

Norwalk Tank Farm Update

Defense Logistics Agency Energy

Norwalk Tank Farm

Restoration Advisory Board

February 9, 2012

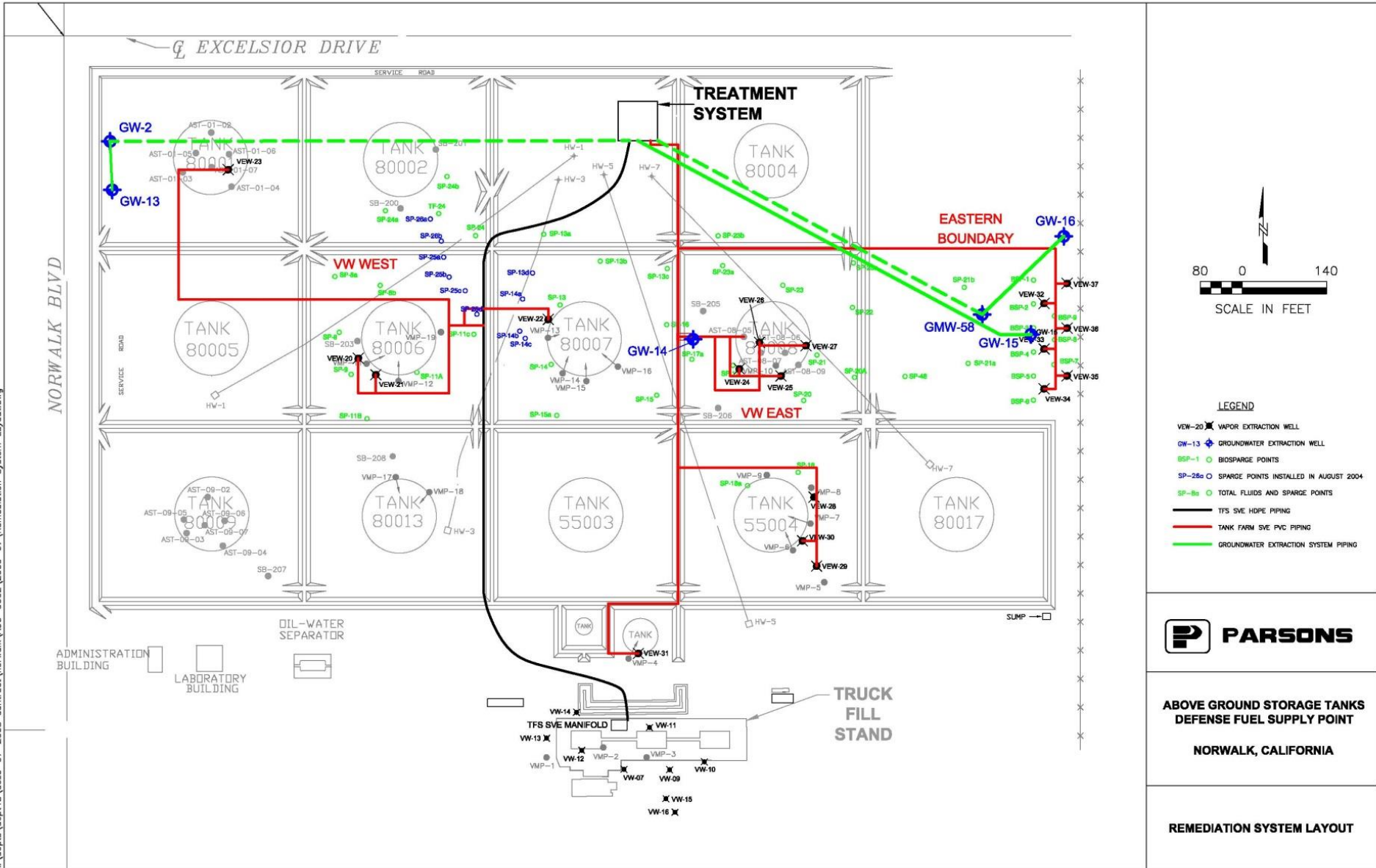


Presentation Overview

- Remediation Operations Update
- Well GMW-62 and Golden West Well Updates
- Concrete Demolition/Asbestos-Containing Material (ACM) Abatement Update
- Additional Assessment Update
- Five-Year Action Plan Progress Report
- Planned Activities
- Second Semiannual 2011 Groundwater Monitoring Event

Remediation Operations Update

DLA Remediation System Layout



ABOVE GROUND STORAGE TANKS
DEFENSE FUEL SUPPLY POINT
NORWALK, CALIFORNIA

REMEDIATION SYSTEM LAYOUT

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General Site Activities

- Submitted Quarterly NPDES Discharge Monitoring Reports (DMR) for 2nd and 3rd Quarters 2011
- Submitted Remediation Monthly Status Summary Reports
- Conducted Groundwater Monitoring (GWM) - 3rd quarter 2011 event (July); 2nd semiannual event (October); 1st quarter 2012 event (January)
- Conducted Soil Vapor Monitoring - 3rd quarter 2011 event (September); 4th quarter 2011 event (December)
- Removed 1 liter of free product from GMW-62 for testing (October 17)
- September 1 – Tested on-site back-flow preventers

Groundwater Treatment System Activities Summary

- GWTS Activities:
 - Granular-activated carbon (GAC) change-out (August 25 and January 12)
- System **On** from July 1 through December 31, 2011 except for the following reasons and dates when it was **Off**:
 - August 24-26: GAC change-out
 - July 5-13: 3rd quarter 2011 GWM event
 - October 3-14: 2nd semiannual 2011 GWM event
 - December 30 - January 16: 1st quarter 2012 GWM event and GAC change-out

Groundwater Treatment System Operations Summary

- GW-15 and GW-16 were down from August 22 - September 9 for repair of inlet line that was ruptured during concrete demolition activities. During this time a hose repair was simultaneously conducted at GW-15
- Groundwater extraction operated from wells GW-2 and GW-13 in the northwest corner of property and from wells GW-15 and GW-16 in the north-eastern site area
- Average groundwater extraction system operations summary (excluding planned downtimes for O&M, GAC change-out, permit compliance sampling, and GWM events):
 - 3rd quarter 2011 operated: 99.4% of time
 - 4th quarter 2011 operated: 98.8% of time

Soil Vapor Extraction System Activities Summary

- SVES Activities:
 - Changed blower oil (September 7)
 - Fiberglass repairs to suction lines (September 29)
 - Troubleshooting and repairs on thermocouple (September 7-30)
- System **On** from July 1 through December 31, 2011 except for the following periods when it was **Off**:
 - July 5-13: 3rd quarter 2011 GWM event
 - October 3-14: 2nd semiannual 2011 GWM event
 - December 30-January 13: 1st quarter 2012 GWM event

Soil Vapor Extraction System Operations Summary

- Soil vapor extraction operated from four horizontal wells (HW-1, HW-3, HW-5, and HW-7) spanning the entire former tank farm area and from 6 wells (SVE-32 through SVE-37) in the north-eastern site area
- Average soil vapor extraction system operations summary (excluding planned downtimes for O&M, permit compliance sampling, and GWM events):
 - 3rd quarter 2011 operated: 82% of time
 - 4th quarter 2011 operated: 100% of time

Remediation Systems Update

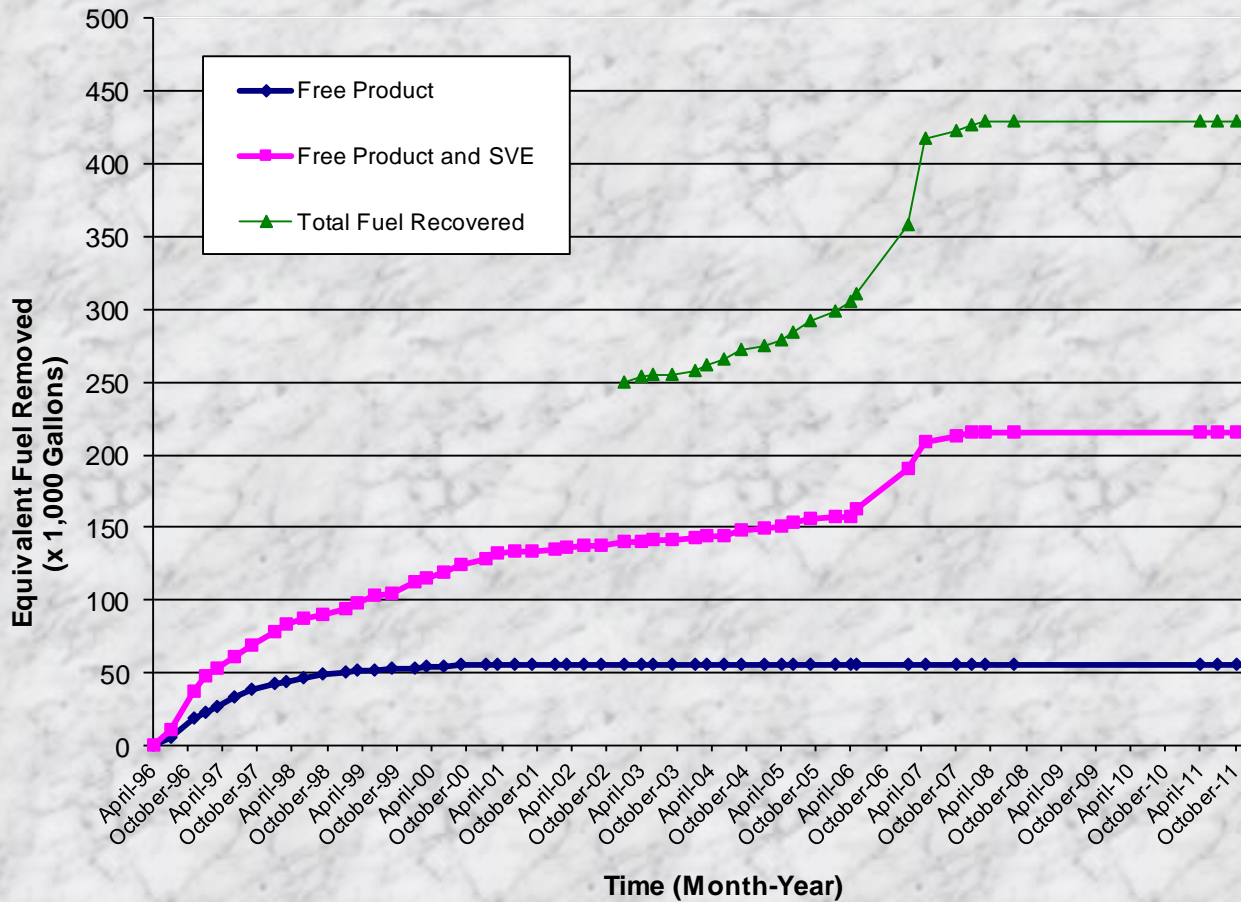
- GWTS & SVES weekly system inspections
- SVES performance & compliance sampling:
 - 3rd quarter 2011: July 27, August 26, September 30
 - 4th quarter 2011: October 28, November 31, December 28
 - 1st quarter 2012: January 26
- GWTS performance & compliance sampling:
 - 3rd quarter 2011: July 14, 22, and 27, August 5, 12, and 30, September 9, 13, 22, and 30
 - 4th quarter 2011: October 28, November 29, December 28
 - 1st quarter 2012: January 26
- GWTS GAC change-out at GAC-1 GAC-2, and GAC-3 on August 25 and January 12

