Expanded Site Inspection Report

Palestine Light, Heat and Power Company Site
Palestine, Anderson County, Texas
TXD981912421

Prepared in cooperation with the

U.S. Environmental Protection Agency

Region VI

Prepared by

Protecting Texas
by Reducing and Preventing Pollution

Texas Commission on Environmental Quality
Superfund Site Discovery and Assessment Program
Austin, Texas

June 2004

The preparation of this report was financed through
grants from the U.S. Environmental Protection Agency.

EXPANDED SITE INSPECTION REPORT

Palestine Light, Heat and Power Company Site

Palestine, Anderson County, Texas

TXD981912421

SIGNATURE PAGE

Meagan H. Guin
Texas Commission on Environmental Quality
Site Investigation Manager

6/28/04
Date

Lloyd Johnson
Texas Commission on Environmental Quality
PA/SI Program QA/QC Specialist

7/6/04
Date

Kelly Cook
Texas Commission on Environmental Quality
PA/SI Program Manager

6/29/04
Date

Wesley G. Newberry
Texas Commission on Environmental Quality
PA/SI Program Technical Director

7/6/04
Date

William Rhotenberry
U.S. Environmental Protection Agency

7/8/04
Date

TABLE OF CONTENTS

TABLE OF CONTENTS (continued) Page

TABLE OF CONTENTS (continued)

Page

TABLES

FIGURES

NOTES TO THE READER

The following rules were used when citing references in this Expanded Site Inspection (ESI) Report:

1. If the reference cited had an original page number, that number is cited.

2. If the reference cited had no original page number, then a designated tracking number is cited.

3. If the reference cited is for analytical data found within a table, the reference document for the data set containing the sample ID will be used.

4. The State predecessor agencies: Texas Water Quality Board (TWQB), Texas Department of Water Resources (TDWR), Texas Water Commission (TWC), Texas Air Control Board (TACB), and Texas Natural Resource Conservation Commission (TNRCC), referred to throughout this report are now known as the Texas Commission on Environmental Quality (TCEQ). The new agency, TCEQ, became effective September 1, 2002, as mandated under the State House Bill 2912 of the 77th Regular Legislative Session.

1.0 INTRODUCTION

The Texas Commission on Environmental Quality (TCEQ) has been tasked by the U.S. Environmental Protection Agency (EPA) Region VI to conduct an Expanded Site Inspection (ESI) at the Palestine Light, Heat and Power Company site (EPA Identification No. TXD981912421) located at 614 West Reagan Street, Palestine, Texas, Anderson County. The facility is located within a mixed industrial/residential area within the city limits of Palestine. The property is not maintained by any governmental or outside entities.

1.1 OBJECTIVES OF THE INVESTIGATION

The purpose of this investigation is to document the release(s) or potential release(s) of hazardous substances from identifiable sources which may have migrated off-site. The preremedial stage of the Superfund process involves a preliminary assessment (PA) and a site inspection stage consisting of a screening site inspection (SSI) and, if necessary, an expanded site inspection (ESI). This ESI is being conducted to obtain more knowledge and information to determine if the Palestine Light, Heat and Power Company site is eligible for proposal to the National Priorities List (NPL) under the Federal Superfund Program. The ESI will concentrate on assessing potential source areas throughout Palestine, Texas, evaluating threats along the surface water migration pathway, and in the soil exposure pathway.

1.2 SCOPE OF WORK

An EPA Preliminary Assessment (PA) report was completed in March of 1987 identifying specific areas within the vicinity of the Palestine Light, Heat and Power Company site requiring further investigation. An SSI report was completed in November 2003. This ESI will build upon existing data by: (1) providing additional background information relevant to the site obtained through a file review and interviews conducted during off-site field reconnaissance efforts and, (2) by the collection of environmental samples to further characterize conditions near the site. Sampling conducted during the field work was intended to document hazardous substance migration from identified potential source areas and to look for evidence of actual human and environmental exposure to contaminants.

1.3 PROJECT CONTACTS

Phone/FAX Number

ESI Report:

Bill Rhotenberry (6H-MA), Site Assessment Manager.....(214) 665-8372
U.S. Environmental Protection Agency, Region VI FAX (214) 665-7447
Superfund Site Assessment Section
1445 Ross Avenue, Suite 1200
Dallas, Texas 75202-2733

Kelly Cook (MC-142), PA/SI Program Manager.....(512) 239-2525
Texas Commission on Environmental Quality FAX (512) 239-4814
Remediation Division
Superfund Site Discovery and Assessment Program
P.O. Box 13087
Austin, Texas 78711-3087

Meagan H. Guin (MC-142), Project Manager.....(512) 239-2176
Texas Commission on Environmental Quality FAX (512) 239-4814
Remediation Division
Superfund Site Discovery and Assessment Program
P.O. Box 13087
Austin, Texas 78711-3087

Site:

Arthur Leuterman, Site Contact.....(832) 295-2556
M-I L.L.C., Property Owner FAX (713) 822-0896
5950 North Course Drive
Houston, Texas 77072

2.0 SITE CHARACTERISTICS

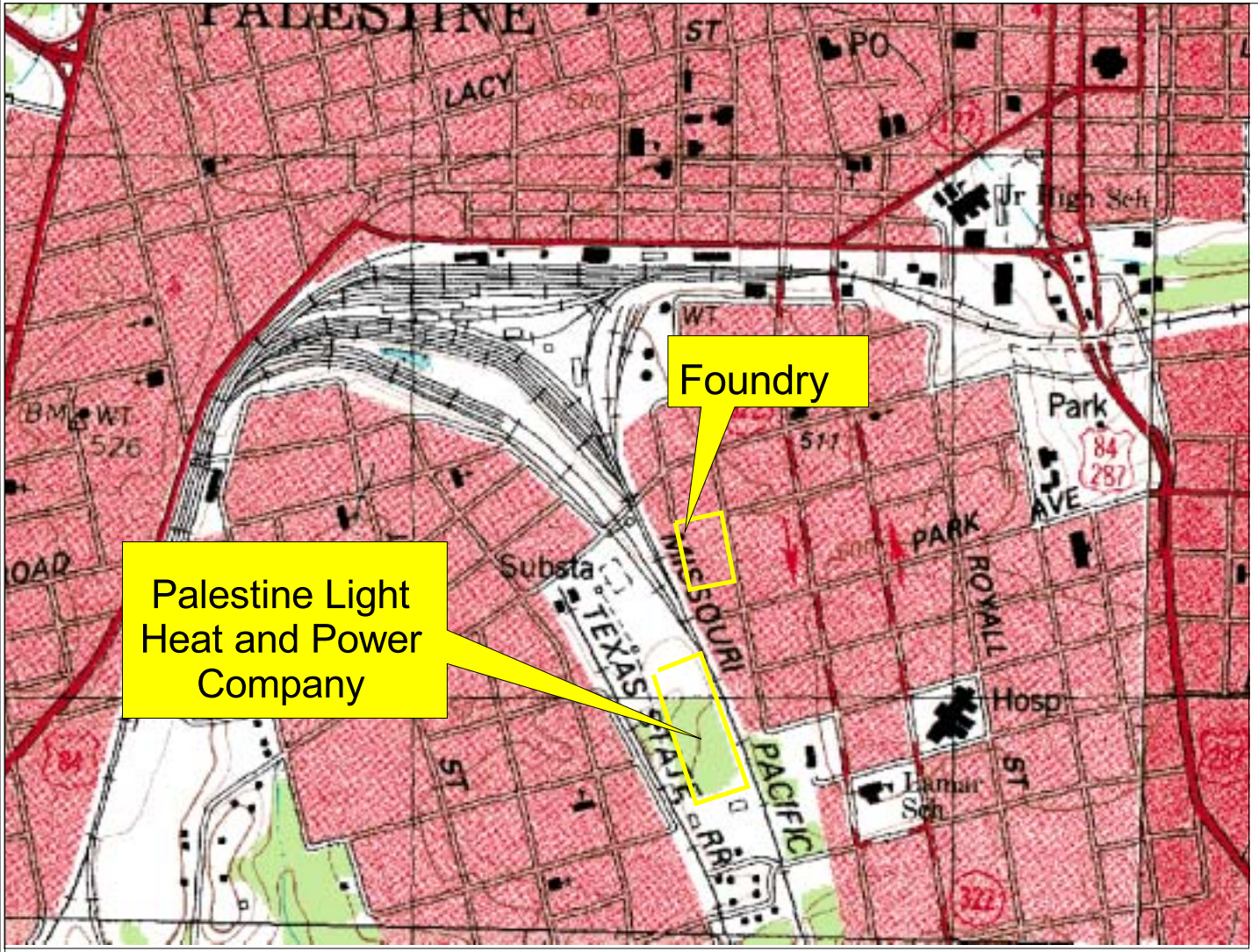
2.1 SITE DESCRIPTION AND BACKGROUND INFORMATION

2.1.1 Site Location and Surrounding Land Use

The site is located in a mixed industrial/residential area within the city limits of Palestine, Anderson County, Texas as shown in Figure 1. The facility consists of several waste piles from the nearby railroad system, thick trees, poison ivy and briars. Residential areas are located on the other side of the railroad tracks to the west and east. There are overgrown areas to the south and a transformer substation located north of the site. The nearest adjacent residence is located across the railroad tracks to the east of the site as shown in Figure 1. The entrance of the site is located at Latitude 31° 45' 15.52" North and Longitude 95° 38' 06.77" West (GPS coordinates).

2.1.2 Site Description

The Palestine Light, Heat and Power Company site (the "site") located at 614 West Reagan Street in Palestine, Anderson County, Texas is about a one (1) acre property formerly a town gas operation which consists of several waste piles from the railroad system on the east side of the property. These piles consist of railroad ties, concrete blocks, and rock piles. The northern, southern and western portion of the site is overgrown with trees, briars, poison ivy, shrubs.



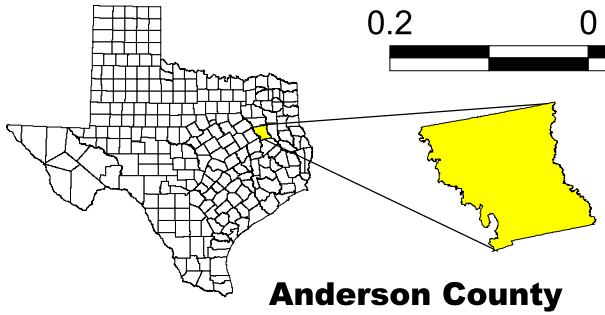
Expanded Site Inspection Report
Figure 1

Site Location Map

Palestine Light, Heat and Power Company
TXD981912421
Palestine, Texas
Anderson County

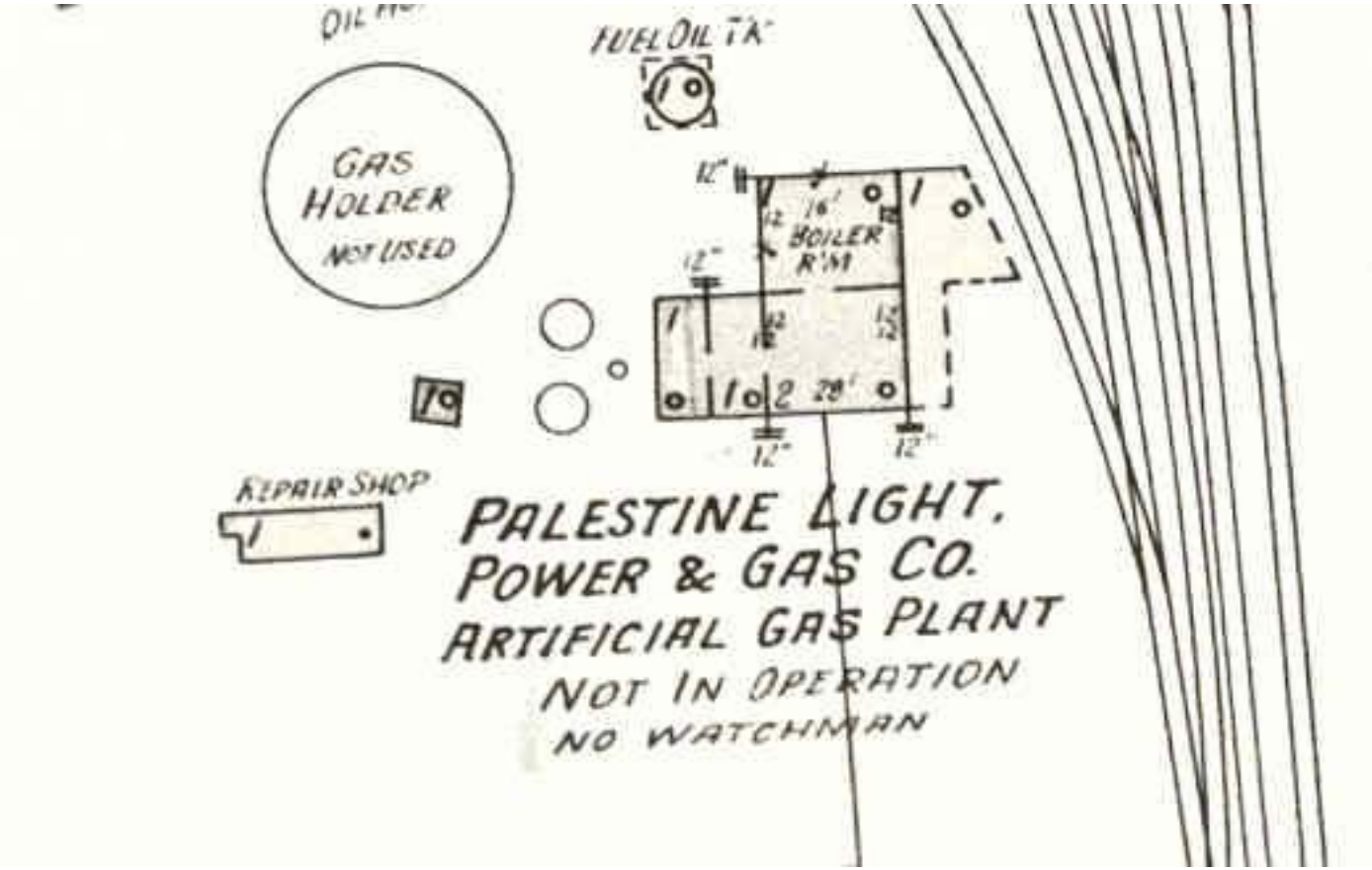
N
W E
S

0.2 0 0.2 0.4 Miles



Anderson County

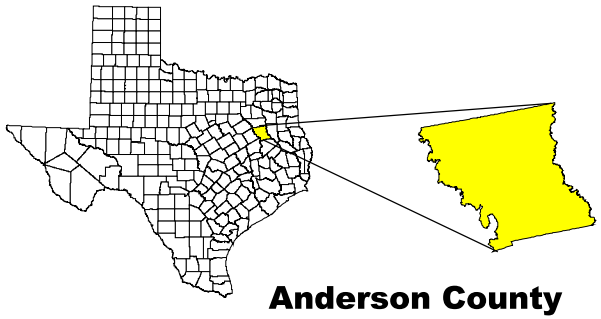
The base data used is the NW, NE, SW, and SE Palestine Digital Raster Graphics (DRGs) which are scanned images of the U.S. Geological Survey topographic maps. UTM NAD 27 Zone 15



Expanded Site Inspection Report
Figure 2

Site Sketch Map

Palestine Light, Heat and Power Company
TXD981912421
Palestine, Texas
Anderson County



Anderson County

The base data used is the Sanborn Fire Insurance Map from January 1935 which was scanned by TCEQ personnel.

