

# ***Norwalk Tank Farm Update***

***Presented to the Norwalk Tank Farm  
Restoration Advisory Board***

***July 29, 2004***

# Presentation Overview

## Topics to be Covered

- HRA Update
- Remediation Operations Update
- Phytoremediation Update
- First Semi-Annual 2004 Groundwater Monitoring Event

# HRA Update

- In a letter dated October 31, 2003, the RWQCB requested that Kinder Morgan “conduct an additional human health risk assessment (HRA), including indoor air analysis, primarily for the southern portion of the facility.”
- As discussed by OCCS members in April 2004, a HRA was conducted by the DESC for the DTSC in 1993. The HHRA evaluated:
  - Potential risk to residents in the southern off-site area assuming exposure via inhalation of indoor air
  - Potential risk to on-site workers assuming exposure via inhalation of ambient and indoor air, dermal contact with soil, and soil ingestion.
  - Potential risk to off-site residents assuming exposure via ingestion of drinking water from off-site wells

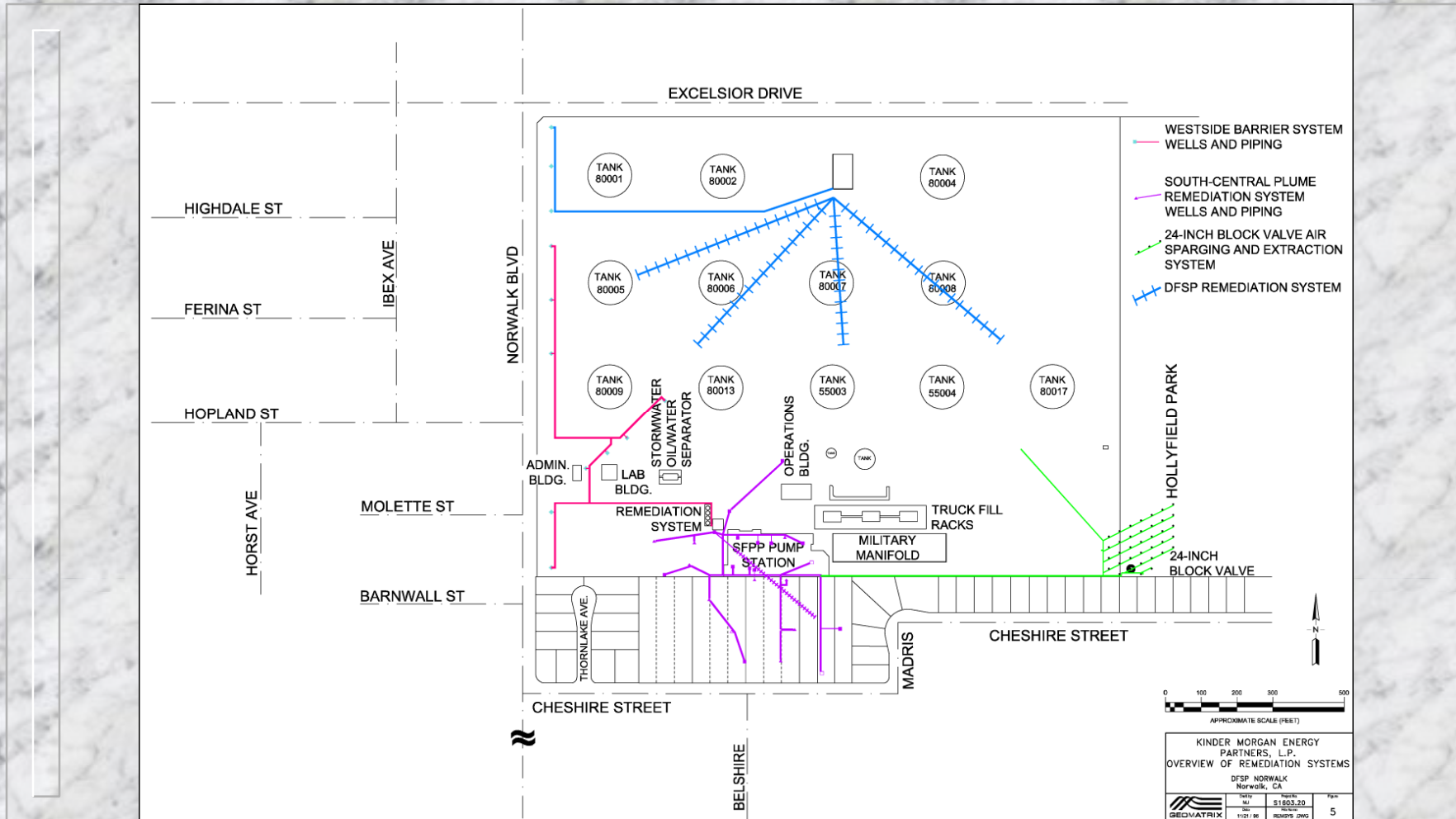
## HRA Update (cont.)

- Pursuant to the RWQCB's request following the April 2004 OCCS meeting, KMEP reviewed the 1993 HRA and evaluated it based on current site conditions.
- Significant differences between the RBCA and GTI methods included:
  - Exposure point concentration
  - Model predicting indoor air concentrations
  - Significantly higher predicted risk using the RBCA method

## **HRA Update (cont.)**

- When elevated risk is predicted using soil or groundwater data, current environmental practice is to collect soil vapor data to better predict potential risks.
- KMEP proposes to collect soil gas data in the south-central plume area.
- KMEP will prepare and submit a draft work plan to RWQCB.

