



# Fort Worth Central City Preliminary Design

## **Hazardous, Toxic, Radioactive Waste (HTRW) Phase I Environmental Site Assessment (ESA)**

### Appendix D

January 2005

**DRAFT**

This document is released for the purpose of interim review under the authority of Donald R. Funderlic, Texas PE License 61169 on 05-January-2005. It is not to be used for construction, bidding, permitting or other purposes.

# Executive Summary

The Fort Worth Central City Project involves the construction of a bypass channel to reroute flood flows and the creation of a quiescent river segment adjacent to the downtown area. The bypass channel will be constructed through an existing industrial and commercial area that has a history of environmental issues. The proposed bypass channel is estimated to be approximately 8,400 feet long, approximately 300 feet wide between top of levees, and 25 to 30 feet below existing grade.

This Limited Phase I Environmental Site Assessment (ESA) was conducted to determine if widespread contamination will be encountered in the construction areas, identify potential Recognized Environmental Conditions (REC) on parcels that are within and immediately adjacent to the construction areas, and provide a framework for planning the next phase of the project. The Phase I activities were supplemented with a series of soil borings and monitoring well installations.

Soil and groundwater data collected to date from within and adjacent to the proposed bypass channel excavation area indicate minimal subsurface contamination. Therefore, widespread subsurface contamination exceeding applicable action levels is not likely to be encountered throughout the entire project area.

Historical records reviews indicate the majority of known major soil and groundwater contamination is located primarily in the North Main Street area, south of the proposed bypass channel. However, 79 parcels with at least one potential REC have been identified along the proposed channel bypass construction areas. Therefore, currently unknown soil and groundwater contamination may be encountered at various locations throughout the construction area, but is not expected to be widespread.

No RECs were identified on any of the Valley Storage Mitigation Sites. However, eight of the sites bordered properties with potential RECs. Only two of the eight sites with adjacent RECs have been retained for final consideration and no major concerns have been identified for these two sites.

It is recommended that additional assessment, including site inspections and interviews with site personnel, be conducted to determine the need for Phase II ESAs at the parcels with identified RECs.

# Contents

<b>Section 1</b>	<b>Introduction</b>	
1.1	Project Description .....	1-1
1.2	Project Objectives.....	1-2
1.3	Scope of Work .....	1-2
1.4	Report Contents .....	1-3
<b>Section 2</b>	<b>Environmental Site Assessment</b>	
2.1	Project Area Description.....	2-1
2.2	Environmental Records Review – Bypass Channel Area .....	2-1
2.2.1	CERCLIS-NFRAP Sites .....	2-1
2.2.2	RCRIS Sites .....	2-1
2.2.3	Leaking Underground Storage Tank Sites.....	2-2
2.2.4	Underground Storage Tank Sites .....	2-2
2.2.5	FINDS Sites.....	2-2
2.2.6	TRIS Sites .....	2-2
2.2.7	TSCA Sites .....	2-2
2.2.8	TX IHW Sites.....	2-3
2.2.9	AIRS Sites .....	2-3
2.2.10	SSTS Sites.....	2-3
2.3	City Directory Abstracts .....	2-3
2.3.1	Automobile/Vehicle Repair Facilities.....	2-3
2.3.2	Wrecker/Vehicle Recovery Facilities .....	2-4
2.3.3	Automobile Salvage Facilities.....	2-4
2.3.4	Machining Facilities .....	2-4
2.3.5	Printing Facilities.....	2-4
2.3.6	Metal Processing/Manufacturing Facilities .....	2-4
2.3.7	Service Stations and Oil/Petroleum Facilities.....	2-4
2.3.8	Paint Facilities .....	2-5
2.3.9	Miscellaneous Facilities .....	2-5
2.4	Asbestos and Lead-Based Paint.....	2-5
2.5	Environmental Records Review – Mitigation Areas .....	2-5
2.5.1	Valley Storage Site III.....	2-9
2.5.2	Valley Storage Site IV.....	2-9
2.5.3	Valley Storage Site VIII.....	2-9
2.5.4	Valley Storage Site IX.....	2-9
2.5.5	Valley Storage Site X.....	2-10
2.5.6	Valley Storage Site XV .....	2-10
2.5.7	Valley Storage Site XVIII .....	2-10
2.5.8	Valley Storage Site XX .....	2-10
2.6	Environmental Records Review – Sites Outside of Project Construction Areas but Adjacent to Interior Water Feature .....	2-11

2.6.1	TXU.....	2-11
2.6.2	Jay’s Salvage.....	2-13
2.6.3	Former Techni-Coat Property.....	2-13
<b>Section 3</b>	<b>Sampling and Analyses</b>	
3.1	Soil Sampling and Analyses.....	3-1
3.2	Groundwater Sampling and Analyses .....	3-2
3.2.1	Initial Groundwater Sampling Round .....	3-2
3.2.2	Second Groundwater Sampling Round .....	3-2
<b>Section 4</b>	<b>Groundwater Modeling</b>	
4.1	Preliminary Groundwater Modeling Conclusions .....	4-1
<b>Section 5</b>	<b>Conclusions &amp; Recommendations</b>	
5.1	Recognized Environmental Conditions .....	5-1
5.2	Recommendations .....	5-1
<b>Section 6</b>	<b>References.....</b>	<b>6-1</b>
<b>Attachments</b>		
	<i>Attachment A</i> EDR Report Executive Summary	
	<i>Attachment B</i> Directory Search Abstracts	
	<i>Attachment C</i> Review Comments	

# Figures

Figure 1-1: Project Overview .....	1-4
Figure 1-2: Hazardous, Toxic, Radioactive Waste Location Reference Map .....	1-5
Figure 2-1: Bypass Channel Parcels .....	2-15
Figure 2-2: Valley Storage Mitigation Sites .....	2-16
Figure 2-3: Interior Water Feature Parcels .....	2-17
Figure 2-4: Environmental Record Bypass Channel Parcels .....	2-18
Figure 2-5: Locations with Identified City Directory Changes .....	2-19
Figure 3-1: Bypass Channel Boring and Monitoring Well Locations .....	3-4
Figure 5-1: North Bypass Channel Area .....	5-2
Figure 5-2: North Central Bypass Channel Area .....	5-3
Figure 5-3: Central Bypass Channel Area .....	5-4
Figure 5-4: South Central Bypass Channel Area .....	5-5
Figure 5-5: South Bypass Channel Area .....	5-6

# Tables

Table 2-1: Summary of Project Parcels .....	2-20
Table 2-2: Summary of Environmental Record Data .....	2-26
Table 2-3: Directory Search Data .....	2-30
Table 3-1: Summary of Detected Compounds in Soil .....	3-5
Table 3-2: Summary of Compounds Detected During Initial Groundwater Sampling (June 2004) .....	3-6
Table 3-3: Summary of Compounds Detected During Second Groundwater Sampling Round (October 2004) .....	3-7
Table 5-1: REC Summary .....	5-7

# Section 1

## Introduction

### 1.1 Project Description

The Fort Worth Central City Project consists of a bypass channel, levee system and associated improvements to divert flood flows around a segment of the existing Trinity River adjacent to downtown Fort Worth. The proposed bypass channel is approximately 8,400 feet long and approximately 300 feet wide between the top of levees. The bypass channel will be approximately 30 feet below existing grade. Figure 1-1 shows the bypass channel and other significant project components.