Overall Operations Summary

- Groundwater extracted and treated:
 - 3rd quarter 2011: 1,903,590 gallons
 - 4th quarter 2011: 1,944,330 gallons
 - 58.8 million gallons since April 1996

- Soil vapor extraction system equivalent fuel removed:
 - 3rd quarter 2011: 4.4 gallons (29.0 pounds)
 - 4th quarter 2011: 3.9 gallons (26.2 pounds)
 - 428,822 gallons (2,852.4 pounds) since April 1996

SVES Operations Summary



Well GMW-62 and Golden West Well Updates

GMW-62 Gauging and Recovery

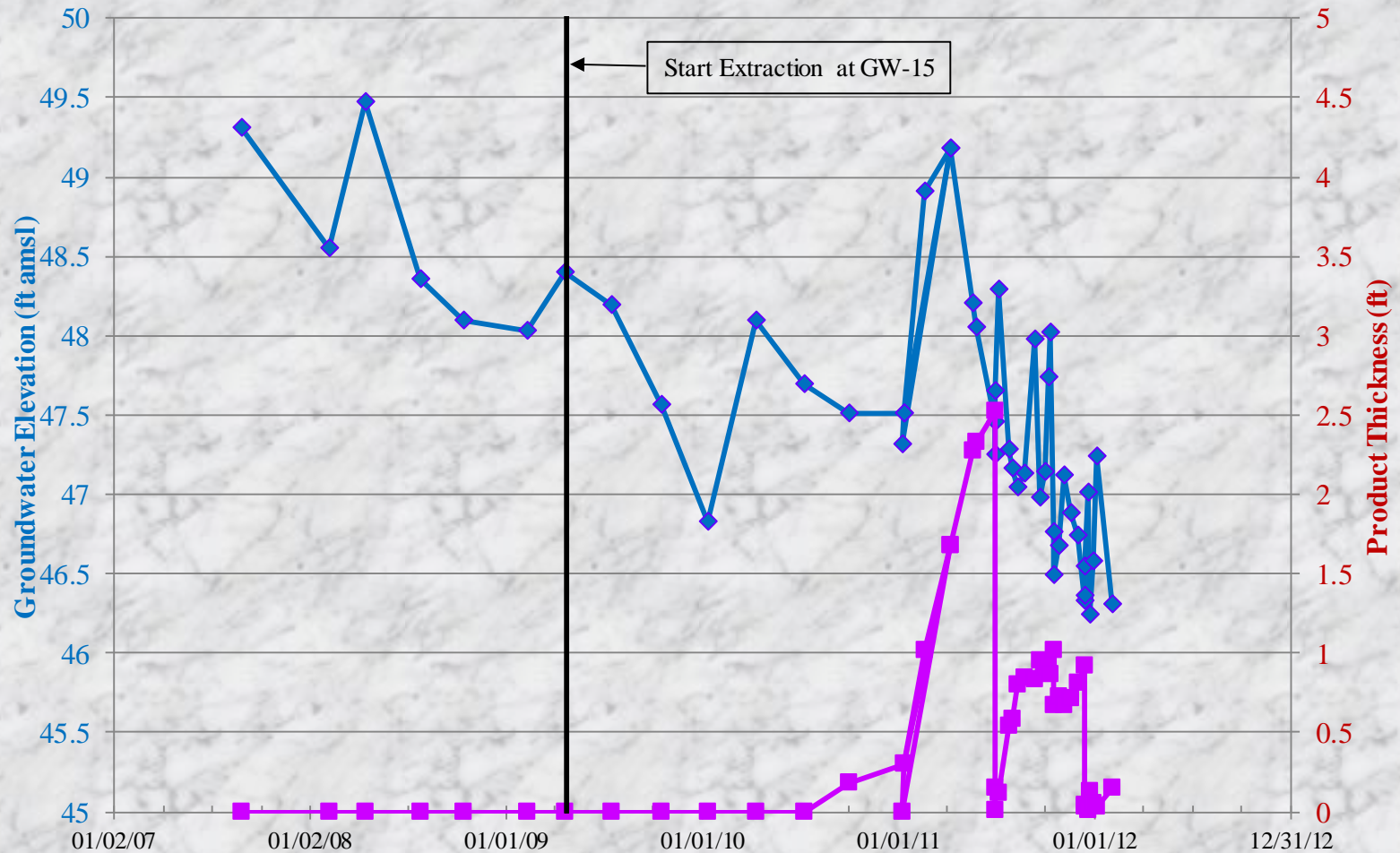
- GMW-62 quarterly gauging:
 - 3rd quarter July 2011: 0.11 feet of product
 - 4th quarter October 2011: 0.94 feet of product
 - 1st quarter January 2012: 0.03 feet of product
- GMW-62 free product recovery:
 - Removed 1 liter of free product from GMW-62 for testing (Oct 17)
 - Product recovery pump test (Dec 14) – Recovered about 1 gallon of free product
- GMW-62 will be gauged once a week and once the measureable free product reaches at least 1 foot, the product will be recovered from the well using vacuum-truck extraction

