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Navy Optimization Meeting

February 8, 2011

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Optimization Study Purpose and Scope

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Purpose: Determine if current OU2 remedy is protective.

Scope:

- ONCT performance
- GM-38 performance
- Outpost wells as early warning of supply well impacts
- Wellhead treatment at supply wells
- Eastern plume, to the extent it affects the OU2 remedy

Questions (Data Gap Analysis)

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1. Is downgradient edge of plume defined?
2. Do we understand how the plume is migrating (is the plume sufficiently characterized to predict future impacts to water supplies)?
3. Does the ONCT prevent off-site migration of contaminated groundwater?
4. Are additional wells (recovery, monitor, outpost) needed?
5. *Are potential sources of groundwater contamination other than Navy, NG, and Oxy identified?*

Topics

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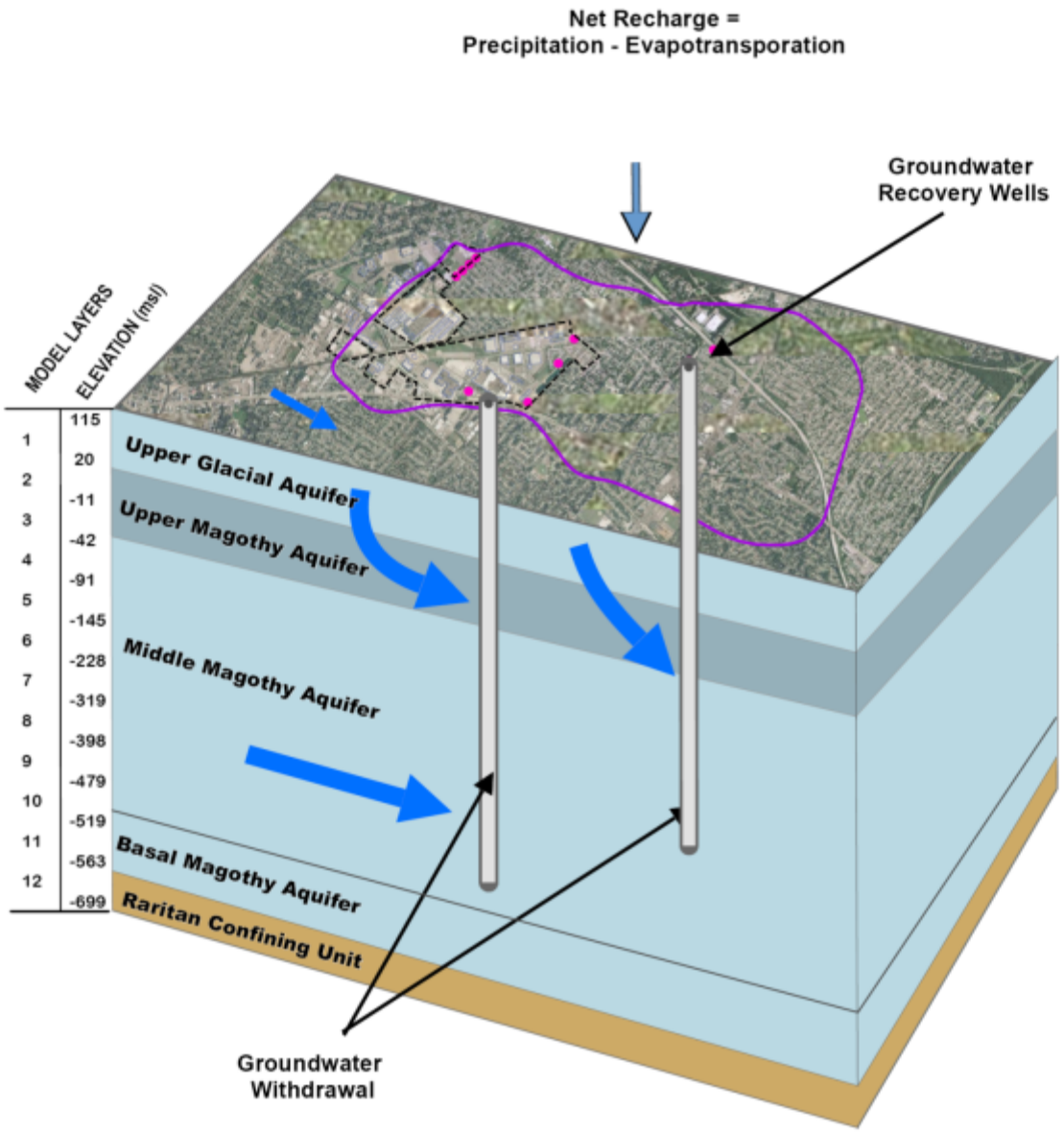
- Conceptual Site Model
- OU2 ONCT
- Park Groundwater IRM
- Park Off-site Recommended Remedy
- Long-term Monitoring / Outpost Well Monitoring
- Wellhead Treatment
- Questions (Data Gap Analysis)
- Path Forward

