# TIER I SCREENING LEVEL HUMAN HEALTH RISK ASSESSMENT 2301 EAST 12TH STREET OAKLAND, CA

DRAFT FINAL

R2013

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# TIER I SCREENING HUMAN HEALTH LEVEL RISK ASSESSMENT

## 1.0 INTRODUCTION

A Tier I screening level human health risk assessment (Tier I SLHHRA) was conducted for the J.W. Silveira Company underground storage tank (UST) located at 2301 East 12th Street in Oakland, California (Site). A Tier I SLHHRA was conducted consistent with the methods outlined by the City of Oakland (City of Oakland, 2000) and the California Regional Water Quality Control Board (CRWQCB; 2001).

A Tier I SLHHRA is the initial step of a three-step human health risk assessment process as outlined in the Urban Land Redevelopment Program Guidance Document (City of Oakland 2000). A Tier I SLHHRA involves comparing detected chemical concentrations to generic risk-based screening concentrations (Tier I screening values). The Tier I SLHHRA is a conservative method of evaluating potential human health impacts at a site. If detected chemical concentrations exceed Tier I screening concentrations, then a Tier II or Tier III SLHHRA may be required. Tier II and Tier III SLHHRA involve refining Tier I screening values using site-specific data that account for the unique features of the Site. This assessment evaluates potential health impacts associated with current site conditions (e.g., no development, earthmoving activities, or re-zoning). An additional assessment may be required to evaluate any subsequent modifications to the Site.

This report summarizes the methodology and results of a Tier I SLHHRA conducted to evaluate potential human health risks associated with exposure to chemicals in soil and groundwater at the Site. The Tier I SLHHRA was based on analytical results for soil and groundwater samples collected between April 1999 and August 2001 (most recent sampling event).

This report consists of the following sections:

- Section 2.0: Site Description and Background
- Section 3.0: Summary of Previously Conducted Sampling Events
- Section 4.0: Tier I SLHHRA Methodology
- Section 5.0: Land Use
- Section 6.0: Conceptual Site Model
- Section 7.0: Tier I SLHHRA Criteria
- Section 8.0: Results
- Section 9.0: Conclusions and Recommendations
- Section 10: References

## 2.0 SITE DESCRIPTION AND BACKGROUND

The Site is approximately ¼ acre in size. The Site was previously a gas station and vehicle repair facility and is currently a tire and brake repair facility (Figure 1). It is located in an industrially zoned area and bordered to the northeast by East 12$^{th}$ street, to the southeast by railroad property, to the northwest by 23rd Avenue and a public park, and to the southwest by a furniture restoration facility. Groundwater flows in a northwesterly direction. Presently, groundwater at the Site is not used for any domestic or industrial purposes. For this reason, groundwater was assumed to be nonpotable. You mentioned previously that you were working on it. Our TDS does not come in high enough. Here's what we put in the groundwater report. "TDS concentrations in the latest six groundwater well samples from the site ranged from 510 mg/L in the sample from MW-4 to 960 mg/L in the sample from MW-1. If the concentration of TDS in groundwater at a site is greater than 3,000 mg/L, then groundwater will be classified as unsuitable for potential drinking water purposes. Previously, four USTs were located along the eastern edge of the Site. :

- One 6000 gallon gasoline UST
- Two 1,000 gallon waste oil USTs and

- One 1,000 gallon diesel UST.

All USTs were excavated between 1990 and 1991 (TtEMI, 2001). Groundwater flow at the site as of August 2001 is north 54 degrees west (N54W; TtEMI, 2001). Leaking underground storage tanks are assumed to be the source of all chemical impacts at the Site. Therefore, the only media of concern at the Site include subsurface soil and groundwater.

## 3.0 SUMMARY OF PREVIOUSLY CONDUCTED SAMPLING ANALYSES

This section briefly summarizes the sampling activities conducted at the Site. Both soil and groundwater were sampled at the Site. Either soil and/or groundwater were sampled during the following time intervals:

For Groundwater:

- March, June, and October 1994
- February, June, and October 1995
- February, June, and September 1996
- January, May, and December 1997
- March and July 1999
- May 2000 and
- August 2001

For Soil:

- December 1990
- January and February 1991
- July 1992
- March 1994 and
- June 1999

A summary of site characterization activities conducted at the Site is presented in Sections 3.1 (subsurface soil) and 3.2 (groundwater) below. A more detailed description is provided in the Groundwater Summary Report (TtEMI, 2001). Appendix A summarizes the results of all soil and groundwater sampling data collected from 1991 through 2001. All samples were analyzed for the presence of:

- Total petroleum hydrocarbons (TPH) as gasoline (TPH-g), diesel (TPH-d) and motor oil (TPH-o)
- 1,2,4-trimethylbenzene (1,2,4-TMB)
- N-Butylbenzene
- Naphthalene
- o-xylene

- 1,3,5-trimethylbenzene (1,3,5-TMB)
- Benzene
- Cholorobenzene
- Ethylbenzene
- Isopropylbenzene
- m,p-Xylenes
- Vinyl Chloride
- Para-Isopropyl Toluene
- Propylbenzene
- sec-Butylbenzene
- tert-Butylbenzene
- Toluene
- Trans-1,2-Dichloroethene
- Trichloroethene

## 3.1 GROUNDWATER

Groundwater was present at the bottom of the diesel and gasoline UST excavations; approximately 1 foot of water was present in the 9-foot-deep former diesel tank excavation, and approximately 0.5 foot of water was present in the 14-foot-deep former gasoline tank excavation. One groundwater sample was collected from each of the excavated locations.

Between December 23, 1991 and March 18, 1994, six monitoring wells were installed at the Site— MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6. Monitoring wells were sampled between one and four times annually since August 2001. MW-1, MW-2, and MW-3 have been sampled 23 times since 1992 and wells MW-4, MW-5, and MW-6 were sampled 17 times since 1994.

On June 28, 1999, as part of an additional site characterization, six soil borings (SB-1 through SB-6) were completed to determine the lateral extent of petroleum contamination at the site. Soil boring depths re-drilled to depths ranging from 16 to 24 feet bgs.

Finally, on August 30, 2001, samples were collected from MW-1 through MW-6. Appendix A summarizes the analytical results for the soil and groundwater data collected between 1992 and 2001. A more detailed summary of previously conducted site characterization activities is presented in the Groundwater Report (TtEMI, 2001). Groundwater data used to conduct the Tier I SLHHRA are presented in Table 1.

## 3.2 SUBSURFACE SOIL

On December 21, 1990 soil samples were collected from the initial diesel and gasoline UST excavation bottoms, at about 9 and 14 feet below the ground surface (bgs), respectively. Presumably (although this activity is not well documented), additional soil removal took place in the diesel and gasoline UST excavations. Following this soil removal, two additional soil samples were collected on December 26, 1990 from the diesel and gasoline UST excavations at 17 and 20 feet bgs, respectively. .

Six additional samples were collected on January 10, 11, and 16, 1991 from the side-walls of the side-by-side gasoline and diesel tank excavations. During January 1991, the side-by-side gasoline and diesel tank excavations were lined with double layers of 6-millimeter-thick plastic sheeting. It is reported that the stockpiled soils on site were combined with imported fill material and used to backfill the side-by-side excavation pits (Epigene, 1995).

On February 11, 1991 the two side-by-side 1,000 waste oil tanks were removed and soil excavated down to 8 feet bgs (TtEMI, 2001). During removal, a hole was observed at the bottom of the tanks and contamination was discovered at both ends of the waste oil tanks. Based on this information, four soil samples were collected from the ends of the USTs at the bottom of the excavation at approximately 8 feet bgs. One soil sample was also collected from the single stockpile of soil that had been removed from the excavation.

On February 27, 1991 the area of excavation for the waste oil tanks with the highest concentration of diesel contamination was excavated to a depth of 13 feet bgs. Three additional soil samples were collected from the bottom of this excavated area along the western edge of the excavations at approximately 13 feet bgs. The excavated area was then backfilled with some stockpiled soil that had been previously removed from the excavation including imported fill material. In addition, approximately 18 cubic yards of stockpiled soil was transported to a disposal facility due to elevated concentrations of TPH-g and TPH-d.

In December 1991, MW-1 was installed and four soil samples were collected from the well borings at depth of 6, 11, 16 and 21 feet bgs. During the construction of MW-2 and MW-3, soil samples were collected from the borings at depths of 9 and 8 feet bgs, respectively. In March 1994 three additional monitoring wells – MW-4, MW-5, and MW-6 - were constructed and one soil sample from each well was collected at 10, 5 and 10 feet bgs, respectively. Soil samples were last collected in June 1999 as part of an "additional site characterization" study. Six soil borings (SB-1 through SB-6) were collected to establish the lateral extent chemical impacts at the site (TtEMI, 2001). Soil depths ranged from 16 to 24 feet bgs. As indicated earlier in Section 2.0, shallow/surface soil samples were not collected because chemical impacts were assumed to be limited to subsurface soils, as a result of subsurface leakage from underground storage tanks. Subsurface soil data used to conduct the Tier I SLHHRA are summarized in Table 2.