Free Product Characterization

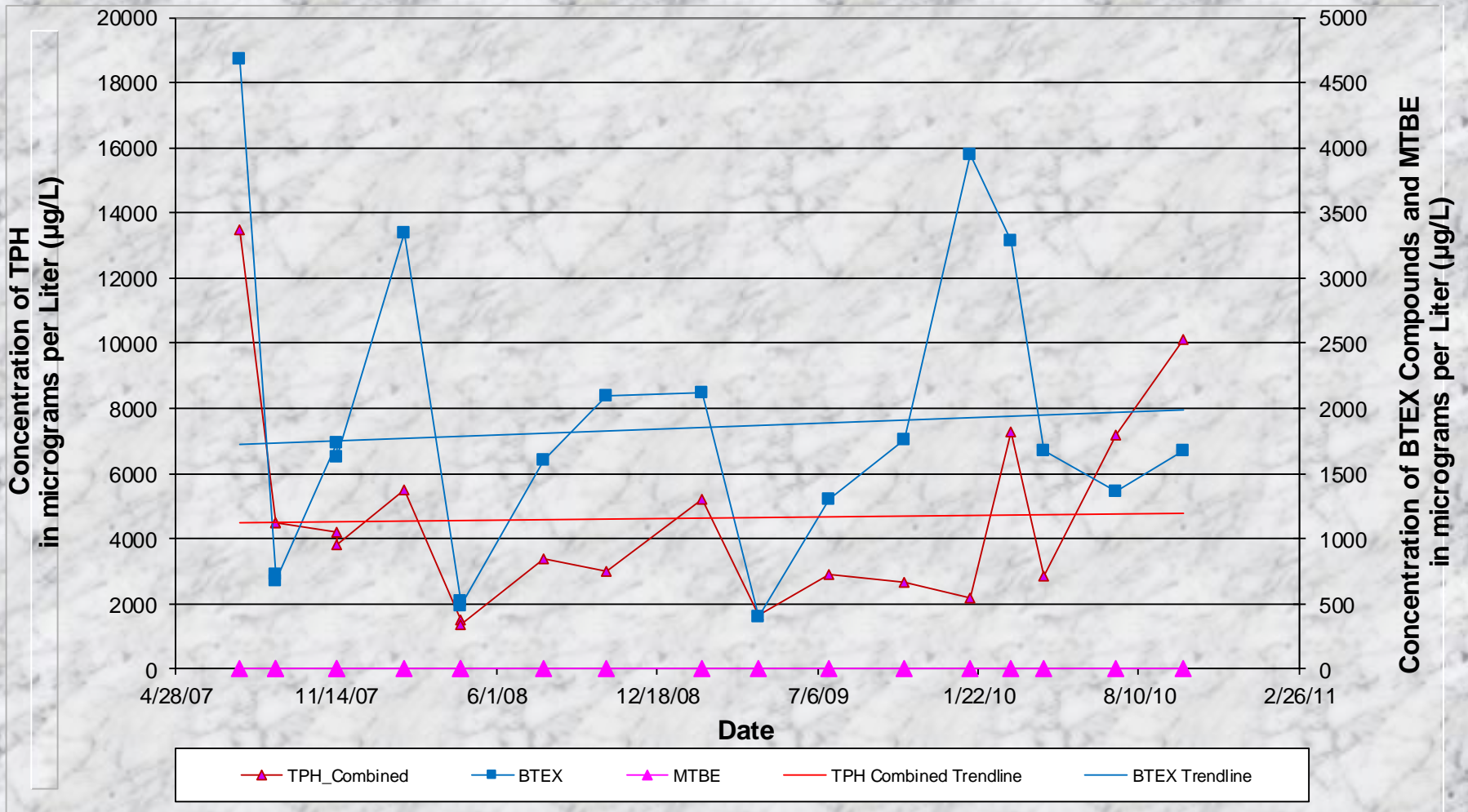
GMW-62 Product Baildown Test

- Product baildown test was conducted on Dec 14, 2011
- Pneumatic skimming pump was used to remove the product to a sheen
- Minimal and sporadic recovery was observed:
 - After 6 hours product thickness = 0.04 feet
 - After 22 hours product thickness = 0.03 feet
 - After about 5 days product thickness = 0.01 feet
 - After about 9 days product thickness = 0.12 feet
- The combination of water level changes, minimal recovery, and data variability make calculation of LNAPL transmissivity dubious, but assumed to be very low

GMW-62 Hydrograph



GMW-62 Concentration Trends



Golden West Well Update

- Based on information from Thrifty Oil (provided by Paul Cho), Well P0-7 was gauged in the past and no impacts were found to have migrated from the Golden West Refinery (located approx 1.5 miles away)

Concrete Demolition and Asbestos-Containing Material Abatement Update

Concrete Demolition Update

- Concrete has been removed from all former tank areas and portions of the truck fill station and pump house areas
 - Approximately 7,900 tons of concrete shipped for recycling
 - Steel tank pads have been shipped for recycling
 - Approximately 2,600 feet of transfer fuel lines have been removed and shipped for recycling
 - Approximately 2,400 feet of steel storm drain piping have been removed and shipped for recycling
 - Approximately 6,600 feet of fire water/fuel lines have been removed and shipped for recycling
 - Approximately 85 tons of contaminated soil has been disposed to a certified treatment facility
 - Approximately 1,000 feet of miscellaneous piping from the former truck fueling area has been removed and shipped for recycling
- October 7 – Last day of concrete demolition due to the discovery of ACM

Soil Confirmation Sampling

- Direct-push technology (DPT) soil confirmation sampling conducted October 31 thru November 16
- 102 DPT soil sampling locations
- DPT locations down to approximately 25 feet
- DPT sampling will resume once all asbestos-containing material and concrete has been removed from site (areas still to be sampled include the truck fueling and pump house areas)

Soil Confirmation Sampling

- Based on initial soil data review the following presents a summary by area compared to proposed soil cleanup goals:
 - Tank 80002, Tank 80013, Tank 80017 – not impacted
 - Tank 55003 and Tank 80004 – impacted at the surface to 1 foot bgs
 - Tank 55004 – impacted at the surface to 1 foot bgs, at 10 feet bgs, and at 25 feet bgs
 - Tank 80001 – impacted from 18 to 25 feet bgs
 - Tank 80005 – impacted at the surface to 1 foot bgs and from 10 to 25 feet bgs
 - Tank 80006 – impacted from 19 to 25 feet bgs
 - Tank 80007 – impacted at the surface to 1 foot bgs and at 25 feet bgs
 - Tank 80008 – impacted from 18 to 25 feet bgs
 - Tank 80009 – impacted at the surface to 1 foot bgs and from 19 to 25 feet bgs
 - Oil-water separator – impacted from 15 to 16 feet bgs
 - Water and slop tanks – impacted from the surface to 25 feet bgs

Updated Site Photos



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Site view from Tank 80009

Updated Site Photos



Site view from southeast corner of site



Former truck fueling area

Asbestos-Containing Material Update

- Sampling conducted from pipes with possible asbestos-containing material – July and December
- Air Quality Management District (AQMD) Procedure 5 notification submitted January 31, 2012

Asbestos-Containing Material Update

- ACM abatement to begin February 13, 2012 to include the following materials and quantities:
 - 12-inch fuel transfer pipes - approximately 1,025 LF
 - 10-inch fuel transfer pipes - approximately 650 LF
 - 8-inch fuel transfer Pipes - approximately 200 LF
 - 2-inch miscellaneous pipes - unidentified length, near surface (where encountered)
 - 16-inch storm drain transite pipes - approximately 825 LF
 - 12-inch storm drain transite pipes - approximately 1,020 LF
 - 10-inch water main transite pipes - approximately 1760 LF
 - 6-inch fire water suppression system pipe - approximately 8,000 LF
 - 6-inch fire water suppression system transite pipes - approximately 900 LF

Additional Assessment Update

- Free Product Characterization
- Vapor Monitoring Program

Free Product Characterization

- 2nd free product investigation report submitted (January 12, 2012)
- Investigation activities included:
 - Drilling and deep soil sampling at two locations, UVB-2 and UVB-9 adjacent to initial UVOST locations (UV-2 and UV-9) that showed deep LIF indications;
 - Conducting analytical and forensic analysis of hydrocarbons from deep soil cores at adjacent boreholes to UV-2 and UV-9; and
 - Performing a product baildown and recovery test at GMW-62
- Deep soil results from UVB-2 and UVB-9 did not show free product present

Free Product Characterization Distribution of Hydrocarbons

- Hydrocarbon LNAPLs in soil were detected at low concentrations at depths near the perched water table
 - vertical extent is limited to a 1 to 2 feet thick smear zone
- Hydrocarbons, tentatively suspected at deeper depths in the saturated zone, were not substantiated
- Horizontal extent of hydrocarbon LNAPLs in soil is limited to one area in the central portion; two areas in the southern portions; and one area on the eastern edge of the site:
 - Central area plume near former Tank 80007 probably had a jet fuel source
 - Eastern plume probably had a jet fuel source
 - Southwestern plume is interpreted to be a gasoline type
 - Plume near the truck fueling area is interpreted to have a motor oil or diesel source.
- Detected hydrocarbons are interpreted to be at less than residual saturation and are therefore no longer mobile

Free Product Characterization Distribution of LNAPL Hydrocarbons near Water Table

