tank farms. A Site Area Map derived from a U.S. Geological Survey (USGS) 7.5-minute topographic map is provided as Figure 2-1 (Reference 2).

The site can be reached by traveling southwest on Interstate 44 (I-44) from Tulsa, Oklahoma for approximately 35 miles. Exit State Highway 66 and continue south, approximately 0.5 mile to an unnamed section line road. Turn left on the section line road and travel approximately 0.2 mile east until you reach the site (References 1 and 2).

Based on EPA file information, the site consists of many tracts of land and is owned by a number of private individuals, a church, and Falcon Oil Properties (Reference 1). The southern portion of the site is owned by four principals: Phil Elias, Jack White, Arthur White, and the First Assembly of God Church. WESTON contacted Mr. Jack White at (b) (6) [redacted], and by phone at (b) (6) [redacted]. Mr. White signed an EPA Access Agreement on 10 July 1996 allowing WESTON access to the Wilcox site. WESTON also contacted Arthur White, (b) (6) [redacted] (phone: (b) (6) [redacted]). Mr. Arthur White signed an EPA Access Agreement on 10 July 1996. Doug Sampley, First Assembly of God Church, also signed an EPA Access Agreement dated 8 July 1996. Copies of the signed access agreements are included in Appendix A. WESTON contacted Mr. Phil Elias at (b) (6) [redacted], and by phone at (b) (6) [redacted]. Mr. Elias granted verbal access to the property but has not returned signed copies of the access agreement to date.

WESTON completed the ESI site reconnaissance on 16 August 1996. WESTON team members were accompanied by the current owners as each portion of the property was visited. Present were Mr. and Mrs. Phil Elias, owners of approximately 80 acres of the southeastern portion of the site; Mr. Arthur White, co-owner of 13 acres of the southcentral portion of the site; and Pastor Sampley, Pastor for the First Assembly of God Church. The church owns approximately 8.75 acres of the southwest portion of the site.

Initially, the site assigned by EPA for this ESI included only properties south of the section line road previously occupied by Wilcox Oil Company. However, based on observations made

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during the site reconnaissance, on review of historic information, and on further discussions with EPA, the site boundaries have been expanded to include adjoining abandoned refinery properties to the north of the section line road.

The site is located on the northern edge of the City of Bristow, Oklahoma. Surrounding the site are Turner Turnpike (I-44) to the north and State Highway 66 to the west. The land immediately east of the site is undeveloped, while Sand Creek and residential neighborhoods of the City of Bristow are south of the site (Reference 2).

The site covers approximately 300 acres and includes remnants of at least two inactive oil refineries. The site contains former tank farm areas, pits, and ponds. Most of the refinery structures have been demolished or dismantled; however, some tanks, buildings, and other structures remain on-site. A pumping or gas compressor station and a Williams Company gas pipeline also exist on-site (References 1 and 3). A Site Plan showing the layout of the site is provided as Figure 2-2.

2.2 SITE HISTORY

The site consists of at least two inactive oil refineries and associated tank farms that cover the northwest portion of Section 29 and the southwest portion of Section 20, Township 16 North, Range 9 East (Indian Meridian). The refineries have operated under various names including the following: Wilcox Oil Refining, Lorraine Refinery, Ohio Oil, Continental Refining, Producers Oil, and Roland Refining (Reference 3). Refinery operations appear to have occurred in the north, southeast, and southwest portions of the site. Two refineries may have existed concurrently, but it appears that name changes were frequent and portions of refineries and corresponding tank farms may have been acquired by neighboring facilities.

Wilcox Oil Company operated as a crude oil refinery from the 1920s until the property was sold by Wilcox Oil Company on 1 November 1963 (Reference 1). According to a 1930 article published in *The Refiner and Natural Gasoline Manufacturer*, the Wilcox Oil Company refinery was operated as a pilot project from about 1920 to 1928 at 1,000 barrels of oil per day by Riley Petroleum Company (Reference 4). Wilcox Oil Company acquired the original site (NE ¼, NW ¼, NW ¼ of Section 29) on 11 October 11 1928 from A.A. Rollestone. A modern skimming and cracking plant was constructed in 1929, which had an operating capacity of 4,000 barrels of crude oil per day. The main components of the system consisted of a skimming plant, cracking unit, and redistillation battery with a vapor recovery system and continuous treating equipment. The crude oil was brought directly from the field, which eliminated storage and handling facilities, but resulted in crude with high bottom sediment and water.

At some later date, the Wilcox Oil Company expanded operations by acquiring the former Lorraine Refinery facility west of the railroad and the tank farm area to the east (Reference 1). The company sold the original site plus the expanded areas, totaling approximately 110 acres, to Wendel Sandlin on 1 November 1963. Most of the equipment and storage tanks that remained on site in 1963 were auctioned and have been salvaged for scrap iron by private land owners. The Wilcox Oil Company no longer operates in Oklahoma, and, based on information acquired from the Oklahoma Secretary of State's office, this company merged with Tenneco Oil

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Company in 1967. According to file information, Jack and Arthur White acquired the original refinery property from J.M. and Kinis Bankston on 27 March 1973. It is not known if or when the Bankstons acquired the property from Wendel Sandlin.

Little is known about the dates of operation of the other refineries located in the southwest and northern portions of the site. Sanborn Fire Insurance (Sanborn) maps from 1915 and 1920 show that the southwest area was occupied by Continental Refining Company (Reference 3). A 1923 Sanborn Fire Insurance Map shows portions of the site west of the railroad line occupied by the Lorraine Refinery. A 1961 Sanborn map identifies the area as the "former location of Producers Oil Co, Oil Refinery." Ohio Oil is listed on an ownership map for the northern portion of the site (Reference 5). By 1966, aerial photos show the refineries in the north portion of the site in ruins and the far southwest corner of the site vacant (Reference 6).

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According to a map provided by the Creek County Assessor's office, the site is currently owned by private individuals, U.S. Cellular, The First Assembly of God Church, and Falcon Oil (Reference 6).

2.3 SUMMARY OF PREVIOUS INVESTIGATIONS

WESTON reviewed available EPA CERCLA files. Previous investigations related to the Wilcox site include the following:

- EPA completed a Potential Hazardous Waste Site Identification form on 7 June 1994 (Reference 7).

- The State of Oklahoma, Department of Environmental Quality (ODEQ) performed a Preliminary Assessment (PA) for the Wilcox site on 15 December 1994 (Reference 1). The PA defined the site as approximately 75 acres in the N 1/2 of the NW 1/4 and 40 acres in the NW 1/4 of the NE 1/4 of Section 29, Township 16 North, Range 9 East. The PA indicated that contamination of groundwater and soils at the site had been observed and that potential receptors exist for these pathways. The PA then recommended a Site Inspection be conducted in order to better characterize the site and to determine whether threats to human health and the environment exist.

2.4 SOURCE CHARACTERISTICS AND SITE CONCERNS

The following subsections describe information concerning the known or potential sources at the site and the constituents thought to be associated with each source, along with a summary of potential concerns associated with contaminant migration and exposure.

2.4.1 Source Characteristics

On-site sources have not been well-defined in terms of size, content, and use. Based on a review of the file information and aerial photographs and on observations made during the site reconnaissance, sources including ponds, pits, tanks, and contaminated soils are suspected. The

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source contaminants may include volatile organic constituents, some semivolatiles, and metals such as lead. No sampling is known to have been conducted in previous investigations to characterize potential sources. Suspected sources at the site are discussed below and are illustrated in Figure 2-2.

The contaminants found on-site may be directly related to crude oil or petroleum products, in which case they may not be addressable under CERCLA because of the petroleum exclusion contained in the law's definition of hazardous waste. However, waste petroleum products that contain higher concentrations of hazardous substances than the virgin product are not considered to be excluded. Also, certain petroleum refining wastes are defined as Resource Conservation and Recovery Act (RCRA) wastes in 40 *Code of Federal Regulations* (CFR) 261.31 and are not excluded. These RCRA wastes include American Petroleum Institute (API) separator sludge, leaded tank bottoms, refinery primary oil/water/solids separation sludge, and refinery secondary (emulsified) oil/water solid separation sludge.

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Leaded Tank Bottoms

Based on the site reconnaissance and aerial photographs, over 30 bermed areas which formerly contained tanks and now potentially contain leaded tank bottoms have been identified on-site (References 8, 9, and 10). The circular berms measure up to 300 feet in diameter, while the tank bottoms measure up to 150 feet in diameter. Some of the circular bermed areas are superimposed upon others, indicating multiple phases of development.

Sanborn maps indicate that tanks in these bermed areas had volumes that ranging from 100 barrels to 56,000 barrels (Reference 3). Contents listed for the tanks include crude oil, fuel oil, distillate, kerosene, gasoline, "benzine", "xerosene", and "gas-oil." The Sanborn maps also show many of the tanks surrounded by 3- and 4-feet high berms. Almost all of the aboveground tanks have been removed, with the exception of approximately four tanks located on the White's property (south-central portion of the site) (Reference 9).

Residences in the northern portion of the site appear to have been constructed directly over former locations of tanks and within tank berms based on a review of aerial photographs, topographic maps, and field observations (References 2, 8, 9, and 10). Some areas of barren, black-colored soils were noted in the yards of homes located within these areas during the site reconnaissance (Reference 10). One of the site owners remarked that discolored soils were common in the yards of their neighborhood. Large, circular areas containing oily, tarry, and black materials were also noted during the site reconnaissance. These areas were presumably occupied by aboveground storage tanks at one time.

Ponds/Pits

Former ponds/pits were also noted in the southcentral portion of the site and were verified later with aerial photographs (References 8, 9, and 10). The total depth and historic use of these ponds/pits is not known. A 1966 aerial photo shows Pond 1 measures 250 feet by 100 feet. Pond 1 is divided into three rectangular cells by berms. Currently the pond is backfilled. Mr. Elias stated he had this performed recently because of safety concerns.

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Pond 2 measures approximately 400 feet by 250 feet and is divided by a berm into two cells. Black, tarry material was observed in this pond during the reconnaissance. A portion of the berm has been cut, and discolored material was noted downgradient of this area. According to Mr. Elias, children frequent his property despite the presence of fences and verbal warnings. The children have reportedly played in and around the pits, and Mr. Elias expressed a great deal of concern about children falling into the ponds.

A suspected 300-feet diameter pit was also identified from aerial photos (References 8 and 9). Oily seeps were observed during the site reconnaissance and are believed to be emanating from this area.

