



EXECUTIVE SUMMARY

Main Place, the designated property (*for the purposes of this application referred to as “the Site”*), is located at 811 Main Street within the Central Business District (CBD) of Houston, Harris County, Texas. The Site is currently being developed to include a newly constructed signature one-million square foot 46-story office tower. The Site consists of 1.1799 acres of land situated within City of Houston Block 93 (Figure 1). The rest of City of Houston Block 93, 0.269 acres of land, is not a portion of the Site. The current and future use of the Site and properties located within a 500-foot radius is anticipated to be high-density commercial or high density residential use for the foreseeable future.

Environmental investigations have identified volatile organic compounds (VOCs), total petroleum hydrocarbons (TPH), and lead as chemicals of concern (COCs) in subsurface environmental media (soil and groundwater) at the Site. Specifically COCs exceeding residential assessments levels, as defined by the Texas Commission of Environmental Quality (TCEQ) Texas Risk Reduction Program’s (TRRP) Tier I Protective Concentration Levels (PCLs), also referred to as ingestion PCLs, at the Site have been determined to include tetrachloroethene (PCE), TPH, and lead in soil and PCE, cis-1,2-dichloroethene (cis-1,2-DCE), vinyl chloride (VC), and TPH in groundwater. Protective Concentration Level Exceedance Zones (PCLEZs) by COC and designated by environmental media are depicted in Figures 6A-10C.

In response to the discovery of COCs at the Site, during pre-development activities, the Site was enrolled into the Voluntary Cleanup Program (VCP) administered by the TCEQ on April 7, 2008. The Site has been designated within the program as VCP No. 2159. The source of the COCs at the Site are believed to be associated with historic on-site commercial operations that occurred between 1920s and the 1960s. The historic uses of concern have been documented to include a dry cleaning operation, a fuel oil storage bunker, and an automotive tire service facility.

The impacted groundwater bearing unit (GWBU) at the Site is present from 37 to 40 feet below ground surface. Concentrations of COCs detected in groundwater have not indicated the suspected presence or the potential occurrence of non-aqueous phase liquid (NAPL). The horizontal delineation of groundwater impacted in excess of residential assessment PCLs (Tier 1 ^{GW}GW_{ing} PCLs) has been investigated to the fullest extent practical given the complexity of restricted access due to the urban and heavily congested environment of the Site’s physical setting within the CBD. The groundwater gradient beneath the Site is generally toward the north-northwest. Clay underlying the impacted GWBU serves as a confining layer limiting the vertical migration of COCs. Since the majority of soil overlying the affected GWBU is no longer present and results of recent groundwater do not indicate increasing COCs in groundwater, the groundwater plume is considered stable if not decreasing.

In addition to the removal of impacted soil, remediation efforts at the Site have included the direct treatment of groundwater via In-situ Chemical Oxidation (ISCO). The ISCO treatment of impacted groundwater was designed to reduce the concentrations of VOCs in groundwater along the northeastern property boundary prior to the development of the current improvements. The ISCO groundwater

treatment program consisted of the application of oxidizing reagents which included alkaline activated sodium persulfate into the designated treatment area.

There are no municipalities within a one-half mile of the Site other than the City of Houston. The City of West University Place is the only other municipality located within five miles of the Site which operates a groundwater supply well meeting the definition of a retail public utility (RPU), as defined in Section 13.022 of Texas Water Code. According to the water well search generated from Texas Water Development Board (TWDB), TCEQ, and Harris-Galveston Subsidence District (HGSD) records, there are 751 registered or permitted water wells located within a five mile radius of the boundary of the Site. The City of Houston (COH) provides municipal drinking water to the Site, as well as properties within one-half mile of the boundary of the Site.

Through implementation of a Municipal Setting Designation (MSD), COC concentrations will not exceed non-ingestion PCLs at the Site. Upon passage of the MSD ordinance by the City of Houston and subsequent certification by the TCEQ, the Applicant plans to obtain a VCP Certificate of Completion for the Site utilizing the MSD. Concurrent to obtaining the MSD ordinance by the City of Houston, the applicant is seeking a resolution of support from the City of West University Place, the only RPU within 5 miles of the Site.



Appendix B



Appendix B – Figures

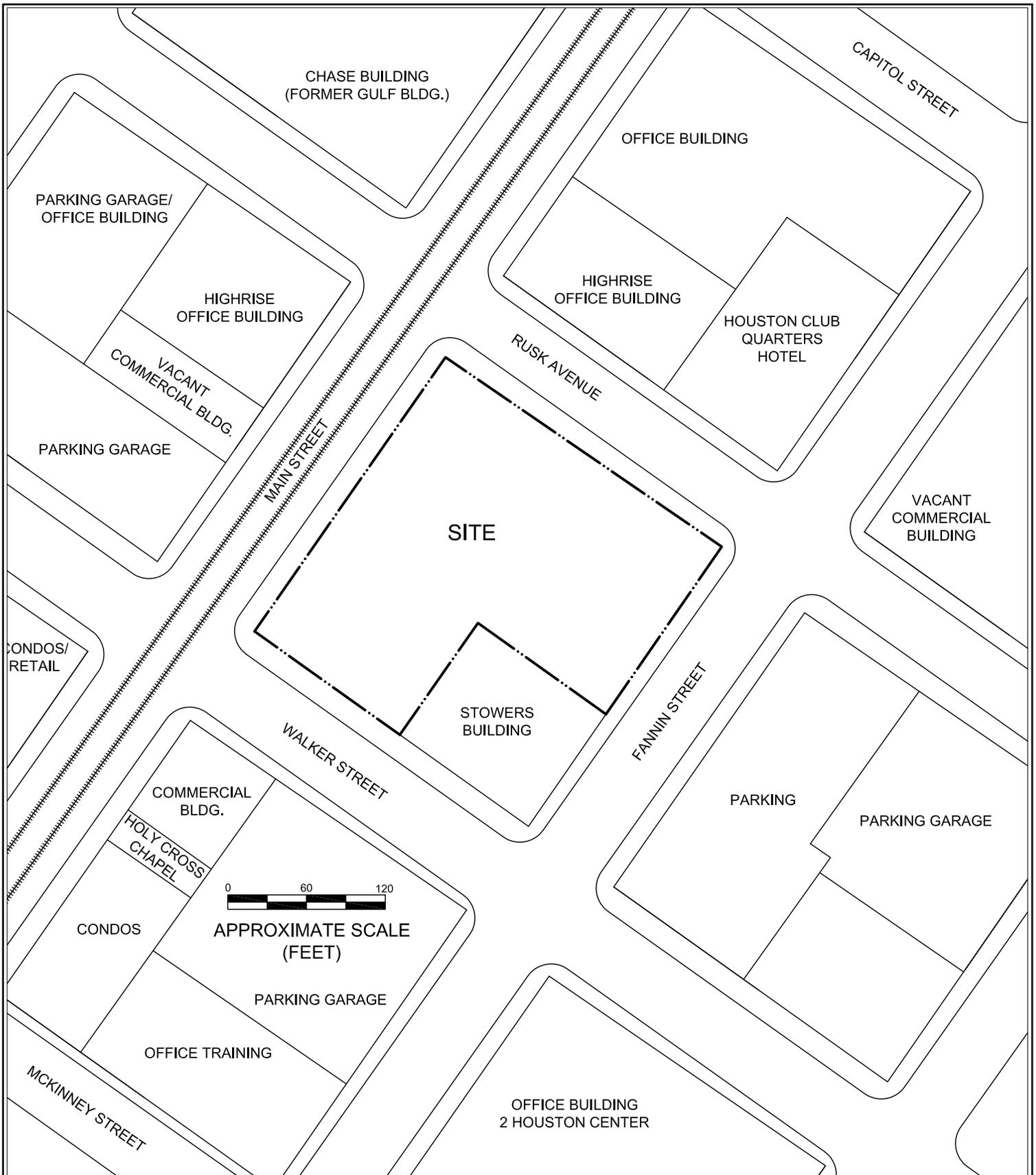
The figures in this appendix provide information required under Item 2 of the COH MSD Application.

Specific figures submitted in support of this application are as follows:

- Figure 1 - Location of Site
- Figure 1A – Location of Site in Central Business District
- Figure 2 - Aerial Photographic Depicting 500 Foot Radius
- Figure 3 - Topographic Map
- Figure 4 - Watershed Map
- Figure 5 - Floodplain Map
- Figure 6 - Soil Sampling Locations
- Figure 6A – Soil PCLE Map for TPH Tier I Ingestion
- Figure 7 - Groundwater Sampling Locations
- Figure 8 - Groundwater PCLE Zone
- Figure 9 - Groundwater Gradient Map
- Figure 10 - Groundwater PCLE Map for TPH Tier I Ingestion
- Figure 10A - Groundwater PCLE for PCE Tier I Ingestion
- Figure 10B - Groundwater PCLE Map for Cis-1,2-DCE Tier I Ingestion
- Figure 10C - Groundwater PCLE Map for Vinyl Chloride Tier I Ingestion
- Figure 11 - ISCO Application Well Map
- Figure 12 – Rusk Avenue Boring Locations
- Figure 13 – Property Survey

The Site (Figures 1 & 2) is located on the USGS Settegast Quadrangle 7.5-minute topographic map (Figure 3) and is situated at approximately 50 feet above mean sea level (msl). Regional topographic gradient for the surrounding area is mostly flat with a slight gradient to the north. The Site is situated within the Buffalo Bayou Watershed (Figure 4). The Buffalo Bayou Watershed, part of the Buffalo San Jacinto drainage system, lies in the central and western portions of metropolitan Houston, Texas. There is no known connection of COCs associated with the Site to any surface water body.

According to Federal Emergency Management Agency (FEMA) website, the Flood Plain Map number for the Site is 48201C0690L dated June 18, 2007. The Site is situated in un-shaded Zone X (Figure 5), which is described as areas outside the 0.2 percent annual chance flood plain. The nearest surface water body, Buffalo Bayou, is located approximately 2,000 feet north of the affected property.



LEGEND:

