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FIGURES

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Basemap: U.S.G.S 7.5' Quadrangles, Hooven and Addyston, Ohio, 1996

N

0 2,000'

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FIGURE 1-1

SITE LOCATION MAP

SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: DVS	Checked By: PM	Scale: 1" = 2,000'	Date: 6/11/10	File: 500USGSSITE200912

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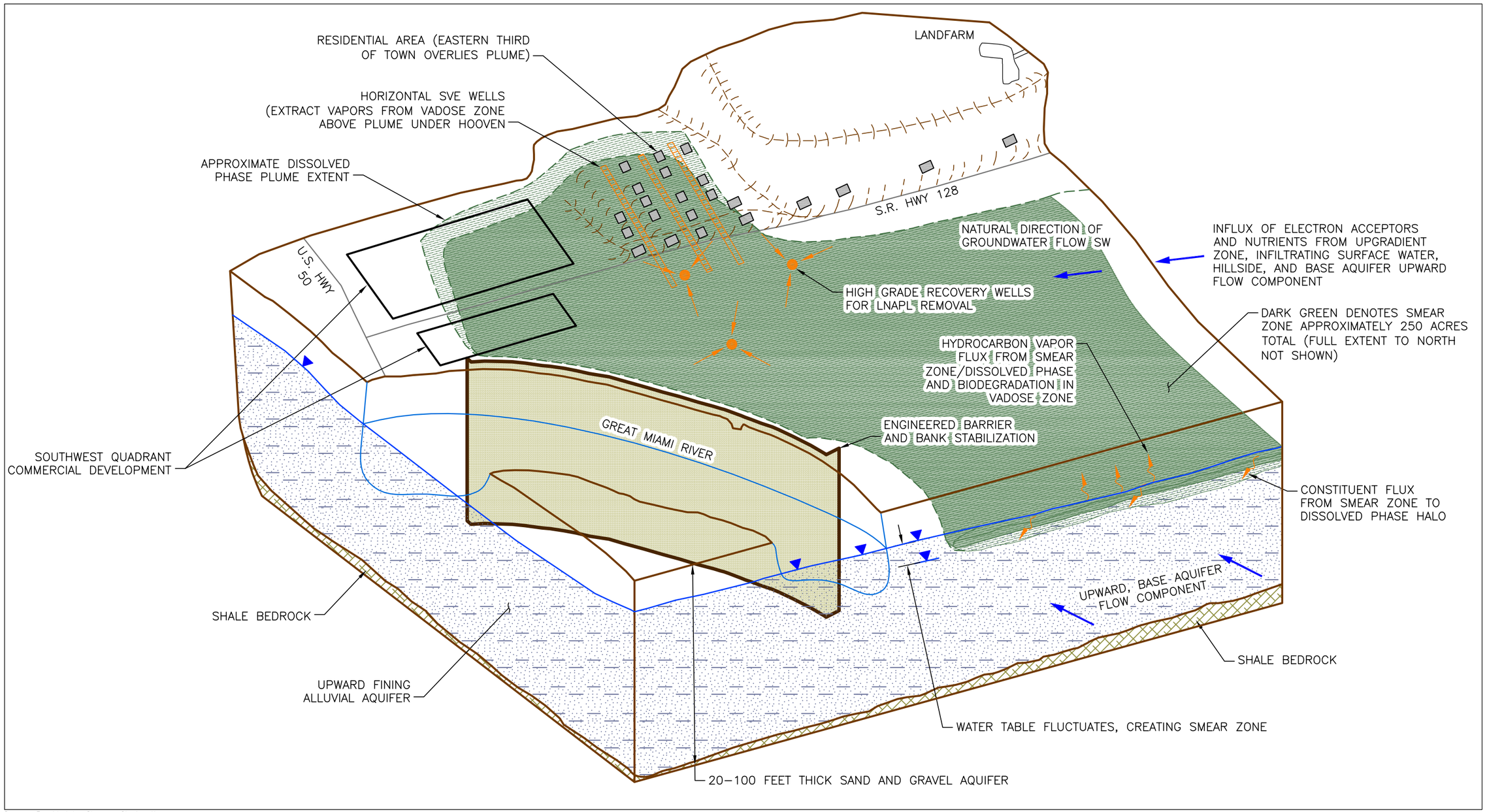

Source: Provided by Chevron Cincinnati.

EXPLANATION

HIGH-GRADE PUMPING TARGETED AREAS WITH HIGHEST RESIDUAL LNAPL SATURATION.

WATER LEVEL

DISSOLVED PHASE PLUME EXTENT

SMEAR ZONE EXTENT

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FIGURE 1-2

GROUNDWATER CONCEPTUAL SITE MODEL

SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: KR	Scale: NONE	Date: 7/10/09	File: 500GWCONCMODEL-200912

TRANSDUCER MONITORING WELLS FOR PLUME MONITORING
MW-19
MW-20S
MW-26R
MW-35
MW-48S
MW-79
MW-85S
MW-94S
MW-96S
MW-100S
MW-104S
MW-112
MW-131
MW-132

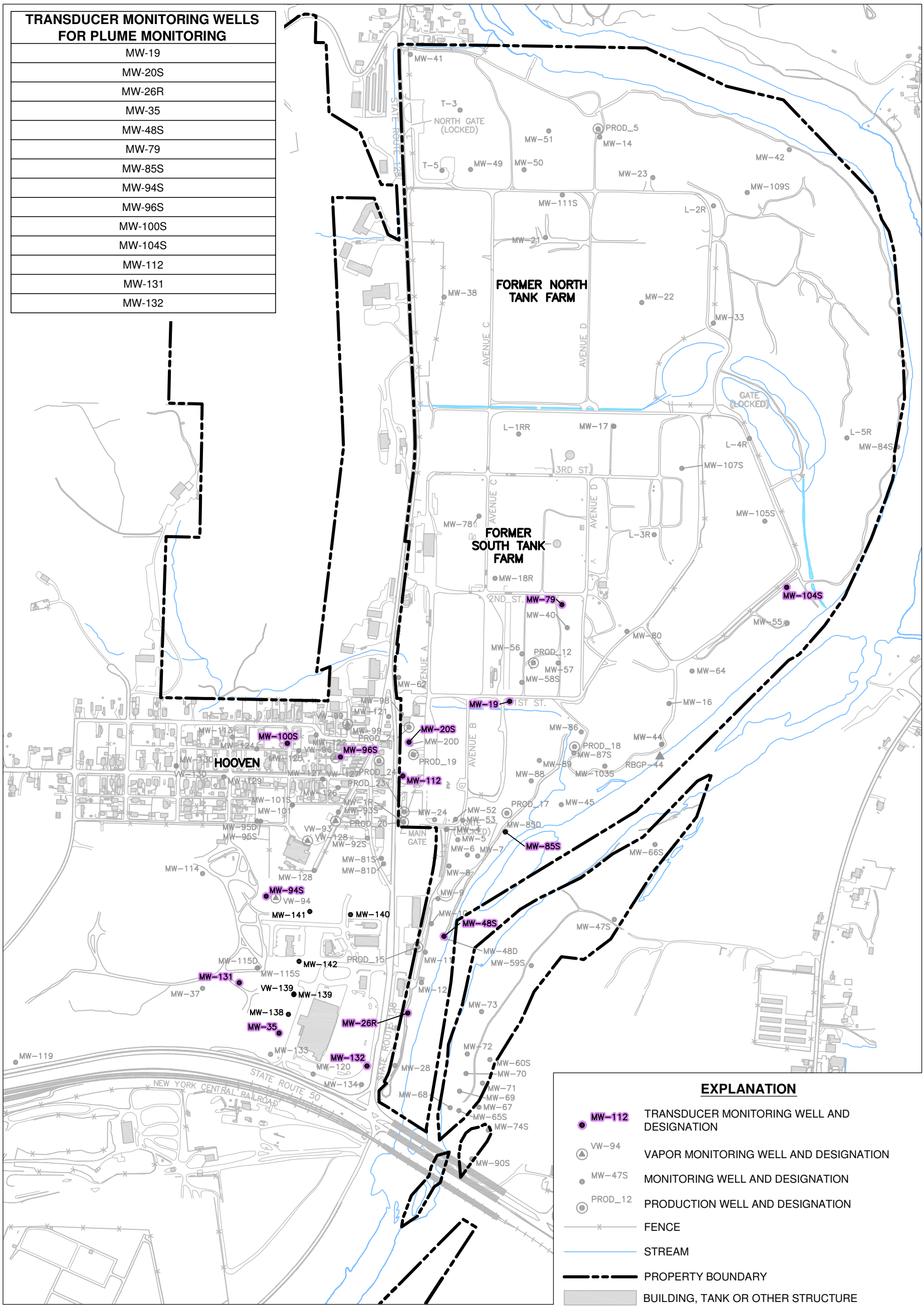

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FIGURE 2-1

TRANSDUCER MONITORING WELLS

SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: PS	Scale: 1" = 650'	Date: 10/31/08	File: 500TRANMONWELLS200912

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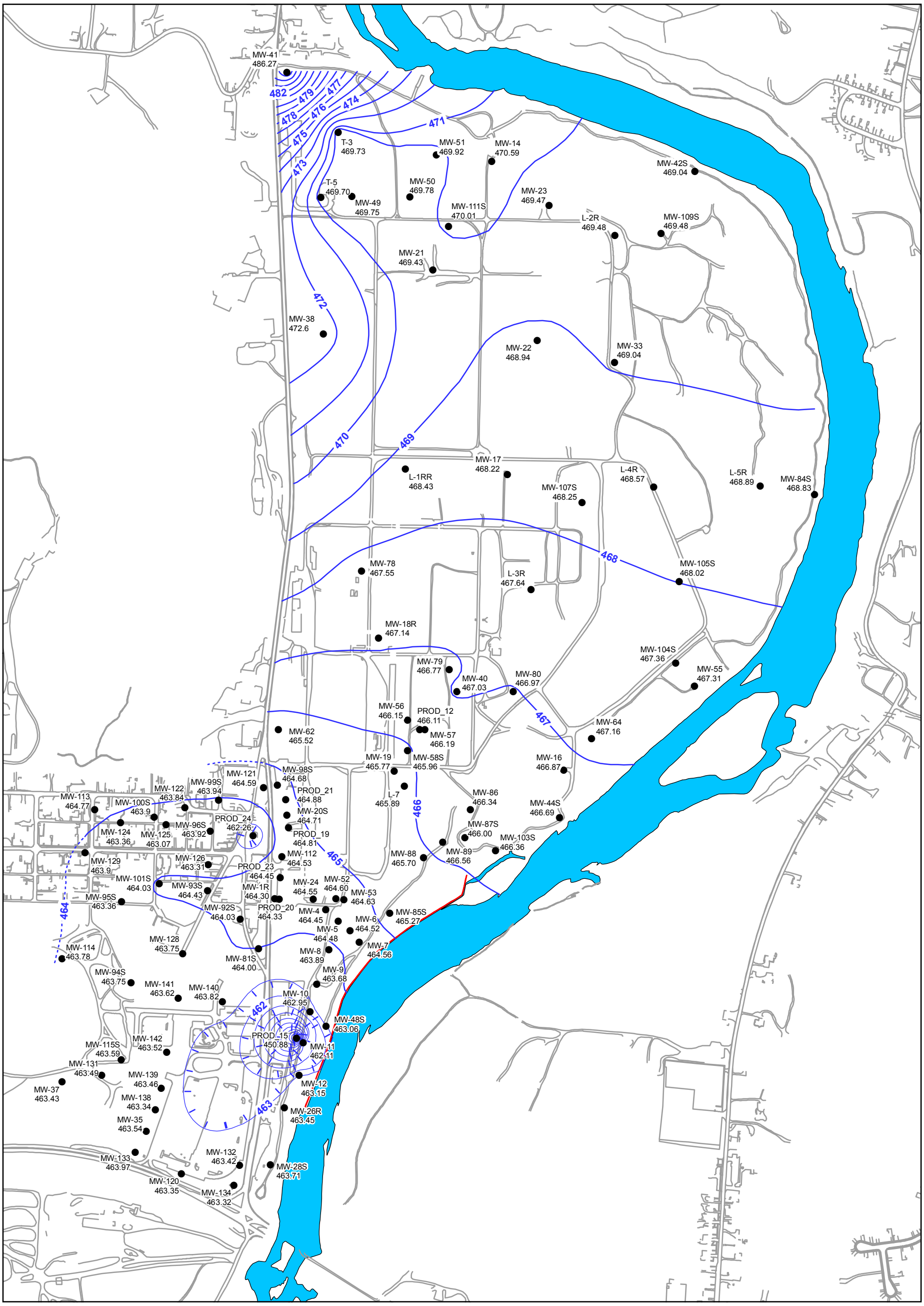

EXPLANATION

EQUIPOTENTIAL CONTOUR LINE
Elevation In Feet Above Mean Sea Level
Contour Interval is 1.0 feet
(Line dashed where approximate)

N

0 600'

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FIGURE 2-2

POTENTIOMETRIC SURFACE MAP
JULY 29, 2009

SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: PS	Checked By: PM	Scale: 1" = 600'	Date: 08/05/09	File: July_29_2009_potsurface.mxd

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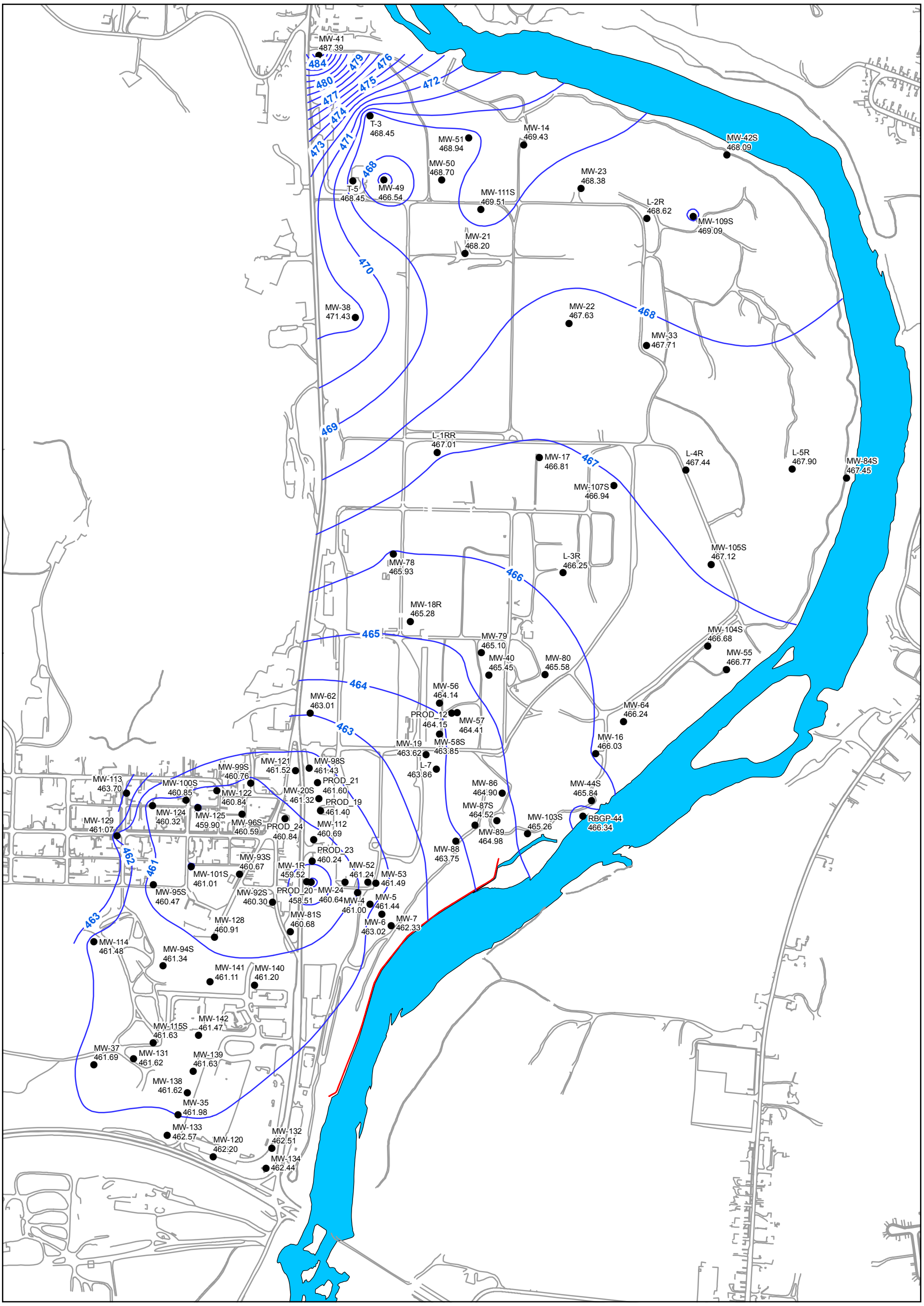

EXPLANATION

EQUIPOTENTIAL CONTOUR LINE
Elevation In Feet Above Mean Sea Level
Contour Interval is 1.0 feet
(Line dashed where approximate)

N

0 600'

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FIGURE 2-3

POTENTIOMETRIC SURFACE MAP
SEPTEMBER 30, 2009

SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: BR	Checked By: PM	Scale: 1" = 600'	Date: 3/3/10	File: Sept_30_2009_Potsurface.mxd

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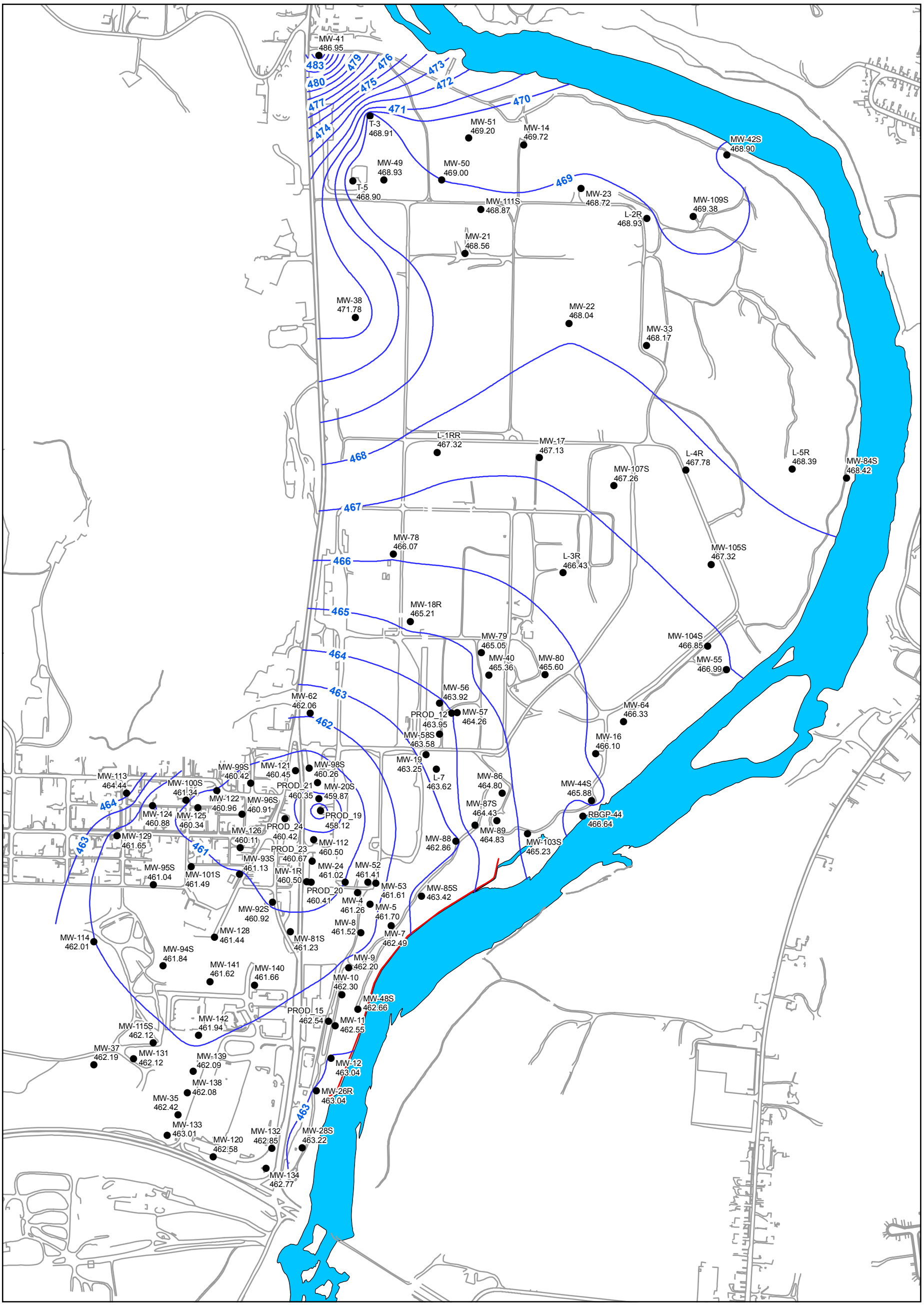

EXPLANATION

EQUIPOTENTIAL CONTOUR LINE
Elevation In Feet Above Mean Sea Level
Contour Interval is 1.0 feet
(Line dashed where approximate)

N

0 600'

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FIGURE 2-4

POTENTIOMETRIC SURFACE MAP
NOVEMBER 30, 2009

SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: BR	Checked By: PM	Scale: 1" = 600'	Date: 3/3/10	File: Nov_30_2009_Potsurface.mxd

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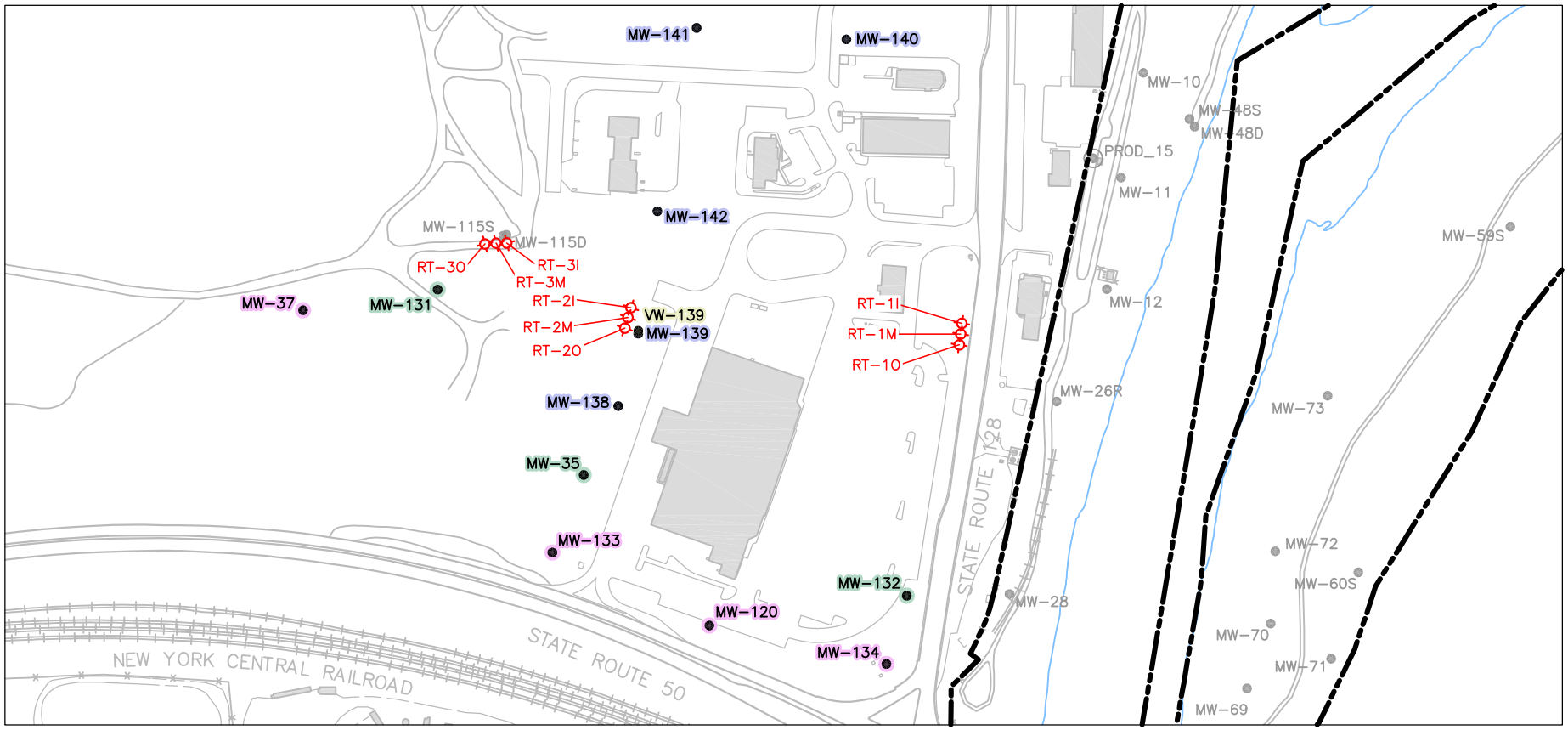

EXPLANATION

RT-2O, RT-2M, RT-2I — PERMANENT ROST TRANSECT AND DESIGNATION

MW-138 — MONITORING WELL AND DESIGNATION (INSTALLED MARCH 2009)

MW-35 — SENTINEL MONITORING WELL AND DESIGNATION

MW-37 — POINT OF COMPLIANCE MONITORING WELL AND DESIGNATION

VW-139 — NESTED VAPOR WELL AND DESIGNATION

MW-47S — MONITORING WELL AND DESIGNATION

PROD_12 — PRODUCTION WELL AND DESIGNATION

STREAM

PROPERTY BOUNDARY

BUILDING, TANK OR OTHER STRUCTURE

N

0 300'

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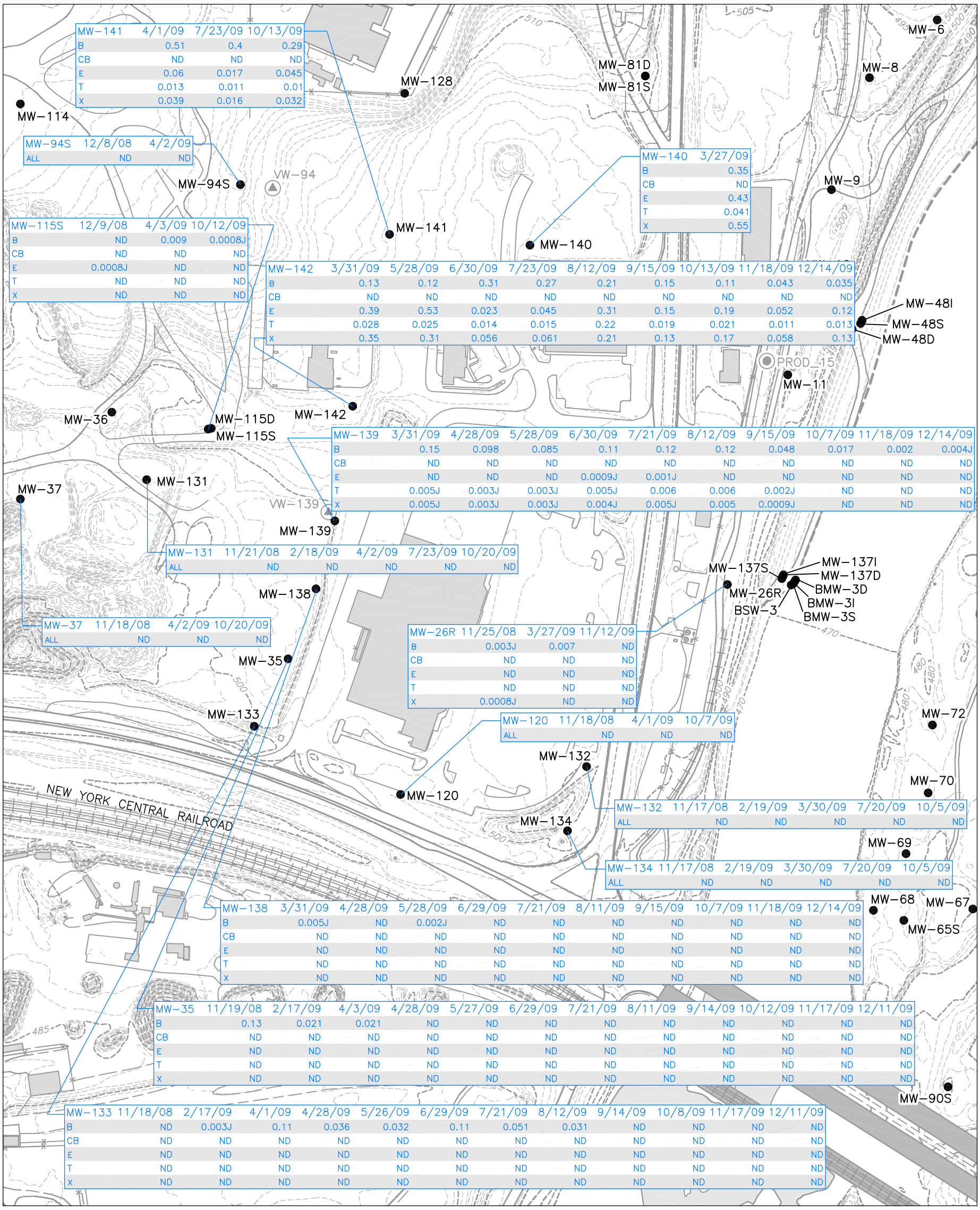
FIGURE 2-5