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Contaminated Soils

Contaminated soils may occur in areas of former refinery operations in which storage, processing, loading, and disposal activities have occurred. Church representatives noted that they have frequently encountered old pipelines and other debris when digging on their property (southwest portion of the site) (Reference 10). Debris and trash (broken brick, glass, etc.) were observed partially buried in the surface soils of the church property.

A barren area of soil was noted in the southern part of the White's property (south-central portion of the site). This area was covered by silty sand and a white, salt-like substance. Former use of this area is unknown; aerial photographs from the 1960s, 1970s, 1980s and 1990s show this area as vacant and barren (References 8 and 9).

2.4.2 Site Concerns

Possible concerns associated with the sources of hazardous substances at the site and the migration of or exposure to these substances through the groundwater, surface water, soil exposure, and air pathways include the following:

- A release to groundwater is of major concern. There are several private wells located on and near the site. The formation containing the drinking water aquifer crops out at the site and the aquifer is unconfined. Although public supply wells are located within a 4-mile radius of the site, the nearest active well is approximately one mile southwest of the site and produces from deep zones of the aquifer.

- A release to surface water is of major concern due to the high potential for off-site migration of contaminants into Sand Creek. The majority of the site drains into Sand Creek, a perennially-flowing creek located on the southwest corner of the site. Some sources at the site have no flood containment features, and portions of the site are located in the 100-year flood zone. Wetlands occur in the 15-mile surface water pathway for the site.

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- Areas of contaminated soil are of major concern since several residences, a church, and businesses are present on-site and in areas of potential soil contamination.

- A release to air is of minor concern because the site is inactive. The potential for exposure by the air pathway is believed to be minimal.

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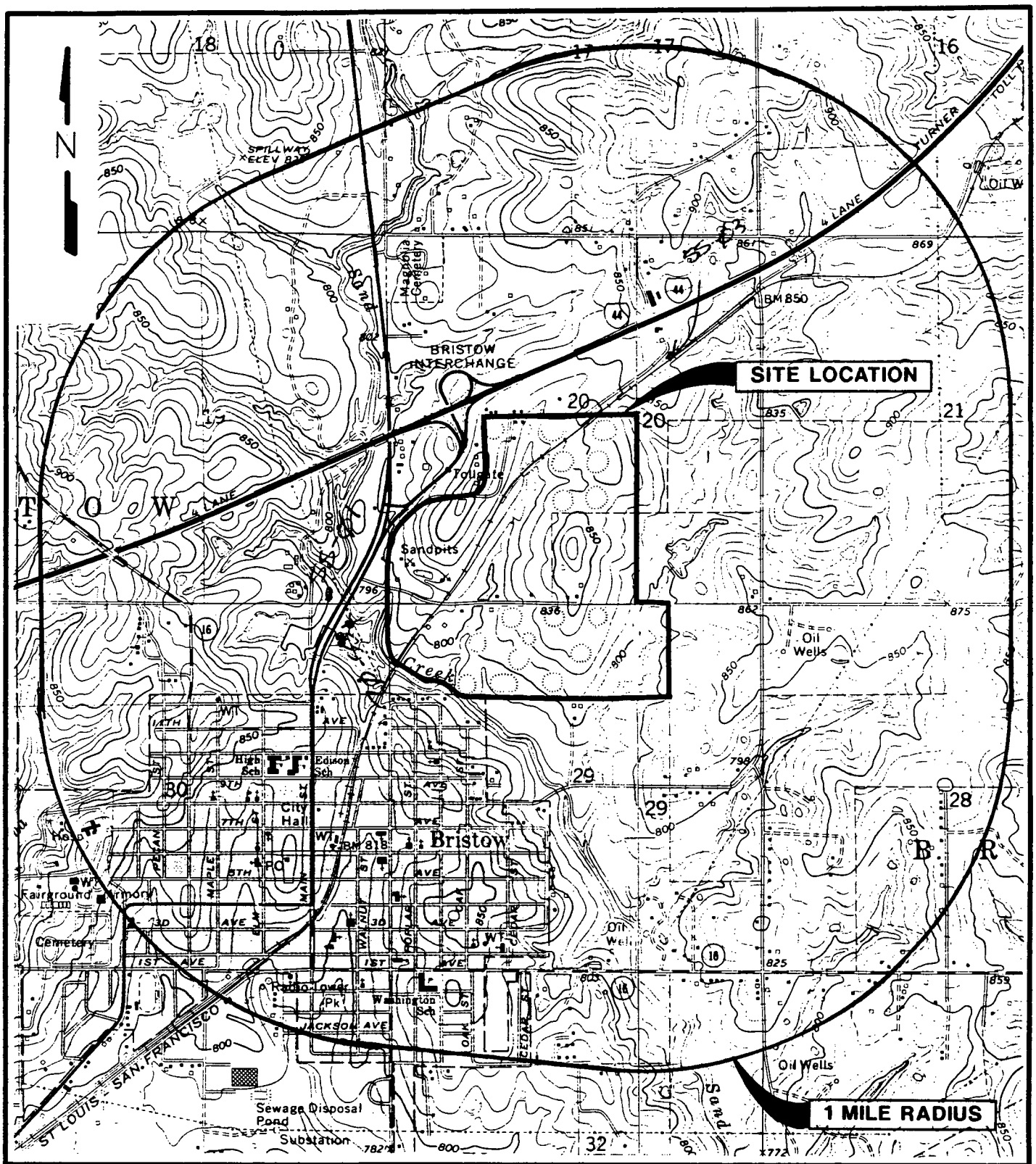

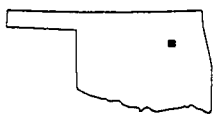

BASE MAP FROM:
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GEOLOGICAL SURVEY
BRISTOW QUADRANGLE
SLICK QUADRANGLE
OKLAHOMA
7.5 MINUTE SERIES (TOPOGRAPHIC)
1973 SERIES