2.1.3 Site History/Background

Coal gasification plants, also called "town gas" plants, were used in the United States in the 1800's and early 1900's to manufacture gas for street illumination, heating, manufacturing and residential use by roasting fossil fuels (coal predominantly and later "smokeless" coke) and later in the early 1900's by injecting light petroleum oils (carburretted water gas process) on heated ceramic bench retorts to produce readily combustible fuel gases. There were two primary roasting processes, carbonization and gasification. The two processes differed only in the initial feedstock and type of gas produced. *Carbonization* heated coal in the absence of oxygen producing coal gas, coke, tars and ammonia. *Gasification* passed superheated steam through hot coal or coke producing water gas, coke and a lesser amount of tar and ammonia. Varying arrays of tar extractors, multi-tubular condensers, washer-scrubbers and purifying boxes were used to separate coal tars and ammoniacal liquors by condensation and gravity or mechanical separation and to remove particulate from the generated gases. Commonly used condensing and filtering agents included quenching waters, slaked (white) lime, wood shavings, sawdust and iron oxide. The final stages in the manufacturing process were storage in large above-ground metal storage tanks and distribution through metered underground gas pipes (Ref. 10, p. 2; Ref. 11, p. 3).

Most of the manufactured coal gas wastes were generally reused (coke from roasted coal, tars re-injected, quenching water recycled). However, a 1984 EPA study that identified large amounts of coal gas wastes typically generated by these facilities, including tars and other complex organic residues, that were often dumped or buried near the sites. There were concerns that persistent organic carcinogenic compounds identified as polycyclic aromatic hydrocarbons (PAHs) including naphthalene, phenol, anthracene, pyridine, chrysene, carbazole, dimethylnaphthalene, acenaphthene, benzo(a)pyrene, benzo(a)anthracene, benzo(k)fluoranthene, fluoranthene, cresols, phenanthrene and pyrene and the volatile organic compounds (VOCs) benzene, toluene and xylene may be impacting local ground water near the sites or at nearby surface water resources. In addition, arsenic naturally occurring in feedstock material and cyanide produced by the combination of hydrogen and nitrogen under heat and pressure were extracted concentrated in the filtering material that was often buried or stored on-site (Ref. 9, p. 5; Ref. 10, p. 2; Ref. 11, pp. 2-4).

The Palestine Light, Heat and Power Company Site (the "site") is identified as a 1-acre former "town gas" generation facility located at 614 West Reagan Street, Palestine, Anderson County, Texas, as shown in Figure 1. When active, the former town gas plant had several buildings including the former gas holder area, repair shop, fuel oil house, and the fuel oil tank as shown in Figure 2. There was no evidence during the SSI sampling event of May 19-22,2003 of the on-site structures (Ref. 6, p. 51).

The current status of the site is inactive and is covered in thick vegetation. There was no evidence of creosote telephone poles. The former town gas generation plant reportedly ceased operations sometime in the late 1920's when available supplies of natural gas and oil replaced the fuels generated by the majority of Texas "town gas" facilities (Ref. 9, p. 2, 5; Ref. 11, p. 2).

The Palestine Light, Heat and Power Company site is currently inactive with no residents or workers on-site. The site EPA Identification Number is TXD981912421.

2.1.4 Previous Investigations

This site was initially identified by the EPA and in March 1987, a Preliminary Assessment was completed. The PA reported the site was not active and there were no buildings on-site. The property owners at that time, Texas Power and Light, used the site to store creosote telephone poles. In May 2003, a SSI was completed and the results indicated no creosote telephone poles or buildings on-site and an elevated level of contaminants in two residential properties sampled (Ref. 29, pp. 6, 32-37. It was determined that a larger residential area needed to be evaluated for potential contamination and other possible sources. Therefore, an ESI was conducted in January 2004 and the findings will be outlined in this report.

3.0 FIELD ACTIVITIES

3.1 SAMPLING ACTIVITIES

3.1.1 Site Non-Sampling Data Collection and Field Work

The Texas Commission on Environmental Quality (TCEQ) performed the activities described in this section to obtain additional site background information and to collect Contract Laboratory Procedure (CLP) quality analytical data that can be used by the EPA to evaluate the Palestine Light, Heat and Power Company site using the revised Hazard Ranking System (HRS), Final Rule, dated December 14, 1990, and appropriate HRS guidance manuals (Ref. 1; Ref. 2; and Ref. 3). The information obtained during field interviews and from environmental samples collected during the ESI will be presented in this ESI report that includes source characterization, sediment and soil sampling as discussed below.

All field work was conducted as outlined in the Expanded Site Inspection Work Plan for Palestine Light, Heat and Power Company site, the site-specific health and safety plan (HSP) and the TCEQ-approved quality assurance project plan (QAPP) prepared for the ESI sampling event (Ref. 7; Ref. 8).

The TCEQ contracted URS Corporation to conduct the field sampling including sample collection off-site, sample preparation, and other tasks as assigned. Before any sampling activities began, the TCEQ field team project manager conducted a required facility safety briefing. The purpose of the meeting was to conduct an initial safety briefing, review the intended sampling work schedule with contractors. Information concerning past and current site conditions were discussed and verified at the initial meeting. After the safety briefing, URS and the TCEQ collected sediment samples from Bassett Creek and Town Creek. The next three days were spent collecting soil samples from area residential properties. Information obtained during the resident interviews was logged in the field logbook to include names of individuals interviewed, physical and mailing addresses, date and time of the interview and observations noted.

Proposed off-site sample locations were confirmed during the site reconnaissance inspection and adjustments noted in the field logbook (Ref. 28, pp. 63-67). A field copy of the work plan was annotated by the TCEQ field team project manager to reflect actual sample locations and identifying sample numbers.

Field work for the ESI was completed from January 12, 2004 through January 16, 2004 All planned off-site samples were collected as outlined in the work plan.

In order to obtain site characterization data, two laboratories were assigned by the EPA Regional Sample Control Center (RSCC) to perform EPA-stipulated Contract Laboratory Program (CLP) analytical methods on all samples collected from the Palestine Light, Heat and Power Company site to adequately document current site conditions. The specific analytical methods for this sampling event were those listed under the CLP routine analytical services (RAS) contract. The assigned organic laboratory was ENVIROSYSTEMS, INC., 9200 Rumsey Road, Suite B102, Columbia, MD 21045 and the assigned inorganic laboratory was BONNER ANALYTICAL TESTING CO., 2703 Oak Grove Road, Hattiesburg, MS 39402.

3.1.2 Source Sampling

There were no additional on-site source samples collected at the Palestine Light, Heat and Power Company site during the January 2004 sampling event. A total of four (4) soil samples were collected during the January 12-16, 2004 ESI to identify and characterize the hazardous substances associated with each potential source located at the George E. Dilley and Son Founders and Machinists Shop (SO-37 through SO-40).

This potential source was created by George M. Dilley in 1873 and was the first large industry in Palestine, Texas. George E. Dilley took over the operation when his father moved to Dallas and assumed ownership when his father passed away in 1902. The foundry employed between twenty and twenty-five people at any given time to provide services to the railroad system. The Dilleys expanded the business to include buying and selling equipment for saw mills, cotton ginning operations and the oil industry. The foundry conducted business for Palestine, East Texas and Western Louisiana.

There were several buildings on the property when the site was active. However, there are only two buildings remaining on the property (See Figure 2). One of the former buildings on site was used to repair a church which needed the antique bricks. The office building is still mostly intact, however is not used for any purpose as observed during the ESI sampling in January 2004. According to the current property owner, the office building might be moved downtown and restored in the future or the property would be donated it to the historical railroad for possible tourism. The second building on site was last used in 1970 as an art studio by Ancel Nunn.

The surrounding area to the George E. Dilley and Son Founders and Machinists Shop aka Palestine Foundry is residential except along the western property boundary where a railroad exists. West of the railroad is the Palestine Light, Heat and Power Company site.

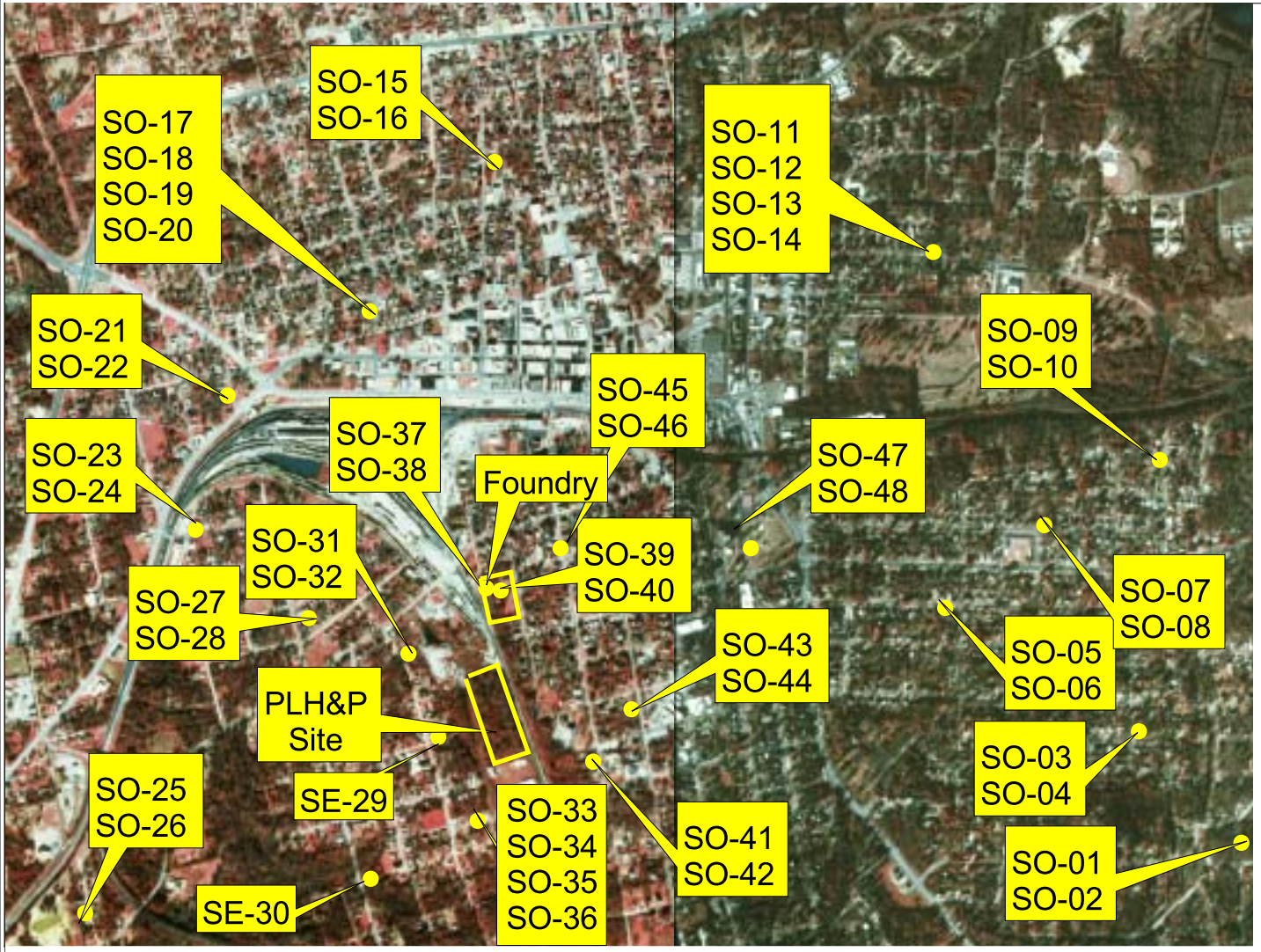
3.1.3 Surface Water Migration Pathway Sampling

During the ESI, a total of six (6) sediment samples including one duplicate were collected to substantiate the release of on-site contaminants to the surface water drainage pathway. In addition, two (2) background sediment samples were collected at an unaffected up gradient location for site attribution. The background sediment samples were collected on Bassett Creek, a creek northwest of the Town Creek sediment samples as shown in Figure 4 (Ref. 28, pp. 71-73, Photographs #1-2).

