GM-38 GROUNDWATER TREATMENT PLANT OPERATION AND CAPTURE ZONE EVALUATION APRIL 2014 TECHNICAL ADVISORY COMMITTEE (TAC)

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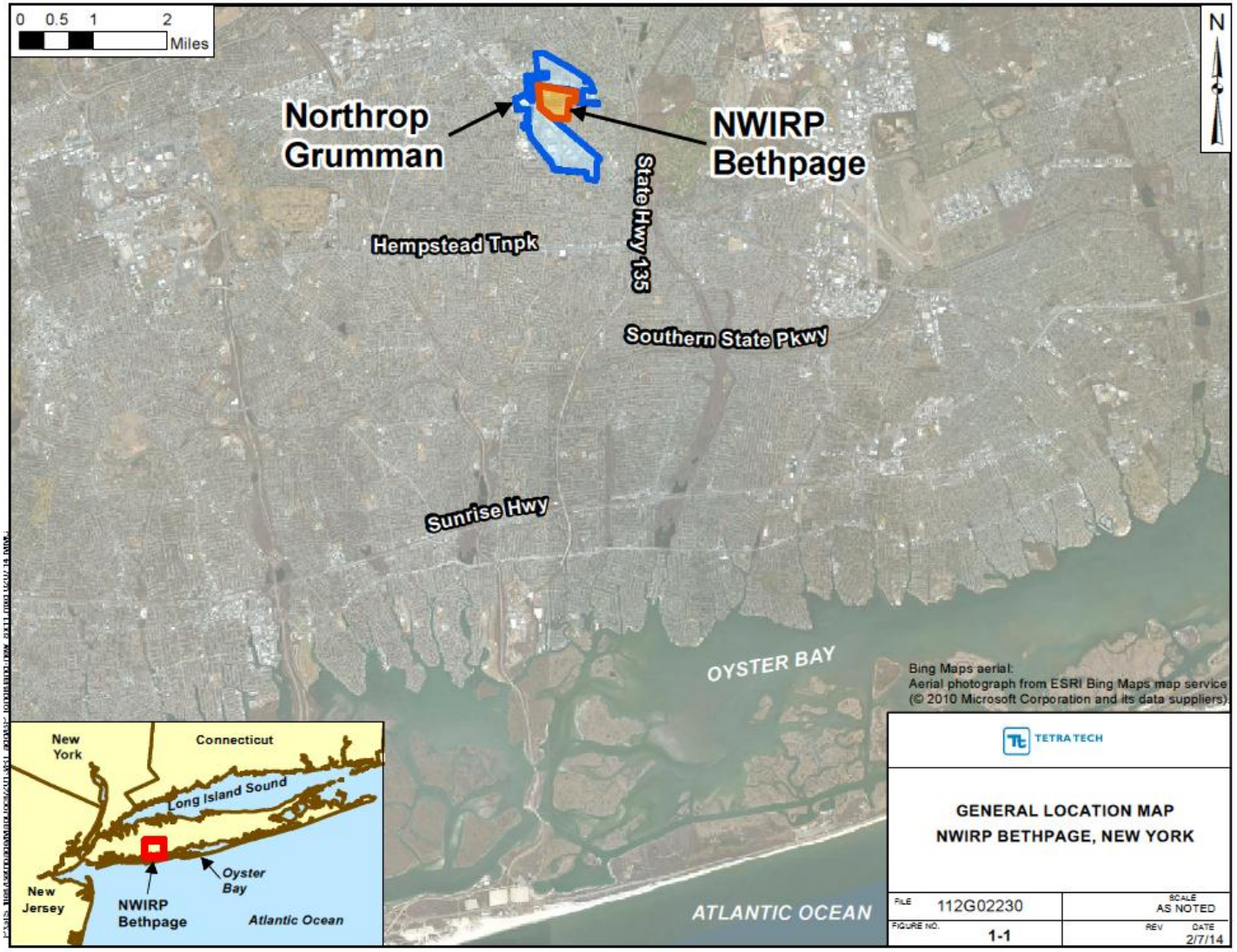
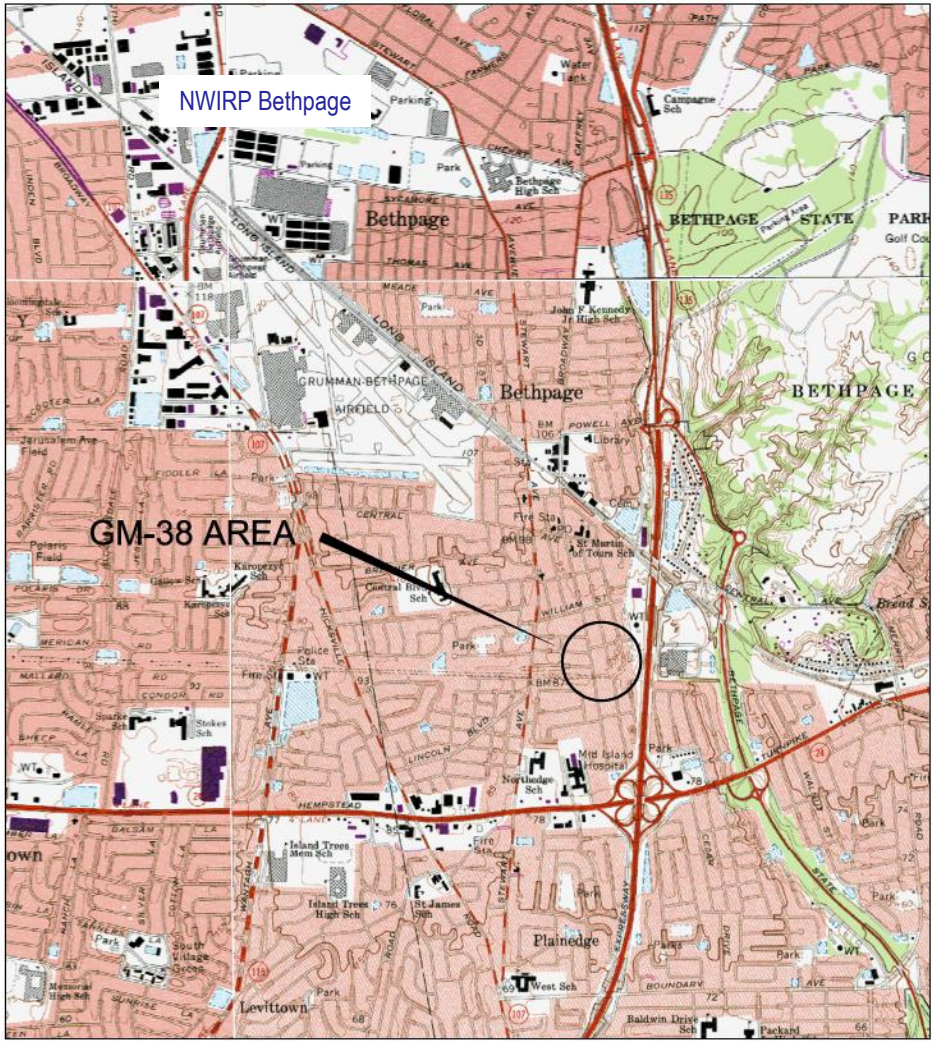
Introduction



