Analysis of Claremont Extraction System

Predicted Vertical Capture Zone of Claremont Extraction Wells

March 23, 2011

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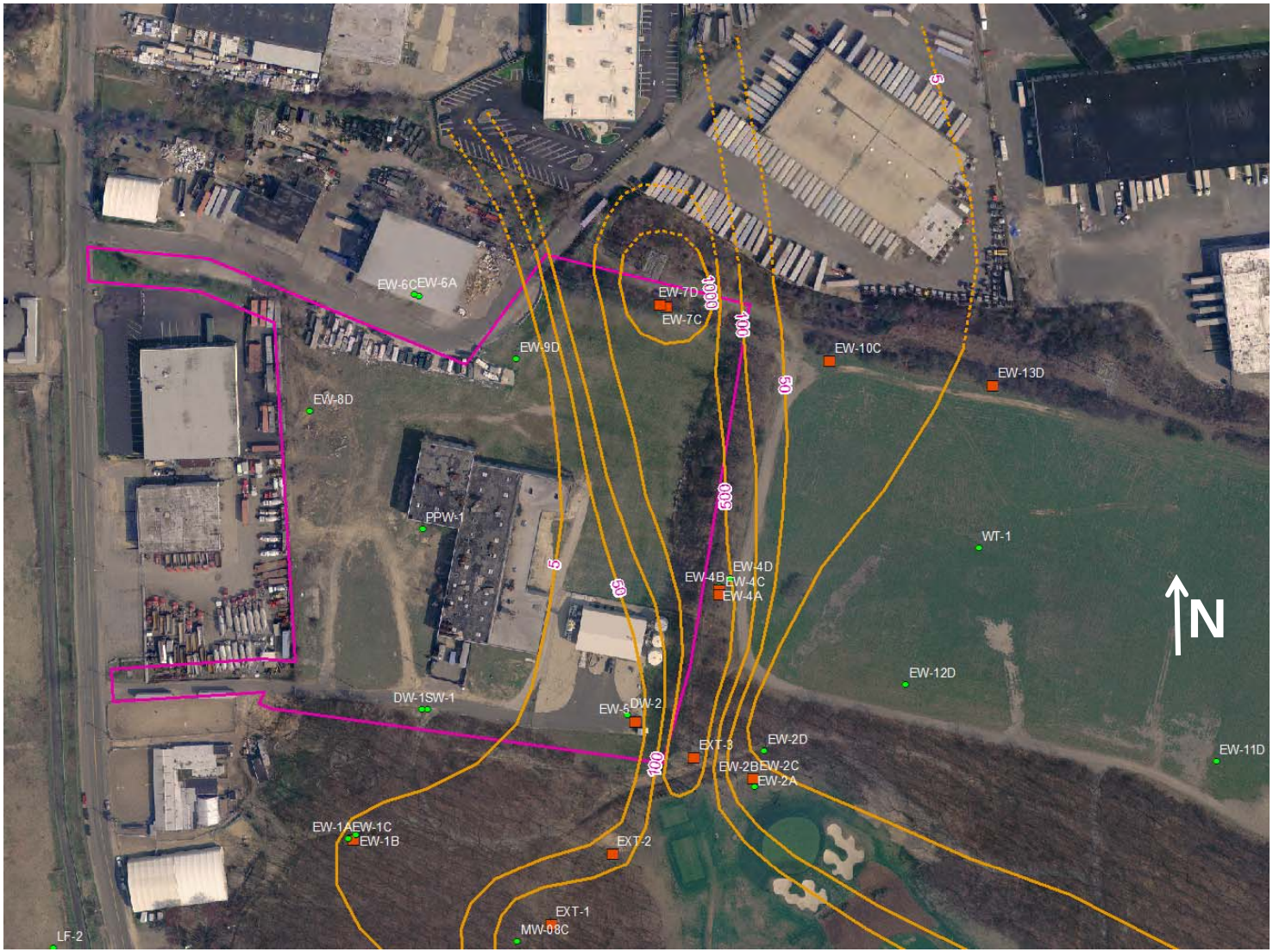
Claremont Site Map