 - PROPERTY BOUNDARY

 - LIGHT RAIL LINE



MEC^x, LP
3203 AUDLEY
HOUSTON, TEXAS 77098

FIGURE 1 - SITE LOCATION MAP

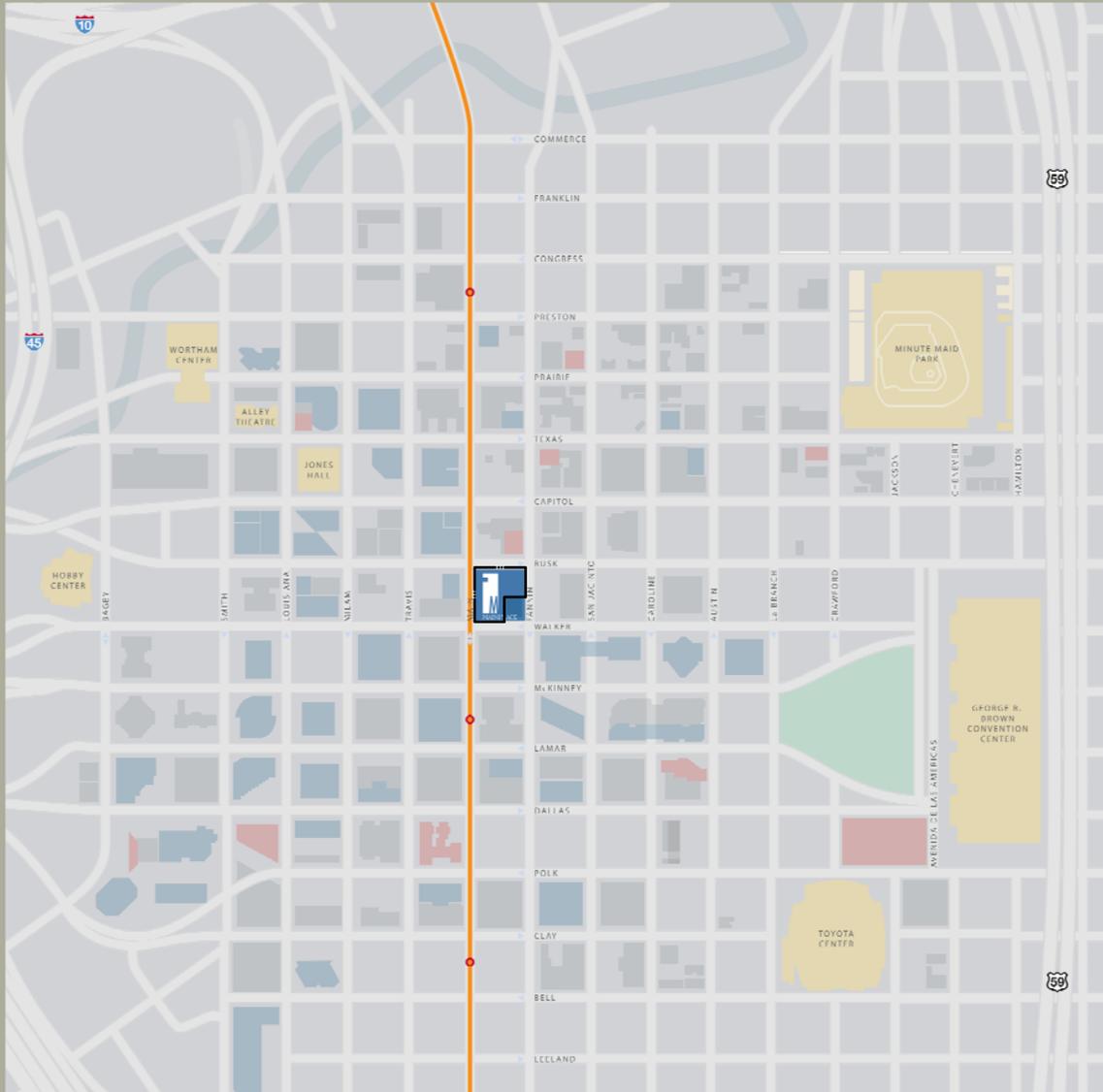
MAIN PLACE
811 MAIN STREET
HOUSTON, TEXAS 77002

PROJECT NO: 1314.001H.02

REV. DATE: 09/30/2010 RCB

DOWNTOWN

CBD Map



Amenities

- HOTELS
- ATTRACTIONS
- OFFICE BUILDINGS
- OTHER BUILDINGS

LEGEND:

f. j - PROPERTY BOUNDARY



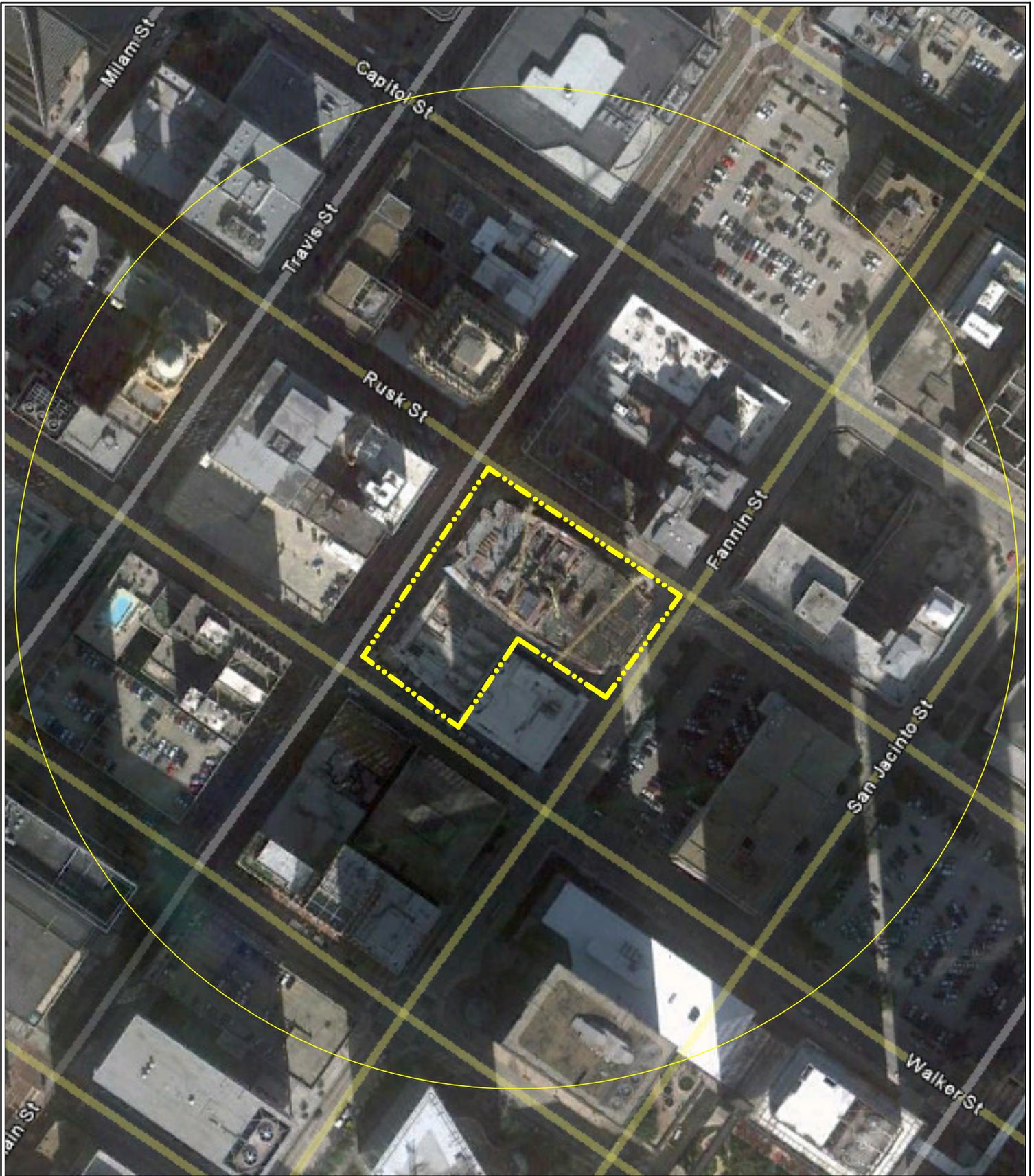
MEC^x, LP
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 HOUSTON, TEXAS 77098

**FIGURE 1A - SITE LOCATION IN
 CENTRAL BUSINESS DISTRICT**

MAIN PLACE
 811 MAIN STREET
 HOUSTON, TEXAS 77002

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LEGEND:

 - PROPERTY BOUNDARY

 - 500 FOOT BOUNDARY

NOTES:
 MAP SOURCE: GOOGLE EARTH, [HTTP://WWW.EARTH.GOOGLE.COM](http://www.earth.google.com)



NORTH



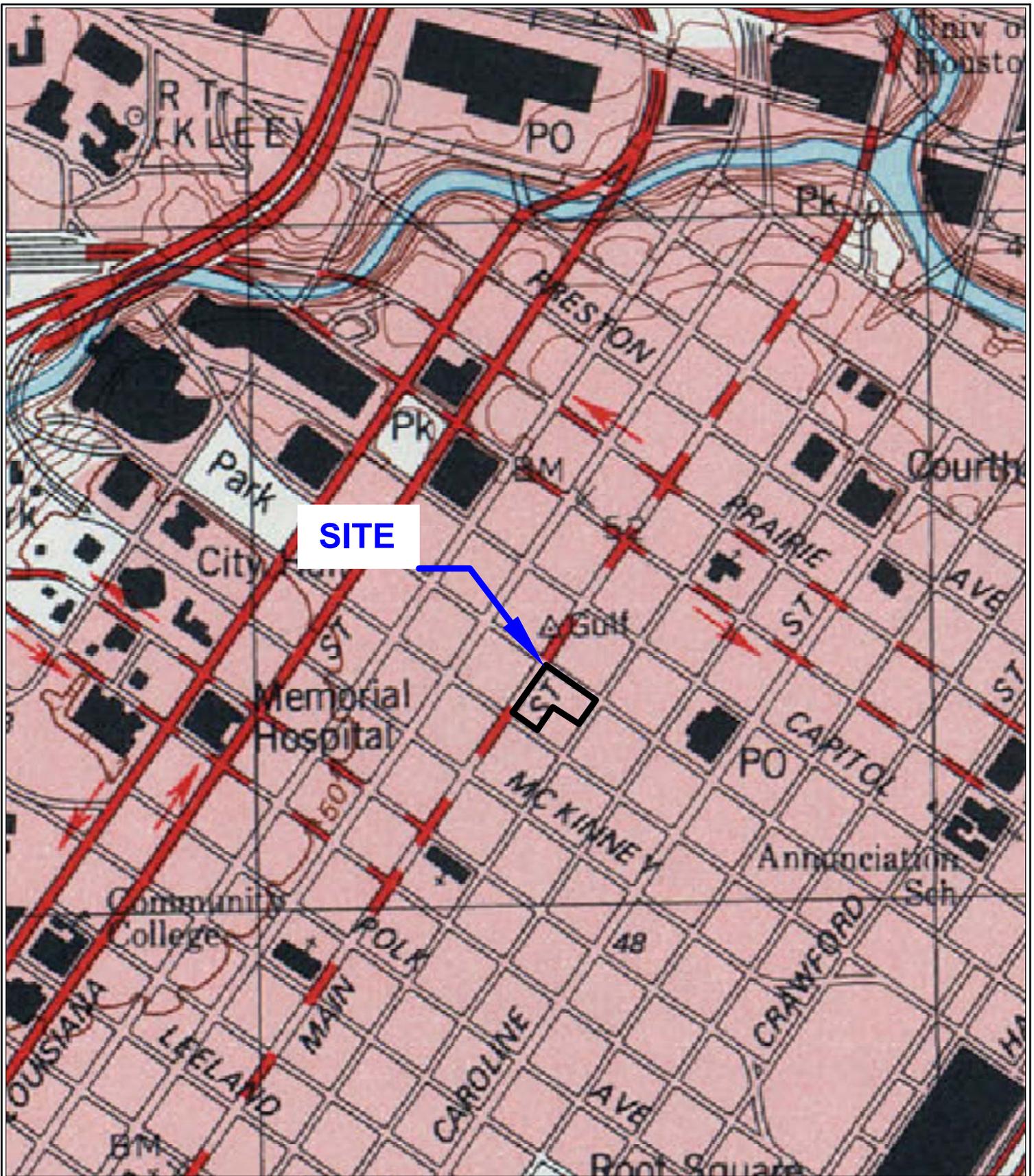
MEC^x, LP
 3203 AUDLEY
 HOUSTON, TEXAS 77098

FIGURE 2 - AERIAL PHOTOGRAPHIC OVERLAY

MAIN PLACE
 811 MAIN STREET
 HOUSTON, TEXAS 77002

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REV. DATE: 09/30/2010 RCB



SITE



SOURCE:

UNITED STATES GEOLOGICAL SURVEY
 TOPOGRAPHIC 7.5' QUADRANGLE MAP,
 SETTLEGAST (DATED 1995)