SENTINEL, POINT OF COMPLIANCE, AND ROST MONITORING NETWORK

SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: MM	Scale: 1"=300'	Date: 12/8/09	File: 500ROST-TRANSECTS200912



EXPLANATION

- BSW-3D — BARRIER MONITORING WELL AND DESIGNATION
- MW-27 — MONITORING WELL AND DESIGNATION
- VW-94 — NESTED SOIL VAPOR MONITORING WELL AND DESIGNATION
- PROD_15 — PRODUCTION WELL AND DESIGNATION
- SHEET PILE BARRIER WALL
- FENCE
- BUILDING, TANK OR OTHER STRUCTURE
- 480 — GROUND SURFACE CONTOURS (INTERVAL= 5')

CONSTITUENT TABLE EXPLANATION

WELL DESIGNATION →	MW-133 12/11/09	← SAMPLE DATE
Benzene →	B	0.5
Chlorobenzene →	CB	0.8
Ethylbenzene →	E	0.8
Toluene →	T	0.7
Xylenes, Total →	X	0.8

N

0 200'

NOTES:

1. ALL VALUES IN MILLIGRAMS PER LITER (mg/L)
2. J ESTIMATED VALUE

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FIGURE 2-6

SOUTHWEST QUAD GROUNDWATER RESULTS (NOVEMBER 2008 THROUGH DECEMBER 2009)

SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: MM	Scale: 1" = 200'	Date: 1/5/2010	File: 500-SW-BTEX-200912

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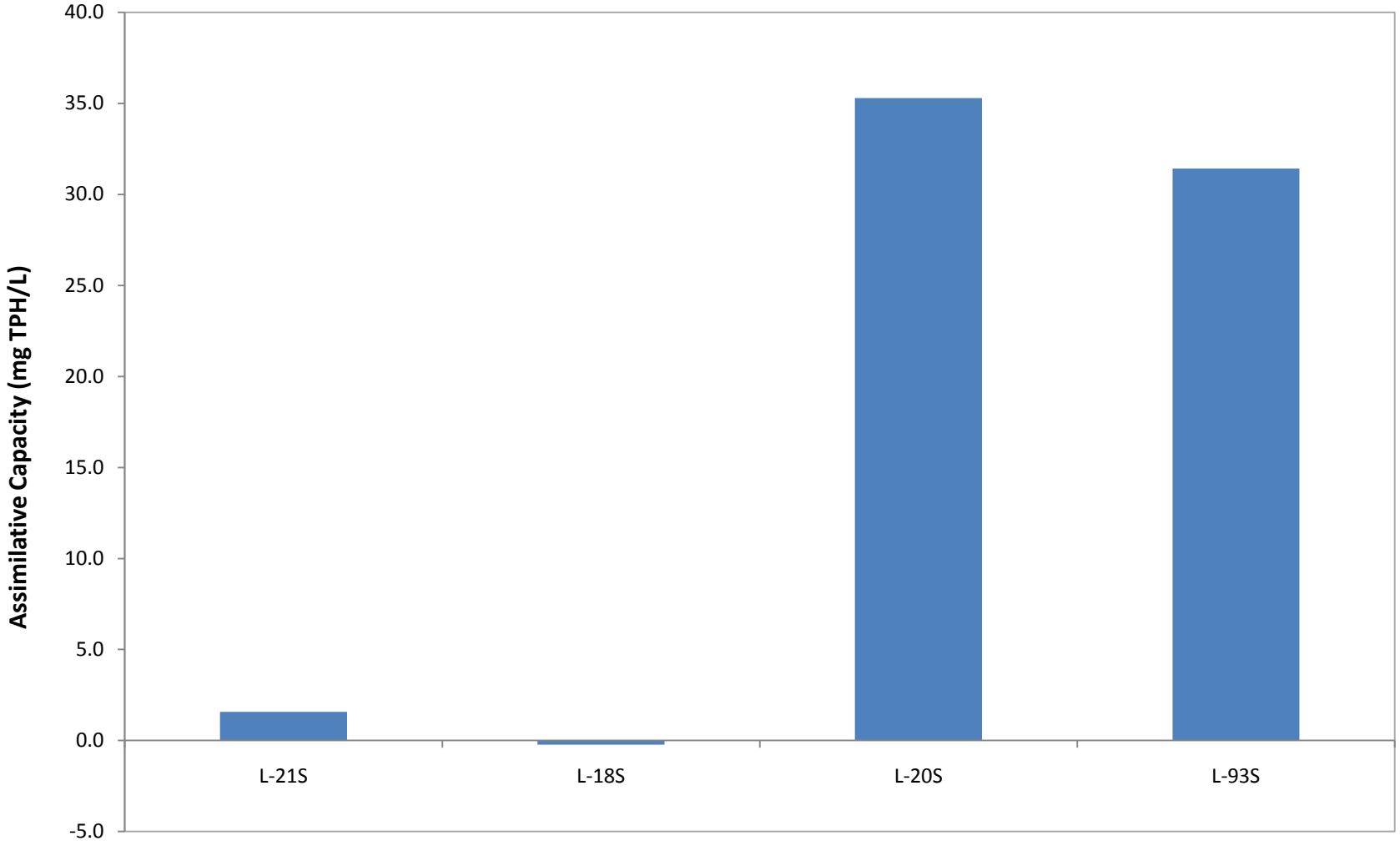
FIGURE 2-7. PORE WATER ASSIMILATIVE CAPACITY
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



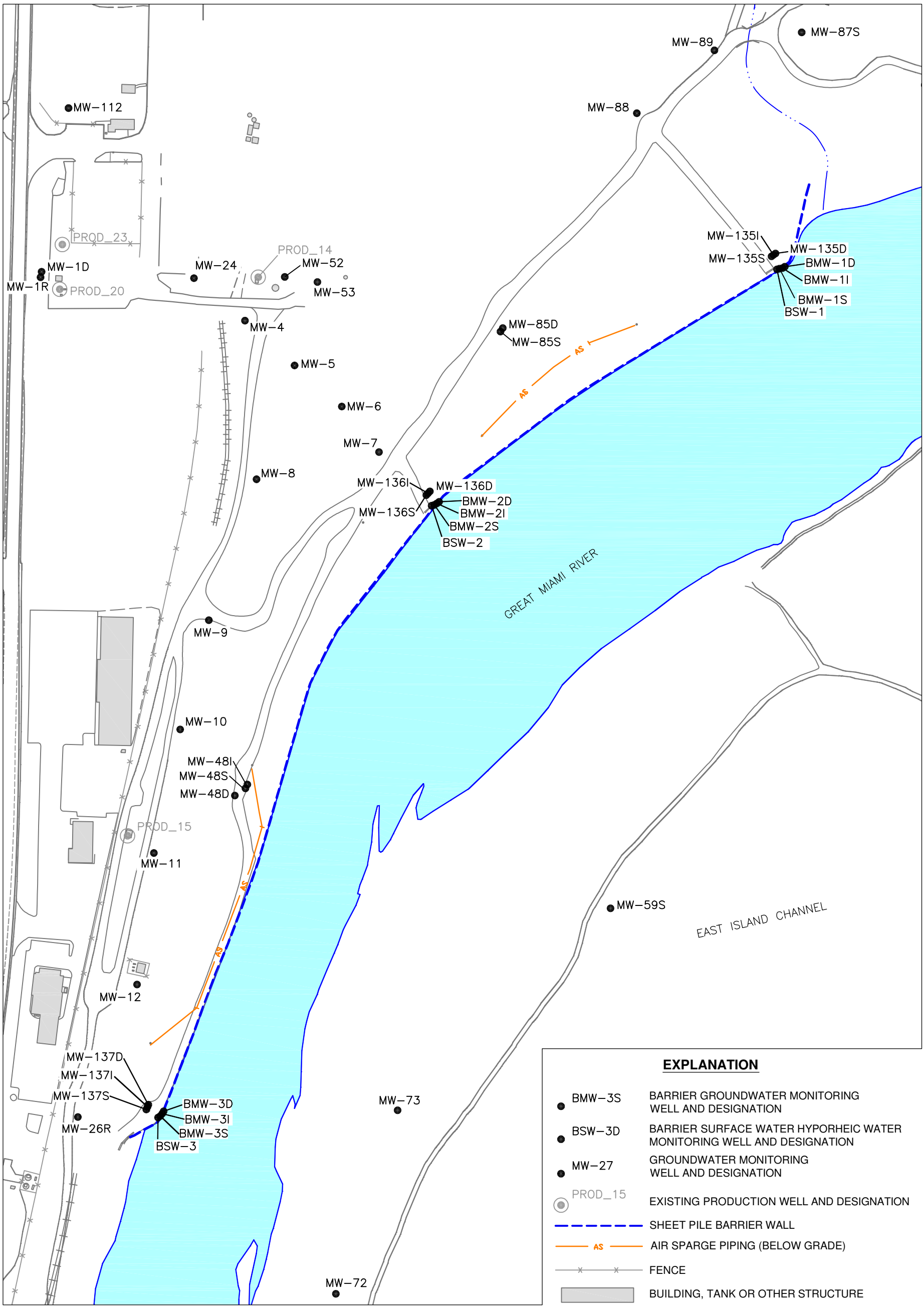


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FIGURE 2-8

BARRIER PERFORMANCE AIR SPARGE AND MONITORING WELL NETWORK

SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: JGP	Scale: 1" = 150'	Date: 7/6/09	File: 500ASBUILTMONNET-200912

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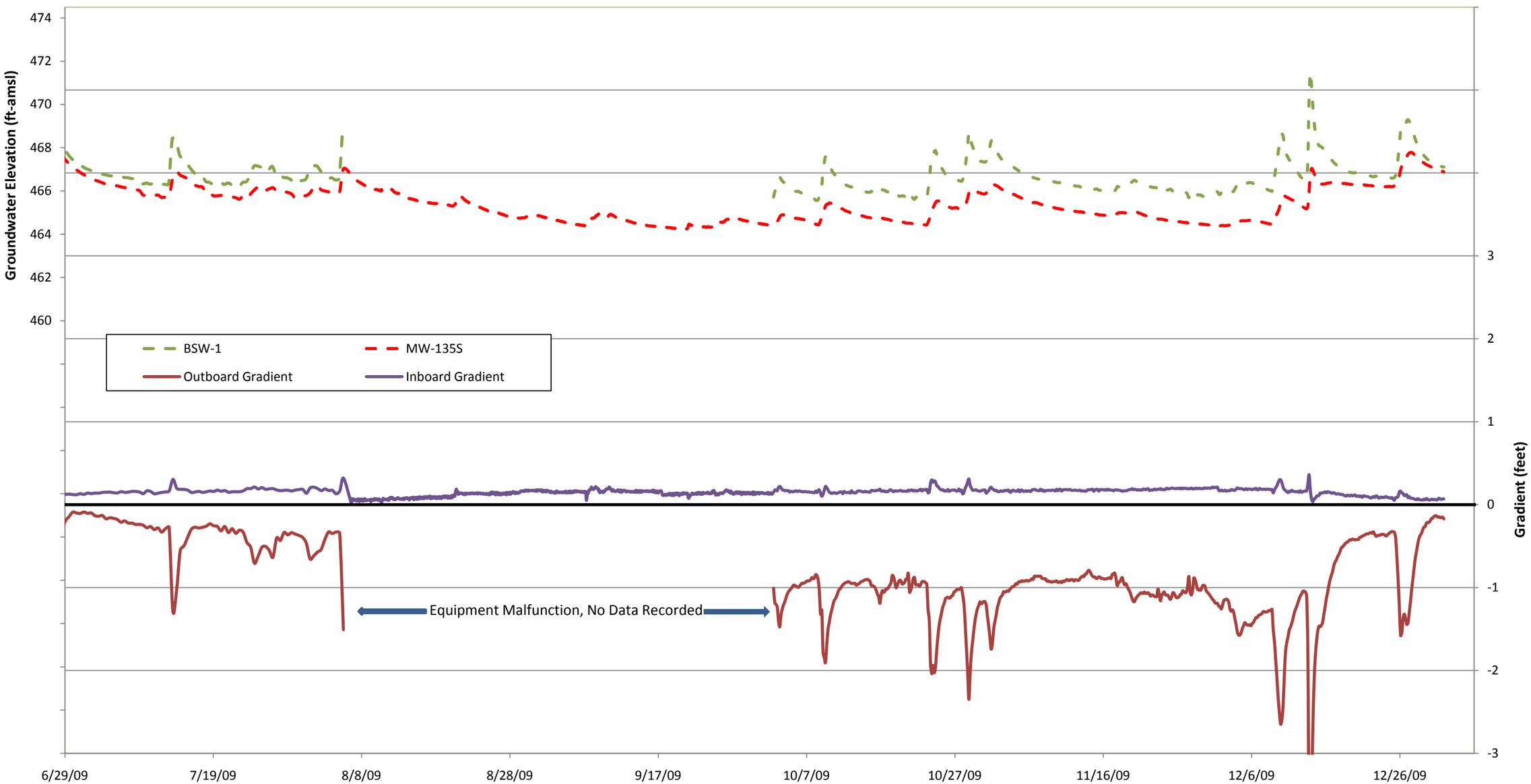
FIGURE 2-9. BARRIER WALL NORTH TRANSECT VERTICAL GRADIENTS
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION
Outboard Gradient - Groundwater elevation at BMW-1D minus the surface water elevation at BSW-1.
Inboard Gradient - Groundwater elevation at MW-135D minus the groundwater elevation at MW-135S.

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FIGURE 2-10. BARRIER WALL SOUTH TRANSECT VERTICAL GRADIENTS
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

EXPLANATION
Outboard Gradient - Groundwater elevation at BMW-3D minus the surface water elevation at BSW-3.
Inboard Gradient - Groundwater elevation at MW-137D minus the groundwater elevation at MW-137S.

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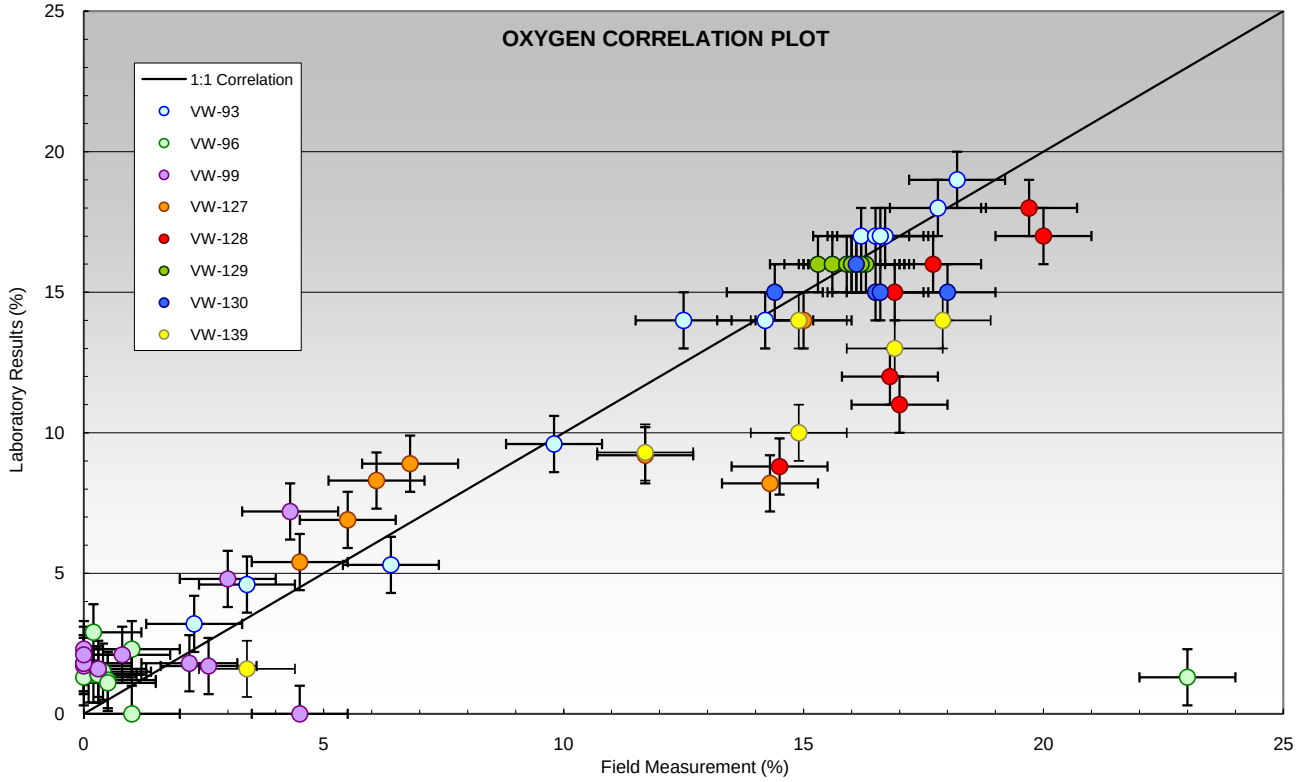
FIGURE 2-11. NESTED SOIL VAPOR MONITORING WELL OXYGEN AND CARBON DIOXIDE CORRELATION PLOT
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



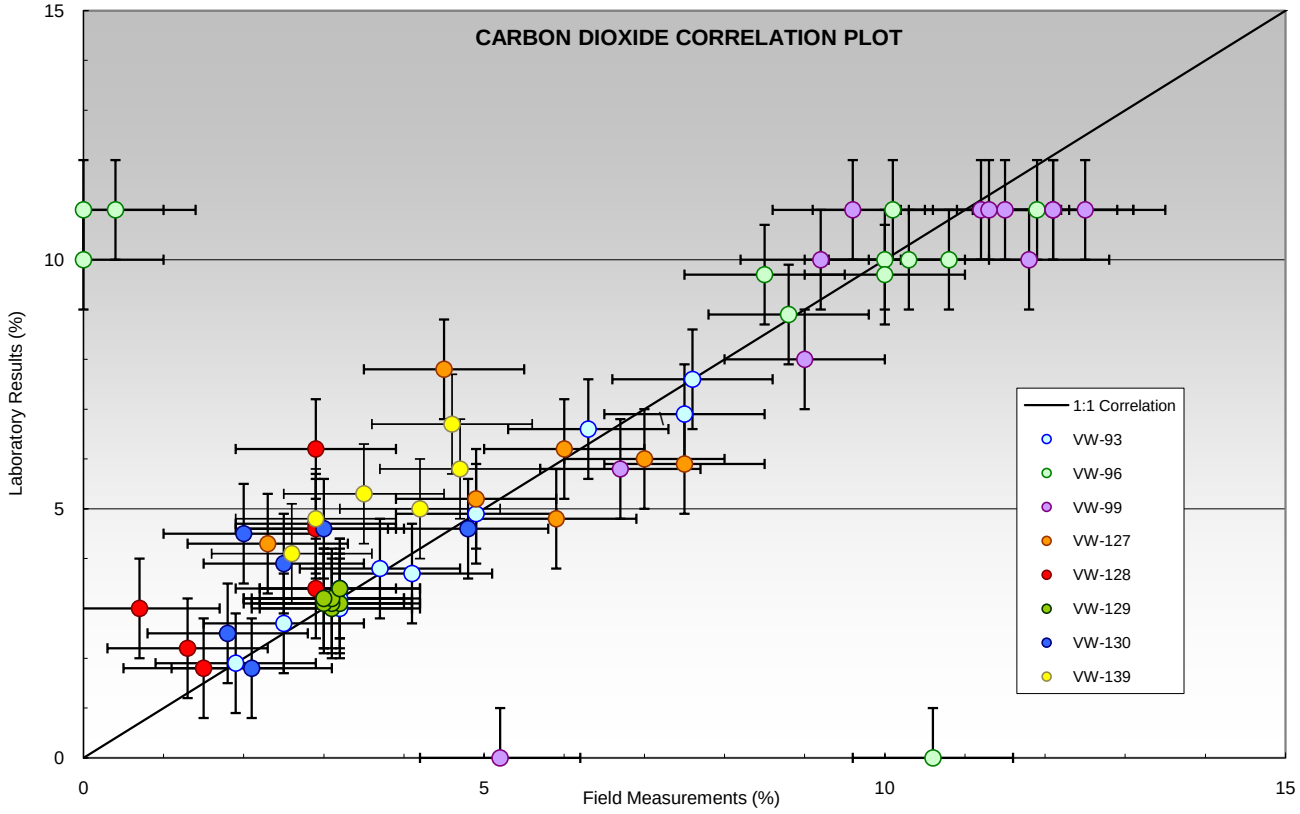


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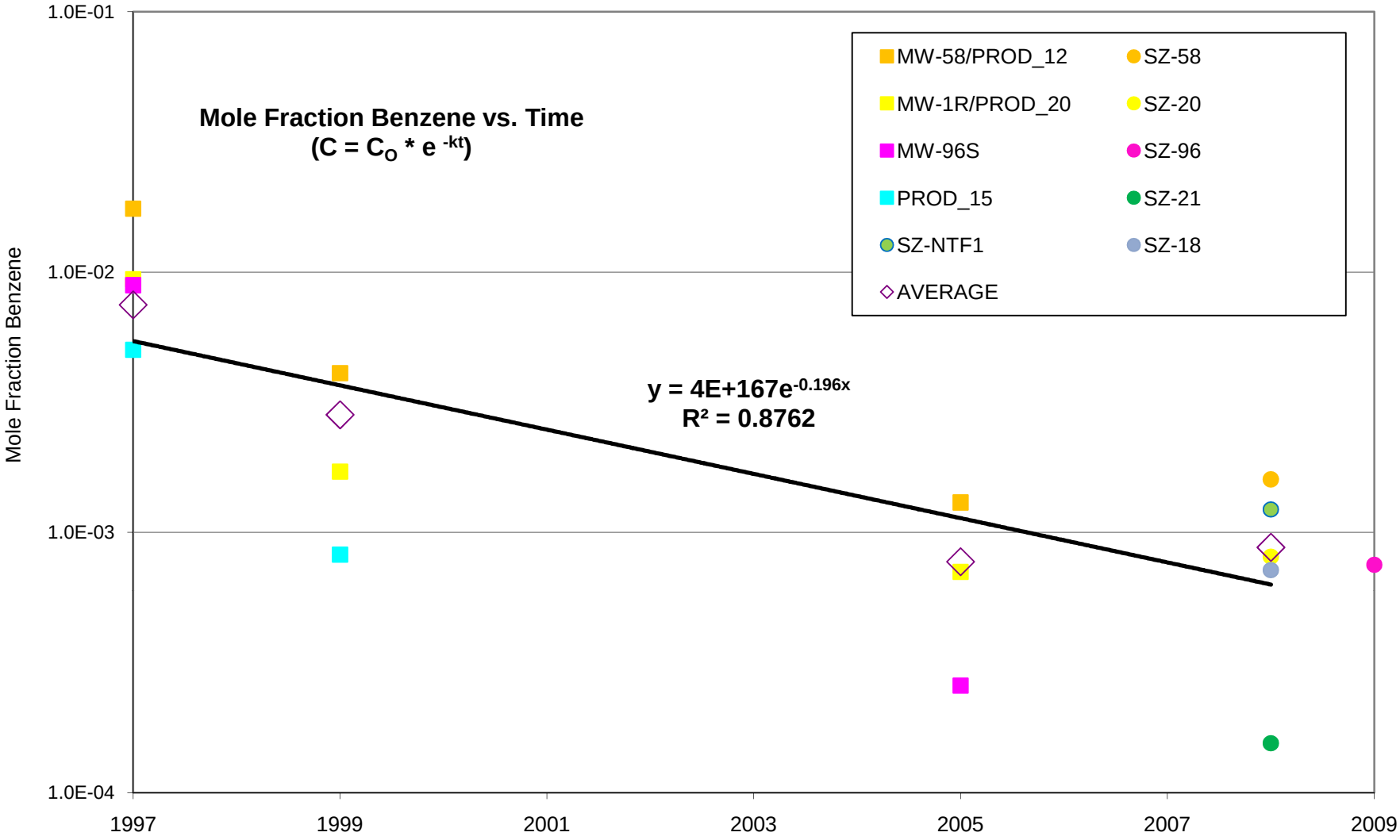
FIGURE 3-1. BENZENE MOLE FRACTION VERSUS TIME IN LNAPL AND SOIL CORE SAMPLES
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION

1. SZ DESIGNATION INDICATES SMEAR ZONE SOIL CORES COLLECTED IN 2008 AND 2009 WHERE MOLE FRACTION BENZENE ARE AVERAGED FOR EACH OF THE SAMPLES COLLECTED FROM THE MIDDLE OF THE SMEAR ZONE AT EACH LOCATION.
2. MOLE FRACTION BENZENE FOR ALL OTHER EVENTS CALCULATED USING LNAPL ANALYTICAL RESULTS

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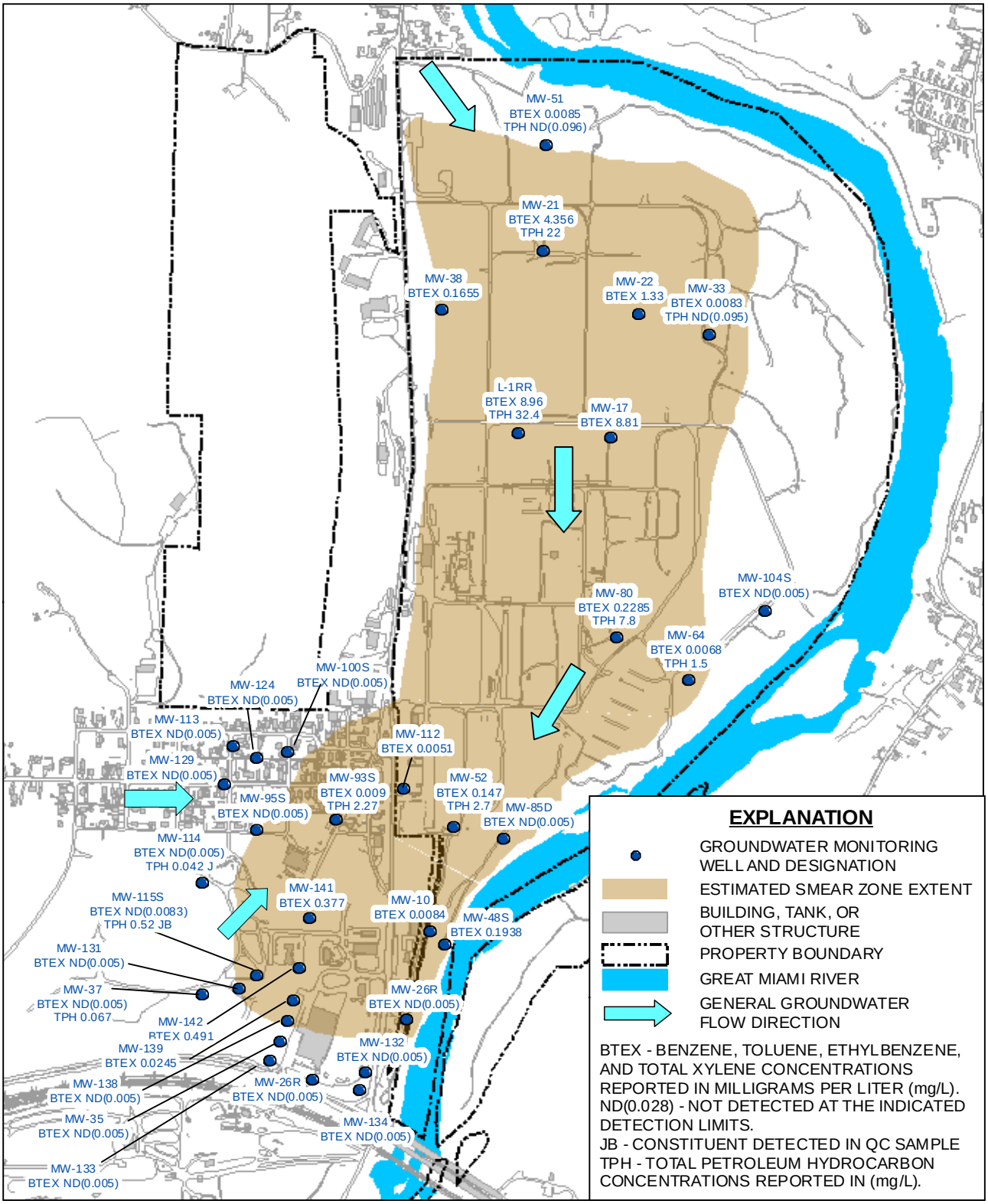