## 4.0 TIER I SLHHRA METHODOLOGY

As indicated in Section 3.0 and summarized in Appendix A, subsurface soil and groundwater data have been collected at the Site since 1991. However, data collected over ten years ago do not reflect current site conditions due to attenuation (e.g., degradation) or migration (in groundwater). For this reason, only data collected during the three most recent sampling activities – (April 1999, May 2000, and August 2001) were used to conduct the SLHHRA.

Detected chemical concentrations in groundwater and subsurface soil were compared to Tier I screening levels identified from one of three sources, as described in Section 7.3 below. Tier I screening levels for commercial/industrial receptors exposed to chemicals in groundwater and subsurface soil through inhalation of indoor air vapors were used in this assessment, with exceptions as noted in Section 7.2. The rationale for receptor and exposure pathway selection is presented in Sections 5 and 6 below.

Each of these health based screening criteria is discussed in detail below followed by a discussion regarding the basis for this hierarchy. RBLs and PRGs are addressed in Section 7.1 and 7.2, respectively.

## 7.1 RBSLs

RBSLs developed by both the City of Oakland and the CRWQCB are based on different assumptions (discussed in detail in "*Application of Risk-Based Screening Levels and Decision Making to Sites with Impacted Soil and Groundwater*" (CRWQCB, 2001a)). Both the City of Oakland and CRWQCB RBSLs evaluate potential residential and commercial/industrial worker exposure scenarios and address exposure to:

- City of Oakland RBSLs
  - Surficial soil which accounts for ingestion, dermal contact, and inhalation of vapors and soil particulates while outdoors.
  - Subsurface soil which accounts separately for
    - Inhaling indoor air vapors
    - Inhaling outdoor air vapors
    - Ingesting groundwater impacted by leachate
  - For Groundwater:
    - Inhaling indoor air vapors
    - Inhaling outdoor air vapors
    - Ingesting groundwater

- Water used for recreation – ingestion and dermal contact (residential only).

- CRWQCB:

  - Surface soil and groundwater as a current or a potential source of drinking water

  - Surface soil and groundwater not a current or a potential source of drinking water

  - Subsurface soil and groundwater as a current or a potential source of drinking water

  - Subsurface soil and groundwater not a current or a potential source of drinking water.

  - Elevated threat to surface water.

Subsurface soil is defined as soil either 1 meter or greater than 3 meters below ground surface (bgs) by the City of Oakland (2000) and the CRWQCB (2001a), respectively.

## 7.2 PRGs

Similar to RBSLs, PRGs are available for residential and commercial/industrial workers exposed to ambient (outdoor) air, tapwater, and soil. Soil and tapwater PRGs account for direct contact exposures (i.e., ingestion and dermal contact) in addition to inhalation of chemical vapors or soil particles. PRGs for tapwater and soil are discussed in more detail below. Ambient air PRGs are not relevant to this assessment and are not discussed further in this report.

### 7.2.1 Tapwater

As indicated in Section 2.0, groundwater at the site is considered nonpotable. For this reason, RBSLs for nonpotable groundwater were used in this evaluation. However, in the absence of nonpotable groundwater RBSLs (City of Oakland or CRWQCB), nonpotable groundwater PRGs developed by EPA Region IX were used in this assessment. Tapwater PRGs incorporate vapor inhalation, ingestion, and dermal contact exposures.

### 7.2.1 Soil

Soil PRGs account for direct exposure (dermal and ingestion) as well as inhalation of vapors or particulates. In case of VOCs, subsurface RBSLs are considered more conservative (i.e., lower) than PRGs because RBSLs account for the inhalation of vapors while indoors (where vapors can accumulate). PRGs also account for vapor inhalation but only while outdoors (where vapors dissipate or degrade more rapidy). As noted earlier, PRGs were only used in the absence of an available and appropriate RBSL.

## 7.3 TIER I SCREENING CRITERIA HIERARCHY

RBSLs developed by the City of Oakland "reflect Oakland-specific geologic, hydrogeologic and climatic conditions." As acknowledged by the CRWQCB (CRWQCB, 2001b) because the Site is located within the Oakland city limits whenever available Oakland RBSLs were used to conduct the Tier 1 SLHRRA. In the absence of Oakland RBSLs, more generic RBSLs developed by the CRWQCB (2001a) were used. The more conservative PRGs were used only when RBSLs were not available for a detected chemical.

The Site is industrial groundwater is not used for recreational activities nor is there a threat to nearby surface water bodies. Potential impacts are associated solely with the inhalation of VOCs emanating from either nonpotable groundwater or subsurface soils. For this reason nonpotable groundwater and subsurface commercial/industrial RBSLs were used in this assessment. As

noted earlier, in some cases RBSLs may not be available for all chemicals detected at the Site. In the absence of RBSLs, PRGs developed by EPA Region IX were selected as Tier I screening level criteria.

## 8.0 EVALUATING TPH-g, TPH-d, and TPH-o

Benzene, toluene, ethylbenzene, and xylenes (BTEX) account for the most toxic components of TPH-g. BTEX was sampled for in both soil and groundwater. In addition to BTEX, semivolatile organic compounds (SVOCs) are indicator chemicals for TPH-d and TPH-o. However, because SVOCs do not readily volatilize exposure to these class of compounds is not expected at the Site. Sampling for the presence of BTEX at the Site is assumed to account for the most relevant components of TPH-g, TPH-d and TPH-o. For this reason TPH-g, TPH-d, and TPH-o were not evaluated separately in this assessment. In addition, the results of the TPH sampling events are summarized in Tables 1 and 2 for the reader's review.

## 9.0 RESULTS OF THE TIER I SLHHRA

The results of the Tier I SLHHRA for groundwater and subsurface soil are presented in Sections 9.1 and 9.2, respectively.

### 9.1 GROUNDWATER

No VOCs detected in MW-1, MW-3, MW-4, MW-5, or MW-6 exceeded Tier I screening levels. 1,2,4-TMB and 1,3,5-TMB were the only VOCs that exceeded Tier I screening levels (12 µg/L) at MW-2 consistently in the three most recent sampling events. 1,2,4-TMB concentrations were 200, 110, and 240 µg/L and 1,3,5-TMB concentrations were 120, 100, and 190 µg/L over the last three sampling rounds. Table 5 presents chemicals detected in groundwater and corresponding Tier I screening levels

### 9.2 SUBSURFACE SOIL

The following chemicals detected at SB-5 (13 to 13.5 feet bgs) exceeded Tier I screening levels for soil: Isopropylbenzene (600 mg/kg), propylbenzene (920 mg/kg), n-butylbenzene (510 mg/kg), and sec-butylbenzene (410 mg/kg). The Tier I screening levels for these chemicals are 540, 240, 240, and 220 mg/kg, respectively.Table 6 presents chemicals detected in subsurface soil and corresponding Tier I screening levels.

## 10.0 CONCLUSIONS AND RECOMMENDATIONS

1,2,4-TMB and 1,3,5-TMB were the only two VOCs detected in groundwater that exceeded Tier I screening levels in MW-2. However, as indicated in Table 3, a domestic tapwater PRG was used in the absence of industrial/commercial worker RBSL for either 1,2,4- or 1,3,5-TMB. The tapwater PRG is overly conservative. Development of an industrial/commercial worker RBSL may indicate that 1,2,4-TMB and 1,3,5-TMB are present below health-based levels of concern. In subsurface soils, exceedances of detected chemicals (isopropylbenzene, propylbenzene, n-butylbenzene, and sec-butylbenzene) are limited to SB-5. Soil excavation along with the collection of confirmation samples may adequately address soil levels exceeding Tier I screening levels.

Based on the results of the Tier I SLHHRA – in the absence of a site soil and groundwater remediation or soil excavation activities, a Tier II or Tier III SLHHRA may be required to establish more site-specific health-based remediation criteria. As noted in Section 4.0 the Tier I RBSLs and PRGs are not site-specific and are considered conservative to allow use across a number of different types of sites. Implementation of a Tier II or Tier III SLHHRA will allow for the development of screening levels that more closely reflect and account for expected industrial uses of the Site as well as site-specific physical/chemical properties such as soil type, soil moisture, soil porosity, and soil pH. These factors can significantly influence development of site-specific screening levels.

## 11.0 REFERENCES


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U.S. Environmental Protection Agency (EPA). 2002. Region 9 PRGs Table 2002 Update. October 1.