Water levels in the bypass channel will be controlled by a dam with crest gates. The dam is proposed on the West Fork of the Trinity River just east of the Samuels Avenue bridge and will be designed to maintain normal water level of approximately 525 feet above sea level in the bypass channel and interior area. Flood isolation gates will be incorporated into the levee system to protect the interior area, otherwise known as Trinity Uptown. The gates are located upstream at the confluence of the bypass channel and the Clear Fork (Clear Fork Gate), at the midpoint of the bypass channel and the West Fork confluence (Trinity Point Gate), and downstream at the confluence of the bypass channel and the West Fork (TRWD Gate).

Construction of the bypass channel, dam and isolation gates will create an approximately two-mile segment of the existing West Fork Trinity River as a controlled, quiescent watercourse. A water feature or urban lake, approximately 900 feet long, is proposed for the interior area (Trinity Uptown). The water feature will extend from the bypass channel southeast to the existing West Fork and Clear Fork confluence of the Trinity River.

Six bridges are proposed for the project, including four vehicular bridges and two pedestrian bridges. Vehicular bridges are proposed over the bypass channel at North Main Street, over the bypass channel and Fort Worth and Western Railroad (FW&W Railroad) at Henderson Street and White Settlement Road, and on the White Settlement Road extension over the urban lake. Two pedestrian bridges are also proposed, across the bypass channel downstream of Henderson Street, and across the West Fork, approximately 500 feet upstream of the existing FW&W Railroad Bridge.

The project also includes proposed modifications to University Drive, which will effectively raise the roadway approximately 10 feet from existing grade and out of the 100 year floodplain. The proposed modifications begin north of the existing bridge over the West Fork extending to Jacksboro Highway (State Highway 199).

The project could result in a loss of floodplain or valley storage due to the diversion of flood flows through the bypass channel as the bypass channel is shorter than the existing river channel. To prevent this potential loss of floodwater retention, valley storage mitigation sites are included in the preliminary design. Valley storage mitigation sites will be provided in three areas, along the West Fork of the Trinity

River upstream of the project area, in the vicinity of the Samuels Avenue Dam, and slightly downstream of the dam in proximity to Riverside Park. Construction of the bypass channel and associated valley storage sites will not increase downstream water surface elevations or downstream flows.

## 1.2 Study Objectives

The objective of this study was to conduct a Limited Phase I Environmental Site Assessment (ESA) for the properties potentially involved with the Central City Project. This report provides the preliminary identification of parcels that are within and immediately adjacent to the construction zone for the project for environmental site assessment purposes. The purpose of the ESA is to: 1) Determine if widespread contamination will be encountered in the project construction areas, 2) Identify potential RECs that may be associated with the project-related parcels or adjacent properties and assess how the RECs may impact the construction project, and 3) Provide a framework for planning the next phase of the project.

## 1.3 Scope of Work

The bypass channel will be constructed through an existing industrial and commercial area that has a history of environmental issues. The bypass channel and affected roadways, the parcels of land proposed for valley storage mitigation, and properties with known contamination that are not within the construction area but are adjacent to or near the interior water feature are highlighted in Figure 1-2. Details for the bypass channel area, the mitigation areas, and the interior water feature area are presented in Figures 2-1, 2-2, and 2-3, respectively.

Due to the size, complexity, and currently limited access of the Central City Project, only some components of the American Society for Testing and Materials (ASTM) Standard for Phase I ESAs (ASTM Standard E 1527-00) were applied for this Limited ESA. A records review was conducted for the properties located in the channel bypass/roadway construction area. Limited records and previous summaries were reviewed for the properties adjacent to the interior water feature and some of the mitigation areas. Site inspections were not conducted for this ESA.

An environmental database search for the project area was reported during June 2000 that included the US Environmental Protection Agency (EPA) database, the Texas Natural Resource Conservation Commission (TNRCC) database, and additional municipal information sources (City of Fort Worth, 2000). In 2003, the United States Army Corp of Engineers (USACE) reported an environmental records review to delineate probable hazardous, toxic, and radioactive waste (HTRW) sites within the project boundary (USACE 2003a). CDM has updated the HTRW environmental database search through ongoing research of Texas Commission on Environmental Quality (TCEQ), formerly TNRCC, regulatory files and a new environmental database review by Environmental Data Resources, Inc. (EDR).



Due to the potential for previous releases in the project area and contamination along the proposed bypass channel route, an initial screening and investigation of soil and groundwater samples was initiated. Eight monitoring wells were installed along the proposed route. Soil and groundwater samples were collected and analyzed for priority and suspected pollutants during and after installation of the monitoring wells in June 2004. Data from this initial sampling round were reported by CDM (CDM 2004a) and are summarized in this ESA for convenience with the results of a second round of groundwater sampling conducted in October 2004.

The scope of work for conducting the ESA includes the following work elements:

- Identify project-related parcels;
- Describe the project area environmental conditions as determined from the available data;
- Identify potential RECs for project-related parcels based on available data;
- Collect soil and groundwater data from within and adjacent to the proposed bypass channel construction area; and
- Develop a conceptual plan for subsequent environmental assessment activities.

## **1.4 Report Contents**

Section 2 of this report provides a description of the project area and the results of the environmental records review. Section 3 summarizes the laboratory data previously submitted for the initial groundwater sampling round and the results of the recently completed second round of groundwater sampling. Section 4 provides a brief summary of preliminary groundwater modeling and Section 5 presents a list of the potential RECs and CDM's conclusions.

# **Section 2**

## **Environmental Site Assessment**

### **2.1 Project Area Description**

The project area consists of parcels that must be acquired for construction purposes and mitigation purposes and adjacent non-project parcels that may have an impact on the interior water feature. These parcels are shown on Figures 2-1, 2-2, and 2-3, respectively. Table 2-1 includes a summary of the identified parcels in the proposed bypass channel area. The project area generally consists of mixed commercial and light industrial land use.

