WASTE MATERIAL AND VISUALLY-IMPACTED SOILS

Legend

- 2008 Drilling
- Barn Samples
- Pepsi Area 3 Soil Samples
- Pepsi Area 5 Soil Samples
- Pepsi Area 6 Soil Samples
- BB-BB-xx Holes
- BH Soil Samples
- MW Holes
- QUAD Samples
- SB Soil Samples
- CDOT Holes
- Pepsi UT (Utility Trenches) Soil Locations

Areal Soil Samples with Addresses

- Parking Restrictor
- 3801 Brighton Blvd
- 4301 Brighton Blvd
- 4375 Brighton Blvd
- 4600 Humbolt

As concentrations exceeding 15 ppm background limit (red)

Depth (ft) - Concentration (ppm)

0 125 250 500
Feet

1 inch = 250 feet

N

Figure 10

Arsenic Soil Sample Concentrations 0 to 5 feet

VB/I-70 Remedial Investigation

EMSI Engineering Support Management, Inc.

Legend

- 2008 Drilling
- Barn Samples
- Pepsi Area 3 Soil Samples
- Pepsi Area 5 Soil Samples
- Pepsi Area 6 Soil Samples
- BB-BB-xx Holes
- BH Soil Samples
- MW Holes
- QUAD Samples
- SB Soil Samples
- CDOT Holes
- Pepsi UT (Utility Trenches) Soil Locations

As concentrations exceeding 15 ppm background limit (red)

Depth (ft) - Concentration (ppm)

0 125 250 500
Feet

1 inch = 250 feet

N

Figure 12

Arsenic Soil Sample Concentrations 5 to 10 feet

VB/I-70 Remedial Investigation

EMSI Engineering Support Management, Inc.

Legend

- 2008 Drilling
- Barn Samples
- Pepsi Area 3 Soil Samples
- Pepsi Area 5 Soil Samples
- Pepsi Area 6 Soil Samples
- BB-BB-xx Holes
- BH Soil Samples
- MW Holes
- QUAD Samples
- SB Soil Samples
- CDOT Holes
- Pepsi UT (Utility Trenches) Soil Locations

As concentrations exceeding 15 ppm background limit (red)

Depth (ft) - Concentration (ppm)