**MAIN TEXT FIGURE**

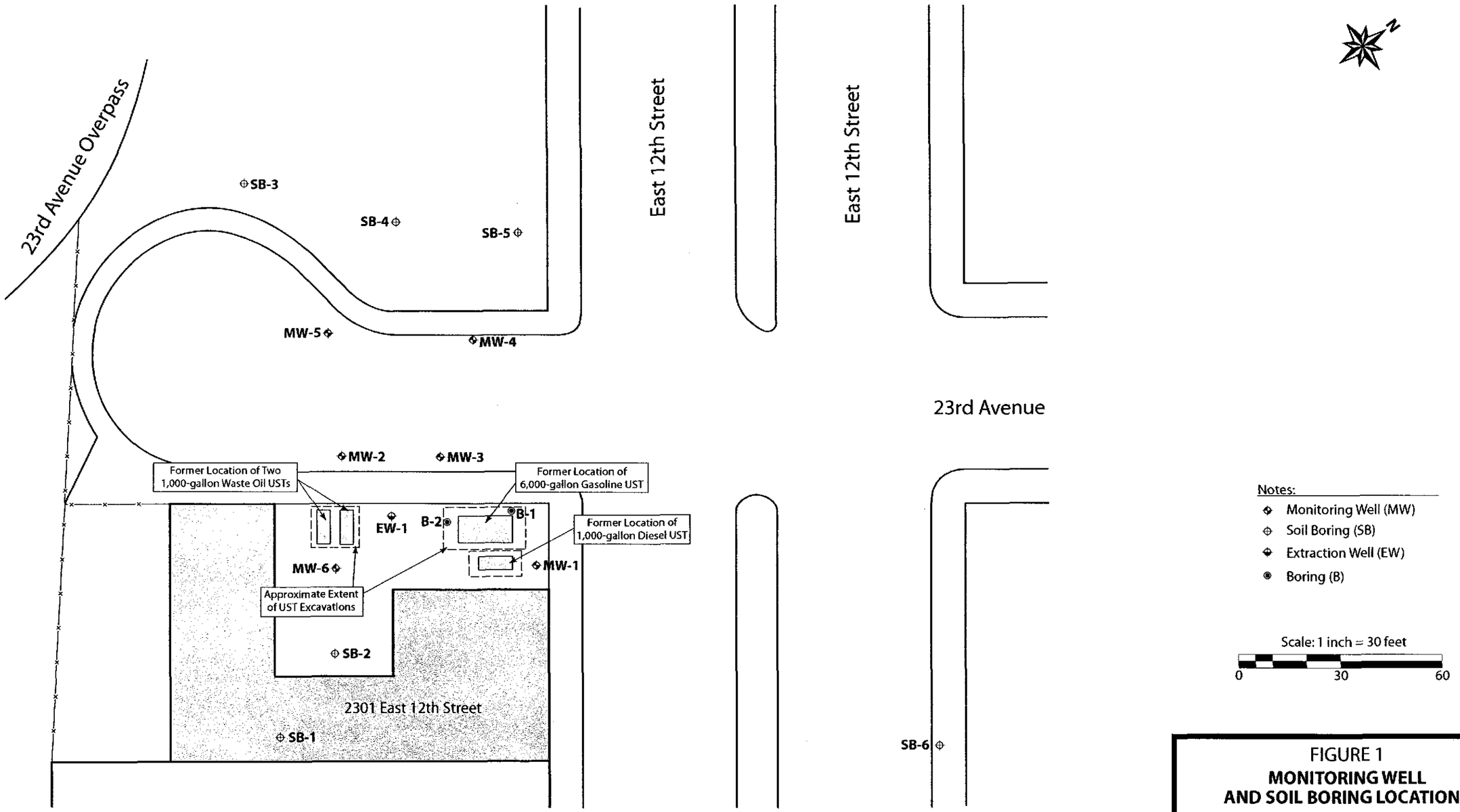


FIGURE 1

**MONITORING WELL AND SOIL BORING LOCATIONS**

J. W. SILVEIRA CO.
2301 EAST 12th STREET
OAKLAND, CALIFORNIA

Tetra Tech EM Inc.

# MAIN TEXT TABLES

**Table 1**
**SUMMARY OF REPORTED CHEMICAL CONCENTRATIONS IN GROUNDWATER**
**FROM THE THREE MOST RECENT GROUNDWATER SAMPLING ACTIVITIES IN 1999, 2000, AND 2001**
**2301 EAST 12TH STREET**

| | MW-1 | | | MW-2 | | | MW-3 | | | MW-4 | | | MW-5 | | | MW-6 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chemical | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 |
| **VOC** (ug/L) | | | | | | | | | | | | | | | | | | |
| 1,2,4-Trimethylbenzene | ND | 5.4 | ND | 200 | 110 | 240 | ND | 0.5 | ND | ND | ND | ND | ND | 0.8 | ND | ND | ND | ND |
| 1,3,5-Trimethylbenzene | ND | 6.4 | ND | 120 | 100 | 190 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzene | 1,300 | 1,300 | 1,000 | 1,100 | 970 | 630 | 73 | 0.5 | 59 | ND | ND | ND | 73 | 53 | 44 | 280 | 320 | 240 |
| Chlorobenzene | ND | ND | ND | 5.2 | 4.6 | ND | ND | ND | ND | ND | ND | ND | ND | 1.1 | 1.4 | ND | ND | ND |
| cis-1,2-Dichloroethene | ND | 1 | ND | ND | ND | ND | ND | 3.4 | ND | ND | ND | ND | ND | 3.6 | 3.1 | 72 | 44 | 43 |
| Ethylbenzene | 93 | 98 | 92 | 540 | 560 | 340 | 29 | 18 | 13 | 0.8 | ND | ND | 13 | 5.6 | 5.2 | 66 | 61 | 34 |
| Isopropylbenzene | ND | 17 | 20 | 50 | 63 | 64 | 41 | 41 | 41 | 18 | 10 | 10 | 55 | 43 | 44 | 17 | 20 | 15 |
| m,p-Xylenes | 36 | 24 | 20 | 370 | 230 | 260 | 6.3 | 5.4 | 4.6 | ND | ND | ND | 13 | 8.1 | 7.3 | 6.4 | 1.9 | ND |
| n-Butylbenzene | ND | 10 | 10 | 39 | 43 | 88 | 17 | 20 | 21 | 11 | 4.6 | 5.9 | 14 | 11 | 12 | ND | 5.8 | 6.7 |
| Naphthalene | ND | 16 | 17 | 570 | 600 | 910 | 3.4 | 3.9 | 3 | ND | ND | ND | 42 | 26 | 23 | ND | ND | ND |
| o-Xylene | ND | 1.9 | ND | 38 | 27 | 31 | ND | 0.6 | ND | ND | ND | ND | ND | 1.5 | 1.3 | ND | ND | ND |
| para-Isopropyl Toluene | ND | 9.6 | 12 | 22 | 21 | 42 | 18 | 21 | 22 | 7.9 | 2.8 | 3.6 | 9.9 | 6.3 | 6.3 | ND | 3.9 | 2.8 |
| Propylbenzene | ND | 17 | 19 | 86 | 120 | 110 | 45 | 48 | 47 | 18 | 9.4 | 9.1 | 80 | 61 | 63 | 15 | 17 | 14 |
| sec-Butylbenzene | ND | 7.2 | 7.6 | ND | 13 | 21 | 12 | 13 | 14 | 13 | 7 | 8.2 | 8.3 | 6.8 | 7.7 | ND | 4 | 3.9 |
| tert-Butylbenzene | ND | ND | ND | ND | ND | ND | 3.3 | 1.3 | 1.3 | ND | 1 | 1.2 | ND | ND | ND | ND | ND | ND |
| Toluene | 30 | 30 | 19 | 100 | 84 | 49 | 7 | 6.3 | 5.8 | ND | ND | ND | 5 | 3.4 | 3.1 | 4.4 | 3.8 | 2.5 |
| trans-1,2-Dichloroethene | ND | ND | ND | ND | ND | ND | 3.3 | 2.6 | ND | ND | ND | ND | 2.7 | 3.6 | 5.3 | 21 | 18 | 15 |
| Trichloroethene | 20 | ND | ND | ND | ND | ND | 6.7 | 3.9 | 4.4 | ND | ND | ND | ND | ND | ND | 75 | 46 | 33 |
| Vinyl Chloride | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 13 | ND | ND | 13 |
| **TPH** (ug/L) | | | | | | | | | | | | | | | | | | |
| Diesel (TPH-d) | 4,300 | 3,300 | 8,800 | 5,800 | 6,900 | 28,000 | 3,200 | 9,700 | 9,800 | 2,500 | 580 | 28,000 | 1,500 | 1,000 | 2,100 | 3,400 | 730 | 1,400 |
| Motor Oil (TPH-o) | 850 | 720 | 2,600 | 750 | 840 | 3,800 | 280 | 390 | 750 | 300 | ND | 3,000 | 290 | ND | 340 | 280 | ND | 300 |

Notes:

| | |
|---|---|
| ug/L | micrograms per liter |
| ND | Not detected |
| TPH | Total petroleum hydrocarbons |
| VOC | Volatile organic compound |