### **2.2 Environmental Records Review – Bypass Channel Area**

An environmental records review was previously conducted by the USACE that includes the project area and all parcels identified for the project (USACE 2003a). Environmental Data Resources, Inc. (EDR) was recently contracted to conduct an electronic database search and report for the bypass channel properties. This report (EDR – Area/Corridor Study, Central City, Tarrant, TX, May 2, 2003) lists properties in the project area having environmental data under several environmental categories. Only the environmental categories that have a property on file in the project area are discussed in this report. A facility may appear on more than one database and inclusion on any of these database lists does not automatically indicate an environmental problem; only the potential for an environmental issue, depending on the facility. This records review should be combined with site inspections to ultimately determine the potential for environmental problems at each facility. The Executive Summary from the EDR report is included as Attachment A. The records review results for the bypass channel parcels are summarized in Table 2-2. The bypass channel parcels that have environmental records reported are shown on Figure 2-4.

#### **2.2.1 CERCLIS-NFRAP Sites**

As of February 1995, Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) sites designated "No Further Remedial Action Planned" (NFRAP) have been removed from CERCLIS. NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly without the need for the site to be placed on the NPL, or the contamination was not serious enough to require Federal Superfund Action or NPL consideration. Although a site may have been removed for the CERCLIS, contamination may exist that may require special handling during construction. A review of the CERCLIS-NFRAP list, as provided by EDR, and dated 03/19/2003 has revealed that there is one CERCLIS-NFRAP site within the searched area: the former Texas Bitulithic property at 505 NW 5<sup>th</sup> Street.

#### **2.2.2 RCRIS Sites**

The Resource Conservation and Recovery Information System (RCRIS) includes selected information on sites that generate, store, treat, or dispose of hazardous waste

as defined by the Resource Conservation and Recovery Act (RCRA). The source of this database is the U.S. EPA. A review of the RCRIS list, as provided by EDR, and dated 09/09/2002 has revealed that there are 14 RCRIS Small Quantity Generator (SQG) sites within the project area.

### **2.2.3 Leaking Underground Storage Tank Sites**

The Leaking Underground Storage Tank (LUST) Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the TCEQ's Leaking Petroleum Storage Tank Database. A review of the LUST list, as provided by EDR, and dated 01/22/2003 has revealed that there are four LUST sites within the project area.

### **2.2.4 Underground Storage Tank Sites**

The UST database contains registered USTs. USTs are regulated under Subtitle I of RCRA. The data come from the TCEQ's Petroleum Storage Tank Database. A review of the UST list, as provided by EDR, and dated 02/07/2003 has revealed that there are 20 UST sites within the project area.

### **2.2.5 FINDS Sites**

The Facility Index System (FINDS) contains both facility information and "pointers" to other sources of information that contain more detail. These include: RCRIS; Permit Compliance System (PCS); Aerometric Information Retrieval System (AIRS); FATES (FIFRA [Federal Insecticide Fungicide Rodenticide Act] and TSCA Enforcement System, FTTS [FIFRA/TSCA Tracking System]; CERCLIS; DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes); Federal Underground Injection Control (FURS); Federal Reporting Data System (FRDS); Surface Impoundments (SIA); TSCA Chemicals in Commerce Information System (CICS); PADS; RCRA-J (medical waste transporters/disposers); TRIS; and TSCA. The source of this database is the U.S. EPA/NTIS. A review of the FINDS list, as provided by EDR, and dated 01/14/2003 has revealed that there are 14 FINDS sites within the project area.

### **2.2.6 TRIS Sites**

The Toxic Chemical Release Inventory System (TRIS) identifies facilities that release toxic chemicals to the air, water, and land in reportable quantities under SARA Title III, Section 313. The source of this database is the U.S. EPA. A review of the TRIS list, as provided by EDR, and dated 12/31/2000 has revealed that there is one TRIS site within the project area: the Texas Refinery Corporation at 840 North Main Street.

### **2.2.7 TSCA Sites**

The Toxic Substances Control Act (TSCA) identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site. The United States Environmental Protection Agency has no current plan to update and/or re-issue this database. A review of the TSCA list, as provided by EDR, and dated

12/31/1998 has revealed that there is one TSCA site within the project area: the Texas Refinery Corporation at 840 North Main Street.

### **2.2.8 TX IHW Sites**

The Texas Industrial and Hazardous Waste Database (TX IHW) contains summary reports by waste handlers, generators and shippers in Texas. A review of the TX IHW list, as provided by EDR, has revealed that there are 18 TX IHW sites within the project area.

### **2.2.9 AIRS Sites**

The database lists by company, along with their actual emissions, the Texas Commission on Environmental Quality's air accounts that emit EPA criteria pollutants. A review of the AIRS list, as provided by EDR, and dated 01/13/2003 has revealed that there are two AIRS sites within the searched area. These sites include McKinley Iron Works at 901 N. Throckmorton Street and Texas Refinery Corporation.

### **2.2.10 SSTS Sites**

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year. A review of the Section & Tracking System (SSTS) list, as provided by EDR, and dated 12/31/2000 has revealed that there is one SSTS site within the searched area: the Texas Refinery Corporation at 840 North Main Street.

## **2.3 City Directory Abstracts**

A City Directory Abstract was prepared for CDM by EDR for most bypass channel parcels identified for the project area. The abstracts are derived from historical telephone directories based on a targeted street address. The abstract is prepared for the target address and for three to four adjacent addresses. The EDR abstracts are included as Attachment B. The abstract results that are potentially indicative of business types that may be associated with environmental issues are summarized in Table 2-3 and the locations are shown on Figure 2-5. Criteria for associating business types with historical and/or ongoing environmental issues are described below.

### **2.3.1 Automobile/Vehicle Repair Facilities**

Thirteen parcels are potentially linked to some form of automobile/vehicle repair and servicing based on the business names identified by the abstract. Automobile repair can include the handling and storage of petroleum products, oils/lubricants, lead acid batteries, and parts cleaning solvents. Body work and/or fiberglass work usually requires resins that contain volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and potentially metals. Automobile painting can generate wastes containing SVOCs, VOCs and metals. Environmental issues can arise at these

facilities if the chemical products or waste from the product use are incidentally spilled or released.

### **2.3.2 Wrecker/Vehicle Recovery Facilities**

Three parcels are potentially linked to wrecker and vehicle recovery services based on the business names identified in the abstract. Damaged vehicles brought onto the wrecker lot may leak fluids from the vehicles onto the ground. These fluids include fuel and oils. As a result, VOC, total petroleum hydrocarbons (TPH), SVOCs and metals contamination may result at wrecker/vehicle recovery facilities.

### **2.3.3 Automobile Salvage Facilities**

Sixteen parcels are potentially linked to automobile salvage services based on the business names identified in the abstract. The salvage vehicles brought onto the lot may leak fluids from the vehicles onto the ground. These fluids include fuel and oils. Parts cleaning using solvents may have also been performed at these facilities. As a result VOC, TPH, SVOC and metals contamination may result at automobile salvage facilities.

### **2.3.4 Machining Facilities**

Four parcels are potentially linked to machining services based on the business names identified in the abstract. Products used for machining may include lubricating oils and/or solvents used for cleaning machined items. Metal waste from machined items could also be an issue. The potential may exist for contamination by metals, VOCs, TPH, and SVOCs at machining facilities.