Conceptual Site Model



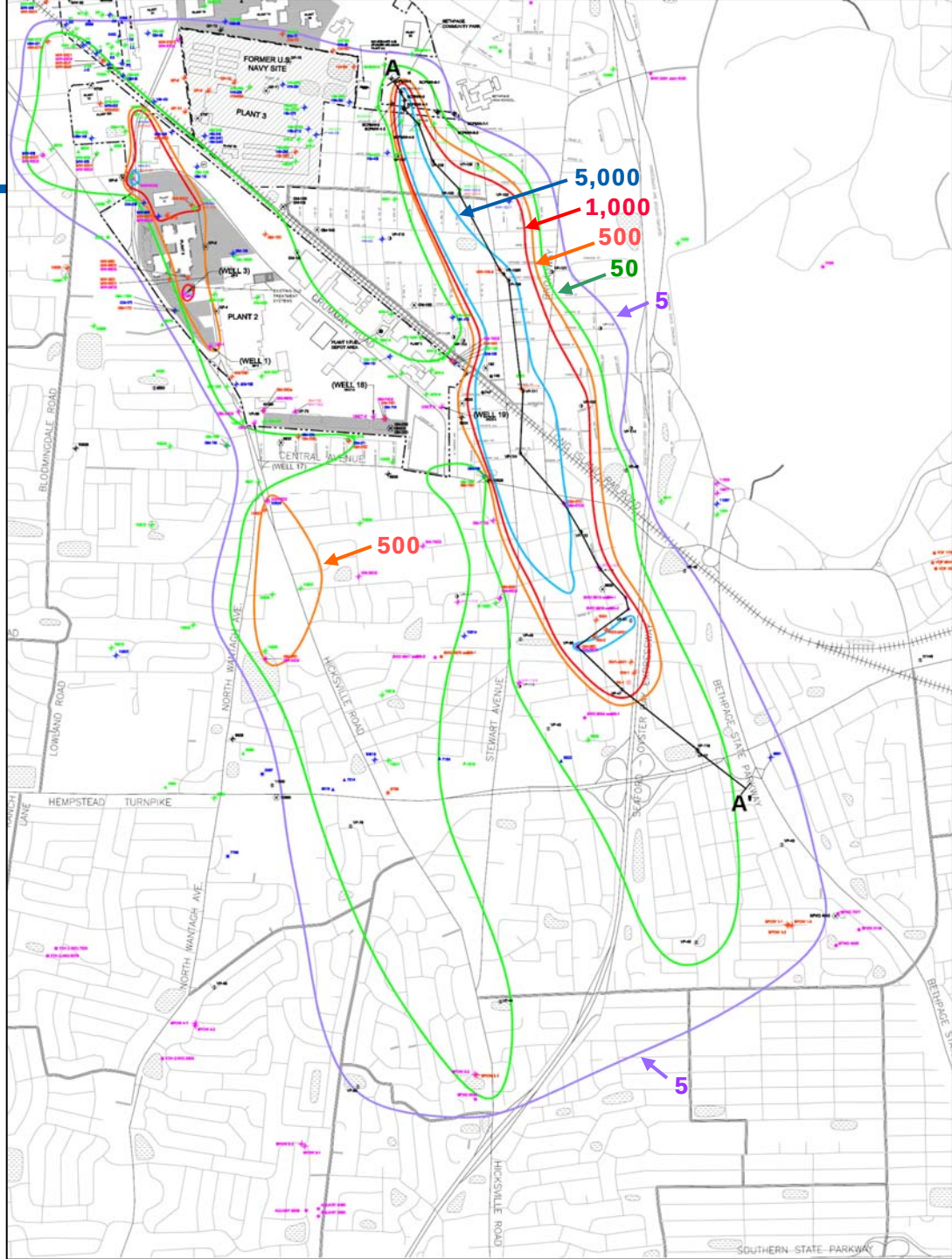
Basis for:

- Defining remedial action objectives
- Determining restoration potential of the site
- Evaluating the effectiveness of the existing remediation system

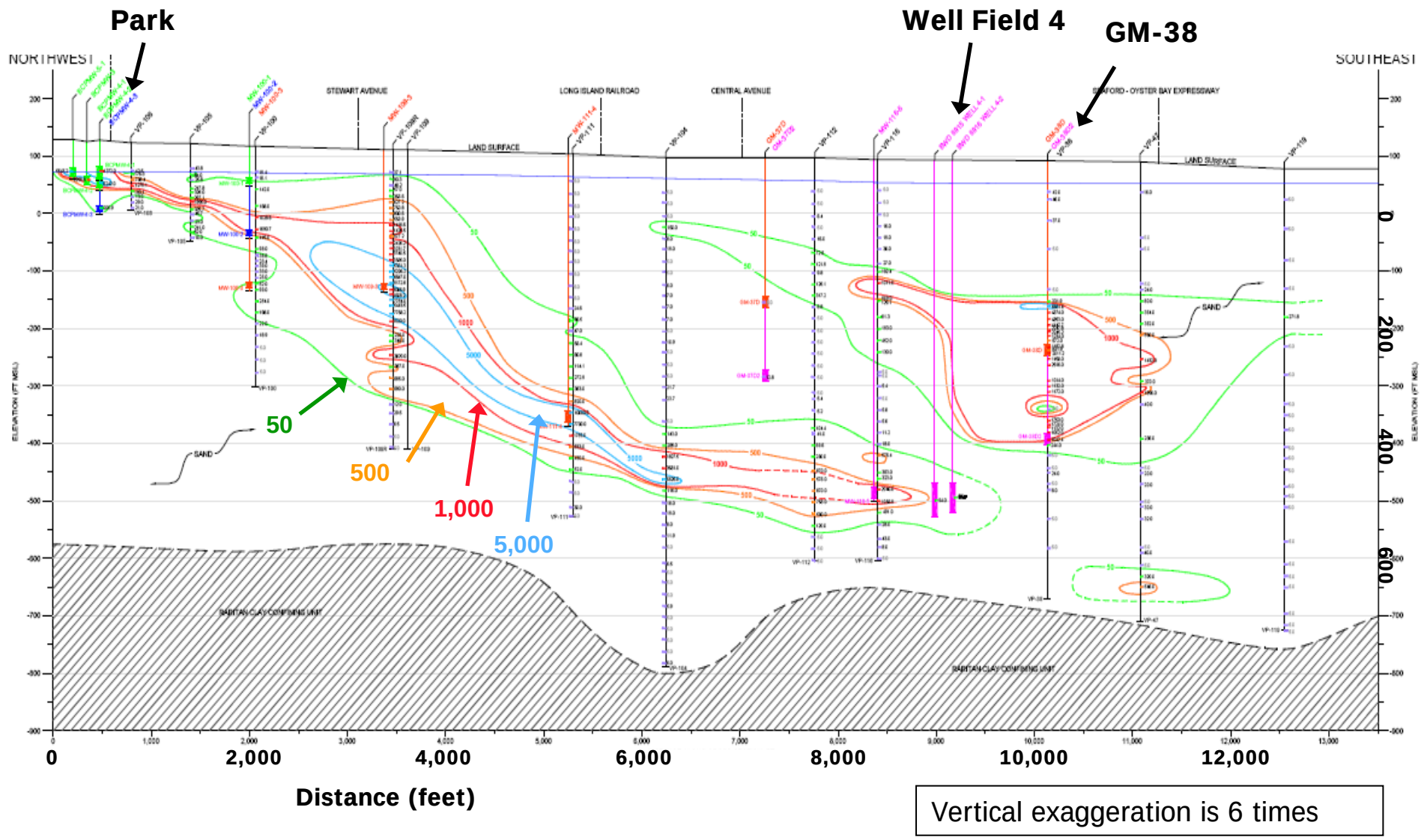
NAVFAC, April 2001

Highest Concentrations in Groundwater

- TVOCs (µg/L)
- Highest concentration encountered at any depth
- Projected to surface and contoured
- Not equivalent to a groundwater plume map



TVOCs at and Downgradient of the Park



Vertical exaggeration is 6 times

Target Treatment Zones and Treatment Trains

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OU2

- On-site groundwater: pump and treat, followed by monitored natural attenuation (MNA)
- Off-site groundwater: pump and treat, followed by MNA; public supply wellhead treatment

OU3

- On-site groundwater: pump and treat, followed by MNA
- Off-site groundwater: pump and treat, followed by MNA
- Source area: in-situ thermal desorption