0 125 250 500
Feet

1 inch = 250 feet

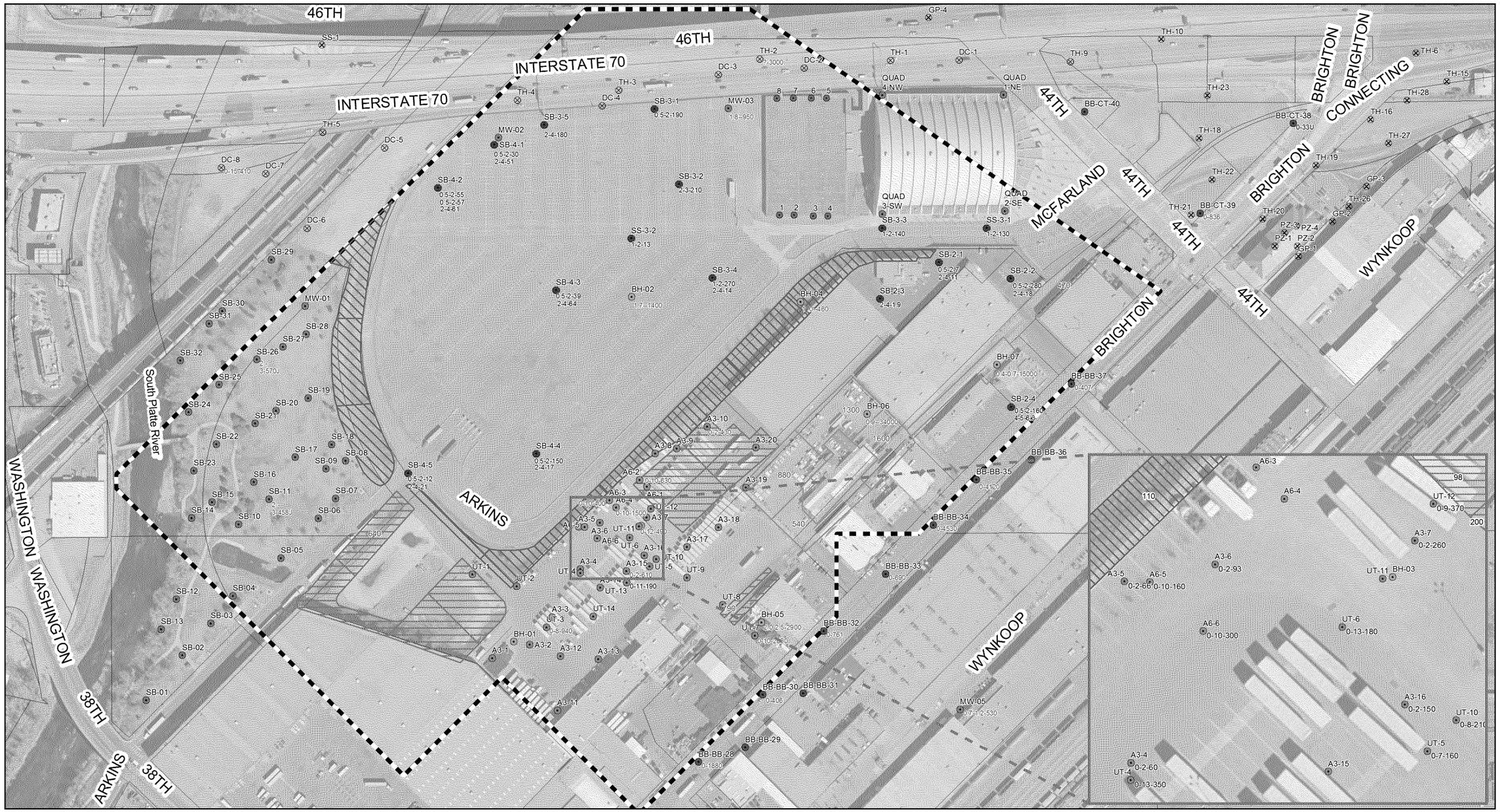
N

Figure 13

Arsenic Soil Sample Concentrations 10 feet and Greater Depth

VB/I-70 Remedial Investigation

EMSI Engineering Support Management, Inc.



Legend

- 2008 Drilling
- Barn Samples
- Pepsi Area 3 Soil Samples
- Pepsi Area 5 Soil Samples
- Pepsi Area 6 Soil Samples
- BB-BB-xx Holes
- BH Soil Samples
- MW Holes
- QUAD Samples
- SB Soil Samples
- CDOT Holes
- Pepsi UT (Utility Trenches) Soil Locations

Areal Soil Samples with Addresses

- Parking Restrictor
- 3801 Brighton Blvd
- 4301 Brighton Blvd
- 4375 Brighton Blvd
- 4600 Humbolt

Pb concentrations exceeding 400 ppm background limit (red)

Depth (ft) - Concentration (ppm)

0 125 250 500
Feet
1 inch = 250 feet

N

Figure 11
Lead Soil Sample Concentrations 0 to 5 feet
VB/I-70 Remedial Investigation

EMSI Engineering Support Management, Inc.

Legend

- 2008 Drilling
- Barn Samples
- Pepsi Area 3 Soil Samples
- Pepsi Area 5 Soil Samples
- Pepsi Area 6 Soil Samples
- BB-BB-xx Holes
- BH Soil Samples
- MW Holes
- QUAD Samples
- SB Soil Samples
- CDOT Holes
- Pepsi UT (Utility Trenches) Soil Locations

Pb concentrations exceeding 400 ppm background limit (red)

Depth (ft) - Concentration (ppm)

0 125 250 500
Feet
1 inch = 250 feet

N

Figure 14
Lead Soil Sample Concentrations 5 to 10 feet
VB/I-70 Remedial Investigation

EMSI Engineering Support Management, Inc.

Legend

- 2008 Drilling
- Barn Samples
- Pepsi Area 3 Soil Samples
- Pepsi Area 5 Soil Samples
- Pepsi Area 6 Soil Samples
- BB-BB-xx Holes
- BH Soil Samples
- MW Holes
- QUAD Samples
- SB Soil Samples
- CDOT Holes
- Pepsi UT (Utility Trenches) Soil Locations

Pb concentrations exceeding 400 ppm background limit (red)

Depth (ft) - Concentration (ppm)