0 1000 2000
SCALE IN FEET

WESTON
MANAGERS DESIGNERS/CONSULTANTS

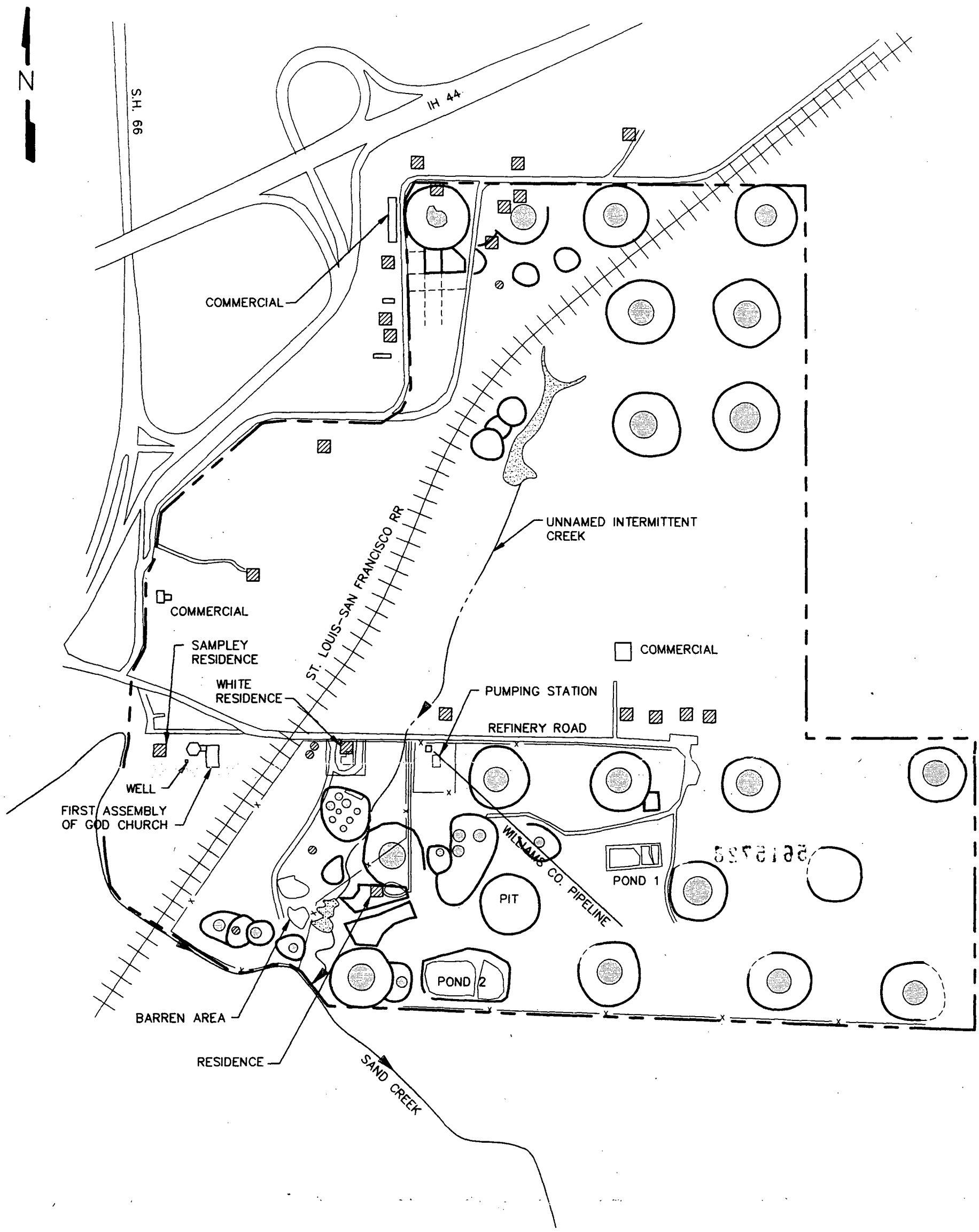
FIGURE 2-1
SITE AREA MAP

WILCOX OIL COMPANY
BRISTOW, OKLAHOMA
CERCLA ID NO.: OKD001010917

EPA REGION VI
ARCS EXPANDED SITE INSPECTION

W.O. NO.: 04606-056-026-0600

5615/29



0 250 500
SCALE IN FEET

LEGEND

- FENCE
- RESIDENCE
- ABOVE GROUND TANK
- BERM
- FORMER LOCATION OF TANK
- SITE BOUNDARY
- POND

WESTON

FIGURE 2-2
SITE PLAN

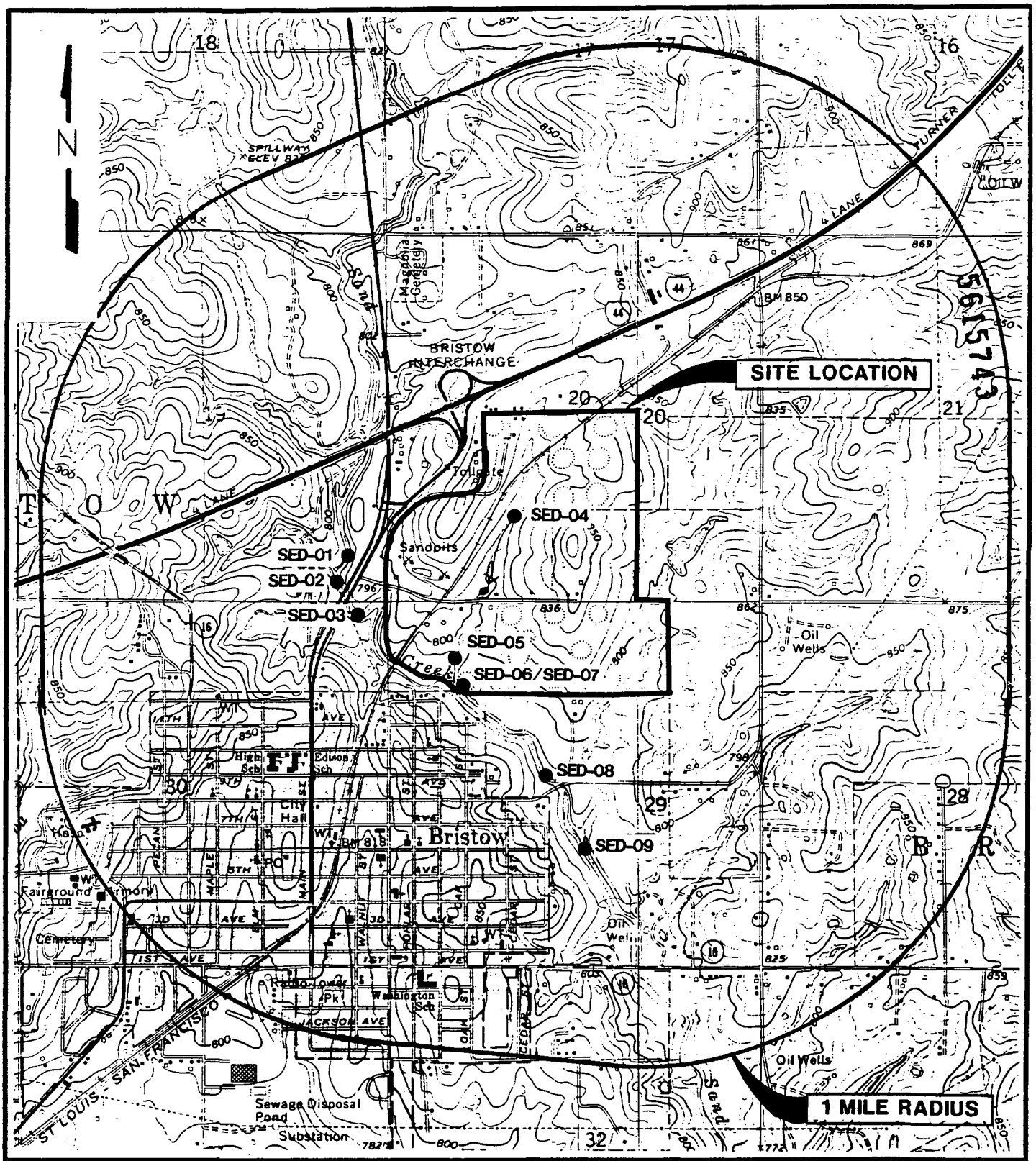
WILCOX OIL COMPANY
BRISTOW, OKLAHOMA
CERCLA ID NO.: OKD001010917

EPA REGION VI
ARCS EXPANDED SITE INSPECTION

W.O. NO.: 04606-056-026-0600

H:\ARCS\ARC4606\0600.PABF 1=500 (PCP=COLOR) 10-04-96

5615727



BASE MAP FROM:
U.S. DEPT. OF THE INTERIOR
GEOLOGICAL SURVEY
BRISTOW QUADRANGLE
SLICK QUADRANGLE
OKLAHOMA
7.5 MINUTE SERIES (TOPOGRAPHIC)
1973 SERIES

SED-10 TO BE COLLECTED JUST PAST THE CONFLUENCE OF SAND CREEK AND THE LITTLE DEEP FORK CREEK.

SED-01
● SEDIMENT SAMPLE LOCATION

0 1000 2000
SCALE IN FEET

WESTON
MANAGERS DESIGNERS/CONSULTANTS

FIGURE 4-2
AREA SAMPLE LOCATION MAP

WILCOX OIL COMPANY
BRISTOW, OKLAHOMA
CERCLA ID NO.: OKD001010917

EPA REGION VI
ARCS EXPANDED SITE INSPECTION

W.O. NO.: 04606-056-026-0600

EXPANDED SITE INSPECTION
TASK WORK PLAN

WILCOX OIL COMPANY
BRISTOW, CREEK COUNTY, OK
EPA CERCLA ID NO.: OKD001010917

5615744

TABLE 4-1

ANTICIPATED PROJECT PERSONNEL

NAME	TITLE	ROLES	PROJECT RESPONSIBILITIES
Diane G. Williams	Associate Geologist	Project Team Leader/Field Team Leader	• Project coordination in the WESTON office. • Implementation of the Task Work Plan and Health and Safety Plan in the field, and final sample location selection. • Logbook documentation and photography. • Public relations and client interactions.
Pam Quackenbush	Associate Engineer	Sample Manager/Site Safety Officer	• Sample documentation, packaging, and shipping. • EPA CLASS/RSCC coordination. • Sample management. • Sampling and safety oversight and quality control.
Eric Tate	Associate Engineer	Sampler	• Collection of samples. • Equipment management and decontamination. • Sample documentation, packaging, and shipping. • Mobilization/Demobilization. • Air monitoring equipment calibration.
Joy Ishigo	Assistant Engineer	Sampler	• Collection of samples. • Equipment management and decontamination. • Sample documentation, packaging, and shipping. • Mobilization/Demobilization. • Air monitoring equipment calibration.

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Table 4-2
Wilcox Oil Company (CERCLIS ID OKD0001010917)
Sampling Station Descriptions and Rationales

Station Identification/Type	Description	Rationale	Sample Identification/QC Type
GW-01 Background	Low concentration groundwater sample collected from a well located upgradient of the site.	To characterize and document background levels of constituents in groundwater.	GW-01 Normal
GW-02 Background	Low concentration groundwater sample collected from a well located upgradient of the site.	To characterize and document background levels of constituents in groundwater.	GW-02 Normal
GW-03 Characterization	Low concentration groundwater sample collected from a well located on-site.	To characterize and document the presence of hazardous constituents in groundwater.	GW-03 Normal GW-13 Duplicate
GW-04 Characterization	Low concentration groundwater sample collected from a well located on-site.	To characterize and document the presence of hazardous constituents in groundwater.	GW-04 Normal GW-14 Duplicate
GW-05 Characterization	Low concentration groundwater sample collected from a well located on-site.	To characterize and document the presence of hazardous constituents in groundwater.	GW-05 Normal
GW-06 Characterization	Low concentration groundwater sample collected from a well located on-site.	To characterize and document the presence of hazardous constituents in groundwater.	GW-06 Normal
GW-07 Characterization	Low concentration groundwater sample collected from a well located on-site.	To characterize and document the presence of hazardous constituents in groundwater.	GW-07 Normal
GW-08 Characterization	Low concentration groundwater sample collected from a well located on-site.	To characterize and document the presence of hazardous constituents in groundwater.	GW-08 Normal
GW-09 Characterization	Low concentration groundwater sample collected from a well located on-site.	To characterize and document the presence of hazardous constituents in groundwater.	GW-09 Normal
GW-10 Characterization	Low concentration groundwater sample collected from a well located on-site.	To characterize and document the presence of hazardous constituents in groundwater.	GW-10 Normal

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Table 4-2 (Continued)
Wilcox Oil Company (CERCLIS ID OKD0001010917)
Sampling Station Descriptions and Rationales

Station Identification/Type	Description	Rationale	Sample Identification/QC Type
GW-11 Characterization	Low concentration groundwater sample collected from a well located on or near the site.	To characterize and document the presence of hazardous constituents in groundwater.	GW-11 Normal
GW-12 Characterization	Low concentration groundwater sample collected from a well located on or near the site.	To characterize and document the presence of hazardous constituents in groundwater.	GW-12 Normal
GW-15 Field QA/QC	Field blank sample collected in the field using deionized water.	Field blank sample for quality assurance purposes.	GW-15 Field Blank
SED-01 Background	Low concentration sediment sample collected from Sand Creek, west of S.H. 66 and upstream of the PPE.	To document a background levels of constituents in the surface water pathway.	SED-01 Normal
SED-02 Background	Low concentration sediment sample collected from Sand Creek, west of S.H. 66 and upstream of the PPE.	To document background levels of constituents in the surface water pathway.	SED-02 Normal
SED-03 Background	Low concentration sediment sample collected from Sand Creek, east of S.H. 66 and upstream of the PPE.	To document background levels of constituents in the surface water pathway.	SED-03 Normal
SED-04 Characterization	Low concentration sediment sample collected from an on-site pond and potential wetland.	To document a release of site-attributable hazardous constituents to the surface water pathway.	SED-04 Normal
SED-05 Characterization	Low concentration sediment sample collected from an on-site pond and potential wetlands.	To document a release of site-attributable hazardous constituents to the surface water pathway.	SED-05 Normal
SED-06 Characterization	Low concentration sediment sample collected from Sand Creek, at the PPE.	To document a release of site-attributable hazardous substances to the surface water pathway.	SED-06 Normal SED-07 Duplicate
SED-08 Characterization	Low concentration sediment sample collected from Sand Creek, approximately 0.5 mile downstream of the PPE.	To document a release of site-attributable hazardous substances to the surface water pathway.	SED-08 Normal
SED-09 Characterization	Low concentration sediment sample collected from Sand Creek, approximately 0.75 mile downstream of the PPE.	To document a release of site-attributable hazardous substances to the surface water pathway.	SED-09 Normal

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Table 4-2 (Continued)
Wilcox Oil Company (CERCLIS ID OKD0001010917)
Sampling Station Descriptions and Rationales