# Map of Current Remediation Systems



# Soil Vapor Extraction System

- 17 onsite and 6 off-site vapor extraction wells in the South-Central Plume area.
- 2 vapor extraction wells in the Southeastern 24-Inch Block Valve area.

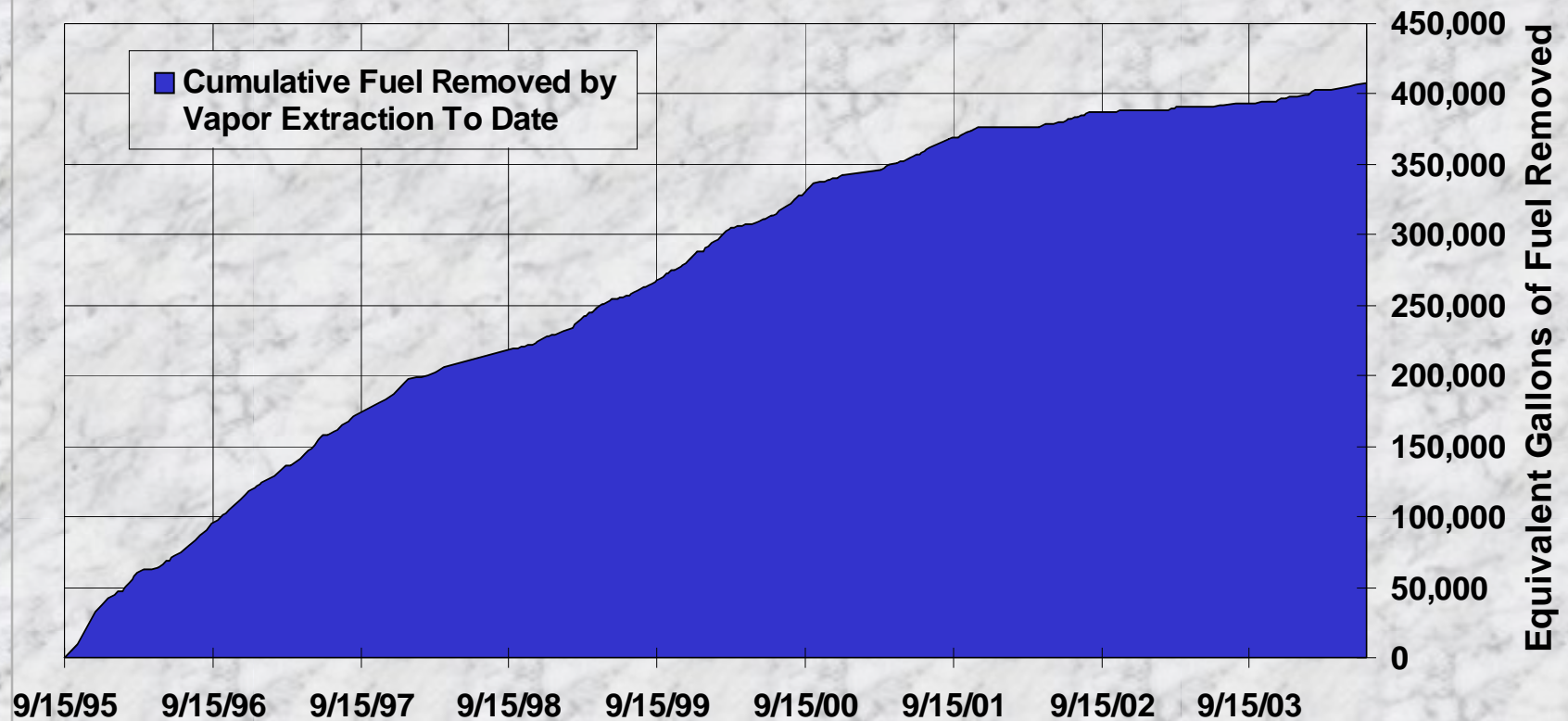
# Soil Vapor Extraction System Operations Summary

- Approximately 4,520 gallons equivalent of fuel removed from soil and destroyed by thermal oxidation since the April 2004 RAB meeting.
- Approximately 407,980 gallons equivalent of fuel removed from soil and destroyed by thermal oxidation since September 1995.