Shutdown criteria have not been definitively established

ONCT System Design

- 2 Treatment systems (Towers 96 & 102)
  - Recovery wells
  - Air strippers with emission controls
  - Treated effluent discharge to recharge basins
- Tower 96 – On-line 1989; Wells 1 and 3 (1,500 gpm)
- Tower 102 – On-line 1998; Wells 17, 18, 19 (2,300 gpm)
- Systems operated, maintained & monitored per OM&M plan

ONCT Performance Objectives / Metrics

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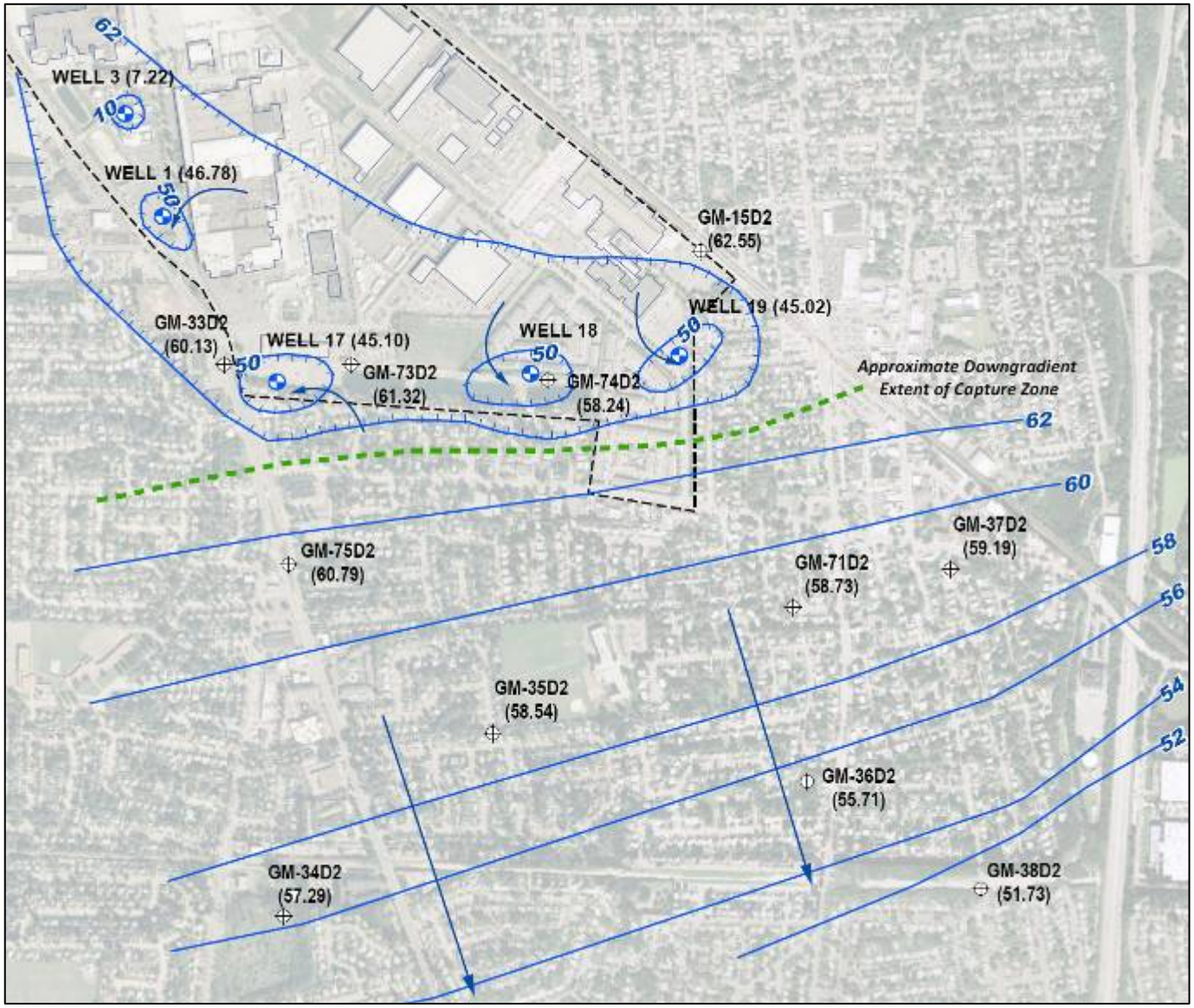
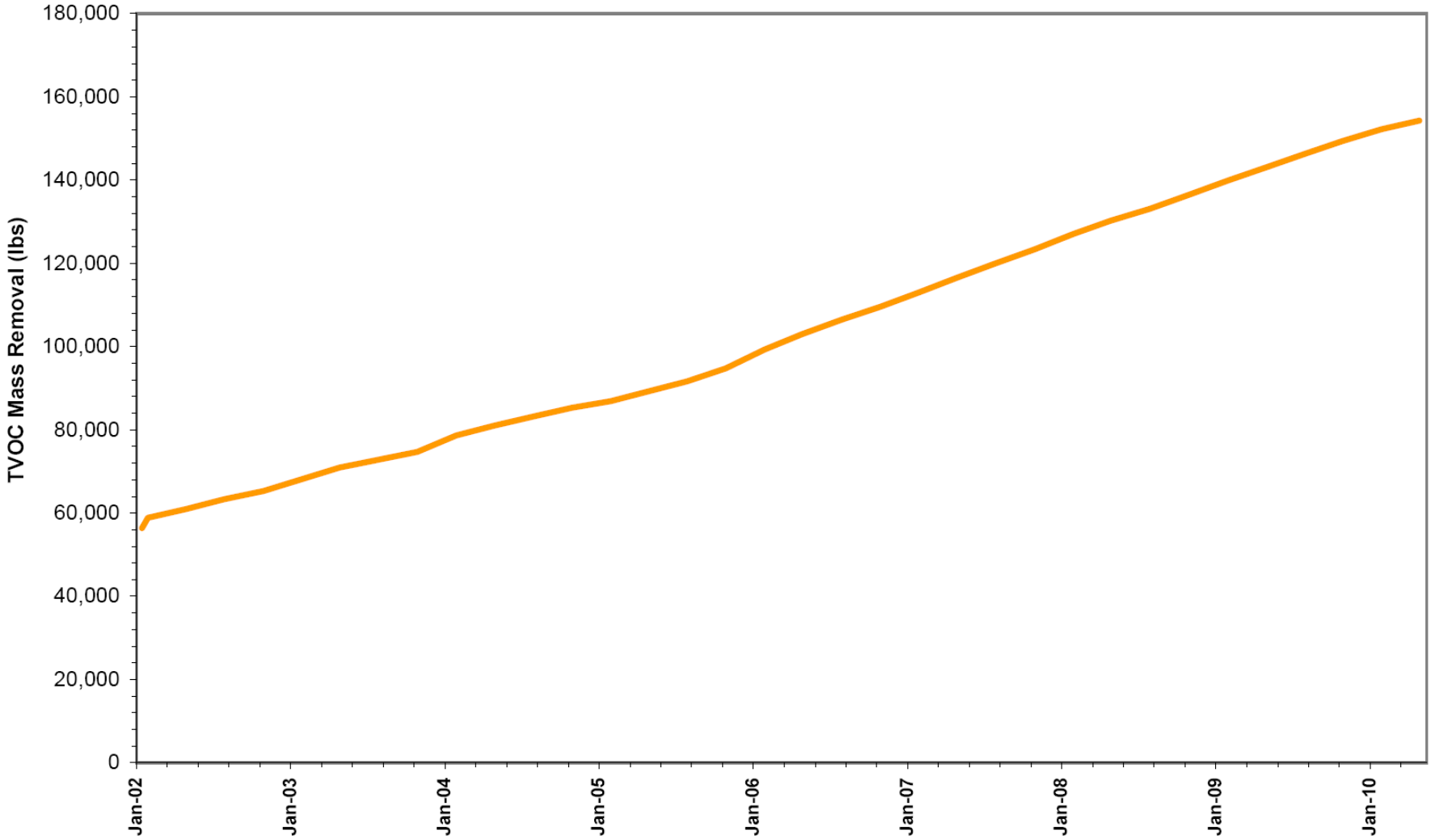
- Hydraulic containment > 5 µg/L TVOCs
  - Inward hydraulic gradient
  - Concentrations / trends in monitoring wells
- Remove mass from plume
  - TVOC mass removed over time vs design
  - Treatment system influent concentration / trends
  - Concentrations / trends in recovery wells
- Meet operational metrics
  - Air emissions and water quality effluent requirements
  - Shutdown criteria (final metric)