# TABLE 2
# SUMMARY OF REPORTED CHEMICAL CONCENTRATIONS IN SUBSURFACE SOIL COLLECTED IN 1999
# 2301 EAST 12TH STREET

| Analyte | Location and Depth | | | | | |
|---|---|---|---|---|---|---|
| **VOC** (mg/kg) | **SB-1** JW1-09 15.5-16 ft bgs | **SB-2** JW1-13 15-15.5 ft bgs | **SB-3** JW1-17 18-18.5 ft bgs | **SB-4** JW1-12 18-18.5 ft bgs | **SB-5** JW1-16 13-13.5 ft bgs | **SB-6** JW1-20 19-19.5 ft bgs |
| Isopropylbenzene | ND | ND | ND | ND | 600 | ND |
| Propylbenzene (as n-Propylbenzene) | ND | ND | ND | ND | 920 | ND |
| cis-1,2-Dichloroethene | ND | ND | ND | 4.2 | ND | ND |
| n-Butylbenzene | ND | ND | ND | ND | 510 | ND |
| para-Isopropyl Toluene | ND | ND | ND | ND | 360 | ND |
| sec-Butylbenzene | ND | ND | ND | ND | 410 | ND |
| **TPH** (mg/kg) | | | | | | |
| Diesel (TPH-d) | ND | ND | ND | ND | 120 | ND |

Notes:

The analytical results of the soil samples were validated by a TtEMI chemist.

bgs below ground surface
ft feet
mg/kg milligrams per Kilogram
ND Not Detected
TPH Total Petroleum Hydrocarbons
VOC Volitile Organic Compound

**TABLE 3**
**GROUNDWATER RBSLs AND PRGs USED TO CONDUCT THE COMMERCIAL/INDUSTRIAL WORKER TIER I SLHHRA**
**2301 EAST 12TH STREET**

| Chemical | City of Oakland Commericial/Industrial Worker RBSLs | CRWQCB Commercial/Industrial Worker RBSLs for Non Potable Groundwater | Region IX Residential Tapwater PRGs | Selected Tier I Screening Levels[a] | Residential or Industrial Tier I Screening Level?[b] | Surrogate |
|---|---|---|---|---|---|---|
| VOC (ug/L) | | | | | | |
| 1,2,4-Trimethylbenzene | NA | NA | 12 | 12 | Residential | |
| 1,3,5-Trimethylbenzene | NA | NA | 12 | 12 | Residential | |
| Benzene | 1800 | 46 | 0.34 | 1800 | Commercial/Industrial | |
| Chlorobenzene | 69000 | 50 | 110 | 69000 | Commercial/Industrial | |
| cis-1,2-Dichloroethene | 1000000 | 590 | 61 | 1000000 | Commercial/Industrial | |
| Ethylbenzene | >SOL | 290 | 2.9 | >SOL | Commercial/Industrial | |
| Isopropylbenzene | NA | NA | 660 | 660 | Commercial/Industrial | |
| m,p-Xylenes | >SOL | 13 (as xylenes) | 210 | >SOL | Commercial/Industrial | |
| n-Butylbenzene | NA | NA | 240 | 240 | Commercial/Industrial | |
| Naphthalene | >SOL | 24 | 6.2 | >SOL | Commercial/Industrial | |
| o-Xylene | >SOL | 13 (as xylenes) | 210 | >SOL | Commercial/Industrial | |
| para-Isopropyl Toluene | >SOL | 130 | 720 | >SOL | Commercial/Industrial | Toluene |
| Propylbenzene (as n-propylbenzene) | NA | NA | 240 | 240 | Residential | |
| sec-Butylbenzene | NA | NA | 240 | 240 | Residential | |
| tert-Butylbenzene | NA | NA | 240 | 240 | Residential | |
| Toluene | >SOL | 130 | 720 | >SOL | Commercial/Industrial | |
| trans-1,2-Dichloroethene | 940000 | 590 | 120 | 940000 | Commercial/Industrial | |
| Trichloroethene | 11000 | 360 | 0.028 | 11000 | Commercial/Industrial | |
| Vinyl Chloride | 59.0 | 4.9 | 0.02 | 59.0 | Commercial/Industrial | |

Notes:

| | |
|---|---|
| CRWQCB | California Regional Water Quality Control Board |
| ug/L | micrograms per liter |
| NA | Not available (applicable) |
| TPH | Total petroleum hydrocarbons |
| VOC | Volatile organic compound |
| >SOL | RBSL exceeds the solubility of the chemical in water. |

Both City of Oakland and CRWQCB groundwater RBSLs assume exposure to chemical vapors emanating from groundwater, through soil into a residence.
Tapwater PRGs assume drinking water exposure and are therefore conservative for this evaluation because groundwater is considered nonpotable.
As indicated in the main text, in order of preference, the Tier I Screening Level are those developed by the City of Oakland, the CRWQCB, and EPA Region IX PRGs.

**Notes**

| | |
|---|---|
| a | Hierarchy for selection of screening criteria is described in the main document. |
| b | Residential screening levels were used only in the absence of an appropriate commercial/industrial worker value. |

**TABLE 4**
**SUBSURFACE SOIL RBSLs AND PRGs USED TO CONDUCT THE COMMERCIAL/INDUSTRIAL TIER I SLHHRA**
**2301 EAST 12TH STREET**

| Analyte | City of Oakland Commerical/Industrial Worker RBSLs | CRWQCB Commercial/Industrial Worker RBSLs Soil Depth > 3ft BGS | EPA Region IX Commercial/Industrial Worker PRGs | Selected Tier I Screening Levels[a] | Residential or Industrial Tier I Screening Level? | Surrogate |
|---|---|---|---|---|---|---|
| VOC (mg/kg) | | | | | | |
| Isopropylbenzene | NA | NA | 520 | 520 | Commercial/Industrial | |
| Propylbenzene (as n-Propylbenzene) | NA | NA | 240 (SAT) | 240 | Commercial/Industrial | |
| cis-1,2-Dichloroethene | 410 | 2.7 | 150 | 410 | Commercial/Industrial | |
| n-Butylbenzene | NA | NA | 240 | 240 | Commercial/Industrial | |
| para-Isopropyl Toluene | SAT | 8.4 | 520 | SAT | Commercial/Industrial | Toluene |
| sec-Butylbenzene | NA | NA | 220 | 220 | Commercial/Industrial | |

Notes:
The analytical results of the soil samples were validated by a TtEMI chemist.

| | |
|---|---|
| bgs | below ground surface |
| CRWQCB | California Regional Water Quality Control Board |
| ft | feet |
| mg/kg | milligrams per Kilogram |
| - - | Not Analyzed |
| PRGs | Preliminary Remediation Goals |
| RBSLs | Risk-Based Screening Levels |
| VOC | Volitile Organic Compound |
| SAT | RBSL exceeds saturated soil concentration. |
| Notes | |
| a | Hierarchy for selection of screening criteria is described in the main document. |

Table 5

RESULTS OF THE COMMERCIAL/INDUSTRIAL WORKER TIER I SLHHRA forGROUNDWATER
FROM THE THREE MOST RECENT GROUNDWATER SAMPLING ACTIVITIES IN 1999, 2000, AND 2001
2301 EAST 12TH STREET