NORTH



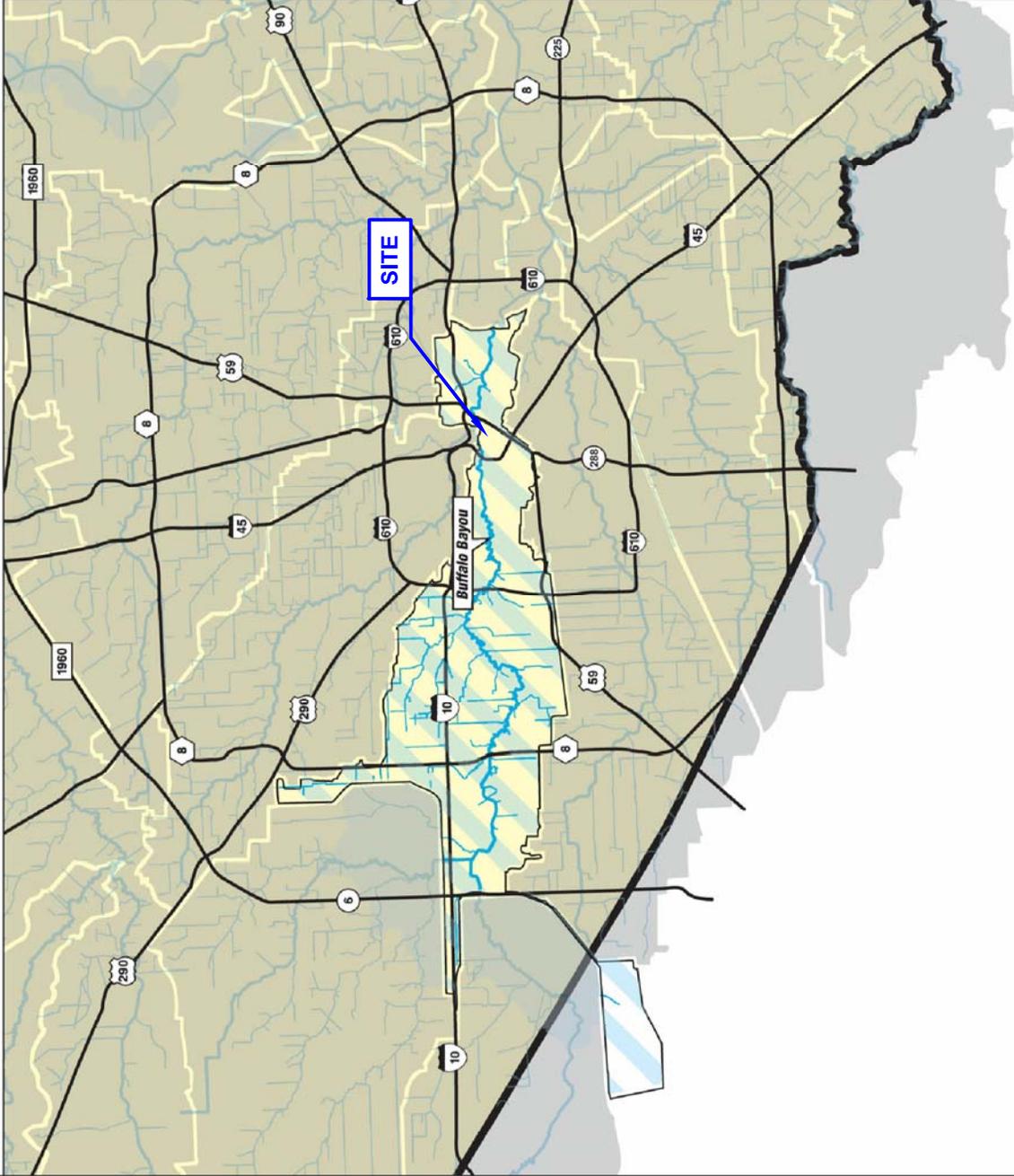
MEC^x, LP
 3203 AUDLEY
 HOUSTON, TEXAS 77098

FIGURE 3 - TOPOGRAPHIC MAP

MAIN PLACE
 811 MAIN STREET
 HOUSTON, TEXAS 77002

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Drainage Area:

103 Sq. Miles

Watershed Population (in Harris County):

410,658

Open Stream Miles:

116 Miles

Primary Streams:

Buffalo Bayou

Channel Unit

**Buffalo Bayou
Watershed**

W

SOURCE:

HARRIS COUNTY FLOOD CONTROL DISTRICT



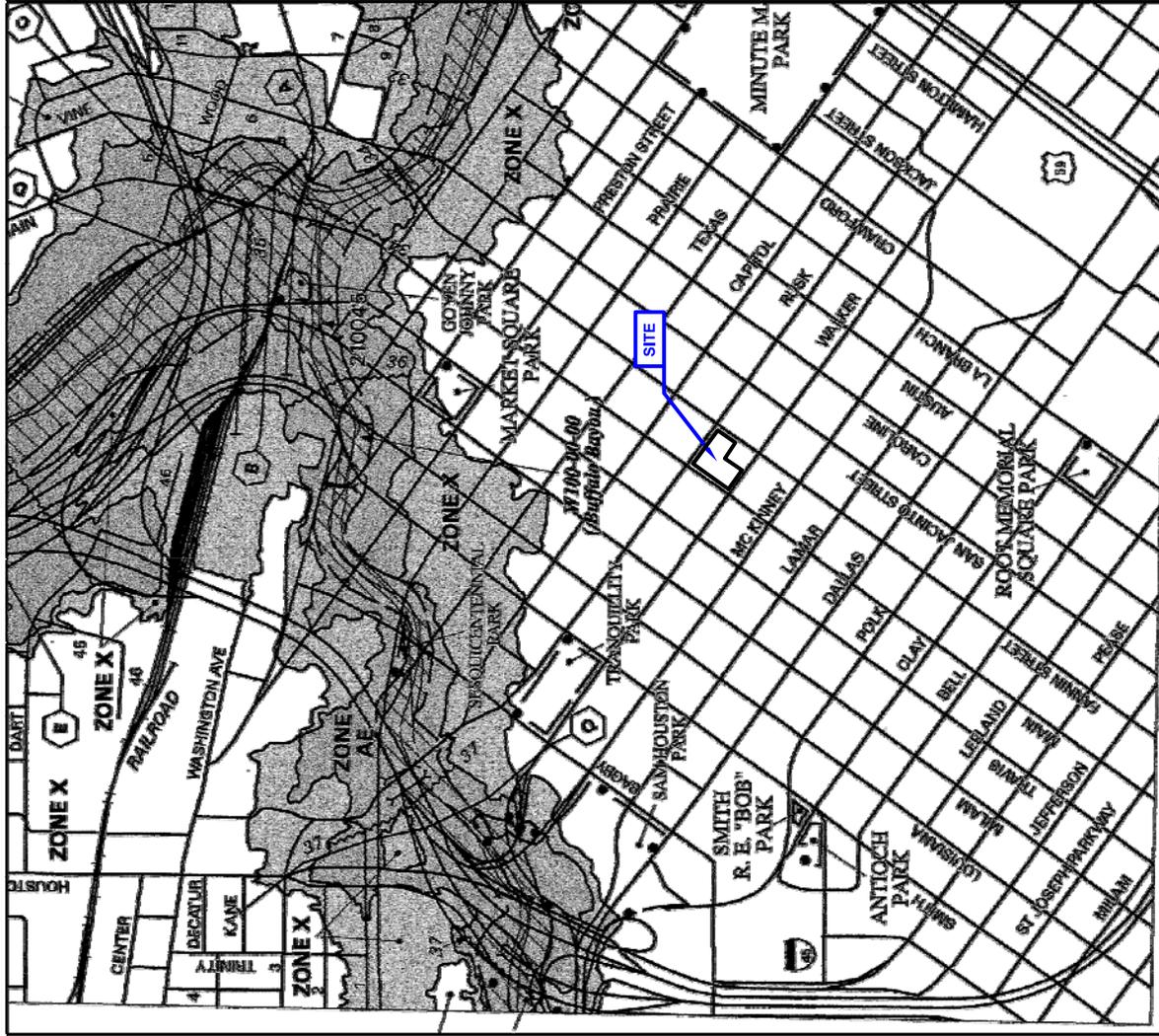
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HOUSTON, TEXAS 77098

FIGURE 4 - WATERSHED MAP

MAIN PLACE
811 MAIN STREET
HOUSTON, TEXAS 77002

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SCALE 1" = 1000'



PANEL 0690L

FIRM
FLOOD INSURANCE RATE MAP
HARRIS COUNTY,
TEXAS
AND INCORPORATED AREAS

PANEL 690 OF 1150

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

DATE: 06/18/2007
 DRAWN BY: J. M. B. / J. M. B.
 CHECKED BY: J. M. B. / J. M. B.
 APPROVED BY: J. M. B. / J. M. B.

MAP NUMBER
48201C0690L
MAP REVISED:
JUNE 18, 2007



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using the MIT 2D-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msa.fema.gov

SOURCE:
 FEDERAL EMERGENCY MANAGEMENT AGENCY
 (FEMA) WEBSITE, WWW.FEMA.GOV

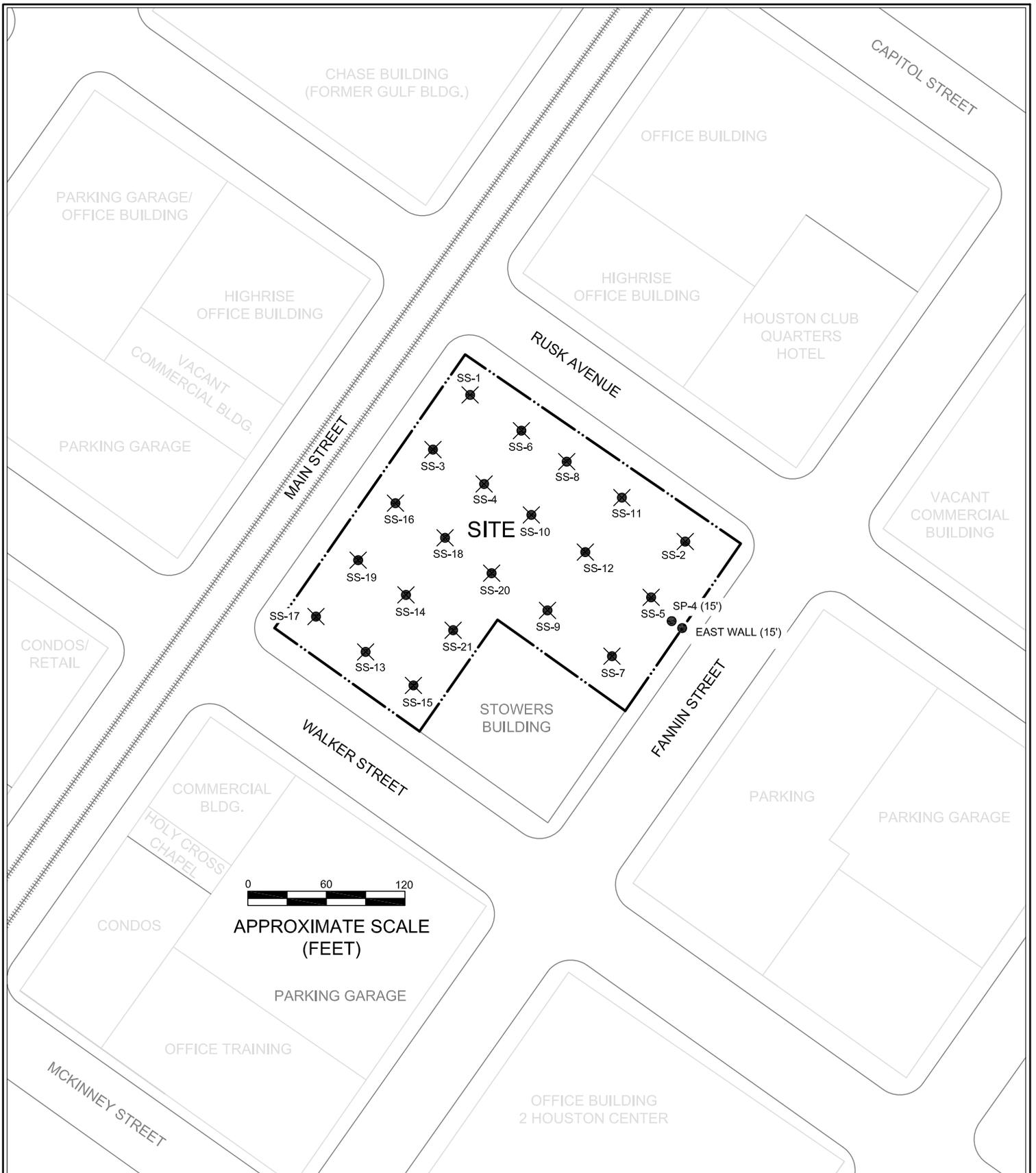


MEC, LP
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FIGURE 5 - FLOODPLAIN MAP
 MAIN PLACE
 811 MAIN STREET
 HOUSTON, TEXAS 77002

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LEGEND:

-  - SOIL BORING
-  - SOIL SAMPLE
-  - PROPERTY BOUNDARY



MEC^x, LP
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 HOUSTON, TEXAS 77098

**FIGURE 6 - SOIL SAMPLING
 LOCATION MAP**
 MAIN PLACE
 811 MAIN STREET
 HOUSTON, TEXAS 77002

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CHASE BUILDING
(FORMER GULF BLDG.)