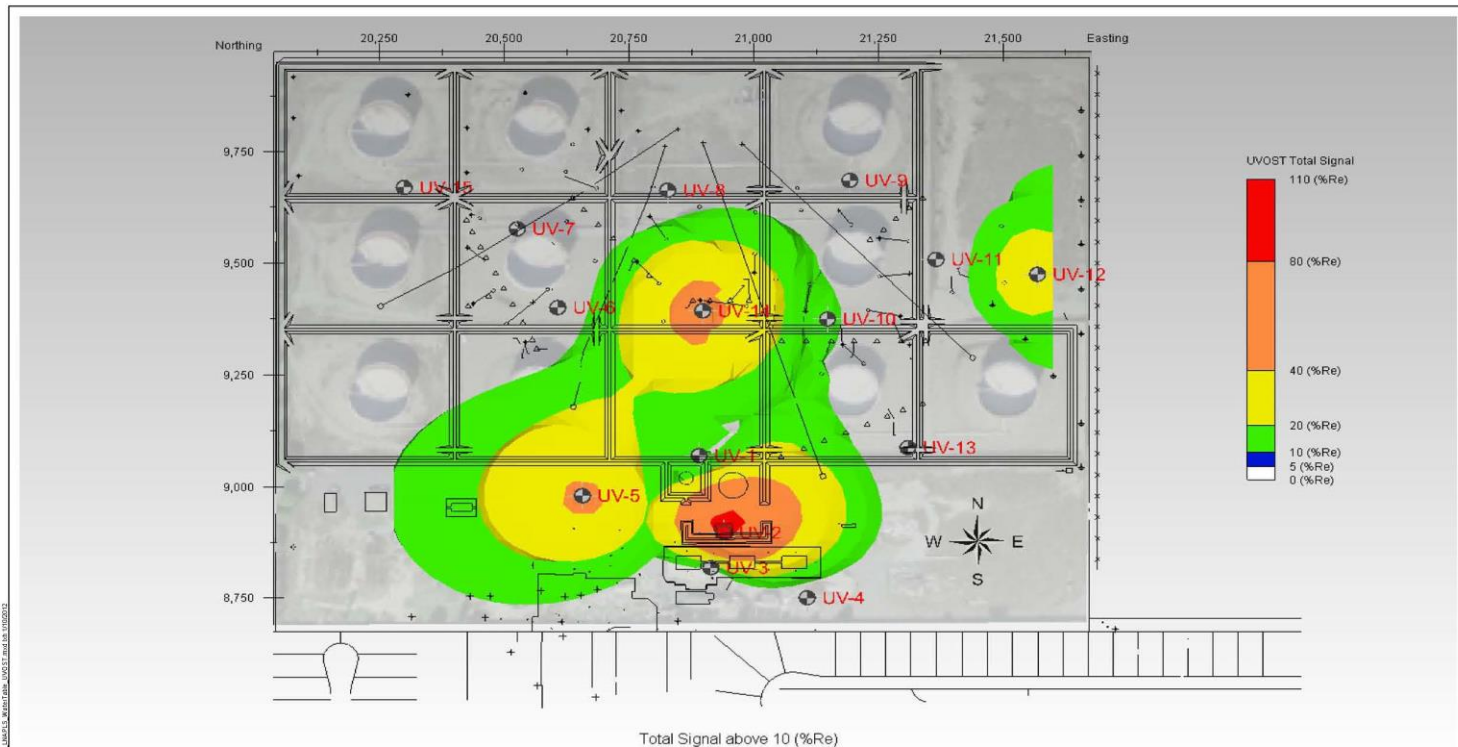


FIGURE 3-3

Distribution of LNAPLs
near the Water Table by UVOST

DEFENSE FUEL SUPPORT POINT
Norwalk, California

PARSONS
Pasadena, California

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Vapor Monitoring Program

- 1st semiannual summary report for the 4th quarter 2010, 1st quarter 2011, and 2nd quarter 2011 was submitted (August 9)
- 3rd quarter soil gas sampled (September)
- 4th quarter soil gas sampled (December)
- Currently preparing the 2nd semiannual 2011 vapor monitoring report (due February 15)
- Soil gas screening levels are being calculated and proposed cleanup goals will be presented in the semiannual report
- There have been low detected VOCs but all are well below the proposed commercial cleanup goals
- The proposed future monitoring schedule will be included in the report

Five-Year Action Plan Progress Report

Update on 5-Year Action Plan

- Free product recovery
 - Fuel thickness and extent of free product in wells throughout the site have decreased
 - October 2011 free product was only detected in 5 wells from four areas of concern: north-eastern/Holifield Park, north-central, truck fueling area, and south-eastern areas
 - Began vacuum-truck free product recovery from GMW-62 located in Holifield Park

Update on 5-Year Action Plan

- Soil venting
 - Expanded well network in various areas
 - SVES began continuous operation from the north and north-eastern areas in January 2011
 - In 2011 approximately 146.3 pounds (22 gallons) of hydrocarbons have been destroyed from the SVES

Update on 5-Year Action Plan

- Groundwater extraction
 - Effectively decreased free product plumes
 - Extraction from north-west corner and north-eastern area for containment has been effective
 - Off-site wells continue to show non-detect or decreasing trends in TPH and BTEX concentrations
 - Although TPH concentrations in most wells are lower and/or are declining, Groundwater extraction is used for plume containment

Remedial Action Plan Update

- RAP addendum proposing soil cleanup goals was submitted January 11, 2012
- **Soil Remediation Schedule**
 - SVE &/or bioventing operation: January 2012 - May 2014
 - Conduct additional soil investigation (under concrete foundations): January 2012 – August 2012
 - Respiration test, soil confirmation sampling and reporting: May 2014 – December 2014
 - Potential new remedial solution: TBD

Remedial Action Plan Update (cont.)

- **Groundwater Remediation Schedule**
 - Groundwater extraction for containment will continue
 - Evaluate groundwater remediation technologies
 - Remedial action will be proposed and implemented:
project for the second half of 2012 thru the end of 2014

Planned Activities

Planned Activities for Next Semiannual Period

- Continue operation, weekly system inspections, required sampling, evaluation, and optimization of GWTS and SVES
- Site-wide weed abatement (February)
- Conduct 1st quarter 2012 GMW sentry event (January); conduct 1st semiannual 2012 event (April); and 3rd quarter 2012 GWM sentry event (July)
- Prepare and submit NPDES DMR for 4th quarter 2011 and 1st quarter 2012

Planned Activities for Next Semiannual Period

- Concrete demolition and ACM abatement tasks:
 - Mobilize and begin ACM abatement
 - Finalize removal of all non ACM pipelines throughout the site, including the pump house areas
 - Finalize all concrete demolition at pump house and truck fueling areas
 - Continue with DPT soil confirmation sampling at the former truck fueling area and pump houses
 - Green waste removal from all steel tank and concrete demolition activities

Second Semiannual 2011 Groundwater Monitoring Event

Second Semiannual 2011 Groundwater Monitoring Event

- Sentry Event – 3rd Quarter
 - January – DLA and SFPP
- Semiannual Event – 4th Quarter
 - April – DLA and SFPP
- Monthly Events (Southeastern area wells)
 - August, September, November, and December 2011 – SFPP

Second Semiannual 2011 Groundwater Monitoring Event

- Well gauging and sampling
 - Low-flow sampling methods
 - 195 wells gauged
 - 113 wells sampled
 - SVE/TFE/GWE systems were turned off prior to gauging and sampling

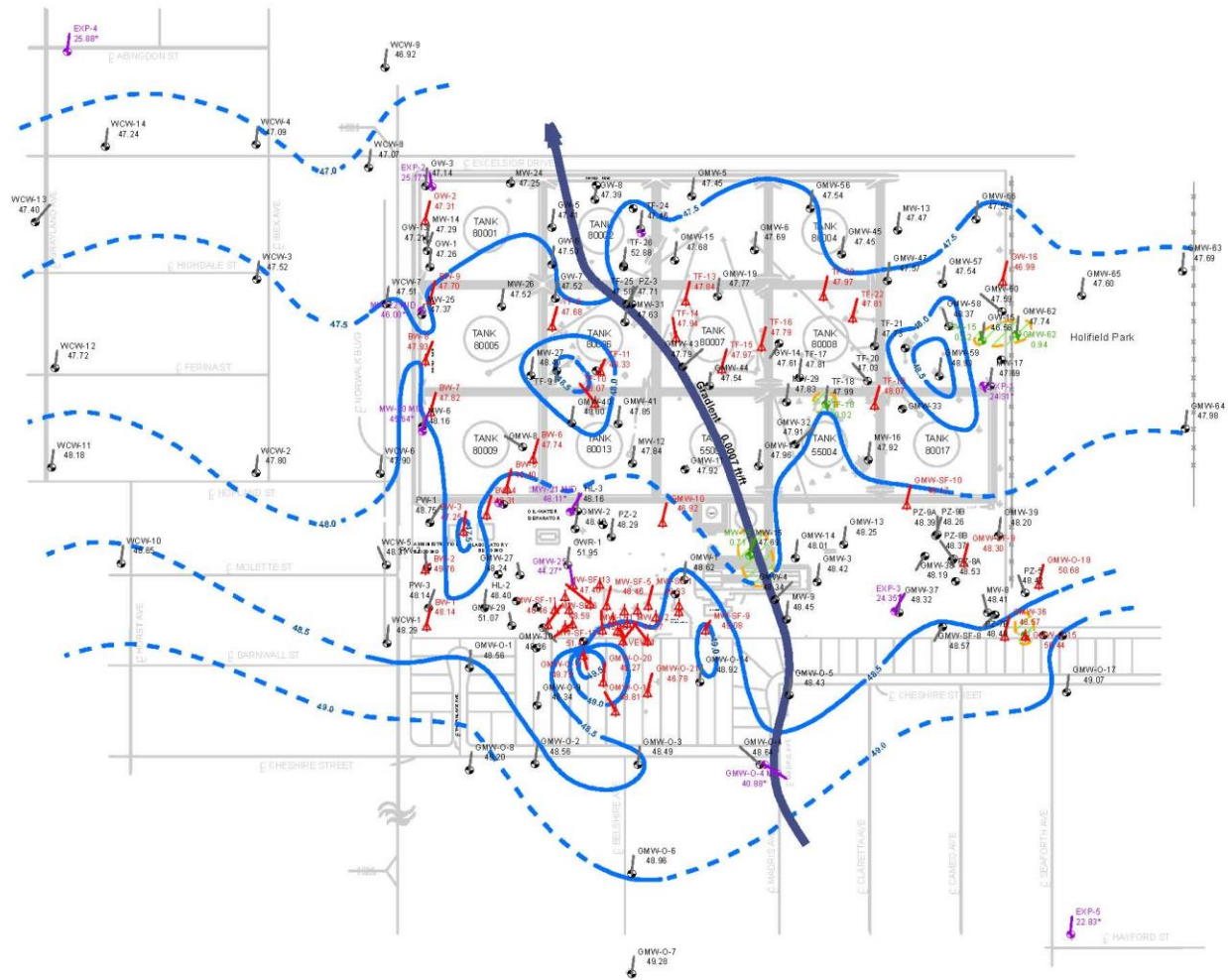
Second Semiannual 2011 Groundwater Monitoring Event

- Groundwater levels during October 2011 generally similar to those encountered during previous monitoring events
- Uppermost Aquifer Groundwater Elevations
 - Groundwater elevations were approximately 0.1 foot to 0.8 foot lower since April 2011
 - Horizontal hydraulic gradient was approximately 0.0007 ft/ft toward the north-northwest
- Exposition Aquifer Groundwater Elevations
 - Groundwater elevations in 3 wells decreased by approximately 0.57 foot to 0.19 foot since April 2011
 - Groundwater elevations in 2 wells increased by 0.17 and 0.24 foot since April 2011
 - Horizontal hydraulic gradient was approximately 0.0009 ft/ft toward the east-southeastward