| Chemical | Selected Tier I Screening Levelsa | MW-1 | | | MW-2 | | | MW-3 | | | MW-4 | | | MW-5 | | | MW-6 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 |
| VOC (ug/L) | | | | | | | | | | | | | | | | | | | |
| 1,2,4-Trimethylbenzene | 12 | ND | 5.4 | ND | **200** | **110** | **240** | ND | 0.5 | ND | ND | ND | ND | ND | 0.8 | ND | ND | ND | ND |
| 1,3,5-Trimethylbenzene | 12 | ND | 6.4 | ND | **120** | **100** | **190** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzene | 1800 | 1,300 | 1,300 | 1,000 | 1,100 | 970 | 630 | 73 | 0.5 | 59 | ND | ND | ND | 73 | 53 | 44 | 280 | 320 | 240 |
| Chlorobenzene | 69000 | ND | ND | ND | 5.2 | 4.6 | ND | ND | ND | ND | ND | ND | ND | ND | 1.1 | 1.4 | ND | ND | ND |
| cis-1,2-Dichloroethene | 1000000 | ND | 1 | ND | ND | ND | ND | ND | 3.4 | ND | ND | ND | ND | ND | 3.6 | 3.1 | 72 | 44 | 43 |
| Ethylbenzene | >SOL | 93 | 98 | 92 | 540 | 560 | 340 | 29 | 18 | 13 | 0.8 | ND | ND | 13 | 5.6 | 5.2 | 66 | 61 | 34 |
| Isopropylbenzene | 660 | ND | 17 | 20 | 50 | 63 | 64 | 41 | 41 | 41 | 18 | 10 | 10 | 55 | 43 | 44 | 17 | 20 | 15 |
| m,p-Xylenes | >SOL | 36 | 24 | 20 | 370 | 230 | 260 | 6.3 | 5.4 | 4.6 | ND | ND | ND | 13 | 8.1 | 7.3 | 6.4 | 1.9 | ND |
| n-Butylbenzene | 240 | ND | 10 | 10 | 39 | 43 | 88 | 17 | 20 | 21 | 11 | 4.6 | 5.9 | 14 | 11 | 12 | ND | 5.8 | 6.7 |
| Naphthalene | >SOL | ND | 16 | 17 | 570 | 600 | 910 | 3.4 | 3.9 | 3 | ND | ND | ND | 42 | 26 | 23 | ND | ND | ND |
| o-Xylene | >SOL | ND | 1.9 | ND | 38 | 27 | 31 | ND | 0.6 | ND | ND | ND | ND | ND | 1.5 | 1.3 | ND | ND | ND |
| para-Isopropyl Toluene | >SOL | ND | 9.6 | 12 | 22 | 21 | 42 | 18 | 21 | 22 | 7.9 | 2.8 | 3.6 | 9.9 | 6.3 | 6.3 | ND | 3.9 | 2.8 |
| Propylbenzene | 240 | ND | 17 | 19 | 86 | 120 | 110 | 45 | 48 | 47 | 18 | 9.4 | 9.1 | 80 | 61 | 63 | 15 | 17 | 14 |
| sec-Butylbenzene | 240 | ND | 7.2 | 7.6 | ND | 13 | 21 | 12 | 13 | 14 | 13 | 7 | 8.2 | 8.3 | 6.8 | 7.7 | ND | 4 | 3.9 |
| tert-Butylbenzene | 240 | ND | ND | ND | ND | ND | ND | 3.3 | 1.3 | 1.3 | ND | 1 | 1.2 | ND | ND | ND | ND | ND | ND |
| Toluene | >SOL | 30 | 30 | 19 | 100 | 84 | 49 | 7 | 6.3 | 5.8 | ND | ND | ND | 5 | 3.4 | 3.1 | 4.4 | 3.8 | 2.5 |
| trans-1,2-Dichloroethene | 940000 | ND | ND | ND | ND | ND | ND | 3.3 | 2.6 | ND | ND | ND | ND | 2.7 | 3.6 | 5.3 | 21 | 18 | 15 |
| Trichloroethene | 11000 | 20 | ND | ND | ND | ND | ND | 6.7 | 3.9 | 4.4 | ND | ND | ND | ND | ND | ND | 75 | 46 | 33 |
| Vinyl Chloride | 59.0 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 13 | ND | ND | 13 |

Notes:

ug/L micrograms per liter
ND Not detected
VOC Volatile organic compound
Bold/shaded numbers indicate concentration exceeds Tier I Screening Level.
>SOL. RBSL exceeds solubility of the chemical in water

# TABLE 6
# RESULTS OF COMMERCIAL/INDUSTRIAL WORKER TIER I SLHHRA FOR SOIL COLLECTED IN 1999
# 2301 EAST 12TH STREET

| Analyte | | Location and Depth | | | | | |
|---|---|---|---|---|---|---|---|
| VOC (mg/Kg) | Selected Tier I Screening Levels | SB-1 JW1-09 15.5-16 ft bgs | SB-2 JW1-13 15-15.5 ft bgs | SB-3 JW1-17 18-18.5 ft bgs | SB-4 JW1-12 18-18.5 ft bgs | SB-5 JW1-16 13-13.5 ft bgs | SB-6 JW1-20 19-19.5 ft bgs |
| Isopropylbenzene | 520 | ND | ND | ND | ND | **600** | ND |
| Propylbenzene (as n-Propylbenzene) | 240 | ND | ND | ND | ND | **920** | ND |
| cis-1,2-Dichloroethene | 410 | ND | ND | ND | 4.2 | ND | ND |
| n-Butylbenzene | 240 | ND | ND | ND | ND | **510** | ND |
| para-Isopropyl Toluene | SAT | ND | ND | ND | ND | 360 | ND |
| sec-Butylbenzene | 220 | ND | ND | ND | ND | **410** | ND |

Notes:

The analytical results of the soil samples were validated by a TtEMI chemist.

| | |
|---|---|
| bgs | below ground surface |
| ft | feet |
| mg/kg | milligrams per kilogram |
| - - | Not Analyzed |
| ND | Not Detected |
| VOC | Volitile Organic Compound |

Bold/shaded numbers indicate concentration exceeds Tier I Screening Level.

# APPENDIX A
# SUMMARY OF PREVIOUSLY CONDUCTED GROUNDWATER SAMPLING CONDUCTED BETWEEN 1991 AND 2001

TABLE A-1
CHEMICAL CONCENTRATIONS IN GROUNDWATER
MONITORING WELL MW-1
FROM JULY 1992 TO AUGUST 2001
2301 EAST 12TH STREET

| ANALYTE | SAMPLE DATE | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VOC (µg/L) | 7/92 | 11/92 | 3/93 | 5/93 | 8/93 | 12/93 | 3/94 | 6/94 | 10/94 | 2/95 | 6/95 | 10/95 | 2/96 | 6/96 | 9/96 | 1/97 | 5/97 | 12/97 | 3/98 | 7/98 | 4/99 | 5/00 | 8/01 |
| 1,2,4-Trimethylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 5.4 | ND |
| 1,3,5-Trimethylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 6.4 | ND |
| Benzene | 600 | 2,400 | 3,800 | 3,400 | 2,300 | 29 | 2,400 | 2,300 | 2,100 | 3,200 | 2,600 | 2,200 | 1,400 | 2,500 | 1,200 | 1,500 | 2,200 | 2,000 | 2,600 | 2,100 | 1,300 | 1,300 | 1,000 |
| Chlorobenzene | -- | -- | ND | ND | ND | -- | -- | -- | -- | ND | ND | ND | ND | ND | ND | ND | ND | -- | -- | ND | ND | ND | ND |
| cis-1,2-Dichloroethene | -- | -- | ND | ND | 1.1 | -- | -- | -- | -- | 1.3 | 1.1 | 0.84 | 0.82 | ND | ND | 0.71 | 0.81 | -- | -- | 1.4 | ND | 1.0 | ND |
| Ethylbenzene | 13 | 41 | 120 | 140 | 180 | 5.8 | 310 | 260 | 250 | 460 | 450 | 220 | 130 | 190 | 86 | 190 | 170 | 81 | 280 | 220 | 93 | 98 | 92 |
| Isopropylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 17 | 20 |
| m,p-Xylenes | 18 | ND | ND | 150 | 57 | 26 | 280 | 170 | 140 | 260 | 220 | 110 | 81 | 130 | 55 | 130 | 110 | 94 | 100 | 83 | 36 | 24 | 20 |
| n-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 10 | 10 |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 16 | 17 |
| o-Xylene | a | ND | ND | a | a | a | a | a | a | a | a | a | a | a | a | a | a | a | a | a | ND | 1.9 | ND |
| para-Isopropyl Toluene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 9.6 | 12 |
| Propylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 17 | 19 |
| sec-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 7.2 | 7.6 |
| tert-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | ND | ND |
| Toluene | 5.1 | 6.1 | ND | 44 | 35 | 16 | 84 | 44 | 35 | 110 | 87 | 63 | 25 | 72 | 29 | 47 | 56 | 46 | 74 | 57 | 30 | 30 | 19 |
| trans-1,2-Dichloroethene | -- | -- | ND | ND | ND | -- | -- | -- | -- | ND | ND | ND | ND | ND | ND | ND | ND | -- | -- | ND | ND | ND | ND |
| Trichloroethene | -- | -- | 5.8 | 6.8 | ND | -- | -- | -- | -- | ND | 6.5 | 2.5 | 24 | ND | 11 | 13 | 2.7 | -- | -- | 3.4 | 20 | ND | ND |
| Vinyl Chloride | -- | -- | ND | ND | ND | -- | -- | -- | -- | ND | ND | ND | ND | ND | ND | ND | ND | -- | -- | ND | ND | ND | ND |
| **TPH (µg/L)** | **7/92** | **11/92** | **3/93** | **5/93** | **8/93** | **12/93** | **3/94** | **6/94** | **10/94** | **2/95** | **6/95** | **10/95** | **2/96** | **6/96** | **9/96** | **1/97** | **5/97** | **12/97** | **3/98** | **7/98** | **4/99** | **5/00** | **8/01** |
| Diesel (TPH-d) | 360 | 670 | 1,100 | 1,170 | 1,200 | ND | 2,600 | 1,500 | 2,000 | 2,500 | 3,500 | 2,700 | 16,000 | 8,000 | 3,100 | 11,000 | 4,300 | 3,400 | 8,600 | 6,800 | 4,300 | 3,300 | 8,800 |
| Motor Oil (TPH-o) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 850 | 720 | 2,600 |

Notes:

| | |
|---|---|
| a | Laboratory analytical report only lists total xylenes |
| µg/L | Micrograms per liter |
| -- | Not analyzed |
| ND | Not detected |
| TPH | Total petroleum hydrocarbons |
| VOC | Volatile organic compound |