N

0 1,000'

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FIGURE 3-2

DISSOLVED PHASE CONSTITUENT CONCENTRATIONS

SECOND SEMIANNUAL 2009 MONITORING EVENT
CHEVRON CINCINNATI FACILITY,
HOOVEN, OHIO

Drawn By: BLM	Checked By: ??	Scale: 1" = 1000'	Date: 03/02/10	File: 200910_QI_TPHTrends.mxd

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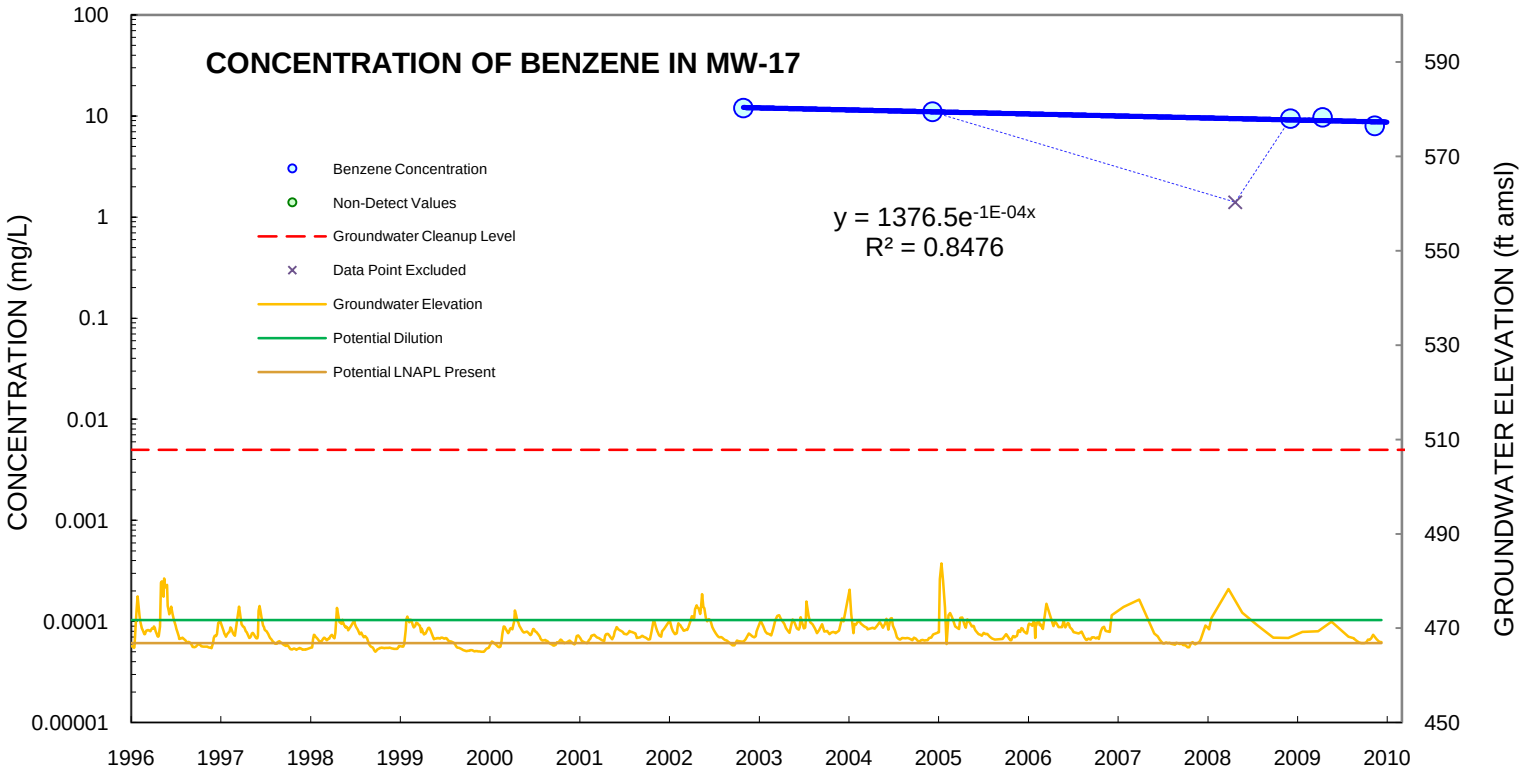
FIGURE 3-3. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME, MONITORING WELL MW-17
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.

ONE DATA POINT EXCLUDED (4/23/08)

FT AMSL - FEET ABOVE MEAN SEA LEVEL

mg/L - MILLIGRAMS PER LITER

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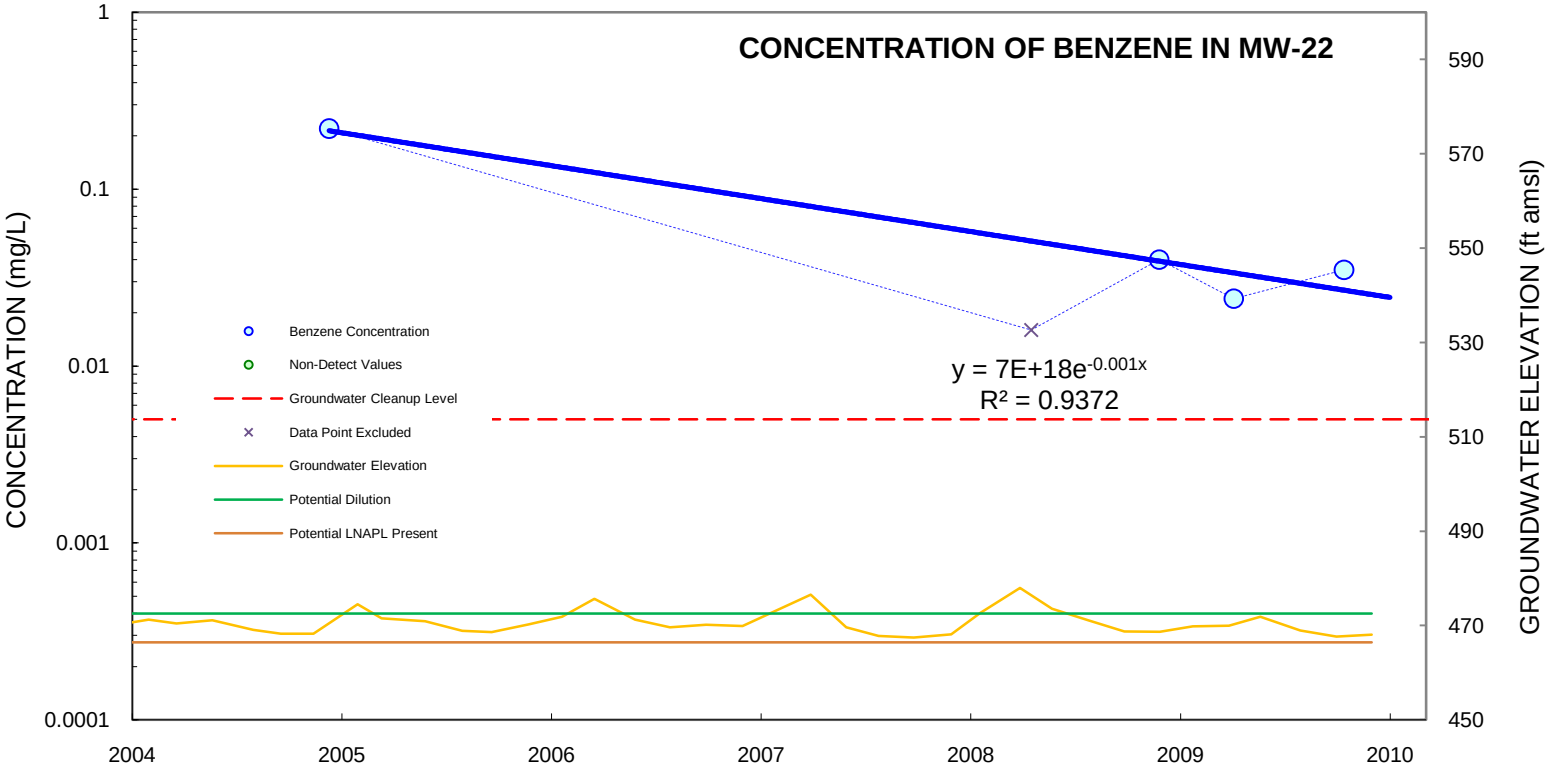
FIGURE 3-4. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME, MONITORING WELL MW-22
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.
ONE DATA POINT EXCLUDED (4/16/08)
FT AMSL - FEET ABOVE MEAN SEA LEVEL
mg/L - MILLIGRAMS PER LITER

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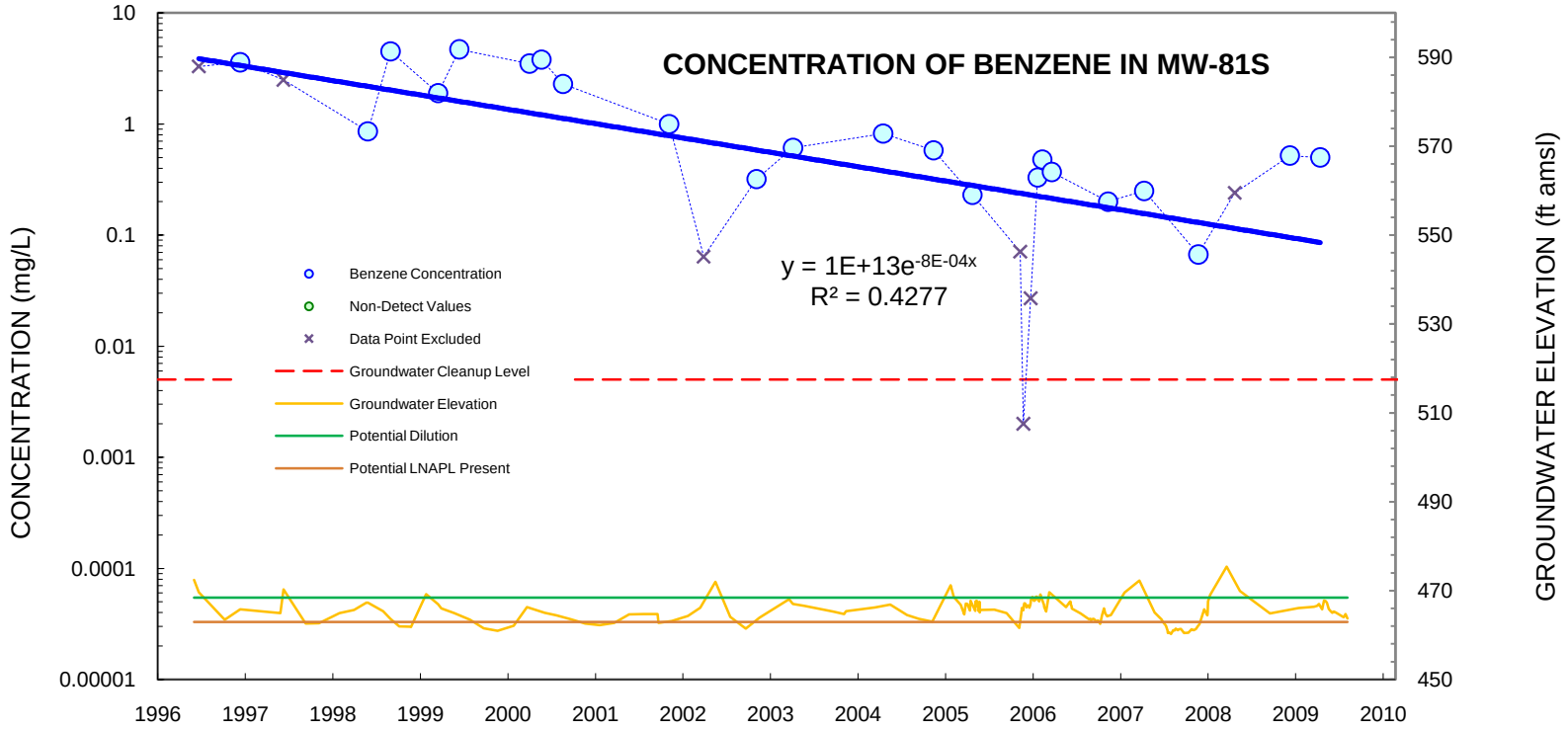
FIGURE 3-5. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME, MONITORING WELL MW-81S
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.

NO ANALYTICAL DATA AVAILABLE FOR FALL 2009 BECAUSE LNAPL WAS PRESENT IN THE WELL.

EIGHT DATA POINTS EXCLUDED (6/20/1996, 6/9/1997, 4/1/2002, 11/15/2005, 11/28/2005, 12/29/2005, 4/30/2008)

FT AMSL - FEET ABOVE MEAN SEA LEVEL

mg/L - MILLIGRAMS PER LITER

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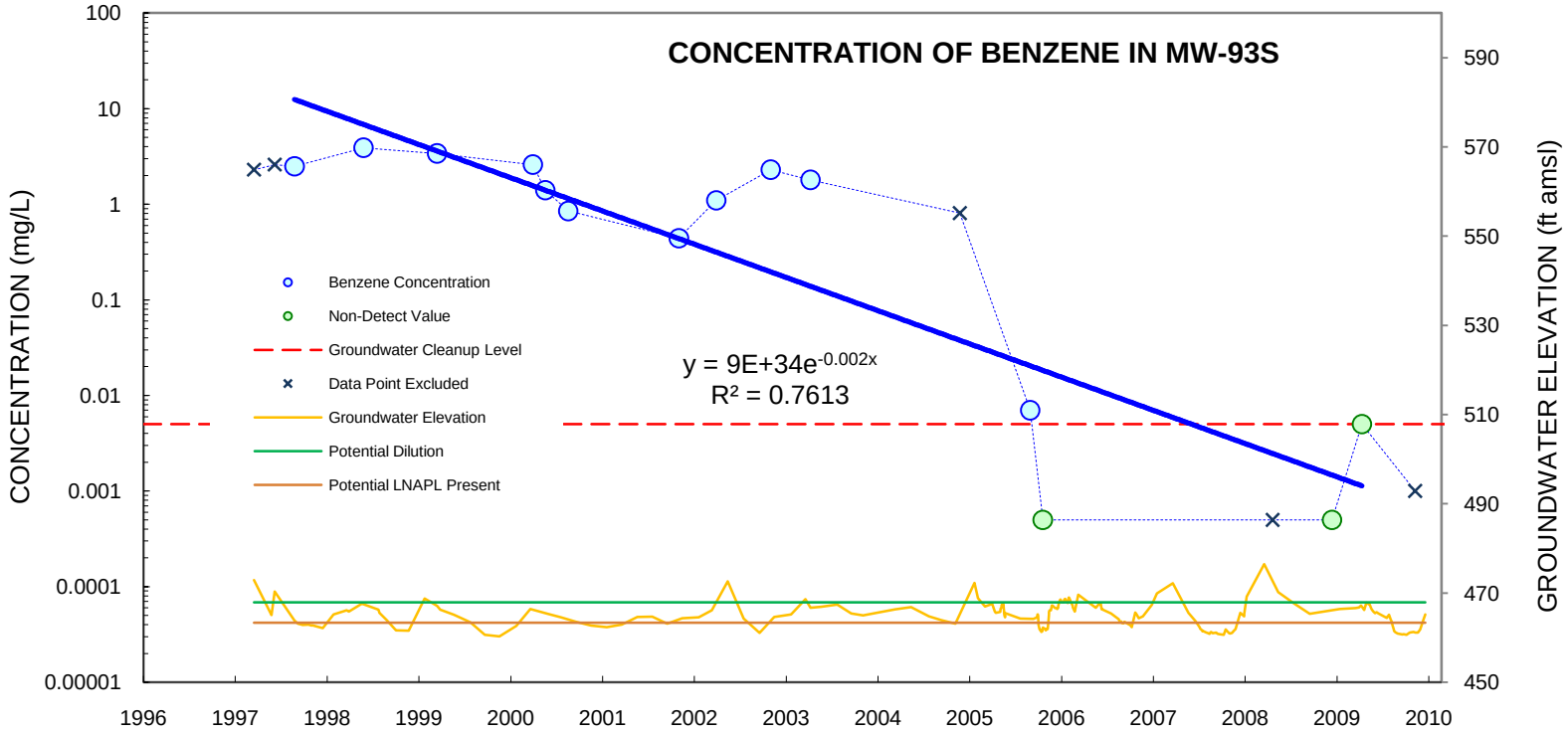
FIGURE 3-6. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME, MONITORING WELL MW-93S
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.

FIVE DATA POINTS EXCLUDED (3/18/97, 6/9/97, 11/30/04, 4/30/2008, AND 11/19/2009)

FT AMSL - FEET ABOVE MEAN SEA LEVEL

mg/L - MILLIGRAMS PER LITER

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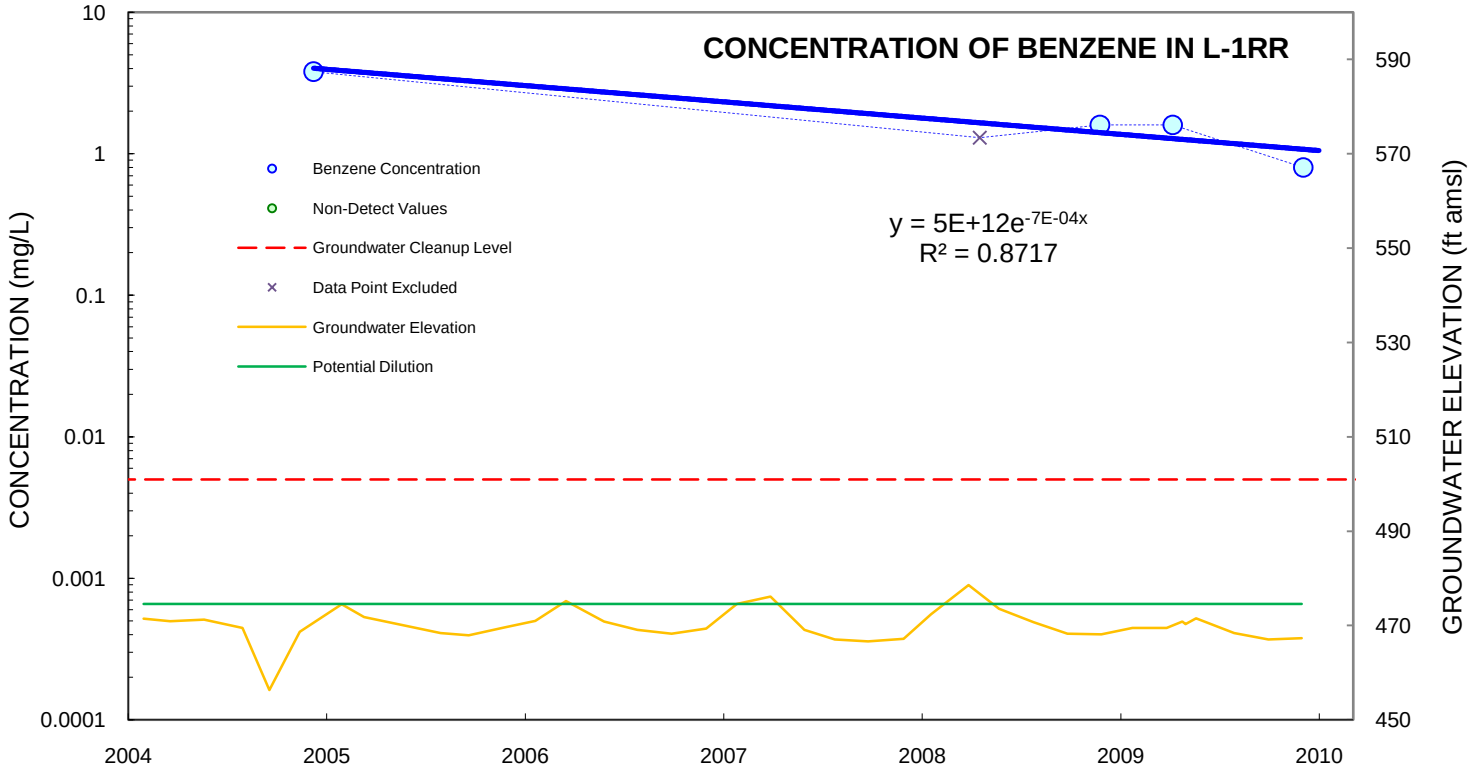
FIGURE 3-7. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME, MONITORING WELL L-1RR
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS BASED ON POTENTIAL DILUTION.
ONE DATA POINT EXCLUDED (4/17/08)
FT AMSL - FEET ABOVE MEAN SEA LEVEL
mg/L - MILLIGRAMS PER LITER

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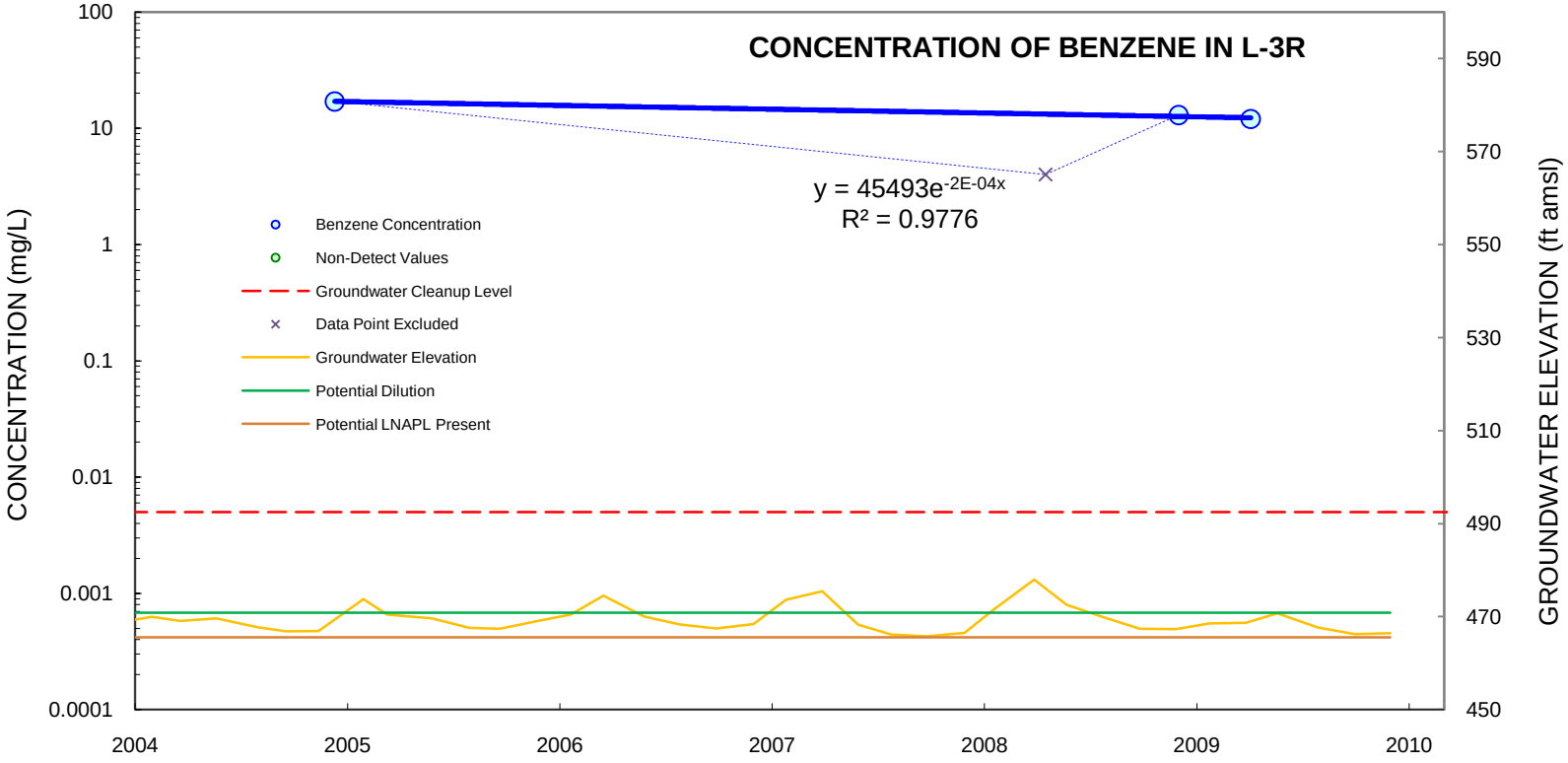
FIGURE 3-8. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME, MONITORING WELL L-3R
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.
NO ANALYTICAL DATA AVAILABLE FOR FALL 2009 BECAUSE LNAPL WAS PRESENT IN THE WELL.
ONE DATA POINT EXCLUDED (4/16/08)
FT AMSL - FEET ABOVE MEAN SEA LEVEL
mg/L - MILLIGRAMS PER LITER

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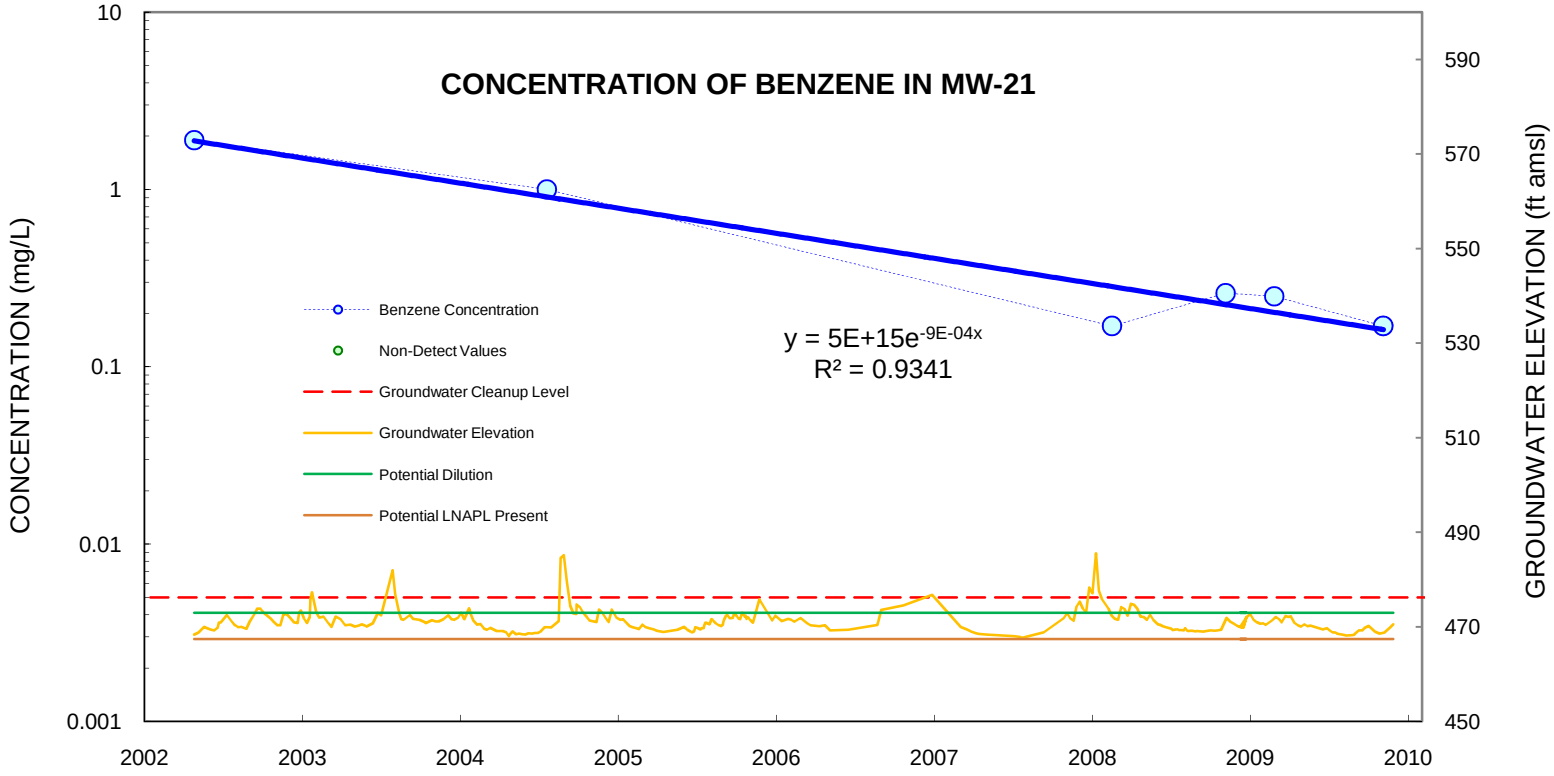
FIGURE 3-9. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME, MONITORING WELL MW-21
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.
NO DATA POINTS EXCLUDED FOR MW-21
FT AMSL - FEET ABOVE MEAN SEA LEVEL
mg/L - MILLIGRAMS PER LITER