Second Semiannual 2011 Groundwater Monitoring Event

- Free product was measured in 5 of the 195 wells gauged from four areas of concern
 - North-eastern area at GMW-62 (0.94 feet) and GW-15 (0.02 feet)
 - Northern tank farm area at TF-18 (0.02 feet)
 - Truck fueling area at MW-15 (0.71 feet)
 - Southeastern 24-inch block valve area at GMW-O-15 (0.57 feet)
- Note that free product was not observed in any south-central area wells

Groundwater Elevation and Free Product Plumes - October 2011

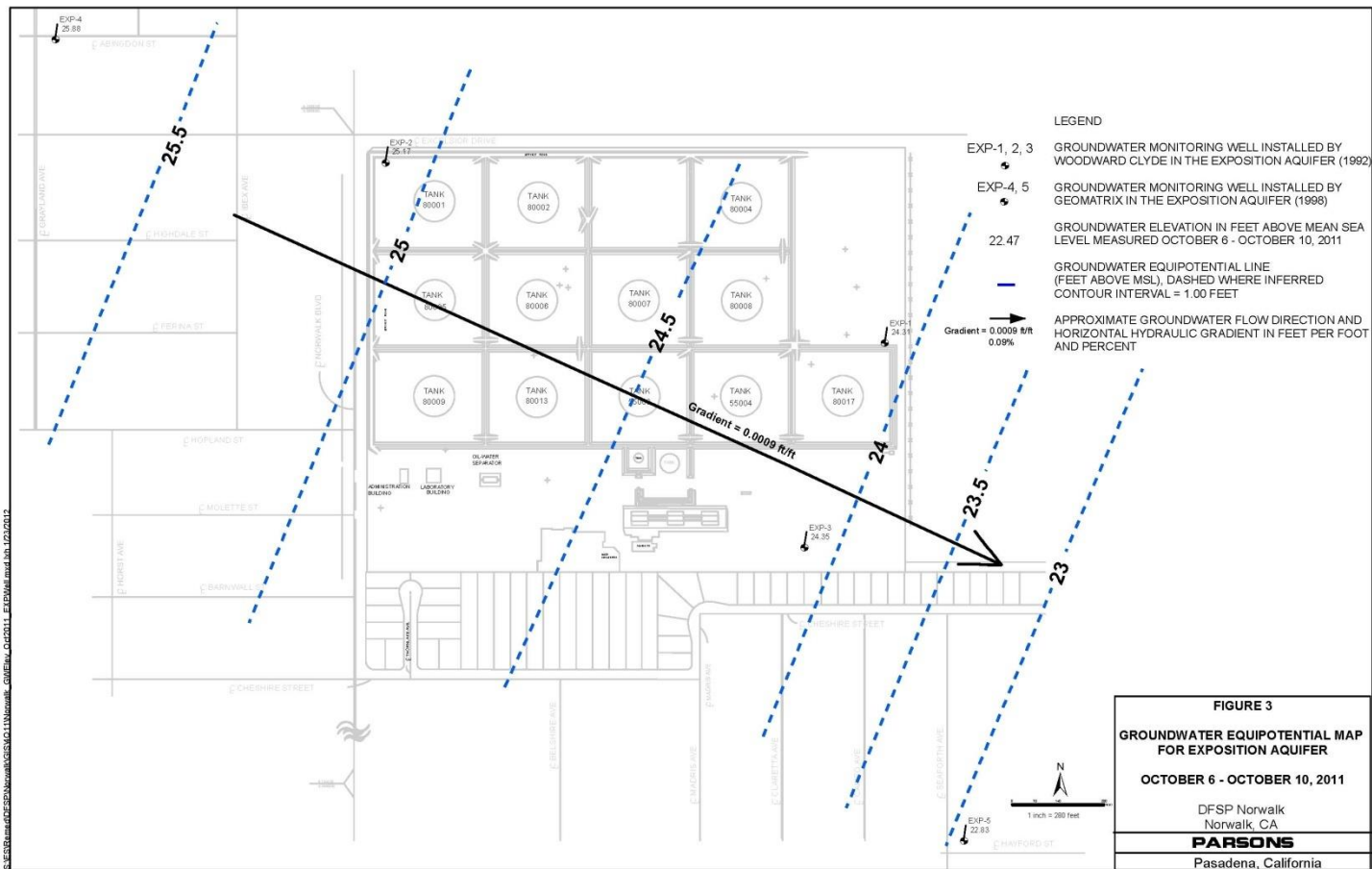


Groundwater Elevation and Free Product Plumes - October 2010



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Groundwater Elevation Exposition - October 2011



Second Semiannual 2011 Groundwater Monitoring Event

■ Exposition Aquifer Wells

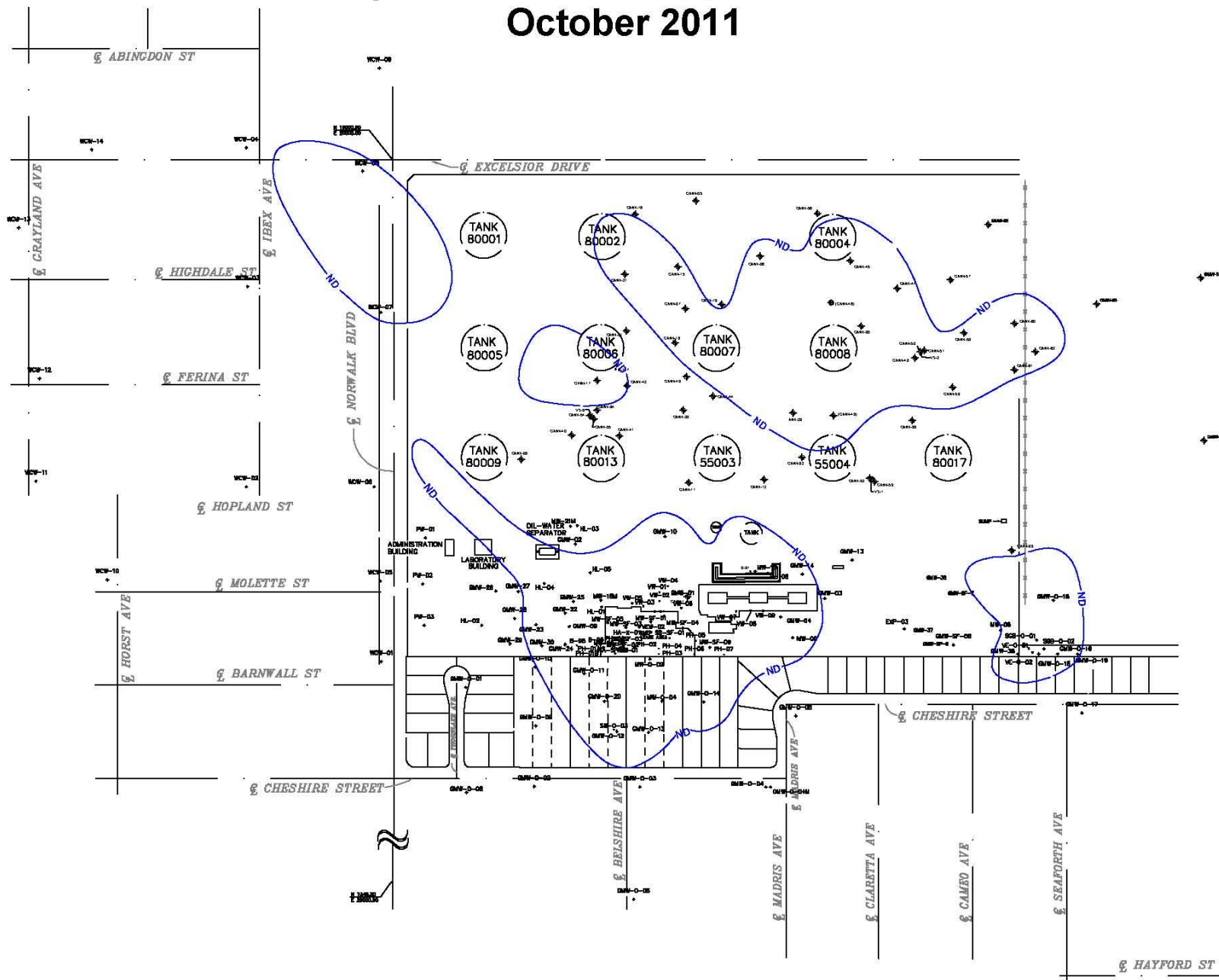
- Wells sampled:
 - EXP-1, -2, and -3 sampled by both DLA and SFPP
 - EXP-5 sampled by SFPP
- All analytical results were non detect, except for the following:
 - TPH as fuel product was detected at EXP-3 in SFPP's sample at a concentration of 140 µg/L (just above the laboratory reporting limit)
 - TBA was detected at EXP-3 in DLA's sample at an estimated concentration of 8.7 J µg/L (near reporting limit)
- These types of low-level detections occasionally occur in the EXP wells but are generally not repeated. The EXP wells will continue to be monitored quarterly