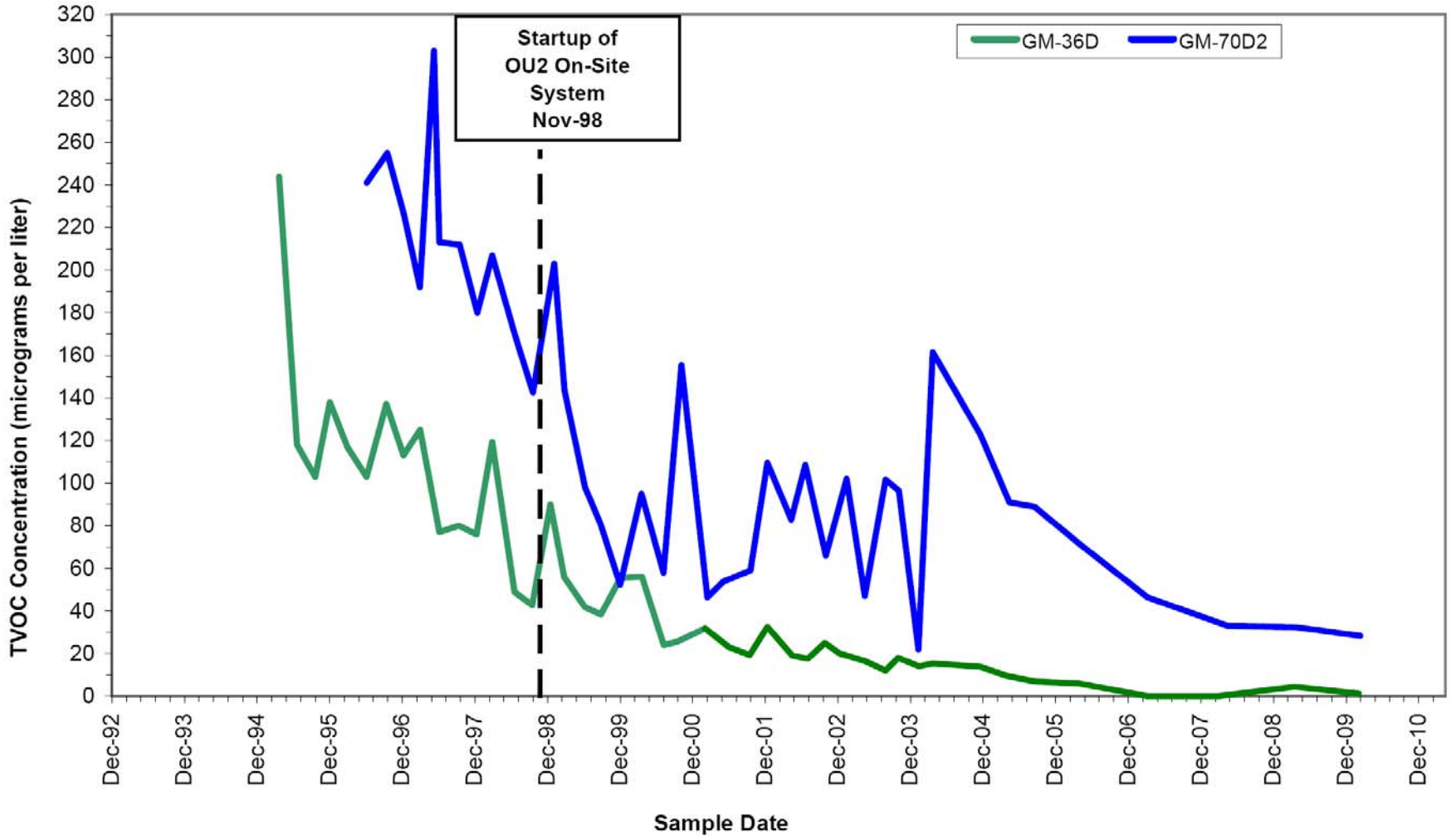
ONCT Hydraulic Containment - August 2009