CAPITOL STREET

OFFICE BUILDING

PARKING GARAGE/
OFFICE BUILDING

HIGHRISE
OFFICE BUILDING

HIGHRISE
OFFICE BUILDING

HOUSTON CLUB
QUARTERS
HOTEL

SS-21			
COC	RESULT	TIER 1 PCL	DEPTH BGS
TPH C6-C12	85.1	65	35

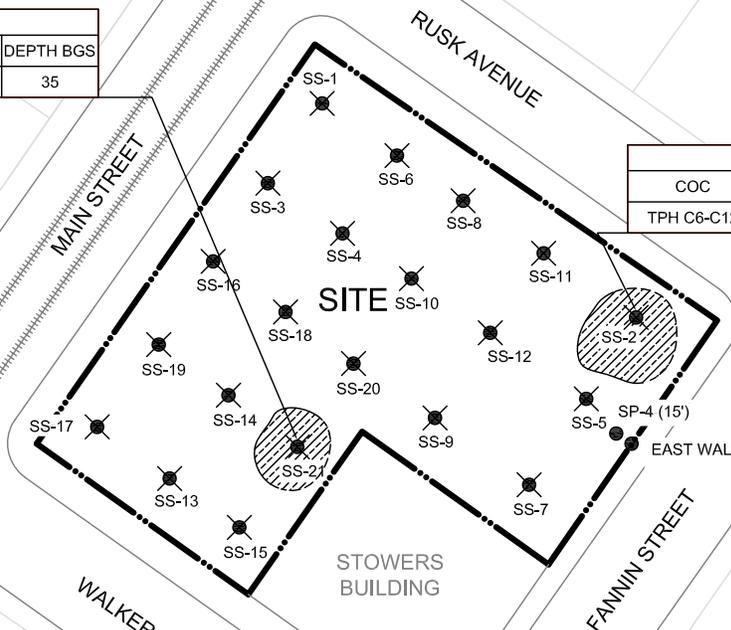
PARKING GARAGE

RUSK AVENUE

SS-2			
COC	RESULT	TIER 1 PCL	DEPTH BGS
TPH C6-C12	80.9	65	35

VACANT
COMMERCIAL
BUILDING

CONDOS/
RETAIL



SITE

SP-4 (15')
EAST WALL (15')

STOWERS
BUILDING

WALKER STREET

FANNIN STREET

COMMERCIAL
BLDG.

PARKING

PARKING GARAGE



APPROXIMATE SCALE
(FEET)

CONDOS

HOLY CROSS
CHAPEL

PARKING GARAGE

OFFICE TRAINING

OFFICE BUILDING
2 HOUSTON CENTER

MCKINNEY STREET

LEGEND:

- SOIL BORING
- SOIL SAMPLE
- PROPERTY BOUNDARY
- ESTIMATE EXTENT OF SOIL TIER 1 RESIDENTIAL EXCEEDENCE

NOTES:
ALL CONCENTRATIONS LISTED IN MG/KG (PPM)
BOLD NUMBERS REPRESENT TIER 1 RESIDENTIAL EXCEEDENCE
BGS - BELOW GROUND SURFACE



NORTH



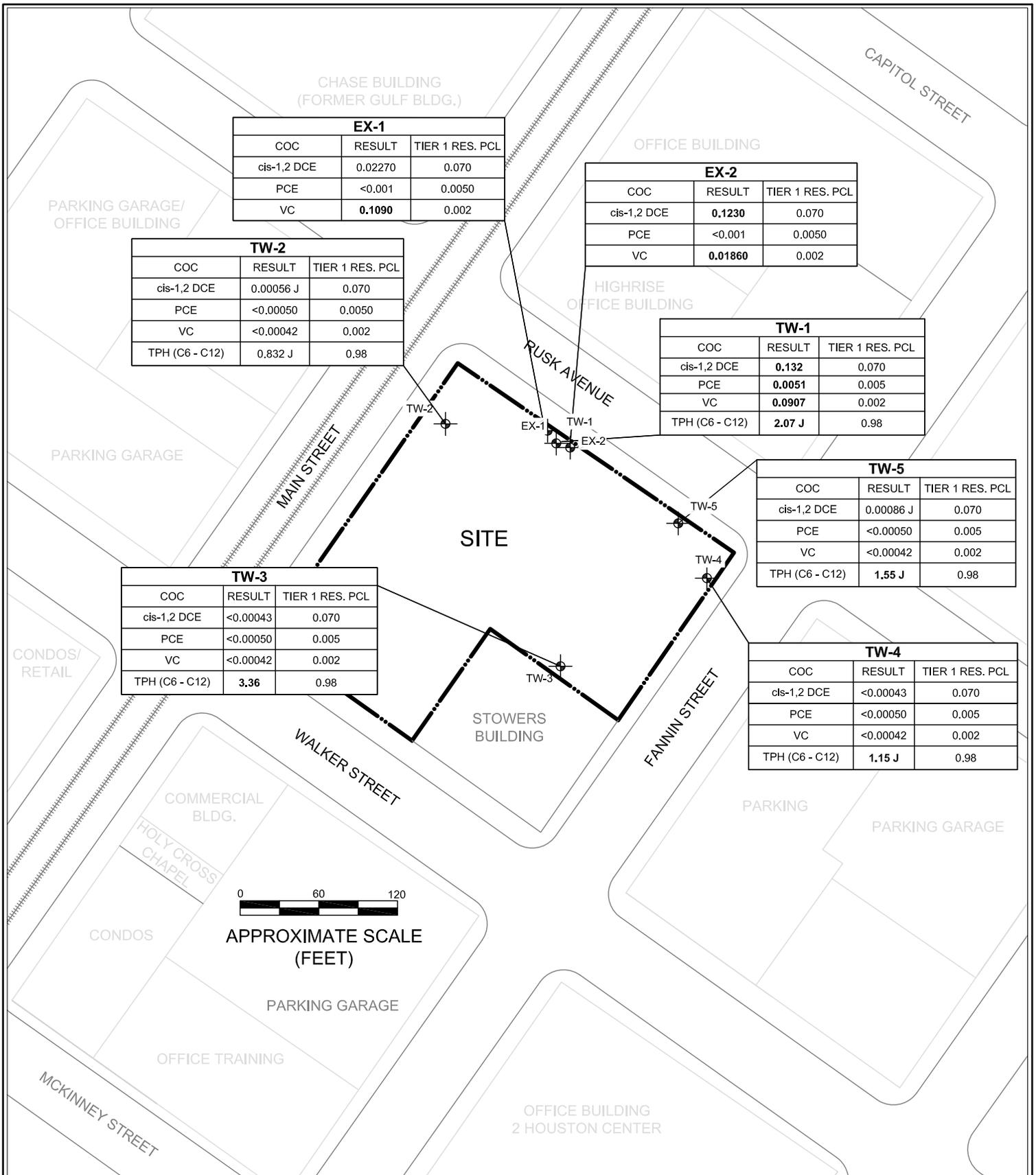
MEC^x, LP
3203 AUDLEY
HOUSTON, TEXAS 77098

**FIGURE 6A - SOIL PCLE MAP FOR
TPH TIER 1 INGESTION PATHWAY**

MAIN PLACE
811 MAIN STREET
HOUSTON, TEXAS 77002

PROJECT NO: 1314.001H.02

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EX-1		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.02270	0.070
PCE	<0.001	0.0050
VC	0.1090	0.002

EX-2		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.1230	0.070
PCE	<0.001	0.0050
VC	0.01860	0.002

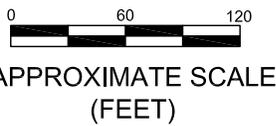
TW-2		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.00056 J	0.070
PCE	<0.00050	0.0050
VC	<0.00042	0.002
TPH (C6 - C12)	0.832 J	0.98

TW-1		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.132	0.070
PCE	0.0051	0.005
VC	0.0907	0.002
TPH (C6 - C12)	2.07 J	0.98

TW-5		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.00086 J	0.070
PCE	<0.00050	0.005
VC	<0.00042	0.002
TPH (C6 - C12)	1.55 J	0.98

TW-3		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	<0.00043	0.070
PCE	<0.00050	0.005
VC	<0.00042	0.002
TPH (C6 - C12)	3.36	0.98

TW-4		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	<0.00043	0.070
PCE	<0.00050	0.005
VC	<0.00042	0.002
TPH (C6 - C12)	1.15 J	0.98



LEGEND:

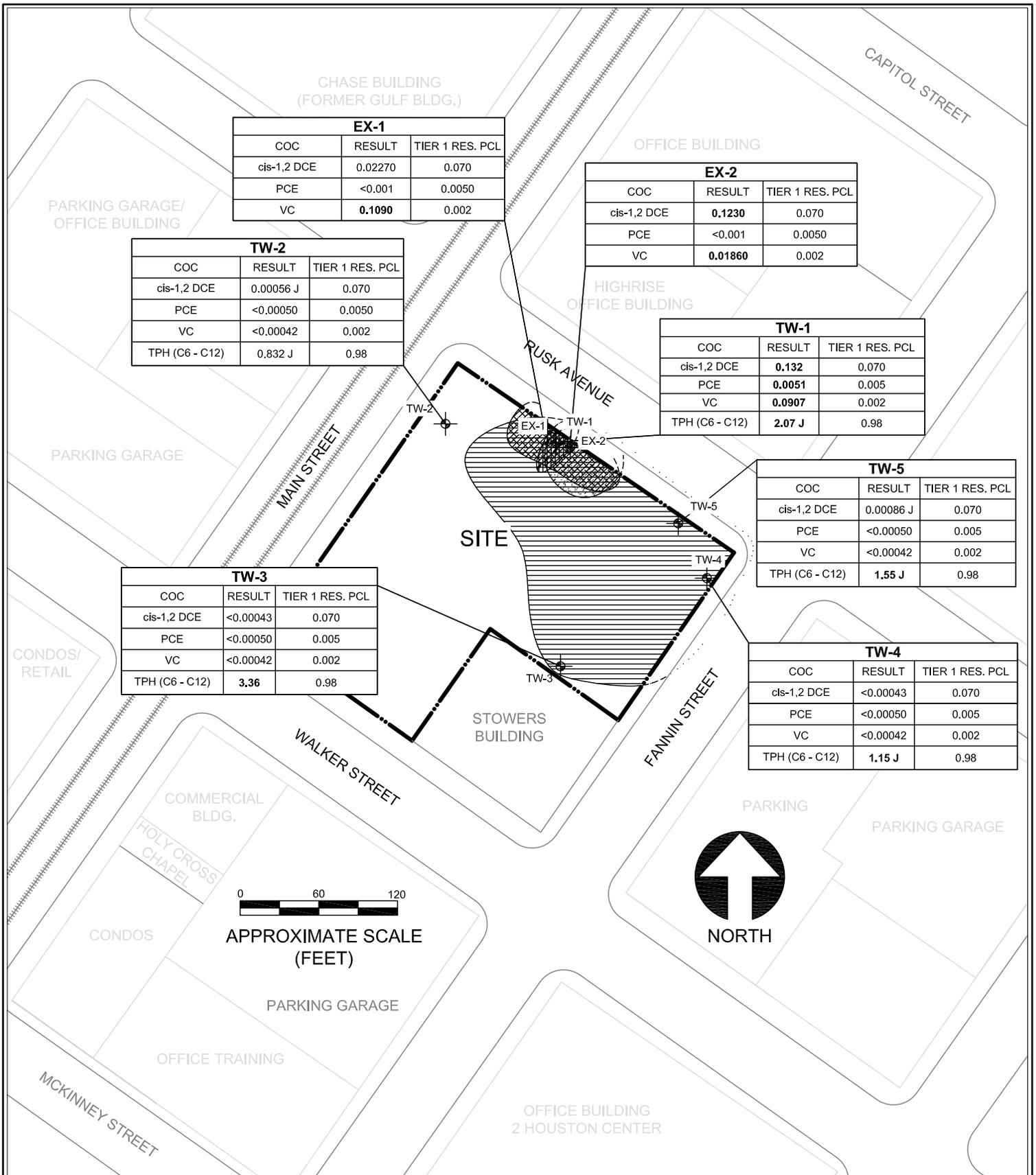
- MONITORING WELL
- PROPERTY BOUNDARY
- LIGHT RAILROAD LINE

NOTES:
 ALL CONCENTRATIONS LISTED IN MG/L (PPM)
BOLD NUMBERS REPRESENT TIER 1 RESIDENTIAL EXCEEDENCE
 BGS - BELOW GROUND SURFACE
 MOST RECENT SAMPLING DATA FOR EACH LOCATION IS PRESENTED