TABLE A-2

CHEMICAL CONCENTRATIONS IN GROUNDWATER

MONITORING WELL MW-2

FROM JULY 1992 TO AUGUST 2001

2301 EAST 12TH STREET

| ANALYTE | SAMPLE DATE | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VOC (µg/L)** | **7/92** | **11/92** | **3/93** | **5/93** | **8/93** | **12/93** | **3/94** | **6/94** | **10/94** | **2/95** | **6/95** | **10/95** | **2/96** | **6/96** | **9/96** | **1/97** | **5/97** | **12/97** | **3/98** | **7/98** | **4/99** | **5/00** | **8/01** |
| 1,2,4-Trimethylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 200 | 110 | 240 |
| 1,3,5-Trimethylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 120 | 100 | 190 |
| Benzene | 110 | 2,800 | 3,800 | 5,200 | 1,700 | 87 | 2,100 | 2,000 | 1,500 | 2,000 | 1,300 | 1,500 | 1,700 | 1,400 | 1,600 | 1,800 | 1,300 | 1,200 | 1,200 | 890 | 1,100 | 970 | 630 |
| Chlorobenzene | -- | -- | ND | 9.8 | 10 | 4.3 | ND | 6.5 | 5.7 | 12 | 7.9 | 5.1 | 4.8 | 5.6 | 8.2 | ND | 5.2 | -- | -- | 1.9 | 5.2 | 4.6 | ND |
| cis-1,2-Dichloroethene | -- | -- | ND | 2.7 | 3.2 | 1.0 | ND | ND | 0.73 | ND | 1.0 | ND | ND | ND | ND | 0.69 | ND | -- | -- | ND | ND | ND | ND |
| Ethylbenzene | 37 | 790 | 950 | 1,000 | 640 | 42 | 630 | 550 | 410 | 660 | 510 | 400 | 490 | 460 | 480 | 670 | 400 | 460 | 430 | 490 | 540 | 560 | 340 |
| Isopropylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 50 | 63 | 64 |
| m,p-Xylenes | 39 | 1,100 | 1,100 | 990 | 710 | 400 | 750 | 520 | 520 | 900 | 520 | 330 | 440 | 410 | 460 | 780 | 410 | 420 | 350 | 850 | 370 | 230 | 260 |
| n-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 39 | 43 | 88 |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 570 | 600 | 910 |
| o-Xylene | a | a | a | a | a | a | a | a | a | a | a | a | a | a | a | a | a | a | a | a | 38 | 27 | 31 |
| para-Isopropyl Toluene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 22 | 21 | 42 |
| Propylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 86 | 120 | 110 |
| sec-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 13 | 21 |
| tert-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | ND | ND |
| Toluene | 6 | 120 | 110 | 140 | 120 | 79 | 100 | 72 | 81 | 120 | 85 | 92 | 93 | 75 | 66 | 150 | 96 | 76 | 74 | 160 | 100 | 84 | 49 |
| trans-1,2-Dichloroethene | -- | -- | ND | 2.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | -- | -- | ND | ND | ND | ND |
| Trichloroethene | -- | -- | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 | ND | ND | -- | -- | ND | ND | ND | ND |
| Vinyl Chloride | -- | -- | ND | ND | 2.2 | 1.5 | ND | ND | 1.0 | ND | 2.1 | ND | ND | ND | ND | ND | ND | -- | -- | 0.46 | ND | ND | ND |
| **TPH (µg/L)** | **7/92** | **11/92** | **3/93** | **5/93** | **8/93** | **12/93** | **3/94** | **6/94** | **10/94** | **2/95** | **6/95** | **10/95** | **2/96** | **6/96** | **9/96** | **1/97** | **5/97** | **12/97** | **3/98** | **7/98** | **4/99** | **5/00** | **8/01** |
| Diesel (TPH-d) | 1,500 | 17,000 | 37,000 | 6,000 | 54,000 | 720 | 6,100 | 3,000 | 53,000 | 49,000 | 6,600 | 31,000 | 11,000 | 5,500 | 13,000 | 30,000 | 24,000 | 24,000 | 9,500 | 490,000 | 5,800 | 6,900 | 28,000 |
| Motor Oil (TPH-o) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 750 | 840 | 3,800 |

Notes:

a Laboratory analytical report only lists total xylenes
µg/L Micrograms per liter
-- Not analyzed
ND Not detected
TPH Total petroleum hydrocarbons
VOC Volatile organic compound

TABLE A-3

CHEMICAL CONCENTRATIONS IN GROUNDWATER

MONITORING WELL MW-3

FROM JULY 1992 TO AUGUST 2001

2301 EAST 12TH STREET

| ANALYTE | SAMPLE DATE | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| VOC (µg/L) | 7/92 | 11/92 | 3/93 | 5/93 | 8/93 | 12/93 | 3/94 | 6/94 | 10/94 | 2/95 | 6/95 | 10/95 | 2/96 | 6/96 | 9/96 | 1/97 | 5/97 | 12/97 | 3/98 | 7/98 | 4/99 | 5/00 | 8/01 |
| 1,2,4-Trimethylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 0.5 | ND |
| 1,3,5-Trimethylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | ND | ND |
| Benzene | 150 | 78 | 120 | 570 | 180 | 30 | 180 | 230 | 140 | 220 | 310 | 120 | 62 | 110 | 68 | 64 | 67 | 63 | ND | 87 | 73 | 0.5 | 59 |
| Chlorobenzene | -- | -- | ND | -- | ND | -- | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | -- | -- | ND | ND | ND | ND |
| cis-1,2-Dichloroethene | -- | -- | ND | -- | ND | -- | ND | 6.0 | 8.4 | 4.3 | 4.9 | 7.1 | 7.3 | 6.9 | 11 | 4.9 | 4.9 | -- | -- | 1.1 | ND | 3.4 | ND |
| Ethylbenzene | 88 | 830 | 240 | 640 | 110 | 12 | 100 | 93 | 68 | 110 | 160 | 32 | 50 | 130 | 61 | 38 | 51 | 68 | 53 | 44 | 29 | 18 | 13 |
| Isopropylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 41 | 41 | 41 |
| m,p-Xylenes | 13 | 13 | 37 | 8.4 | 9.4 | 62 | 24 | 7.6 | 25 | 22 | 63 | 16 | 33 | 160 | 42 | 60 | 20 | 48 | 21 | 25 | 6.3 | 5.4 | 4.6 |
| n-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 17 | 20 | 21 |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.4 | 3.9 | 3 |
| o-Xylene | a | ND | ND | a | a | a | a | a | a | a | a | a | a | a | a | a | a | a | a | a | ND | 0.6 | ND |
| para-Isopropyl Toluene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 18 | 21 | 22 |
| Propylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 45 | 48 | 47 |
| sec-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 12 | 13 | 14 |
| tert-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 3.3 | 1.3 | 1.3 |
| Toluene | 8.6 | 3.1 | ND | 4.1 | 15 | 14 | 10 | 13 | 8.7 | 17 | 23 | 6.7 | 13 | 65 | 20 | 19 | 13 | 22 | 1.5 | 13 | 7.0 | 6.3 | 5.8 |
| trans-1,2-Dichloroethene | -- | -- | ND | -- | ND | -- | ND | 1.5 | 2.1 | 1.3 | 1.7 | 2.0 | 2.6 | 2.5 | ND | 2.0 | 2.4 | -- | -- | 0.81 | 3.3 | 2.6 | ND |
| Trichloroethene | -- | -- | ND | -- | 16 | -- | 6.0 | ND | 12 | 5.1 | 5.7 | 7.8 | 9.3 | ND | 13 | 3.9 | ND | -- | -- | ND | 6.7 | 3.9 | 4.4 |
| Vinyl Chloride | -- | -- | ND | -- | ND | -- | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | -- | -- | ND | ND | ND | ND |
| **TPH (µg/L)** | **7/92** | **11/92** | **3/93** | **5/93** | **8/93** | **12/93** | **3/94** | **6/94** | **10/94** | **2/95** | **6/95** | **10/95** | **2/96** | **6/96** | **9/96** | **1/97** | **5/97** | **12/97** | **3/98** | **7/98** | **4/99** | **5/00** | **8/01** |
| Diesel (TPH-d) | 4,000 | 21,000 | 9,300 | 4,400 | 8,200 | 230 | 4,300 | 1,500 | 2,700 | 1,600 | 13,000 | 1,900 | 9,400 | 5,000 | 15,000 | 57,000 | 30,000 | 16,000 | 10,000 | 17,000 | 3,200 | 9,700 | 9,800 |
| Motor Oil (TPH-o) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 280 | 390 | 750 |

Notes:

| | |
|---|---|
| a | Laboratory analytical report only lists total xylenes |
| µg/L | Micrograms per liter |
| -- | Not analyzed |
| ND | Not detected |
| TPH | Total petroleum hydrocarbons |
| VOC | Volatile organic compound |