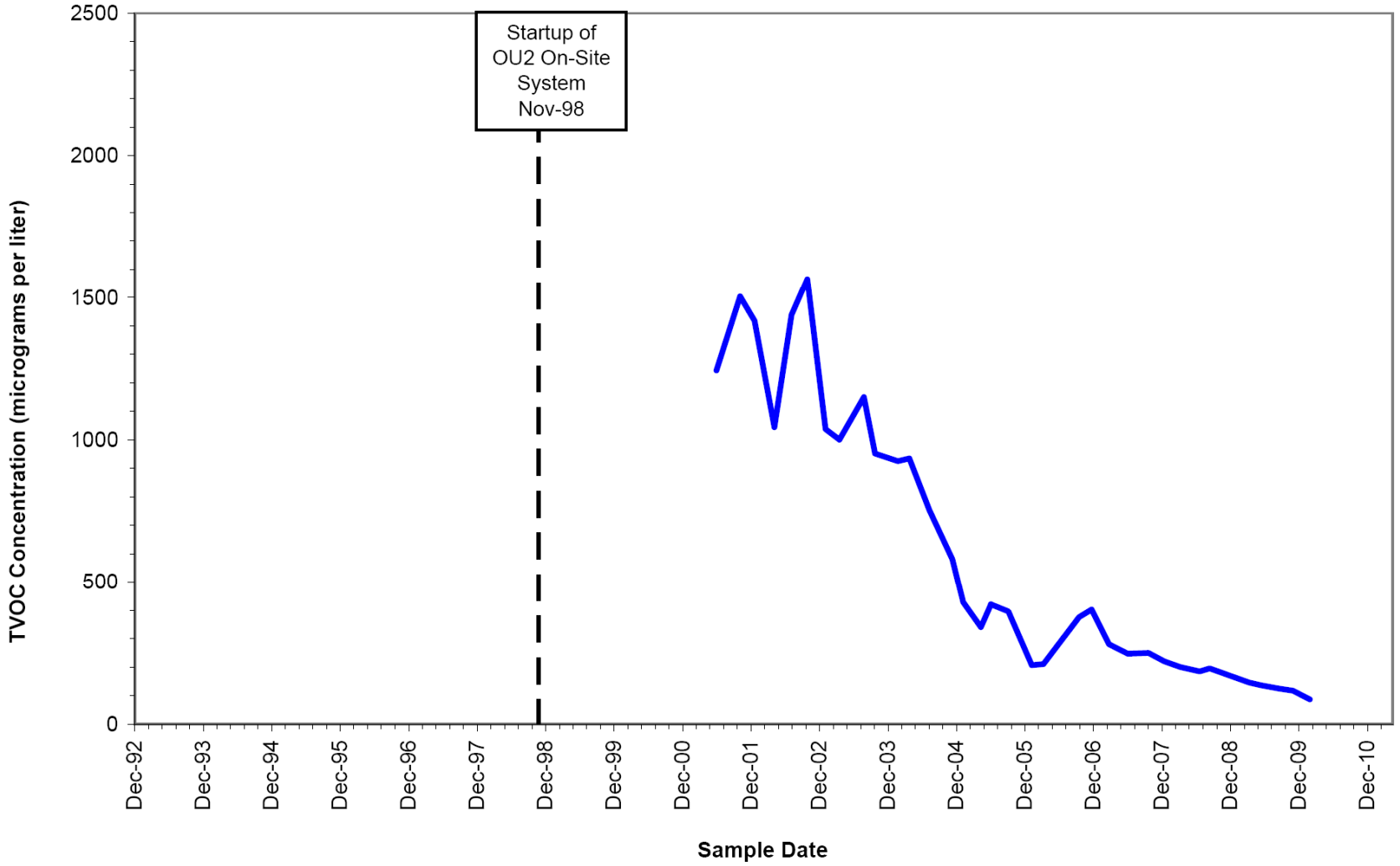
ONCT Mass Removal



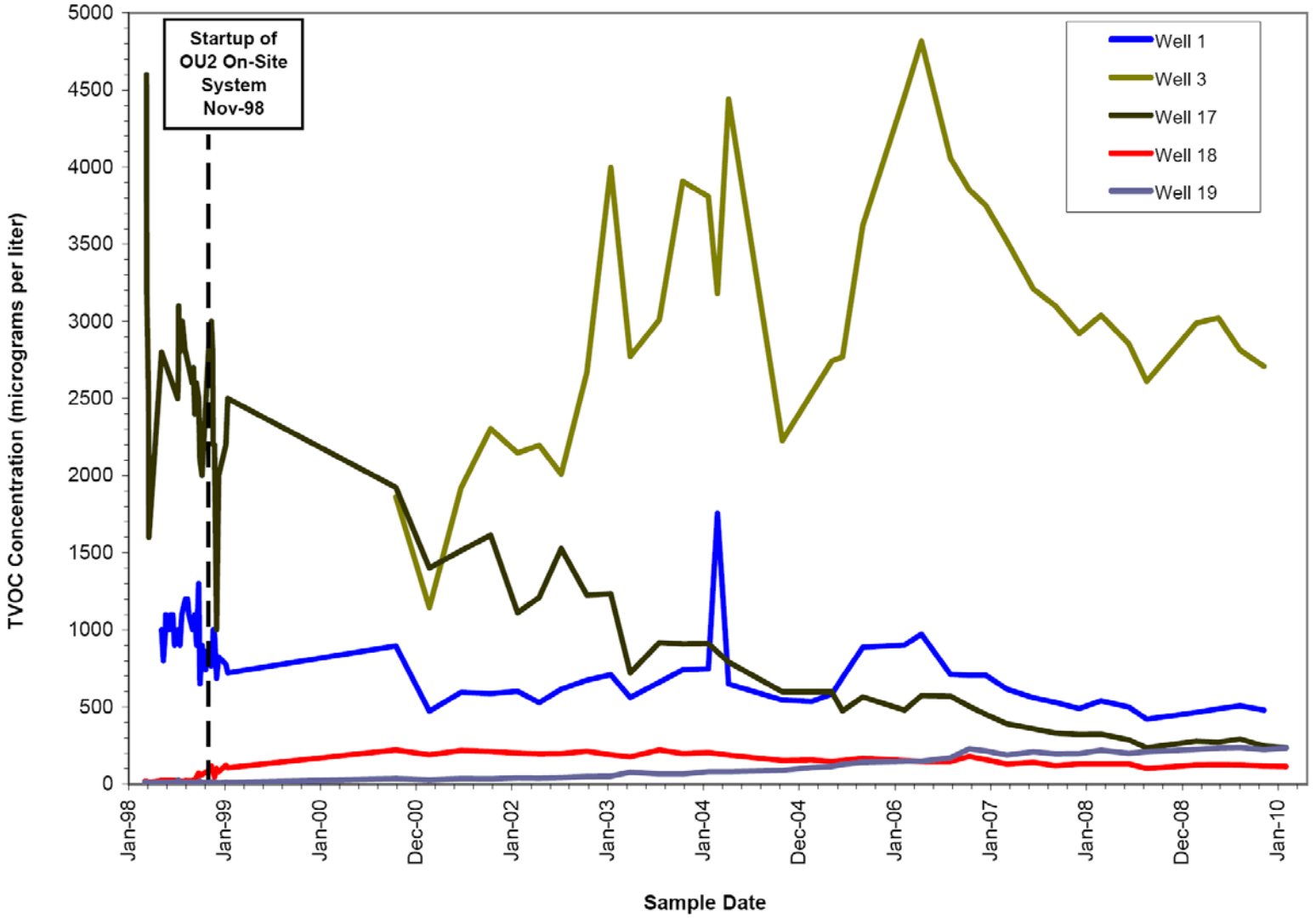
Concentration Trends in Off-site Downgradient Monitoring Wells