0 62.5 125 250 375 500
Feet
1 inch = 250 feet

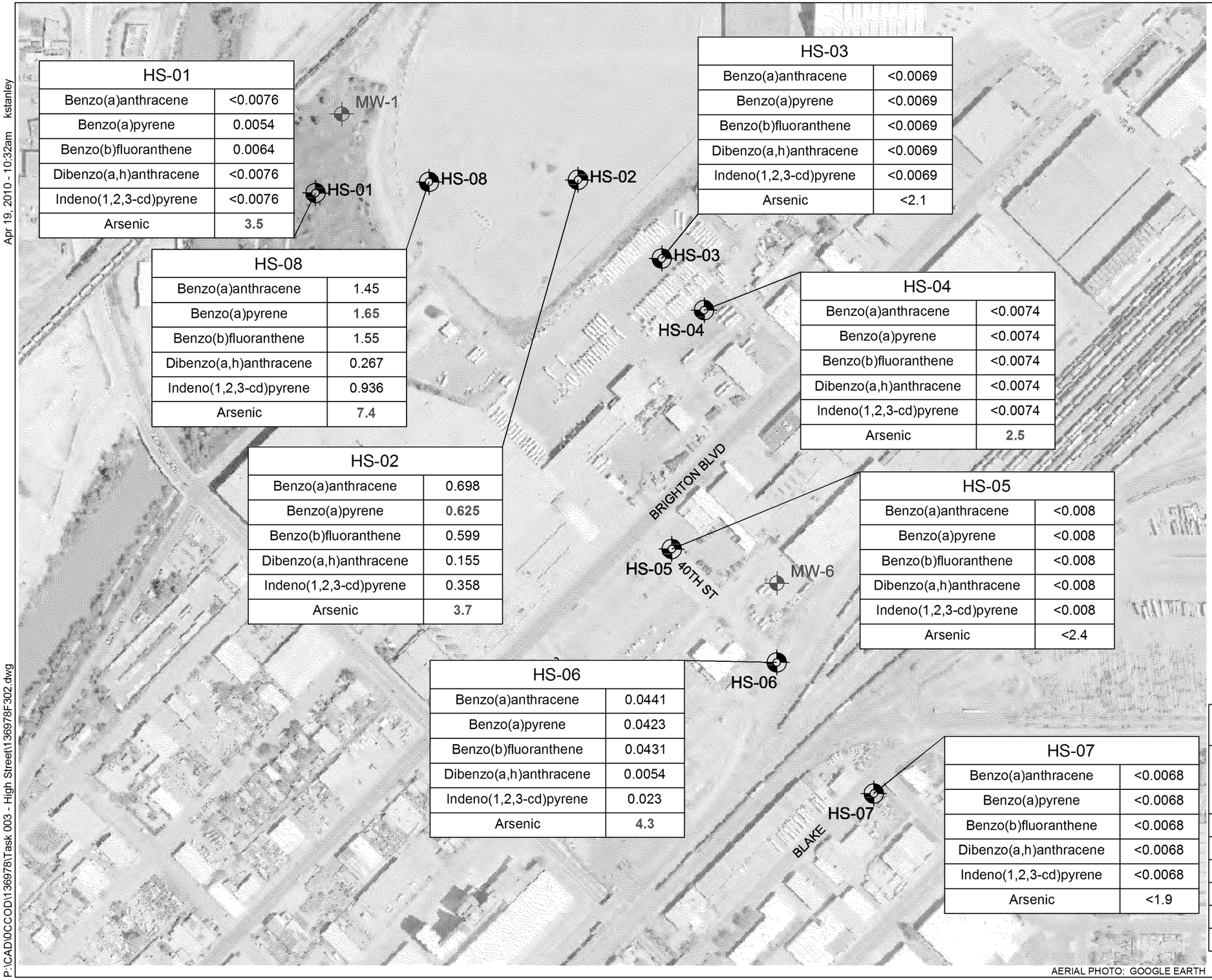
N

Figure 15

Lead Soil Sample Concentrations 10 feet and Greater Depth

VB/I-70 Remedial Investigation

EMSI Engineering Support Management, Inc.



HS-01	
Benzo(a)anthracene	<0.0076
Benzo(a)pyrene	0.0054
Benzo(b)fluoranthene	0.0064
Dibenzo(a,h)anthracene	<0.0076
Indeno(1,2,3-cd)pyrene	<0.0076
Arsenic	**3.5**

HS-08	
Benzo(a)anthracene	1.45
Benzo(a)pyrene	**1.65**
Benzo(b)fluoranthene	1.55
Dibenzo(a,h)anthracene	0.267
Indeno(1,2,3-cd)pyrene	0.936
Arsenic	**7.4**

HS-02	
Benzo(a)anthracene	0.698
Benzo(a)pyrene	**0.625**
Benzo(b)fluoranthene	0.599
Dibenzo(a,h)anthracene	0.155
Indeno(1,2,3-cd)pyrene	0.358
Arsenic	**3.7**

HS-03	
Benzo(a)anthracene	<0.0069
Benzo(a)pyrene	<0.0069
Benzo(b)fluoranthene	<0.0069
Dibenzo(a,h)anthracene	<0.0069
Indeno(1,2,3-cd)pyrene	<0.0069
Arsenic	<2.1

HS-04	
Benzo(a)anthracene	<0.0074
Benzo(a)pyrene	<0.0074
Benzo(b)fluoranthene	<0.0074
Dibenzo(a,h)anthracene	<0.0074
Indeno(1,2,3-cd)pyrene	<0.0074
Arsenic	**2.5**

HS-05	
Benzo(a)anthracene	<0.008
Benzo(a)pyrene	<0.008
Benzo(b)fluoranthene	<0.008
Dibenzo(a,h)anthracene	<0.008
Indeno(1,2,3-cd)pyrene	<0.008
Arsenic	<2.4

HS-06	
Benzo(a)anthracene	0.0441
Benzo(a)pyrene	0.0423
Benzo(b)fluoranthene	0.0431
Dibenzo(a,h)anthracene	0.0054
Indeno(1,2,3-cd)pyrene	0.023
Arsenic	**4.3**

HS-07	
Benzo(a)anthracene	<0.0068
Benzo(a)pyrene	<0.0068
Benzo(b)fluoranthene	<0.0068
Dibenzo(a,h)anthracene	<0.0068
Indeno(1,2,3-cd)pyrene	<0.0068
Arsenic	<1.9

0 300' 600'
APPROXIMATE SCALE IN FEET

LEGEND

HS-07 SOIL AND GROUNDWATER SAMPLE LOCATION

MW-6 EXISTING MONITORING WELL LOCATION

CSEV COLORADO SOIL EVALUATION VALUES

mg/kg MILLIGRAMS PER KILOGRAM

REFERENCE STANDARD TABLE	
CONSTITUENT	WORKER CSEV EXCEEDANCE (mg/kg)
Benzo(a)anthracene	**3.9**
Benzo(a)pyrene	**0.39**
Benzo(b)fluoranthene	**3.9**
Dibenzo(a,h)anthracene	**0.39**
Indeno(1,2,3-cd)pyrene	**3.9**
Arsenic	**1.6**