MEC^x, LP
 3203 AUDLEY
 HOUSTON, TEXAS 77098

FIGURE 7 - GROUNDWATER SAMPLING LOCATIONS
 MAIN PLACE
 811 MAIN STREET
 HOUSTON, TEXAS 77002



EX-1		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.02270	0.070
PCE	<0.001	0.0050
VC	0.1090	0.002

EX-2		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.1230	0.070
PCE	<0.001	0.0050
VC	0.01860	0.002

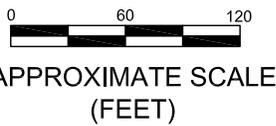
TW-2		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.00056 J	0.070
PCE	<0.00050	0.0050
VC	<0.00042	0.002
TPH (C6 - C12)	0.832 J	0.98

TW-1		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.132	0.070
PCE	0.0051	0.005
VC	0.0907	0.002
TPH (C6 - C12)	2.07 J	0.98

TW-5		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.00086 J	0.070
PCE	<0.00050	0.005
VC	<0.00042	0.002
TPH (C6 - C12)	1.55 J	0.98

TW-3		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	<0.00043	0.070
PCE	<0.00050	0.005
VC	<0.00042	0.002
TPH (C6 - C12)	3.36	0.98

TW-4		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	<0.00043	0.070
PCE	<0.00050	0.005
VC	<0.00042	0.002
TPH (C6 - C12)	1.15 J	0.98



LEGEND:

- MONITORING WELL
- PROPERTY BOUNDARY
- LIGHT RAILROAD TRACKS

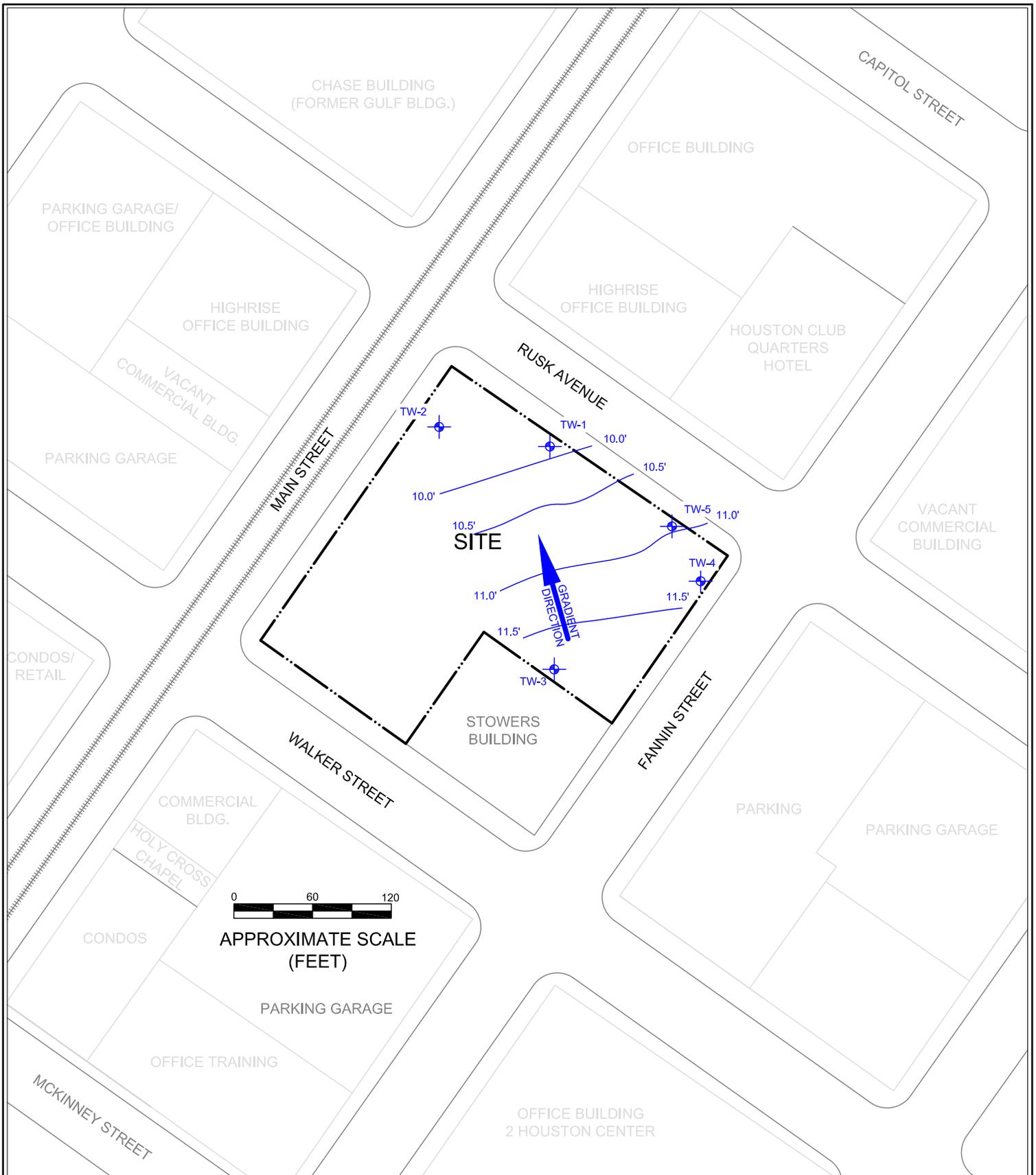
- TPH TIER 1 EXCEEDENCE PLUME (GROUNDWATER ONLY)
- cis-1,2 DCE TIER 1 EXCEEDENCE PLUME (GROUNDWATER ONLY)
- PCE TIER 1 EXCEEDENCE PLUME (GROUNDWATER ONLY)
- VC TIER 1 EXCEEDENCE PLUME (GROUNDWATER ONLY)

NOTES:
 ALL CONCENTRATIONS LISTED IN MG/L (PPM)
 BOLD NUMBERS REPRESENT TIER 1 RESIDENTIAL EXCEEDENCE
 BGS - BELOW GROUND SURFACE
 GROUNDWATER PLUME EXTENTS ARE ASSUMED AT PROPERTY BOUNDARY. PLUME CONFINING SAMPLES WERE NOT ABLE TO BE TAKEN DUE TO ACCESS LIMITATIONS



MEC^x, LP
 3203 AUDLEY
 HOUSTON, TEXAS 77098

FIGURE 8 - GROUNDWATER PCLE ZONES
 MAIN PLACE
 811 MAIN STREET
 HOUSTON, TEXAS 77002



LEGEND:

-  - MONITORING WELL
-  - PROPERTY BOUNDARY
- 10.0' - GROUNDWATER ELEVATION (FEET MSL)

NOTES:
MSL - MEAN SEA LEVEL



MEC^x, LP
3203 AUDLEY
HOUSTON, TEXAS 77098

FIGURE 9 - GROUNDWATER GRADIENT MAP

MAIN PLACE
811 MAIN STREET
HOUSTON, TEXAS 77002

PROJECT NO: 1314.001H.02

REV. DATE: 09/30/2010 RCB

CHASE BUILDING
(FORMER GULF BLDG.)

OFFICE BUILDING

CAPITOL STREET

PARKING GARAGE/
OFFICE BUILDING

TW-2		
COC	RESULT	TIER 1 RES. PCL
TPH (C6 - C12)	0.832 J	0.98

HIGHRISE
OFFICE BUILDING

HIGHRISE
OFFICE BUILDING

TW-1		
COC	RESULT	TIER 1 RES. PCL
TPH (C6 - C12)	2.07 J	0.98

PARKING GARAGE

MAIN STREET

RUSK AVENUE

TW-5		
COC	RESULT	TIER 1 RES. PCL
TPH (C6 - C12)	1.55 J	0.98

VACANT
COMMERCIAL
BUILDING

SITE

TW-2

EX-1

TW-1

EX-2

TW-5

TW-4

TW-3

TW-4		
COC	RESULT	TIER 1 RES. PCL
TPH (C6 - C12)	1.15 J	0.98

CONDOS/
RETAIL

STOWERS
BUILDING

FANNIN STREET

TW-3		
COC	RESULT	TIER 1 RES. PCL
TPH (C6 - C12)	3.36	0.98



APPROXIMATE SCALE
(FEET)

PARKING

PARKING GARAGE

COMMERCIAL
BLDG.

HOLY CROSS
CHAPEL

CONDOS

PARKING GARAGE

OFFICE TRAINING

OFFICE BUILDING
2 HOUSTON CENTER

MCKINNEY STREET

LEGEND:

- MONITORING WELL
- PROPERTY BOUNDARY
- LIGHT RAILROAD LINE

- TPH TIER 1 EXCEEDENCE
PLUME (GROUNDWATER ONLY)

NOTES:
ALL CONCENTRATIONS LISTED IN MG/L (PPM)
BOLD NUMBERS REPRESENT TIER 1 RESIDENTIAL EXCEEDENCE
BGS - BELOW GROUND SURFACE