Concentration Trends in Off-site Downgradient Monitoring Well GM-75D2

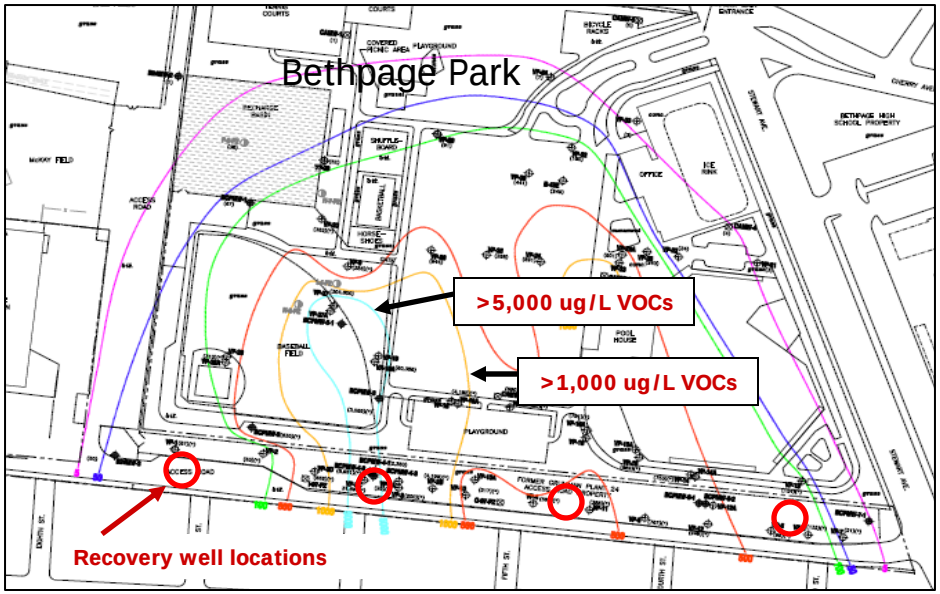


Concentration Trends in ONCT Recovery Wells



Park IRM Design

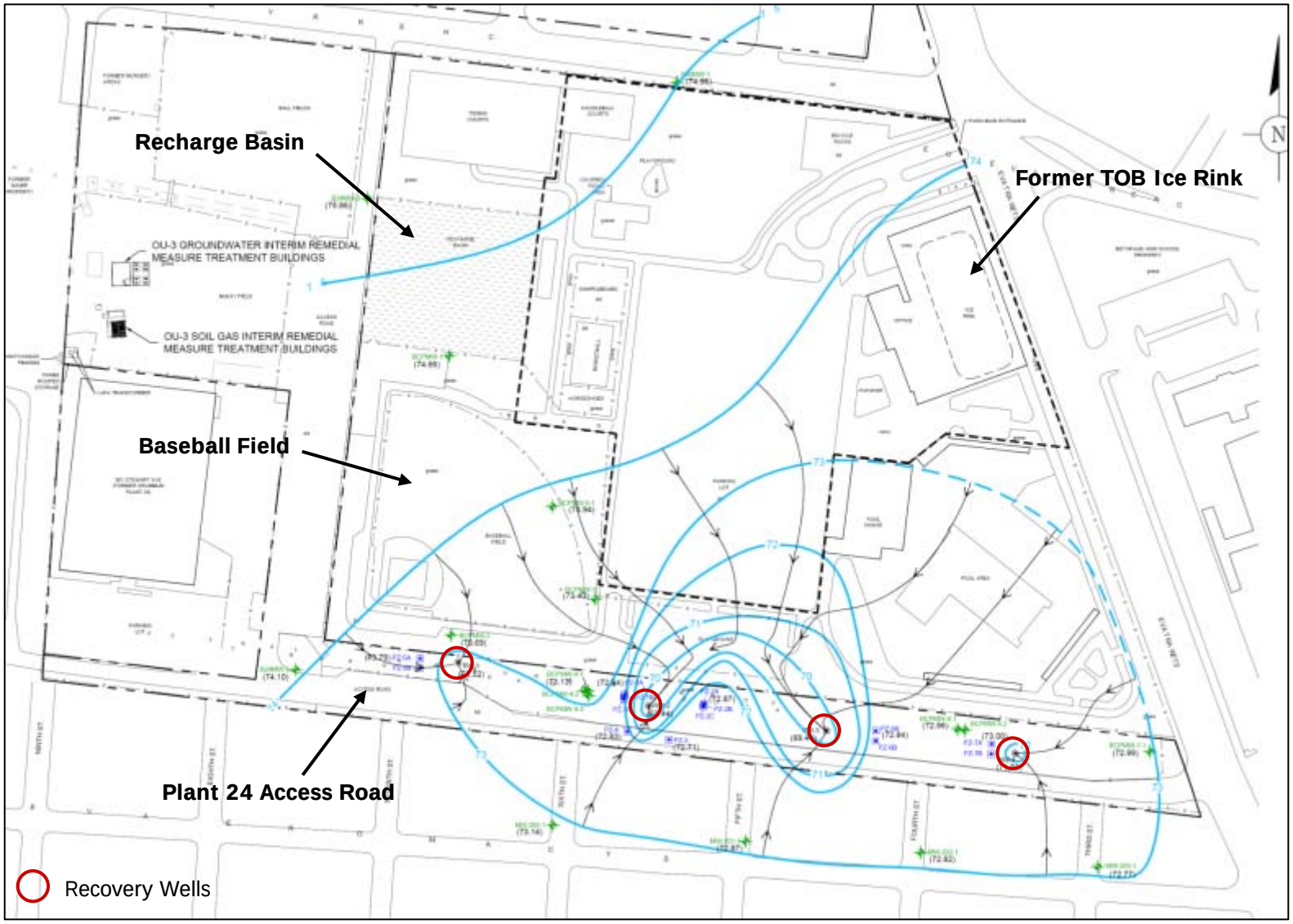
- Components:
  - 4 recovery wells (210 gpm) along 1,200-ft downgradient boundary of Park
  - Air stripper with emission controls
  - Treated effluent discharge to recharge basin
- Full-time operation began July 2009
- System operated, maintained & monitored per Groundwater IRM OM&M Manual