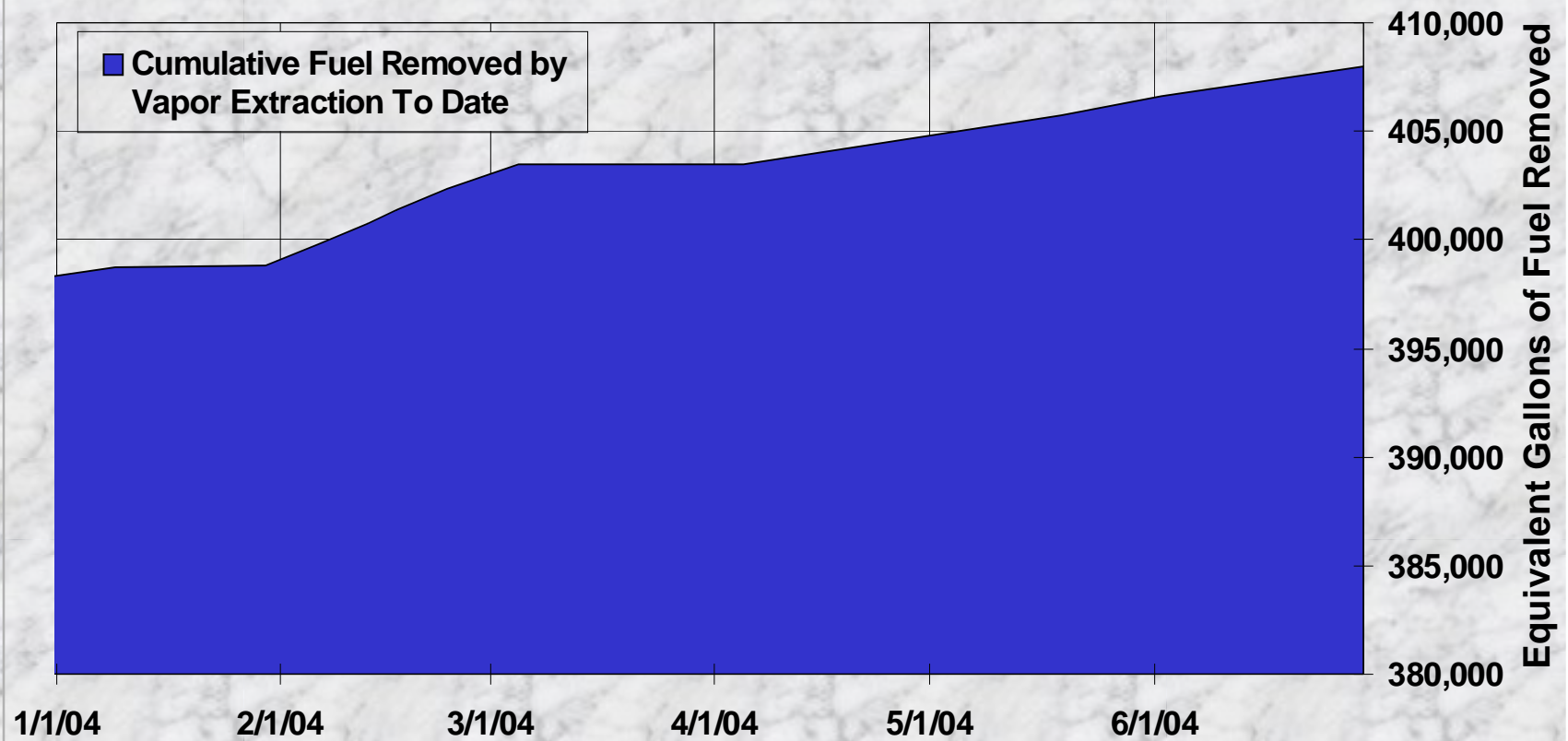
# Soil Vapor Extraction System Operations Summary

Cumulative Fuel Removed by Vapor Extraction To Date



# Soil Vapor Extraction System Operations Summary

Cumulative Fuel Removed by Vapor Extraction - Past Six Months



# Groundwater/Product Extraction System

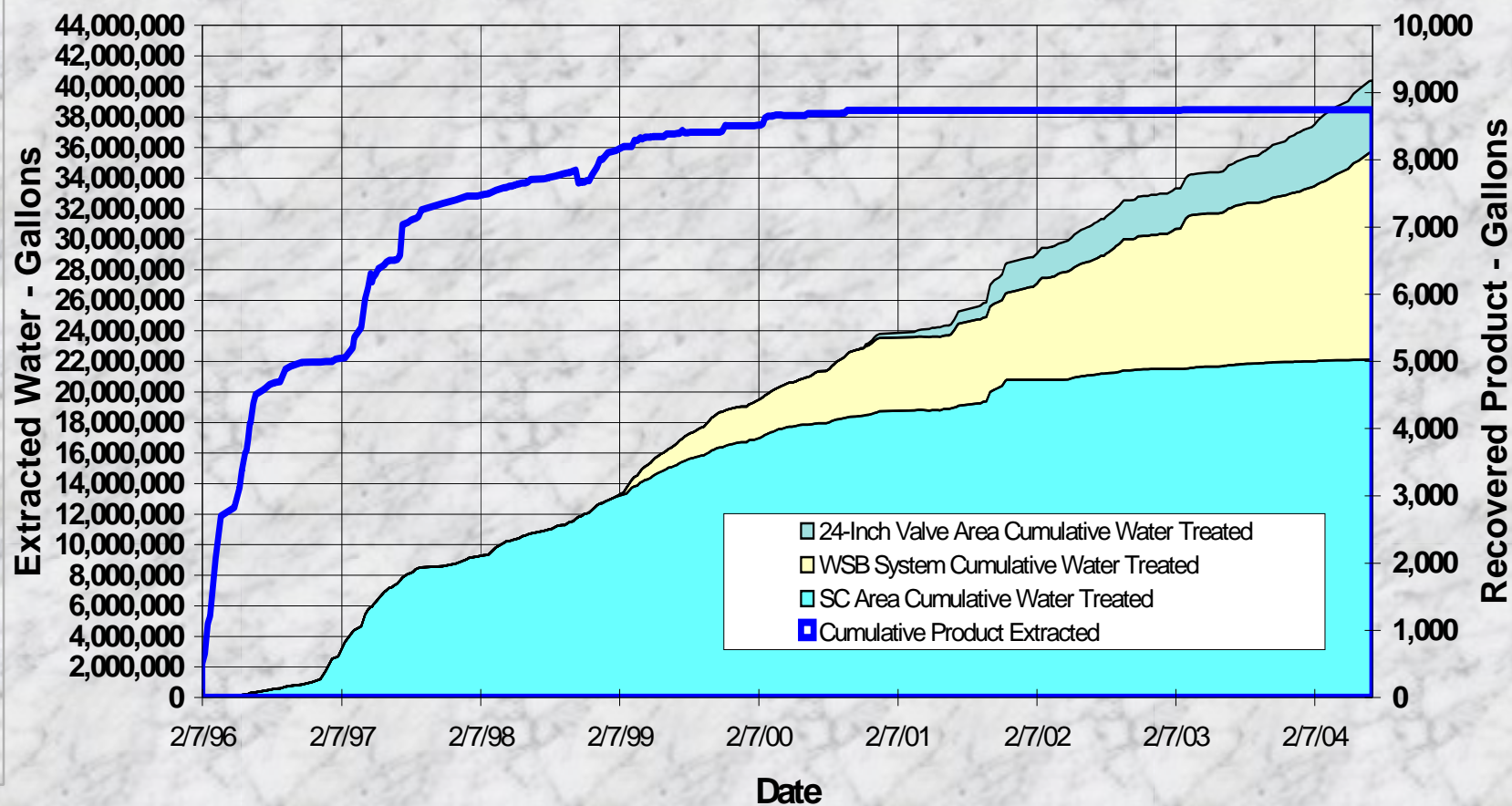
- 8 groundwater extraction wells in the West Side Barrier area
- 8 groundwater/product extraction wells in the South-Central Plume area
- 3 groundwater/product extraction wells and 2 groundwater extraction wells in the Southeastern 24-Inch Block Valve area