### **2.3.5 Printing Facilities**

Six parcels are potentially linked to printing services based on the business names identified in the abstract. Printing ink may contain VOCs, SVOCs and metals. Printing equipment may be cleaned using solvents. The potential may exist for contamination by metals, VOCs, and SVOCs at printing facilities.

### **2.3.6 Metal Processing/Manufacturing Facilities**

Eleven parcels are potentially linked to metal processing/manufacturing services based on the business names identified in the abstract. Waste metal may be produced at these facilities. Facility operations typically require hydraulic machinery and spills of hydraulic fluid can occur. The operation may also require the use of solvents for cleaning. The potential may exist for contamination by metals, VOCs, TPH, and SVOCs at metal processing/manufacturing facilities.

### **2.3.7 Service Stations & Oil/Petroleum Facilities**

Seven parcels are potentially linked to fuel storage, distribution, sales, and vehicle repair/maintenance based on the business names identified by the abstract. These facilities may share the environmental issues of the automobile/vehicle repair and servicing facilities. In addition, releases can occur from UST systems. The potential may exist for contamination by metals, VOCs, TPH, and SVOCs at these facilities.

### **2.3.8 Paint Facilities**

Five parcels are potentially linked to paint-related services based on the business names identified by the abstract. These facilities may have been used to prepare and/or mix paint. Paint handling can generate wastes containing SVOCs, VOCs and metals. The potential may exist for contamination by metals, VOCs, and SVOCs at paint facilities.

### **2.3.9 Miscellaneous Facilities**

Seven parcels identified by the abstract have business names that could imply other environmental issues. Three of these facilities could have been asphalt plants. Hydrocarbons from asphalt could have been released. Asphalt plants were also sometimes required to perform quality assurance measurements of the asphalt product and the equipment used for these measurements may have been cleaned with solvent. As a result, environmental contamination from asphalt facilities by VOCs, TPH, and SVOCs could occur.

It is possible that fiberglass work was conducted at a historical fishing rod manufacturing facility. Fiberglass working can result in wastes containing SVOCs and VOCs. A chemical company and a testing laboratory are also identified in the abstract. The exact nature and consequential environmental implications of the business conducted at these facilities is not indicated by the business names, but chemical storage and handling is expected and may constitute a potential REC.

## **2.4 Asbestos and Lead-Based Paint**

Due to the age of many of the buildings located within the project area boundaries, the presence of both asbestos and lead-based paint (LBP) is expected. Asbestos is a component of commonly used pipe wrap insulation and floor/ceiling tiles used earlier in the century, as was lead in interior wall paints. The potential presence of both materials should be assessed during site visits and interviews as part of the next phase of environmental assessment. The presence of suspect asbestos containing materials (ACM) and LBP should be verified prior to demolition of any building expected to contain such materials to ensure abatement and monitoring prior to and during demolition.

In addition to existing LBP inside buildings, flaking of exterior LBP may have resulted in lead contamination in soil outside of buildings. Buildings with identified LBP on exterior walls may require soil sampling to determine if lead contamination has resulted from weathering of the exterior paint.

## **2.5 Environmental Records Review – Mitigation Areas**

Forty sites were initially considered along the floodplain fringe areas of the West Fork of the Trinity River and along the main stem of the Trinity River (downstream of its confluence with the Clear Fork of the Trinity River) to mitigate valley storage loss resulting from the construction of the bypass channel. The 40 parcels (Sites I through XL) considered as valley storage site alternatives are shown in Figures 1-2 and 2-2.

Thirty-nine of the 40 sites have been evaluated for the presence of potential RECs as determined from an Environmental Data Resources (EDR) regulatory database search of Texas Commission on Environmental Quality (TCEQ), U.S. Environmental Protection Agency (EPA), and other applicable agency records. The 40<sup>th</sup> site, site XL, is primarily composed of a golf course and was not given a high priority as a mitigation area; therefore, the site was not evaluated for potential RECs. One additional site, XLI, has since been added only as a fill site. A records review will be conducted for this parcel if purchase of the property is required (vs. leasing). Of the 39 sites studied (Sites I through Site XXXIX), all sites are considered “clean” without any known RECs attributed directly to each excavation parcel, with the qualifications outlined below.

The clean sites without qualification are listed first with the result of the screening for use as a valley storage mitigation site followed by eight sites that are considered clean, but with qualifications due to adjacent properties.

- Valley Storage Site I – No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site II - No RECs identified. After preliminary evaluation, this parcel has been retained for final consideration as a valley storage mitigation site.
- Valley Storage Site V - No RECs identified. After preliminary evaluation, this parcel has been retained for final consideration as a valley storage mitigation site.
- Valley Storage Site VI - No RECs identified. After preliminary evaluation, this parcel has been retained for final consideration as a valley storage mitigation site.
- Valley Storage Site VII - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XI - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XII - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XIII - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XIV - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.

- Valley Storage Site XVI - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XVII - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XIX - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXI - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXII - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXIII - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXIV - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXV - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXVI - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXVII - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXVIII - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXIX - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.



- Valley Storage Site XXX - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXXI - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXXII - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXXIII - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXXIV - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXXV - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXXVI - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXXVII - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.
- Valley Storage Site XXXVIII - No RECs identified. After preliminary evaluation, this parcel has been retained for final consideration as a valley storage mitigation site.
- Valley Storage Site XXXIX - No RECs identified. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.

The following valley storage sites are considered clean, based on the available data reviewed for this ESA. However, potential RECs were identified on adjacent property.

### **2.5.1 Valley Storage Site III**

This site is located directly southwest of the former City of Fort Worth North Central Landfill site that lies between the City's Brennan Service Center and the Trinity River. Leachate transport from the former landfill onto Site III is an indirect source of potential RECs. However, it is unlikely that pollutant transport would have migrated towards the southwest and upgradient onto Site III. Sites III and IV are also separated by a drainage ditch that should also preclude pollutant transport to the west. The City of Fort Worth has conducted groundwater monitoring near the former landfill and to date, this parcel has not been impacted from migrating pollutants. After preliminary evaluation, this parcel has been retained for final consideration as a valley storage mitigation site.

### **2.5.2 Valley Storage Site IV**

This site lies directly south of the former City of Fort Worth North Central Landfill site and lies east of and adjacent to Site III (described above). This site lies south of the City's Brennan Service Center and the Trinity River. Leachate transport from the former landfill onto Site IV may be an indirect source of potential RECs. The City of Fort Worth has conducted groundwater monitoring near the former landfill and to date, this parcel has not been impacted from migrating pollutants. After preliminary evaluation, this parcel has been retained for final consideration as a valley storage mitigation site.