Introduction

GM-38 Groundwater Treatment System

- Objective
- Construction and Operation
- Capture Zone Evaluation
- Path Forward



Objective

From the Operable Unit 2 Record of Decision (April 2003):

- "The main objective of the GM-38 well area remedy would be additional protection of human health by reducing the future elevated mass contaminant load to the down gradient public water supplies. The remedy would also enhance the long-term natural process of aquifer restoration."

Construction and Operation

- GM-38 Treatment System consists of the following components:
  - –Two groundwater recovery wells RW-1 and RW-3
  - –Equalization Tank
  - –Air Stripping Tower
  - –Liquid Phase Granular Activated Carbon Polishing
  - –Discharge to a Recharge Basin
  - –Vapor Phase Treatment using Granular Activated Carbon and Permanganate-Based Resin

Operation

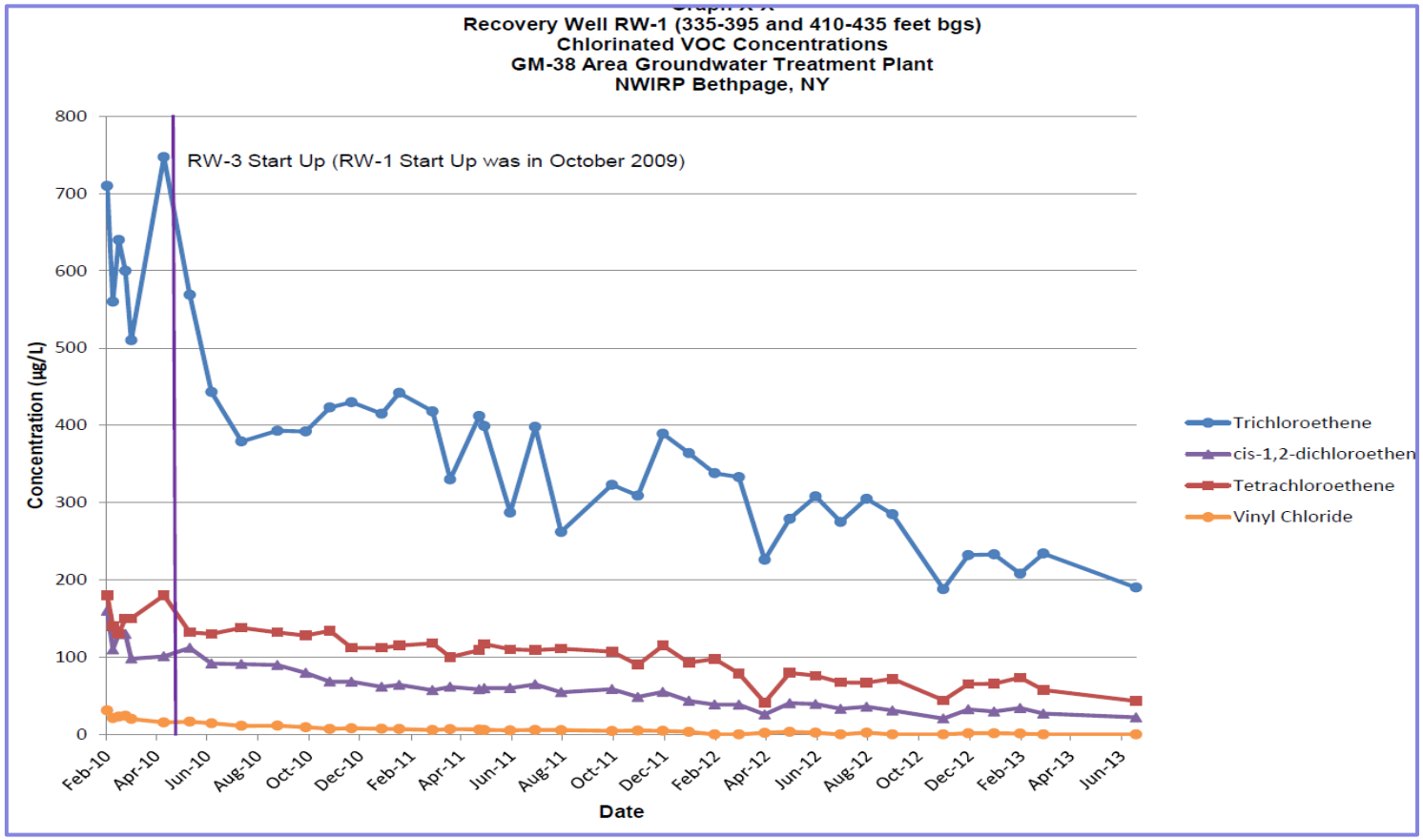

MW-116-5
VPB-42
GM-36D
GM-36D2
BWD 4-1
BWD 4-2
Recharge Basin
GM-38D2
GM-38D
VPB-51
Treatment Plant
GM-38RW03
GM-38 RW2-MW2
VPB-48
GM-38RW02
VPB-38
Recovery Well RW03
GM-38RW01
GM-38 RW1-MW1
Miller Rd
MW-118-5
Recovery Well RW01
VPB-47
VPB-40
BWD 5-1

Operation

- Since Startup, System has treated:
  - 2 Billion gallons of water (2.2 times the Hotspot Volume), and
  - 7,500 pounds of volatile organics
- Monthly compliance sampling of water and air – Consistently achieves requirements
- Quarterly to bi-annual sampling of groundwater monitoring wells
  - December 2013
  - March 2014
  - September 2014
- Two month shutdown in October 2013 for maintenance:
  - Replace duct work
  - Carbon Change outs – liquid and vapor phase
- Normal runtime is 95% - power outages and schedule maintenance