# Groundwater/Product Extraction System Operations Summary

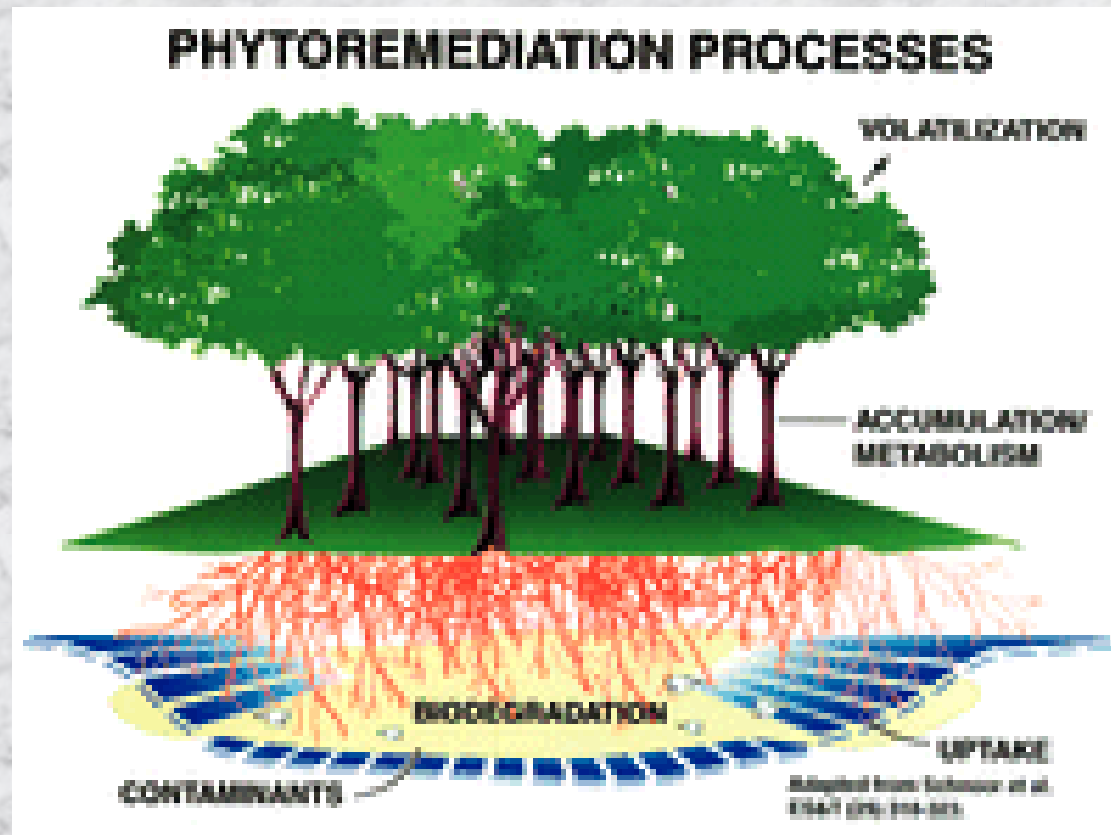
- Total groundwater extracted since April 2004 RAB meeting:
  - South-Central Plume area, 45,100 gallons
  - Southeastern 24-Inch Valve area, 282,800 gallons
  - West Side Barrier area, 1,383,300 gallons
  - No free product was recovered
- Total groundwater extracted since September 1995:
  - South-Central Plume area, 22.1 million gallons
  - Southeastern 24-Inch Valve area, 4.7 million gallons
  - West Side Barrier area, 13.6 million gallons
  - Total groundwater extracted, 40.4 million gallons
  - 8,745 gallons free product removed