### **2.5.3 Valley Storage Site VIII**

This site is located on the west bank of the Trinity River and lies on the southwest corner of the Texas State Highway 121 at Interstate 35 interchange just north of East 4th Street. This site does not have any known RECs; however, two businesses that are located on 4th Street are listed with TCEQ as having UST systems. The two listings are for Loomis Armored Inc. located at 2109 E. 4th Street and Eli Witt Co. located at 2020 E. 4th Street along the southern boundary of Site VIII. Neither of these UST systems is in the TCEQ LUST program. However, UST sites provide an indirect source for potential contaminants on Site VIII. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.

### **2.5.4 Valley Storage Site IX**

This site lies on the north bank of the West Fork of the Trinity River and is located northwest of Henderson Street and south of the Oakwood Cemetery. This site does not have any known RECs. The Gifford Hill & Co. Plant #41 (801 N. Houston Street) concrete plant is located northeast of Site IX and beyond it is part of the Texas Refinery Corporation site at 901 N. Houston Street. These facilities have slight potential to have caused indirect groundwater pollution on Site IX, but because of their distance and the hydraulic gradients involved, the risk to Site IX is considered minimal. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.

### **2.5.5 Valley Storage Site X**

This site is located directly south of Texas State Highway 121 along the east bank of the Trinity River (just east of Site XX) and is partially bounded by Sylvania Avenue (east) and a railway (south). This site does not have any known RECs; however, two adjacent businesses that are located on Sylvania Avenue are listed with TCEQ. One listing is for 18 Hour Food Mart located at 301 S. Sylvania Avenue as having an UST system. The other site is for Southwest Drive Axle Inc. located at 2202 S. Sylvania and is listed as a RCRA Small Quantity Generator (SQG). The UST system is not in the LUST program, while the SQG has had three minor administrative violations that have all been corrected with TCEQ concurrence. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.

### **2.5.6 Valley Storage Site XV**

This site lies along the south bank of the Trinity River between railroad tracks (near Cold Springs Road / Northside Drive, to the west) and IH-35 (to the east). This site's area of excavation is clear of any known RECs; however, within the proposed fill area, to the south and west, lies a City of Fort Worth Heliport facility that has an UST system. The UST is not in the LUST program. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.

### **2.5.7 Valley Storage Site XVIII**

This site is located on the west bank of the Trinity River and lies just to the east of Interstate 35. This site does not have any known RECs; however, the Southwest International Trucks facility lies across IH-35 and is located at 617 North Freeway. The UST system listed there is not in the LUST program. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.

### **2.5.8 Valley Storage Site XX**

This site is located directly south of Texas State Highway 121 along the east bank of the Trinity River (adjacent and just west of Site X). This site does not have any known RECs. A listing for Freeman Hyundai (1803 Airport Freeway, Irving, Texas) is indicated as having an UST system at a location plotted on the southeast corner of the Highway 121 Bridge at the Trinity River. This site location seems suspect and aerial photographic imagery does not display evidence of an auto dealership at this location. This UST system is not in the LUST program. After preliminary evaluation, this parcel has been eliminated from final consideration as a valley storage mitigation site.

After evaluating the potential mitigation areas, the parcels selected for final consideration are: II, III, IV, V, VI, XXXVIII, and XLI.

## 2.6 Environmental Records Review – Sites Outside of Project Construction Areas but Adjacent to Interior Water Feature

A review of available reports was conducted to provide a summary of known environmental contamination at sites outside of the project construction areas but adjacent to or near the planned interior water feature. Four known areas of concerns have been previously identified: Texas Utilities Electric (TXU), Jay's Salvage, Techni-Coat, and American Cyanamid, located south of 9<sup>th</sup> Street at the North Main Street intersection (Figure 2-3). The preliminary design of the interior water feature has taken these sites into consideration and has been configured to exclude these sites from the project.

Data from available reports on these areas of concerns were reviewed and are summarized below.

### 2.6.1 TXU

The western portion of the TXU property (Figure 2-3) was leased to National Metal and Smelting Company (NMS) from 1950 to 1988. Soil and groundwater contamination has been identified in this area and has been under an Agreed Order between TXU and the TCEQ since 1993 to address the contamination.

The primary contamination at the site is the chlorinated solvent contamination in groundwater. Compounds detected in site groundwater include trichloroethene (TCE), *cis*-1,2-dichloroethene (*cis*-DCE), *trans*-1,2-dichloroethene (*trans*-DCE), and vinyl chloride. Other groundwater contamination includes antimony, arsenic, chromium, and lead. Soil contamination at the site consists primarily of the same metals and TPH.

Remedial activities at the site include removal of three former solvent waste disposal pits, the installation of a low permeability cap over lead-contaminated soils, and installation of a groundwater extraction and treatment system. In correspondence from TCEQ (formerly Texas Natural Resources Conservation Commission, TNRCC) to TXU in 2000, TNRCC indicated that the groundwater contamination was migrating beyond the approved groundwater extraction systems design and influence. TNRCC requested additional monitoring wells (ThermoRetec, 2000)

Data from the Post-Closure Groundwater Monitoring Report for the second quarter of 2004 (Pastor, Behling & Wheeler 2004a) indicates the following:

- Arsenic continues to be observed in monitoring wells MRS-14R, MRS-16, and MRS-17 at concentrations exceeding the maximum contaminant level (MCL) for arsenic in groundwater (0.01 mg/L). Each of these wells are downgradient from the groundwater extraction system and are adjacent to the West Fork of the Trinity

River, indicating arsenic contamination continues to migrate offsite towards the river. The highest concentration of arsenic in these wells during the second quarter of 2004 was 0.068 mg/L (MRS-17).

- Vinyl chloride and *cis*-DCE, anaerobic biodegradation products of TCE, continue to be observed in monitoring wells MRS-13 and MRS-14R at concentrations exceeding MCLs. These wells are downgradient from the groundwater extraction system indicating continued migration of the chlorinated solvent groundwater plume towards the river. The highest concentrations of *cis*-DCE and vinyl chloride in these wells during the second quarter of 2004 were 1,600 µg/L and 100 µg/L, respectively. Their respective MCLs are 70 µg/L and 2 µg/L.
- The highest *cis*-DCE and vinyl chloride concentrations detected in the second quarter of 2004 were 99,000 µg/L and 2,000 µg/L in MRS-11. This *cis*-DCE concentration is greater than 1% of the solubility limit for both TCE (potentially the parent product, 11,000 µg/L) and DCE (63,000 µg/L for *trans*-DCE). Chlorinated solvent concentrations in groundwater that are greater than 1% of the solubility limit is often indicative of the presence of free-phase product or dense non-aqueous phase liquid (DNAPL). These concentrations are the highest that have ever been detected at the site since 1994.