BOLD RED TEXT INDICATES EXCEEDANCE

AERIAL PHOTO: GOOGLE EARTH

Apr 19, 2010 - 10:32am kstanley

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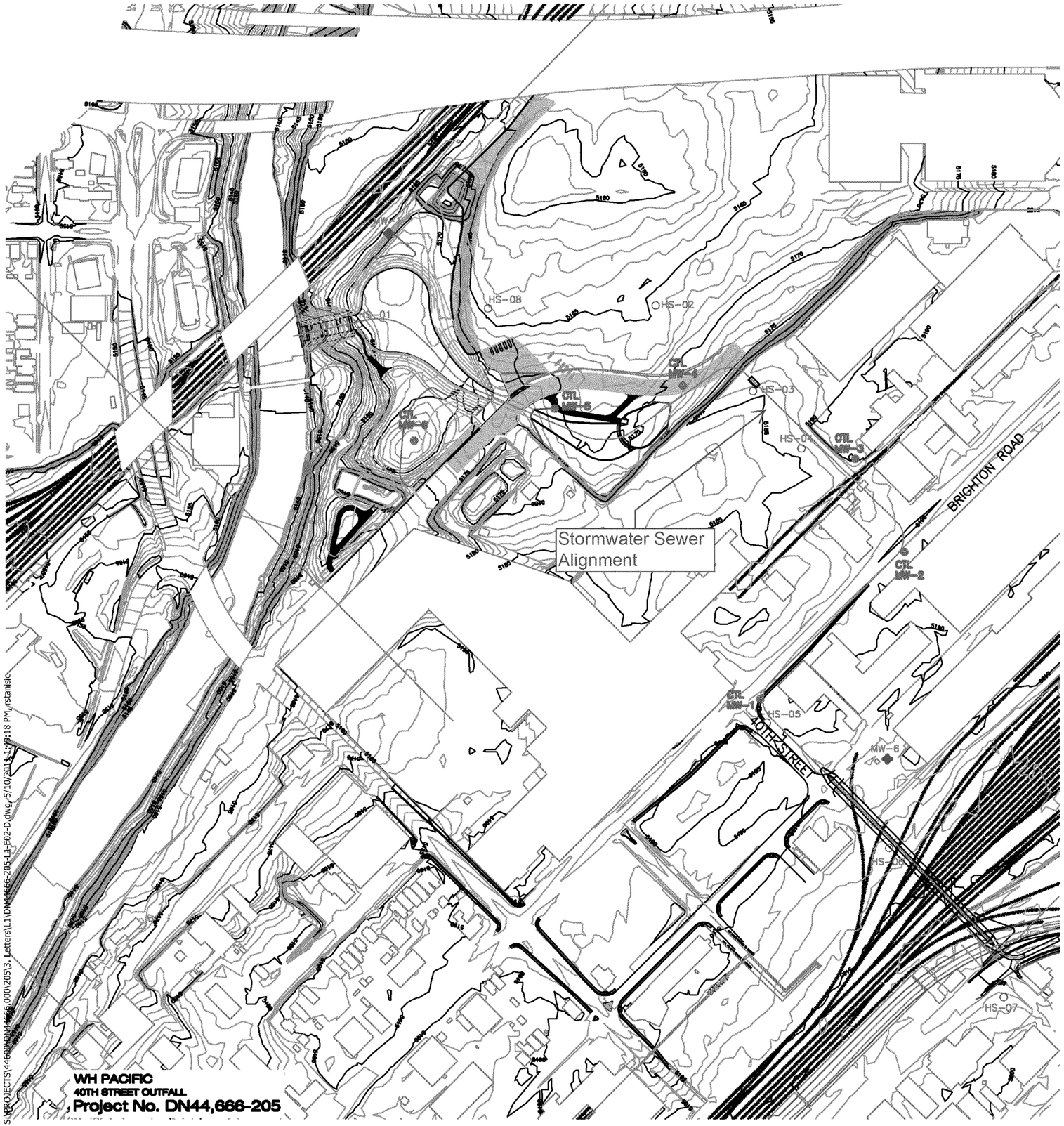
BROWN AND CALDWELL

FIGURE 2 - SOIL SAMPLE EXCEEDANCES
CITY AND COUNTY OF DENVER
HIGH STREET STORM DRAINAGE PROJECT



CTL MW-1	
ARSENIC	1.6

CTL MW-2	
ARSENIC	2.2

CTL MW-3	
ARSENIC	7.9

CTL MW-4	
ARSENIC	6.8
P-DICHLOROBENZENE	0.1769
ETHYLBENZENE	0.163
TOLUENE	0.8693
XYLENE	0.483

CTL MW-5	
ARSENIC	3.4

CTL MW-6	
ARSENIC	11.2

HS-01	
BENZO(A)ANTHRACENE	<0.0076
BENZO(A)PYRENE	0.0054
BENZO(B)FLUROANTHENE	0.0064
DIBENZO(A,H)ANTHRACENE	<0.0076
INDENO(1,2,3-CD)PYRENE	<0.0076
ARSENIC	3.5

HS-02	
BENZO(A)ANTHRACENE	0.698
BENZO(A)PYRENE	0.625
BENZO(B)FLUROANTHENE	0.599
DIBENZO(A,H)ANTHRACENE	0.155
INDENO(1,2,3-CD)PYRENE	0.358
ARSENIC	3.7

HS-03	
BENZO(A)ANTHRACENE	<0.0069
BENZO(A)PYRENE	<0.0069
BENZO(B)FLUROANTHENE	<0.0069
DIBENZO(A,H)ANTHRACENE	<0.0069
INDENO(1,2,3-CD)PYRENE	<0.0069
ARSENIC	<2.1

HS-04	
BENZO(A)ANTHRACENE	<0.0074
BENZO(A)PYRENE	<0.0074
BENZO(B)FLUROANTHENE	<0.0074
DIBENZO(A,H)ANTHRACENE	<0.0074
INDENO(1,2,3-CD)PYRENE	<0.0074
ARSENIC	2.5

HS-05	
BENZO(A)ANTHRACENE	<0.008
BENZO(A)PYRENE	<0.008
BENZO(B)FLUROANTHENE	<0.008
DIBENZO(A,H)ANTHRACENE	<0.008
INDENO(1,2,3-CD)PYRENE	<0.008
ARSENIC	<2.4