# Groundwater/Product Extraction System Operations Summary

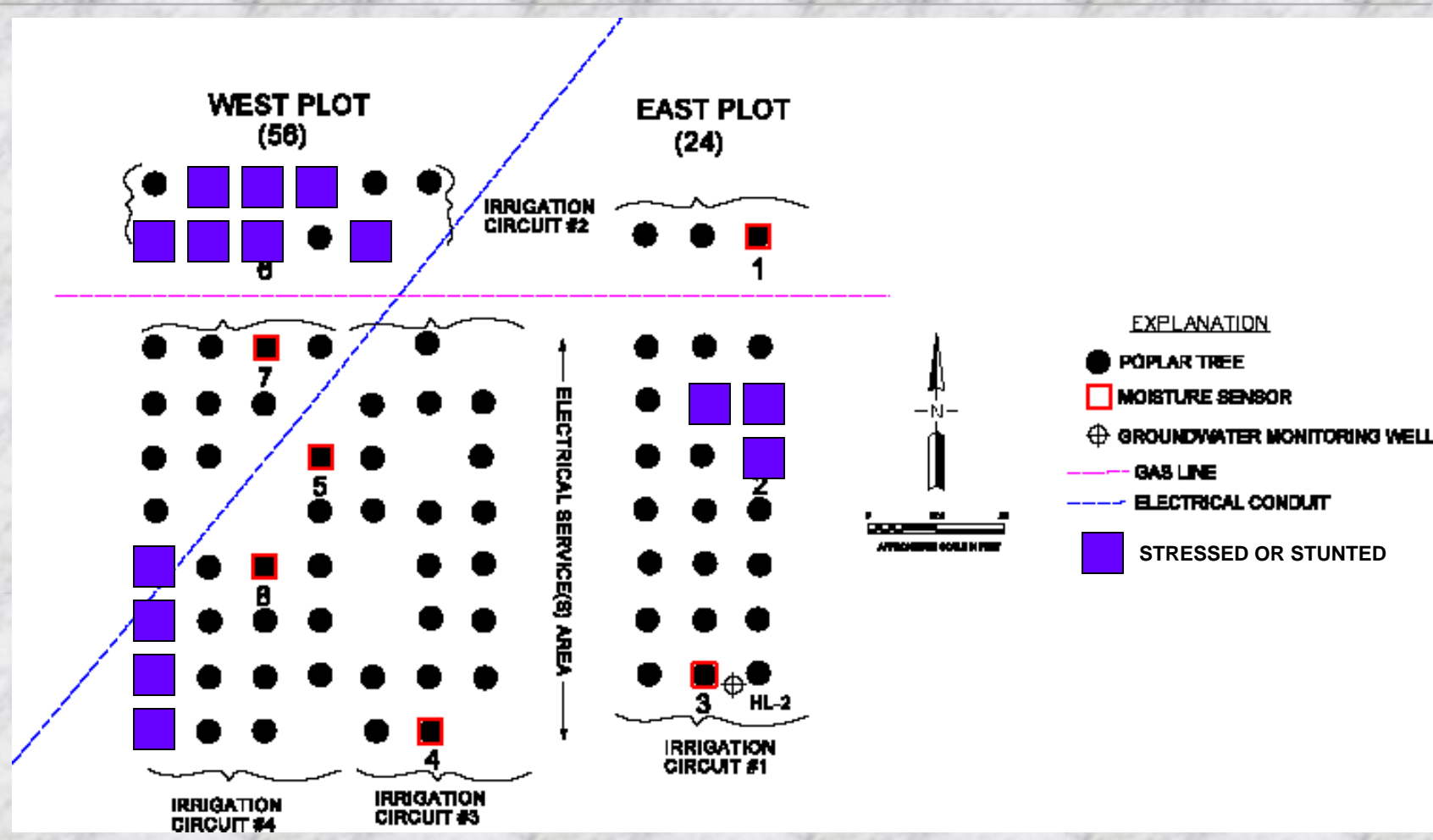
## Producted Extracted and Water Treated Summary



# The Phytoremediation Process



# Phytoremediation Areas



## **Phytoremediation cont.**

- Replaced over-stressed trees with new trees during July 2004.
- Performed groundwater monitoring activities in April and July 2004.
- Installed transducers in wells in phytoremediation area to gauge diurnal effects of poplars during July 2004.
- Will evaluate data collected to date and present summary of results during next RAB meeting.