Sediment sampling in the West Fork of the Trinity River was conducted on January 22, 2002 adjacent to the metals recycling site. Sediments were analyzed for *cis*-DCE, and vinyl chloride, as well as physical properties. Results from the sediment sampling indicated that neither *cis*-DCE nor vinyl chloride was detected in any of the four sediment samples collected (MFG, 2002).

TXU and TCEQ are currently involved in discussions over the potential discharge of contaminated groundwater from the metals recycling site to the river. Future discussions will likely take place with the altering of the hydrogeologic conditions due to the proposed interior water feature.

In addition to the former metals recycling site, the west tract of the TXU property also contains soil and groundwater contamination. An Affected Property Assessment Report was submitted to TCEQ on July 15, 2004 for the TXU North Main West Tract (Pastor, Behling & Wheeler 2004b). The west tract of the TXU property has housed the electric power generation plant since 1912 and potential environmental release areas include: a former fuel oil pipeline, metals in shallow soils associated with metals recycling, unidentified chlorinated solvent spills, and a former underground fuel oil storage tank.

Results from the soil assessment indicate that only lead in surface soils (1,100 mg/kg) exceeded the assessment level. Results from the groundwater assessment indicate that TCE, *cis*-DCE, and vinyl chloride exceeded assessment levels at concentrations of 101 µg/L, 603 µg/L, and 7.9 µg/L, respectively.

## 2.6.2 Jay's Salvage

Jay's Salvage operates on approximately 3.7 acres of the 20-acre tract leased to NMS by the owner of the property, Union Pacific Railroad Company (UPRR) (Figure 2-3). Jay's salvage is currently an active metals salvage operation.

The primary contaminants at the site are TPH, metals and chlorinated solvents. According to the USACE HTRW Records Review, Volume 2 (USACE 2003b), the subsurface and surface TPH concentrations reported in the 2002 Affected Property Assessment Report were as high as 5,750 mg/kg and 874 mg/kg, respectively. Lead was present in the subsurface and surface at a concentration of 2,950 mg/kg and exceeding 10,000 mg/kg, respectively. Chromium was also reported at 1,500 mg/kg in surface soil.

Data from the July 2001 Groundwater Monitoring Report for Jay's Salvage Lease Property (ThermoRetec, 2001) indicates the following:

- Concentrations of 1,1-dichloroethene, *cis*-DCE, TCE, and vinyl chloride were all detected above applicable groundwater standards. During the reporting period, TCE was detected as high as 789 µg/L.
- The semi-volatile organic compound (SVOC), bis (2-ethylhexyl) phthalate was detected as high as 101 µg/L during the reporting period exceeding the groundwater industrial standard of 6 µg/L.
- Lead was present as high as 0.1785 mg/L (MCL is 0.01 mg/L) during the reporting period.
- Light non-aqueous phase liquid (LNAPL), as thick as 1.21 feet, is present in monitoring well MW99-3.
- Historical concentrations of site contaminants in groundwater have been as high as 5,900 µg/L for *cis*-DCE and 49.7 µg/L for vinyl chloride.

## 2.6.3 Former Techni-Coat / Former American Cyanamid

The former Techni-Coat property, located at 301 N.E. 6<sup>th</sup> Street, and the former American Cyanamid property, located at 500 N. Commerce Street, (Figure 2-3) are both currently owned by the City of Fort Worth. The properties are adjacent to one another, and have been paved over to provide parking for the nearby minor league baseball park as well as for remote parking for Tarrant County jurors. Both properties are enrolled in the Texas Voluntary Cleanup Program (TCEQ VCP#1359).

Techni-Coat conducted coating operations on air-conditioning and heating coils as well as sulfuric acid anodizing operations. The southern portion of the property on which Techni-Coat operated was owned by American Cyanamid. Techni-Coat ceased operations at this location on April 30, 1990. The City acquired title to the property in November 2001.

The American Cyanamid plant was built in the 1940s by Defense Plant Corporation at the request of the United States government to manufacture cracking catalyst. This was a strategic material used in the production of petroleum products for the war effort. American Cyanamid purchased the plant in 1946 and continued to operate it as a petroleum refinery catalyst plant. The plant ceased operations in 1983. It remained idle until 1990 when Cyanamid dismantled the equipment and demolished the buildings. Ownership of the plant was transferred to Cytec Industries, Inc., on December 17, 1993. Cytec is a corporation that spun off from Cyanamid that same year. The City acquired title to the property in November 2001.

The City began environmental investigation of these two sites in 2000. A Phase I environmental site assessment was completed in September 2001. A brief summary of additional investigational activities conducted on behalf of the City at the two properties includes:

- May/June 2000 - Installed additional groundwater monitoring wells CFW-1 through CFW-10.
- August 2000 - Performed Limited Subsurface Investigation
- March 2001 Final Groundwater Sampling Report
- August 2001 - Site Investigation Report for Soils & Passive Soil Gas Survey
- October 2001 - Site Investigation of groundwater under agreed order
- February 2002 – Completion of Phase II Soil Investigation Report
- June 2002 – Installation of groundwater monitoring wells CFW-11 & CFW-12. Initiation of quarterly groundwater monitoring
- August 2002 – Removal of contaminated soil and remains of closed in-ground tank (concrete slab)
- February 2003 – Performance of Potassium Permanganate Pilot Test
  - (2/18/03) Groundwater sampled for pre-injection baseline
  - (2/19/03) Injected solution at approximately 4 gpm totaling 2,020 gallons at 24 feet
  - (2/20/03) Injected solution at approximately 4 gpm totaling 2,020 gallons at 23 feet
  - (2/19/03) Injected solution at approximately 4 gpm totaling 900 gallons at 19 feet

Results indicated a decrease in TCE and cis-1,2-DCE, mass of KMNO<sub>4</sub> injected was 825 lbs., March 2003 sampling showed a rebound indicating a potential source of chlorinated ethenes other than in dissolved groundwater.

- 4<sup>th</sup> Quarter 2003 - Joint venture between the County & City involved the paving of the southern portion of the American Cyanamid property providing an impervious cover to subsurface.
- 1<sup>st</sup> Quarter 2004 - Joint venture between the County & City involved the paving of the Former Techni-Coat property providing an impervious cover to the subsurface.
- On Going - Quarterly Groundwater Monitoring & Natural Attenuation
  - The most recent sampling event occurred December 9, 2004, with depth to groundwater ranging from approximately 7 feet below ground surface to 23 feet below ground surface. Dissolved chlorinated solvents identified in the groundwater consist of PCE, TCE, cis-1,2-DCE, Vinyl Chloride and lesser amounts of Trans 1,2-DCE and 1,1 DCE. The concentrations of chlorinated solvents in most wells show a general decrease.
  - Analysis of metals in the groundwater recently conducted indicated that all metal analyzed were below the Industrial Groundwater Media Specific Concentrations.
  - The accumulation of daughter products consisting of cis-1,2-DCE, vinyl chloride, and chloride in the groundwater monitoring wells indicate reductive dechlorination is occurring at the site.
  - The presence of measurable nitrite at the site also indicates nitrate reduction may be occurring at the site.