Four (4) sediment samples including a duplicate were collected from Town Creek to substantiate the release of hazardous substances along the surface water migratory pathway and to assess potential receptor targets. Selected sample locations are shown in Figure 4.

Two (2) sediment samples were collected in drainage ditches along the overland flow from the site to Town Creek (SE-29 and SE-30). Please refer to Figure 3 for sample locations.

All the sediment samples were grab samples and were collected with a clean dedicated stainless steel bowl and spoon. The bowl and spoon were used to carefully extract the accumulated sediments which were placed in a clean dedicated stainless steel bowl. Sampling conditions, sample type collected and sampling depth were documented in the field log book at each sample location (Ref. 28, pp. 73-77 and 105, Photographs #3-5, 18 and 19).



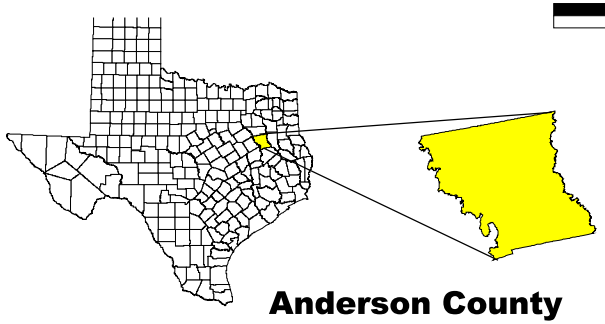
Expanded Site Inspection Report
Figure 3

Soil Sample Location Map

Palestine Light, Heat and Power Company
TXD981912421
Palestine, Texas
Anderson County

0.2 0 0.2 0.4 0.6 0.8 Miles

N
W E
S



Anderson County

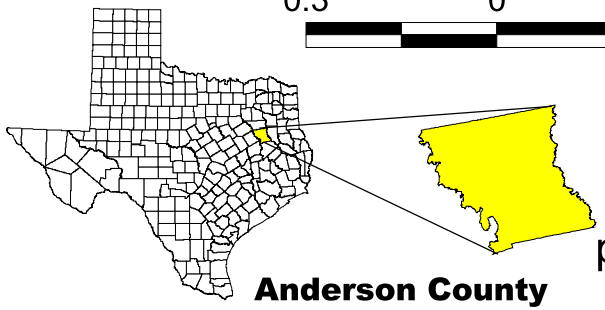
The base data used is the SW NE Palestine and SE NW Palestine Digital Orthophoto Quadrangles (DOQs) which is a digital version of an aerial photograph. These DOQs were produced by TCEQ using USGS guidelines. UTM NAD 27 Zone 15

Expanded Site Inspection Report
Figure 4

Sediment Sample Location Map

Palestine Light, Heat and Power Company
TXD981912421
Palestine, Texas
Anderson County

N
W E
S



Anderson County

The base data used is the SE NW Palestine and the NE SW Palestine Digital Orthophoto Quadrangles (DOQs) which is a digital version of an aerial photograph. These DOQs were produced by the TCEQ using USGS guidelines. UTM NAD 83 Zone 15

3.1.4 Soil Exposure Pathway Sampling

A total of forty-six (46) soil samples including six (6) duplicates and twelve (12) background samples were collected from off-site locations. Twelve (12) background soil samples were collected from four residential properties north of the Missouri Pacific Railroad (SO-11 through SO-22). Sixteen (16) residences approximately one mile from the site, including background sample locations, were sampled for potential soil contamination (SO-01 through SO-28, SO-31, SO-32, and SO-41 through SO-46). Sampling conditions, sample type collected and sampling depth were documented in the field log book at each sample location (Ref. 28, pp. 79-91, 95-104, and 106-115, Photographs #6-17, and 20-28).

Refer to Figure 3 for all soil sample locations.

3.1.5 Field Quality Assurance (QA) and Quality Control (QC) Sampling

Four types of QA/QC samples were used during the ESI sampling event, duplicate samples, equipment rinsates, field blanks and temperature blanks. Duplicate samples were taken at the minimum rate of one (1) duplicate for every ten (10) samples collected. Seven (7) duplicate samples were collected during the four-day sampling event. At each duplicate sample location, sampling conditions, type sample and sampling depth were documented in the field log book (Ref. 28, pp.75, 89, 95, 109 and 110). Sufficient volume was collected at the selected location so that a complete duplicate sample could be placed in a set of identical containers. After mixing, sample material for metals was selected since metals are the primary concern, followed by semivolatiles (BNAs). Three (3) equipment rinsates and three (3) field blanks were collected during the sampling event after decontamination of sampling trowels (Ref. 28, pp. 77, 93 and 112). In addition, a temperature blank was placed in each ice chest to accompany the packaged samples to their respective laboratory (Ref. 8, pp. 22, 38-39).

3.2 HEALTH AND SAFETY

3.2.1 Site Health and Safety

A site-specific health and safety plan (HSP) was written prior to beginning any field activities at the Palestine Light, Heat and Power Company site located in Palestine, Anderson County, Texas. The HSP establishes personnel protection standards and mandatory safety practices and describes site-specific work procedures while conducting ESI sampling events as prescribed by the TCEQ PA/SI Program. The HSP defines and assigns site safety responsibilities, establishes standard safety operating procedures while collecting field samples and provides for emergency contingencies that may arise while field work is being conducted (Ref. 8).

All TCEQ personnel who engaged in field project activities at the site became familiar with the HSP plan prior to commencing activities and acknowledged by signing the Plan Acceptance Form (Ref. 7, Appendix A). Health and safety provisions of the plan were mandatory for all TCEQ field personnel assigned to the project (Ref. 7).

A daily Site Safety Briefing was conducted by the site safety officer appointed by the TCEQ field team project manager prior to commencing any sampling activities. Topics covered during the daily briefing included sampling tasks to be performed, required personnel protective equipment (PPE)

at each sampling location, physical hazards that may be encountered, safety control methods (i.e., alert notification signals, the buddy system, safe entry and exit corridors, identification of hot/cold zones, evacuation procedures and meeting area, etc.), known chemical hazards, decontamination procedures/tasks, location of the nearest hospital and special topics. All TCEQ personnel who engaged in sampling activities acknowledged by signing the daily Site Safety Briefing Form (Ref. 7, Appendix B).

3.2.2 Investigation Derived Wastes (IDW) Management

Equipment Decontamination

Previously decontaminated sampling equipment was used to collect the sediment samples during the ESI event while trowels were used to collect soil samples and were decontaminated three times, therefore investigation derived equipment decon wastes were generated between each decontamination event. As specified in the QAPP, the prior equipment decontamination event ID Numbers (i.e., DECON No. 29) was noted in the field log book at each sample location for attribution of site contaminants, if required (Ref. 8).

At the completion of the ESI sampling activities, the used sampling equipment, which included stainless steel spoons, bowls and sampling tips, were pre-washed to remove gross (visible) contamination prior to placement in their original bags until final decontamination could be accomplished in accordance with the QAPP (Ref. 8). In addition, all steel-toed boots, waders and the sediment coring tool were pre-washed and rinsed with distilled water to remove gross contamination, which generated a small amount of liquid IDW.

The resulting decontamination fluids used to clean sampling and personnel equipment was collected and disposed within one of the identified waste management area at the site where samples had been collected. The approximate location of the disposed liquid wastes was noted in the field log book in accordance with investigation derived waste (IDW) guidelines outlined in the ESI work plan and TCEQ QAPP (Ref. 28, p. 112, Ref. 7; Ref. 8).

Personnel Decontamination

All used disposable clothing and equipment (i.e., nitrile gloves, glove liners, used plastic sediment extraction tubes, empty plastic distilled water containers and ice bags, etc.) were rendered unusable prior to disposal to prevent inadvertent reuse in accordance with the ESI work plan and HSP guidelines. All solid wastes were collected and placed in disposable plastic trash bags for disposal in accordance with investigation derived waste (IDW) guidelines outlined in the EPA 540/G-91/009, May 1991 handbook (Ref. 7).

4.0 SOURCE CHARACTERIZATION

4.1 SOURCE IDENTIFICATION

Potential sources at the site could not be fully determined and therefore, the area of interest has increased in size since the May 2003 SSI. The total amount of hazardous substances on- or off-site and the extent of contamination at the site Palestine, Texas is not known.

4.2 SOURCE CHARACTERIZATION SAMPLING

4.2.1 Determination of Source Background Concentrations

Twelve (12) background soil samples were collected north of the Missouri Pacific Railroad during the January 12-16, 2004 ESI for attribution of naturally occurring source contaminants (Ref. 28, pp. 89-97; Ref. 7). Table 1 provides a summary of the background soil samples collected at the Palestine Light, Heat and Power Company site.

Table 1–Background Soil Samples

Sample Number	Matrix	Location	Rationale
F0S53 MF0S53 SO-11	Soil	Off-site composite soil sample, 0-3" depth, residential property located at 1021 East Lacy Street	Background soil sample for attribution of contaminants to site sources
F0S54 MF0S54 SO-12	Soil	Off-site composite soil sample, 3-6" depth, residential property located at 1021 East Lacy Street	Background soil sample for attribution of contaminants to site sources
F0S55 MF0S55 SO-13	Soil	Quality Assurance/Quality Control (QA/QC)	Duplicate composite soil sample collected at the same location and depth as SO-11
F0S56 MF0S56 SO-14	Soil	Quality Assurance/Quality Control (QA/QC)	Duplicate composite soil sample collected at the same location and depth as SO-12
F0S57 MF0S57 SO-15	Soil	Off-site composite soil sample, 0-3" depth, residential property located at 209 W. Kolstad Street	Background soil sample for attribution of contaminants to site sources
F0S58 MF0S58 SO-16	Soil	Off-site composite soil sample, 3-6" depth, residential property located at 209 W. Kolstad Street	Background soil sample for attribution of contaminants to site sources
Sample Number	**Matrix**	**Location**	**Rationale**

F0S59 MF0S59 SO-17	Soil	Off-site composite soil sample, 0-3" depth, residential property located at 509 N. Howard Street	Background soil sample for attribution of contaminants to site sources
F0S60 MF0S60 SO-18	Soil	Off-site composite soil sample, 3-6" depth, residential property located at 509 N. Howard Street	Background soil sample for attribution of contaminants to site sources
F0S61 MF0S61 SO-19	Soil	Quality Assurance/Quality Control (QA/QC)	Duplicate composite soil sample collected at the same location and depth as SO-17
F0S62 MF0S62 SO-20	Soil	Quality Assurance/Quality Control (QA/QC)	Duplicate composite soil sample collected at the same location and depth as SO-18
F0S63 MF0S63 SO-21	Soil	Off-site composite soil sample, 0-3" depth, residential property located at 313 N. Cottage Ave.	Background soil sample for attribution of contaminants to site sources
F0S64 MF0S64 SO-22	Soil	Off-site composite soil sample, 3-6" depth, residential property located at 313 N. Cottage Ave.	Background soil sample for attribution of contaminants to site sources

Background soil sample SO-11 was collected 0" - 3" deep using a clean stainless steel spoon and bowl from soils located at 1021 East Lacy Street. Site Photograph #11 illustrates the sample location and soil conditions encountered.

Background soil sample SO-12 was collected 3"- 6" deep using a clean stainless steel spoon and bowl from soils located at 1021 East Lacy Street. Site Photograph #11 illustrates the sample location and soil conditions encountered.

Background duplicate soil sample SO-13 was collected 0"- 3" deep using a clean stainless steel spoon and bowl from soils located at 1021 East Lacy Street. Site Photograph #11 illustrates the sample location and the soil conditions encountered.

Background duplicate soil sample SO-14 was collected 3"- 6" deep using a clean stainless steel spoon and bowl from soils located at 1021 East Lacy Street. Site Photograph #11 illustrates the sample location and the soil conditions encountered.

Background soil sample SO-15 was collected 0"- 3" deep using a clean stainless steel spoon and bowl from soils located at 209 W. Kolstad Street. Site Photograph #12 illustrates the sample location and the soil conditions encountered.

Background soil sample SO-16 was collected 3"- 6" deep using a clean stainless steel spoon and bowl from soils located at 209 W. Kolstad Street. Site Photograph #12 illustrates the sample location and the soil conditions encountered.

Background soil sample SO-17 was collected 0"- 3" deep using a clean stainless steel spoon and bowl from soils located at 509 N. Howard Street. Site Photograph #13 illustrates the sample

location and the soil conditions encountered.

Background soil sample SO-18 was collected 3"- 6" deep using a clean stainless steel spoon and bowl from soils located at 509 N. Howard Street. Site Photograph #13 illustrates the sample location and the soil conditions encountered.

Background duplicate soil sample SO-19 was collected 0"- 3" deep using a clean stainless steel spoon and bowl from soils located at 509 N. Howard Street. Site Photograph #13 illustrates the sample location and the soil conditions encountered.

Background duplicate soil sample SO-20 was collected 3"- 6" deep using a clean stainless steel spoon and bowl from soils located at 509 N. Howard Street. Site Photograph #13 illustrates the sample location and the soil conditions encountered.

Background soil sample SO-21 was collected 0"- 3" deep using a clean stainless steel spoon and bowl from soils located at 313 N. Cottage Ave. Site Photograph #14 illustrates the sample location and the soil conditions encountered.

Background soil sample SO-22 was collected 3"- 6" deep using a clean stainless steel spoon and bowl from soils located at 313 N. Cottage Ave. Site Photograph #14 illustrates the sample location and the soil conditions encountered.