Station Identification/Type	Description	Rationale	Sample Identification/QC Type
SED-10 Characterization	Low concentration sediment sample collected from the Little Deep Fork Creek, just past the confluence of Sand Creek.	To document a release of site-attributable hazardous substances to the surface water pathway.	SED-10 Normal
SS-01 Background	Low concentration soil sample collected from the yard of an off-site residence.	To characterize background levels of constituents in soils.	SS-01 Normal
SS-02 Background	Low concentration soil sample collected north of and outside the influence of the site.	To characterize background levels of constituents in soils.	SS-02 Normal
SS-03 Background	Low concentration soil sample collected from an undisturbed area east of the site.	To document the background levels of constituents in soils.	SS-03 Normal
SS-04 Characterization	Low concentration soil sample collected from the yard of the Sampley residence.	To document the presence of hazardous constituents in surface soils.	SS-04 Normal
SS-05 Characterization	Low concentration soil sample collected from the yard of the White residence.	To document the presence of hazardous constituents in the surface soils.	SS-05 Normal
SS-06 Characterization	Low concentration soil sample collected from barren area in the southern portion of the White's property.	To document the presence of hazardous constituents in surface soils.	SS-06 Normal
SS-07 Characterization	Low concentration soil sample collected from an on-site residential property.	To document the presence of hazardous constituents in surface soils.	SS-07 Normal SS-08 Duplicate
SS-09 Characterization	Low concentration soil sample collected from an on-site residential property.	To document the presence of hazardous constituents in surface soils.	SS-09 Normal
SS-10 Characterization	Low concentration soil sample collected from an on-site residential property.	To document the presence of hazardous constituents in surface soils.	SS-10 Normal
SS-11 Characterization	Low concentration soil sample collected from an on-site residential property.	To characterize and document the presence of hazardous constituents in on-site soils.	SS-11 Normal

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Table 4-2 (Continued)
Wilcox Oil Company (CERCLIS ID OKD0001010917)
Sampling Station Descriptions and Rationales

Station Identification/Type	Description	Rationale	Sample Identification/QC Type
SS-12 Characterization	Low concentration sample collected from a residential property.	To characterize and document the presence of hazardous constituents in on-site soils.	SS-12 Normal
SS-13 Characterization	Low concentration sample collected from a residential property.	To characterize and document the presence of hazardous constituents in soils.	SS-13 Normal
SS-14 Characterization	Low concentration sample collected from a residential property.	To characterize and document the presence of hazardous constituents in soils.	SS-14 Normal
SS-15 Characterization	Low concentration sample collected from an on-site residential property.	To characterize and document the presence of hazardous constituents in on-site soils.	SS-15 Normal SS-16 Duplicate
SS-17 Characterization	Low concentration sample collected from an on-site residential property.	To characterize and document the presence of hazardous constituents in on-site soils.	SS-17 Normal
SS-18 Characterization	Low concentration sample collected from an on-site residential property.	To characterize and document the presence of hazardous constituents in on-site soils.	SS-18 Normal
SS-19 Characterization	Low concentration sample collected from a residential property.	To characterize and document the presence of hazardous constituents in surface soils.	SS-19 Normal
SS-20 Characterization	Low concentration sample collected from a residential property.	To characterize and document the presence of hazardous constituents in surface soils.	SS-20 Normal
WS-01 Characterization	High concentration waste sample collected from Pond 1.	To characterize and document the presences of hazardous constituents in the pond.	WC-01 Normal
WS-02 Characterization	High concentration waste sample collected from Pond 1.	To characterize and document the presences of hazardous constituents in the pond.	WS-02 Normal
WS-03 Characterization	High concentration waste sample collected from Pond 2.	To characterize and document the presences of hazardous constituents in the pond.	WS-03 Normal

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Table 4-2 (Continued)
Wilcox Oil Company (CERCLIS ID OKD0001010917)
Sampling Station Descriptions and Rationales

Station Identification/Type	**Description**	**Rationale**	**Sample** Identification/QC Type
WS-04 Characterization	High concentration waste sample collected from Pond 2.	To characterize and document the presence of hazardous constituents in the pond.	WS-04 Normal WS-05 Duplicate
WS-06 Characterization	High concentration waste sample collected from Pit.	To characterize and document the presence of hazardous constituents in the Pit.	WS-06 Normal
WS-07 Characterization	High concentration waste sample collected from a leaded tank bottom.	To characterize and document the presence of hazardous constituents in the source.	WS-07 Normal
WS-08 Characterization	High concentration waste sample collected from a leaded tank bottom.	To characterize and document the presence of hazardous constituents in the source.	WS-08 Normal

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EXPANDED SITE INSPECTION
TASK WORK PLAN

WILCOX OIL COMPANY
BRISTOW, CREEK COUNTY, OK
EPA CERCLA ID NO.: OKD001010917

TABLE 4-3

SAMPLING INFORMATION

SAMPLE TYPE	NUMBER AND TYPE OF CONTAINERS REQUIRED PER SAMPLE	ANALYSES REQUIRED	SAMPLE PRESERVATION REQUIRED
Groundwater	Two 40-mL glass bottles	Volatiles	Cool to 4°C
	Two 1-Liter glass bottles	Extractables	Cool to 4°C
	Two 1-Liter glass bottles	Pesticides/PCBs	Cool to 4°C
	One 1-Liter plastic bottle	Total Metals	Cool to 4°C, add HNO_3 to pH of 2
	One 1-Liter plastic bottle	Cyanide	Cool to 4°C, add NaOH to pH of 12
Groundwater Lab QA/QC	Six 40-mL glass bottles	Volatiles	Cool to 4°C
	Six 1-Liter glass bottles	Extractables	Cool to 4°C
	Six 1-Liter glass bottles	Pesticides/PCBs	Cool to 4°C
	Two 1-Liter plastic bottles	Total Metals	Cool to 4°C, add HNO_3 to pH of 2
	Two 1-Liter plastic bottles	Cyanide	Cool to 4°C, add NaOH to pH of 12
Soil/Sediment	Two 4 oz. glass jars	Volatiles	Cool to 4°C
	One 8 oz. glass jar	Extractables/Pesticides /PCBs	Cool to 4°C
	One 8 oz. glass jar	Metals/Cyanide	Cool to 4°C

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SECTION 5
PROJECT INFORMATION

This section outlines basic project management information for the ESI. Details concerning key personnel and the project schedule are provided. Reference should be made to WESTON's Generic Expanded Site Inspection Work Plan (WESTON Document Control Number 4603-26-0002) for more detailed information concerning WESTON's project management plan.

5615751

5.1 KEY PROJECT PERSONNEL

The anticipated key project personnel for this ESI assignment are shown on Figure 5-1.

5.2 PROJECT SCHEDULE

The overall project schedule is summarized in Table 5-1.

5.3 SAMPLING VISIT SCHEDULE

Sunday	8:00 p.m.	Team members arrive in Tulsa, Oklahoma.
Monday	8:00 a.m.	Team arrives at site and conducts site health and safety meeting. Samplers establish command post. FTL and Sample Manager prepare sample tags and labels.
	9:00 a.m.	Team collects samples. Sample Manager documents samples.
	12:00 p.m.	Lunch.
	1:00 p.m.	Team verifies sample documentation and packages samples.
	4:00 p.m.	FTL and Sample Manager depart for Federal Express to ship samples. Samplers decontaminate and load equipment and depart the site for the day.
Tuesday	8:00 a.m.	Team arrives at site and holds brief safety meeting. Samplers establish command post. FTL and Sample Manager prepare sample tags and labels.
	9:00 a.m.	Team collects samples. Sample Manager documents samples.
	12:00 p.m.	Lunch.
	1:00 p.m.	Team verifies sample documentation and packages samples.

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	4:00 p.m.	FTL and Sample Manager depart for Federal Express to ship samples. Samplers decontaminate and load equipment and depart the site for the day.
Wednesday	8:00 a.m.	Team arrives at site and holds brief safety meeting. Samplers establish command post. FTL and Sample Manager prepare sample tags and labels.
	9:00 a.m.	Team collects samples. Sample Manager documents samples.
	12:00 p.m.	Lunch.
	1:00 p.m.	Team verifies sample documentation and packages samples.
	4:00 p.m.	FTL and Sample Manager depart for Federal Express to ship samples. Samplers decontaminate and load equipment and depart the site for the day.
Thursday	8:00 a.m.	Team arrives at the site and holds brief safety meeting. Samplers establish command post. FTL and Sample Manager prepare sample tags and labels.
	9:00 a.m.	Team collects remainder of samples. Sample Manager documents samples.
	12:00 p.m.	Lunch.
	1:00 p.m.	Team verifies sample documentation and packages samples.
	4:00 p.m.	FTL and Sample Manager depart for Federal Express to ship samples. Samplers decontaminate and load equipment and depart the site for the day.
Friday	8:00 a.m.	Team departs for Houston (contingency day).

5.4 IMPORTANT PHONE NUMBERS

Important phone numbers that may be needed by the FTL include the following:

- Local Hospital (Bristow Memorial Hospital): (918) 367-2215
- WESTON 24-hour Emergency: (800) 229-3674
- WESTON Office: (713) 621-1620
- WESTON RES: (713) 957-3267
- EPA WAM (Lon Biasco): (214) 665-6673
- EPA RSSC (Myra Perez/Christy McDowell): (713) 983-2130/(713) 983-2137
- EPA (CLASS): (703) 519-1471

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- Place of Lodging in the Field: To be determined
- Federal Express (National): (800) 238-5355