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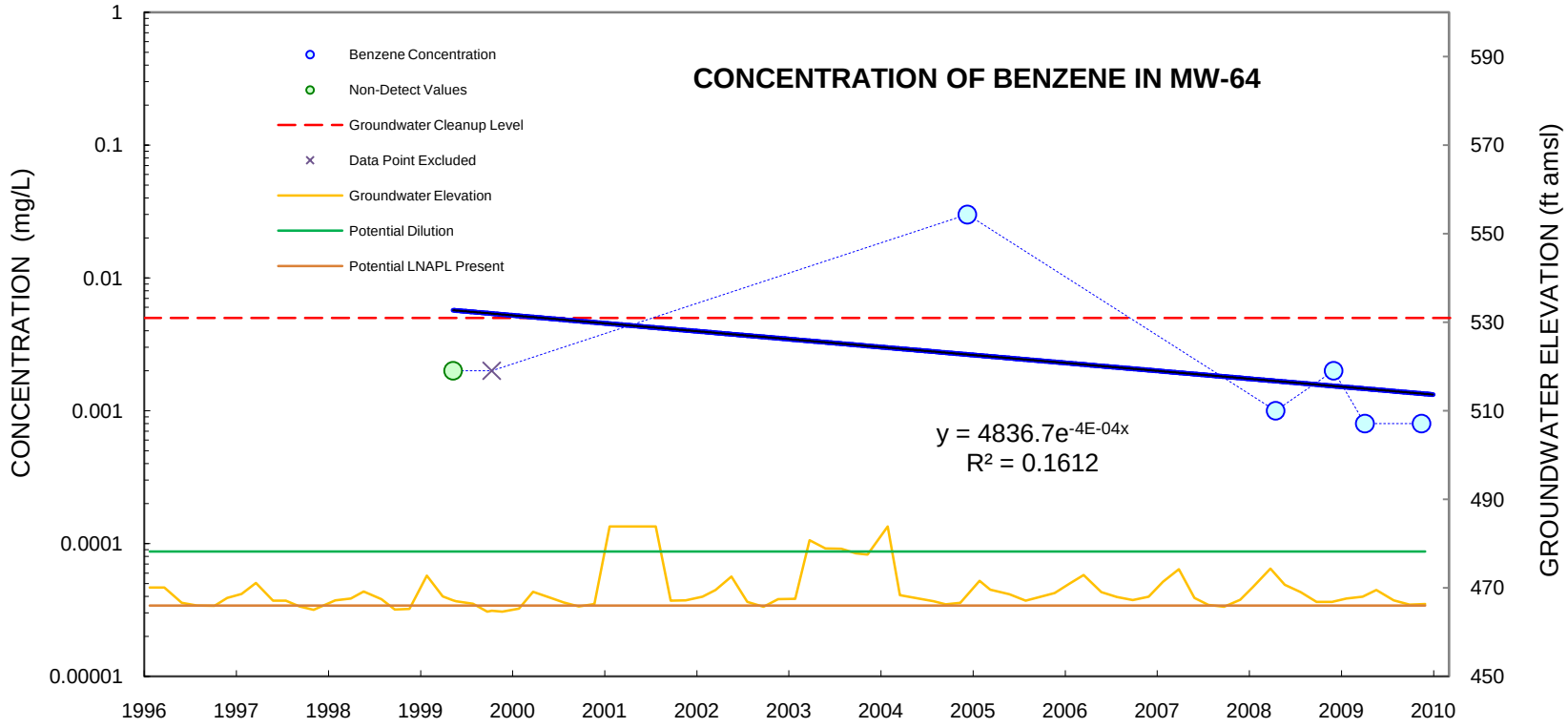
FIGURE 3-10. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME, MONITORING WELL MW-64
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.
ONE DATA POINT EXCLUDED (10/12/99)
FT AMSL - FEET ABOVE MEAN SEA LEVEL
mg/L - MILLIGRAMS PER LITER

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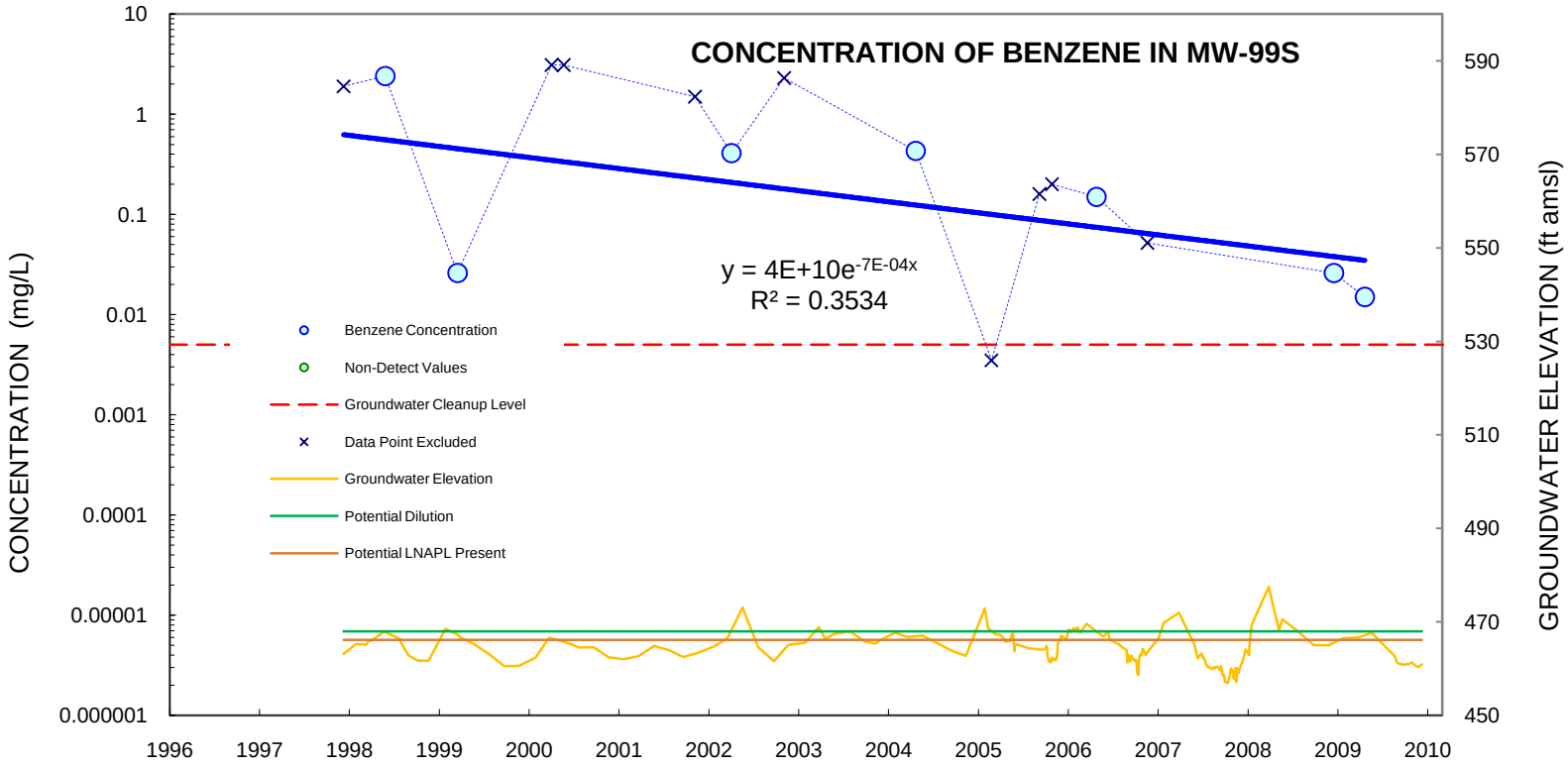
FIGURE 3-11. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME, MONITORING WELL MW-99S
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION:

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.

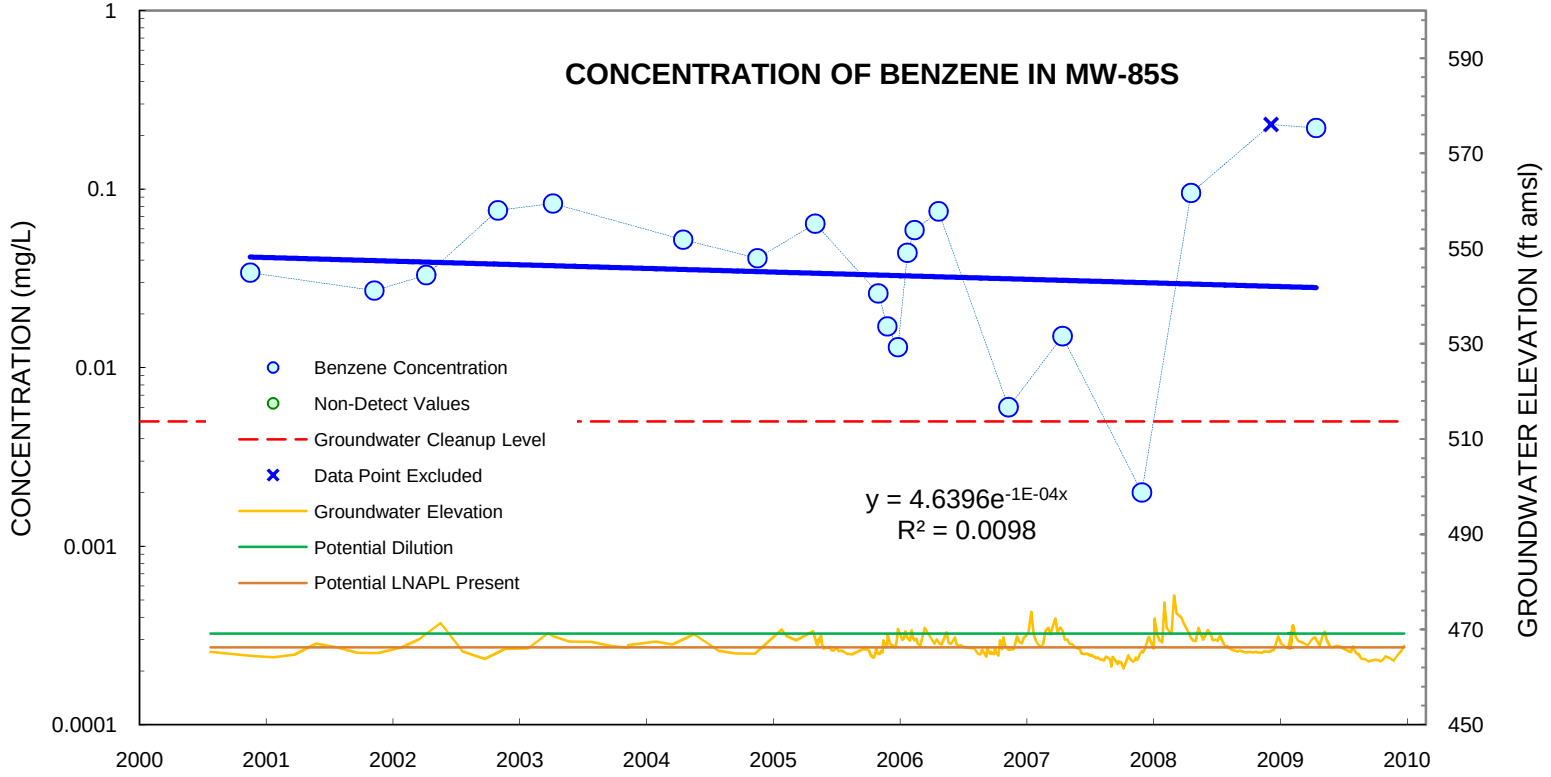
NINE DATA POINTS EXCLUDED (12/10/1997, 4/3/2000, 5/23/2000, 11/7/2001, 11/4/2002, 2/24/2005, 9/7/2005, 10/28/2005, and 11/20/2006).

FT AMSL - FEET ABOVE MEAN SEA LEVEL

mg/L - MILLIGRAMS PER LITER

US EPA ARCHIVE DOCUMENT

FIGURE 3-12. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME, MONITORING WELL MW-85S
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS BASED ON POTENTIAL DILUTION OR PRESENCE OF LNAPL.

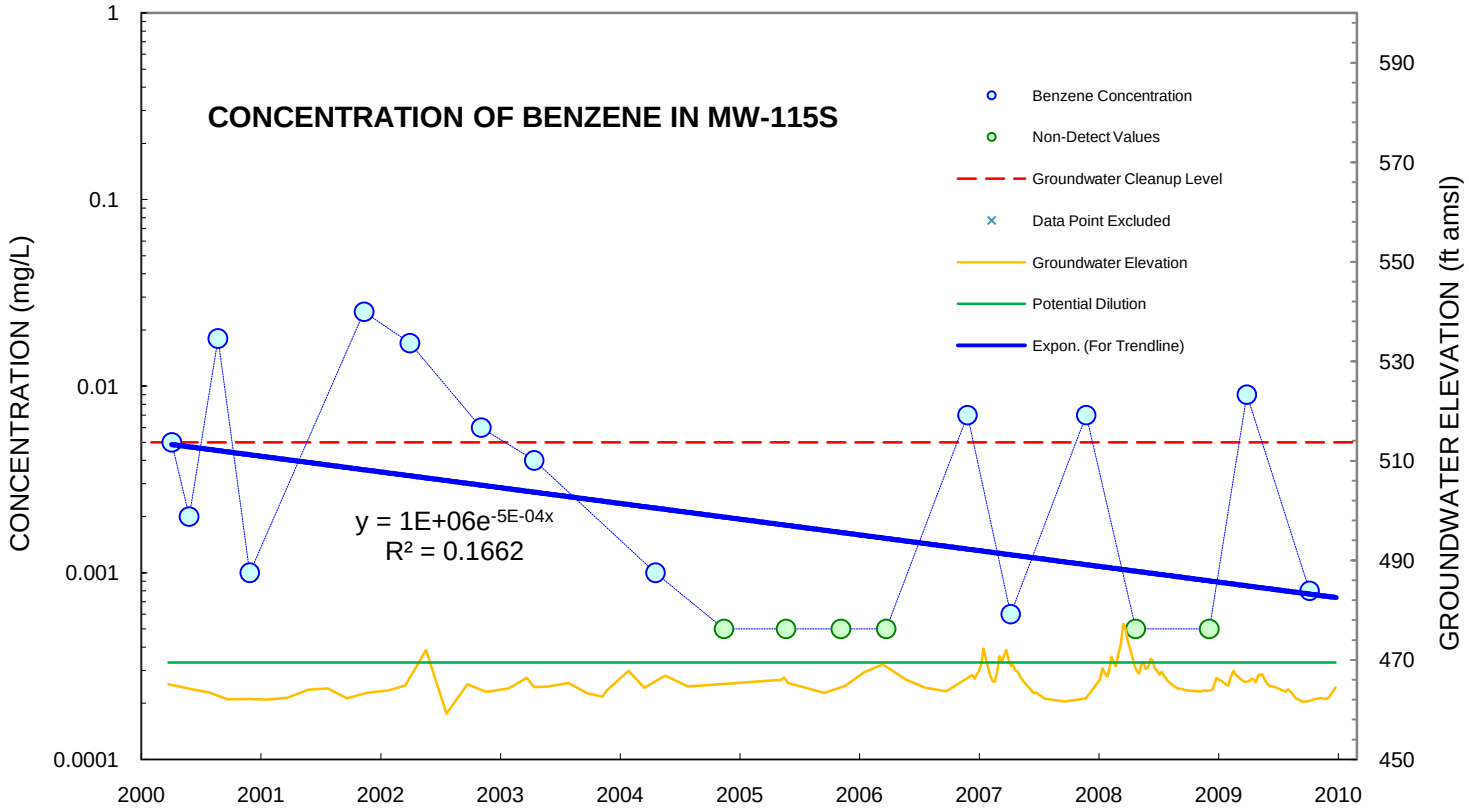
ONE DATA POINT EXCLUDED (12/11/08)

FT AMSL - FEET ABOVE MEAN SEA LEVEL

mg/L - MILLIGRAMS PER LITER

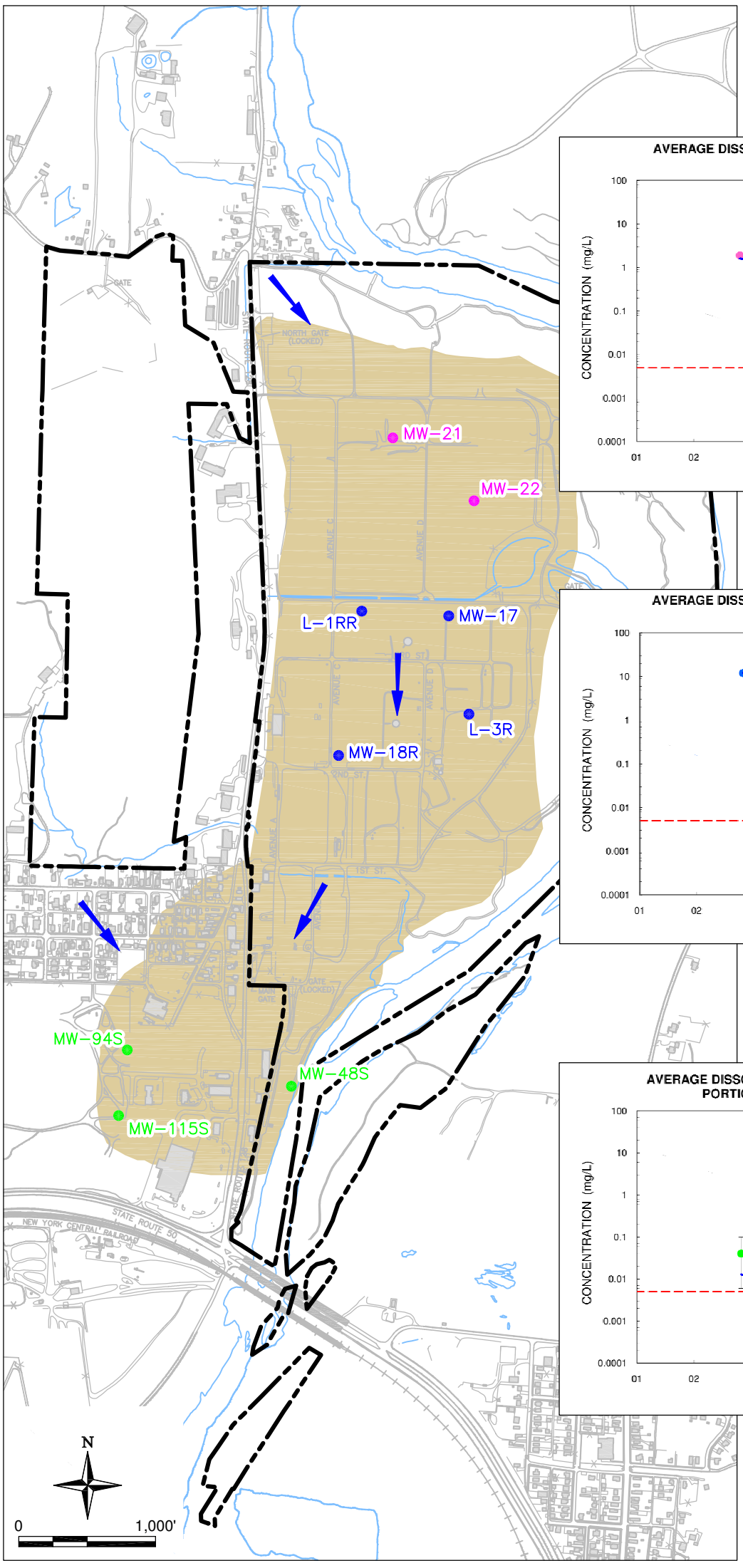
US EPA ARCHIVE DOCUMENT

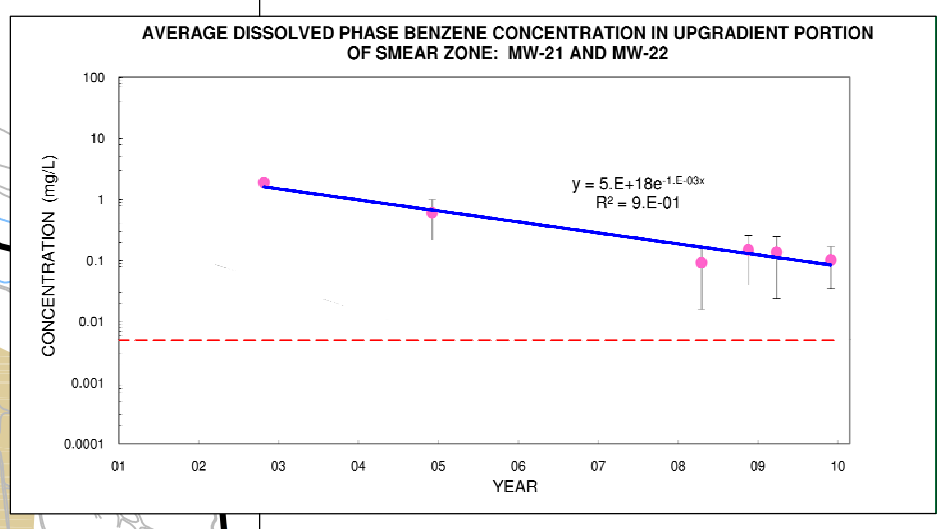
FIGURE 3-13. GROUNDWATER CONSTITUENT CONCENTRATIONS VERSUS TIME, MONITORING WELL MW-115S
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

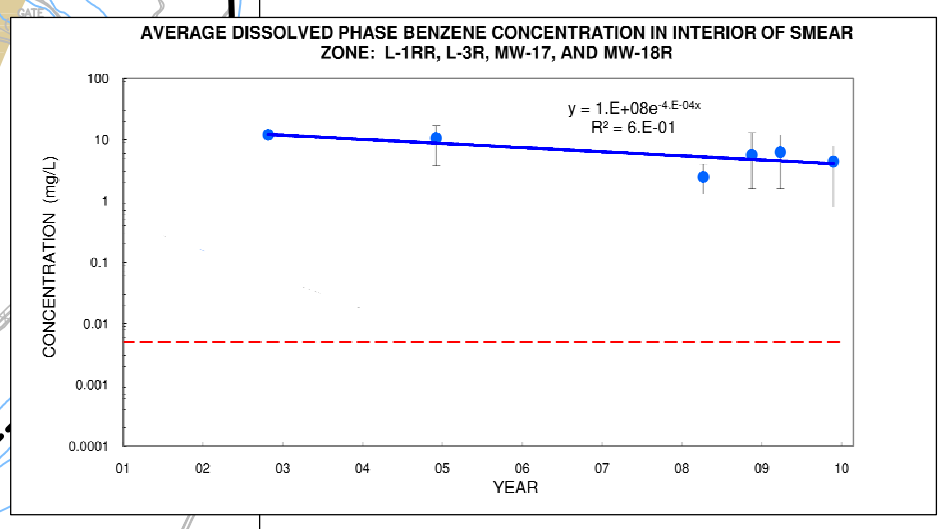


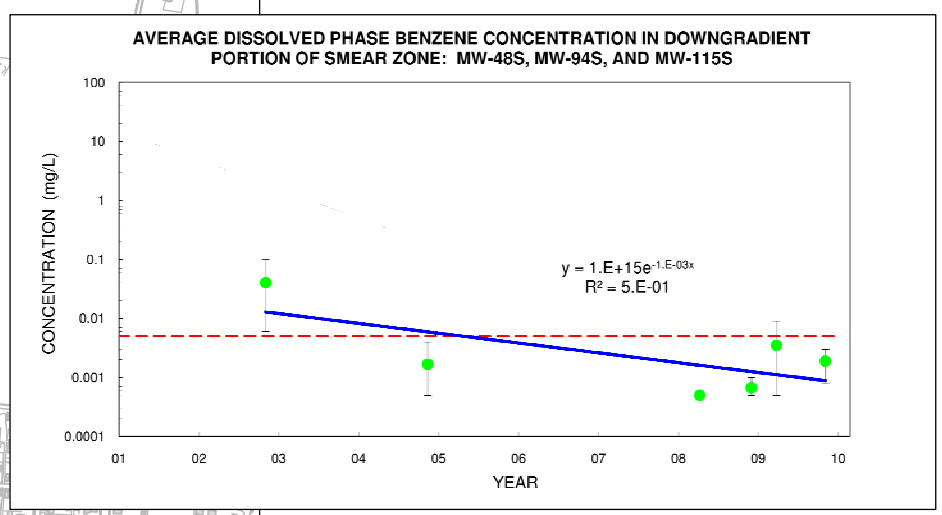
EXPLANATION

WATER LEVELS PRESENTED FOR POSSIBLE EXCLUSION OF DATA POINTS BASED ON POTENTIAL DILUTION.
NO DATA POINTS EXCLUDED FOR MW-115S
FT AMSL - FEET ABOVE MEAN SEA LEVEL
mg/L - MILLIGRAMS PER LITER









EXPLANATION

- MW-22 — UPGRADIENT MONITORING WELL AND DESIGNATION
- MW-17 — INTERIOR MONITORING WELL AND DESIGNATION
- MW-48S — DOWNGRADIENT MONITORING WELL AND DESIGNATION
- PROPERTY BOUNDARY
- FENCE
- STREAM
- GROUNDWATER CLEANUP LEVEL
- GENERAL GROUNDWATER FLOW DIRECTION
- BUILDING, TANK OR OTHER STRUCTURE
- SMEAR ZONE

NOTES:

1. ERROR BARS REPRESENT MINIMUM AND MAXIMUM CONCENTRATIONS MEASURED DURING SAMPLING EVENT
2. NON-DETECT CONCENTRATIONS SET TO REPORTING LIMIT FOR AVERAGING
3. SAMPLING EVENTS DISPLAYED: FALL 2002, FALL 2004, SPRING 2008, FALL 2008, SPRING 2009, AND FALL 2009