# Phytoremediation cont.



# Phytoremediation cont.



2004 7 8

# Phytoremediation cont.

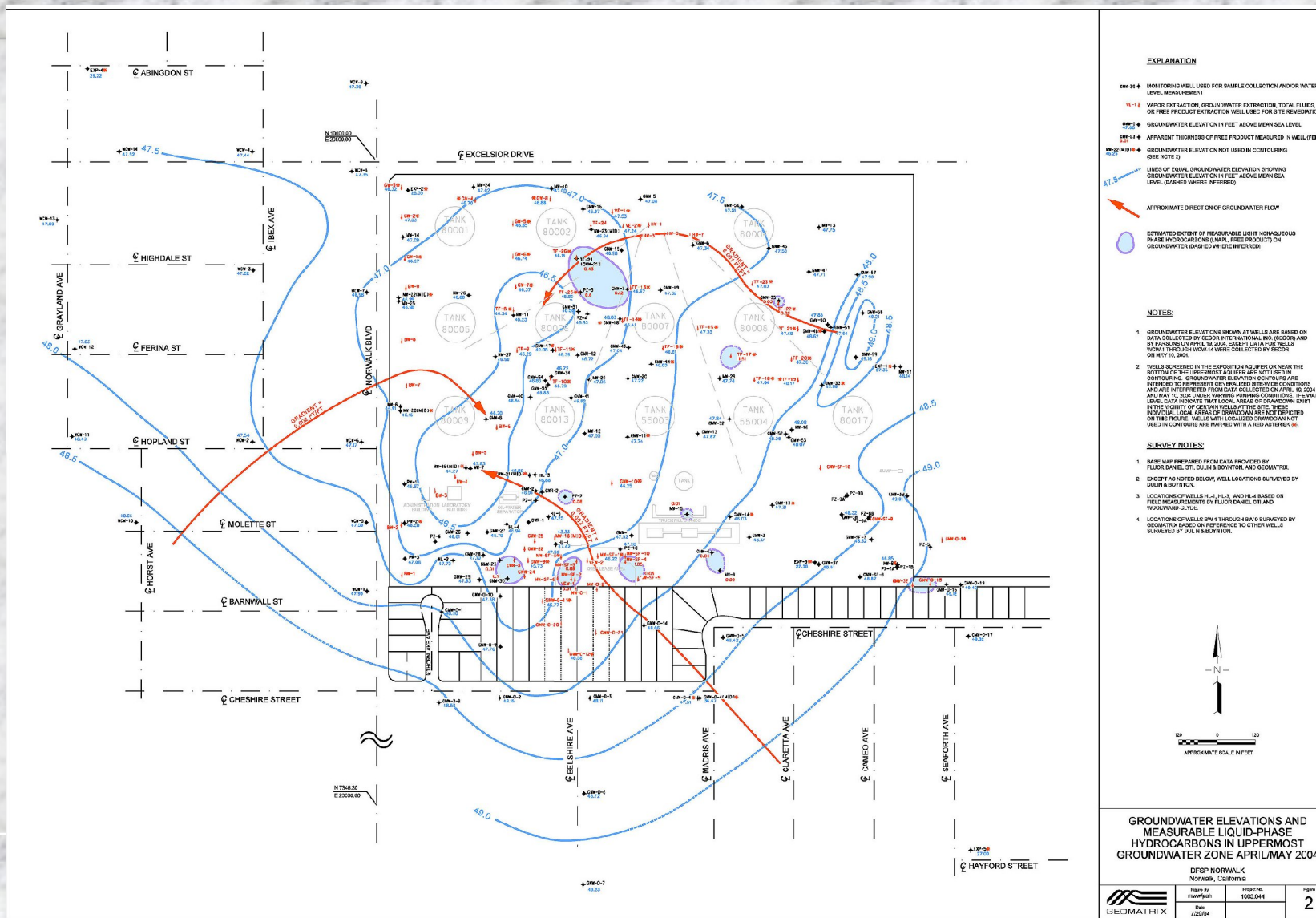


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# First Semi-Annual 2004 Groundwater Monitoring Event

- 85 wells sampled, including 4 Exposition wells.
- No VOCs detected in Exposition wells. TPHfp was detected in EXP-5. This well was re-sampled during the July 2004 Sentry Event.
- Free product observed in 16 of 163 wells gauged.
- North-Central free-product plume remains as smaller separated plumes in same general areas as noted during previous monitoring events.
- South-Central free-product plume remains in the same general areas as noted during previous monitoring events but appears as two smaller separated plumes.
- Free product also observed in truck rack area, intermediate block valve area, PZ-2, and may be present in southeastern 24-inch valve area.