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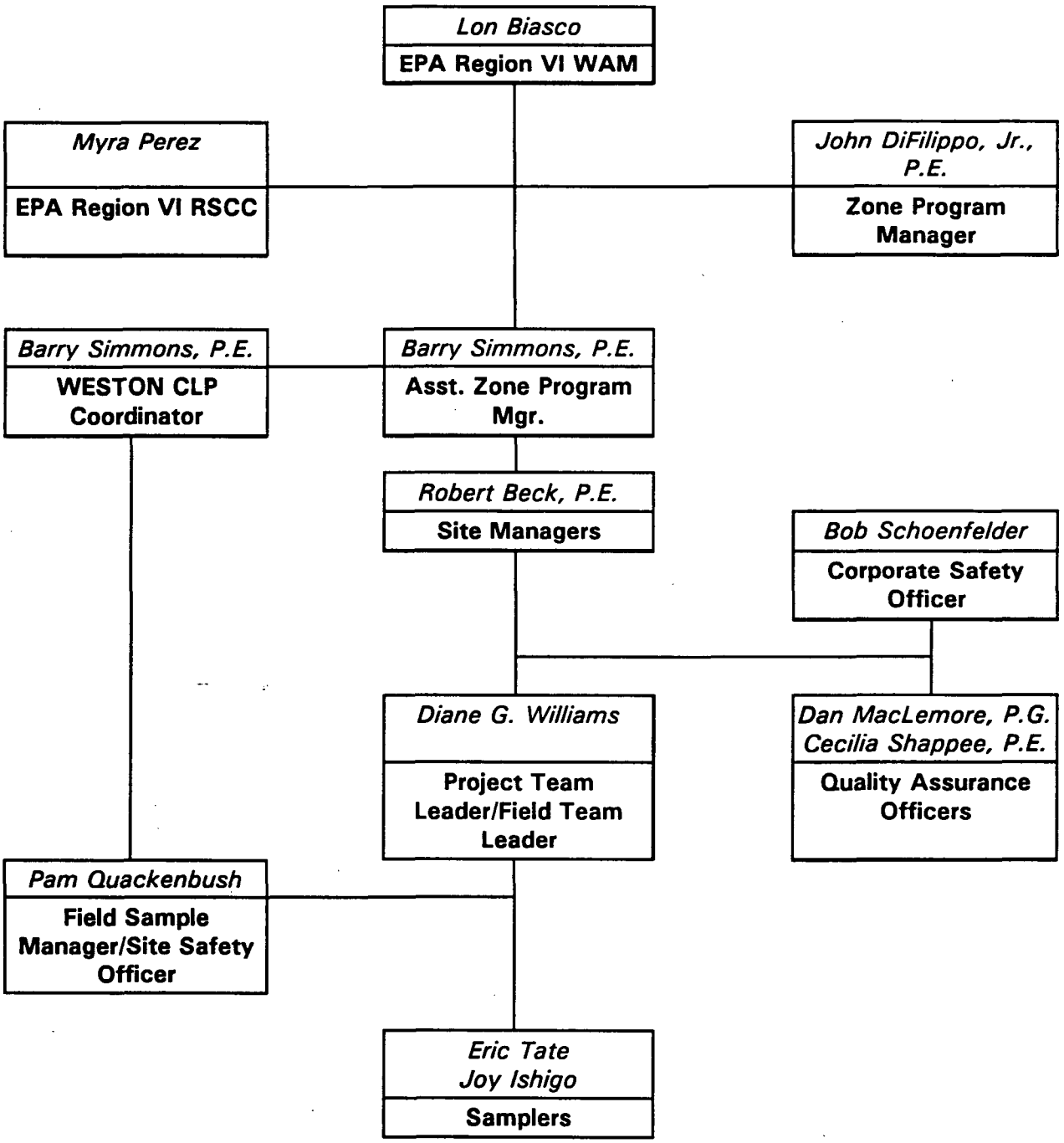
FIGURE 5-1
ANTICIPATED KEY PERSONNEL



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EXPANDED SITE INSPECTION
TASK WORK PLAN

WILCOX OIL COMPANY
BRISTOW, CREEK COUNTY, OK
EPA CERCLA ID NO.: OKD001010917

TABLE 5-1

PROJECT SCHEDULE
(1996 - 1997)

TARGET MILESTONES	OCTOBER	NOVEMBER	DECEMBER	JANUARY
WORK PLAN SUBMITTAL TO EPA				
WORK PLAN REVIEW/APPROVAL BY EPA				
LABORATORY SPACE REQUEST				
EQUIPMENT MOBILIZATION				
FIELD SAMPLING VISIT				
DATA ANALYSIS BY EPA LAB/CLP LAB				
DATA VALIDATION BY EPA				
REPORT WRITING				
REPORT QUALITY ASSURANCE				
REPORT SUBMISSION				

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SECTION 6
REFERENCE LIST

1. State of Oklahoma, Department of Environmental Quality (ODEQ). 1994. Preliminary Assessment of the Wilcox Oil Company, Bristow, Creek County, Oklahoma. 15 December 1994.

2. USGS (U.S. Geological Survey). 1973. Bristow Quadrangle, Oklahoma (7.5-minute series topographic map).

3. Sanborn Map Company. Excerpts from Fire Insurance Maps for Bristow, Creek County, Oklahoma: 1915, 1920, 1923, and 1961.

4. Reid, G. 1930. "Wilcox Has Modern Installation in Bristow Plant." *The Refiner and Natural Gasoline Manufacturer.* Vol. 9, No. 9. September 1930.

5. Creek County Tax Assessor. Ownership Map for the Wilcox Oil site. Unknown date.

6. Creek County Assessor. 1996. Ownership map for the Wilcox Oil site. 22 August 1996.

7. EPA (U.S. Environmental Protection Agency). 1994. Potential Hazardous Waste Site, Site Identification Form.

8. Ace Aerial Photo Service. Aerial Photographs for the Southern 2/3 Section 20 and the Northern 1/2 of Section 29, Township 16 North, Range 9 East: 1966, 1976, 1985.

9. Aerial Oklahoma, Inc. 1995. Aerial Photographs for the Southern 2/3 Section 20 and the Northern 1/2 of Section 29, Township 16 North, Range 9 East.

10. Williams, D.G. 1996. WESTON (Roy F. Weston, Inc.). Field Logbook Notes for the Wilcox Oil Company site. 16 August 1996.

11. USGS. 1990. Bristow, Oklahoma. (30 x 60 minute series topographic map).

12. Federal Emergency Management Agency. 1981. Flood Hazard Boundary Map, Creek County, Oklahoma (Unincorporated Area). Community Panel Number 400490 0007 A. 19 May 1981.

13. U.S. Department of Agriculture, Soil Conservation Service. 1959. Soil Survey for Creek County, Oklahoma. May 1959.

14. U.S. Department of Commerce, Bureau of the Census. 1991. 1990 Census of Population and Housing, Oklahoma. August 1991.

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APPENDIX A

SITE ACCESS AGREEMENT

CONSENT FOR ACCESS TO PROPERTY

Name: Pastor Sampley

EPA I.D. No.: OKD0001010917
Site Name: Wilcox Oil Company
Bristow, Oklahoma

Description of Property: The Wilcox Oil Company site is located in Bristow, Oklahoma (see attached location map).

5615758

I hereby consent to officers, employees, and representatives authorized by the United States Environmental Protection Agency (EPA) entering and having continued access to my property for the following purposes:

1. Reviewing and copying documents related to the site;
2. The taking of such soil, water and air samples as may be determined to be necessary;
3. The sampling of any solids or liquids stored or disposed of on property;
4. The drilling of holes and the installation of monitoring wells for subsurface investigation of subsurface contamination.

I realize that these actions are undertaken pursuant to EPA's response and enforcement responsibilities under the Comprehensive Environmental Responsibility, Compensation, and Liability Act, as amended (CERCLA), 42 U.S.C. § 9601 et seq., as well as 40 CFR Part 300.400 Subpart E.

I am the property owner, or a responsible agent of the property owner, and I warrant that I have the authority to enter into this access agreement.

Place a check mark in the appropriate space. Please note that if no selection is made EPA will assume that you do not wish to be provided with a portion of the sample.

( ) Please provide me with a portion of each sample taken at the property described above. I understand that there will be no charge for the sample portions provided by the EPA. I also understand that I must furnish suitable containers, be responsible for the laboratory analytical analysis, and sign for the transfer of custody from the EPA designated sampler.

(X) I do not wish to receive a portion of samples taken at the property described above.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

July 8, 1996
DATE

Doug Sampley, PASTOR
SIGNATURE, Title

area:46065621:sampley.626(hann)

CONSENT FOR ACCESS TO PROPERTY

Name: Jack White

Mr. Jack White
(b) (6) [redacted]

EPA I.D. No.: OKD0001010917
Site Name: Wilcox Oil Company
Bristow, Oklahoma

Description of Property: The Wilcox Oil Company site is located in Bristow, Oklahoma (see attached location map).

5615759

I hereby consent to officers, employees, and representatives authorized by the United States Environmental Protection Agency (EPA) entering and having continued access to my property for the following purposes:

1. Reviewing and copying documents related to the site;
2. The taking of such soil, water and air samples as may be determined to be necessary;
3. The sampling of any solids or liquids stored or disposed of on property;
4. The drilling of holes and the installation of monitoring wells for subsurface investigation of subsurface contamination.

I realize that these actions are undertaken pursuant to EPA's response and enforcement responsibilities under the Comprehensive Environmental Responsibility, Compensation, and Liability Act, as amended (CERCLA), 42 U.S.C. § 9601 et seq., as well as 40 CFR Part 300.400 Subpart E.

I am the property owner, or a responsible agent of the property owner, and I warrant that I have the authority to enter into this access agreement.

Place a check mark in the appropriate space. Please note that if no selection is made EPA will assume that you do not wish to be provided with a portion of the sample.

( ) Please provide me with a portion of each sample taken at the property described above. I understand that there will be no charge for the sample portions provided by the EPA. I also understand that I must furnish suitable containers, be responsible for the laboratory analytical analysis, and sign for the transfer of custody from the EPA designated sampler.

( ) I do not wish to receive a portion of samples taken at the property described above.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

10 July 1996
DATE

Jack White
SIGNATURE, Title

Note:
The Area marked in red on the site map attached (approx. 10 Ac.) under fence is owned by the above signed only & Arthur B. White

area:46065621:white2.626(bmm)

CONSENT FOR ACCESS TO PROPERTY

Name: Arthur White

EPA I.D. No.: OKD0001010917
Site Name: Wilcox Oil Company
Bristow, Oklahoma

Description of Property: The Bristow Oil Company site is located in Bristow, Oklahoma (see attached location map).

5615760

I hereby consent to officers, employees, and representatives authorized by the United States Environmental Protection Agency (EPA) entering and having continued access to my property for the following purposes:

1. Reviewing and copying documents related to the site;
2. The taking of such soil, water and air samples as may be determined to be necessary;
3. The sampling of any solids or liquids stored or disposed of on property;
4. The drilling of holes and the installation of monitoring wells for subsurface investigation of subsurface contamination.

I realize that these actions are undertaken pursuant to EPA's response and enforcement responsibilities under the Comprehensive Environmental Responsibility, Compensation, and Liability Act, as amended (CERCLA), 42 U.S.C. § 9601 et seq., as well as 40 CFR Part 300.400 Subpart E.

I am the property owner, or a responsible agent of the property owner, and I warrant that I have the authority to enter into this access agreement.

Place a check mark in the appropriate space. Please note that if no selection is made EPA will assume that you do not wish to be provided with a portion of the sample.

( ) Please provide me with a portion of each sample taken at the property described above. I understand that there will be no charge for the sample portions provided by the EPA. I also understand that I must furnish suitable containers, be responsible for the laboratory analytical analysis, and sign for the transfer of custody from the EPA designated sampler.

( ) I do not wish to receive a portion of samples taken at the property described above.

This written permission is given by me voluntarily with knowledge of my right to refuse and without threats or promises of any kind.