4.2.2 Source Characterization Sample Results

Source Characterization Samples

A total of four (4) soil samples were collected during the January 12-16, 2004 ESI to identify and characterize the hazardous substances associated with each potential source, as specified in the HRS Rule, Section 2.2.2 (Ref. 1). These four soil samples were collected on the George E. Dilley and Son Founders and Machinists Shop. Table 3 on the following page lists all of the source characterization samples collected during the ESI by sample number, location, depth and date collected.

Source samples SO-37 through SO-40 were all composite samples collected 0"-3" and 3"- 6" deep from the soils located adjacent to a potential source area (contaminated soil) using clean stainless steel spoon and bowl. Sample locations are shown in Figure 3. A Global Positioning Satellite (GPS) instrument was used to record the geographic coordinates at each sample location. Sample locations were selected at the lowest area visibly observed adjacent to the potential source area where surface water would normally accumulate (Ref. 28, pp. 110-111).

Table 2 lists all of the source samples collected during the ESI by sample number and location (Ref. 13, p. 20-21). Sample locations are shown in Figure 3.

Table 2–Source Soil Samples

Sample Number	Matrix	Location	Rationale
F0S79 MF0S79 SO-37	Soil	Composite soil sample, 0-3" depth, located at George E. Dilley and Son Founders and Machinists Shop.	Assess potential off-site contamination near building's concrete foundation.
F0S80 MF0S80 SO-38	Soil	Composite soil sample, 3-6" depth, located at George E. Dilley and Son Founders and Machinists Shop.	Assess potential off-site contamination near building's concrete foundation.
F0S81 MF0S81 SO-39	Soil	Composite soil sample, 0-3" depth, located at George E. Dilley and Son Founders and Machinists Shop.	Assess potential off-site contamination near possible furnace area.
F0S82 MF0S82 SO-40	Soil	Composite soil sample, 3-6" depth, located at George E. Dilley and Son Founders and Machinists Shop.	Assess potential off-site contamination near possible furnace area.

A Global Positioning Satellite (GPS) instrument was used to record the geographic coordinates at each sample location. Analytical results of the soil source and background samples are summarized in Tables 3-5 and a complete listing of all source characterization sample results in included as References 23 and 27.

All samples were collected according to the EPA approved Quality Assurance Project Plan and sample locations were approved by the EPA prior to sample collection (Ref. 7, pp. 1-31; Ref. 8, pp. 1-59).

Table 3–Background Soil Semivolatiles Sample Results

Palestine Light Heat and Power Soil Samples - Semivolatiles (Background)												
Constituents µg/Kg	SO-11 F0S53		SO-12 F0S54		SO-13 F0S55 Dup of SO-11		SO-14 F0S56 Dup of SO-12		SO-15 F0S57		SO-16 F0S58	
	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL
Phenanthrene	620 U	620	370 U	370	400 U	400	38 LJ	380	440 U	440	490 U	490
Fluoranthene	200 LJ	620	150 LJ	370	88 LJ	400	280 LJ	380	440 U	440	490 U	490
Pyrene	250 LJ	620	200 LJ	370	84 LJ	400	330 LJ	380	440 U	440	490 U	490
Benzo(a)anthracene	120 LJ	620	120 LJ	370	59 LJ	400	170 LJ	380	440 U	440	490 U	490
Chrysene	140 LJ	620	140 LJ	370	84 LJ	400	210 LJ	380	440 U	440	490 U	490
Benzo(b)fluoranthene	250	62	170 LJ	370	73 LJ	400	220 LJ	380	440 U	440	490 U	490
Benzo(k)fluoranthene	110 LJ	620	91 LJ	370	46 LJ	400	130 LJ	380	440 U	440	490 U	490
Benzo(a)pyrene	120 LJ	620	120 LJ	370	79 LJ	400	170 LJ	380	440 U	440	490 U	490
Indeno(1,2,3-cd)-pyrene	620 U	620	130 LJ	370	64 LJ	400	160 LJ	380	440 U	440	490 U	490
Reference 22	**Ref. 20, pp. 92-94 Ref 21, p. 17**		**Ref. 20, pp. 95-97**		**pp. 50-52**		**Ref. 20, pp.98-100**		**pp. 53-55**		**pp. 56-58**	

Notes

SQL Sample quantitation limit.
U Undetected at the laboratory reported instrument detection limit (IDL).
L Reported concentration is between the IDL and the SQL.
J Result is estimated due to quality control issues.
* Result is considered unusable by the laboratory.

Table 3-Continued

Palestine Light Heat and Power Soil Samples - Semivolatiles (Background)														
Constituents µg/Kg	SO-17 F0S59		SO-18 F0S60		SO-19 F0S61 Dup of SO-17		SO-20 F0S62 Dup of SO-18		SO-21 F0S63		SO-22 F0S64		**Highest Background**	
	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL
Phenanthrene	380 U	380	380 U	380	380 U	380	380 U	380	49 LJ	410	390 U	390	49 LJ	410
Fluoranthene	380 U	380	380 U	380	380 U	380	380 U	380	84 LJ	410	390 U	390	280 LJ	380
Pyrene	380 U	380	380 U	380	380 U	380	380 U	380	91 LJ	410	390 U	390	330 LJ	380
Benzo(a)anthracene	380 U	380	380 U	380	380 U	380	380 U	380	41 LJ	410	390 U	390	130 LJ	380
Chrysene	380 U	380	380 U	380	380 U	380	380 U	380	57 LJ	410	390 U	390	210 LJ	380
Benzo(b)fluoranthene	380 U	380	380 U	380	380 U	380	380 U	380	410 U	410	390 U	390	250	62
Benzo(k)fluoranthene	380 U	380	380 U	380	380 U	380	380 U	380	410 U	410	390 U	390	130 LJ	380
Benzo(a)pyrene	380 U	380	380 U	380	380 U	380	380 U	380	50 LJ	410	390 U	390	170 LJ	380
Indeno(1,2,3-cd)-pyrene	380 U	380	380 U	380	380 U	380	380 U	380	410 U	410	390 U	390	160 LJ	380
Reference 22	**pp. 59-61**		**pp. 62-64**		**pp. 65-67**		**pp. 68-70**		**pp. 71-73**		**pp. 74-76**		**NA**	

Notes

SQL Sample quantitation limit.
U Undetected at the laboratory reported instrument detection limit (IDL).
L Reported concentration is between the IDL and the SQL.
J Result is estimated due to quality control issues.
* Result is considered unusable by the laboratory.

Table 4–Source Soil Semivolatiles Sample Results
Unlisted source soil samples in Table 4 (SO-39 and SO-40) did not met the observed release criteria for semivolatiles.

Palestine Light Heat and Power Soil Samples - Semivolatiles								
Constituents µg/Kg	**Highest Background**		SO-37 F0S79		SO-38 F0S80		SO-38DL F0S80DL	
	Result	SQL	Result	SQL	Result	SQL	Result	SQL
Phenanthrene	49 LJ	410	**1500**	430	4500 *	400	**3400**	800
Fluoranthene	280 LJ	380	**1800 J**	430	4600 *	400	**4100 J**	800
Pyrene	330 LJ	380	**2100**	430	4200 *	400	**3200**	800
Benzo(a)anthracene	130 LJ	380	**600**	430	**1500**	400	1500 *	800
Chrysene	210 LJ	380	**1000**	430	**1700**	400	1800 *	800
Benzo(b)fluoranthene	250	62	**1100**	430	**1400**	400	1400 *	800
Benzo(k)fluoranthene	130 LJ	380	**770**	430	**1100**	400	1000 *	800
Benzo(a)pyrene	170 LJ	380	500	430	**980**	400	1100 *	800
Indeno(1,2,3-cd)-pyrene	160 LJ	380	**740**	430	**1100**	400	1000 *	200 LJ
Reference 23	**NA**		**pp. 67-69**		**pp70-72.**		**pp. 73-75**	

Notes
SQL Sample quantitation limit.
U Undetected at the laboratory reported instrument detection limit (IDL).
L Reported concentration is between the IDL and the SQL.
J Result is estimated due to quality control issues.
* Result is considered unusable by the laboratory.
Boldface indicates a release.

Table 5–Background Soil Inorganic Sample Results

Palestine Light Heat and Power Soil Samples - Inorganics (Background)												
Constituents mg/Kg	SO-11 MF0S53		SO-12 MF0S54		SO-13 MF0S55 Dup of SO-11		SO-14 MF0S56 Dup of SO-12		SO-15 MF0S57		SO-16 MF0S58	
	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL
Arsenic	12.3	3.6	29.7	3.4	22.2	3.6	10.9 J	3.4	9.2 J	4.0	10.8 J	3.6
Beryllium	0.39 LJ	1.2	0.66 LJ	1.1	0.53 LJ	1.2	0.36 LJ	1.1	0.48 LJ	1.3	0.37 LJ	1.2
Chromium	16.0	2.4	33.3 J	2.3	26.5	2.4	12.9 J	2.3	23.1	2.7	26.1	2.4
Copper	7.7	5.9	20.9	5.6	7.2	5.0	13.7	5.7	13.2	6.7	7.8	6.0
Lead	74.4	2.4	100	2.3	68.2	2.4	87.9	2.3	204	2.7	265	2.4
Nickel	7.0 LJ	9.5	16.4	9.0	8.0 LJ	9.6	6.9 LJ	9.1	9.8 LJ	10.7	8.2 LJ	9.6
Vanadium	37.1 Jv	11.8	75.4 Jv	11.3	59.8 Jv	12.0	32.7 Jv	11.3	31.6 J	13.4	35.7 J	12.0
Reference 25	**p. 39**		**p. 40**		**p. 41**		**p. 42**		**Ref. 26 p. 22**		**Ref. 26 p. 23**	

Notes

SQL Sample Quantitation Limit.
U Undetected at the laboratory reported instrument detection limit (IDL).
L Reported concentration is between the IDL and the SQL.
J Result is estimated due to quality control issues.
^ Result is biased high.
v Result is biased low.

Table 5–Continued

Palestine Light Heat and Power Soil Samples - Inorganics (Background)														
Constituents mg/Kg	SO-17 MF0S59		SO-18 MF0S60		SO-19 MF0S61 Dup of SO-17		SO-20 MF0S62 Dup of SO-18		SO-21 MF0S63		SO-22 MF0S64		**Highest Background**	
	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL
Arsenic	15.2 J	3.5	18.3 J	3.5	19.4 J	3.5	15.0 J	3.4	14.3 J	3.6	19.3 J	3.5	29.7 J	3.4
Beryllium	0.48 LJ	1.2	0.57 LJ	1.2	0.62 LJ	1.2	0.53 LJ	1.1	0.47 LJ	1.2	0.55 LJ	1.2	0.66 LJ	1.1
Chromium	20.8	2.3	25.5	2.3	28.5	2.3	27.3	2.3	26.6	2.4	30.3	2.4	33.3 J	2.3
Copper	4.7 LJ	5.8	7.1	5.8	5.6 LJ	5.9	6.9	5.7	10.8	6.1	10.8	5.9	20.0	11.5
Lead	75.0	2.3	128	2.3	84.5	2.3	121	2.3	117	2.4	131	2.4	265	2.4
Nickel	13.5	9.3	15.0	9.2	19.4	9.4	18.0	9.2	13.2	9.7	15.7	9.4	19.4	9.4
Vanadium	51.0 J	11.6	63.7 J	11.5	70.3 J	11.7	56.1 J	11.5	43.8 J	12.2	49.7 J	11.8	75.4 Jv	11.3
Reference 26	**p. 24**		**p. 25**		**p. 26**		**p. 27**		**p. 28**		**p. 29**		**NA**	

Notes
SQL Sample Quantitation Limit.
U Undetected at the laboratory reported instrument detection limit (IDL).
L Reported concentration is between the IDL and the SQL.
J Result is estimated due to quality control issues.
^ Result is biased high.
v Result is biased low.
Boldface indicates a release.

Table 6–Source Soil Sample Inorganic Results

Palestine Light Heat and Power Soil Samples - Inorganics										
Constituents mg/Kg	**Highest Background**		SO-37 MF0S79		SO-38 MF0S80		SO-39 MF0S81		SO-40 MF0S82	
	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL
Arsenic	29.7 J	3.4	24.8 J^	3.9	27.2 J^	3.6	**198 J^**	3.9	**183 J^**	3.6
Beryllium	0.66 LJ	1.1	0.45 LJ	1.3	0.64 LJ	1.2	0.26 LJ	1.3	0.30 LJ	1.2
Chromium	33.3 J	2.3	22.3 J^	2.6	39.1 J^	2.4	84.3 J^	2.6	96.4 J^	2.4
Copper	20.0	11.5	**98.8 J^**	6.5	**84.1 J^**	6.1	**273 J^**	6.5	**452 J^**	6.1
Lead	265	2.4	299 Jv	2.6	191 Jv	2.4	726 Jv	2.6	**1000 Jv**	2.4
Nickel	19.4	9.4	15.9	10.5	23.7	9.7	29.2	10.4	59.8	9.7
Vanadium	75.4 Jv	11.3	54.4 Jv	13.1	92.6 Jv	12.1	54.9 Jv	13.0	61.1 Jv	12.1
Reference 27	**NA**		**p. 25**		**p. 26**		**p. 27**		**p. 28**	

Notes
SQL Sample Quantitation Limit.
U Undetected at the laboratory reported instrument detection limit (IDL).
L Reported concentration is between the IDL and the SQL.
J Result is estimated due to quality control issues.
^ Result is biased high.
v Result is biased low.
Boldface indicates a release.

5.0 GROUND WATER PATHWAY AND TARGETS

5.1 GENERAL CONSIDERATIONS

No ground water samples were collected during the Palestine Light, Heat and Power Company ESI. However, the following information concerning the ground water pathway was previously evaluated during the SSI based on the potential ground water use.