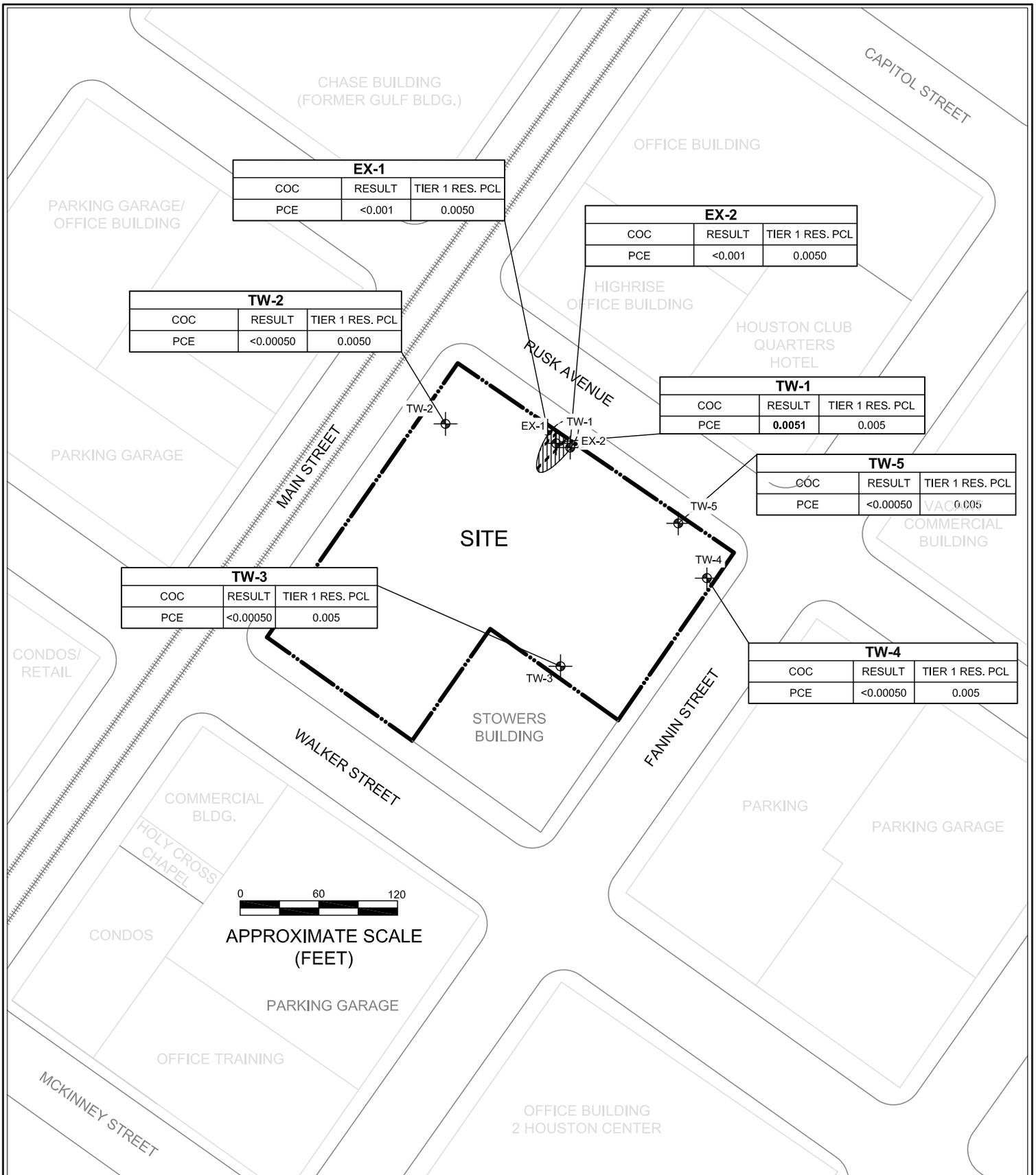
MEC^x, LP
3203 AUDLEY
HOUSTON, TEXAS 77098

**FIGURE 10 - GROUNDWATER PCL MAP FOR
TPH TIER 1 INGESTION PATHWAY**

MAIN PLACE
811 MAIN STREET
HOUSTON, TEXAS 77002

PROJECT NO: 1314.001H.02

REV. DATE: 09/30/2010 RCB



EX-1		
COC	RESULT	TIER 1 RES. PCL
PCE	<0.001	0.0050

EX-2		
COC	RESULT	TIER 1 RES. PCL
PCE	<0.001	0.0050

TW-2		
COC	RESULT	TIER 1 RES. PCL
PCE	<0.00050	0.0050

TW-1		
COC	RESULT	TIER 1 RES. PCL
PCE	0.0051	0.005

TW-5		
COC	RESULT	TIER 1 RES. PCL
PCE	<0.00050	VAC 0.005

TW-3		
COC	RESULT	TIER 1 RES. PCL
PCE	<0.00050	0.005

TW-4		
COC	RESULT	TIER 1 RES. PCL
PCE	<0.00050	0.005



APPROXIMATE SCALE
(FEET)

LEGEND:

- MONITORING WELL
- PROPERTY BOUNDARY

- PCE TIER 1 EXCEEDENCE PLUME (GROUNDWATER ONLY)

NOTES:
ALL CONCENTRATIONS LISTED IN MG/L (PPM)
BOLD NUMBERS REPRESENT TIER 1 RESIDENTIAL EXCEEDENCE
BGS - BELOW GROUND SURFACE
MOST RECENT SAMPLING DATA FOR EACH LOCATION IS PRESENTED



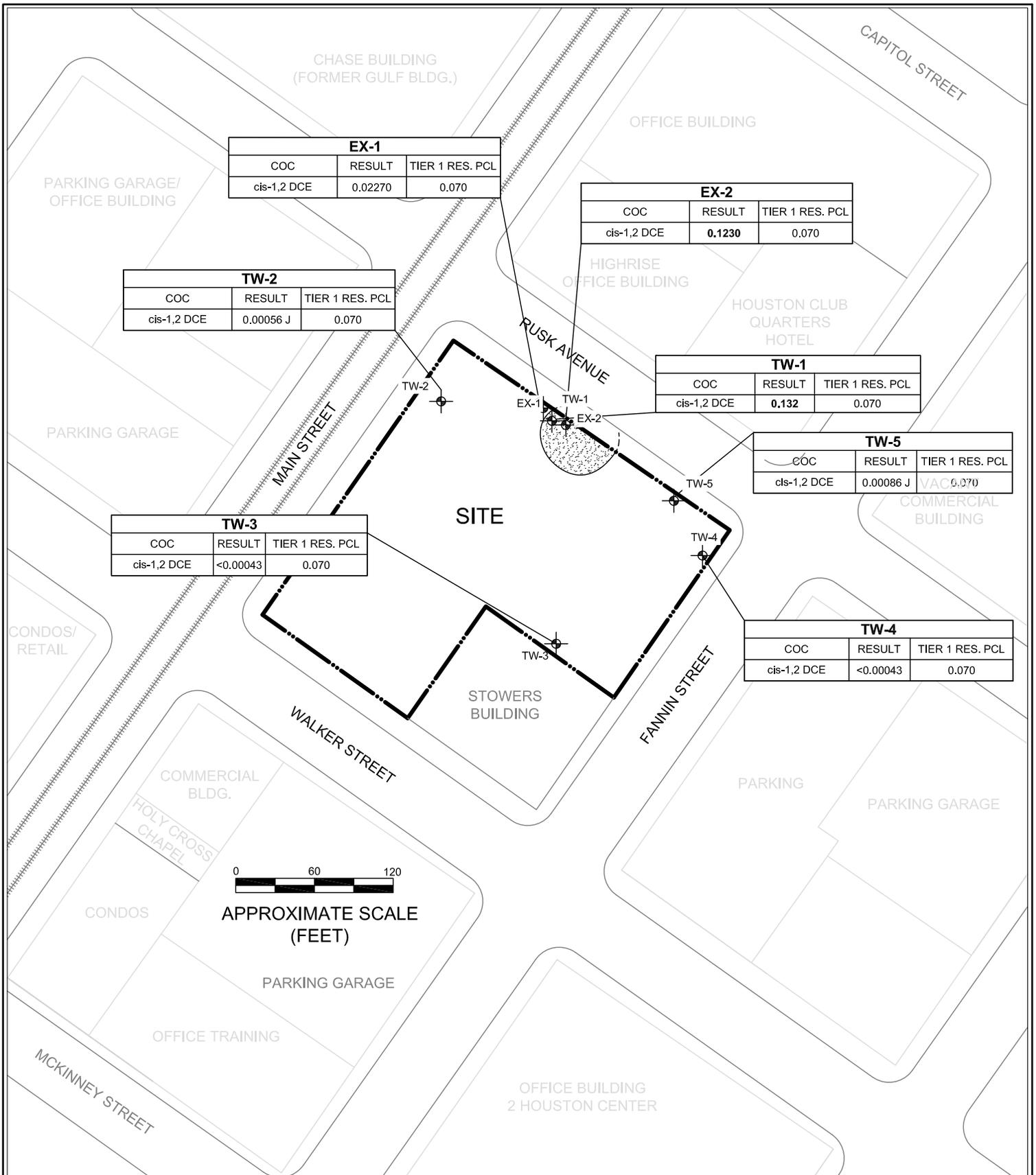
MEC^x, LP
3203 AUDLEY
HOUSTON, TEXAS 77098

**FIGURE 10A - GROUNDWATER PCE FOR
PCE TIER 1 INGESTION PATHWAY**

MAIN PLACE
811 MAIN STREET
HOUSTON, TEXAS 77002

PROJECT NO: 1314.001H.02

REV. DATE: 09/30/2010 RCB



EX-1		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.02270	0.070

EX-2		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.1230	0.070

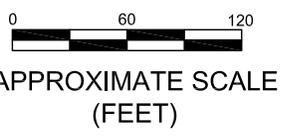
TW-2		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.00056 J	0.070

TW-1		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.132	0.070

TW-5		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	0.00086 J	VAC 0.070

TW-3		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	<0.00043	0.070

TW-4		
COC	RESULT	TIER 1 RES. PCL
cis-1,2 DCE	<0.00043	0.070



LEGEND:

- MONITORING WELL
- PROPERTY BOUNDARY
- LIGHT RAILROAD LINE

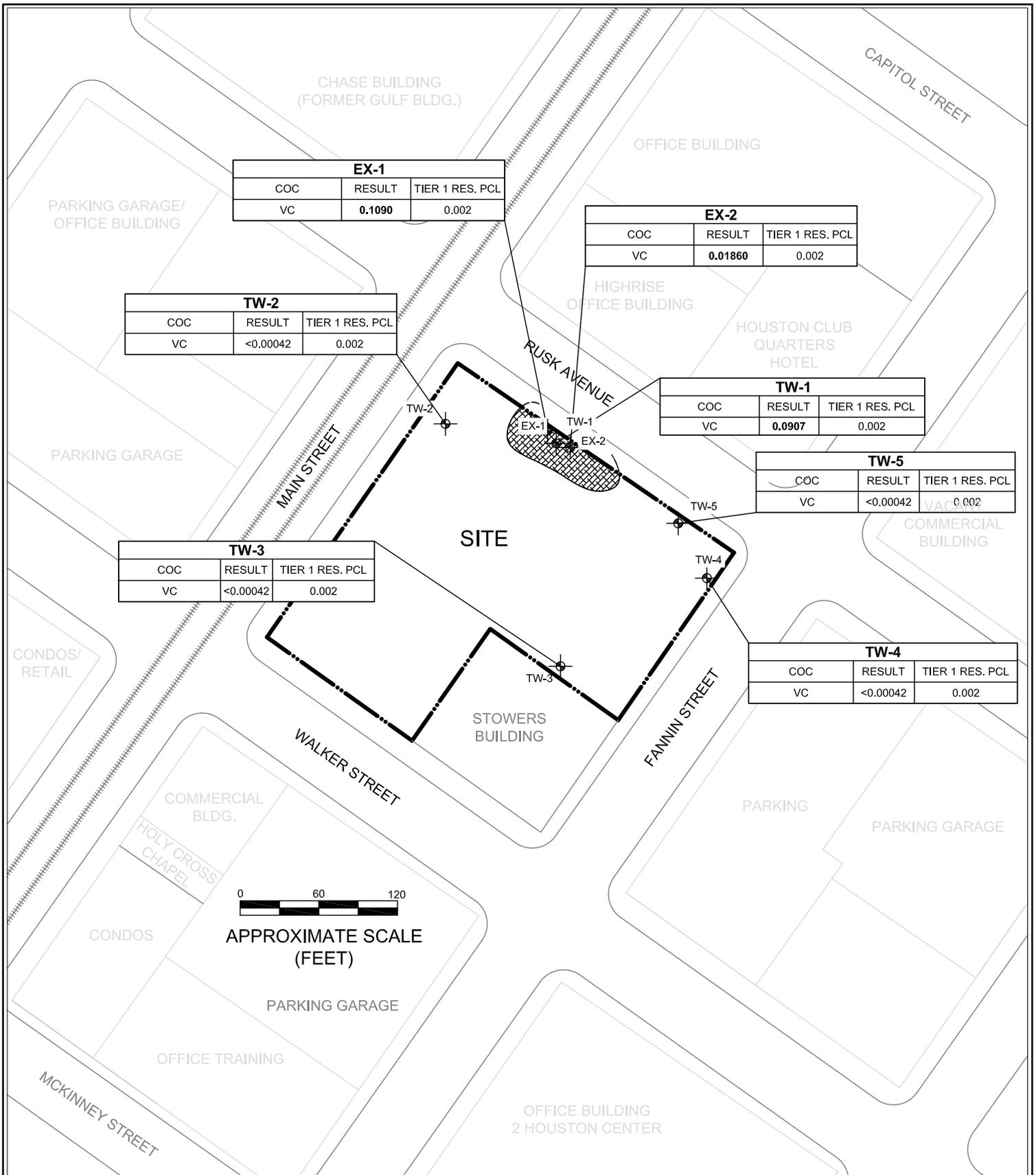
- cis 1,2 DCE TIER 1 EXCEEDENCE PLUME (GROUNDWATER ONLY)