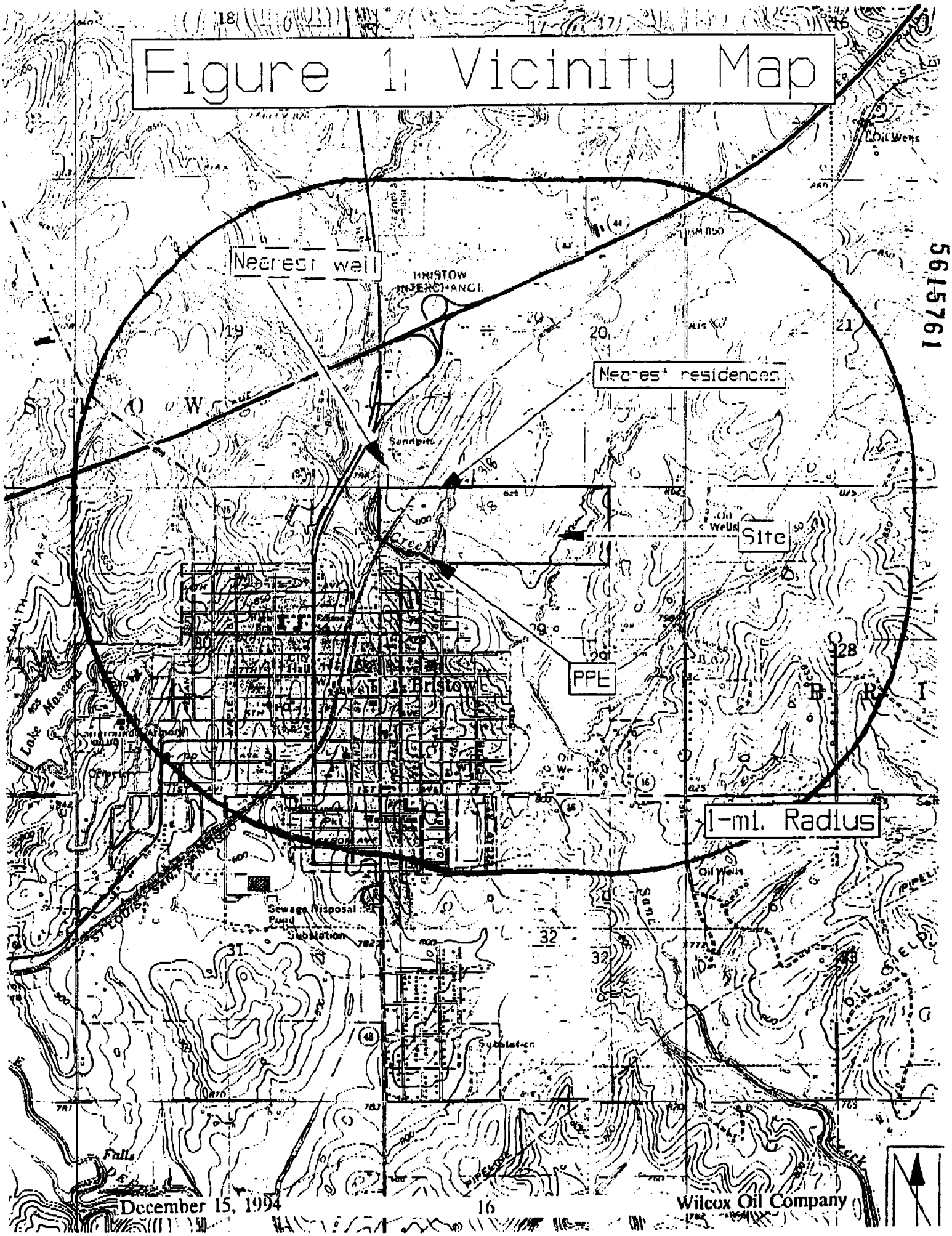
10 July 1996
DATE

Arthur B White
SIGNATURE, Title

Note: See attached Site Map & Area in Red

arcs:46032327:white.626(bmm)

Figure 1: Vicinity Map



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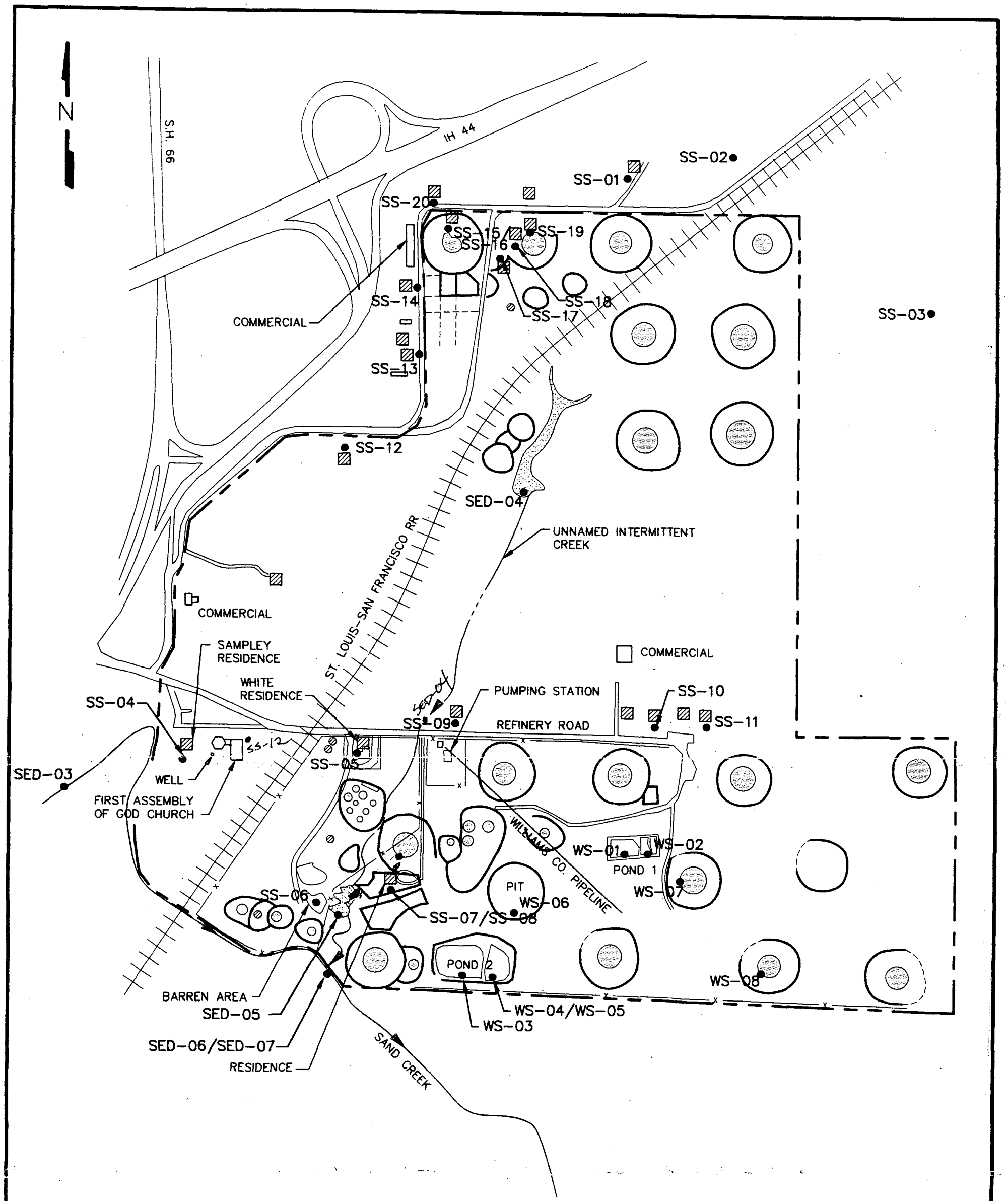

LEGEND

- FENCE
- RESIDENCE
- ABOVE GROUND TANK
- BERM
- FORMER LOCATION OF TANK
- SITE BOUNDARY
- SS-00 SOIL SAMPLE
- POND

NOTE

GROUNDWATER SAMPLE LOCATIONS WILL BE IDENTIFIED DURING THE FIELD SAMPLING ACTIVITIES.

0 250 500
SCALE IN FEET

WESTON

FIGURE 4-1
SAMPLE LOCATION MAP

WILCOX OIL COMPANY
BRISTOW, OKLAHOMA
CERCLA ID NO.: OKD001010917

EPA REGION VI
ARCS EXPANDED SITE INSPECTION

W.O. NO.: 04606-056-026-0600

H:\ARCS\ARC4606\0601.BF 1=500 (PCP=COLOR) 10-04-96

SECTION 3
EXPOSURE AND MIGRATION PATHWAY CHARACTERISTICS

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Information regarding the groundwater, surface water, soil exposure, and air pathways is presented in the following subsection. Sampling and nonsampling data collected to date are addressed. Known data gaps are identified at the end of the section.

3.1 GROUNDWATER PATHWAY

The Wilcox site is located on an exposure of the Pennsylvanian-age Barnsdall Formation (Reference 1). The Barnsdall Formation is heterogeneous in character and contains sandstone interbedded with silty and sandy shales. The sandstone beds are collectively known as the Okesa Sandstone Member.

The Barnsdall Formation is the principal source of groundwater to eight active municipal supply wells in Bristow, Oklahoma (Reference 1). The upper part of the Barnsdall Formation is unconfined with a shallow water table. The depth to the shallowest water-bearing unit is reportedly less than 25 feet. However, a depth of 60 feet was reported for the first water-saturated sandstone in an on-site domestic water well located in the SW ¼ of the SW ¼ of the SW ¼ of Section 20, Township 16 North, Range 9 East.

Sources at the site have no known containment features to prevent a release to groundwater. The Barnsdall Formation is unconfined and crops out at the site; thus, a high potential for a release to groundwater exists for the site. Water wells on the First Assembly of God Church property and on the White's property have been abandoned because of oil contamination (Reference 1).

Groundwater pathway targets include drinking water provided to the population, from wells located near the site; Well Head Protection Areas (WHPAs); and resources relying on groundwater. There are eight active drinking water wells for the City of Bristow located within 4 miles of the site (Reference 1). However, the nearest active public supply well is approximately one mile southwest of the site. Residences to the north of the refinery road receive drinking water from private wells on-site, but the exact locations of these wells are unknown (Reference 10).

3.2 SURFACE WATER PATHWAY

The Wilcox site occurs in the Little Deep Fork Creek basin. Drainage from the site flows south across the site into Sand Creek, which borders the southwest corner of the site (References 1 and 2). Sand Creek discharges into Little Deep Fork Creek approximately 3.5 miles downstream of the site (Reference 11). Flow continues in Little Deep Fork Creek for the remaining 11.5 miles of the site surface water pathway.