5.1.1 Hydrologic Setting

Anderson County, Texas is located in the rolling hills and forests of East Texas. The area is comprised of overlapping Cretaceous-aged formations that tend to increase in thickness toward the coast. The depth of the first ground water zone is less than 100 feet. The most important water-bearing formations are listed below from youngest to oldest.

Sparta Sand
Queen City Sand
Carrizo Sand
Wilcox Group

The aquifers associated with the above formations have the same names and are the principal water-bearing units in the area.

Sparta Aquifer
Queen City Aquifer
Carrizo Aquifer
Wilcox Aquifer

The Sparta Sand is generally composed of very fine- to fine grained quartz sand, clay and silty clay containing some lignitic beds. This formation yields small quantities of fresh water and is approximately 60 feet thick in the area of the site (Ref. 5).

Underlying the Sparta Sand is the Queen City Sand, consisting of alternating beds of very fine- to fine-grained quartz sand and clay. This aquifer yields very small quantities of fresh water and in the site area, this formation is about 450 feet thick (Ref. 5).

The Carrizo Sand is typically a white, massive, fine- to medium grained quartz sand and often contains a few this clay lenses. The Carrizo Aquifer yields small to large quantities of fresh water and is around 100 feet thick in the Palestine area (Ref. 5).

Underlying the Carrizo Sand is the Wilcox Group which consists of mainly interbedded sand, silt and clay with minor amounts of lignite. The Wilcox Aquifer contains mostly brackish water in the southern third of Anderson County and is approximately 1,550 feet thick (Ref. 5).

The Carrizo and Wilcox Aquifers are used extensively in the area for drinking water supply wells.

5.1.2 Ground Water Targets

The Ground Water Pathway for the Palestine Light, Heat and Power Company site was evaluated to have several public supply drinking water wells located within a 4-mile radius of the site (Ref. 10, pp. 5, 8). Most public water supply wells are completed in the Carrizo and Wilcox Aquifers and range from 1300-2200 feet deep (Ref. 5). Based upon review of state records, the following public water supply (PWS) wells were defined.

0-1/4 mile	No PWS wells
1/4-1/2 mile	No PWS wells
1/2-1 mile	No PWS wells
1-2 miles	3 PWS wells (one active and two used in emergencies)
2-3 miles	3 PWS wells
3-4 miles	2 PWS wells

All of the above PWS wells are also connected to the main drinking water source of the City of Palestine, a surface water intake from Lake Palestine/Neches River over 30 miles to the north (Ref. 12). Information obtained from TCEQ Region 5 staff indicated that any residential domestic wells within one-quarter mile of the site are used for irrigation purposes only and not for drinking water (Ref. 12).

6.0 SURFACE WATER MIGRATION PATHWAY AND TARGETS

6.1 GENERAL CONSIDERATIONS

6.1.1 Surface Water Drainage Pathways/Watersheds

Characteristics

The Texas Surface Water Quality Standards (Title 30, Chapter 307 of the Texas Administrative Code) establishes explicit water quality goals throughout the State. Regional hydrologic and geologic diversity is given consideration by dividing major river basins, bay and estuaries into defined segments (referred to as classified and designated segments). Palestine Light, Heat and Power Company is located approximately 0.65 miles northeast of Town Creek which ultimately flows into the Trinity River Segment 0804 (Ref. 15). Anderson County Flood Insurance Rate Map Panel 10 of 10 indicates that the site does not lie within the 100 or 500 year flood plain (Ref. 19). The average annual rainfall in the area of the Palestine Light, Heat and Power Company site is estimated as 42 inches (Ref. 17, p. 18). Figure 5 depicts the 15 mile target distance limit (TDL) or surface water pathway from the Palestine Light, Heat and Power Company site.

6.1.2 Description of the In-Water Segments and Target Distance Limit

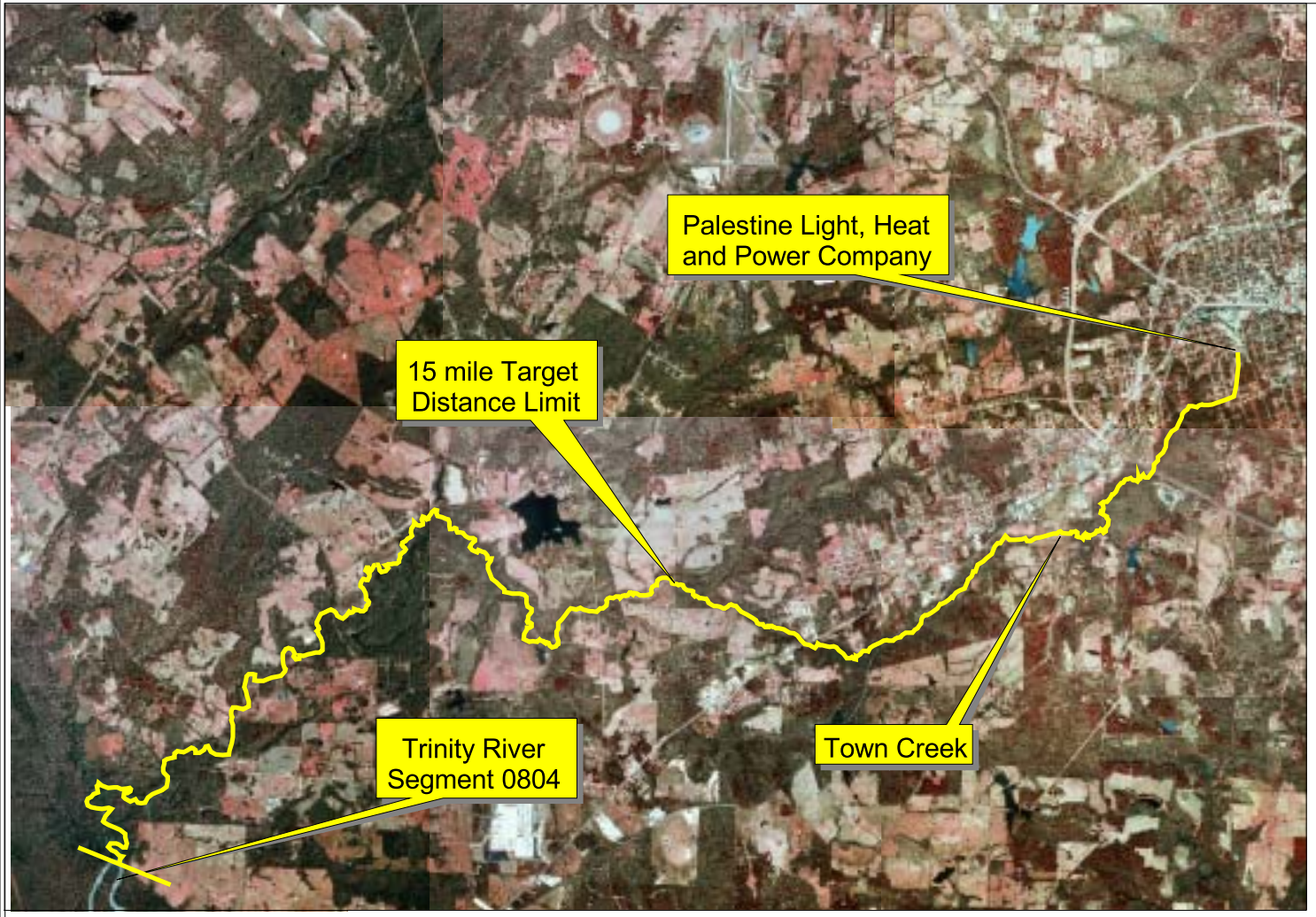
For this ESI, there was only one (1) surface water category identified within the in-water segment of the HRS-defined target distance limit for the overland/flood migration component. This category was classified based on differing types of surface water bodies and/or stream flow characteristics, as outlined in HRS Rule Section 4.0.2, and discussed below (Ref. 1):

(1) In-Water Segment No. 1 (Town Creek to the Trinity River): approximately 15 miles of Town Creek to the Trinity River. The creek's width is estimated to range from 2-10 feet and from 1-4 feet deep. There are several wetlands that meet the HRS wetland definition in this segment. There are no known drinking water intakes or other known surface water permits located with this in-water segment.

6.2 LIKELIHOOD OF RELEASE

6.2.1 Distance to Surface Water

The overland drainage pathway extends from the site to Town Creek approximately 0.65 miles southwest. The shortest distance to perennial surface water was determined by measuring from the southwest portion of the site to Town Creek. The estimated distance was from 0.4 miles to 0.65 miles based on measurements taken from available aerial photographs (Figure 4). Since the distance to surface water was between 2,500 feet and 1.5 miles, a Distance to Surface Water Factor Value of 6 was selected from HRS Rule Table 4-7, as specified in HRS Rule Section 4.1.2.1.2.1.3 (Ref. 1).



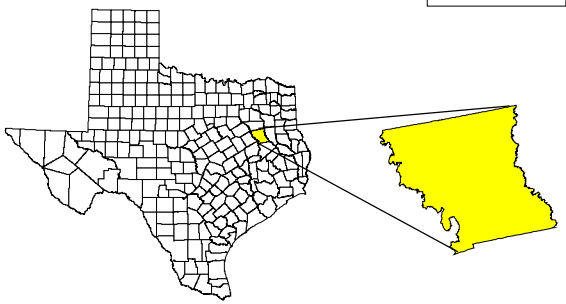
Expanded Site Inspection Report
Figure 5

Surface Water Pathway Map

Palestine Light, Heat and Power Company
TXD981912421
Palestine, Texas
Anderson County

2 0 2 4 Miles

N
W E
S



Anderson County

The base data used is the NW and NE SW Palestine, the SW and SE NW Palestine, SE Tennessee Colony, and the NE Long Lake Digital Orthophoto Quadrangles (DOQs) which is a digital version of an aerial photograph. This DOQ was produced by the TCEQ using USGS guidelines. UTM NAD 83 Zone 15

6.2.2 Containment and Flood Frequency

During the SSI on-site reconnaissance in May 2003, there were no observed flood control measures (i.e., containment dikes or berms) noted around any of the identified on-site waste management areas (Ref. 6, p. 51). Therefore, a Containment (Flood) Factor Value of 10 was assigned to the floodplain category applicable to each source from HRS Rule Table 4-8, as specified in HRS Rule Section 4.1.2.1.2.2.1 (Ref. 1).

Based on prior investigations and floodplain maps, the site is located outside of the 500-year flood zone (Ref. 19). A Flood Frequency Factor Value for a source located outside a 500-year floodplain of 0 was assigned from HRS Rule Table 4-9, as specified in HRS Rule Section 4.1.2.1.2.2.2.

6.2.3 2-Year 24-Hour Rainfall

Based on rainfall frequency maps, the two-year, 24 hour rainfall for this area is 4.0 inches (Ref. 17).

6.2.4 Determination of Background Concentrations

Background Sediment Samples

Two (2) background sediment samples were collected during the January 12-16, 2004 ESI at a portion of Bassett Creek approximately 1.5 miles west and up gradient from the site for attribution of site contaminants (Ref. 13, pp. 21, 27; Ref. 28, pp. 71-73, Photographs #1-2). Sample locations are shown in Figure 4. Table 7 provides a summary of the background sediment samples collected.

Table 7–Background Sediment Samples

Sample Number	Matrix	Location	Rationale
MF0S37 F0S37 SE-01	Sediment	In Bassett Creek on the northeast corner of West Sterne and Loop 256.	Background sediment sample for attribution of contaminants to site sources
MF0S38 F07S38 SE-02	Sediment	In Town Creek on the northeast corner of West Sterne and Loop 256.	Background sediment sample for attribution of contaminants to site sources

Background sediment sample SE-01 was collected from 0" to 6" using a clean, dedicated stainless steel bowl and spoon to capture fine sediments located within undisturbed shallow areas in Town Creek located approximately 0.5 miles west of the site. Roots, leaves and other organic material were removed before placing the sample into the jars (Ref. 28, p. 73).

Background sediment sample SE-02 was collected from 0" to 6" using a clean, dedicated stainless steel bowl and spoon to capture fine sediments located within undisturbed shallow areas in Town Creek located approximately 0.5 miles west of the site. Roots, leaves and other organic material were removed before placing the sample into the jars (Ref. 28, p. 71).

6.2.5 Sediment Sample Results

Releases of hazardous substances to a pathway can be documented in the HRS system by two methods: (a) direct observation and (b) chemical analysis (Ref. 1, Section 4.1.2.1.1). The chemical analysis method was used during the ESI to substantiate releases to the surface water migratory pathway.

Chemical Analysis

Establishing a release by chemical analysis requires detailed analytical documentation of constituent concentrations in the specified media of concern, i.e., soil, water or air. First, naturally occurring background concentrations of the hazardous substances must be determined. Second, it must be demonstrated that the concentrations of the hazardous substances in a release sample are significantly above the appropriate background level. In order to document a significant increase above the background levels, the hazardous substances must be present in concentrations of at least three times (3x) above the highest identified background level present in the background sample. Or, if the hazardous substances have not been detected in the background samples, then the hazardous substances must be present at concentrations both above the release's and the highest background samples' laboratory Sample Quantitation Limit (SQL), as specified in the HRS Rule, Section 2.3 and Table 2-3 (Ref. 1).

Sediment Samples

A total of six (6) sediment samples including one duplicate were collected during the January 12-16, 2004 ESI to document the release of hazardous substances, as outlined in the HRS Rule, Section 4.1.2.1.1 (Ref. 1). Four (4) sediment samples (SE-03 through SE-06) including one duplicate were collected from Town Creek located west of the site. Two (2) sediment samples (SE-29 and SE-30) were collected from drainage ditches between the site and the PPE to Town Creek. Table 8 lists all of the sediment samples collected by sample number and location collected.