NOTES:
 ALL CONCENTRATIONS LISTED IN MG/L (PPM)
BOLD NUMBERS REPRESENT TIER 1 RESIDENTIAL EXCEEDENCE
 BGS - BELOW GROUND SURFACE
 MOST RECENT SAMPLING DATA FOR EACH LOCATION IS PRESENTED



MEC^x, LP
 3203 AUDLEY
 HOUSTON, TEXAS 77098

FIGURE 10B - GROUNDWATER PCLE FOR CIS 1,2 DCE TIER 1 INGESTION PATHWAY
 MAIN PLACE
 811 MAIN STREET
 HOUSTON, TEXAS 77002



EX-1		
COC	RESULT	TIER 1 RES. PCL
VC	0.1090	0.002

EX-2		
COC	RESULT	TIER 1 RES. PCL
VC	0.01860	0.002

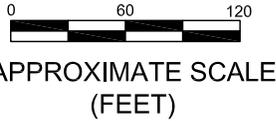
TW-2		
COC	RESULT	TIER 1 RES. PCL
VC	<0.00042	0.002

TW-1		
COC	RESULT	TIER 1 RES. PCL
VC	0.0907	0.002

TW-5		
COC	RESULT	TIER 1 RES. PCL
VC	<0.00042	VAC 0.002

TW-3		
COC	RESULT	TIER 1 RES. PCL
VC	<0.00042	0.002

TW-4		
COC	RESULT	TIER 1 RES. PCL
VC	<0.00042	0.002



LEGEND:

- MONITORING WELL
- PROPERTY BOUNDARY
- LIGHT RAILROAD LINE

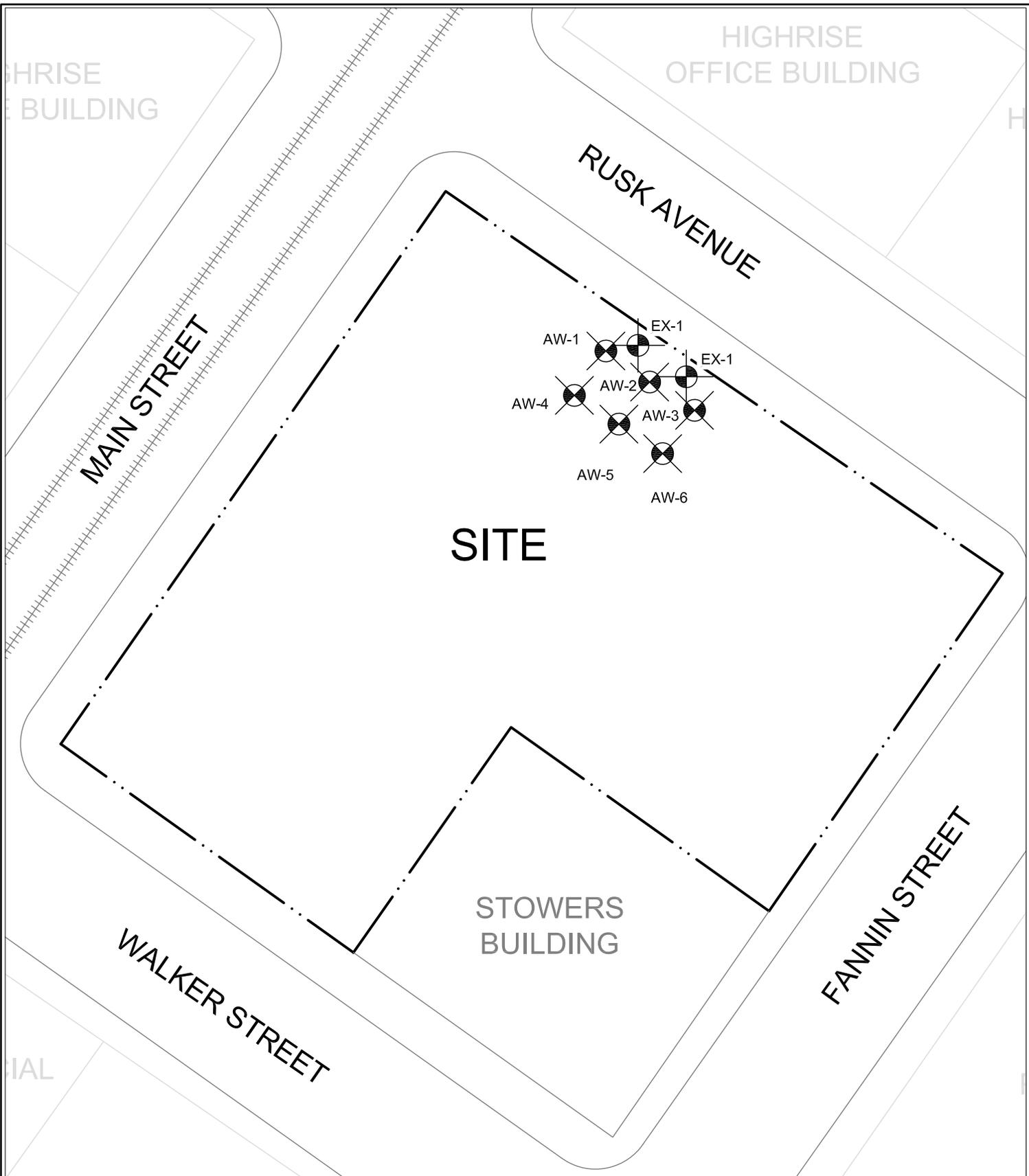
- VC TIER 1 EXCEEDENCE PLUME (GROUNDWATER ONLY)

NOTES:
 ALL CONCENTRATIONS LISTED IN MG/L (PPM)
BOLD NUMBERS REPRESENT TIER 1 RESIDENTIAL EXCEEDENCE
 BGS - BELOW GROUND SURFACE
 MOST RECENT SAMPLING DATA FOR EACH LOCATION IS PRESENTED



MEC^x, LP
 3203 AUDLEY
 HOUSTON, TEXAS 77098

FIGURE 10C - GROUNDWATER PCLE FOR VC TIER 1 INGESTION PATHWAY
 MAIN PLACE
 811 MAIN STREET
 HOUSTON, TEXAS 77002



LEGEND:

-  - ISCO APPLICATION WELL
-  - ISCO RECIRCULATION WELL
-  - PROPERTY BOUNDARY

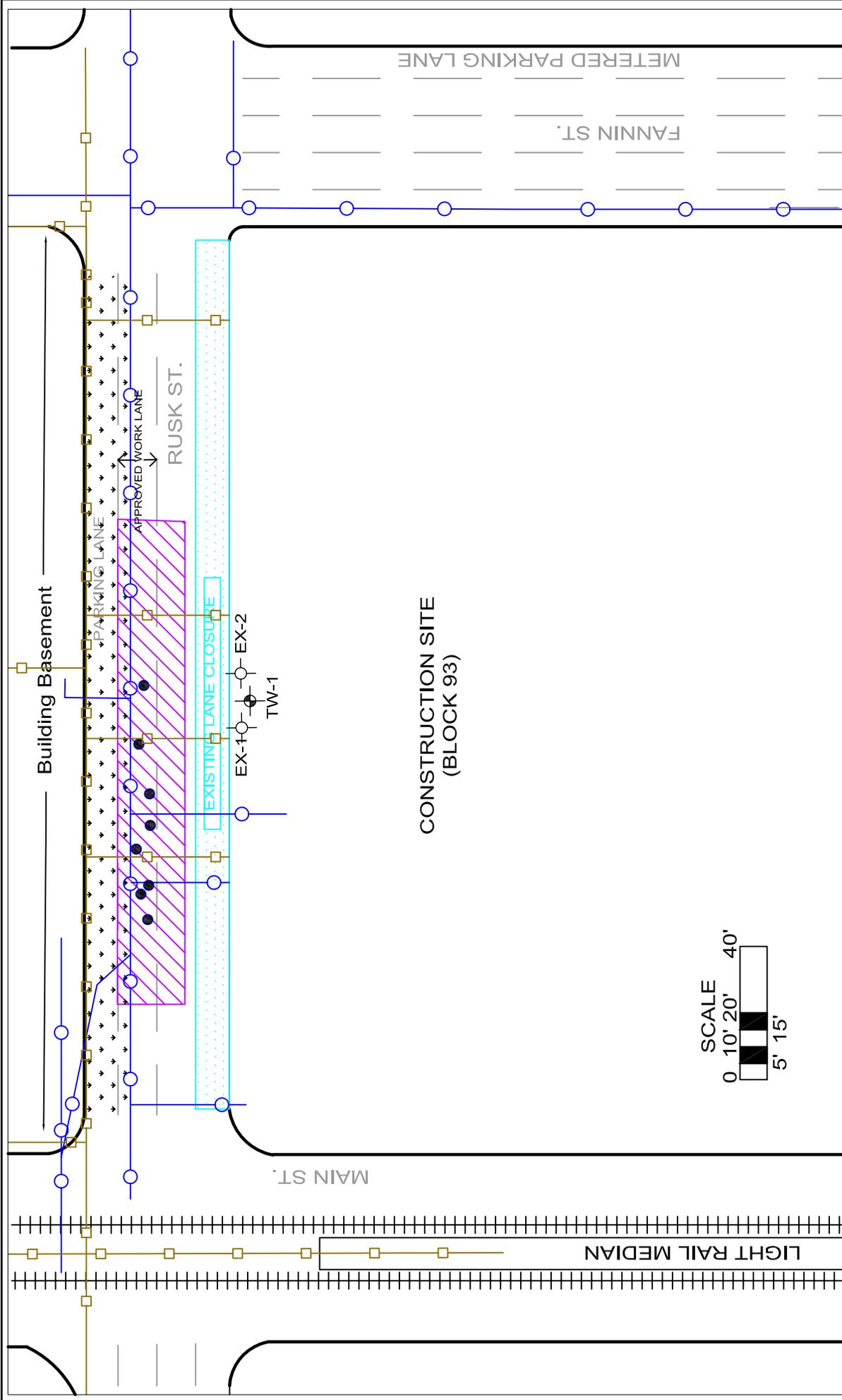


MEC^x, LP
3203 AUDLEY
HOUSTON, TEXAS 77098

**FIGURE 11 - ISCO APPLICATION
WELL MAP**
MAIN PLACE
811 MAIN STREET
HOUSTON, TEXAS 77002

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REV. DATE: 09/30/2010 RCB



MEC^x
 MEC^x, LP
 3203 AUDLEY
 HOUSTON, TEXAS 77098

**FIGURE 12 - RUSK AVENUE
 BORING LOCATIONS**
 MAIN PLACE
 811 MAIN STREET
 HOUSTON, TEXAS 77002

PROJECT NO: 1314.001H.02 REV. DATE: 09/30/2010 RCB



- LEGEND:**
- MONITORING WELL
 - EXTRACTION WELL
 - ATTEMPTED BORING LOCATION
 - TELEPHONE EASEMENT
 - WATER LINE
 - SEWER LINE
 - CONCRETE SLAG / UNMARKED UTILITIES / WIRE MESH AREA
 - LIGHT RAILROAD LINE



Appendix C



Appendix C – Description of Current Use

The Site is located at 811 Main Street within the Central Business District (CBD) of Houston, Harris County, Texas. The Site is currently being developed to include a newly constructed signature one-million square foot 46-story office tower. The Site consists of 1.1799 acres of land situated within City of Houston Block 93 (Figure 1). The rest of City of Houston Block 93, 0.269 acres of land, is not a portion of the Site. The current and future use of the Site and properties located within a 500-foot radius is anticipated to be high-density commercial or high density residential use for the foreseeable future.