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FIGURE 3-14

AVERAGE DISSOLVED PHASE BENZENE TRENDS ACROSS THE SMEAR ZONE

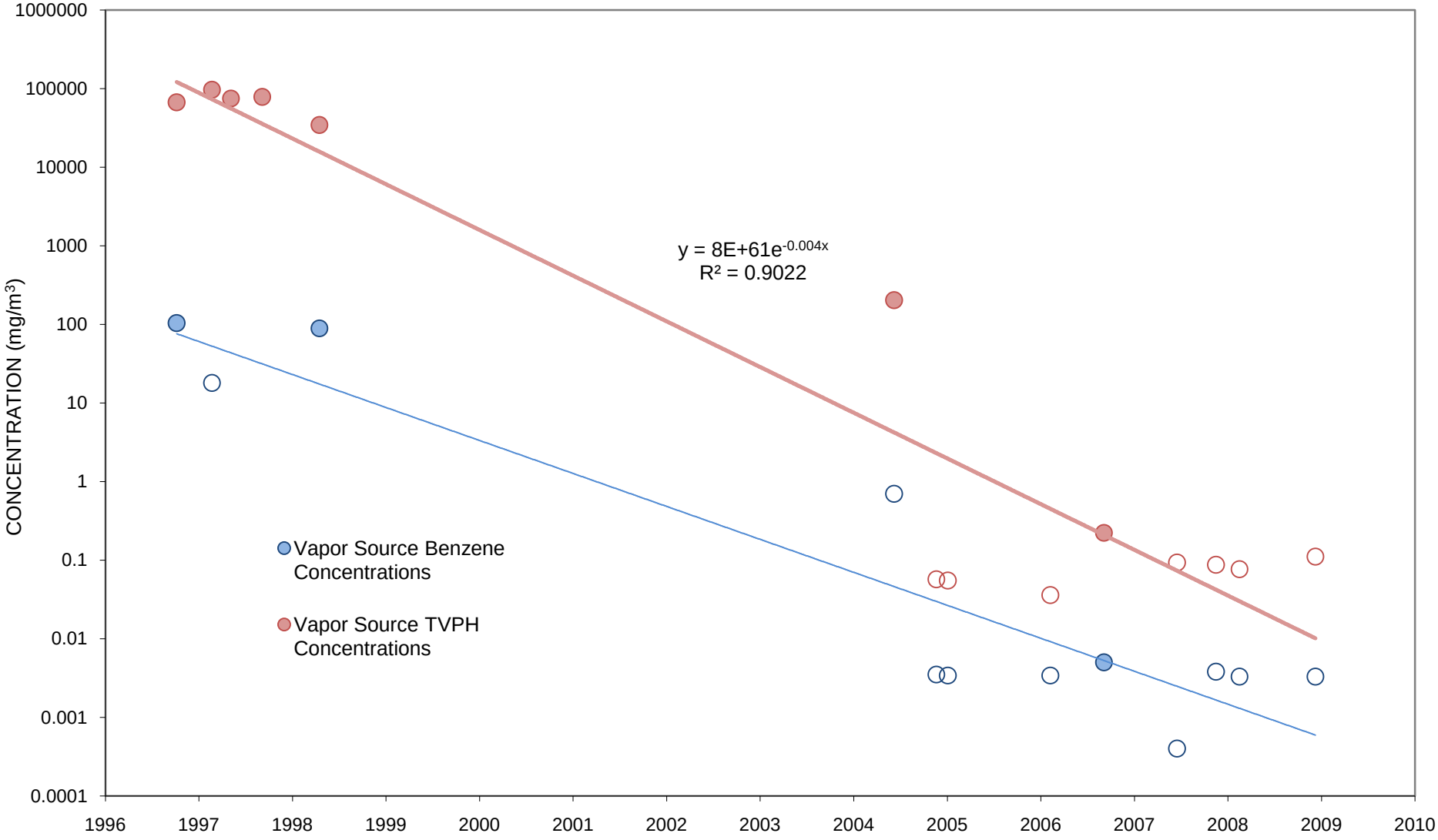
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: REP	Checked By: PM	Scale: AS SHOWN	Date: 12/15/09	File: 500SPATIO201006

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT

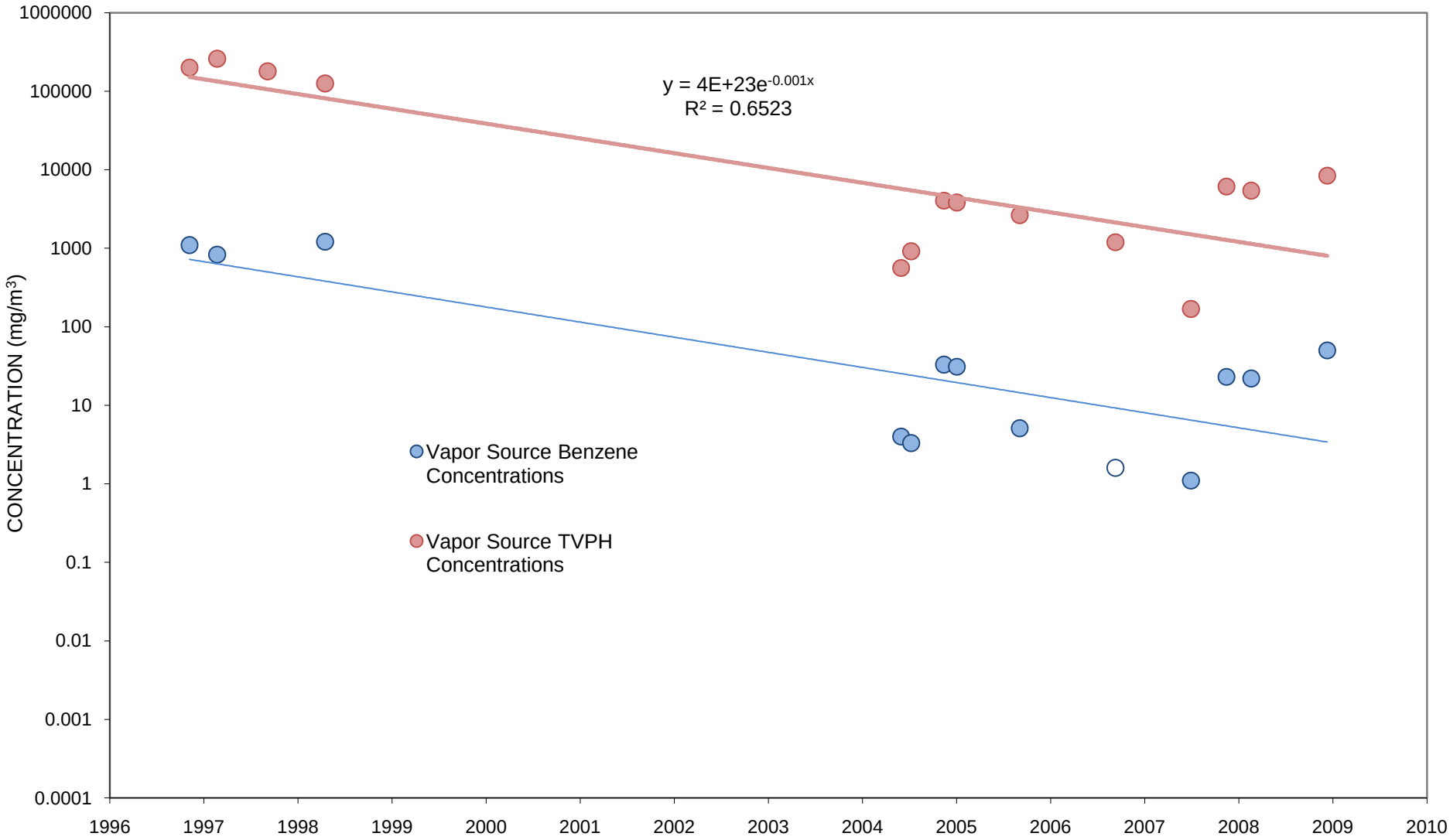
FIGURE 3-15. VAPOR SOURCE CONCENTRATIONS, NESTED VAPOR MONITORING WELL VW-93
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION
OPEN SYMBOL DESIGNATES A NON-DETECT VALUE

US EPA ARCHIVE DOCUMENT

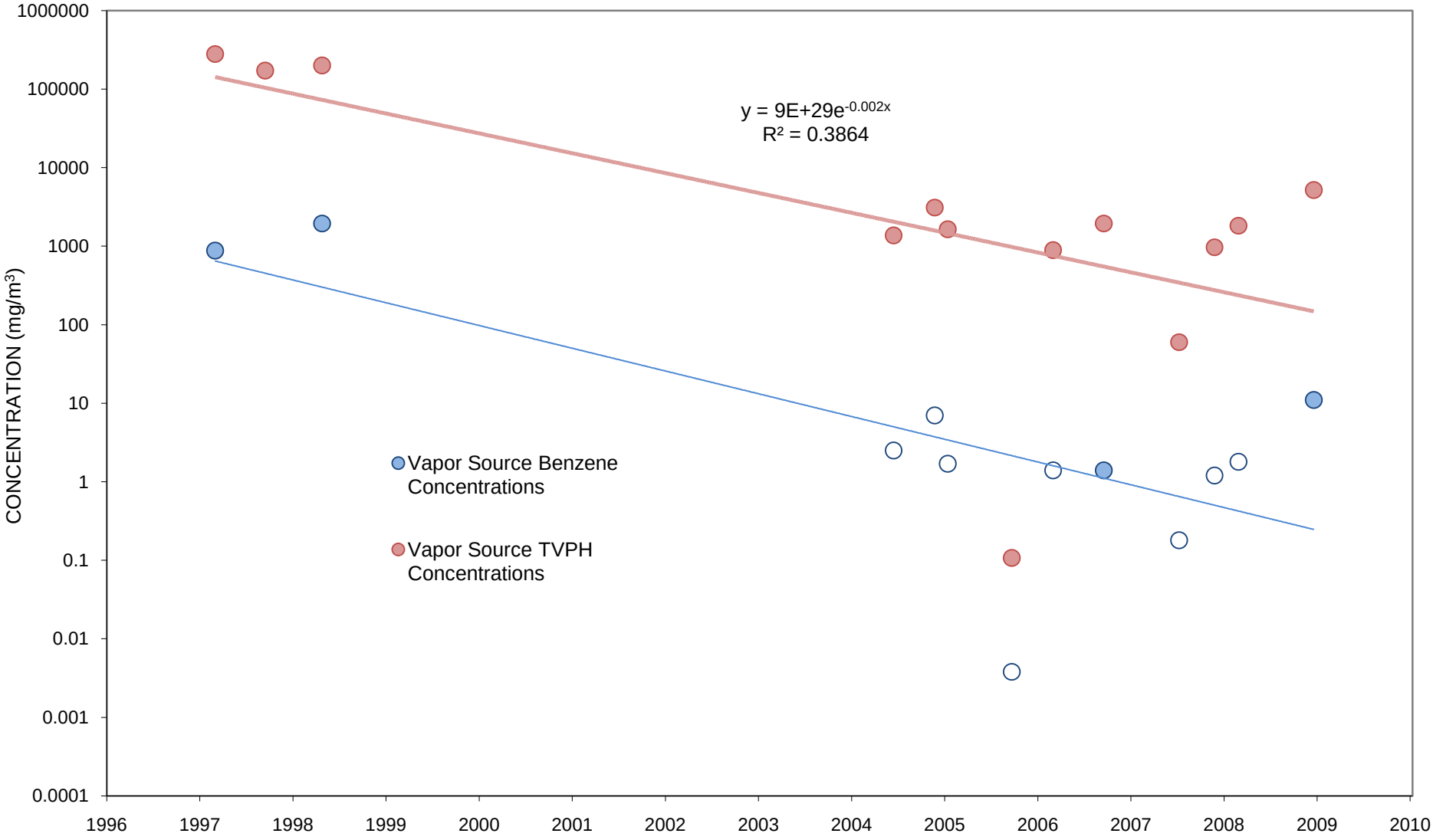
FIGURE 3-16. VAPOR SOURCE CONCENTRATIONS, NESTED VAPOR MONITORING WELL VW-96
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION
OPEN SYMBOL DESIGNATES A NON-DETECT VALUE

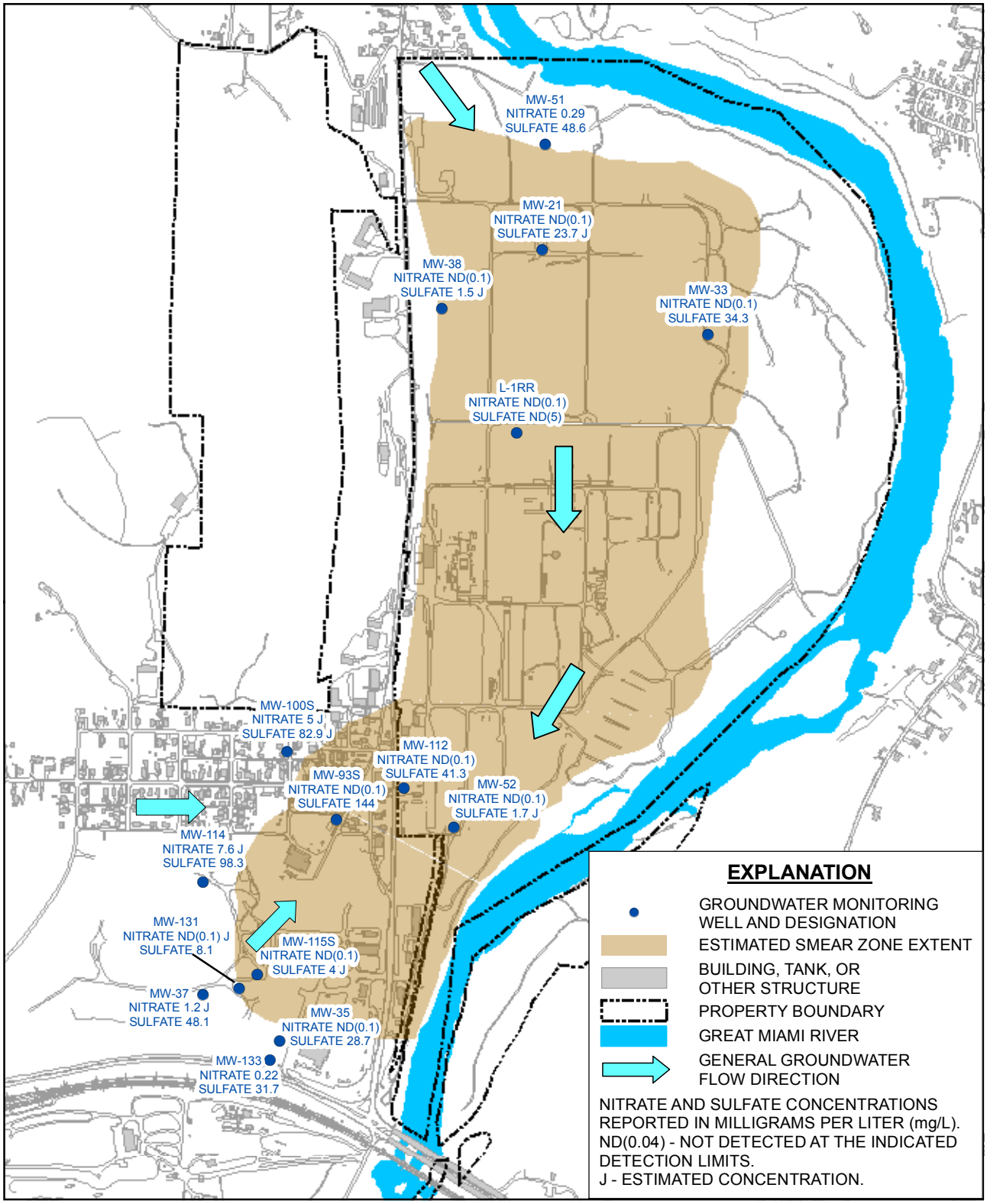
US EPA ARCHIVE DOCUMENT

FIGURE 3-17. VAPOR SOURCE CONCENTRATIONS, NESTED VAPOR MONITORING WELL VW-99
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION
OPEN SYMBOL DESIGNATES A NON-DETECT VALUE

US EPA ARCHIVE DOCUMENT



N

0 1,000'

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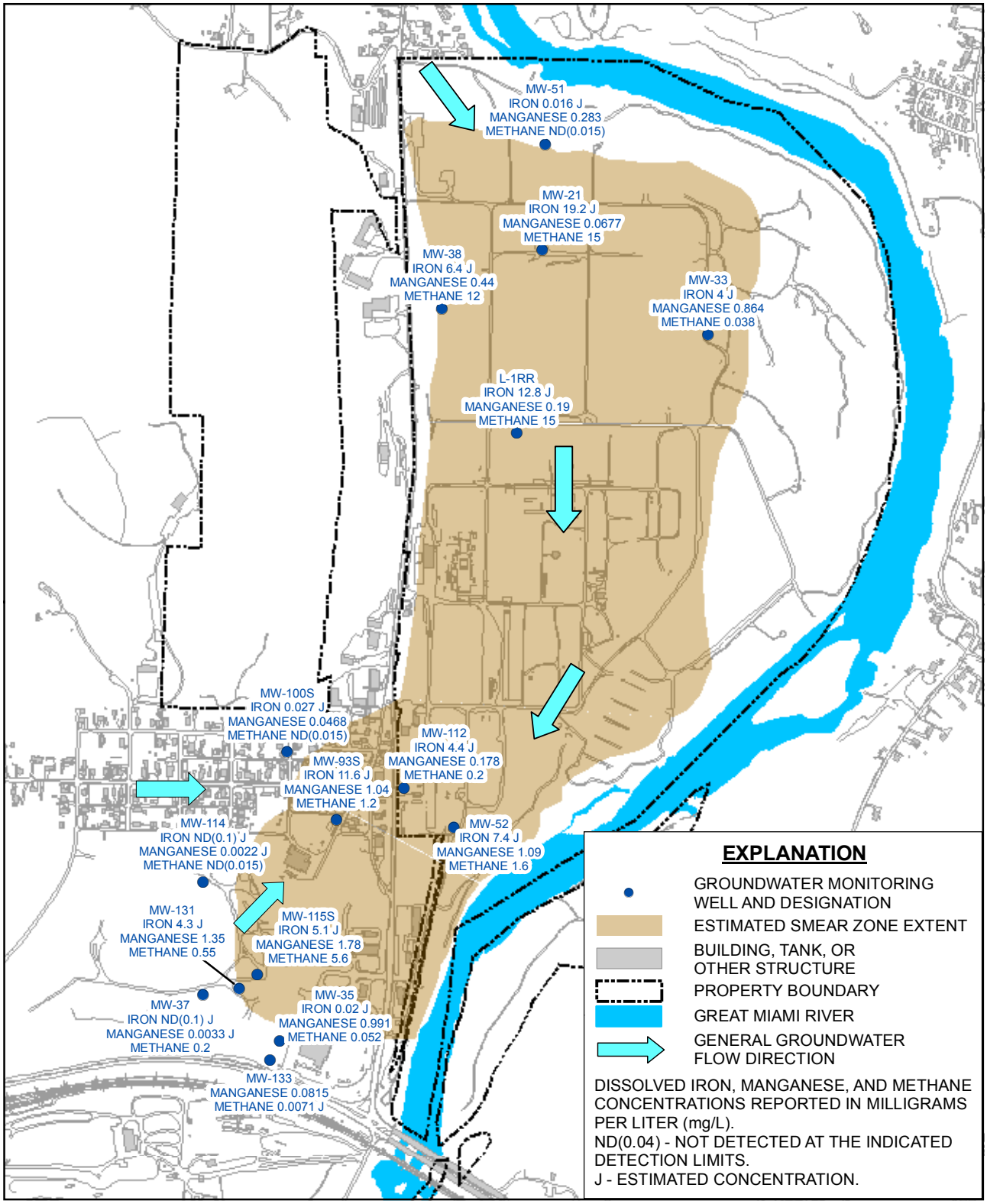
FIGURE 3-18

DISSOLVED PHASE NITRATE AND SULFATE CONCENTRATIONS

SECOND SEMIANNUAL 2009 MONITORING EVENT CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

Drawn By: BLM	Checked By: ??	Scale: 1" = 1000'	Date: 03/02/10	File: 200910_QI_EAccept_OxTrends.mxd

US EPA ARCHIVE DOCUMENT



N

0 1,000'

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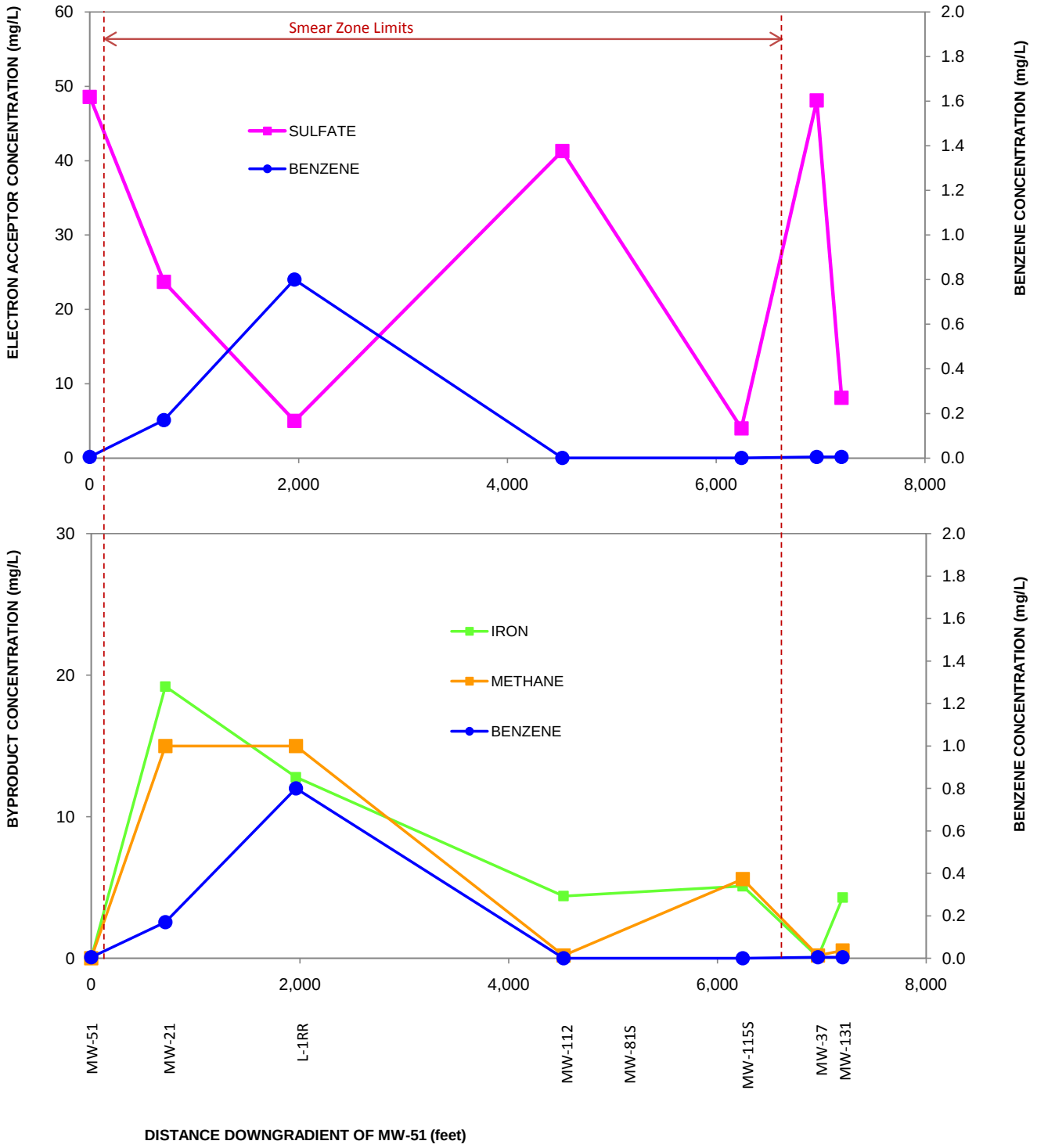
FIGURE 3-19

DISSOLVED PHASE IRON, MANGANESE, AND AND METHANE CONCENTRATIONS

SECOND SEMIANNUAL 2009 MONITORING EVENT CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

Drawn By: BLM	Checked By: ??	Scale: 1" = 1000'	Date: 03/02/10	File: 200910_QI_EAccept_RedTrends.mxd

FIGURE 3-20. DISSOLVED PHASE BENZENE AND NATURAL ATTENUATION INDICATOR CONCENTRATIONS VERSUS DISTANCE
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



EXPLANATION

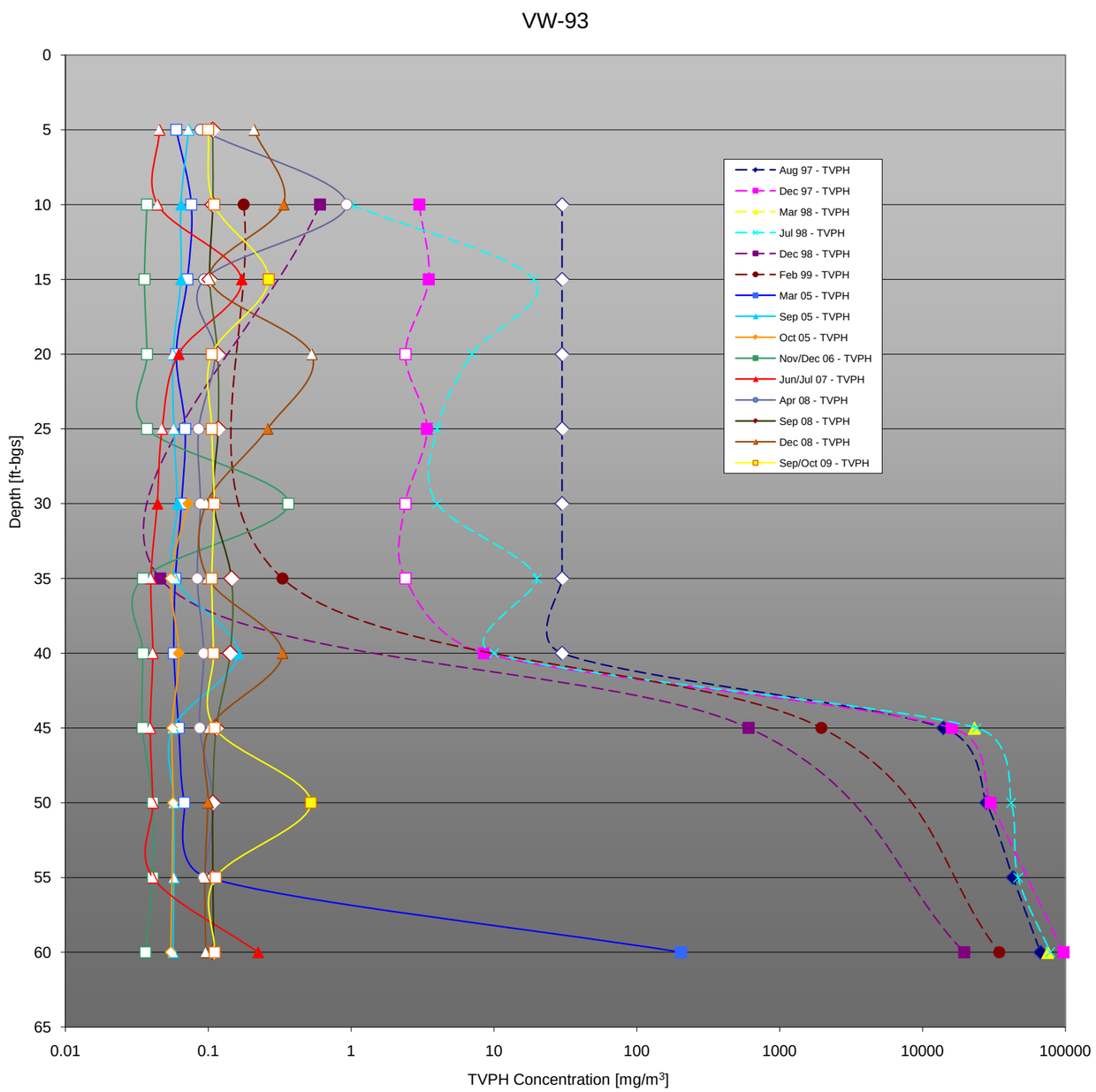
NON-DETECTED CONSTITUENTS SET AT THE DETECTION LIMIT

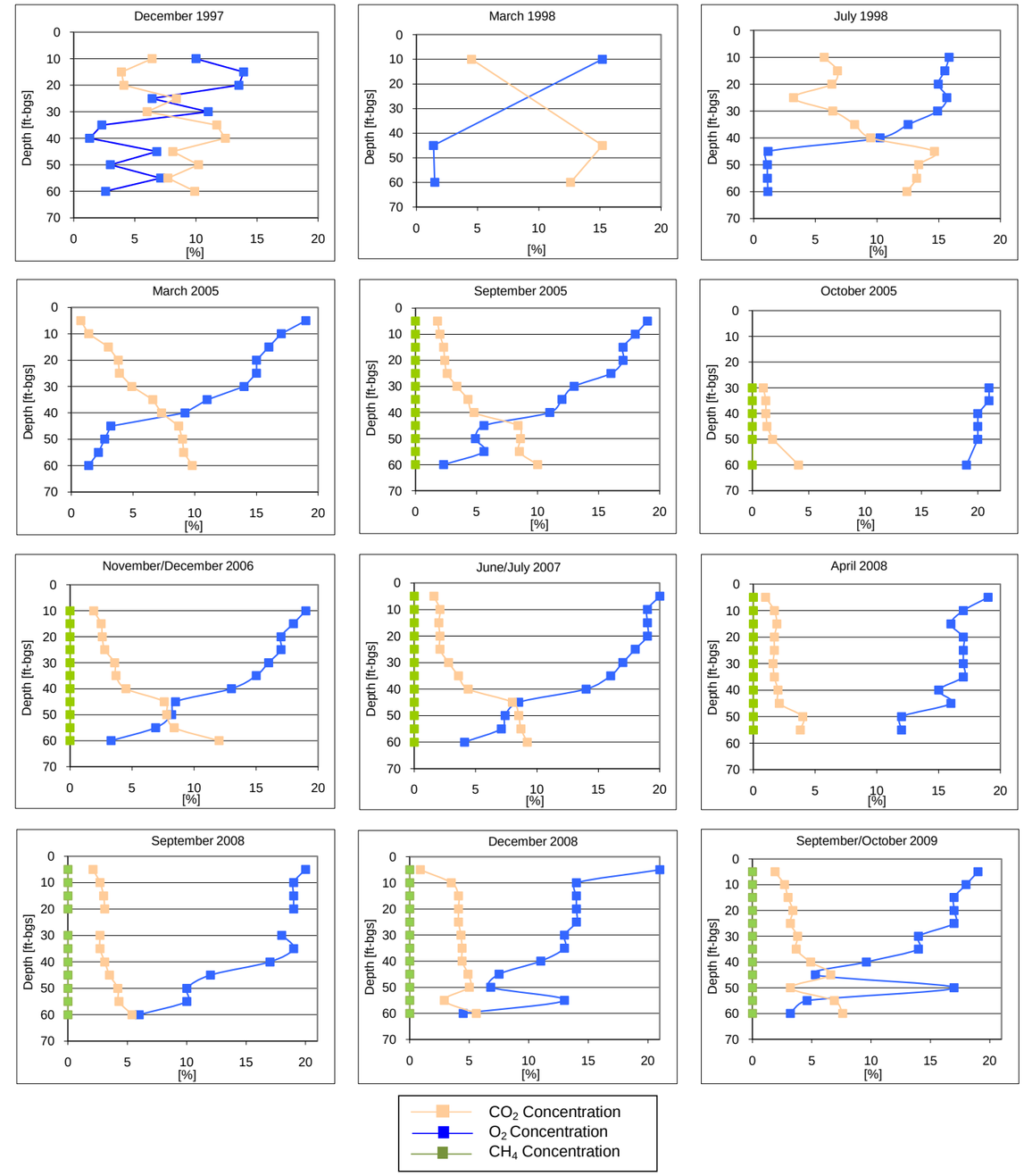
IRON DISPLAYED AS FERROUS IRON

mg/L - MILLIGRAMS PER LITER

US EPA ARCHIVE DOCUMENT

FIGURE 3-21. TVPH AND FIXED GAS PROFILES, NESTED VAPOR MONITORING WELL VW-93
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