Table 8–Source Sediment Samples

Sample Number	Matrix	Location	Rationale
F0S39 MF0S39 SE-03	Sediment	Town Creek, north of Giraud Street.	Assess constituents for attribution from upstream contributions.
F0S40 MF0S40 SE-04	Sediment	Town Creek, access from 1504 West Reagan Street.	Assess constituents for attribution from upstream contributions.
F0JS41 MF0S41 SE-05	Sediment	Duplicate of SE-04	Quality Assurance/Quality Control (QA/QC)
F0S42 MF0S42 SE-06	Sediment	Town Creek, approximately 1.0 mile downstream of the site, 0.25 miles downstream of the PFO1A wetland.	Assess constituents for attribution from upstream contributions.
F0J50 MF0J50 SE-29	Sediment	Drainage ditch located on the northeast corner of West Dye and South Dorrance Streets.	Assess constituents for attribution from site drainage patterns.
F0J51 MF0J51 SE-30	Sediment	Drainage ditch located on the northeast corner of South Jackson and West Burkitt Streets.	Assess constituents for attribution from site drainage patterns.

Sediment sample SE-03 was a grab sample collected at "0-4" deep along Town Creek north of Giraud Street using a clean, dedicated stainless steel bowl and spoon. Sample locations are shown in Figure 4. Sampling conditions encountered and depth were documented in the Field Log Book at each sample location (Ref. 28, p. 73).

Sediment samples SE-04 and SE-05 (duplicate sample) were grab samples collected from 0"-6" deep from Town Creek, access from 1504 West Reagan Street using a clean, dedicated stainless steel bowl and spoon. Sample locations are shown in Figure 4. Sampling conditions encountered and sample depth were documented in the Field Log Book at each sample location (Ref. 28, p. 75).

Sediment sample SE-06 was a grab sample collected from 0"-6" deep Town Creek, approximately 1.0 mile downstream of the site, 0.25 miles downstream of the PFO1A wetland using a clean, dedicated stainless steel bowl and spoon. Sample locations are shown in Figure 4. Sampling conditions encountered and depth were documented in the Field Log Book at each sample location (Ref. 28, p. 77).

Sediment sample SE-29 was a grab sample collected at 0"-6" deep from a drainage ditch located on the northeast corner of West Dye and South Dorrance Streets using a clean, dedicated stainless steel bowl and spoon. Sample locations are shown in Figure 4. Sampling conditions encountered and depth were documented in the Field Log Book at each sample location (Ref. 28, p. 105).

Sediment sample SE-30 was a grab sample collected at 0"-6" deep from a drainage ditch located on the northeast corner of South Jackson and West Burkitt Streets using a clean, dedicated stainless steel bowl and spoon. Sample locations are shown in Figure 4. Sampling conditions encountered and depth were documented in the Field Log Book at each sample location (Ref. 28, p. 105).

Analytical results of the ESI sediment samples are summarized in Table 9 on the following pages. The following results identify hazardous substances that met release criteria by chemical analysis in accordance with the guidelines outlined in the HRS Rule, Section 2.3 (Ref. 1).

A complete listing of all sediment release sample results are included in References 20, 23 and 25. No metals from the sediment samples met the observed release criteria.

All samples were collected according to the EPA approved Quality Assurance Project Plan and sample locations were approved by the EPA prior to sample collection (Ref. 8, pp. 1-59; Ref. 7, pp 1-31).

Table 9–Off-site Sediment Inorganic Sample Results
Unlisted source sediment samples in Table 9 (SE-04 through SE-06, SE-29 and SE-30) did not met the observed release criteria for semivolatiles and no source sediment samples met the observed release criteria for metals.

Palestine Light Heat and Power Sediment Samples - Semivolatiles								
Constituent µg/Kg	SE-01 F0S37 (Background)		SE-02 F0S38 (Background)		**Highest Background**		SE-03 F0S39	
	Result	SQL	Result	SQL	Result	SQL	Result	SQL
Fluoranthene	43 LJ	400	410 U	410	43 LJ	400	**880**	490
Pyrene	55 LJ	400	64 LJ	410	64 LJ	410	**750**	490
Chrysene	400 U	400	79 LJ	410	79 LJ	410	**630**	490
Reference 20	**pp. 47-49**		**Ref. 23 pp. 49-51**		**NA**		**pp. 50-52**	

Notes
SQL Sample Quantitation Limit
U Undetected at the laboratory reported instrument detection limit.
L Reported concentration is between the IDL and the SQL.
J Result is estimated due to quality control issues.
Boldface indicates a release.

6.3 SURFACE WATER PATHWAY TARGETS

6.3.1 Surface Water Use Permits and Drinking Water Intakes

Based on prior investigations, there were no surface water use permits found to be located within the 15-mile target distance limit (Ref. 12).

Based on prior investigations and a file review, there are currently no in-use or standby drinking water intakes located within the 15-mile target distance limit for the site (Ref. 12).

6.3.2 Resources

Based on a file review and interviews conducted during the SSI and ESI investigations, there are no designated water-use public recreation areas identified within a watershed that qualify as resources as defined in Section 4.1.2.3.3 of the HRS Rule (Ref. 1).

6.3.3 Fisheries and Estimated Annual Production

There are no fisheries within the 15 mile target distance limit, according to US Fish and Wildlife research (Ref. 6, p. 55).

6.3.4 Wetlands and Other Sensitive Environments

Based on a review of Fish and Wildlife Service topographic wetland maps in the vicinity of the site, the following sensitive environment, as defined in Section 4.1.4.3.1.1 of the HRS Rule and the Hazard Ranking System Guidance Manual, was identified located within the watershed. According to the Palestine Southwest Quadrangle wetland map, a Palustrine/Forested/Broad-leaved Deciduous/Temporary (PFO1A) wetland is located approximately 0.75 miles downstream of the site and extends approximately 0.4 miles (Ref. 18).

Results of the ESI do not indicate releases of hazardous substances to HRS qualifying wetlands. Sediment sample SE-06 was collected approximately 1.0 mile downstream of the site, 0.25 miles downstream of the PFO1A wetland. SE-29 and SE-30 were collected at drainage ditches from the site to the PPE to Town Creek. Analytical results indicated concentrations are less than three times (3x) the highest identified background level or at concentrations both above the releases's and the highest back-ground sample's Sample Quantitation Limit (SQL).

A list of state and federal endangered and/or threatened species that may occur within the 15-mile target distance limit was provided by the Texas Parks and Wildlife Department, Natural Heritage Program. The list includes the following for Anderson County (Ref. 16, p. 1):

✔ Federal Listed Threatened or Endangered Species: Birds: *Haliaeetus leucocephalus*, Bald Eagle; Mammals: *Ursus americanus luteolus*, Louisiana Black Bear; and

✔ State Listed Threatened or Endangered Species: Birds: *Falco peregrinus tundris*, Arctic Peregrine Falcon; *Aimophila aestivalis*, Bachman's Sparrow; *Haliaeetus leucocephalus*, Bald Eagle; *Mycteria americana*, Wood Stork; Mammals: *Ursus americanus*, Black Bear; *Ursus americanus luteolus*, Louisana Black Bear; Reptiles: *Macrochelys temminckii*, Alligator Snapping Turtle; *Pituophis ruthveni*, Louisiana Pine Snake; *Phrynosoma cornutum*, Texas Horned Lizard; and *Crotalus horridus*, Timber/Canebrake Rattlesnake.

7.0 SOIL EXPOSURE PATHWAY AND TARGETS

7.1 GENERAL CONSIDERATIONS

The soil exposure pathway was evaluated during the January 12-16, 2004 ESI and soil samples were collected based on elevated levels of contaminants found during the SSI and potential exposure to remaining wastes at the site or other source areas. The other potential source areas for the soil exposure pathway include the Missouri Pacific railroad tracks where a herbicide may have been used to prevent the growth of grasses, historic cotton farming in the area, shingles on rooftops that may have used arsenic in manufacturing, the foundry (George E. Dilley and Son Founders and Machinists Shop) located opposite the site across the railroad tracks on South May Street, or some other unknown source.

7.2 LIKELIHOOD OF EXPOSURE

7.2.1 Attractiveness/Accessibility of the Site

Section 5.2.1.1 of the HRS Rule qualifies site attractiveness for an area of observed contamination based on the degree of accessibility and whether the area has been designated for recreational use or is regularly used for public recreation, excluding residences (Ref. 1). During the SSI and ESI site reconnaissance, there were no on-site recreational areas identified as regularly used for public recreation, however, waste piles at the site indicate possible pedestrian use (Ref 6, p. 51). The Palestine Light, Heat and Power Company site is not fenced (Ref. 6, p. 7).

7.2.2 Determination of Background Concentrations

Background Soil Exposure Samples

Twelve (12) background soil samples were collected to evaluate the soil exposure pathway during the January 12-16, 2004 ESI sampling event. Samples were collected north of the Missouri Pacific Railroad for attribution of naturally occurring source contaminants (Ref. 28, pp. 89-97; Ref. 13, pp. 19-20, 26). Table 1 of this ESI report provides a summary of the background soil samples collected at the Palestine Light, Heat and Power Company site.

7.2.3 Soil Sample Results

Soil Exposure Samples

A total of thirty (30) soil samples were collected during the January 12-16, 2004 ESI sampling event to document the release of hazardous substances and evaluate the resident population threat, as outlined in the HRS Rule, Section 5.1.3 (Ref. 1). All soil samples (SO-01 through SO-10, SO-23 through SO-28, SO-31 through SO-36, and SO-41 through SO-48) were collected off-site in residential yards or public parks located within one mile of the site. Tables 10-12 on the following pages lists all of the soil samples collected by sample number.

Refer to Figure 3 for all soil sample locations.

Table 10–Soil Exposure Samples

Sample Number	Matrix	Location	Rationale
F0S43 MF0S43 SO-01	Soil	Composite soil sample, 0-3" depth, residential property located at 1205 Hilltop Drive	Assess potential off-site contamination.
F0S44 MF0S44 SO-02	Soil	Composite soil sample, 3-6" depth, residential property located at 1205 Hilltop Drive	Assess potential off-site contamination.
F0S45 MF0S45 SO-03	Soil	Composite soil sample, 0-3" depth, residential property located at 53 Rambling Road	Assess potential off-site contamination.
F0S46 MF0S46 SO-04	Soil	Composite soil sample, 3-6" depth, residential property located at 53 Rambling Road	Assess potential off-site contamination.
F0S47 MF0S47 SO-05	Soil	Composite soil sample, 0-3" depth, residential property located at 808 East Neches Street	Assess potential off-site contamination.
F0S48 MF0S48 SO-06	Soil	Composite soil sample, 3-6" depth, residential property located at 808 East Neches Street	Assess potential off-site contamination.
F0S49 MF0S49 SO-07	Soil	Composite soil sample, 0-3" depth, residential property located at 1101 East Lamar Street	Assess potential off-site contamination.
F0S50 MF0S50 SO-08	Soil	Composite soil sample, 3-6" depth, residential property located at 1101 East Lamar Street	Assess potential off-site contamination.
F0S51 MF0S51 SO-09	Soil	Composite soil sample, 0-3" depth, residential property located at 201 Lakeview Avenue	Assess potential off-site contamination.
F0S52 MF0S52 SO-10	Soil	Composite soil sample, 3-6" depth, residential property located at 201 Lakeview Avenue	Assess potential off-site contamination.
F0S65 MF0S65 SO-23	Soil	Composite soil sample, 0-3" depth, residential property located at 925 San Jacinto Street	Assess potential off-site contamination.
Sample Number	**Matrix**	**Location**	**Rationale**
F0S66 MF0S66 SO-24	Soil	Composite soil sample, 3-6" depth, residential property located at 925 San Jacinto Street	Assess potential off-site contamination.

F0S67 MF0S67 SO-25	Soil	Composite soil sample, 0-3" depth, residential property located at 105 Miller Street	Assess potential off-site contamination.
F0S68 MF0S68 SO-26	Soil	Composite soil sample, 3-6" depth, residential property located at 105 Miller Street	Assess potential off-site contamination.
F0S69 MF0S69 SO-27	Soil	Composite soil sample, 0-3" depth, residential property located at 807 Giraud Street	Assess potential off-site contamination.
F0S70 MF0S70 SO-28	Soil	Composite soil sample, 3-6" depth, residential property located at 807 Giraud Street	Assess potential off-site contamination.
F0S73 MF0S73 SO-31	Soil	Composite soil sample, 0-3" depth, residential property located at 616 South Dorrance Street	Assess potential off-site contamination.
F0S74 MF0S74 SO-32	Soil	Composite soil sample, 3-6" depth, residential property located at 616 South Dorrance Street	Assess potential off-site contamination.
F0S75 MF0S75 SO-33	Soil	Composite soil sample, 0-3" depth, City of Palestine, Willie Meyer Park	Assess potential off-site contamination.
F0S76 MF0S76 SO-34	Soil	Composite soil sample, 3-6" depth, City of Palestine, Willie Meyer Park	Assess potential off-site contamination.
F0S77 MF0S77 SO-35	Soil	Duplicate of SO-33	Quality Assurance/Quality Control (QA/QC)
F0S78 MF0S78 SO-36	Soil	Duplicate of SO-34	Quality Assurance/Quality Control (QA/QC)
F0S83 MF0S83 SO-41	Soil	Composite soil sample, 0-3" depth, residential property located at 1009 South Magnolia Street	Assess potential off-site contamination.
Sample Number	**Matrix**	**Location**	**Rationale**
F0S84 MF0S84 SO-42	Soil	Composite soil sample, 3-6" depth, residential property located at 1009 South Magnolia Street	Assess potential off-site contamination.
F0S85 MF0S85 SO-43	Soil	Composite soil sample, 0-3" depth, residential property located at 909 South Sycamore Street	Assess potential off-site contamination.