The Site is bounded by Rusk Street, Fannin Street, Walker Street and Main Street.

Properties neighboring the Site are as follows:

- North – The Site is bounded to the north by the intersection of Main and Rusk Streets with the Chase Bank Building (former Gulf Oil Building) beyond.
- Northeast – The Site is bounded to the northeast by Rusk Avenue with commercial and residential buildings beyond.
- East - The Site is bounded to the east by the intersection of Rusk and Fannin Streets with the former Texas Company Building and commercial buildings beyond.
- Southeast – The Site is bounded to the southeast by Fannin Street with parking areas and commercial buildings beyond.
- South – The Site is bounded to the south by the Stowers Building with the intersection of Fannin and Walker Streets and commercial buildings beyond.
- Southwest – The Site is bounded to the southwest by the Stowers Building with Walker Street and commercial buildings, the Holy Cross Chapel, parking garage and office buildings beyond.
- West - The Site is bounded to the west by the intersection of Walker and Main Streets with high-rise residential condominiums and commercial buildings beyond.
- Northwest – The Site is bounded to the northwest by Main Street with office buildings and a parking garage beyond.



Appendix D



Appendix D – COCs within Ingestion PCLEZ

As discussed in Appendix J (Origin of Contamination), the sources of the COCs at the Site are related to historic commercial usage of the Site between the 1920s and the 1960s. The operations associated with the source of COCs are no longer present at the Site.

A) COCs within Ingestion PCLEZ

COCs detected above PCLs applicable to residential assessment levels (Tier 1 ^{GW}GW_{Ing} PCL), also referred to as ingestion PCLs, at the Site have been determined to include the following:

- Tetrachloroethene (PCE)
- Cis-1,2-dichloroethylene (cis-1,2-DCE)
- Vinyl chloride (VC)
- Total Petroleum Hydrocarbons (C₆-C₁₂)

The impacted GWBU at the Site is present from 37 to 40 feet bgs. Concentrations of COCs detected in soil and groundwater have not indicated the suspected presence or the potential occurrence of non-aqueous phase liquid (NAPL).

The horizontal delineation of groundwater impacted in excess of residential assessment levels (Tier 1 ^{GW}GW_{Ing} PCL) has been investigated to the fullest extent practical given the complexity of restricted access due to the urban and heavily congested environment of the Site's physical setting within the CBD. The groundwater gradient beneath the Site is generally toward the north-northwest (Figure 9). Clay underlying the impacted GWBU serves as a confining layer limiting the vertical migration of COCs.

B) Maximum PCLEZ by COC in Groundwater

COC	CAS	Sample ID / Location	Date of Sample	Result (mg/L)	Tier 1 ^{GW} GW _{Ing} Residential PCL (Ingestion)	Tier 1 ^{Air} GW _{Inh-V} Residential PCL (Non-Ingestion)
PCE	127-18-4	TW-01	3/26/2008	0.0051	0.005	500
Cis-1,2-DCE	156-59-2	EX-2	2/12/2009	0.7300	0.070	16000
Vinyl Chloride	75-01-4	EX-1	10/1/2009	0.1360	0.002	3.8
TPH (C6-C12)	TPH 1005-1	TW-03	3/26/2008	3.36	0.98	1800

Results of groundwater monitoring do not indicate an exceedance of COCs for the applicable non-ingestion PCL (Tier 1 ^{Air}GW_{Inh-V}) at the Site.



PCLEZ for applicable residential ingestion PCLs for groundwater (Tier 1 ^{GW}GW_{ing} PCL) and soil (Tier 1 ^{GW}Soil_{ing} PCL) at the Site are depicted in Appendix B within Figures 6A-7A and 10-10C.

C) Description of Basic Geochemical Properties by COC

TPH is a term used to describe a large family of several hundred chemical compounds that originally come from crude oil (hydrocarbons). The associated chemicals can include gasoline, diesel, petroleum based fluids, waste oil, heating oil, and crude oil. TPH is generally considered a light non-aqueous phase liquid (LNAPL) that is immiscible with water and has a density less than water (<1 g/mL). TPH derived from certain formulations of heating oil is typically dense non-aqueous phase liquid (DNAPL) that is immiscible with water and has a density greater than water (>1 g/mL). The physical and chemical properties of DNAPLs include relative low solubility, high specific gravity, and a tendency to remain sorbed to organic materials. Spills or releases of NAPLs into the environment are common at petroleum manufacturing, storage, and handling facilities. In both cases (LNAPL and DNAPL), dissolved components of TPH into groundwater are limited by partitioning properties and, as such, TPH can move as dissolved molecules in groundwater.

PCE is a manufactured chemical that is widely used for dry cleaning of fabrics and for metal-degreasing. PCE is considered a VOC and chlorinated solvent. PCE is a DNAPL. PCE has the chemical formula C₂Cl₄ and a density of 1.6227 g/ml at 20°C. Solubility in water is 150 mg/L at 25°C. PCE can move vertically through the saturated zone and as dissolved molecules in groundwater.

Cis-1,2-DCE is a man-made VOC that is not found naturally in the environment. Its primary uses are as an industrial solvent and as an intermediate to make other chemicals. 1,2-Dichloroethene is a daughter product associated with the degradation of PCE. DCE has the chemical formula C₂H₂Cl₂ and a density of 1.2837 g/ml at 20°C. Solubility in water is 3,500 mg/L at 25°C. Cis-1,2-DCE can move vertically through the saturated zone and as dissolved molecules in ground water.

Vinyl chloride is a man-made VOC that does not occur naturally, but can be formed in the environment from the breakdown of other VOCs such as PCE. Vinyl Chloride has the chemical formula C₂H₃Cl₁ and a density of 0.9106 g/ml at 20°C. Solubility in water is 1,100 mg/L at 25°C. Vinyl Chloride can move as dissolved molecules in ground water.

The source of the chemical and physical information detailed in this section was obtained from U.S. Department of Health and Human Services' Agency for Toxic Substances and Disease Registry (ATSDR).



Appendix E



Appendix E – COCs in Designated Groundwater

- A) Refer to Appendix D for a discussion of COCs located within groundwater relative to applicable Tier I PCLs. COCs detected above TRRP Tier 1 Residential Groundwater Ingestion (Tier 1^{GW}Soil_{ing} PCL) PCLs for residential usage at the Site are as follows:
- Tetrachloroethene (PCE)
 - Cis-1,2-dichloroethylene (cis-1,2-DCE)
 - Vinyl chloride (VC)
 - Total Petroleum Hydrocarbons (C₆-C₁₂)
- B) Refer to the table presented in Appendix D (Item B) for a tabulated comparison of COC concentrations with the respective to ingestion and non-ingestion TRRP PCLs.
- C) Refer to Appendix D for a discussion of the basic geochemical properties of the COCs within the ingestion PCLEZ and designated groundwater.



Appendix F



Appendix F – Soil and Groundwater Concentrations

The tables below summarize the concentration levels for the detected COCs in soil and groundwater at the Site relative to applicable ingestion and non-ingestion PCLs. The tables include the highest detected concentration for each COC relative to the environmental media (soil or groundwater) in which it was determined to be present.

Applicability of Ingestion PCLs (without MSD)

The applicable residential assessment PCL for soil at the Site is the Tier 1 ^{GW}Soil_{Ing} PCL. The applicable groundwater PCL at the Site is the Tier 1 ^{GW}GW_{Ing} PCL. The aforementioned PCLs would be applicable to COCs at the Site without a MSD.

Applicability of Non-Ingestion PCLs (with MSD)

The applicable non-ingestion PCL (MSD adjusted critical PCL) for soil at the Site is the Tier 1 ^{Tot}Soil_{Comb} PCL. The applicable non-ingestion PCL (MSD adjusted critical PCL) for residential assessment at the Site is the Tier 1 ^{Air}Soil_{Inh-V} PCL. The aforementioned PCLs would be applicable to COCs at the Site with a MSD.

Applicable MSD and Non-MSD PCL Comparison for Groundwater

COC	CAS#	Sample ID / Location	Date of Sample	Result (mg/L)	Tier 1 ^{GW} GW _{Ing} Residential PCL (Without MSD)	Tier 1 ^{Air} GW _{Inh-V} Residential PCL (With MSD)
PCE	127-18-4	TW-01	3/26/2008	0.0051	0.005	500
Cis-1,2-DCE	156-59-2	EX-2	2/12/2009	0.7300	0.070	16000
Vinyl Chloride	75-01-4	EX-1	10/1/2009	0.1360	0.002	3.8
TPH (C ₆ -C ₁₂)	TPH 1005-1	TW-03	3/26/2008	3.36	0.98	1800

Applicable MSD and Non-MSD PCL Comparison for Soil

COCs detected above TRRP Tier 1 Residential Soil-to-Groundwater Ingestion (^{GW}Soil_{Ing}) PCLs for residential usage determined during preconstruction investigations were determined to be:

- PCE
- TPH (C₆-C₁₂)
- Lead



Affected soils within the vicinity of the soil borings impacted with PCE, TPH, and lead were excavated, segregated from non-impacted soils, and disposed of at an off-site landfill during preconstruction preparations of the Site. Construction of the current improvements required the excavation of soils impacted with COCs in addition to non-impacted native soils within the full extent of the property boundary of the Site to total depths ranging between 31 and 37 feet below ground surface (bgs). In addition to removing impacted soil media, this excavation facilitated the completion of below grade portions of the structure and the building foundation mat which consists of 9 feet of poured in place high-density concrete. Because of the excavation, PCE, lead and TPH are not considered COCs relative to the Site. Residual TPH located within the groundwater capillary fringe of soil borings SS-2 and SS-21 at a depth of 35 feet bgs, does not exceed the MSD-adjusted critical PCL.

Applicable MSD and Non-MSD PCL Comparison - Soil

COC	CAS	Sample ID / Collection Depth	Date of Sample	Result (mg/Kg)	Tier 1 ^{GW} Soil _{Ing} Residential PCL (Without MSD)	Tier 1 ^{Tot} Soil _{Comb} Residential PCL (With MSD)
TPH (C ₆ -C ₁₂)	TPH 1005-1	SS-2-D (35')	3/24/2008	80.9	65	6500
TPH (C ₆ -C ₁₂)	TPH 1005-1	SS-21-D (35')	3/24/2008	85.1	65	6500

Ingestion and Non-ingestion PCL Comparison Summary

- Exceedances of ingestion PCLs (non-MSD adjusted critical PCLs) are present for PCE (groundwater), cis-1,2-DCE (groundwater), vinyl chloride (groundwater), and TPH C₆-C₁₂ (soil and groundwater).
- Results of the soil sampling and groundwater monitoring do not indicate an exceedance of COCs for any non-ingestion PCL (MSD adjusted critical PCL) in either soil or groundwater.



Appendix G



Appendix G – Plume Stability

Groundwater at the Site has been affected by dissolved phase COCs which include PCE, cis-1,2-DCE, vinyl chloride, and TPH. The COCs are associated with historic operations as detailed within Appendix J (Origin of Contamination) that were present at the Site between the 1920s and the 1960s.

The plume is believed to be stable such that further migration is unlikely based upon groundwater monitoring data which indicates concentrations within monitoring wells. In addition to the monitoring data indicating relatively stable concentrations, large quantities of soil at the Site, both affected and non-affected, have been removed. Soil removal required for the construction of the current improvements was completed in 2008 to a total depth of between 31 and 37 feet bgs. Further, the source operations which caused the releases of the COCs at the Site are no longer present. As a result, it is unlikely that the concentrations of COCs in groundwater will increase or that the plume will expand.