Park IRM Performance Objectives / Metrics

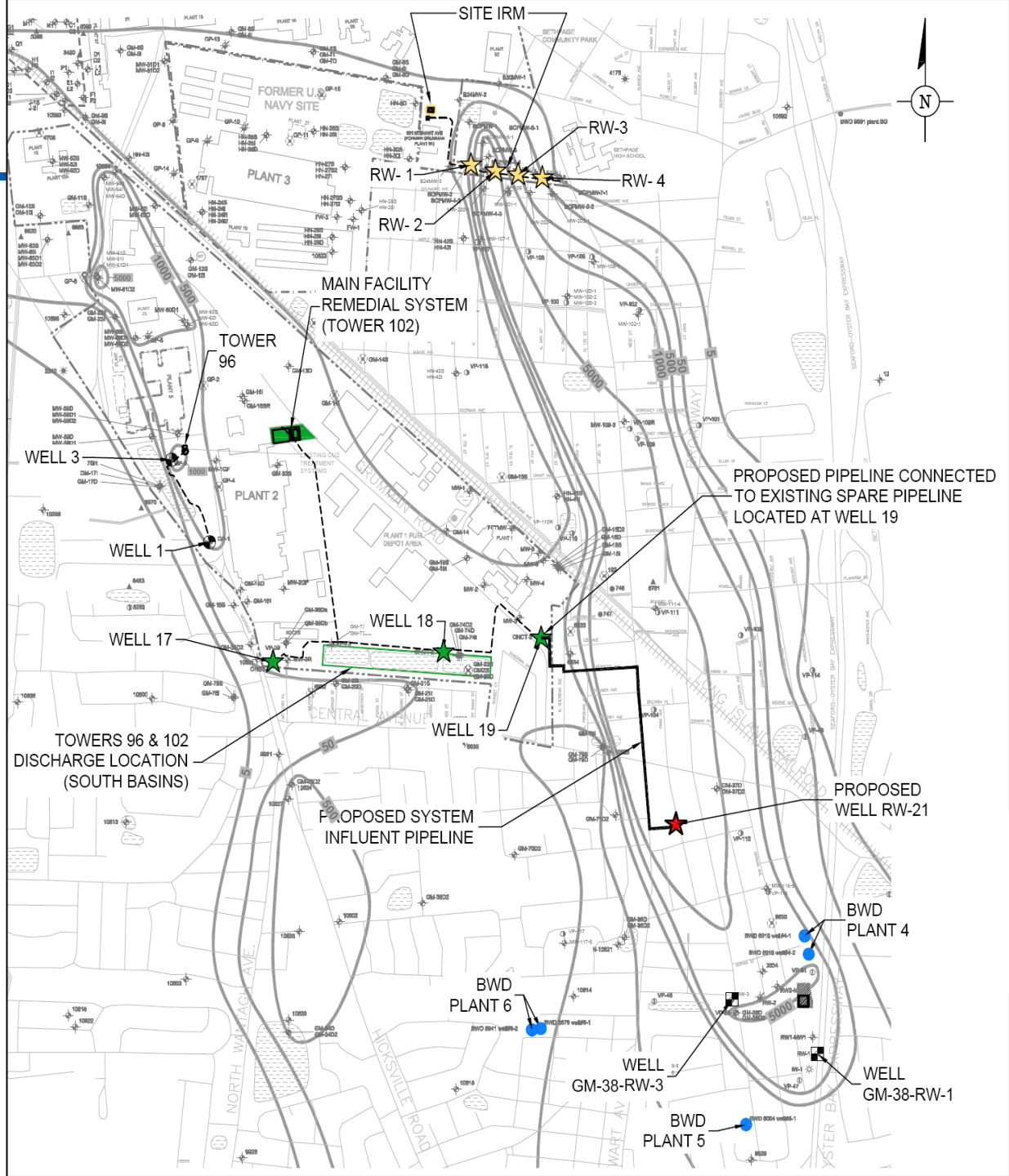
- Hydraulic containment > 5 µg/L in upper 20 feet; > 50 µg/L below upper 20 feet
  - Inward hydraulic gradient
  - Concentrations / trends in monitoring wells
- Remove mass from plume
  - TVOC mass removed over time vs design
  - Treatment system influent concentration / trends
  - Concentrations / trends in recovery wells
- Meet operational metrics
  - Air emissions & water quality effluent requirements
  - Shutdown criteria (final metric)

Park IRM Hydraulic Control – August 2010



Park Off-site Recommended Remedy

- Continued operation of remediation systems:
  - Park IRM
  - ONCT
  - GM-38
- Continued operation of BWD wellhead treatment systems
- Park VOC source remediation
- One new remedial well (RW-21) to reduce VOC mass in groundwater
- MNA following active remediation



Long-Term Monitoring and Outpost Monitoring

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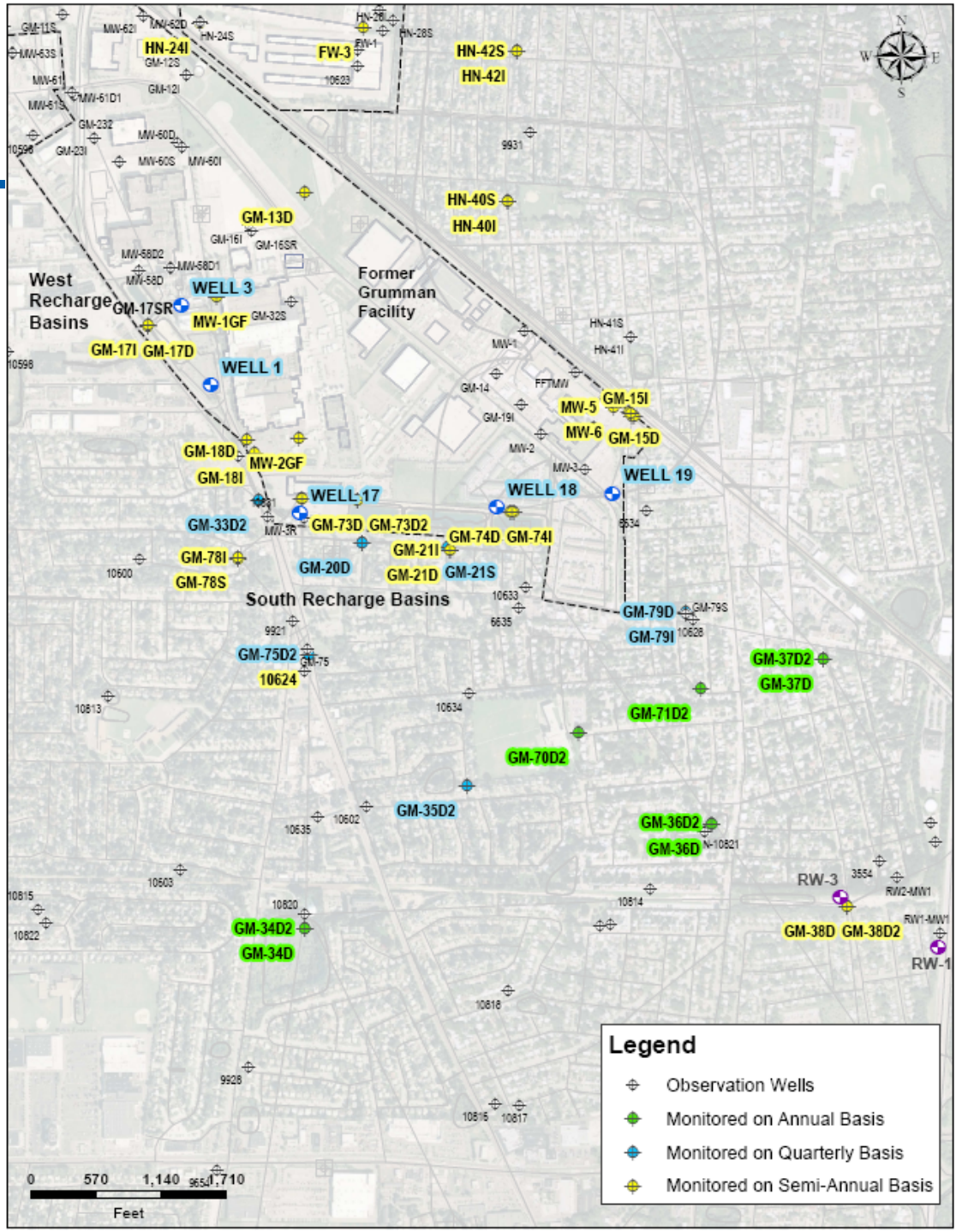
- OU2 semi-annual water-level monitoring
- OU2 quarterly/semiannual/annual well sampling
- OU2 quarterly ONCT system performance sampling (water/vapor)
- OU2 quarterly outpost well sampling
- OU3 LTM program - TBD