F0S86 MF0S86 SO-44	Soil	Composite soil sample, 3-6" depth, residential property located at 909 South Sycamore Street	Assess potential off-site contamination.
F0S87 MF0S87 SO-45	Soil	Composite soil sample, 0-3" depth, residential property located at 520 South Magnolia Street	Assess potential off-site contamination.
F0S88 MF0S88 SO-46	Soil	Composite soil sample, 3-6" depth, residential property located at 520 South Magnolia Street	Assess potential off-site contamination.
F0S89 MF0S89 SO-47	Soil	Composite soil sample, 0-3" depth, City of Palestine, Reagan Park	Assess potential off-site contamination.
F0S90 MF0S90 SO-48	Soil	Composite soil sample, 3-6" depth, City of Palestine, Reagan Park	Assess potential off-site contamination.

Soil sample SO-01 was a three-part composite sample collected from 0-3" deep in the backyard of 1205 Hilltop Drive. Soil sample SO-02 was a three-part composite sample collected from 3-6" deep in the backyard of 1205 Hilltop Drive. Clean stainless steel spoons and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.79).

Soil sample SO-03 was a three-part composite sample collected from 0-3" deep in the east yard of 53 Rambling Road. Soil sample SO-04 was a three-part composite sample collected from 3-6" deep in the east yard of 53 Rambling Road. Clean stainless steel spoons and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.81).

Soil sample SO-05 was a three-part composite sample collected from 0-3" deep in the north and east yards of 808 East Neches Street. Soil sample SO-06 was a three-part composite sample collected from 3-6" deep in the north and east yards of 808 East Neches Street. Clean stainless steel spoons and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.83).

Soil sample SO-07 was a three-part composite sample collected from 0-3" deep in the east and west yards of 1101 East Lamar Street. Soil sample SO-08 was a three-part composite sample collected from 3-6" deep in the east and west yards of 1101 East Lamar Street. Clean stainless steel spoons and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.85).

Soil sample SO-09 was a three-part composite sample collected from 0-3" deep in the north and east yards of 201 Lakeview Avenue. Soil sample SO-10 was a three-part composite sample collected from 3-6" deep in the north and east yards of 201 Lakeview Avenue. Clean stainless steel spoons

and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.87).

Soil sample SO-23 was a three-part composite sample collected from 0-3" deep in the south yard of 925 San Jacinto Street. Soil sample SO-24 was a three-part composite sample collected from 3-6" deep in the south yard of 925 San Jacinto Street. Clean stainless steel spoons and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.99).

Soil sample SO-25 was a three-part composite sample collected from 0-3" deep in the easth yard of 105 Miller Street. Soil sample SO-26 was a three-part composite sample collected from 3-6" deep in the east yard of 105 Miller Street. Clean stainless steel spoons and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.101).

Soil sample SO-27 was a three-part composite sample collected from 0-3" deep in the north yard of 807 Giraud Street. Soil sample SO-28 was a three-part composite sample collected from 3-6" deep in the north yard of 807 Giraud Street. Clean stainless steel spoons and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.103).

Soil sample SO-31 was a three-part composite sample collected from 0-3" deep in the back yard of 616 South Dorrance Street. Soil sample SO-32 was a three-part composite sample collected from 3-6" deep in the back yard of 616 South Dorrance Street. Clean stainless steel spoons and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.107).

Soil samples SO-33 and SO-35 (duplicate sample) were three-part composite samples collected from 0-3" deep between the basketball court and the playground of Willie Meyer Park. Soil samples SO-34 and SO-36 (duplicate sample) were three-part composite samples collected from 3-6" deep between the basketball court and the playground of Willie Meyer Park. Clean stainless steel spoons and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.109-110).

Soil sample SO-41 was a three-part composite sample collected from 0-3" deep in the front yard of 1009 South Magnolia Street. Soil sample SO-42 was a three-part composite sample collected from 3-6" deep in the front yard of 1009 South Magnolia Street. Clean stainless steel spoons and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.112).

Soil sample SO-43 was a three-part composite sample collected from 0-3" deep in the front yard of 909 South Sycamore Street. Soil sample SO-44 was a three-part composite sample collected from 3-6" deep in the front yard of 909 South Sycamore Street. Clean stainless steel spoons and bowls

were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.113).

Soil sample SO-45 was a three-part composite sample collected from 0-3" deep in the front yard of 520 South Magnolia Street. Soil sample SO-46 was a three-part composite sample collected from 3-6" deep in the front yard of 520 South Sycamore Street. Clean stainless steel spoons and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.114).

Soil sample SO-47 was a three-part composite sample collected from 0-3" deep in the drainage area between the gazebo and the museum in Reagan Park. Soil sample SO-48 was a three-part composite sample collected from 3-6" deep in the drainage area between the gazebo and the museum in Reagan Park. Clean stainless steel spoons and bowls were used to collect the samples after the top 1" layer of grass, roots, leaves and other organic material was scraped away. Sample locations are shown in Figure 3. Sampling conditions encountered were documented in the Field Log Book at each sample location (Ref. 28, p.115).

A complete listing of all soil exposure sample results is included as References 20, 23, 25, 26 and 27.

Table 11–Off-site Soil Semivolatiles Sample Results

Unlisted soil samples in Table 11 (SO-01 through SO-10, SO-23 through SO-28, SO-33 through SO-36, and SO-41 through 48) did not met the observed release criteria for semivolatiles.

Palestine Light Heat and Power Soil Samples - Semivolatiles						
Constituents µg/Kg	**Highest Background**		SO-31 F0S73		SO-32 F0S74	
	Result	SQL	Result	SQL	Result	SQL
Phenanthrene	49 LJ	410	200 LJ	420	270 LJ	420
Fluoranthene	280 LJ	380	290 LJ	420	260 LJ	420
Pyrene	330 LJ	380	390 LJ	420	420	420
Benzo(a)anthracene	130 LJ	380	**880**	420	**1400**	420
Chrysene	210 LJ	380	**1300**	420	**2300**	420
Benzo(b)fluoranthene	250	62	**1100**	420	**1500**	420

Benzo(k)fluoranthene	130 LJ	380	320 LJ	420	**490**	420
Benzo(a)pyrene	170 LJ	380	**950**	420	**1200**	420
Indeno(1,2,3-cd)-pyrene	160 LJ	380	**660**	420	**830**	420
Reference 22	**NA**		**pp. 98-100**		**pp. 101-103**	

Notes
SQL Sample quantitation limit.
U Undetected at the laboratory reported instrument detection limit (IDL).
L Reported concentration is between the IDL and the SQL.
J Result is estimated due to quality control issues.
* Result is considered unusable by the laboratory.
Boldface indicates a release.

Table 12–Off-site Soil Inorganic Sample Results

Unlisted source soil samples in Table 12 (SO-03 through SO-10, SO-23 through SO-28, SO-33 through SO-36, SO-43 and SO-44) did not met the observed release criteria for metals.

Palestine Light Heat and Power Soil Samples - Inorganics										
Constituents mg/Kg	**Highest Background**		SO-01 MF0S43		SO-02 MF0S44		SO-41 MF0S83		SO-42 MF0S84	
	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL
Arsenic	29.7 J	3.4	88.9	3.6	72.9	3.6	**212 J^**	4.1	**196 J^**	3.7
Beryllium	0.66 LJ	1.1	**2.0**	1.2	**2.0**	1.2	1.2 LJ	1.4	1.5	1.2
Chromium	33.3 J	2.3	**122**	24.0	97.6	2.4	114 J^	2.7	**118 J^**	2.4
Copper	20.0	11.5	6.8	6.0	5.3 LJ	6.0	24.1 J^	6.8	14.8 J^	6.1
Lead	265	2.4	36.6	2.4	27.4	2.4	**1460 Jv**	2.7	134 Jv	2.4
Nickel	19.4	9.4	**66.8**	9.6	**71.2**	9.7	29.4	10.9	35.9	9.7
Vanadium	75.4 Jv	11.3	**348 Jv**	120	**290 Jv**	61.0	149 Jv	13.6	193 Jv	12.2
	NA		**Ref. 25 p. 29**		**Ref. 25 p. 30**		**Ref. 27 p. 29**		**Ref. 27 p. 30**	

Notes

SQL Sample Quantitation Limit.
U Undetected at the laboratory reported instrument detection limit (IDL).
L Reported concentration is between the IDL and the SQL.
J Result is estimated due to quality control issues.
^ Result is biased high.
v Result is biased low.

Boldface indicates a release.

Table 12–Continued

Palestine Light Heat and Power Soil Samples - Inorganics										
Constituents mg/Kg	**Highest Background**		SO-45 MF0S87		SO-46 MF0S88		SO-47 MF0S89		SO-48 MF0S90	
	Result	SQL	Result	SQL	Result	SQL	Result	SQL	Result	SQL
Arsenic	29.7 J	3.4	**170 J^**	3.4	**193 J^**	3.5	**212 J^**	3.8	**201 J^**	3.6
Beryllium	0.66 LJ	1.1	0.97 LJ	1.1	1.7	1.2	1.4	1.3	1.3	1.2
Chromium	33.3 J	2.3	87.8 J^	2.3	**123 J^**	2.3	**102 J^**	2.6	92.5 J^	2.4
Copper	20.0	11.5	9.9 J^	5.7	11.7 J^	5.8	7.8 J^	6.4	6.6 J^	6.1
Lead	265	2.4	48.6 Jv	2.3	52.8 Jv	2.3	61.0 Jv	12.8	33.9 Jv	12.2
Nickel	19.4	9.4	30.7	9.1	57.4	9.3	37.2	10.3	35.7	9.7
Vanadium	75.4 Jv	11.3	124	11.4	224 Jv	11.7	184 Jv	12.8	165 Jv	12.2
Reference 27	**NA**		**p. 33**		**p. 34**		**p. 35**		**p. 36**	

Notes
SQL Sample Quantitation Limit.
U Undetected at the laboratory reported instrument detection limit (IDL).
L Reported concentration is between the IDL and the SQL.
J Result is estimated due to quality control issues.
^ Result is biased high.
v Result is biased low.
Boldface indicates a release.

7.3 SOIL EXPOSURE TARGETS

7.3.1 Resident Individual and Resident Population

According to the HRS Rule, Section 5.1.3, a resident individual is a person living or attending school or day care on a property with an area of observed contamination and whose residence, school, or day care center, respectively, is on or within 200 feet of the area of observed contamination (Ref. 1).
The results from soil samples SO-01, SO-02, SO-31, SO-32, SO-41, SO-42, SO-45 and SO-46, collected from four residential properties in the surrounding area (see Figure 6), indicate an observed release of hazardous substances to surface soils (Ref. 28, pp. 79, 107, 112 and 145). Analytical results indicate release concentrations greater than three times (3x) the highest identified background level and above the background sample's Sample Quantitation Limit (SQL). Soil samples SO-31, SO-32, SO-41, SO-42, SO-45 and SO-46 also exceeded health-based benchmarks for hazardous substances in soil and is subject to Level I concentrations as specified by the HRS Rule, Section 5.1.3.2, Table 5-3 (Ref. 1).

The resident individual is assigned a value of 50 since there is at least one resident individual in the area of observed contamination that is subject to Level I concentrations. Figure 6 illustrates where the area of observed contamination is located.

Using 2.58 as the average number of persons per household for Anderson County, the resident population subject to Level I concentrations is approximately 10.32 people. This sum (10.32) is multiplied by 10 for Level I concentrations resulting in a Level I factor Value of 103.2 (Ref. 1 Section 5.1.3.2.1). The resident population subject to Level II concentrations is approximately 350 people. This sum (350) is assigned as the Level II Factor Value of 350 (Ref. 1, Section 5.1.3.2.2).

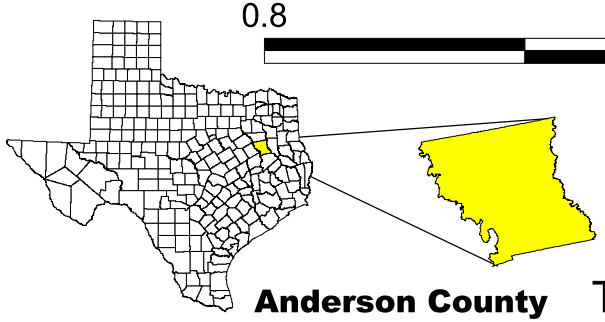
Expanded Site Inspection Report
Figure 6

Area of Observed Contamination Map

Palestine Light, Heat and Power Company
TXD981912421
Palestine, Texas
Anderson County

Area of Observed Contamination

0.8 0 0.8 Miles



Anderson County

The base data used is the SW NE Palestine and the SE NW Palestine Digital Orthophoto Quadrangles (DOQs) which is a digital version of an aerial photograph. This DOQ was produced by the TCEQ using USGS guidelines. UTM NAD 83 Zone 15

N
W E
S

According to the HRS Rule, Section 5.1.3.2, the resident population is the number of persons living or attending school or day care on a property with an area of observed contamination and whose residence, school, or day care center, respectively, is on or within 200 feet of the area of observed contamination (Ref. 1). A summary of the hazardous substances detected and the total resident population is as follows:

Resident Property	Contaminant Location (Sample #) [Depth]	Total Resident Population	Level of Hazardous Substances Released	Reference(s)
1205 Hilltop Drive	Residence (SO-01) [0 - 3"]	2.58	Beryllium - Level II	Ref. 25 pp. 29
			Chromium - Level II	Ref. 25 pp. 29
			Nickel - Level II	Ref. 25 pp. 29
			Vanadium - Level II	Ref. 25 pp. 29
1205 Hilltop Drive	Residence (SO-02) [3 - 6"]	2.58	Beryllium - Level II	Ref. 25 pp. 30
			Chromium - Level II	Ref. 25 pp. 30
			Nickel - Level II	Ref. 25 pp. 30
			Vanadium - Level II	Ref. 25 pp. 30
616 South Dorrance St.	Residence (SO-31) [0 - 3"]	2.58	Benzo (a) anthracene - Level I	Ref. 22 pp. 98-100
			Benzo (b) fluoranthene-Level II	Ref. 22 pp. 98-100
			Benzo (a) pyrene - Level I	Ref. 22 pp. 98-100
			Ideno (1,2,3-cd) pyrene - Level I	Ref. 22 pp. 98-100
			Chrysene - Level II	Ref. 22 pp. 98-100
616 South Dorrance St.	Residence (SO-32) [3 - 6"]	2.58	Benzo (a) anthracene - Level I	Ref. 22 pp. 101-103
			Benzo (b) fluoranthene-Level II	Ref. 22 pp. 101-103
			Benzo (k) fluoranthene-Level II	Ref. 22 pp. 101-103
			Benzo (a) pyrene - Level I	Ref. 22 pp. 101-103
			Ideno (1,2,3-cd) pyrene - Level I	Ref. 22 pp. 101-103
			Chrysene - Level II	Ref. 22 pp. 101-103
1009 South Magnolia St.	Residence (SO-41)	2.58	Arsenic - Level I	Ref. 27 p. 29
			Lead - Level II	Ref. 27 p. 29

	[0 - 3"]			
1009 South Magnolia St.	Residence (SO-42) [3 - 6"]	2.58	Arsenic - Level I Chromium - Level II	Ref. 27 p. 30 Ref. 27 p. 30
520 South Magnolia St.	Residence (SO-45) [0 - 3"]	2.58	Arsenic - Level I	Ref. 27 p. 33
520 South Magnolia St.	Residence (SO-46) [3 - 6"]	2.58	Arsenic - Level I Chromium - Level II	Ref. 27 p. 34 Ref. 27 p. 34

Arsenic levels were widespread and exceeded health-based levels. Further investigation is needed to determine background levels of arsenic and potential sources.