Interpreted TCE plume based on 2006 groundwater quality data

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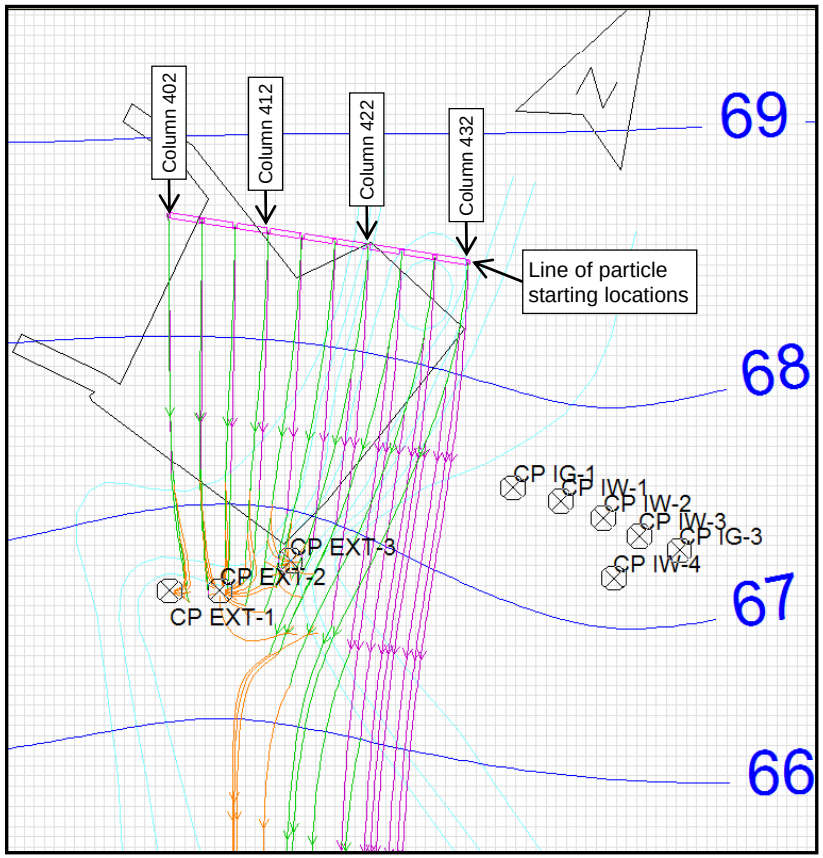
Vertical Capture Zone of Claremont Extraction Wells

- Objective
  - Estimate at what depth/elevation that upgradient off-site contamination will pass beneath Claremont extraction wells without being captured