HS-06	
BENZO(A)ANTHRACENE	0.0441
BENZO(A)PYRENE	0.0423
BENZO(B)FLUROANTHENE	0.0431
DIBENZO(A,H)ANTHRACENE	0.0054
INDENO(1,2,3-CD)PYRENE	0.023
ARSENIC	4.3
LEAD	102
TCLP LEAD	<0.05

HS-07	
BENZO(A)ANTHRACENE	<0.0068
BENZO(A)PYRENE	<0.0068
BENZO(B)FLUROANTHENE	<0.0068
DIBENZO(A,H)ANTHRACENE	<0.0068
INDENO(1,2,3-CD)PYRENE	<0.0068
ARSENIC	<1.9

HS-08	
BENZO(A)ANTHRACENE	1.45
BENZO(A)PYRENE	1.65
BENZO(B)FLUROANTHENE	1.55
DIBENZO(A,H)ANTHRACENE	0.267
INDENO(1,2,3-CD)PYRENE	0.936
ARSENIC	7.4
LEAD	176
TCLP LEAD	0.94

N

0 150 300

SCALE: 1" = 300'

LEGEND:

HS-01 ○ SOIL AND GROUNDWATER SAMPLE LOCATION INSTALLED BY BROWN AND CALDWELL 2010

MW-1 ◆ SOIL AND GROUNDWATER SAMPLE LOCATION INSTALLED AS PART OF VB/I-70 OU2 ASSESSMENTS

MW-1 ● CTL MONITORING WELL LOCATION

5170 EXISTING GROUND SURFACE ELEVATION (FEET)

NOTES: RESULTS PRESENTED IN mg/kg MILLIGRAMS/KILOGRAM

TCLP LEAD RESULTS PRESENTED IN mg/L MILLIGRAMS/LITER

Summary of Soil Sample Results

Fig. 3

LEGEND:

HS-01 SOIL AND GROUNDWATER SAMPLE LOCATION INSTALLED BY BROWN AND CALDWELL 2010

MW-1 SOIL AND GROUNDWATER SAMPLE LOCATION INSTALLED AS PART OF VB/I-70 OU2 ASSESSMENTS

MW-1 CTL MONITORING WELL LOCATION

5170 EXISTING GROUND SURFACE ELEVATION (FEET)

NOTES:

ND-NONE DETECTED

N

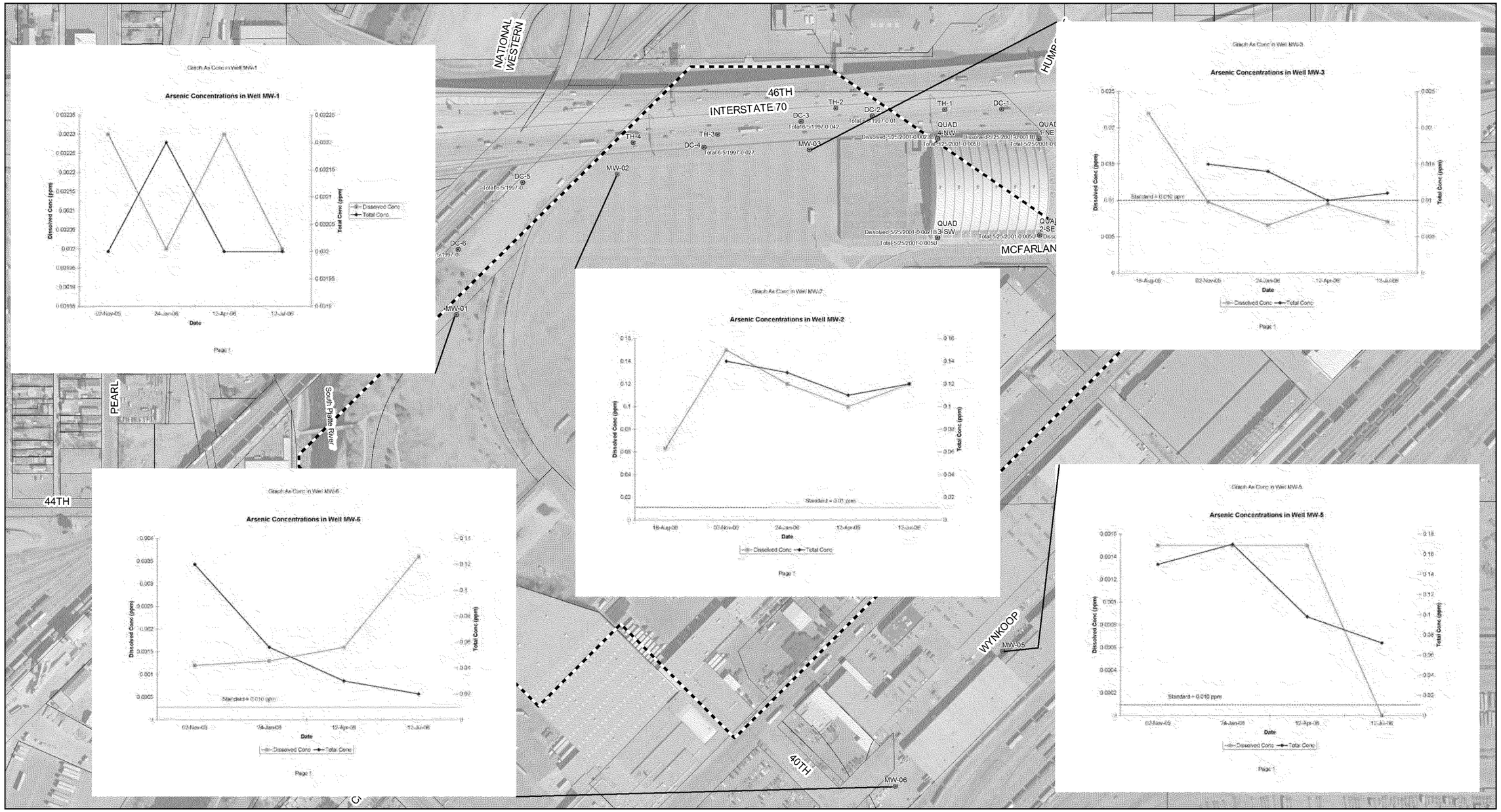
0 150 300

SCALE: 1" = 300'