7.3.2 Workers

There were workers observed on the railroad tracks adjacent to the site from the east. However, the exact number of workers nearby is unknown. There are no workers present on-site (Ref. 6, p. 51).

7.3.3 Resources

According to the HRS Rule, Section 5.1.3.4 and the HRS Guidance Manual, a resource use includes commercial agriculture, silviculture (forestry), commercial livestock production or grazing activities conducted within the boundary of an area of observed contamination (Ref. 1; Ref. 2, p. 373). Based on previous SSI site reconnaissance, there were no resource use areas identified within the boundary of an area of observed contamination for the soil exposure pathway (Ref. 6).

7.3.4 Terrestrial Sensitive Environments

Based on a file review and results of the previous SSI site reconnaissance, there were no terrestrial sensitive environments, as defined in Table 5.5 of the HRS Rule, Section 5.1.3.5, identified on or partially on an area of observed contamination for the soil exposure pathway (Ref. 1; Ref. 2, p. 375-381; Ref. 6, p. 59).

8.0 AIR MIGRATION PATHWAY AND TARGETS

The Air Migration Pathway was researched, but not evaluated since inclusion of this pathway would not significantly affect the site score.

REFERENCES

Reference Number	Description of the Reference
1.	U.S. Environmental Protection Agency, Federal Register - 40 CFR Part 300, *Hazard Ranking System; Final Rule*, Volume 55, No. 241, December 14, 1990.
2.	U.S. Environmental Protection Agency, *Hazard Ranking System Guidance Manual*, EPA 540-R-92-026, OSWER Directive 9345.1-07, November 1992. 431 pages plus appendices.
3.	U.S. Environmental Protection Agency, *Guidance for Performing Site Inspections Under CERCLA*, Office of Emergency and Remedial Response, Hazardous Site Evaluation Division, Publication 9345.1-05, September 1992. 125 pages.
4.	U.S. Environmental Protection Agency, *1996 Superfund Chemical Data Matrix (SCDM).* June 1996.
5.	Texas Water Development Board, Report 150 Groundwater Conditions in Anderson, Cherokee, Freestone, and Henderson Counties, Texas. August 1972. 193 pages.
6.	U. S. Environmental Protection Agency, Screening Site Inspection Field Log Book Notes and Site Photographs. May 19-22, 2003. 61 pages plus photographs.
7.	Texas Commission on Environmental Quality. Health and Safety Plan for Screening Site Inspection Field Work. Palestine Light, Heat and Power Company, TXD981912421. December 2003. 24 pages plus attachments.
8.	Texas Commission on Environmental Quality, *Quality Assurance Project Plan for Texas Natural Resource Conservation Commission Preliminary Assessment/Site Inspection Program (FY 2002 and 2003).* October 2002. 49 pages plus attachments.
9.	U.S. Environmental Protection Agency. Potential Hazardous Waste Site Identification and Preliminary Assessment, Palestine Light, Heat & Power Company, inspection conducted by Patricia Curl, Investigator, Contracts Remedial Activities Section, Texas Water Commission on March 26, 1987. 4 pages.
10.	Ecology and Environment, Inc. Memo to U.S. Environmental Protection Agency, Region 6 Superfund Section, Site Assessment Group, *Coal Gas Manufacturing Sites in Louisiana and Texas*, work performed under Contract DACA 56-01-D-2001, Task Order 2, WCN 01 for the USACE Tulsa District. Undated. 18 pages.

Reference Number	Description of the Reference
11.	Kramer, Jackson H., Chief, Contracts Remedial Activities Section, Hazardous and Solid Waste Division, Texas Water Commission. Interoffice Memorandum to District Managers, thru Carol Batterton, Director, Field Operations Division, Subj: Town Gas Project. August 15, 1989. 1 page plus Attachments.
12.	Texas Commission on Environmental Quality, Telephone Memo to File. Robert Reagins, Tyler-Region 5. April 2, 2003. 1 page.
13.	U. S. Environmental Protection Agency, *Expanded Site Inspection Work Plan for Palestine Light, Heat and Power Company Site*. EPA ID No. TXD981912421, Palestine, Anderson County, Texas. December 2003. 34 pages plus attachments.
14.	U. S. Geological Survey, Northwest Palestine and Southwest Palestine Quadrangle, Texas, 7.5 Minute Series, Topographic Map. Provisional Edition 1982. 2 pages.
15.	Texas Water Quality Inventory. Trinity River Above Lake Livingston, Segment: 0804, Trinity River Basin. 2002. 1 page.
16.	Scott, Dorinda, Information System Manager, Texas Parks and Wildlife Department. Annotated County Lists of Texas' Special Species, Anderson County. February 13, 2003. 2 pages.
17.	Texas Department of Water Resources, Climatic Atlas of Texas LP-192. December 1983. 151 pages.
18.	U. S. Department of the Interior, Fish and Wildlife Service. Northwest Palestine and Southwest Palestine, Texas Quadrangle, Taylor County, 7.5 Minute Series (Topographic). *National Wetlands Inventory Maps*. 1980. 2 pages.
19.	Federal Emergency Management Agency Federal Insurance Administration, Flood Insurance Rate Map - City of Palestine, Texas, Anderson County, Panel 10 of 10, February 18, 1981. 3 pages.
20.	U.S. Environmental Protection Agency, Region 6, Houston Branch, *Case Number 32489, Sample Designation Group F0S31, CLP Data Review and Organic Regional Data Assessment Package.* From: Marvelyn Humphrey, ESAT Regional PO, 6MD-H, To: B. Rhotenberry, 6SF-RA. February 18, 2004. 100 pages.

REFERENCES (continued)

Reference Number	Description of the Reference
21.	U.S. Environmental Protection Agency, Region 6, Houston Branch, *Case Number 32489, Sample Designation Group F0S53, CLP Data Review and Organic Regional Data Assessment Package.* From: Marvelyn Humphrey, ESAT Regional PO, 6MD-H, To: B. Rhotenberry, 6SF-RA. March 5, 2004. 17 pages.
22.	U.S. Environmental Protection Agency, Region 6, Houston Branch, *Case Number 32489, Sample Designation Group F0S55, CLP Data Review and Organic Regional Data Assessment Package.* From: Marvelyn Humphrey, ESAT Regional PO, 6MD-H, To: B. Rhotenberry, 6SF-RA. February 19, 2004. 103 pages.
23.	U.S. Environmental Protection Agency, Region 6, Houston Branch, *Case Number 32489, Sample Designation Group F0S68, CLP Data Review and Organic Regional Data Assessment Package.* From: Marvelyn Humphrey, ESAT Regional PO, 6MD-H, To: B. Rhotenberry, 6SF-RA. February 19, 2004. 105 pages.
24.	U.S. Environmental Protection Agency, Region 6, Houston Branch, *Case Number 32489, Sample Designation Group MF0S31, CLP Data Review and Inorganic Regional Data Assessment Package.* From: Marvelyn Humphrey, ESAT Regional PO, 6MD-H, To: B. Rhotenberry, 6SF-RA. February 18, 2004. 21 pages.
25.	U.S. Environmental Protection Agency, Region 6, Houston Branch, *Case Number 32489, Sample Designation Group MF0S37, CLP Data Review and Inorganic Regional Data Assessment Package.* From: Marvelyn Humphrey, ESAT Regional PO, 6MD-H, To: B. Rhotenberry, 6SF-RA. February 18, 2004. 42 pages.
26.	U.S. Environmental Protection Agency, Region 6, Houston Branch, *Case Number 32489, Sample Designation Group MF0S57, CLP Data Review and Inorganic Regional Data Assessment Package.* From: Marvelyn Humphrey, ESAT Regional PO, 6MD-H, To: B. Rhotenberry, 6SF-RA. February 18, 2004. 39 pages.
27.	U.S. Environmental Protection Agency, Region 6, Houston Branch, *Case Number 32489, Sample Designation Group MF0S75, CLP Data Review and Inorganic Regional Data Assessment Package.* From: Marvelyn Humphrey, ESAT Regional PO, 6MD-H, To: B. Rhotenberry, 6SF-RA. February 13, 2004. 36 pages.
28.	U. S. Environmental Protection Agency, Expanded Site Inspection Field Log Book Notes and Site Photographs. January, 2003. 47 pages plus photographs.
29.	U. S. Environmental Protection Agency, *Screening Site Inspection Report for Palestine Light, Heat and Power Company Site*. EPA ID No. TXD981912421, Palestine, Anderson County, Texas. November 2003. 41 pages plus attachments.

Reference 1
(Not Included)

Federal Register - 40 CFR
Part 300 Hazard Ranking System:
Final Rule

Reference 2
(Not Included)

Hazard Ranking System
Guidance Manual

Reference 3
(Not Included)

Guidance for Performing Site Inspections Under CERCLA

Reference 4
(Not Included)

Superfund Chemical Data Matrix (SCDM)

Reference 5
(Not Included)

Texas Water Development Board Report 150 Groundwater Conditions in Anderson, Cherokee, Freestone, and Henderson Counties, Texas

Reference 6
(Not Included)

Screening Site Inspection Field Log Book Notes and Site Photographs

Reference 7
(Not Included)

Health and Safety Plan for Screening Site Inspection Field Work
Palestine Light, Heat and Power Company Site
May 2003

Reference 8
(Not Included)

Texas Commission on Environmental Quality Quality Assurance Project Plan for Texas Commission on Environmental Quality Preliminary Assessment/Site Inspection Program (FY 2002 and 2003)

Reference 9
(Not Included)

Environmental Protection Agency Potential Hazardous Waste Site Identification and Preliminary Assessment
Palestine Light, Heat & Power Company

Reference 10

Ecology and Environment, Inc. Coal Gas Manufacturing Sites in Louisiana and Texas

Reference 11
(Not Included)

Interoffice Memorandum to District Managers
Texas Water Commission
Subj: Town Gas Project

Reference 12

Texas Commission on Environmental Quality, Telephone Memo to File Robert Reagins, Tyler-Region 5

Reference 13

Expanded Site Inspection Work Plan for Palestine Light, Heat and Power Company Site

Reference 14

U. S. Geological Survey
Palestine NW Quadrangle and SW Quadrangle
Topographic Maps

Reference 15

Texas Water Quality Inventory Trinity River Above Lake Livingston, Segment: 0804, Trinity River Basin

Reference 16

Texas Parks and Wildlife Department
Annotated County Lists of Texas' Special Species, Anderson County

Reference 17
(Not Included)

Texas Department of Water Resources
Climatic Atlas of Texas LP-192

Reference 18

Northwest Palestine and Southwest Palestine, Texas National Wetlands Inventory Maps

Reference 19

Flood Insurance Rate Map - City of Palestine, Texas, Anderson County, Panel 10 of 10

Reference 20

Case Number 32489, Sample Designation Group F0S31

CLP Data Review and Organic Regional Data Assessment Package

Reference 21

Case Number 32489, Sample Designation Group F0S53

CLP Data Review and Organic Regional Data Assessment Package

Reference 22

Case Number 32489, Sample Designation Group F0S55

CLP Data Review and Organic Regional Data Assessment Package

Reference 23

Case Number 32489, Sample Designation Group F0S68

CLP Data Review and Organic Regional Data Assessment Package

Reference 24

Case Number 32489, Sample Designation Group MF0S31

CLP Data Review and Inorganic Regional Data Assessment Package

Reference 25

Case Number 32489, Sample Designation Group MF0S37

CLP Data Review and Inorganic Regional Data Assessment Package

Reference 26

Case Number 32489, Sample Designation Group MF0S57

CLP Data Review and Inorganic Regional Data Assessment Package

Reference 27

Case Number 32489, Sample Designation Group MF0S75

CLP Data Review and Inorganic Regional Data Assessment Package

Reference 28

Expanded Site Inspection Field Log Book Notes and Site Photographs

Reference 29
(Not Including References)

Screening Site Inspection Report for Palestine Light, Heat and Power Company Site