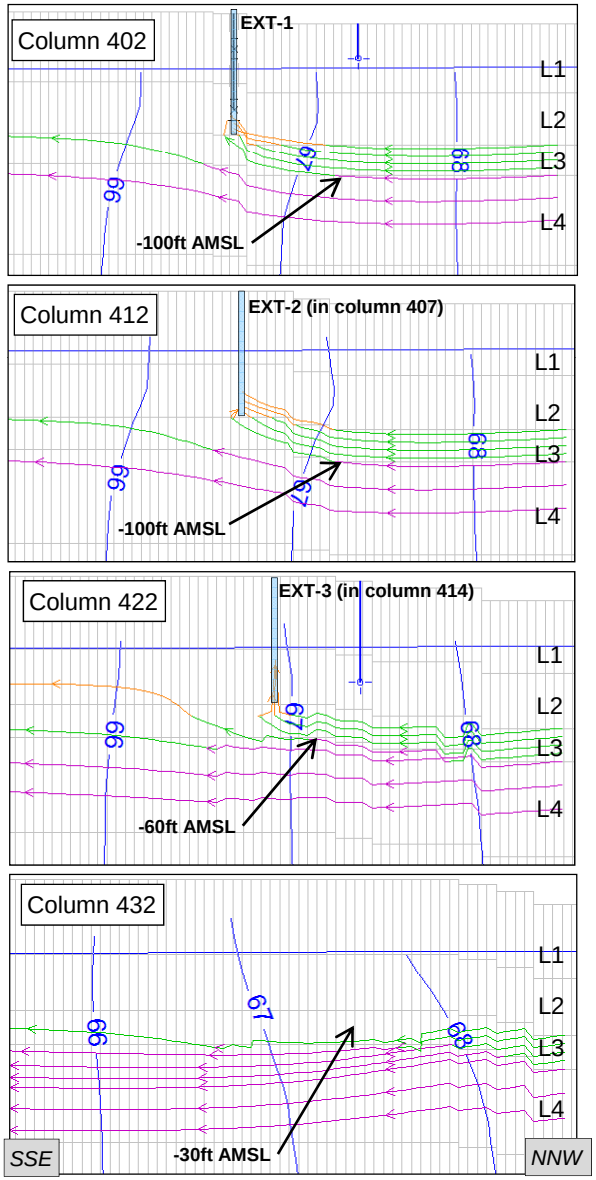
- Methods
  - Perform particle tracking w/ gw model to assess flow paths and vertical capture zone
  - Modify model by splitting layer 2 into two separate layers
    - Previously, in area of Claremont extraction wells, bottoms of layers 1 and 2 were about +45ft MSL and -75ft MSL, respectively
    - Claremont extraction wells are screened to about -30ft MSL
    - Need to better match the layer elevations to the well screen elevations for this analysis
    - So, split old layer 2 into two layers, with bottom elevations (in area of extraction wells) of roughly
      - » -30ft MSL for bottom of new layer 2 (same as bottom screen elevation for Claremont extraction wells)
      - » -75ft MSL for bottom of new layer 3 (same as bottom of old layer 2)
    - Claremont extraction wells specified in new layer 2 (and overlying layer 1)
      - » Bottom of layer 2 co-incident with screen bottom elevation
    - Note: these layering changes were made for previous Feb 2011 analysis of Claremont extraction system, as well
  - Place starting particles across north side of Claremont site in model layers 3 & 4
    - below extraction well elevations (previous bullet)
  - Use April 2010 extraction rate data
    - EXT-1: 110 gpm
    - EXT-2: 113 gpm
    - EXT-3: 118.5 gpm
    - Total: ~340 gpm

Predicted Vertical Capture Zone of Claremont Extraction Wells: Particle Tracks Originating in Layers 3 and 4 (below wells)

- Image below shows site configuration and particle tracking results in plan view
- Particles released in layers 3 and 4 and color-coded by residence (not release) layer
  - Layer 2: orange
  - Layer 3: green
  - Layer 4: magenta



Cross-section display of particle tracking results for particles originating in indicated model columns



- Particles move generally in the column direction, but deviate to adjacent columns
  - Evident in plan view map
  - Example: on middle 2 sections, particles terminate at extraction wells that are in different columns than particle starting column
- Particles released in layers 3 and 4 and color-coded by residence layer (not by release layer)
  - Layer 2: orange
  - Layer 3: green
  - Layer 4: magenta
- *Predicted* capture elevation varies for different starting locations along north side of Claremont due to well configuration
  - West half (cols 402 and 412) captured down to about -100ft MSL
  - Col 422 captured down to about -60ft MSL
  - Col 432 captured down to about -30ft MSL, not quite to bottom of layer 2 (no capture of L3/L4 particles shown in col 432 cross-section; -30ft MSL is from February 2011 capture zone analysis)

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Predicted Vertical Capture Zone of Claremont Extraction Wells: Summary

- Objective
  - Estimate at what depth/elevation that upgradient off-site contamination will pass beneath Claremont extraction wells without being captured
- Methods
  - Perform particle tracking w/ gw model to assess flow paths and vertical capture zone
  - Modify model layering to accurately represent screen bottom elevations for Claremont extraction wells (-30ft MSL)
  - Place starting particles across north side of Claremont site below extraction well elevations
  - Use April 2010 extraction rate data
- Results
  - For north side of site, predicted vertical capture zone varies from west to east
    - Capture down to about -100ft MSL on west end
    - Capture down to nearly -30ft MSL on east end
    - See figures on previous slide
- Note:
  - Because results are developed using particle tracking, dispersion is neglected
    - Dispersion would somewhat reduce vertical capture zone