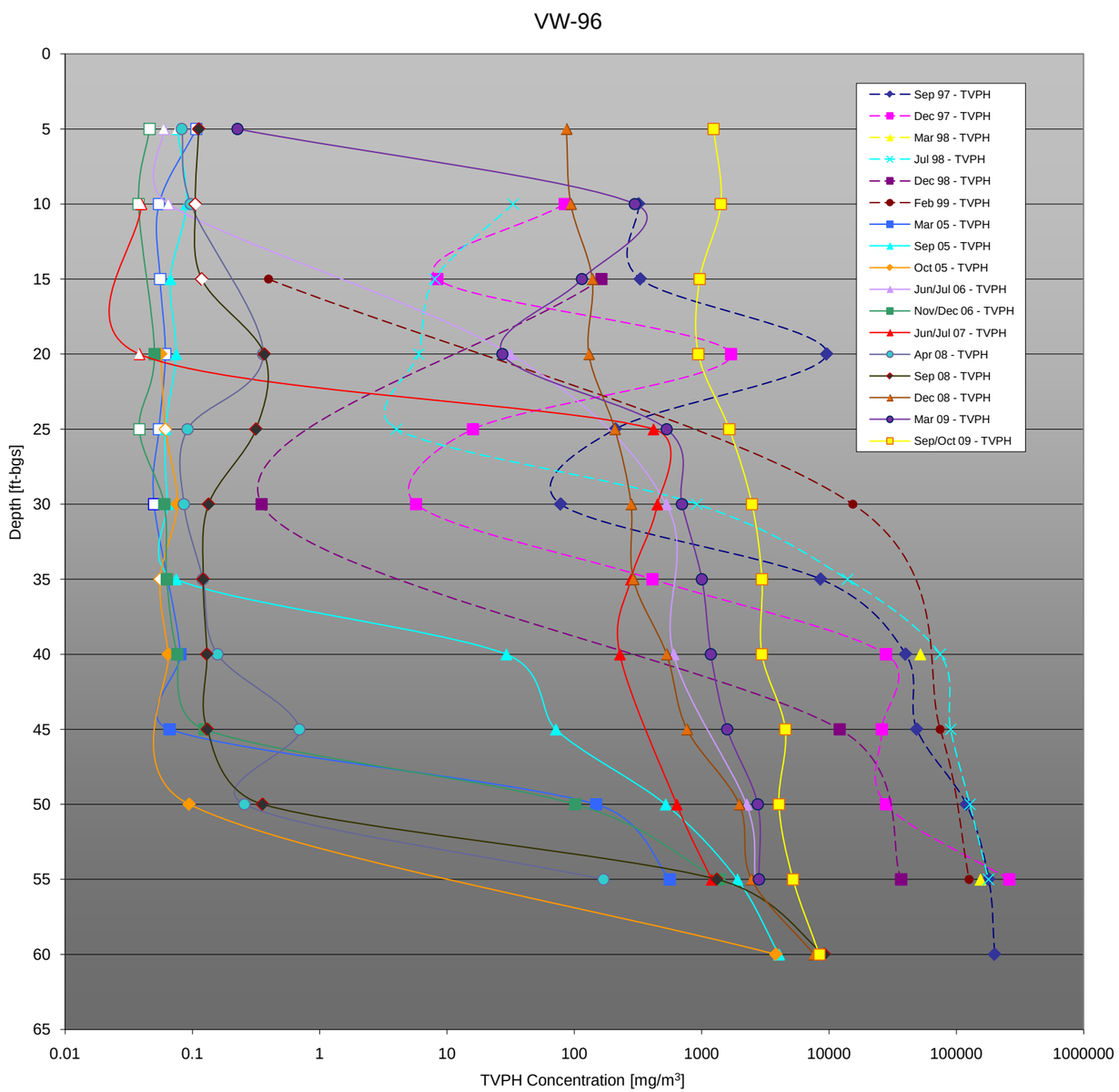


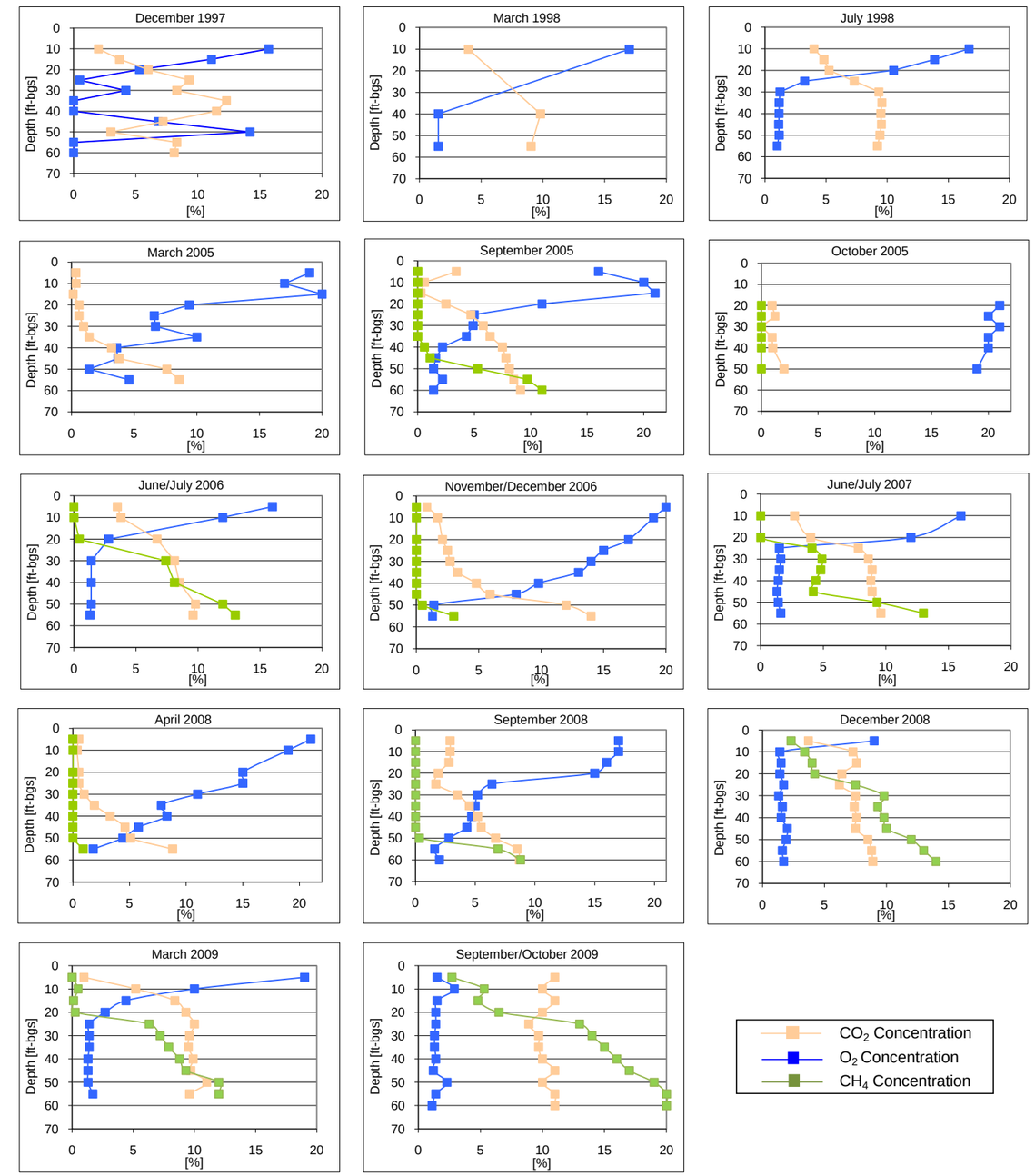


EXPLANATION
1. OPEN SYMBOL DESIGNATES A NON-DETECT VALUE
2. THE HSVE SYSTEM WAS OPERATING DURING THE SAMPLING CONDUCTED IN OCTOBER 2005
3. TVPH - TOTAL VOLATILE PETROLEUM HYDROCARBONS AS GASOLINE

US EPA ARCHIVE DOCUMENT

FIGURE 3-22. TVPH AND FIXED GAS PROFILES, NESTED VAPOR MONITORING WELL VW-96
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

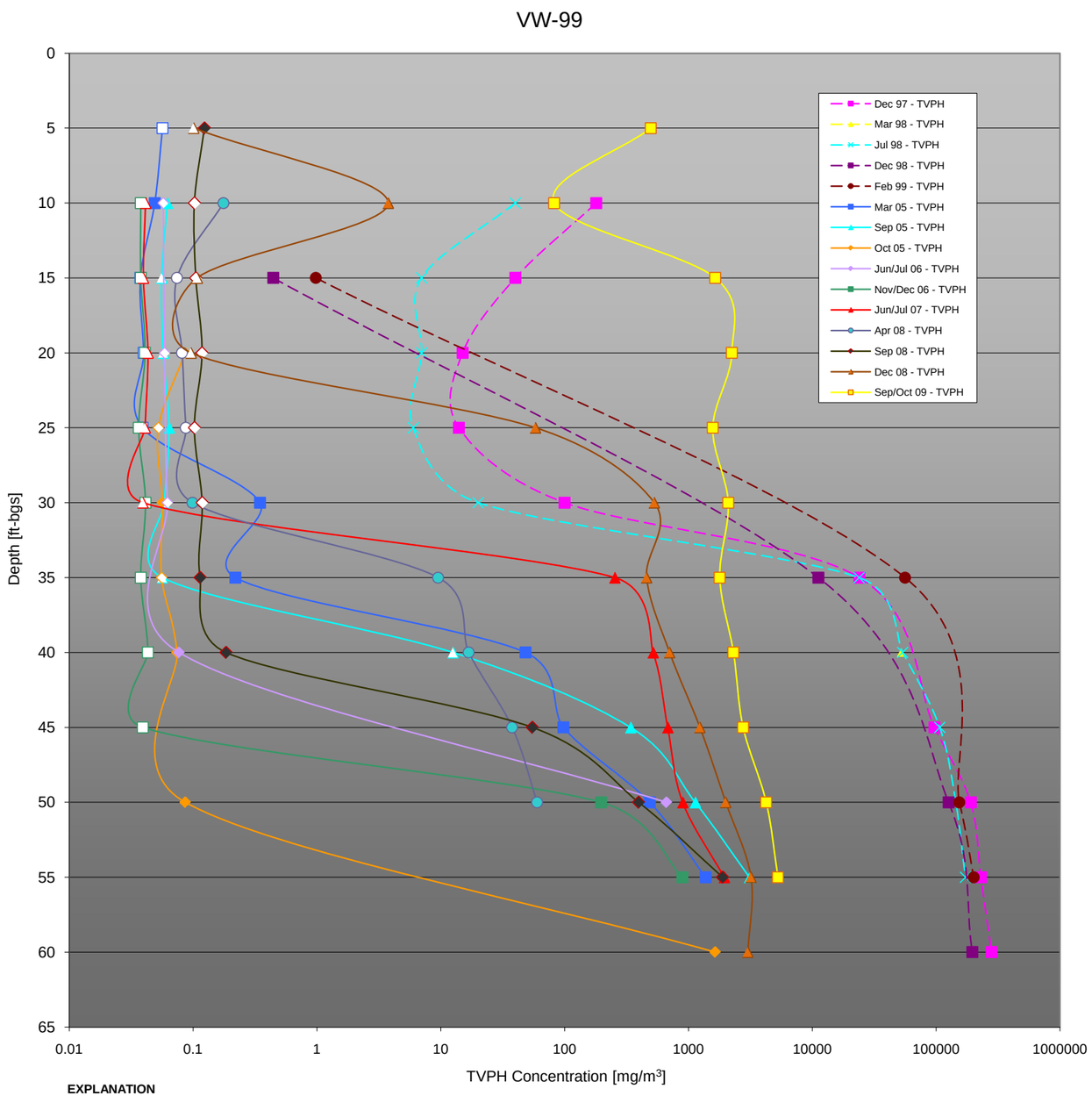


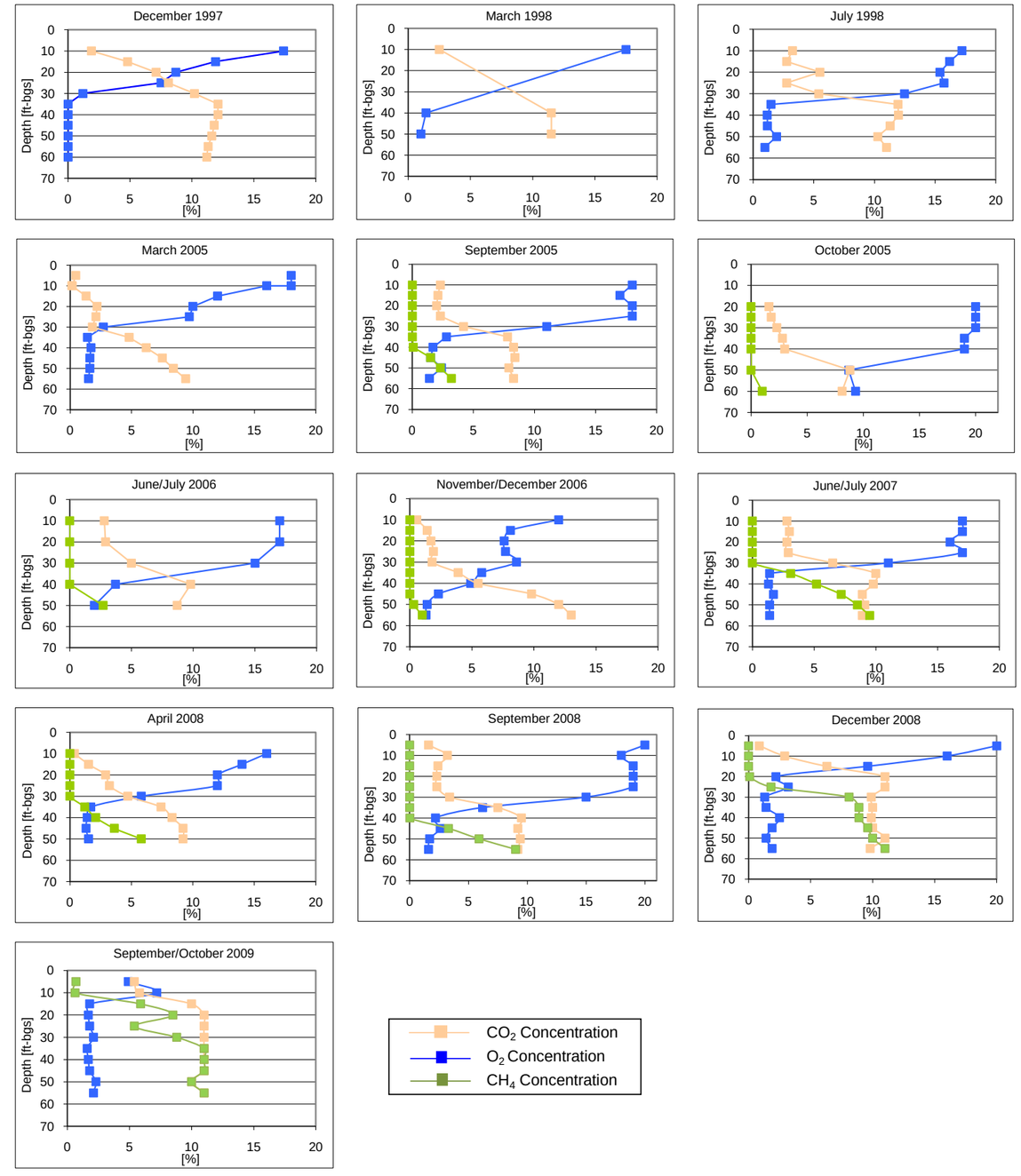


EXPLANATION
1. OPEN SYMBOL DESIGNATES A NON-DETECT VALUE
2. THE HSVE SYSTEM WAS OPERATING DURING THE SAMPLING CONDUCTED IN OCTOBER 2005
3. TVPH - TOTAL VOLATILE PETROLEUM HYDROCARBONS AS GASOLINE

US EPA ARCHIVE DOCUMENT

FIGURE 3-23. TVPH AND FIXED GAS PROFILES, NESTED VAPOR MONITORING WELL VW-99
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

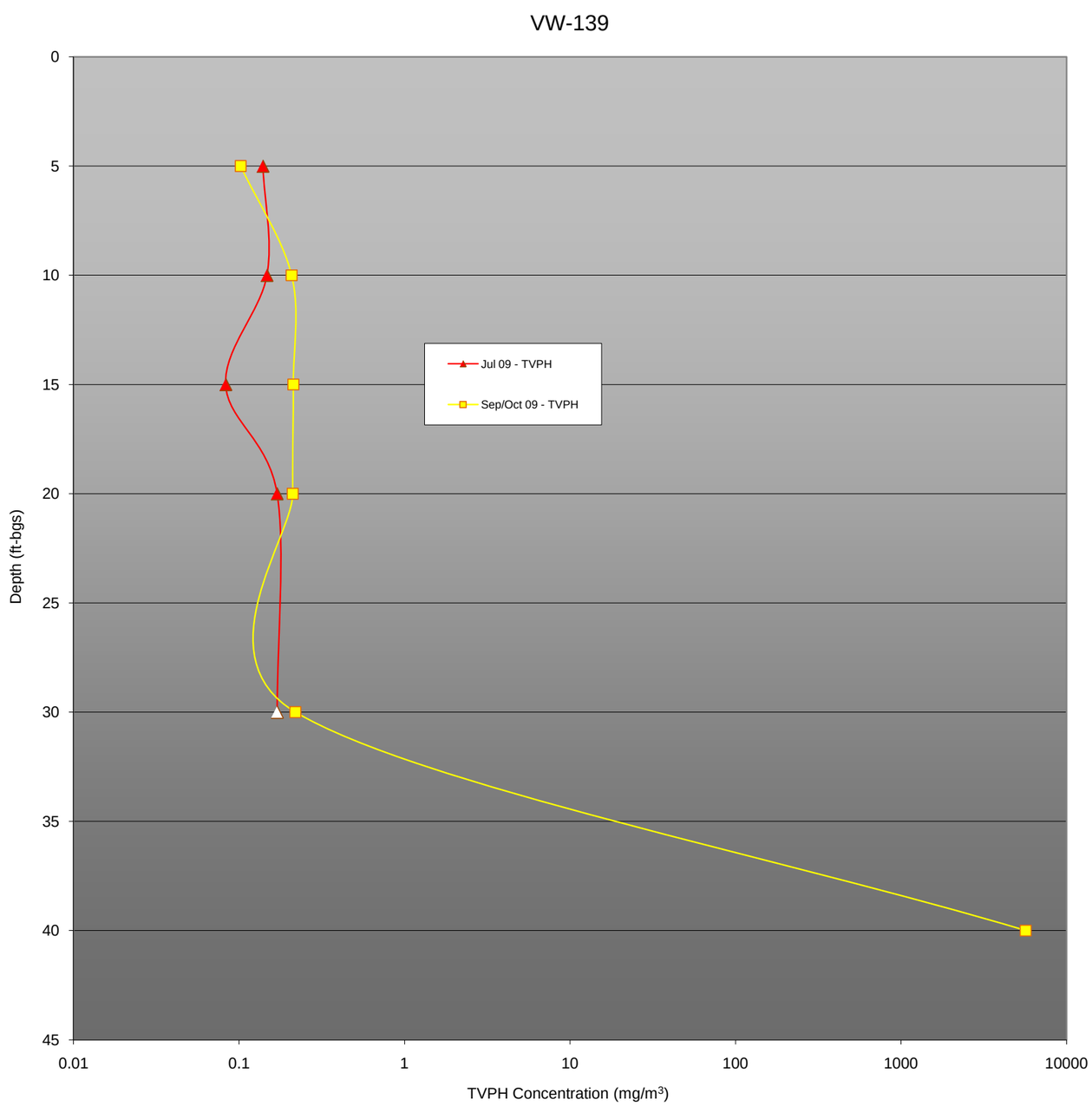


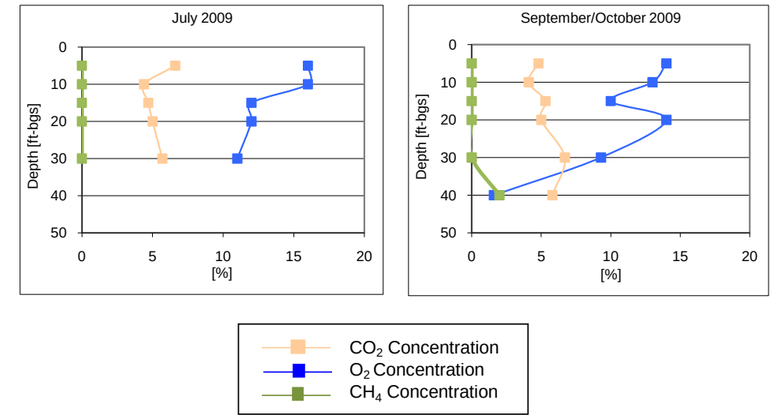


EXPLANATION
1. OPEN SYMBOL DESIGNATES A NON-DETECT VALUE
2. THE HSVE SYSTEM WAS OPERATING DURING THE SAMPLING CONDUCTED IN OCTOBER 2005
3. TVPH - TOTAL VOLATILE PETROLEUM HYDROCARBONS AS GASOLINE
4. DATA FROM THE 60 FT-BGS PROBE IS NOT USED FOR THE SEP 05, JUN/JUL 06, OR SEP 08 PROFILES DUE TO DILUTION

US EPA ARCHIVE DOCUMENT

FIGURE 3-24. TVPH AND FIXED GAS PROFILES, NESTED VAPOR MONITORING WELL VW-139
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

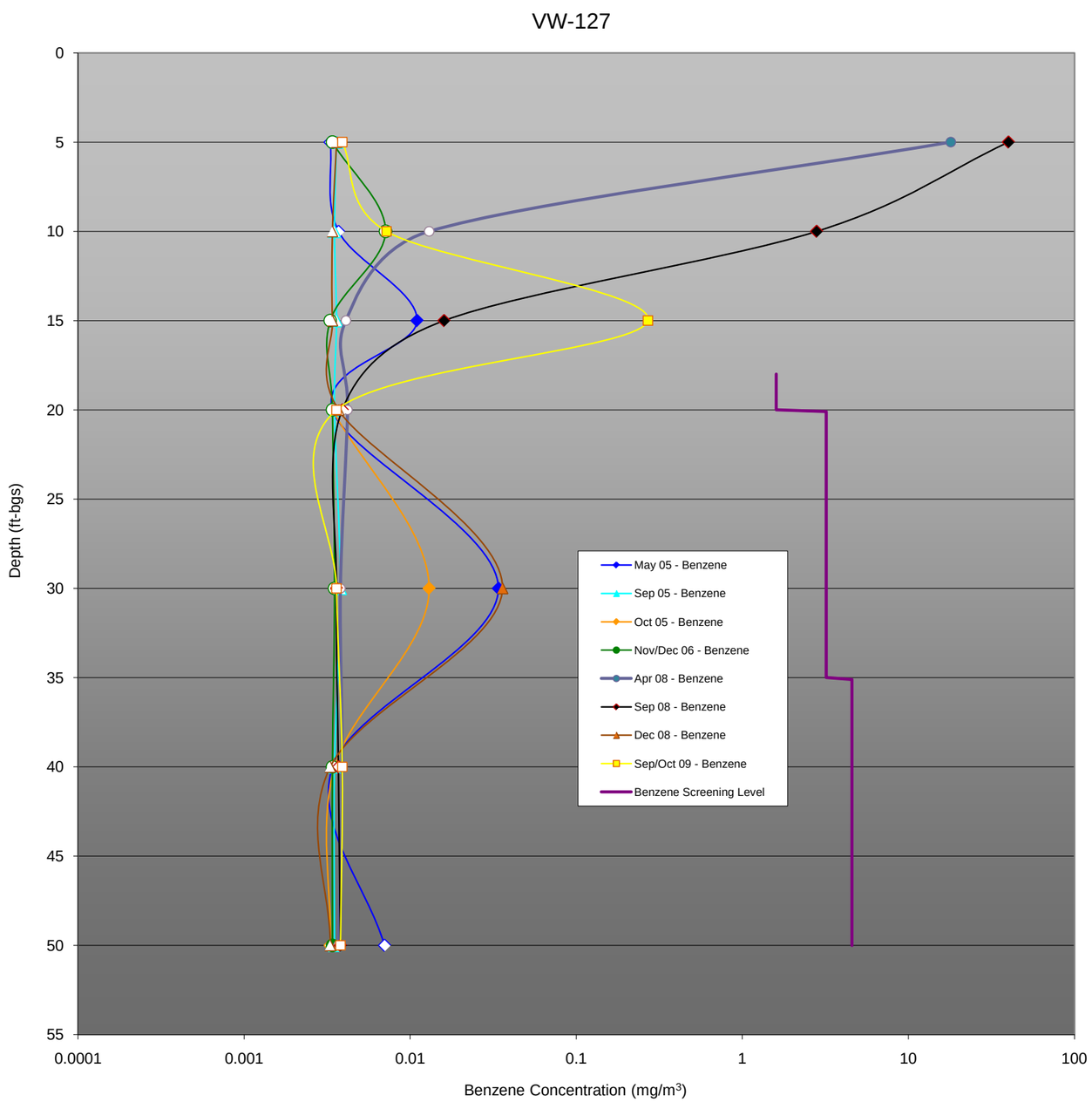


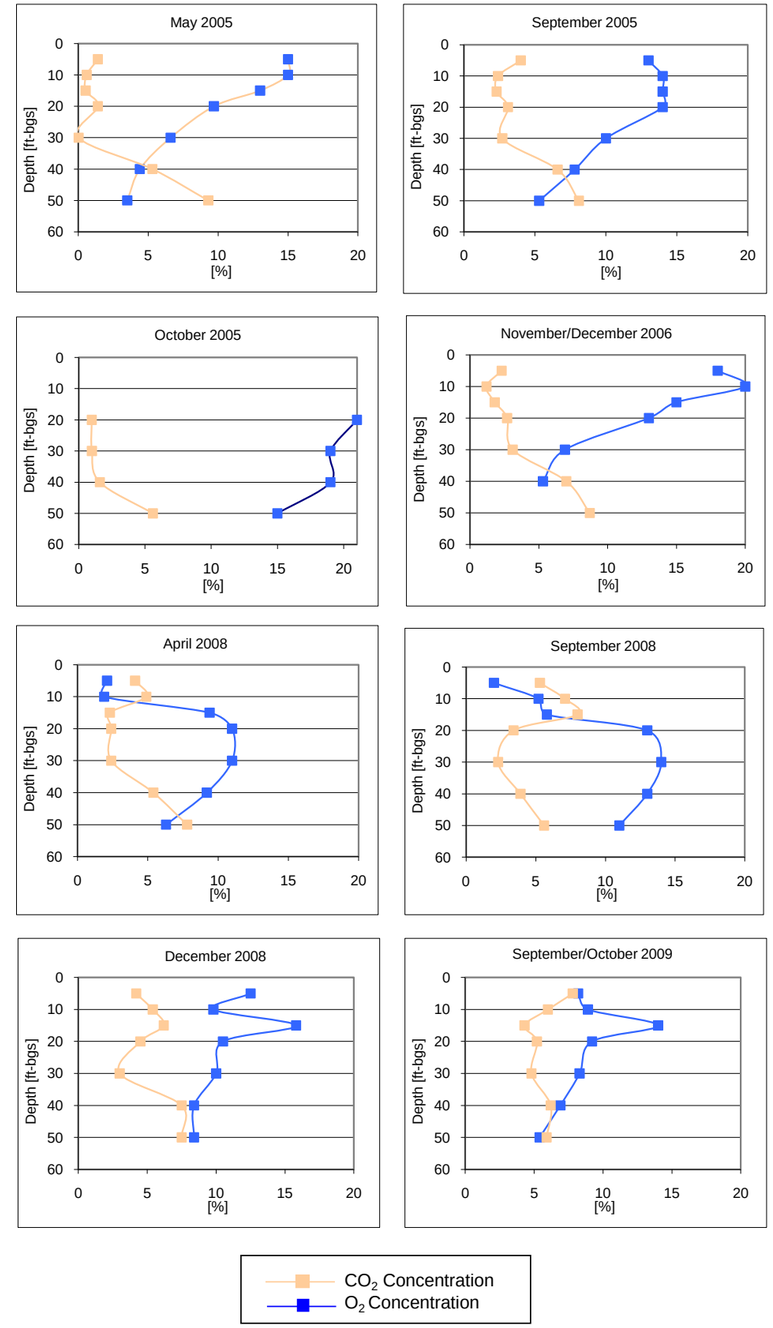


EXPLANATION
1. OPEN SYMBOL DESIGNATES A NON-DETECT VALUE
2. TVPH - TOTAL VOLATILE PETROLEUM HYDROCARBONS AS GASOLINE

US EPA ARCHIVE DOCUMENT

FIGURE 3-25. BENZENE AND O_2/CO_2 PROFILES, NESTED VAPOR MONITORING WELL VW-127
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