Second Semiannual 2011 Groundwater Monitoring Event

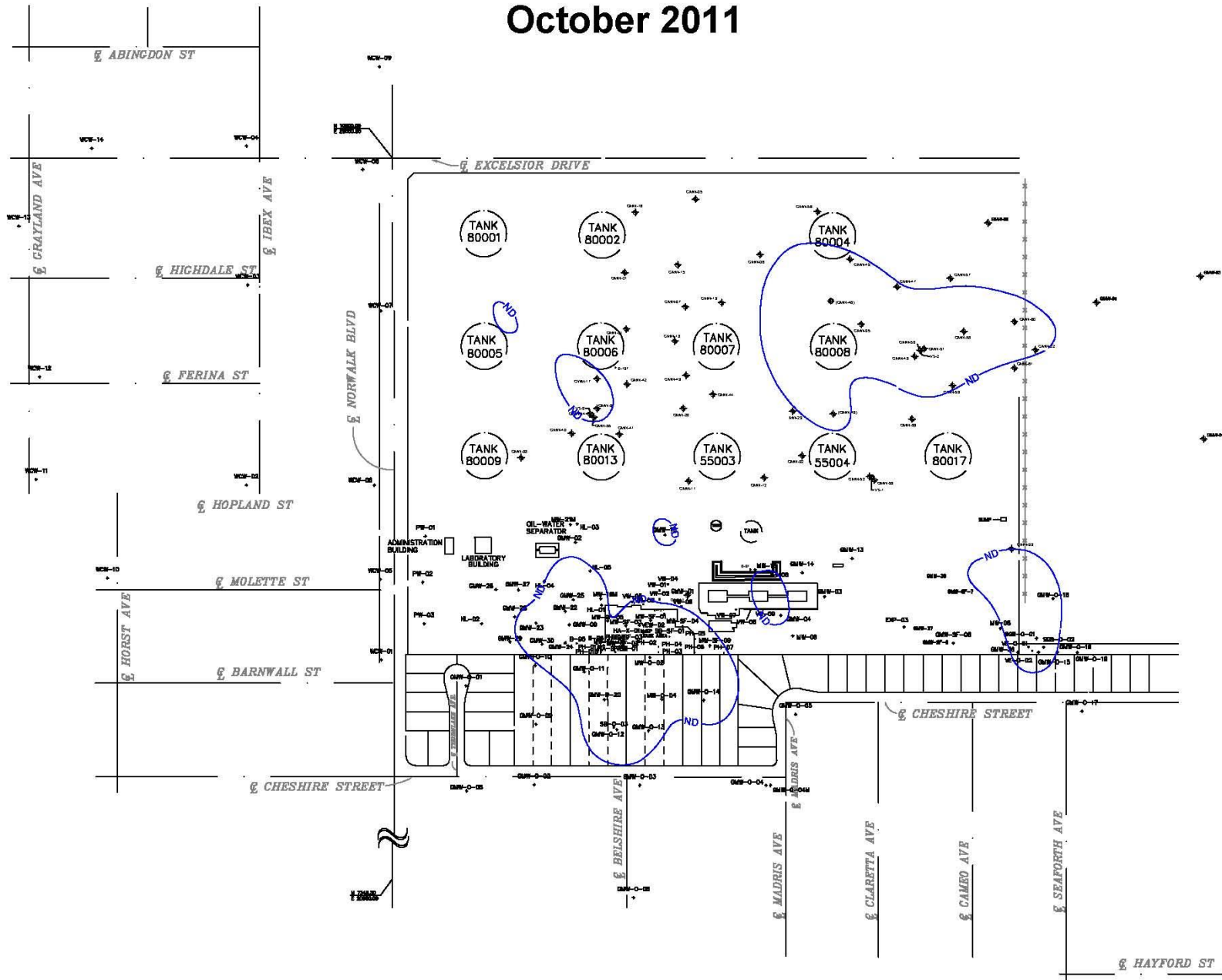
■ Uppermost Aquifer Wells

- In most areas, the lateral extents of TPH, MTBE, and 1,2-DCA in groundwater remain similar to those interpreted during recent previous monitoring events
- The lateral extent of benzene in the northern tank farm plume has reduced in size and eliminated the plume in the vicinity of former Tank 80007; however, the benzene plume in the southeast 24-inch block valve area has increased since previous monitoring events
- The lateral extent of TBA in the southeast 24-inch block valve area appears to have expanded further onsite to the northwest; the north-central tank farm TBA plume is similar to one year ago, but larger than the previous April semiannual event
- Concentrations are influenced by water level fluctuations

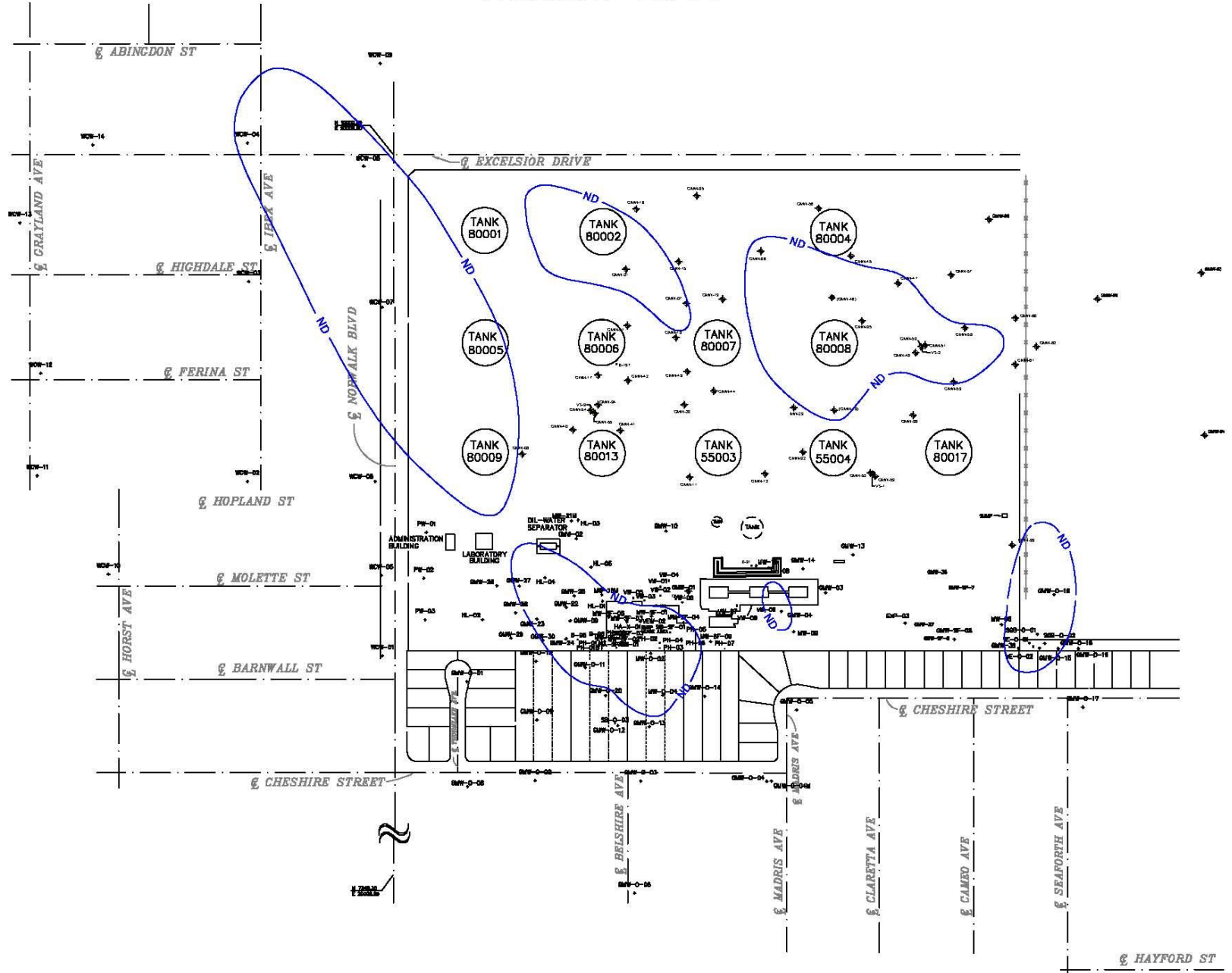
Total Petroleum Hydrocarbons In Uppermost Groundwater Zone October 2011