## Section 3

# Sampling and Analyses

Groundwater and soil sampling and analyses have been performed at select locations within the project area. The sample collection locations are shown on Figure 3-1. The soil and the initial round of groundwater sample data were previously reported by CDM (CDM 2004a). A second round of groundwater samples has been recently collected (October 2004) and these results are reported herein as well as the results from the first round of groundwater sampling

### 3.1 Soil Sampling and Analyses

Eight soil borings were installed at the locations shown on Figure 3-1. All drilling was conducted by the USACE and sample handling/preparation was performed by CDM. The analyses for soil included VOCs (8260B), TPH (TX-1005), pesticides/PCBs (8081A/8082), RCRA metals (6020/7471A), molybdenum (6010B), and cobalt (6020).

A summary of the detected compounds in soil is presented in Table 3-1. The constituents detected in soil include TPH, metals, VOCs, and one pesticide. Many of the detected compounds are qualified by the lab as estimated concentrations (J qualifier) due to detections above the method detection limit but below the reporting limit. Also included on Table 3-1 are select concentration-based standards for comparison purposes. None of the detected metals exceed the Texas-Specific Background concentrations. None of the TPH, VOCs, or pesticides detected exceed TCEQ Tier 1 residential land use standards.

The Texas Risk Reduction Program (TRRP) standards listed in Table 3-1 include the (30 TAC §350.51 (m) Texas-Specific Background median concentrations for metals (<http://www.tnrcc.state.tx.us/oprd/rules/pdfflib/350c.pdf>). The table also includes the Tier 1 Protective Concentration Levels (PCLs) for the detected constituents. The Tier 1 PCLs have evolved from the TRPP rule and provides a three-tiered process for establishing human health PCLs. Application of PCLs to remediation sites is intended for use after a chemical of concern release has been reported to the TCEQ program area and the program area has determined the need for action under the TRRP. The last standard included in the table is intended to allow a conservative screening against the RCRA characteristic hazardous waste listing criteria that requires a Toxicity Characteristic Leaching Procedure (TCLP) test to make the hazardous waste determination. The concentration appearing in the table is the TCLP concentration times a factor of 20, which is the dilution factor inherent to the TCLP test method. Only select chemicals have TCLP criteria. CDM concludes that the soil sampled during this investigation will not require special handling and its use should be unrestricted.

With limited access during this soil sampling event, samples were only collected in public right-of-ways. Although no detected compounds are present above regulatory criteria in the soil sampled, the presence of these contaminants indicates the potential for nearby soil contamination that may exceed regulatory criteria. No samples were

collected on private properties where potential chemical releases would be more likely to occur. As site access is attained and additional investigations take place, more information concerning the occurrence of soil contamination along the proposed bypass channel will become available.

## **3.2 Groundwater Sampling and Analyses**

Eight monitoring wells were installed along the proposed bypass channel (Figure 3-1). All well installation was conducted by the USACE and groundwater sampling was performed by CDM. Two rounds of groundwater sampling were conducted, as outlined below.

### **3.2.1 Initial Groundwater Sampling Round**

The first round of groundwater samples was collected during June 2004. Groundwater samples were analyzed for Priority Pollutant Metals (6010B/7470A), SVOCs (8270C), pesticides/PCBs (8081A/8082), and VOCs (8260B). A summary of the compounds detected during the first sampling event is provided in Table 3-2.

The constituents detected in groundwater include metals, VOCs, and SVOCs. The summary tables also include select concentration-based standards for comparison purposes. The table also includes the Tier 1 Protective Concentration Levels (PCLs) for the detected constituents from the TRPP rule. The PCLs essentially mirror the Federal Maximum Contaminant Levels (MCLs) from the National Primary Drinking Water Standards. The RCRA HW standard (TCLP) is intended to allow a screening against the RCRA characteristic hazardous waste listing criteria.

Constituents exceeding the criteria from the first sampling event include arsenic and bis (2-ethylhexyl) phthalate. Arsenic exceeded the Texas PCL and Federal MCL at four locations out of the eight locations sampled. The highest concentration reported was 242 µg/L (MW-C10) compared to the Texas Tier I PCL standard of 10 µg/L. Bis (2-ethylhexyl) phthalate exceeded the Texas Tier I PCL at two locations out of the eight locations sampled. The highest concentration reported was 116 µg/L (MW-B2) compared to the standard of 6 µg/L. This compound does not have a Federal MCL.

### **3.2.2 Second Groundwater Sampling Round**

The second round of groundwater samples was collected during October 2004. Groundwater samples analyzed for Priority Pollutant Metals (6010B/7470A), SVOCs (8270C), and VOCs (8260B). A summary of the compounds detected during the second sampling event is provided in Table 3-3. Fewer wells were sampled during the second event because the groundwater level was below the screened interval at some monitoring wells.

The constituents detected during the second round of groundwater sampling are metals and VOCs. Neither arsenic nor bis (2-ethylhexyl) phthalate were detected during the second round. Manganese slightly exceeded the Texas Tier I PCL

residential standard of 1.1 µg/L in one well (1.3 µg/L in well MW-C10) but was below the commercial standard.

The implications of the groundwater data on the construction project are twofold. Of most immediate concern to construction is whether this groundwater will require treatment prior to discharge/disposal during construction of the channel. The second concern is whether contaminated groundwater not recovered during construction will require remediation for environmental compliance reasons. Groundwater sampling to date indicates that treatment of groundwater during dewatering may not be required. The compound bis (2-ethylhexyl) phthalate is a common artifact of sampling and laboratory procedures. Based on the currently available data, it is probable that the bis (2-ethylhexyl) phthalate detected in the first round is an analytical artifact. In addition, it is possible that the arsenic concentrations observed are associated with background concentrations rather than associated with a source of contamination. The average arsenic concentration in soil is 3.4 mg/kg. Sufficient arsenic is available in the native soil to result in the observed arsenic concentrations in groundwater. Outside of the known areas of groundwater contamination in the North Main Street area, south of the proposed bypass channel, no groundwater contamination has been discovered to date that may require remediation for compliance.

Water encountered during excavation of the bypass channel will be tested prior to dewatering. If arsenic, or any other compound, is present above regulatory levels, then the appropriate discharge permit may be required and portable water treatment system established for dewatering.

# Section 4

## Groundwater Modeling

Preliminary groundwater modeling was conducted using available information to summarize groundwater conditions in the alluvial aquifer system associated with the Clear Fork and West Fork of the Trinity River (CDM 2004b). This analysis was conducted to assess the potential impacts of groundwater on construction of the proposed bypass channel and to evaluate the potential impacts of the project on groundwater conditions after construction. This analysis has been conducted using available information obtained from regulatory agency files and field studies conducted for the channel construction under the geotechnical and environmental tasks. The analysis included development of a reconnaissance level groundwater model, using MODFLOW, to assess groundwater conditions at the site, including the potential range of inflow rates during construction dewatering, post project water levels and changes in groundwater flow directions.