# Groundwater Elevations and Measureable Liquid-Phase Hydrocarbons April/May 2004

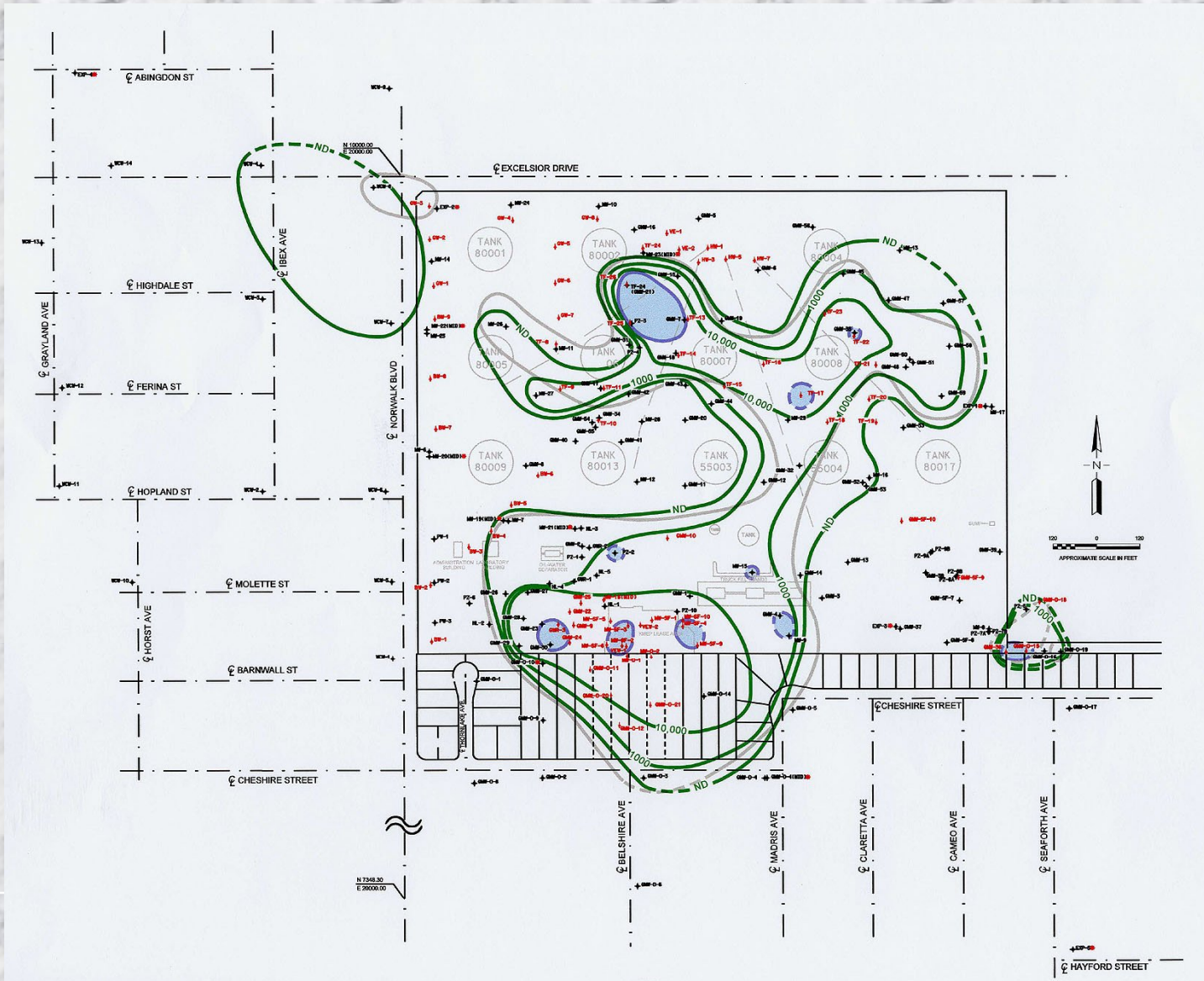




## **First Semi-Annual 2004 Groundwater Monitoring Event cont.**

- Lateral extent and concentrations of TPHfp decreased in the northern area and the area between the North-Central and South-Central free-product plumes since October 2003. Lateral extent of TPH resembles that of April 2003.
- TPH concentrations increased in wells located near the South-Central free-product plume but decreased near the southern extent of the TPH plume and remained non-detected in several southern off-site wells.
- TPHfp was detected in GWM-O-16 and GMW-O-19 near the southeastern 24-inch block valve and in EXP-5. These wells were re-sampled during the July 2004 Sentry event.

# Total Petroleum Hydrocarbons April/May 2004



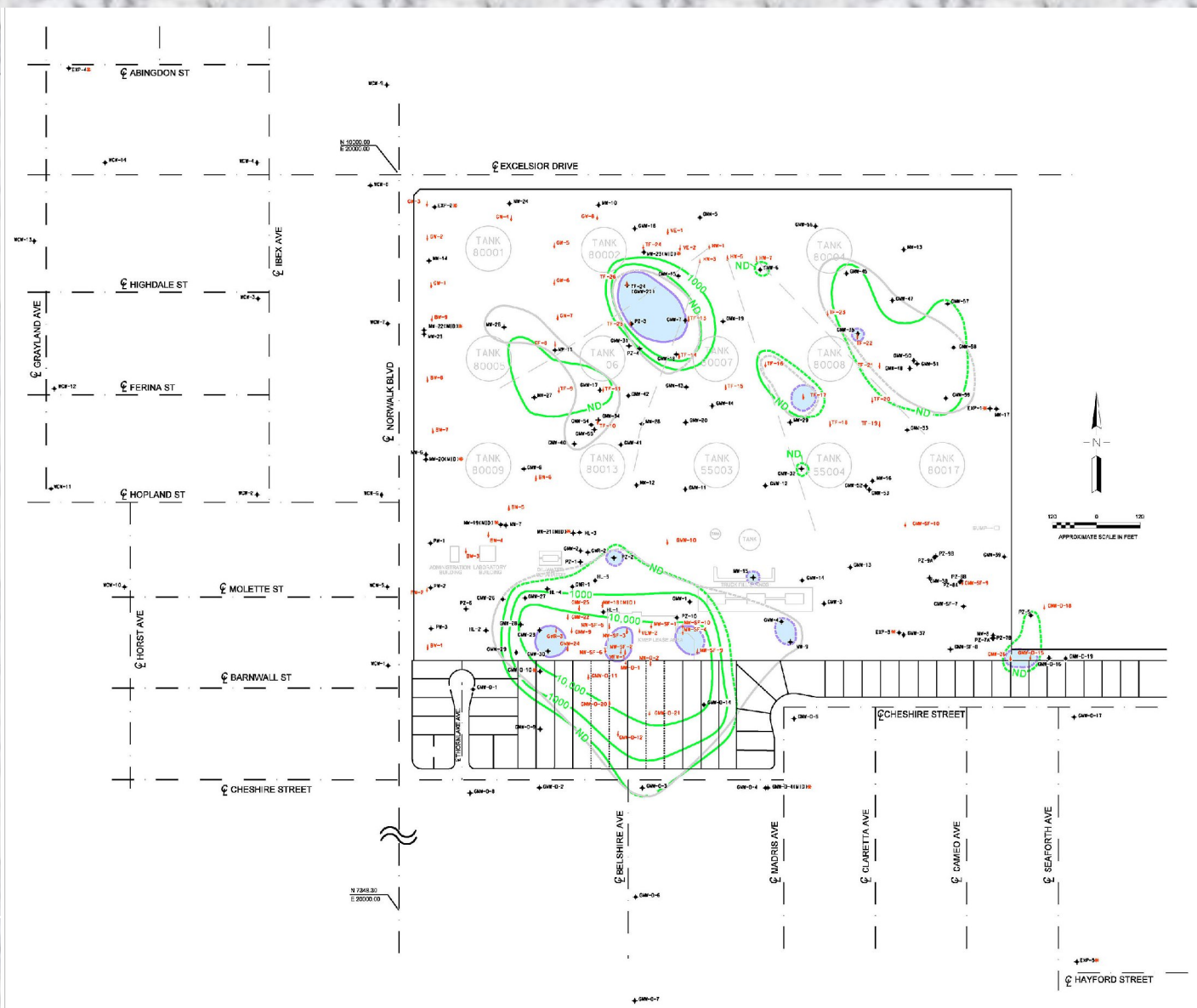


# First Semi-Annual 2004 Groundwater Monitoring Event cont.

- Benzene concentrations decreased in wells GMW-45, GMW- 57, and GMW-59 in the northeast field area.
- Benzene concentrations increased in four wells surrounding the South-Central free-product plume but decreased in southern off-site well GMW-O-3 and remained non-detected in several southern off-site wells.
- Benzene was not detected in the southeastern 24-inch valve area during the April 2004 monitoring event.