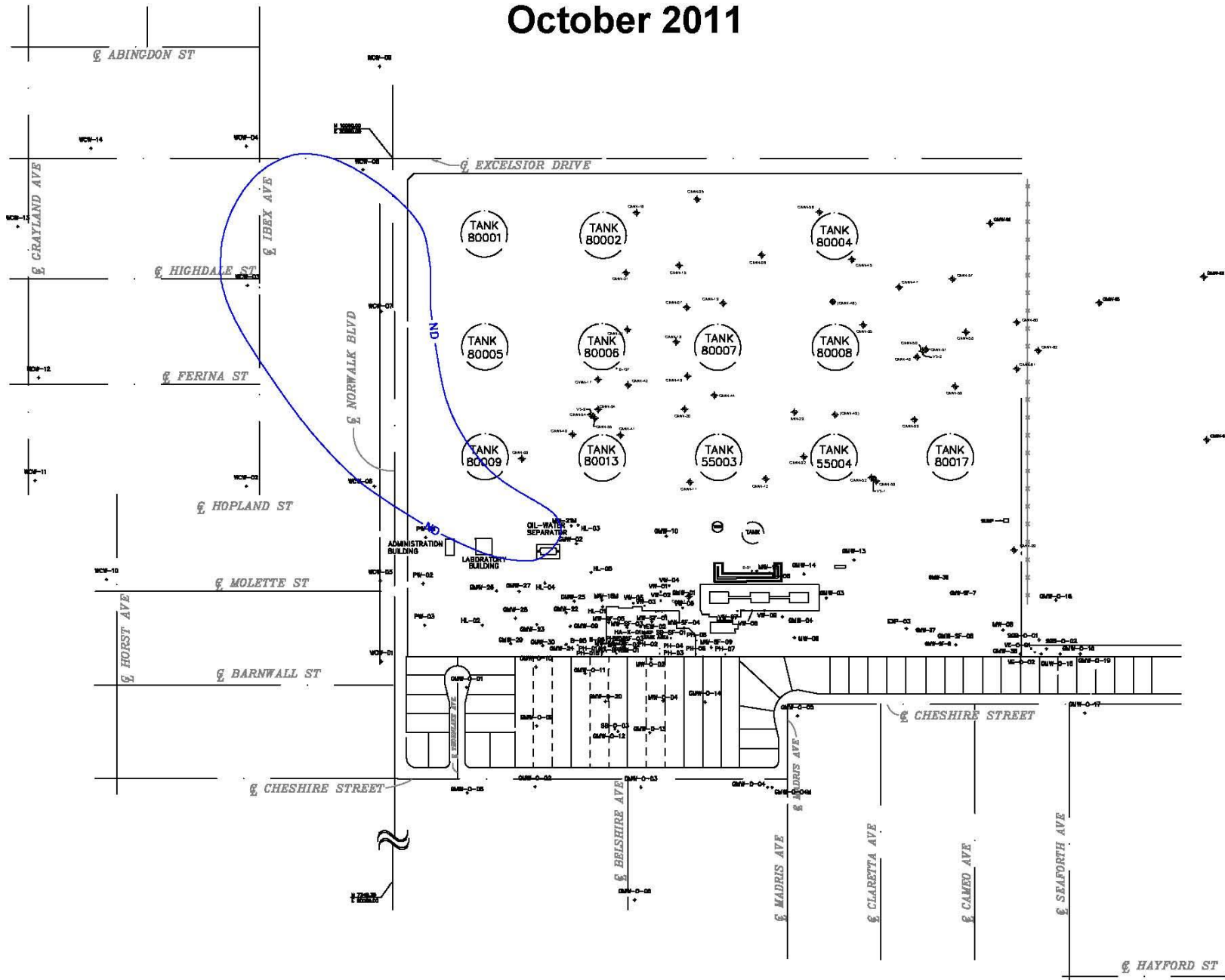
Benzene In Uppermost Groundwater Zone October 2011



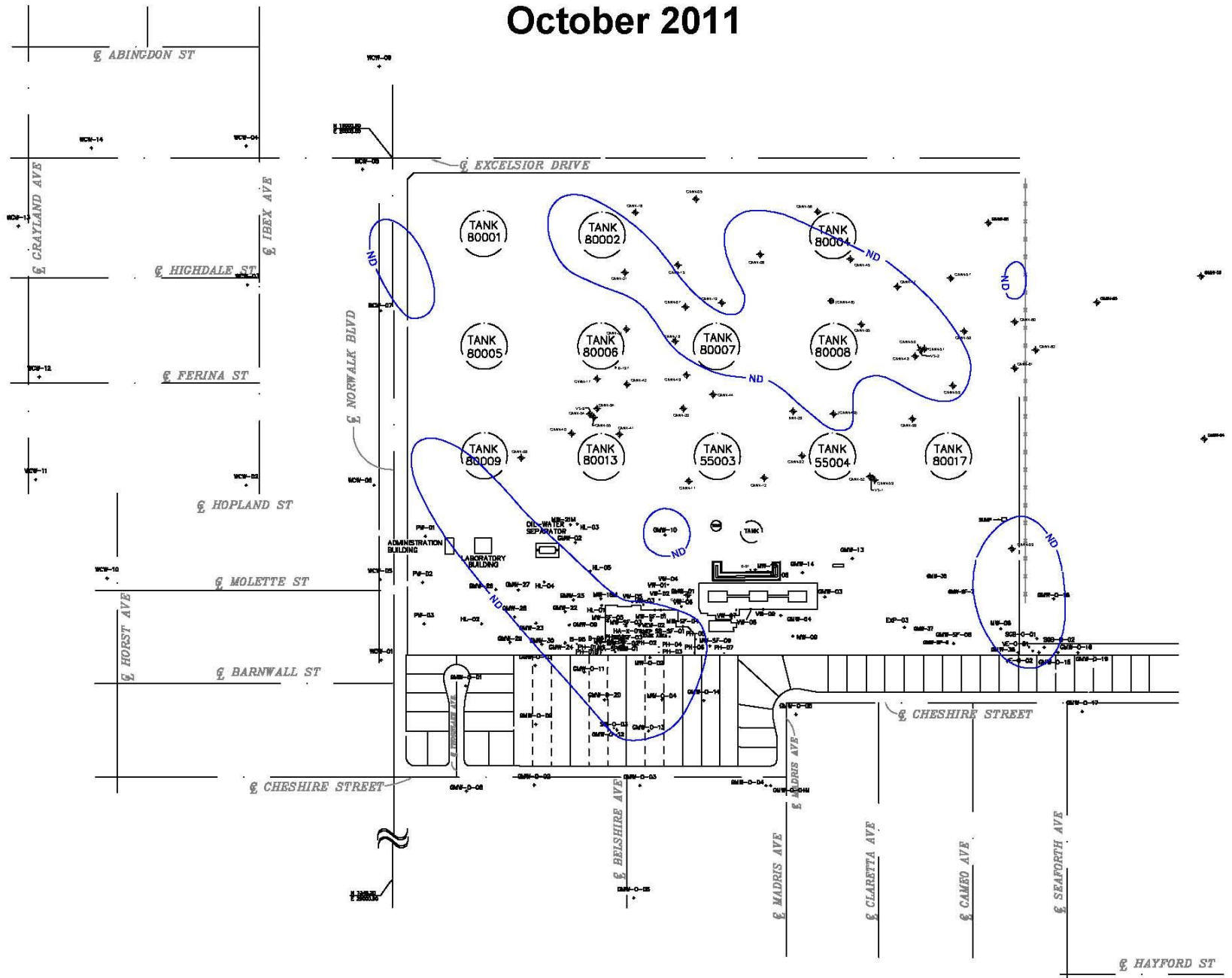
Methyl tert-butyl ether In Uppermost Groundwater Zone October 2011



1,2-Dichloroethane In Uppermost Groundwater Zone October 2011



Tert-Butyl Alcohol In Uppermost Groundwater Zone October 2011



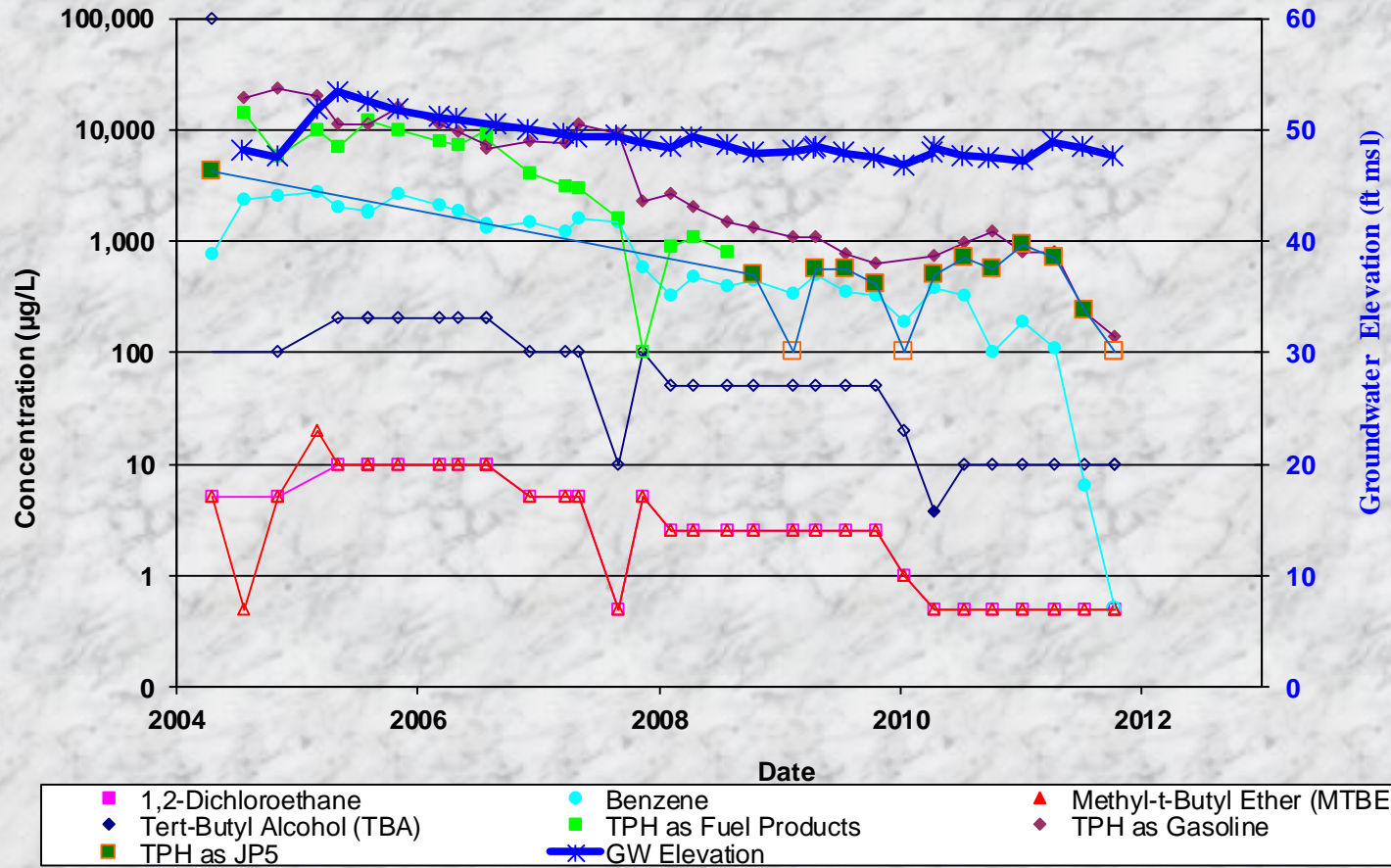
Groundwater Elevation and Concentration Time Series Charts