## TABLE A-4
## CHEMICAL CONCENTRATIONS IN GROUNDWATER
## MONITORING WELL MW-4
## FROM MARCH 1994 TO AUGUST 2001
## 2301 EAST 12TH STREET

| ANALYTE | SAMPLE DATE | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VOC (µg/L)** | **3/94** | **6/94** | **10/94** | **2/95** | **6/95** | **10/95** | **2/96** | **6/96** | **9/96** | **1/97** | **5/97** | **12/97** | **3/98** | **7/98** | **4/99** | **5/00** | **8/01** |
| 1,2,4-Trimethylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | ND | ND |
| 1,3,5-Trimethylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | ND | ND |
| Benzene | 19 | 2.9 | 3.8 | 100 | 31 | 43 | ND | 12 | ND | ND | ND | 41 | ND | 2.2 | ND | ND | ND |
| Chlorobenzene | -- | -- | ND | ND | ND | ND | ND | ND | ND | ND | ND | -- | -- | ND | ND | ND | ND |
| cis-1,2-Dichloroethene | -- | -- | 0.71 | ND | 2.2 | 1.3 | 1.8 | ND | ND | 0.76 | ND | -- | -- | ND | ND | ND | ND |
| Ethylbenzene | 2.9 | 2.8 | 5.2 | 3.8 | 6.1 | 8.4 | ND | 3.4 | 78 | 3.0 | 3.4 | 14 | 3.7 | 2.0 | 0.8 | ND | ND |
| Isopropylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 18 | 10 | 10 |
| m,p-Xylenes | 12 | 4.6 | 24 | 7.1 | 12 | 6.9 | ND | 9.6 | 12 | 15 | 5.7 | 20 | 6.2 | 2.1 | ND | ND | ND |
| n-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 11 | 4.6 | 5.9 |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | ND | ND |
| o-Xylene | a | a | a | a | a | a | ND | a | a | a | a | a | a | a | ND | ND | ND |
| para-Isopropyl Toluene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7.9 | 2.8 | 3.6 |
| Propylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 18 | 9.4 | 9.1 |
| sec-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13 | 7.0 | 8.2 |
| tert-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 1.0 | 1.2 |
| Toluene | 1.2 | 1.6 | 2.0 | 100 | 3.4 | 2.3 | ND | 5.7 | 15 | 7.0 | 5.1 | 13 | 5.0 | 1.5 | ND | ND | ND |
| trans-1,2-Dichloroethene | -- | -- | ND | ND | 1.0 | ND | 0.79 | ND | ND | ND | ND | -- | -- | ND | ND | ND | ND |
| Trichloroethene | -- | -- | ND | ND | ND | ND | ND | ND | ND | ND | ND | -- | -- | ND | ND | ND | ND |
| Vinyl Chloride | -- | -- | ND | ND | ND | ND | ND | ND | ND | ND | ND | -- | -- | ND | ND | ND | ND |
| **TPH (µg/L)** | **3/94** | **6/94** | **10/94** | **2/95** | **6/95** | **10/95** | **2/96** | **6/96** | **9/96** | **1/97** | **5/97** | **12/97** | **3/98** | **7/98** | **4/99** | **5/00** | **8/01** |
| Diesel (TPH-d) | 1,800 | 420 | 900 | 630 | 1,100 | 1,100 | 940 | 1,100 | 2,500 | 13,000 | 6,200 | 650 | 1,300 | 1,000 | 2,500 | 580 | 28,000 |
| Motor Oil (TPH-o) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 300 | ND | 3,000 |

Notes:

| | |
|---|---|
| a | Laboratory analytical report only lists total xylenes |
| µg/L | Micrograms per liter |
| -- | Not analyzed |
| ND | Not detected |
| TPH | Total petroleum hydrocarbons |
| VOC | Volatile organic compound |

## TABLE A-5
## CHEMICAL CONCENTRATIONS IN GROUNDWATER
## MONITORING WELL MW-5
## FROM MARCH 1994 TO AUGUST 2001
## 2301 EAST 12TH STREET

| ANALYTE | SAMPLE DATE | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VOC (µg/L)** | **3/94** | **6/94** | **10/94** | **2/95** | **6/95** | **10/95** | **2/96** | **6/96** | **9/96** | **1/97** | **5/97** | **12/97** | **3/98** | **7/98** | **4/99** | **5/00** | **8/01** |
| 1,2,4-Trimethylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 0.8 | ND |
| 1,3,5-Trimethyibenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | ND | ND |
| Benzene | 71 | 220 | 120 | 130 | 140 | 43 | 61 | 94 | 140 | 64 | 120 | 66 | 48 | 69 | 73 | 53 | 44 |
| Chlorobenzene | -- | 0.53 | 0.66 | ND | 0.95 | 0.54 | 0.57 | ND | 0.83 | 0.71 | ND | -- | -- | 0.68 | ND | 1.1 | 1.4 |
| cis-1,2-Dichloroethene | -- | 11 | 16 | 20 | 12 | 9.8 | 7.7 | 2.9 | 4.5 | 6.1 | 0.55 | -- | -- | 1.8 | ND | 3.6 | 3.1 |
| Ethylbenzene | 27 | 38 | 27 | 38 | 27 | 8.4 | 34 | 32 | 18 | 23 | 21 | 15 | 14 | 11 | 13 | 5.6 | 5.2 |
| Isopropylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 55 | 43 | 44 |
| m,p-Xylenes | 15 | 24 | 13 | 29 | 29 | 6.9 | ND | 40 | 21 | 26 | 23 | 25 | 21 | 15 | 13 | 8.1 | 7.3 |
| n-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 14 | 11 | 12 |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 42 | 26 | 23 |
| o-Xylene | a | a | a | a | a | a | ND | a | a | a | a | a | a | a | ND | 1.5 | 1.3 |
| para-Isopropyl Toluene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9.9 | 6.3 | 6.3 |
| Propylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 80 | 61 | 63 |
| sec-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8.3 | 6.8 | 7.7 |
| tert-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | ND | ND |
| Toluene | ND | 12 | 5.1 | 7.9 | 6.7 | 2.3 | 5.3 | 11 | 7.5 | 8.7 | 7.6 | 8.7 | 7.2 | 6.0 | 5.0 | 3.4 | 3.1 |
| trans-1,2-Dichloroethene | -- | 3.1 | 4.2 | 5.1 | 4.1 | 2.9 | ND | ND | 2.7 | 3.8 | ND | -- | -- | 2.0 | 2.7 | 3.6 | 5.3 |
| Trichloroethene | -- | ND | ND | ND | ND | 2.0 | ND | ND | ND | ND | ND | -- | -- | ND | ND | ND | ND |
| Vinyl Chloride | -- | 7.5 | 9.6 | 8.4 | 10 | 7.6 | 5.3 | ND | 7.3 | 9.1 | 1.1 | -- | -- | 5.3 | ND | ND | 13 |
| **TPH (µg/L)** | **3/94** | **6/94** | **10/94** | **2/95** | **6/95** | **10/95** | **2/96** | **6/96** | **9/96** | **1/97** | **5/97** | **12/97** | **3/98** | **7/98** | **4/99** | **5/00** | **8/01** |
| Diesel (TPH-d) | 870 | 950 | 1,100 | 1,200 | 1,000 | 940 | 2,200 | -- | 1,600 | 2,500 | 3,400 | 2,400 | 1,200 | 1,600 | 1,500 | 1,000 | 2,100 |
| Motor Oil (TPH-o) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 290 | ND | 340 |

Notes:

| | |
|---|---|
| a | Laboratory analytical report only lists total xylenes |
| µg/L | Micrograms per liter |
| -- | Not analyzed |
| ND | Not detected |
| TPH | Total petroleum hydrocarbons |
| VOC | Volatile organic compound |