# Benzene

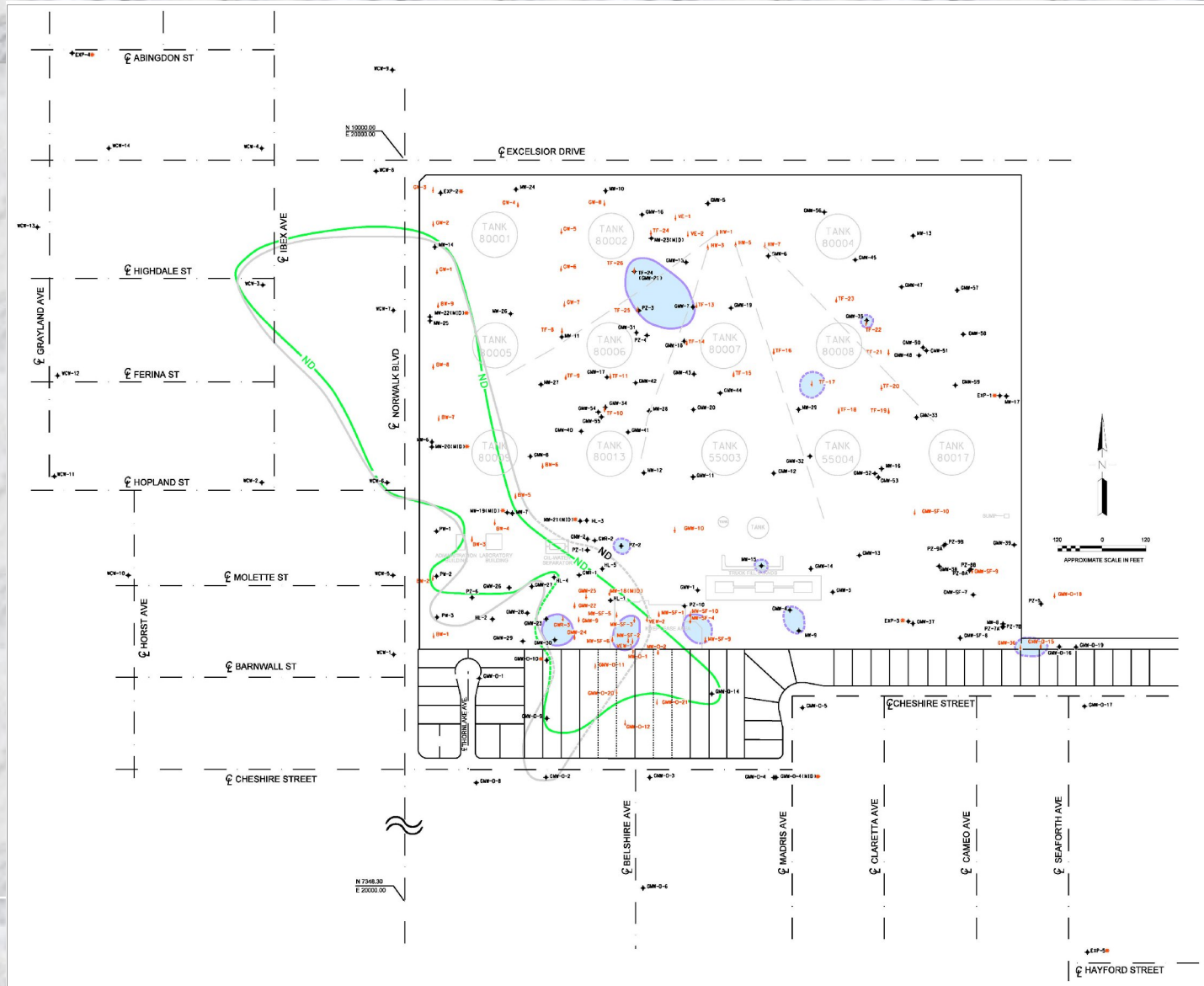
## April/May 2004



# First Semi-Annual 2004 Groundwater Monitoring Event cont.

- Concentrations of 1,2-DCA in off-site wells west of the site remained non-detected or similar to those detected during previous monitoring events.
- 1,2-DCA decreased in wells WCW-3, WCW-6, and WCW-7 west of the site and in wells GWM-O-9 and GMW-O-14 south of the site.

# 1,2-Dichloroethane April/May 2004



# First Semi-Annual 2004 Groundwater Monitoring Event cont.

- Two smaller MTBE plumes detected in north-central and northeastern area.
- The MTBE concentration in well MW-19 (MID) has consistently decreased and was not detected during April 2004.
- MTBE remained non-detected in off-site monitoring wells west of the site, except at WCW-7 where the concentration remained low.
- The lateral extent of MTBE in the southeastern portion of the site has decreased since one year ago. Groundwater extraction in that area is effective in stabilizing the plume.

# Methyl tert-butyl ether

## April/May 2004