Based on the information presently available, a release to surface water is suspected. Drainage from some of the sources at the site is not controlled (References 1 and 10). A former pastor

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of the First Assembly of God church observed an oily substance seeping into Sand Creek southwest of the church (Reference 1). In addition, discolored material was observed downgradient of a breached berm on Pond 2 during the reconnaissance (Reference 10). Portions of the site are in the 100-year flood zone (Reference 12).

Surface water pathway targets include fisheries, drinking water intakes, sensitive environments, and resources that rely on surface water. It is not known whether Sand Creek and Little Deep Fork Creek are fisheries. According to the State of Oklahoma, Sand Creek is considered to be in the "habitat limited aquatic community" subcategory of the fish and wildlife propagation beneficial use category and within the primary body contact subcategory for recreational beneficial use category (Reference 1). According to the PA, approximately 30 miles of wetland frontage also occur along the surface water pathway for the site. Habitats for endangered and threatened species are known to occur in Creek County; however, no sightings or habitats for those species have been observed or reported for the site.

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3.3 SOIL EXPOSURE

Based on the soil survey for Creek County, the site contains several soil series: the Darnell and Pottsville soils, sloping and strongly sloping; the Stephensville and Darnell fine sandy loams, sloping and gently sloping; the Verdigris silt loam; and Oil-waste Land (Reference 13). Soils are described by the soil survey as follows:

- The Darnell and Pottsville soils are located primarily in the north portion of the site (north of the section line road). These soils consist of shallow, more or less sandy and stony, acid soils that overlie slightly acid to neutral reddish or yellowish interbedded sandstone, silty or sandy shale, and shale. Internal drainage is moderate in the Darnell soils, but it is very slow in the Pottsville soils.

- The Stephenville and Darnell fine sandy loams are located primarily in the south portion of the site (south of the section line road). These soils consist of shallow to moderately deep upland soils developed over reddish-yellow to red sandstone or interbedded sandstone and sandy shale. Runoff is slow to moderate, but internal drainage is moderate to rapid.

- The Verdigris silt loam is located in the southwestern portion of the site, along Sand Creek. These soils occupy the flood plains of streams and are moderately well drained; however, they are flooded occasionally to frequently. Parent material consists of slightly acid to weakly alkaline alluvial sediments washed from soils of the prairies.

- Oil-waste Land has been mapped in areas throughout the site, occurring in tank farm and refinery equipment areas. The areas mapped in this miscellaneous land type have been practically ruined for agricultural use by oil and salt-water waste from oil wells. They are more or less gullied and eroded and are almost barren of vegetation. They range in size from one acre to several acres.

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The likelihood of exposure to areas of soil contamination appear to be high based on observations made during the site reconnaissance. Areas of barren, black-stained soils were noted in residential yards during a drive-through of the northern portion of the site (Reference 10). Based on aerial photos of the site, residences have been built directly over former locations of aboveground storage tanks (References 8 and 9). Although parts of the south portion of the site are fenced, children frequently trespass onto the property to play (Reference 10).

Soil exposure targets include the resident population living or working in an area of soil contamination, the nearby population, and terrestrial resources such as agriculture. An estimated 17 residences occur on-site but have not been field verified. Based on the average number of people per household in Creek County, the on-site population is estimated to be approximately 46 people (Reference 14). Residential areas of the City of Bristow are south of the site. Commercial businesses also occur on-site; however, it is not known how many workers are associated with these facilities. Aerial photos indicate that some of the site may be used for farming purposes (Reference 9). No terrestrial-sensitive environments have been identified at the site (Reference 1).

3.4 AIR PATHWAY

Information concerning the weather conditions and patterns in the site vicinity has not been identified.

Based on available information, a release to air has not been documented. A significant release to air does not seem likely because the site is inactive and is located in a rural area.

Potential targets of the air pathway include the school population and the population living near the site, as well as any sensitive environments in the area. These targets have been described in the previous pathways.

3.5 DATA GAPS

Based on review of the background information available and observations made during the site reconnaissance, data gaps identified for the site include the following:

- Background concentrations of constituents in the soils, groundwater, and surface water have not been established in the area of the site.
- Potential sources at the site, such as the tank bottoms areas, discolored soils, and ponds, have not been sampled or characterized.
- Water quality of nearby drinking water wells on and near the site is unknown.
- It is unknown whether surface water bodies that receive runoff from the site have been adversely affected.

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- It is unknown whether areas of soil contamination exist on residential and commercial properties that are present within the site.

WESTON will conduct additional background research as time permits to close remaining nonsampling data gaps, such as site history and area resources.

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SECTION 4
SAMPLING ACTIVITIES

The activities planned for the ESI sampling visit are outlined in this section of the TWP. The sampling strategy presented is based on the operational history, known source waste characteristics, probable pathways of contaminant migration, and likely targets related to the site. The ESI field activities will focus on both on- and off-site sampling to document and characterize hazardous waste sources at the site and to identify observed contamination or releases.

WESTON will complete soil, sediment, groundwater, and waste sampling activities as part of the ESI. Samples will be collected using sampling techniques and QC procedures that meet EPA Region VI, EPA CLP, and WESTON guidelines. The specific tasks that will be performed during the sampling visit are described in Subsections 4.2, 4.3, and 4.4. It is expected that the tasks will be completed in the order outlined in these subsections. However, some tasks may overlap with others. General information for each task is provided as instructions to guide the field team.

It is important to note that the intent of the sampling mission is to sample what appear to be the most contaminated materials in the areas targeted for sampling. Based on the results of the site reconnaissance, WESTON has selected locations for sampling that appear to be those most likely to provide positive evidence of the presence of hazardous substances on- and off-site.

4.1 FIELD PERSONNEL

WESTON plans to have a field team of four personnel complete the tasks described in the following subsections. The anticipated personnel, along with their respective project roles and responsibilities, are identified in Table 4-1.

4.2 MOBILIZATION TASKS

The tasks that the WESTON field team will complete prior to sampling are described in this subsection.

4.2.1 Task 1—Mobilization

The WESTON field team will mobilize from the WESTON Regional Equipment Stores (RES) warehouse in Houston, Texas. One or two team members will load equipment for the ESI sampling visit in a van, quality-checking the equipment in the process. An equipment checklist will be used to verify that the necessary sampling equipment is included in the mobilization.

As part of the mobilization effort, the field team will assemble the required sample containers and CLP documentation prior to leaving for the site, as time permits. The sample tags, sample numbers, and custody seals needed for each sample station will be placed in a plastic lock-top bag. The sample station number will be labeled in ink on each bag. This process will facilitate sampling efforts once the fieldwork begins. When the required sampling equipment has been

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loaded, one or two field team members will drive the equipment van to the site. This will be done the day before sampling activities are scheduled. The remaining field team members may drive or fly to the site. The field team generally will meet at its place of lodging, if any, before proceeding to the site. WESTON will inform the EPA Work Assignment Manager (WAM) of the sampling mission and its final schedule 2 weeks before the start date of the fieldwork.

Once at the site, the Field Team Leader (FTL) will meet with the site and EPA representatives, if present. The access agreement should be shown to the site representative to reconfirm site access. A copy of the Consent for Access forms signed by the site representatives are included as Appendix A.

As part of initial mobilization reconnaissance activities before going on-site, the WESTON team will drive the route from the site to the nearest hospital.

4.2.2 Task 2—Health and Safety Meeting and Protocol

After arriving at the site and checking in with the site representative, if present, the WESTON FTL and the Site Health and Safety Coordinator (SHSC) will conduct a meeting to review the technical aspects of the project and discuss the site-specific HASP and related WESTON Standard Operating Procedures (SOPs) with the sampling team. The HASP and related SOPs are provided in this TWP as Appendix B. After this meeting, a copy of the HASP with the map to the hospital on the first page will be placed on the dashboard of the field vehicle designated for emergency use. At the start of each day and as necessary at other times during the sampling visit, the team leader will conduct safety meetings to reiterate site concerns and to address any new technical or safety issues.

The fieldwork for the ESI will be conducted in accordance with the site-specific HASP. The sampling team generally will work with Level-D personal protective clothing and equipment as specified in the HASP, as long as air-monitoring results justify this level of protection. The monitoring instruments to be used are specified in the HASP. Depending on the air monitoring results, the sampling team may be required to upgrade to a Level-C personal protection status, if one or more of the air-monitoring action levels listed in the HASP are met or exceeded. Designated team members will perform a field calibration check and overall inspection of the monitoring instruments each day prior to sampling.

4.2.3 Task 3—Initial Sample Location Reconnaissance

After the safety meeting is conducted, the WESTON FTL will meet with the site representatives and any EPA representative present to complete an initial survey of the sample locations indicated in the TWP. This will be done to allow the FTL to become familiar with the area of investigation, to verify that sample locations are accessible, and to identify potential health and safety concerns at each location. This initial reconnaissance will be conducted from the support zone as much as possible. If entry into a potential exclusion zone is required for this task, a second WESTON team member will accompany the FTL to perform air monitoring during the reconnaissance.

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If a sample location is found to be inaccessible for some reason, alternative sample locations may be chosen in consultation with the WESTON Site Manager. The Site Manager will communicate alterations in the TWP to the WESTON Site Manager and EPA WAM.

4.2.4 Task 4—Acquisition of Off-site Access

Prior to performing sampling activities, the owners of any off-site properties for which sampling has been proposed will be contacted. Unless an EPA representative is present in the field, the WESTON FTL will obtain permission from the owners for WESTON to collect samples from their property. The owners of off-site properties targeted for sampling will be provided with a fact sheet explaining the investigation, if one is available.

If access cannot be obtained at an off-site property targeted for sampling, the WESTON FTL will select an alternate sampling location after consultation with the WESTON Site Manager, who in turn will notify the EPA WAM of any alterations to the TWP.

4.2.5 Task 5—Command Post Establishment

After the safety meeting has been held, the WESTON team will establish a command post in an accessible location at the site in an area generally thought to be unaffected by site operations, if such an area is available. The command post will be located in the support zone in which work may proceed in Level D without continuous air monitoring. Access to the exclusion zone and contaminant reduction zone established around the on-site waste sources will be controlled through the command post.

The command post will include the following:

- An equipment staging area where equipment can be prepared for usage.
- A decontamination area (as specified in the HASP, Appendix B) where field personnel and equipment can be decontaminated.
- A sample management area where samples can be labeled, preserved, and packaged.

Sampling activities to be performed in off-site areas, if any, will mobilize from the on-site command post.