OU2 Monitoring Wells



Basis of Outpost Well Design

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- Described in Public Water Supply Contingency Plan
- Flow modeling/forward particle tracking used to identify potentially affected well fields within 30-year travel time of plume edge
- Flow modeling/reverse particle tracking used to locate outpost wells to provide 5-year warning of VOC impacts to supply wells
- Screen intervals for outpost wells based on two fastest particle paths in aquifer

Outpost Wells

Wellhead Treatment

- Critical element of protective remedy
- Performance objectives, design and O&M are responsibility of water districts

Questions (Data Gap Analysis)

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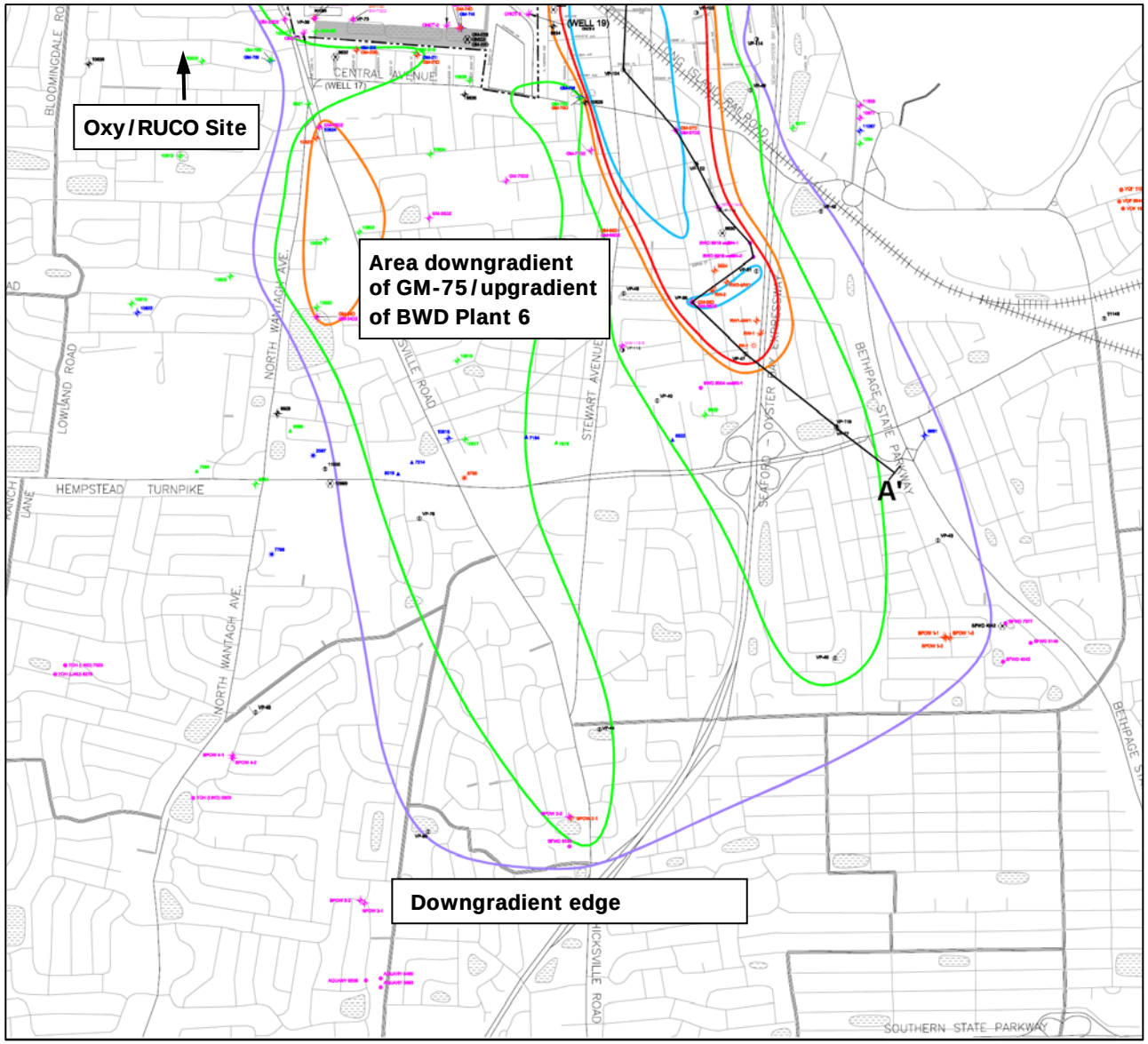
1. Is downgradient edge of plume defined?
2. Do we understand how the plume is migrating (is the plume sufficiently characterized to predict future impacts to water supplies)?
   - Area downgradient of GM-75 and upgradient of BWD Plant 6
   - Area downgradient of Oxy RUCO
3. Does the ONCT prevent off-site migration of contaminated groundwater?
4. Are additional wells (recovery, monitor, outpost) needed?

Data Gap Analysis



Path Forward

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- Continue OM&M of ONCT
- Continue OM&M of Park IRM
- Continue to honor agreements with BWD


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