## TABLE A-6
## CHEMICAL CONCENTRATIONS IN GROUNDWATER
## MONITORING WELL MW-6
## FROM MARCH 1994 TO AUGUST 2001
## 2301 EAST 12TH STREET

| ANALYTE | SAMPLE DATE | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **VOC (µg/L)** | **3/94** | **6/94** | **10/94** | **2/95** | **6/95** | **10/95** | **2/96** | **6/96** | **9/96** | **1/97** | **5/97** | **12/97** | **3/98** | **7/98** | **4/99** | **5/00** | **8/01** |
| 1,2,4-Trimethylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | ND | ND |
| 1,3,5-Trimethylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | ND | ND |
| Benzene | 1,100 | 1,200 | 870 | 1,000 | 1,300 | 590 | 460 | 630 | 550 | 850 | 450 | 530 | 630 | 420 | 280 | 320 | 240 |
| Chlorobenzene | -- | -- | -- | ND | ND | ND | ND | ND | ND | ND | ND | -- | -- | ND | ND | ND | ND |
| cis-1,2-Dichloroethene | -- | -- | -- | 40 | 26 | 75 | 110 | 72 | 73 | 81 | 50 | -- | -- | 54 | 72 | 44 | 43 |
| Ethylbenzene | 180 | 210 | 140 | 210 | 240 | 84 | 110 | 140 | 120 | 190 | 38 | 130 | 120 | 60 | 66 | 61 | 34 |
| Isopropylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 17 | 20 | 15 |
| m,p-Xylenes | 41 | 54 | 49 | 55 | 79 | 24 | 23 | 37 | 38 | 43 | 35 | 38 | 25 | 14 | 6.4 | 1.9 | ND |
| n-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 5.8 | 6.7 |
| Naphthalene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | ND | ND |
| o-Xylene | a | a | a | a | a | a | a | a | a | a | a | a | a | a | ND | ND | ND |
| para-Isopropyl Toluene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 3.9 | 2.8 |
| Propylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 15 | 17 | 14 |
| sec-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | 4.0 | 3.9 |
| tert-Butylbenzene | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | ND | ND | ND |
| Toluene | 17 | 21 | 14 | 17 | 24 | 8.8 | 11 | 14 | 14 | 17 | 9.1 | 13 | 11 | 7 | 4.4 | 3.8 | 2.5 |
| trans-1,2-Dichloroethene | -- | -- | -- | 13 | 17 | 16 | 25 | 20 | 25 | 21 | 17 | -- | -- | 16 | 21 | 18 | 15 |
| Trichloroethene | -- | -- | -- | 99 | 29 | 110 | 160 | 83 | 59 | 82 | 52 | -- | -- | 34 | 75 | 46 | 33 |
| Vinyl Chloride | -- | -- | -- | 87 | 130 | 54 | 46 | 33 | 48 | 29 | 26 | -- | -- | 12 | ND | ND | 13 |
| **TPH (µg/L)** | **3/94** | **6/94** | **10/94** | **2/95** | **6/95** | **10/95** | **2/96** | **6/96** | **9/96** | **1/97** | **5/97** | **12/97** | **3/98** | **7/98** | **4/99** | **5/00** | **8/01** |
| Diesel (TPH-d) | 1,000 | 660 | 850 | 1,000 | 1,400 | 770 | 1,500 | 1,300 | 1,300 | 2,200 | 3,500 | 1,200 | 1,200 | 1,600 | 3,400 | 730 | 1,400 |
| Motor Oil (TPH-o) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 280 | ND | 300 |

Notes:

| | |
|---|---|
| a | Laboratory analytical report only lists total xylenes |
| µg/L | Micrograms per liter |
| -- | Not analyzed |
| ND | Not detected |
| TPH | Total petroleum hydrocarbons |
| VOC | Volatile organic compound |

# APPENDIX B
# RESULTS OF RESIDENTIAL TIER I SLHHRA

Table B-1

RESULTS OF THE RESIDENTIAL TIER I SLHHRA FOR GROUNDWATER
FROM THE THREE MOST RECENT GROUNDWATER SAMPLING ACTIVITIES IN 1999, 2000, AND 2001
2301 EAST 12TH STREET

| Chemical | Selected Tier I Screening Levels | MW-1 | | | MW-2 | | | MW-3 | | | MW-4 | | | MW-5 | | | MW-6 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 | 4/99 | 5/00 | 8/01 |
| VOC (ug/L) | | | | | | | | | | | | | | | | | | | |
| 1,2,4-Trimethylbenzene | 12 | ND | 5.4 | ND | **200** | **110** | **240** | ND | 0.5 | ND | ND | ND | ND | ND | 0.8 | ND | ND | ND | ND |
| 1,3,5-Trimethylbenzene | 12 | ND | 6.4 | ND | **120** | **100** | **190** | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| Benzene | 110 | **1,300** | **1,300** | **1,000** | **1,100** | **970** | **630** | 73 | 0.5 | 59 | ND | ND | ND | 73 | 53 | 44 | **280** | **320** | **240** |
| Chlorobenzene | 2400 | ND | ND | ND | 5.2 | 4.6 | ND | ND | ND | ND | ND | ND | ND | ND | 1.1 | 1.4 | ND | ND | ND |
| cis-1,2-Dichloroethene | 35000 | ND | 1 | ND | ND | ND | ND | ND | 3.4 | ND | ND | ND | ND | ND | 3.6 | 3.1 | 72 | 44 | 43 |
| Ethylbenzene | >SOL | 93 | 98 | 92 | 540 | 560 | 340 | 29 | 18 | 13 | 0.8 | ND | ND | 13 | 5.6 | 5.2 | 66 | 61 | 34 |
| Isopropylbenzene | 660 | ND | 17 | 20 | 50 | 63 | 64 | 41 | 41 | 41 | 18 | 10 | 10 | 55 | 43 | 44 | 17 | 20 | 15 |
| m,p-Xylenes | >SOL | 36 | 24 | 20 | 370 | 230 | 260 | 6.3 | 5.4 | 4.6 | ND | ND | ND | 13 | 8.1 | 7.3 | 6.4 | 1.9 | ND |
| n-Butylbenzene | 240 | ND | 10 | 10 | 39 | 43 | 88 | 17 | 20 | 21 | 11 | 4.6 | 5.9 | 14 | 11 | 12 | ND | 5.8 | 6.7 |
| Naphthalene | >SOL | ND | 16 | 17 | 570 | 600 | 910 | 3.4 | 3.9 | 3 | ND | ND | ND | 42 | 26 | 23 | ND | ND | ND |
| o-Xylene | >SOL | ND | 1.9 | ND | 38 | 27 | 31 | ND | 0.6 | ND | ND | ND | ND | ND | 1.5 | 1.3 | ND | ND | ND |
| para-Isopropyl Toluene | 210000 | ND | 9.6 | 12 | 22 | 21 | 42 | 18 | 21 | 22 | 7.9 | 2.8 | 3.6 | 9.9 | 6.3 | 6.3 | ND | 3.9 | 2.8 |
| Propylbenzene | 240 | ND | 17 | 19 | 86 | 120 | 110 | 45 | 48 | 47 | 18 | 9.4 | 9.1 | 80 | 61 | 63 | 15 | 17 | 14 |
| sec-Butylbenzene | 240 | ND | 7.2 | 7.6 | ND | 13 | 21 | 12 | 13 | 14 | 13 | 7 | 8.2 | 8.3 | 6.8 | 7.7 | ND | 4 | 3.9 |
| tert-Butylbenzene | 240 | ND | ND | ND | ND | ND | ND | 3.3 | 1.3 | 1.3 | ND | 1 | 1.2 | ND | ND | ND | ND | ND | ND |
| Toluene | 210000 | 30 | 30 | 19 | 100 | 84 | 49 | 7 | 6.3 | 5.8 | ND | ND | ND | 5 | 3.4 | 3.1 | 4.4 | 3.8 | 2.5 |
| trans-1,2-Dichloroethene | 32000 | ND | ND | ND | ND | ND | ND | 3.3 | 2.6 | ND | ND | ND | ND | 2.7 | 3.6 | 5.3 | 21 | 18 | 15 |
| Trichloroethene | 690 | 20 | ND | ND | ND | ND | ND | 6.7 | 3.9 | 4.4 | ND | ND | ND | ND | ND | ND | 75 | 46 | 33 |
| Vinyl Chloride | 3.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | **13** | ND | ND | **13** |

Notes:

ug/L micrograms per liter
ND Not detected
VOC Volatile organic compound
Bold/shaded numbers indicate concentration exceeds Tier I Screening Level.
>SOL RBSL exceeds the solubility of the chemical in water.

# TABLE B-2
# RESULTS OF RESIDENTIAL TIER I SLHHRA FOR SOIL
# COLLECTED IN 1999
# 2301 EAST 12TH STREET

| Analyte | | Location and Depth | | | | | |
|---|---|---|---|---|---|---|---|
| VOC (mg/Kg) | Selected Tier I Screening Levels | SB-1 JW1-09 15.5-16 ft bgs | SB-2 JW1-13 15-15.5 ft bgs | SB-3 JW1-17 18-18.5 ft bgs | SB-4 JW1-12 18-18.5 ft bgs | SB-5 JW1-16 13-13.5 ft bgs | SB-6 JW1-20 19-19.5 ft bgs |
| Isopropylbenzene | 160 | ND | ND | ND | ND | **600** | ND |
| Propylbenzene (as n-Propylbenzene) | 240 | ND | ND | ND | ND | **920** | ND |
| cis-1,2-Dichloroethene | 14 | ND | ND | ND | 4.2 | ND | ND |
| n-Butylbenzene | 240 | ND | ND | ND | ND | **510** | ND |
| para-Isopropyl Toluene | 360 | ND | ND | ND | ND | **360** | ND |
| sec-Butylbenzene | 220 | ND | ND | ND | ND | **410** | ND |

Notes:

The analytical results of the soil samples were validated by a TtEMI chemist.

| | |
|---|---|
| bgs | below ground surface |
| ft | feet |
| mg/kg | milligrams per kilogram |
| - - | Not Analyzed |
| ND | Not Detected |
| VOC | Volitile Organic Compound |

Bold/shaded numbers indicate concentration exceeds Tier I Screening Level.