Asbestos Sample Results

Fig. 6

GROUNDWATER



Legend

- GW-SampleLocations

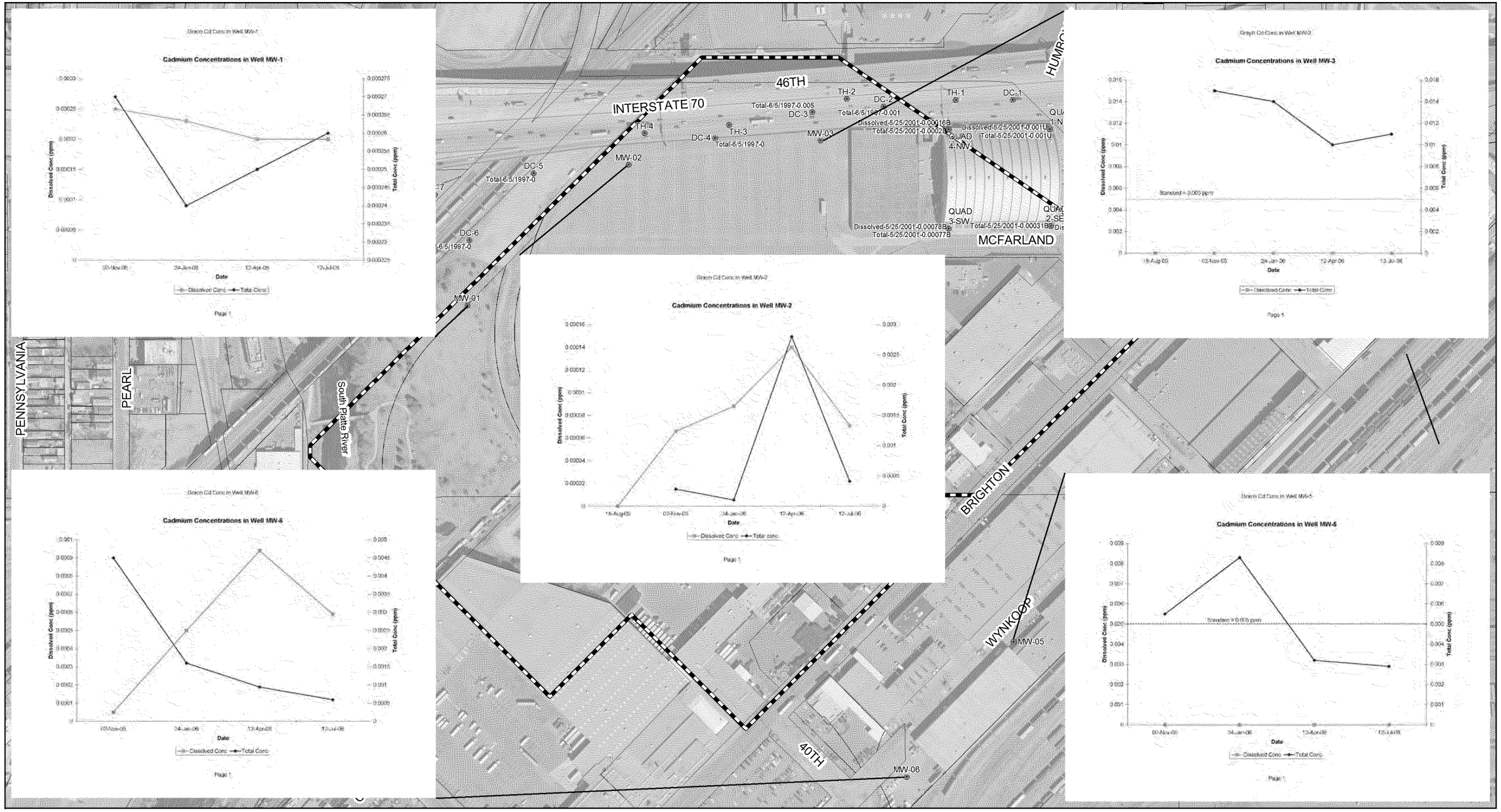
0 150 300 600
Feet

1 inch = 300 feet

N

Figure 22
Arsenic Groundwater Concentrations
VB/I-70 Remedial Investigation

EMSI Engineering Support Management, Inc.