- Groundwater elevation and concentration time series charts have been graphed for 18 wells and included in the hard-copy packet
 - Former tank farm area:
 - GMW-6, GMW-45, GMW-47, MW-23 MID
 - Northeast onsite/Holifield Park area:
 - GMW-60, GMW-61, GMW-62
 - Former truck fueling area:
 - GMW-1, GMW-4, GMW-10, MW-15
 - South-central area:
 - GMW-O-10, GMW-O-14, GWR-1, MW-20 MID, MW-SF-1
 - Southeast 24-inch block valve area:
 - GMW-O-18, PZ-5

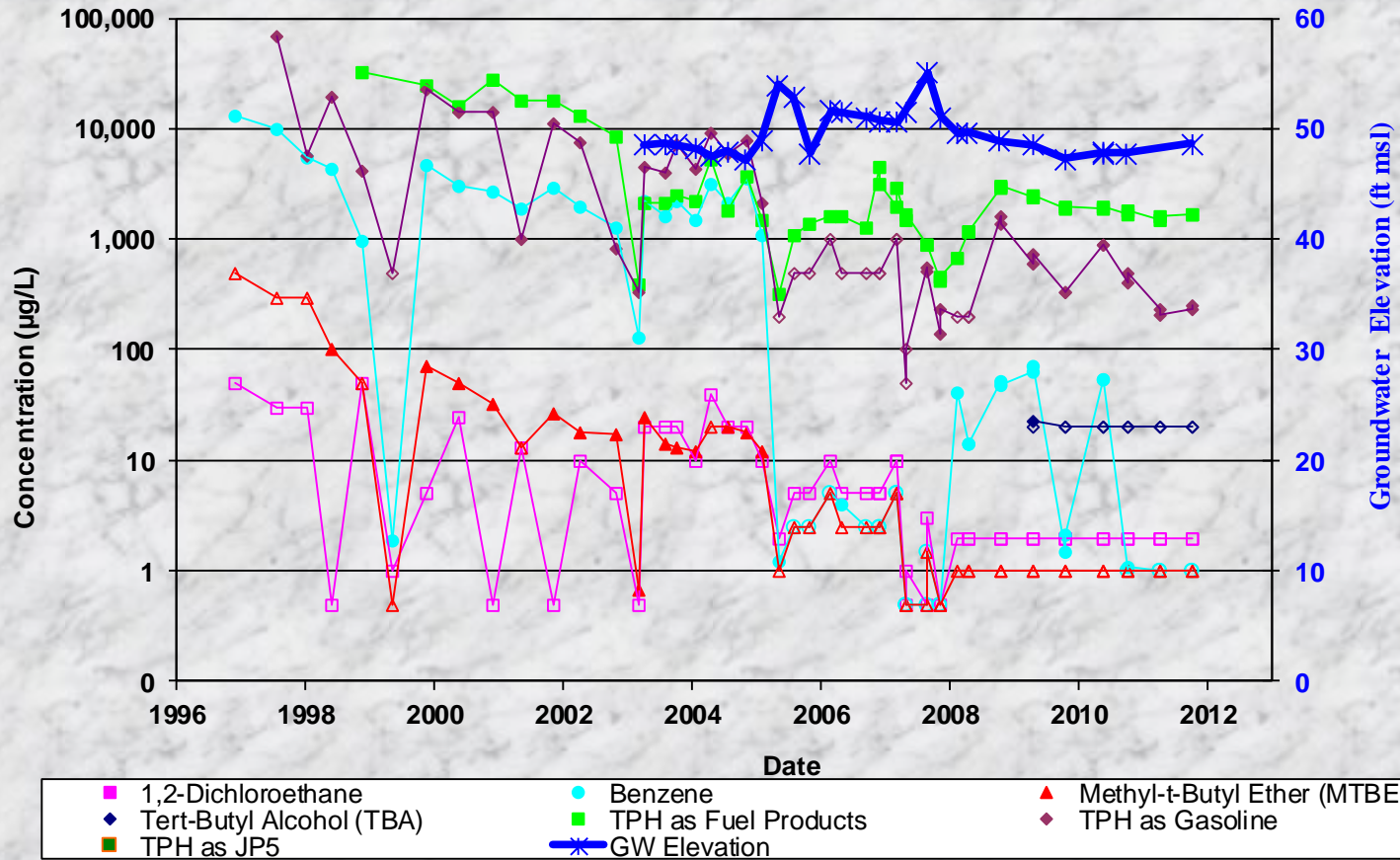
Groundwater Elevation and Concentration Time Series Charts

- These are plotted on logarithmic concentration scale which flattens out the trend
- The water table has gone through some cycles
 - Since May 2005, the water level was slowly lowering about 4 feet until March 2010 when it stabilized and began slowly rising for the last 1½ years
- Fluctuations in contaminant concentrations may be due to groundwater level fluctuations and pumping at nearby extraction wells

Time Series Chart at GMW-61



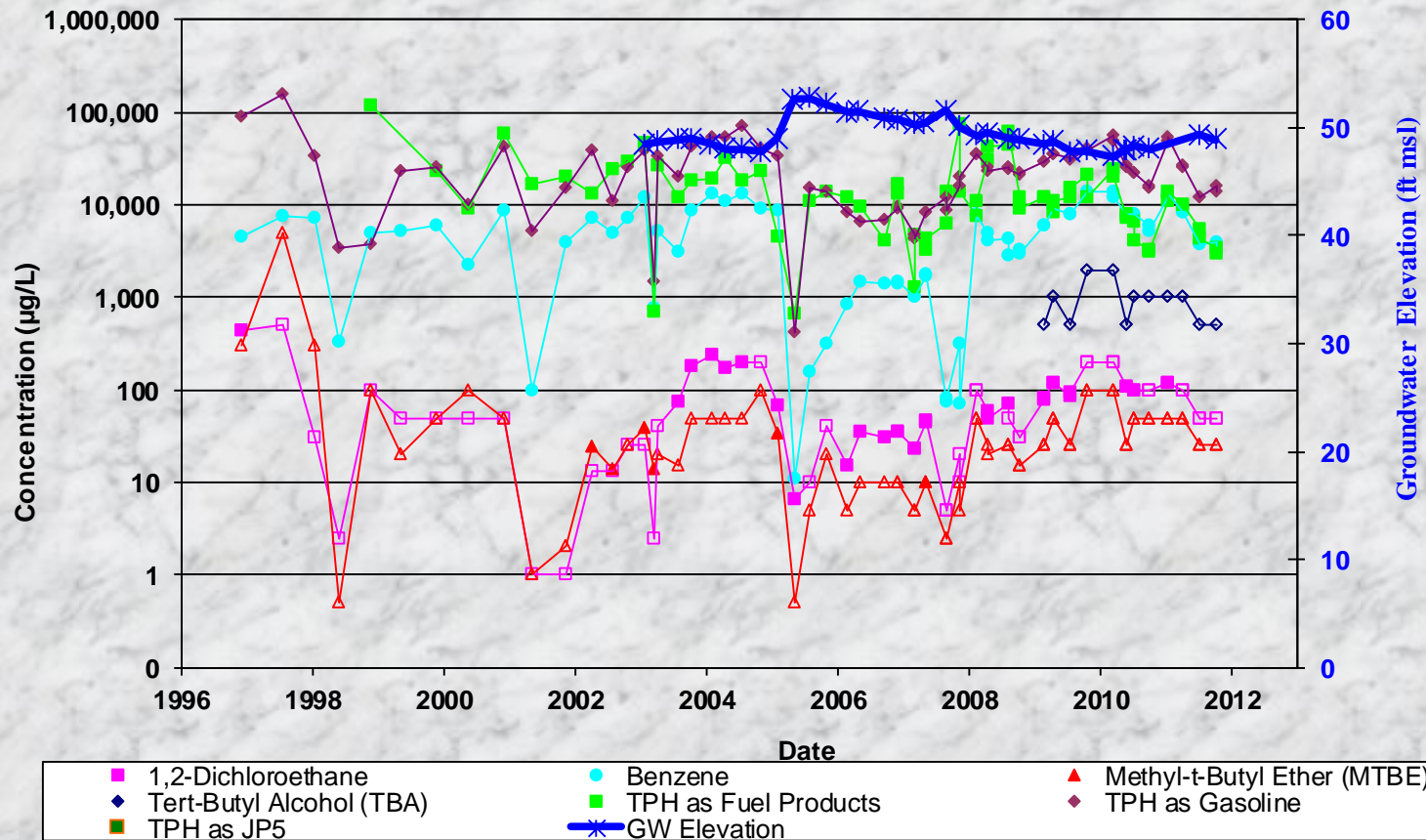
Time Series Chart at GMW-1



Non detect results (ND) are plotted with an open symbol using the laboratory reporting limit.

parsons

Time Series Chart at GMW-O-14



Non detect results (ND) are plotted with an open symbol using the laboratory reporting limit.

parsons

Questions?