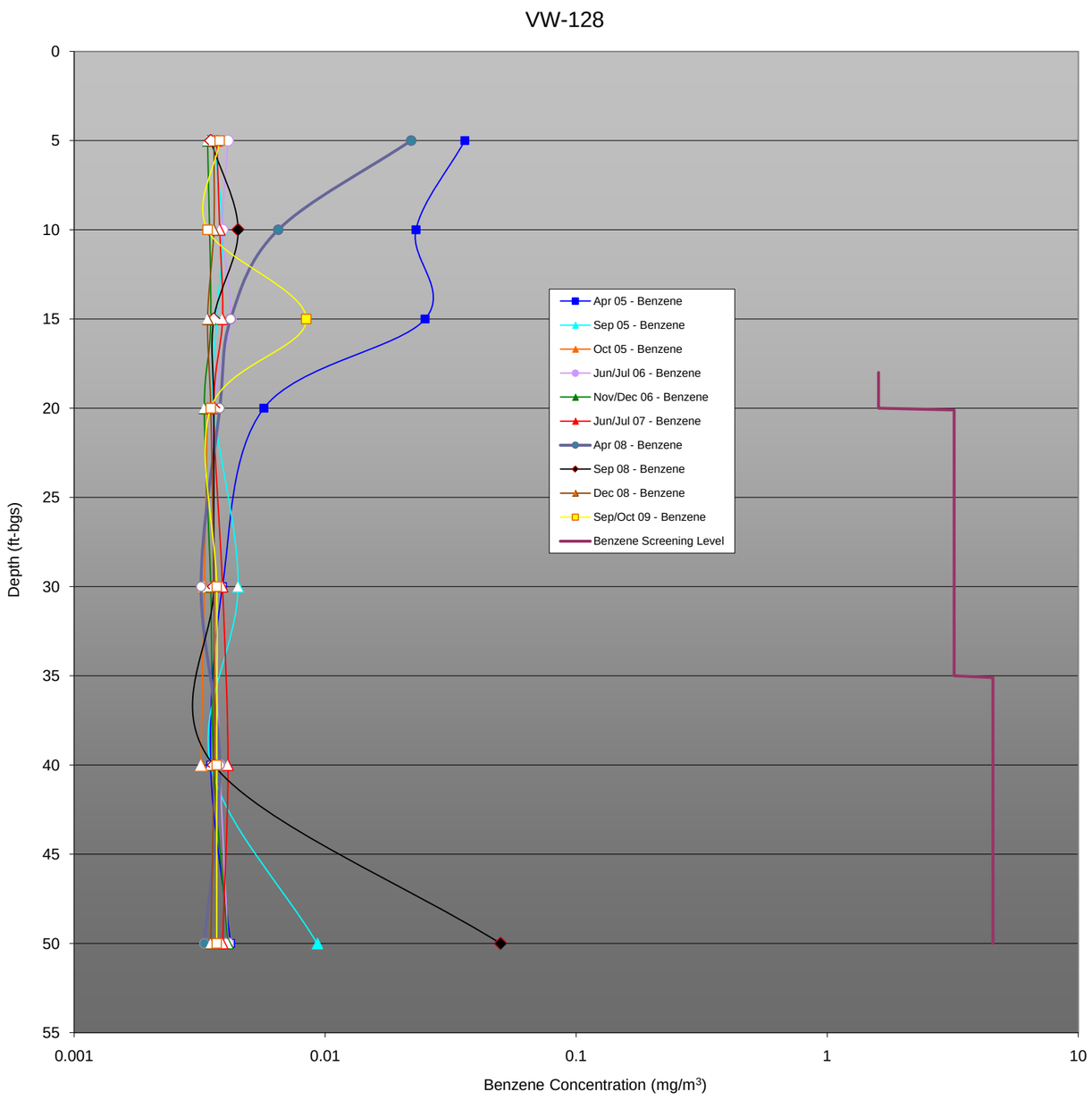


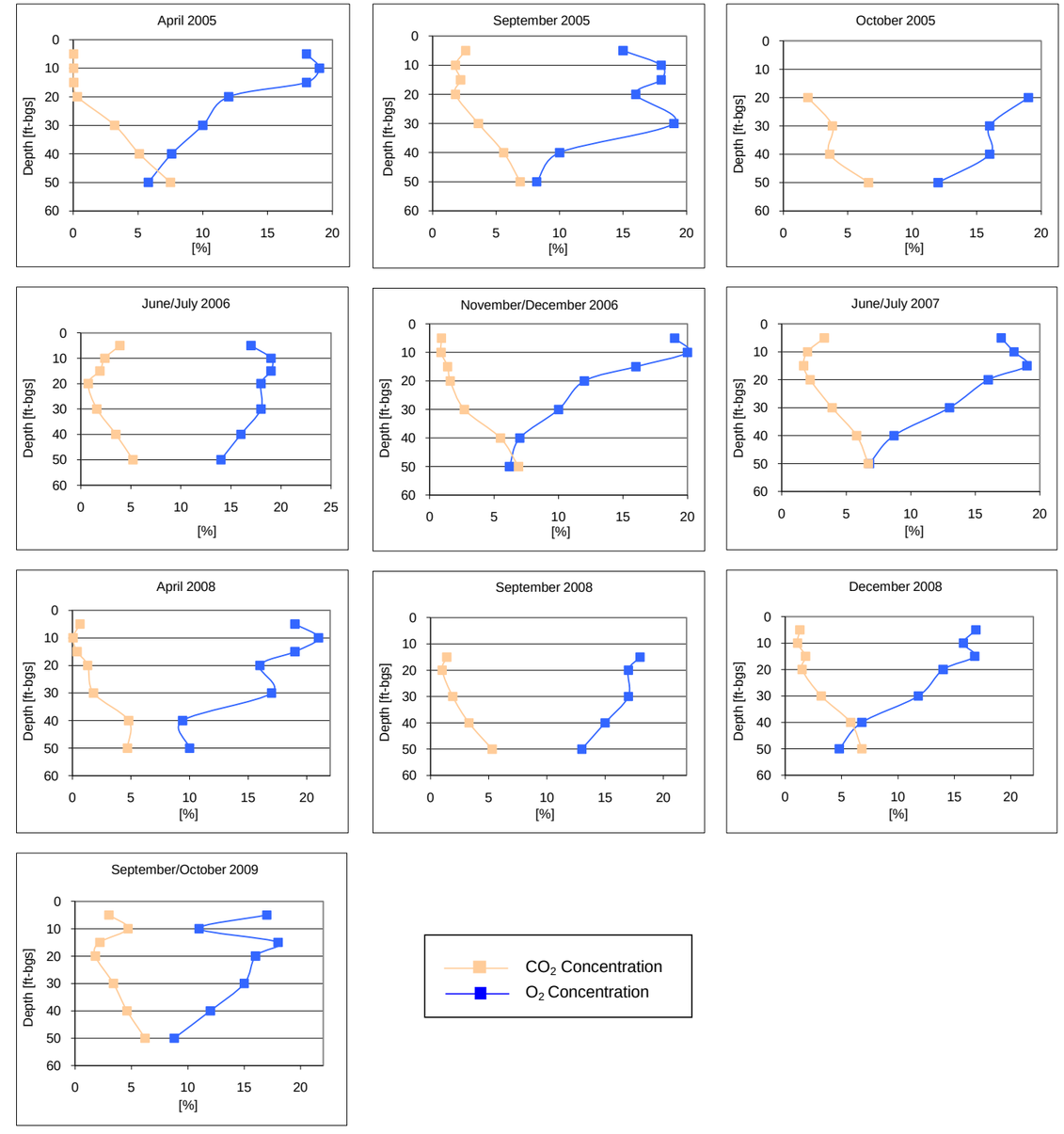


EXPLANATION
1. OPEN SYMBOL DESIGNATES A NON-DETECT VALUE
2. THE HSVE SYSTEM WAS OPERATING DURING THE SAMPLING CONDUCTED IN OCTOBER 2005

US EPA ARCHIVE DOCUMENT

FIGURE 3-26. BENZENE AND O_2/CO_2 PROFILES, NESTED VAPOR MONITORING WELL VW-128
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

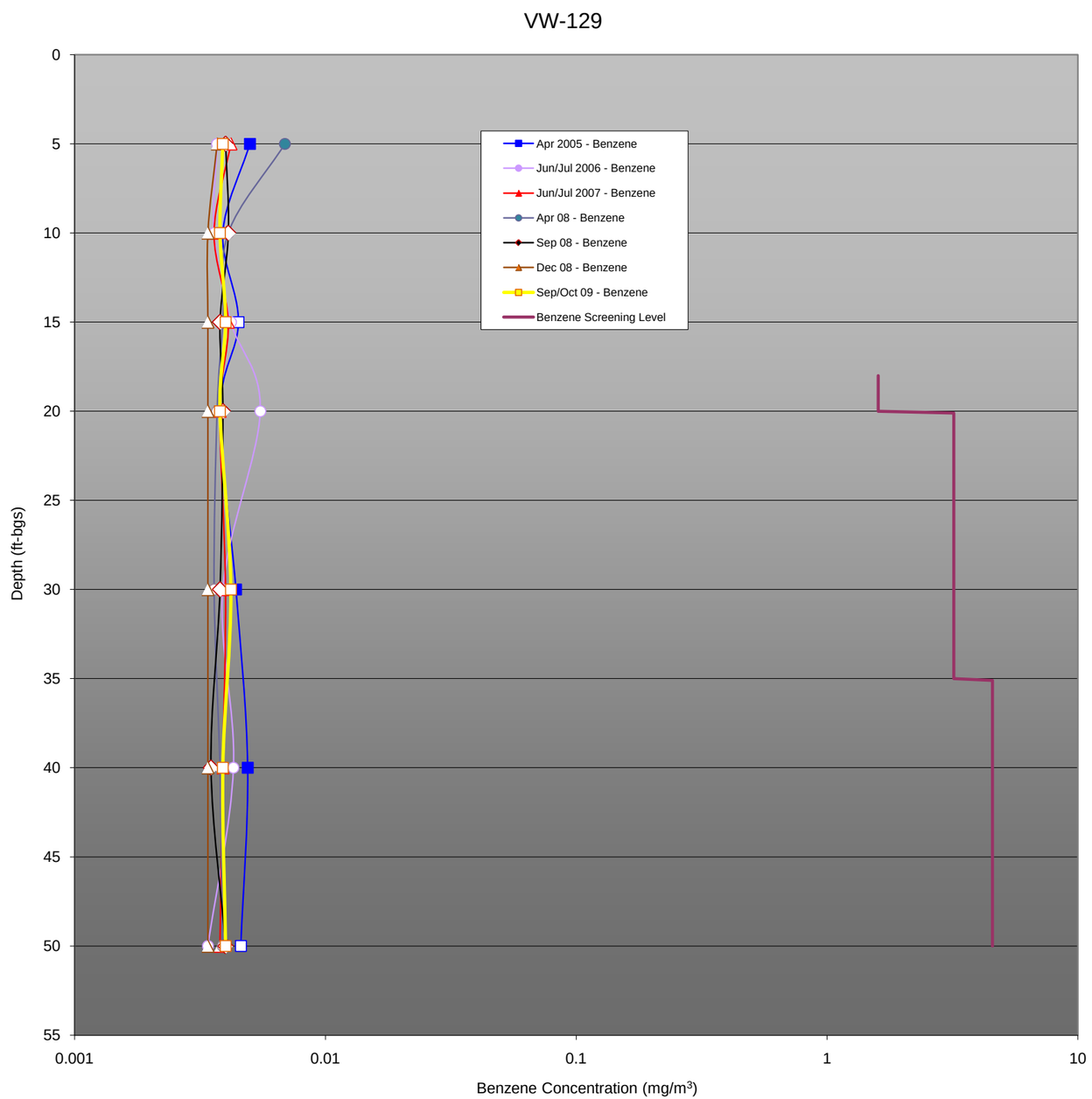


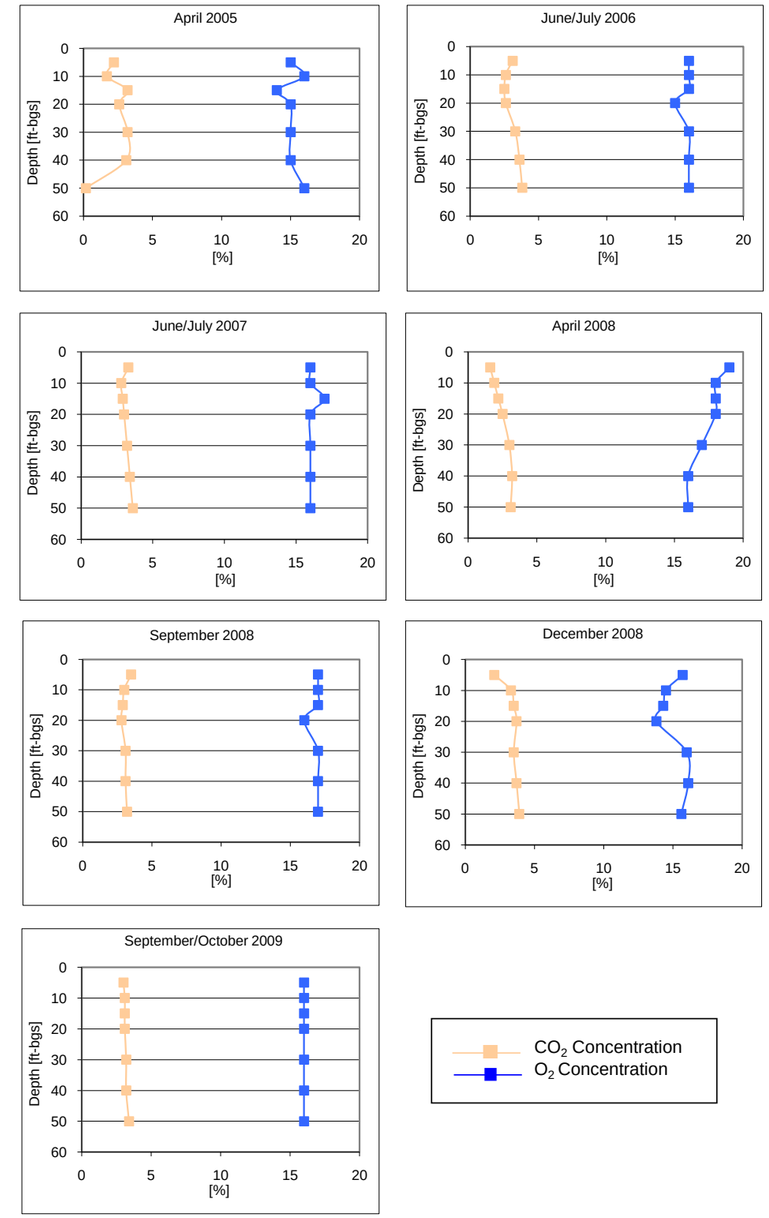


EXPLANATION
1. OPEN SYMBOL DESIGNATES A NON-DETECT VALUE
2. THE HSVE SYSTEM WAS OPERATING DURING THE SAMPLING CONDUCTED IN OCTOBER 2005

US EPA ARCHIVE DOCUMENT

FIGURE 3-27. BENZENE AND O_2/CO_2 PROFILES, NESTED VAPOR MONITORING WELL VW-129
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

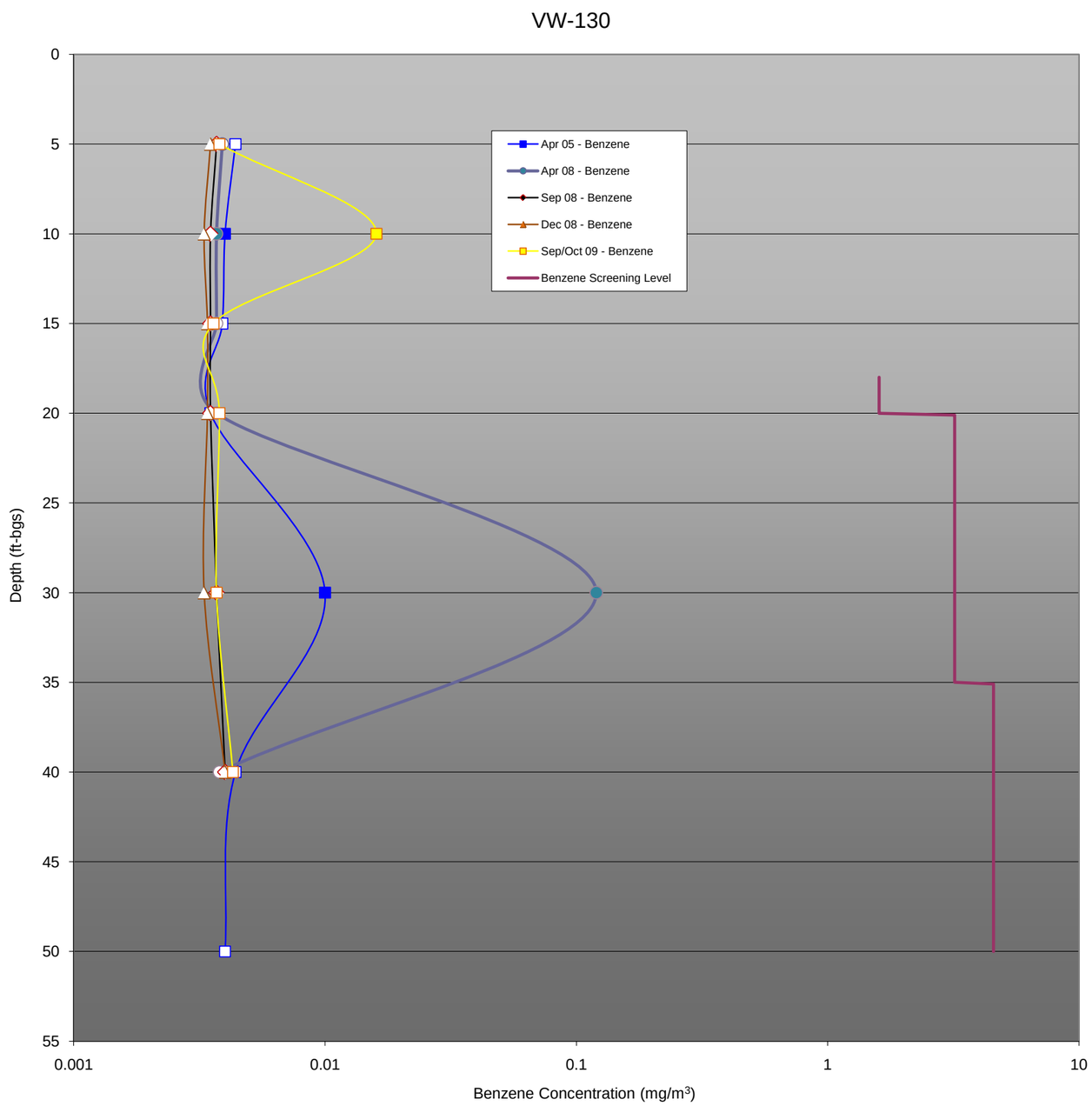


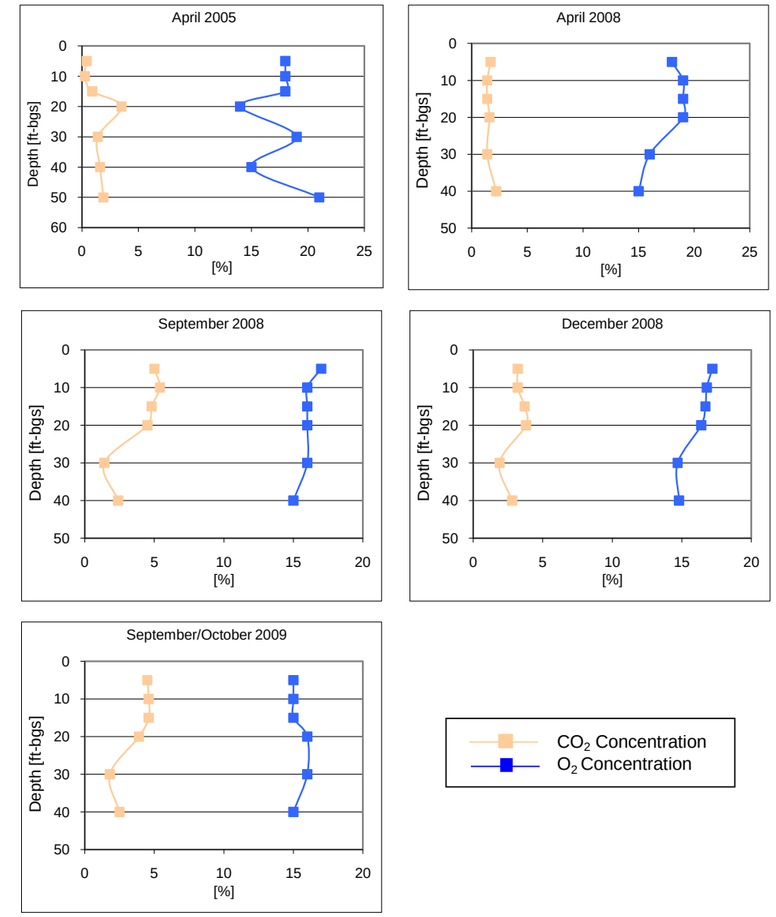


EXPLANATION
1. OPEN SYMBOL DESIGNATES A NON-DETECT VALUE

US EPA ARCHIVE DOCUMENT

FIGURE 3-28. BENZENE AND O_2/CO_2 PROFILES, NESTED VAPOR MONITORING WELL VW-130
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO

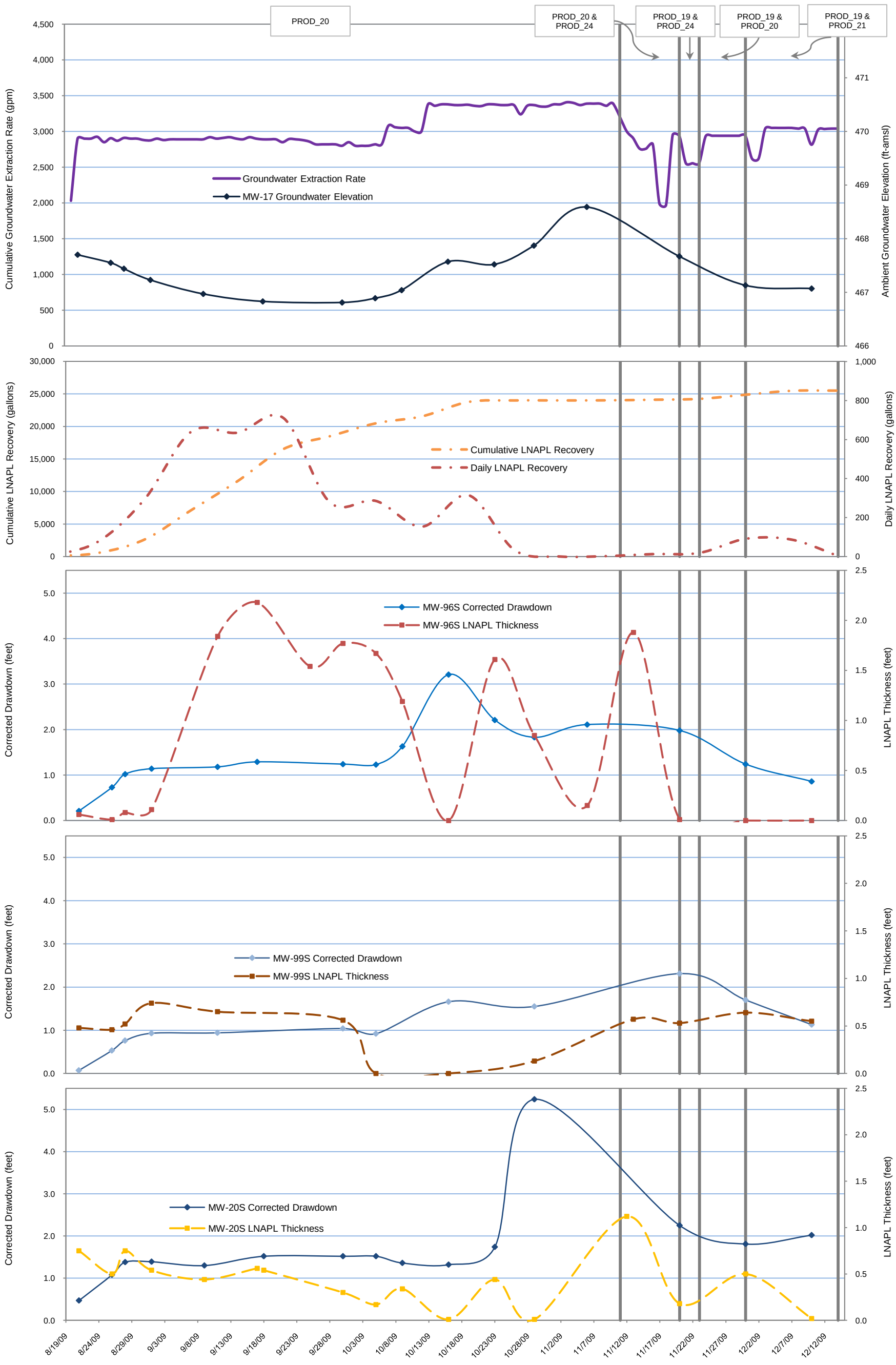




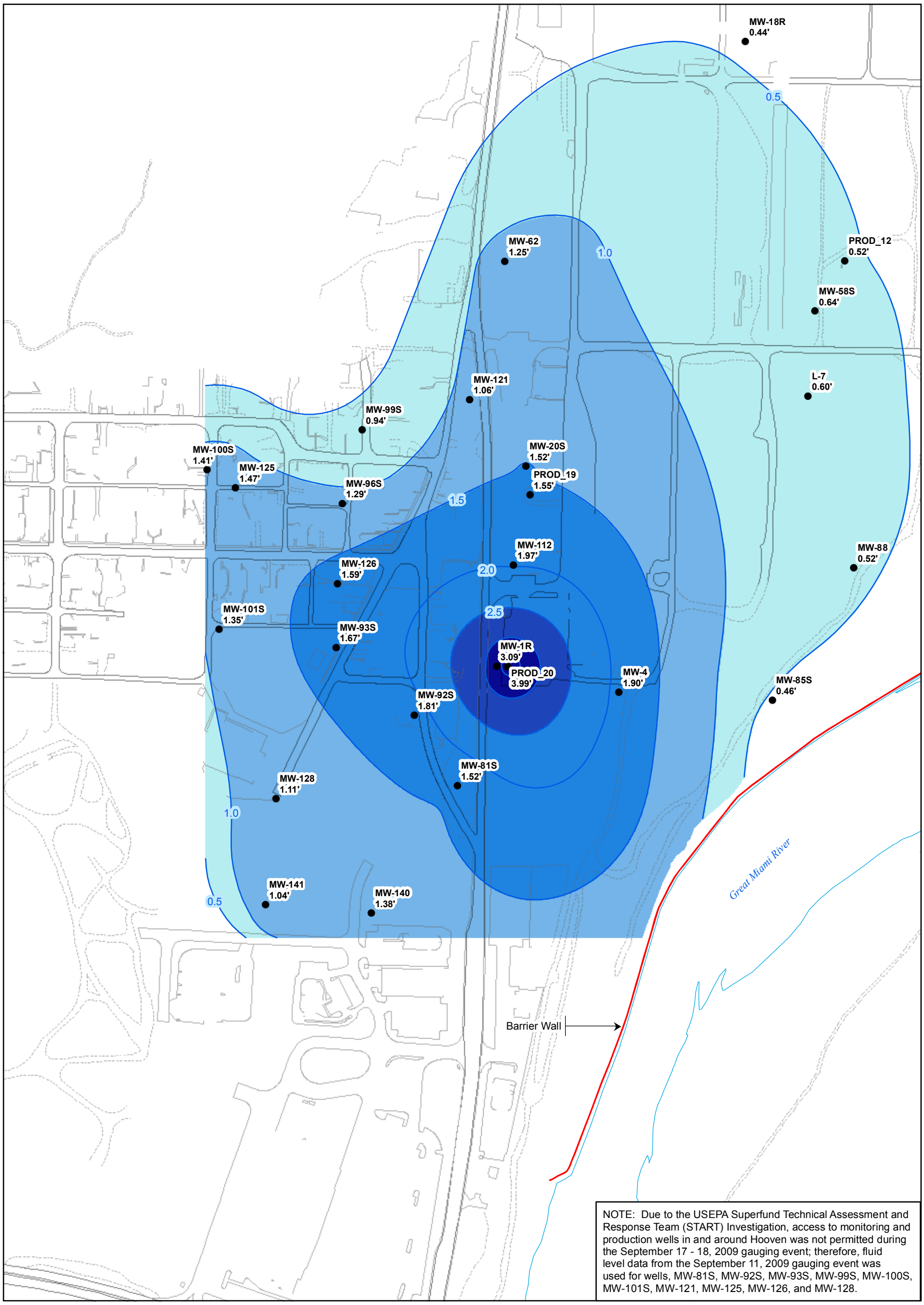
EXPLANATION
1. OPEN SYMBOL DESIGNATES A NON-DETECT VALUE

US EPA ARCHIVE DOCUMENT

FIGURE 4-1. LNAPL RECOVERY, DRAWDOWN, AND FLUID LEVEL SUMMARY (2009 HIGH-GRADE EVENT)
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



US EPA ARCHIVE DOCUMENT



NOTE: Due to the USEPA Superfund Technical Assessment and Response Team (START) Investigation, access to monitoring and production wells in and around Hooven was not permitted during the September 17 - 18, 2009 gauging event; therefore, fluid level data from the September 11, 2009 gauging event was used for wells, MW-81S, MW-92S, MW-93S, MW-99S, MW-100S, MW-101S, MW-121, MW-125, MW-126, and MW-128.

EXPLANATION

CONTOUR LINE OF EQUAL DRAWDOWN, CONTOUR INTERVAL IS 0.5 FEET

AREA OF EQUAL DRAWDOWN IN FEET

0 — 3.99

N

0 — 250'

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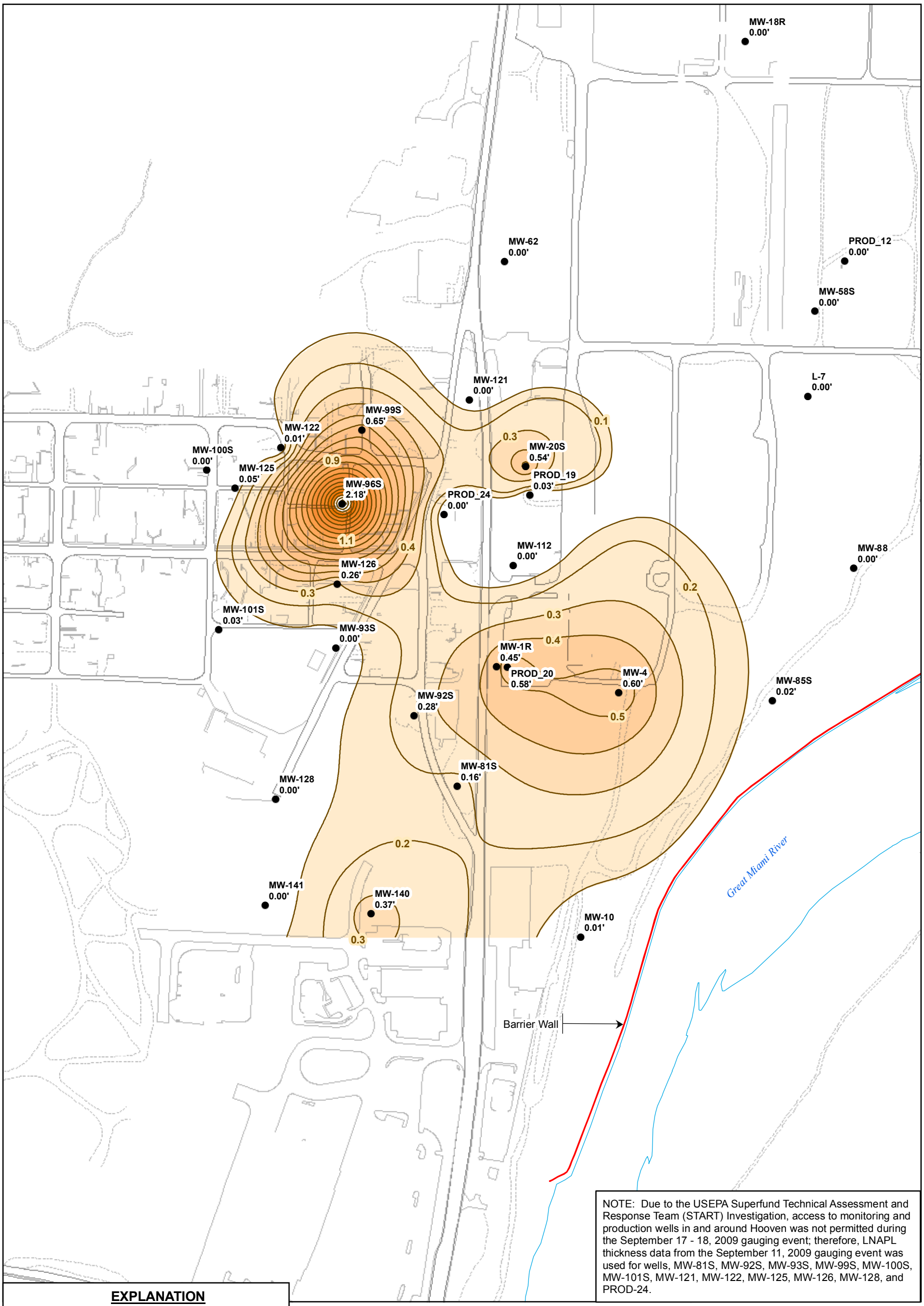
FIGURE 4-2

HIGH-GRADE EFFECTIVE DRAWDOWN MAP
SEPTEMBER 11, 17, & 18, 2009

SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: BR	Checked By: PM	Scale: 1" = 250'	Date: 3/19/10	File: Sept_9_11_09_DrawDown.mxd

US EPA ARCHIVE DOCUMENT



NOTE: Due to the USEPA Superfund Technical Assessment and Response Team (START) Investigation, access to monitoring and production wells in and around Hooven was not permitted during the September 17 - 18, 2009 gauging event; therefore, LNAPL thickness data from the September 11, 2009 gauging event was used for wells, MW-81S, MW-92S, MW-93S, MW-99S, MW-100S, MW-101S, MW-121, MW-122, MW-125, MW-126, MW-128, and PROD-24.

EXPLANATION

EQUIPOTENTIAL CONTOUR LINE OF LNAPL THICKNESS, CONTOUR INTERVAL IS 0.1 FEET

AREA OF EQUAL LNAPL THICKNESS IN FEET

0.01 — 2.18

N

0 — 250'

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FIGURE 4-3

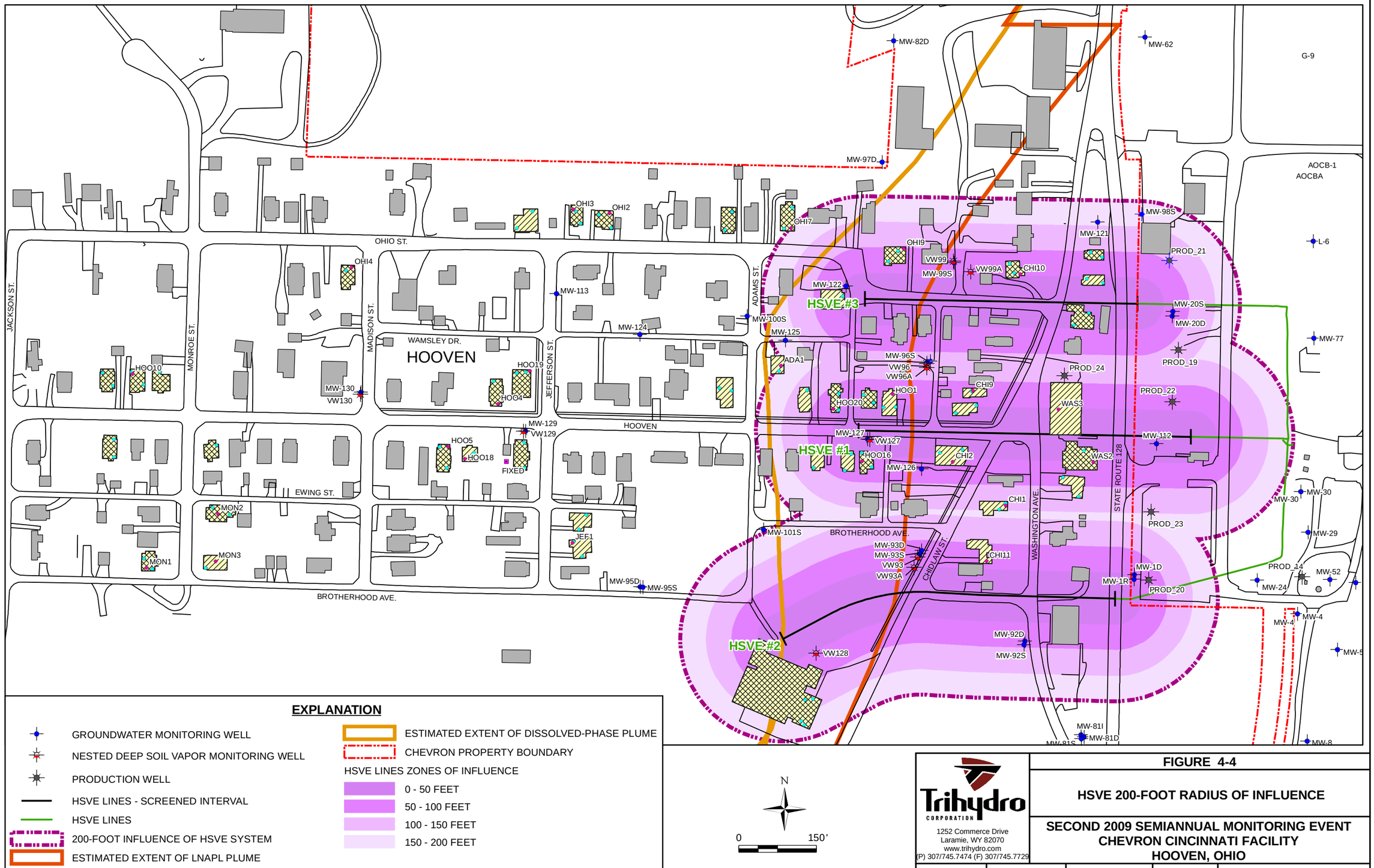
HIGH-GRADE LNAPL THICKNESS MAP
SEPTEMBER 11, 17, & 18, 2009

SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: BR	Checked By: PM	Scale: 1" = 250'	Date: 3/19/10	File: Sept_9_11_09_NAPL_Thickness.mxd

US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT



EXPLANATION

- GROUNDWATER MONITORING WELL
- NESTED DEEP SOIL VAPOR MONITORING WELL
- PRODUCTION WELL
- HSVE LINES - SCREENED INTERVAL
- HSVE LINES
- 200-FOOT INFLUENCE OF HSVE SYSTEM
- ESTIMATED EXTENT OF LNAPL PLUME
- ESTIMATED EXTENT OF DISSOLVED-PHASE PLUME
- CHEVRON PROPERTY BOUNDARY

HSVE LINES ZONES OF INFLUENCE

- 0 - 50 FEET
- 50 - 100 FEET
- 100 - 150 FEET
- 150 - 200 FEET

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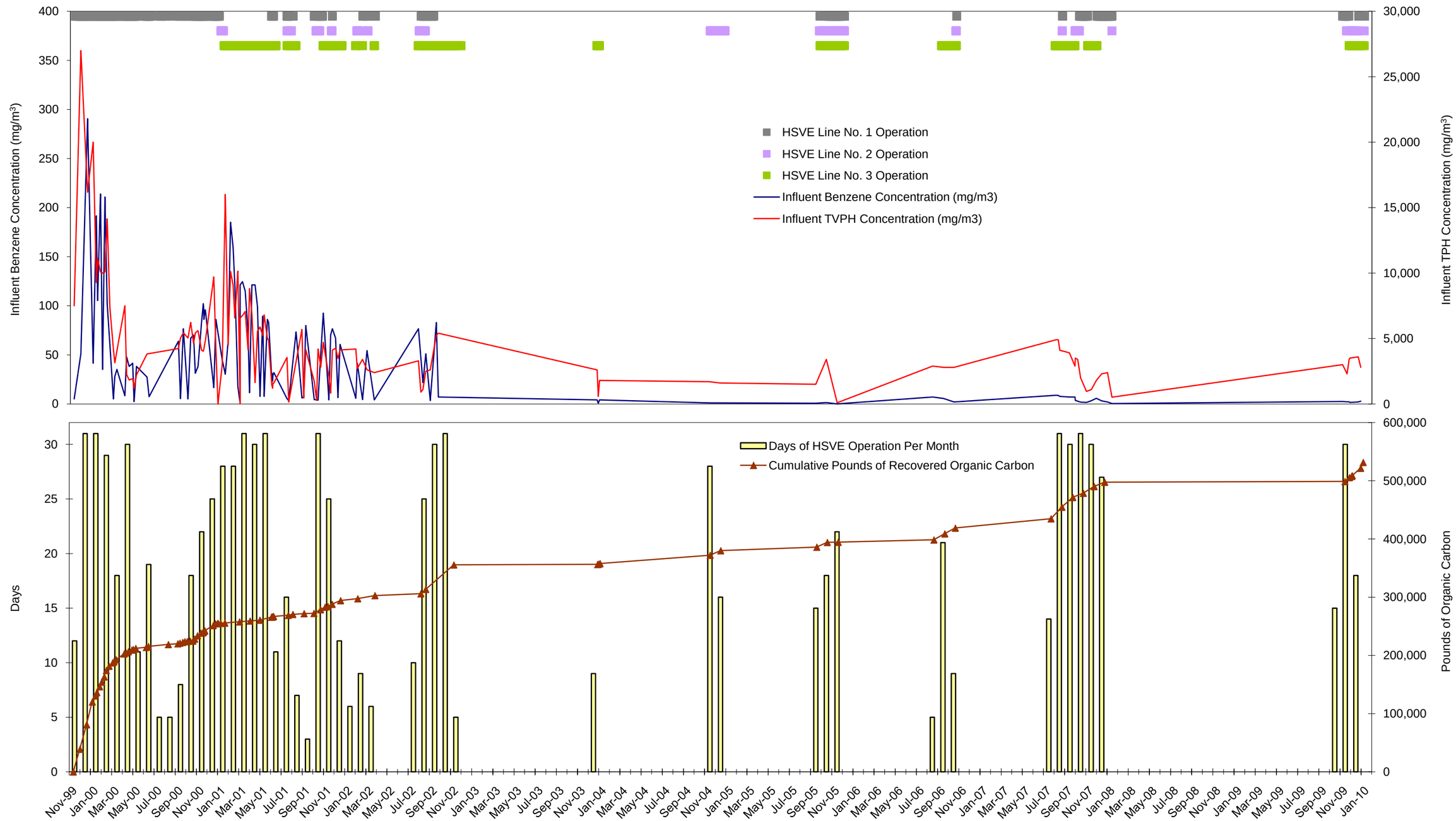
FIGURE 4-4

HSVE 200-FOOT RADIUS OF INFLUENCE

SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

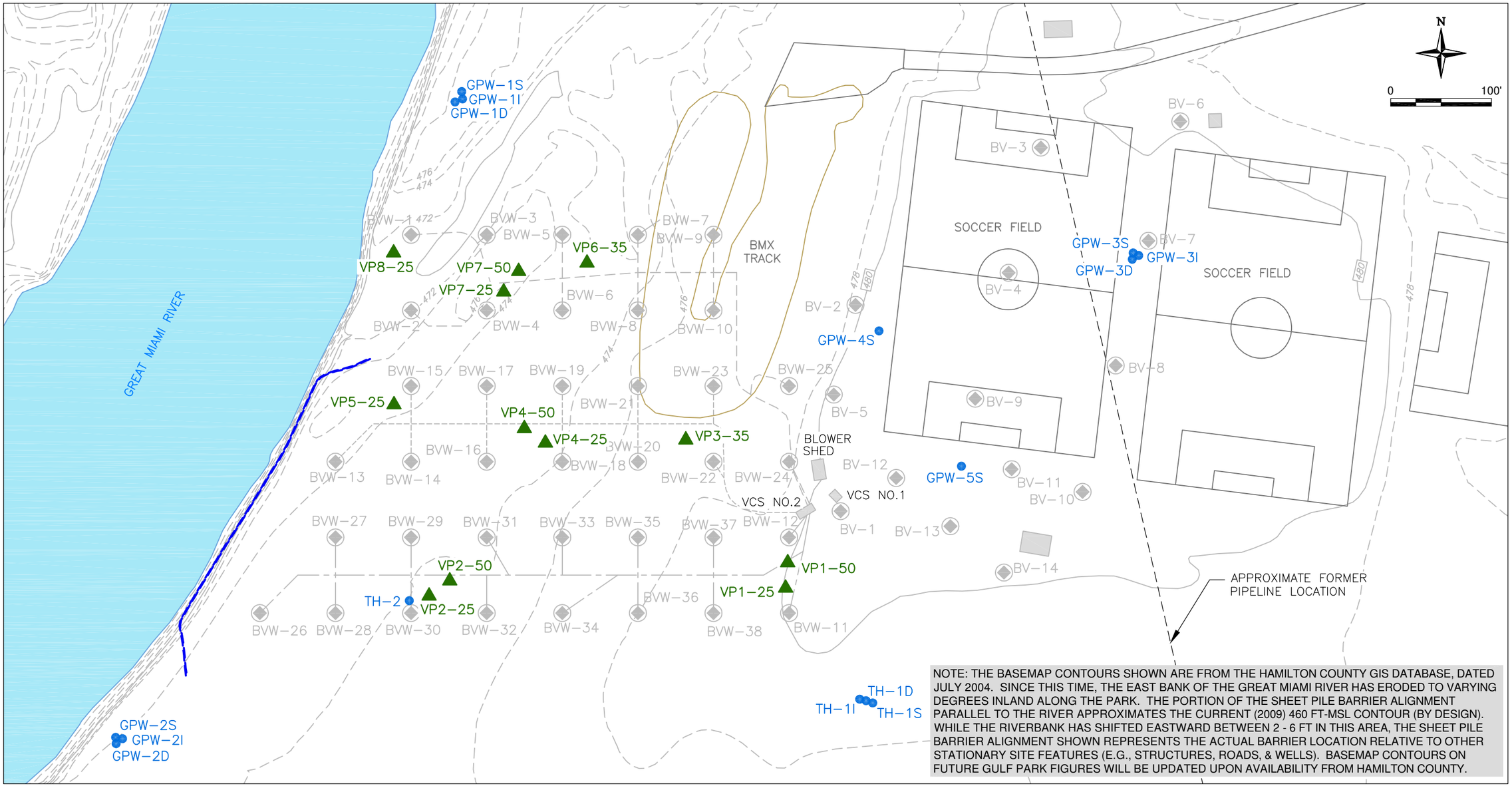
Drawn By: BR	Checked By: PM	Scale: 1" = 150'	Date: 2/15/10	File:201002_Figure_1_PM.mxd

FIGURE 4-5. HSVE OPERATION, INFLUENT CONCENTRATION, AND CUMULATIVE POUNDS OF RECOVERED ORGANIC CARBON
SECOND 2009 SEMIANNUAL MONITORING EVENT
CHEVRON CINCINNATI FACILITY, HOOVEN, OHIO



US EPA ARCHIVE DOCUMENT

US EPA ARCHIVE DOCUMENT



NOTE: THE BASEMAP CONTOURS SHOWN ARE FROM THE HAMILTON COUNTY GIS DATABASE, DATED JULY 2004. SINCE THIS TIME, THE EAST BANK OF THE GREAT MIAMI RIVER HAS ERODED TO VARYING DEGREES INLAND ALONG THE PARK. THE PORTION OF THE SHEET PILE BARRIER ALIGNMENT PARALLEL TO THE RIVER APPROXIMATES THE CURRENT (2009) 460 FT-MSL CONTOUR (BY DESIGN). WHILE THE RIVERBANK HAS SHIFTED EASTWARD BETWEEN 2 - 6 FT IN THIS AREA, THE SHEET PILE BARRIER ALIGNMENT SHOWN REPRESENTS THE ACTUAL BARRIER LOCATION RELATIVE TO OTHER STATIONARY SITE FEATURES (E.G., STRUCTURES, ROADS, & WELLS). BASEMAP CONTOURS ON FUTURE GULF PARK FIGURES WILL BE UPDATED UPON AVAILABILITY FROM HAMILTON COUNTY.

EXPLANATION

- GPW-2D — GROUNDWATER MONITORING WELL AND DESIGNATION
- VP2-25 — VAPOR MONITORING POINT
- BVW-26 — BIOVENT WELL AND DESIGNATION
- EXPANDED BIOVENTING SYSTEM PIPE RUN #1
- EXPANDED BIOVENTING SYSTEM PIPE RUN #2
- EXPANDED BIOVENTING SYSTEM PIPE RUN #3
- SHEET PILE BARRIER WALL
- 480 — GENERAL TOPOGRAPHIC CONTOUR (FT-AMSL, INTERVAL 2 FEET, DASHED WHERE INFERRED)
- BUILDING, TANK OR OTHER STRUCTURE
- ROAD
- VCS — VALVE CONTROL SHED
- FT AMSL — FEET ABOVE MEAN SEA LEVEL

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FIGURE 5-1

GULF PARK LAYOUT

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CHEVRON CINCINNATI FACILITY
HOOVEN, OHIO

Drawn By: JP	Checked By: PM	Scale: 1"=100'	Date: 6/11/10	File: 500GP_LAYOUT

US EPA ARCHIVE DOCUMENT
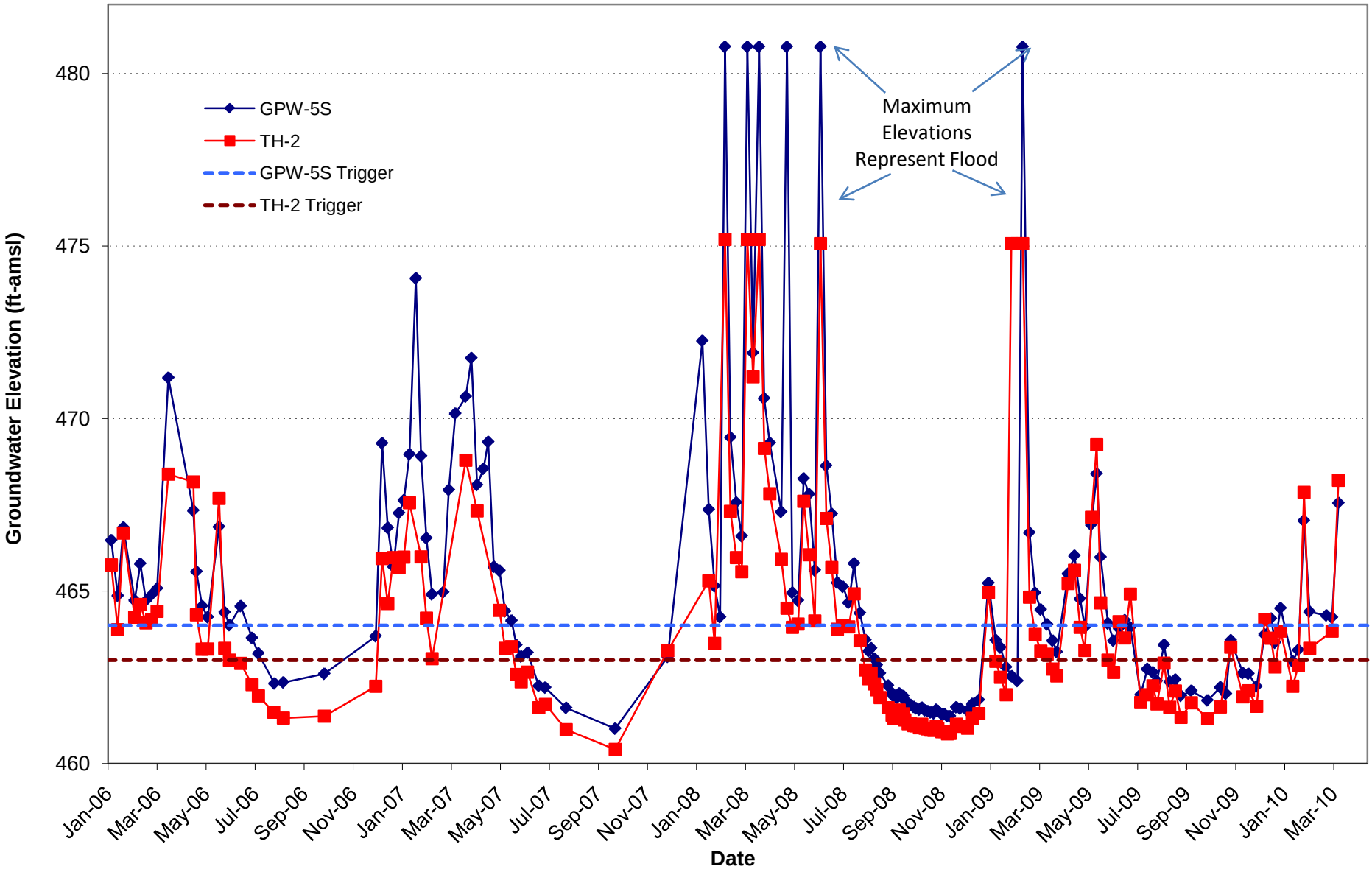
FIGURE 5-2. HYDROGRAPHS AND TRIGGER LEVELS FOR TH-2 AND GPW-5S (2006-2009)
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