4.3 SAMPLING TASKS

Field tasks 6 through 12, associated with the collection of samples, are described in the following subsections. Sample locations are shown in Figures 4-1 and 4-2 and are described in Table 4-2 at the end of this section. Samples will be collected in accordance with the sample operating procedures included in Appendix C.

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4.3.1 Task 6—Documentation of Field Activities

The WESTON FTL will document in a logbook the activities performed during the ESI sampling visit, as well as other significant observations made throughout the field investigation. The FTL will keep a chronological log of field activities in the logbook. Additionally, the FTL will take photographs to support the observations documented in the logbook.

The documentation recorded in the logbook for each sample location will include the following:

- Sample station number.
- Sample location.
- Sample description.
- CLP sample numbers and tag numbers.
- Date and time of sample collection.
- Conditions around the sample location.

4.3.2 Task 7—Equipment Decontamination

Prior to sampling, the WESTON field team will decontaminate the sampling equipment that will come in contact with the samples during collection procedures. Equipment decontamination will be performed at the command post. To complete the decontamination process, the following steps will be taken:

- Wash equipment in a tub or bucket with a mixture of potable water and Liquinox (or other nonphosphate detergent).
- Rinse in a bucket with potable water.
- Rinse with deionized water.
- Allow to air-dry.

To minimize the need for decontamination, WESTON will use dedicated disposable sampling equipment, when available, for each sample station. WESTON will decontaminate any nondedicated sampling equipment at the command post before and after use. The amount of rinsate water generated will be kept to a minimum, and the rinsate water generated during the decontamination processes will be collected in a small drum or 5-gallon buckets.

At the end of the field activities, the water will be disposed of at the end of the sampling mission in accordance with Task 15, discussed later in this TWP.

4.3.3 Task 8—Waste Sampling

During the site reconnaissance, WESTON observed on-site waste sources (ponds, pits, and leaded tank bottoms) that WESTON intends to sample as part of the ESI. WESTON will collect 8 waste source samples (WS-01 through WS-08), including one duplicate sample (WS-05). If

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additional potentially hazardous waste source areas are observed during the sample mission, they may be sampled. Waste source samples will be collected in general accordance with the waste sampling operating procedures provided in Appendix C. The samples will be shipped to a contract laboratory for high concentration analyses.

4.3.4 Task 9—Soil Sampling

As part of the ESI, WESTON will collect 20 soil samples (SS-01 through SS-20) to document contamination in the soil exposure pathway. As part of the 20 samples, 3 background samples will be collected to establish background levels in the vicinity of the site. The background samples will be collected off-site from soils similar to those found at the site, but outside the influence of the site. Permission to collect these samples will be obtained in the field; if permission to collect a sample is denied, that sample will be moved to a new location. Two duplicate samples will also be collected for laboratory QC purposes. In all cases, the soil samples will be collected from a depth not to exceed 24 inches.

4.3.5 Task 10—Bottom Sediment Sampling

WESTON will collect 10 sediment samples (SED-01 through SED-10) to document a release to the surface water pathway. As part of the 10 samples, 3 background and 1 duplicate sample will be collected.

4.3.6 Task 11—Groundwater Sampling

WESTON will collect 15 groundwater samples (GW-01 through GW-15) from drinking water wells on and near the site. These samples will include two background samples (GW-01, GW-02), a field blank (GW-15), and two duplicate samples (GW-13, GW-14). The well locations are not known yet, but wells will be identified based on information still to be received or in the field during the sampling visit. If time permits, well owners will be contacted for confirmation of well locations and to obtain permission for sampling prior to performance of field activities. Otherwise, permission will be obtained in the field as described in Subsection 4.2.4.

4.3.7 Task 12—Sample Management

WESTON will manage the samples collected during the ESI in a manner consistent with EPA and EPA CLP guidelines. Specific guidelines are provided in the following subsections. Additional guidelines are provided in Appendix D.

4.3.7.1 Sample Container Decontamination

When a sample is collected and returned to the command post, the Sample Manager will see that the outside of each container is decontaminated. To decontaminate the sample containers, each sample container will be washed with deionized water and dried with a paper towel.

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4.3.7.2 Sample Documentation

Each sample will be appropriately documented and identified using the appropriate EPA CLP labels, tags, and forms. Although high concentration waste samples will not be sent to a CLP laboratory, EPA documentation protocols will be followed. The following guidelines will be used:

- Each sample station will receive a set of CLP sample numbers with the exception of sample stations at high concentration waste sources, which will be assigned a unique set of sample numbers. Samples for organic analysis will receive sample numbers beginning with "F," and the inorganic samples will receive sample numbers beginning with "M."

- Each bottle or jar for a sample station will receive a sample number sticker, a sample tag, and a custody seal.

- The sample information will be written on the appropriate traffic reports/chain-of-custody forms, which will remain with the samples.

Additional information regarding sample documentation procedures is included in Appendix C.

4.3.7.3 Sample Packaging

Once labeling is completed, the Sample Manager and FTL will review the sample documentation for accuracy before the samples are packaged for shipping. Once this QA check is completed, the samples will be packaged in coolers using the following guidelines:

- Each sample bottle or jar will be placed within a lock-top bag, which will be sealed.

- The bottles and jars will be placed into coolers. Samples for organic, inorganic, and special analyses will be placed into different coolers, as they typically will be going to different laboratories.

- Vermiculite will be poured and packed into the spaces around the sample containers to fill empty space and help prevent breakage during transport.

- At least two lock-top bags filled with ice will be placed on the samples in each cooler to help maintain the ice chest temperature at approximately 4°C. Additional vermiculite may be added on top of the ice to fill the cooler.

- The appropriate traffic report/chain-of-custody forms (laboratory copies only) will be sealed inside a plastic lock-top bag and taped to the inside of the cooler lid.

- The coolers will then be closed, and they will be sealed with strapping or packing tape and at least two EPA custody seals (on opposite sides of the cooler). Also,

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if samples need to be left unattended, they will be packed in a cooler and the cooler will be sealed with custody tape and stored in a secured place.

4.3.7.4 Sample Shipping

When sampling is completed for a given day, the sampling team will ship the samples by Federal Express Priority Overnight Service (at government rate) to the assigned laboratories for analytical testing. The names and addresses of the EPA CLP laboratories will be provided by EPA by the Friday prior to the week that sampling activities are scheduled. Additionally, WESTON will subcontract a laboratory to perform high concentration analyses for the waste samples, unless arrangements can be made with the EPA Houston Lab for analyses. After shipping the samples, the Sample Manager will contact the EPA Contract Laboratory Analytic Services Support (CLASS) with information concerning the shipment.

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4.3.8 Task 13—Sample Receipt Form Completion

Following sampling activities at the site or at off-site locations, the WESTON FTL will provide an EPA Receipt for Samples form to the representatives of the property sampled. The property representatives will need to sign these forms, and the FTL should provide the property owners with a carbon copy of the signed form. These forms will identify the date, location, and type of each sample collected. The forms will be forwarded to EPA as part of the final ESI report.

4.4 DEMOBILIZATION AND OTHER ACTIVITIES

The remaining tasks will be completed by the field team after all samples are collected and shipped and after the FTL acquires the consent of the WESTON PTL or Site Manager.

4.4.1 Task 14—Demobilization

Following the completion of all sampling activities, the field team will decontaminate, package, and transfer all nondisposable sampling equipment back to the WESTON RES warehouse in Houston, Texas. The command post and decontamination areas will also be dismantled. WESTON will, as possible, leave the site in the same condition it was prior to the investigation.

4.4.2 Task 15—Decontamination Rinsate Water Disposal or Staging

After completing sampling activities, the FTL will request permission from the site representative, if present, to dispose of the decontamination rinsate water in a known or suspected source area at the site. If permission is granted, the water will be disposed of on-site. If the site representatives are not present during the fieldwork and the site is inactive and abandoned, WESTON generally will dispose of the water on-site unless the site representatives have previously objected to this practice. The WESTON PTL will inform the site representatives of WESTON's intent to dispose of the rinsate water on-site when the FTL is notified of the dates of the sampling visit.

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If the site representatives will not grant permission for on-site rinsate water disposal, the rinsate water will be transferred to a small drum. The rinsate water will be sampled using protocol similar to that used for surface water sampling. The drum of water then will be sealed with EPA custody tape, labeled, and staged in an area of the site designated by the site representatives.

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4.4.3 Task 16—Background Information Acquisition

While in the field, the WESTON FTL and other designated personnel may collect background information needed to close project data gaps, as time allows. Activities may include visiting city offices to collect local agency file information and to obtain maps, locating water wells in the area, or driving along the surface water pathway to visually document fisheries and wetlands.

4.5 COMMUNITY RELATIONS

Persons requesting site information from the WESTON field team will be instructed to submit a Freedom of Information Act Request to Freedom of Information Officer, U.S. EPA Region VI, 1445 Ross Avenue, Dallas, Texas 75202-2733. Reporters will be instructed to contact EPA's Office of External Affairs at (214) 665-2200 or contact the EPA representative in the field, if one is present. The WESTON FTL will notify the Site Manager immediately, if reporters are present at the site. WESTON personnel in the office, in turn, will notify the EPA WAM.

4.6 FIELD FOLLOW-UP MEMORANDUM

As stated in WESTON's Generic Expanded Site Inspection Work Plan, WESTON will submit a memorandum to the WAM describing any alterations that were made to the TWP in the field. This memorandum will also serve to notify the WAM of any conditions observed at the site that appeared to represent an imminent threat.

4.7 REPORT PREPARATION

After receipt of the validated analytical data, WESTON will prepare the final report for the ESI. The report will contain information as specified in WESTON's Generic Expanded Site Inspection Work Plan and by regional guidance. The report format will include the following:

- An introduction describing the background and purpose of the investigation.
- A site characteristics section describing the site location, operating history, source waste characteristics, and site concerns.
- A sampling activities section describing the field activities completed during the ESI.

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- Individual sections for the groundwater, surface water, soil exposure, and air pathways describing the environmental conditions at the site and likelihood of a release, targets, and relevant analytical data.

- A summary and conclusions section discussing the major site concerns.

- A reference list.

- Photographs, field notes, and other reference material (included as appendices).

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APPENDIX B

HEALTH AND SAFETY PLAN

(APPENDIX OMITTED PER REQUEST OF WORK ASSIGNMENT MANAGER)

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APPENDIX C

SAMPLING PROCEDURES

(APPENDIX OMITTED PER REQUEST OF WORK ASSIGNMENT MANAGER)

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APPENDIX D

CLP GUIDELINES

(APPENDIX OMITTED PER REQUEST OF WORK ASSIGNMENT MANAGER)