The evaluation of conditions during the construction phase includes an assessment of the probable range of dewatering inflows that will be encountered during construction of the bypass channel. The potential for inducing flow of contaminated groundwater into the excavation for the new channel was also evaluated. After the project is in place, the river level and groundwater levels will rise, since an average pool elevation of 524.3 ft MSL will be maintained. Projection of groundwater levels under these future conditions are necessary to assess the potential impact on foundations and on existing contaminated soil areas that may be inundated by the rising groundwater table.

### 4.1 Preliminary Groundwater Modeling Conclusions

The proposed channel is located in a sequence of alluvial valley fill deposits up to about 60 feet in thickness. These deposits fill a valley eroded in limestone and shale bedrock that does not support significant groundwater flow due to the lack of fracturing. A surficial deposit consisting of clay and silty clay is present through most of the project area. This is the primary unit that will be encountered during excavation of the new channel. The upper unit is underlain by a more permeable sand and clayey sand interval. The deepest aquifer is comprised of gravel and sandy gravel overlying bedrock that is the most permeable unit at the site. The more permeable aquifers will likely only be encountered in a limited section of the proposed new channel. All three of the units are saturated through most of the site. The saturated thickness decreases significantly over a high bedrock area near the northern extent of the proposed channel realignment. Water level and stream stage monitoring indicates that surface water and groundwater are in good communication. Known areas of groundwater contamination are present in the project area. Substantial concentrations of volatile organic constituents are present in the vicinity of Jay's Salvage and the Texas Utilities sites.

The model incorporated the known geometry of the aquifers that have been identified at the site and connected surface water. Hydraulic characteristics were estimated

from on-site field tests at wells and from observed fluctuations in stream stage and the corresponding groundwater level changes. Uncertainties due to a lack of field testing in more permeable units at the site necessitated the use of ranges in hydraulic conductivity for the most permeable gravel interval to bracket results within a reasonable range.

The baseline model reflecting current groundwater conditions was configured and used to assess groundwater conditions both during dewatering and after project construction. Dewatering flows for the channel construction phase are estimated to range from about 150 to 450 gpm, assuming that the channel does not penetrate into the more permeable sand and gravel deposits in the southern portion of the channel between the Clear Fork and West Fork. The modeling indicates that dewatering operations will locally change groundwater flow directions, but are not anticipated to induce flow of contaminated groundwater from known HTRW sites to the channel. Water levels will rise after project construction in response to a higher stream elevation behind the new dam. This will cause a change in groundwater flow rates and direction of flow. In addition, groundwater velocities will decrease, since stream stage will be flat over the extent of the pool.

# **Section 5**

## **Conclusions & Recommendations**

### **5.1 Recognized Environmental Conditions**

The potential RECs on the bypass channel parcels identified in this report have been selected conservatively and it is likely that many of the RECs can be assigned a “no further action” (NFA) status based on analytical data collected from a Phase II ESA. Table 5-1 includes those parcels that are currently considered to potentially have RECs and warrant Phase II ESA sampling activities based on the information presented in Section 2 of this report. These parcel locations are included on Figure 5-1 through Figure 5-5. The number of parcels assumed to have one or more RECs is 79.

Data from the soil borings and groundwater monitoring wells installed in 2004 within and near the proposed bypass channel indicate that widespread contamination is not present throughout the area. Soil and groundwater contamination that may be encountered during bypass channel excavation should be limited to localized areas, based on the data collected to date. Additional information regarding potential subsurface contamination will become available as site access is granted and Phase II investigations proceed. The groundwater contamination in the North Main Street section south of the bypass channel will be considered during final design.

### **5.2 Recommendations**

In general, site inspections and interviews with property owners/managers should be completed for the parcels identified with potential RECs. The site inspection and interviews should allow a determination of the need for a Phase II ESA, which could include sampling for suspect ACM and LBP and soil and groundwater sampling. Before inspections take place, access agreements must be established for the properties not owned by the Central City Project stakeholders. After establishing property agreements at the required properties, the inspections and interviews can proceed.

Upon completion of the site inspections and interviews, a list of properties needing further investigation will be developed. The technical approach to Phase II investigations will be determined after evaluation of the list with regards to opportunities for efficiencies in the follow-up work. For example, the properties requiring additional investigation may be sampled as a group rather than individual properties. At some properties, Phase II sampling may be combined with UST removal that is known to be required. In some cases, Phase III investigations may be required to determine the nature and extent of any discovered contamination, depending on the location of the property with regard to the bypass channel.

# Section 6

## References

- CDM 2004a – Sampling and Analysis Report, Tarrant Regional Water District, Fort Worth Central City, CDM, August 18, 2004.
- CDM 2004b – Draft Technical Memorandum – Evaluation of Groundwater Issues for the Proposed Trinity River Realignment, Fort Worth, Texas, CDM, November 16, 2004.
- City of Fort Worth 2000 – North Main Street Corridor Study Environmental Report, City of Fort Worth, Texas, City of Fort Worth, Department of Environmental Management, June 12, 2000.
- MFG 2002 – Letter dated March 19, 2002 from MFG, Inc. to Mr. Jeff Jones of the TXU Business Services concerning Sediment Sampling in West Fork Trinity River at the TXU North Main Metals Recycling Site, Fort Worth, Texas.
- Pastor, Behling & Wheeler 2004a – Draft Post-Closure Groundwater Monitoring Report, Second Quarter 2004, Metals Recycling Site, Fort Worth, Texas, Pastor, Behling & Wheeler, LLC, July 8 2004.
- Pastor, Behling & Wheeler 2004b – Affected Property Assessment Report, North Main West Tract, 201 NW 4<sup>th</sup> Street, Fort Worth, Texas, VCP No. 1705, Pastor, Behling & Wheeler, LLC, July 15 2004.
- ThermoRetec 2000 – Supplemental Site Investigation – Jay’s Salvage Lease Property, Fort Worth, Texas, ThermoRetec Consulting Corporation, 2000.
- ThermoRetec 2001 – Groundwater Monitoring Report (May 2000 – February 2001) – Jay’s Salvage Lease Property, Fort Worth, Texas, July 23, 2001.
- USACE 2003a – Records Review – Hazardous, Toxic, and Radioactive Waste (HTRW) Investigations, Central City, Fort Worth, Texas, U.S. Army Corps of Engineers, Fort Worth District, May 2003.
- USACE 2003b - Records Review – Volume 2 – Hazardous, Toxic, and Radioactive Waste (HTRW) Investigations, Central City, Fort Worth, Texas, U.S. Army Corps of Engineers, Fort Worth District, May 2003.