Legend

- Groundwater Sample Locations

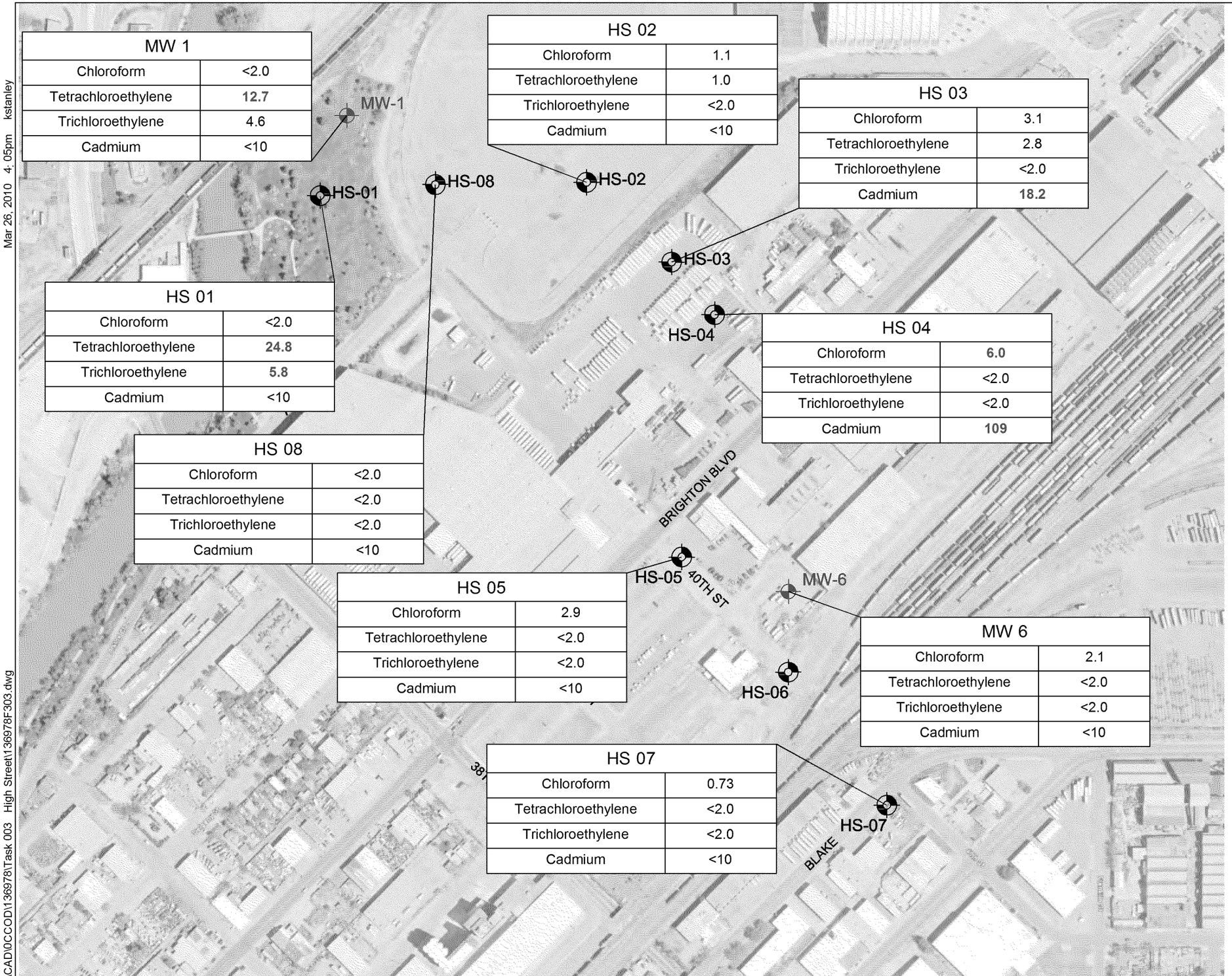
0 150 300 600
Feet

1 inch = 300 feet

N

Figure 24
Cadmium Groundwater Concentrations
VB/I-70 Remedial Investigation

EMSI Engineering Support Management, Inc.



MW 1	
Chloroform	<2.0
Tetrachloroethylene	**12.7**
Trichloroethylene	4.6
Cadmium	<10

HS 02	
Chloroform	1.1
Tetrachloroethylene	1.0
Trichloroethylene	<2.0
Cadmium	<10

HS 03	
Chloroform	3.1
Tetrachloroethylene	2.8
Trichloroethylene	<2.0
Cadmium	**18.2**

HS 01	
Chloroform	<2.0
Tetrachloroethylene	**24.8**
Trichloroethylene	**5.8**
Cadmium	<10

HS 04	
Chloroform	**6.0**
Tetrachloroethylene	<2.0
Trichloroethylene	<2.0
Cadmium	**109**

HS 08	
Chloroform	<2.0
Tetrachloroethylene	<2.0
Trichloroethylene	<2.0
Cadmium	<10

HS 05	
Chloroform	2.9
Tetrachloroethylene	<2.0
Trichloroethylene	<2.0
Cadmium	<10

MW 6	
Chloroform	2.1
Tetrachloroethylene	<2.0
Trichloroethylene	<2.0
Cadmium	<10

HS 07	
Chloroform	0.73
Tetrachloroethylene	<2.0
Trichloroethylene	<2.0
Cadmium	<10

0 300' 600'
APPROXIMATE SCALE IN FEET

LEGEND

HS 07 — SOIL AND GROUNDWATER SAMPLE LOCATION

MW 6 — EXISTING MONITORING WELL LOCATION

CDPHE — COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT, REGULATION 41, BASIC STANDARDS FOR GROUNDWATER

(:g/L) — MICROGRAMS PER LITER

REFERENCE STANDARD TABLE	
CONSTITUENT	CDPHE EXCEEDANCE (:g/L)
Chloroform	**3.5**
Tetrachloroethylene	**5**
Trichloroethylene	**5**
Cadmium	**5**

BOLD BLUE TEXT INDICATES EXCEEDANCE

AERIAL PHOTO: GOOGLE EARTH

Mar 26, 2010 4:05pm kstanley

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BROWN AND CALDWELL

FIGURE 3 GROUNDWATER SAMPLE EXCEEDANCES
CITY AND COUNTY OF DENVER
HIGH STREET STORM DRAINAGE PROJECT

CTL MW-1	
CHLOROFORM	4.1
PCE	1.1
XYLENE	0.99
TOTAL ARSENIC	18.2

CTL MW-2	
CHLOROFORM	1.1
XYLENE	0.61
TOTAL ARSENIC	22.1

CTL MW-3	
CHLOROFORM	2.6
XYLENE	0.73
TOTAL ARSENIC	32.7
DISSOLVED CADMIUM	264
DISSOLVED MANGANESE	92.7

CTL MW-4	
PCE	1.2
CIS-1,2-DCE	0.46
XYLENE	0.75
TOTAL ARSENIC	15.4
DISSOLVED MANGANESE	2140

CTL MW-5	
TOTAL ARSENIC	8.5
DISOLVED IRON	23300
DISSOLVED MANGANESE	775
HEXAVALENT CHROMIUM	<50

CTL MW-6	
PCE	26.3
CIS-1,2-DCE	0.39
TCE	10.0
XELENE	0.71
TOTAL ARSENIC	57.3
DISSOLVED IRON	1000
DISSOLVED MANGANESE	3320
NAPHTHALENE	1.2

HS-01	
CHLOROFORM	<2.0
TETRACHLOROETHYLENE	24.8
TRICHLOROETHYLENE	5.8
CADMIUM	<10

HS-02	
CHLOROFORM	1.1
TETRACHLOROETHYLENE	1.0
TRICHLOROETHYLENE	<2.0
CADMIUM	<10

HS-03	
CHLOROFORM	3.1
TETRACHLOROETHYLENE	2.8
TRICHLOROETHYLENE	<2.0
CADMIUM	18.2

HS-04	
CHLOROFORM	6.0
TETRACHLOROETHYLENE	<2.0
TRICHLOROETHYLENE	<2.0
CADMIUM	109

HS-05	
CHLOROFORM	2.9
TETRACHLOROETHYLENE	<2.0
TRICHLOROETHYLENE	<2.0
CADMIUM	<10

HS-07	
CHLOROFORM	0.73
TETRACHLOROETHYLENE	<2.0
TRICHLOROETHYLENE	<2.0
CADMIUM	<10

HS-08	
CHLOROFORM	<2.0
TETRACHLOROETHYLENE	<2.0
TRICHLOROETHYLENE	<2.0
CADMIUM	<10

MW-1	
CHLOROFORM	<2.0
TETRACHLOROETHYLENE	12.7
TRICHLOROETHYLENE	4.6
CADMIUM	<10

MW-6	
CHLOROFORM	2.1
TETRACHLOROETHYLENE	<2.0
TRICHLOROETHYLENE	<2.0
CADMIUM	<10

N

0 150 300
SCALE: 1" = 300'

LEGEND:

HS-01 SOIL AND GROUNDWATER SAMPLE LOCATION INSTALLED BY BROWN AND CALDWELL 2010

MW-1 SOIL AND GROUNDWATER SAMPLE LOCATION INSTALLED AS PART OF VB/I-70 OU2 ASSESSMENTS

MW-1 CTL MONITORING WELL LOCATION

5170 EXISTING GROUND SURFACE ELEVATION (FEET)

NOTES:

RESULTS PROVIDED IN MICROGRAMS/LITERS (ug/L)
PCE-TETRACHLOROETHENE
TCE-TRICHLOROETHENE
CIS-1,2-DCE-CIS-1,2, DICHLOROETHENE
TOTAL-METAL RESULTS PROVIDED BY 200.8 ANALYSIS
DISOLVED-METAL RESULTS PROVIDED BY 200.7 ANALYSIS
(SAMPLES LAB FILTERED PRIOR TO ANALYSIS)

Summary of Ground Water Results

Fig. 4

LEGEND:

HS-01 ○ SOIL AND GROUNDWATER SAMPLE LOCATION INSTALLED BY BROWN AND CALDWELL 2010

MW-1 ◆ SOIL AND GROUNDWATER SAMPLE LOCATION INSTALLED AS PART OF VB/I-70 OU2 ASSESSMENTS

MW-1 ● CTL MONITORING WELL LOCATION

5170 EXISTING GROUND SURFACE ELEVATION (FEET)

NOTES:

(5185.96) APPROXIMATE GROUND WATER ELEVATIONS MEASURED APRIL 5, 2011

0 150 300

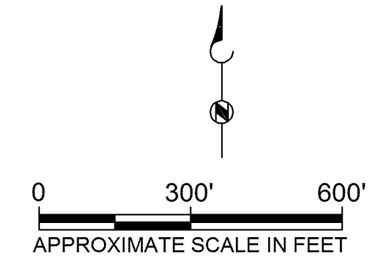
SCALE: 1" = 300'

Ground Water Elevations Fig. 5

2016-010025-0001320

LANDFILL GAS

AERIAL PHOTO: GOOGLE EARTH



LEGEND

HS-07 SOIL AND GROUNDWATER SAMPLE LOCATION

MW-6 EXISTING MONITORING WELL LOCATION

CH_4 METHANE SOIL GAS CONCENTRATION (PERCENT OF TOTAL)

Mar 22, 2010 - 1:27pm kstanley

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BROWN AND CALDWELL

FIGURE 4 - METHANE SOIL GAS CONCENTRATION
CITY AND COUNTY OF DENVER
HIGH STREET STORM DRAINAGE PROJECT