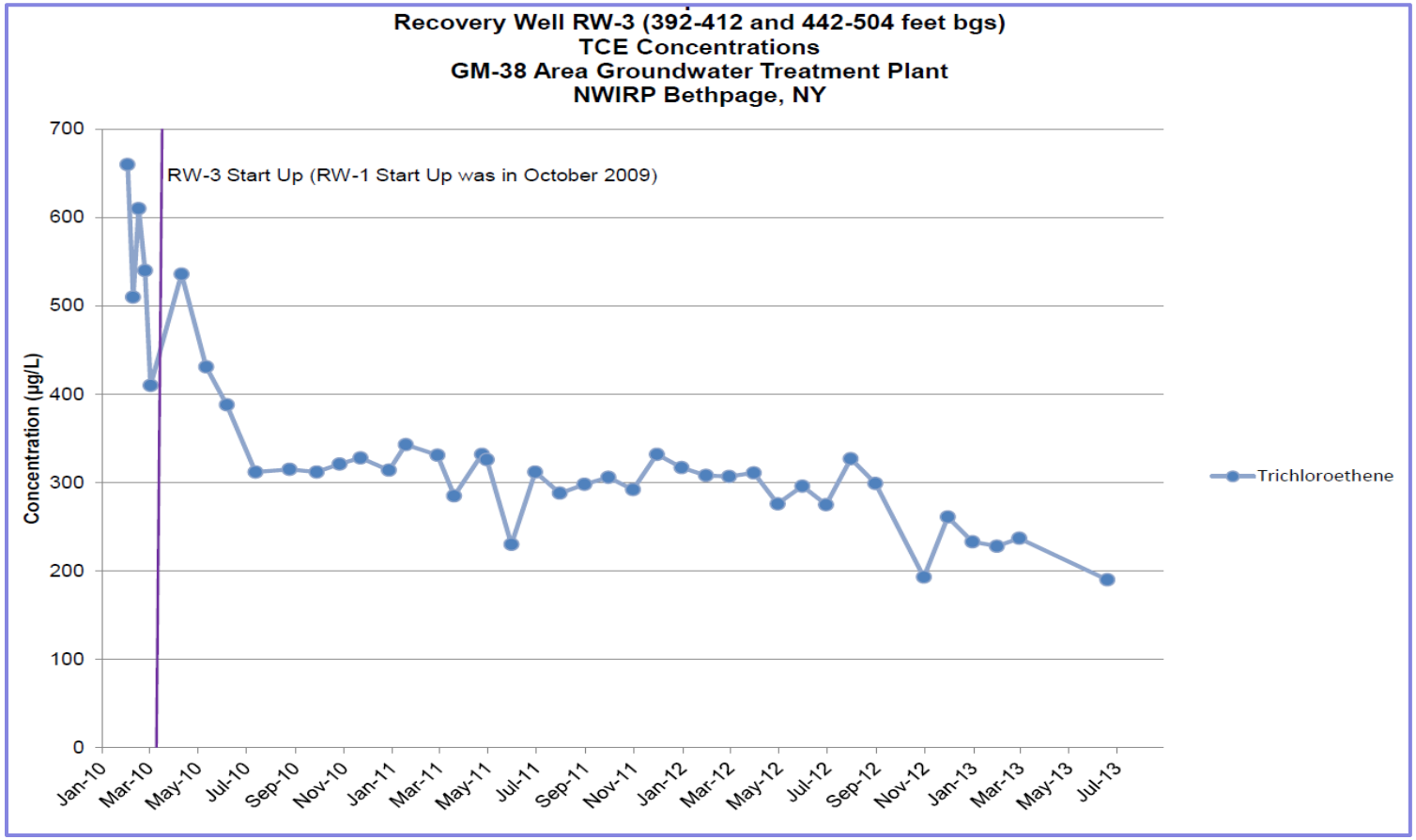
Operation – Recovery Well RW01

- Well extracts from upper and middle portion of Hotspot – less than 435 feet
- 75% Reduction in volatile organics since startup

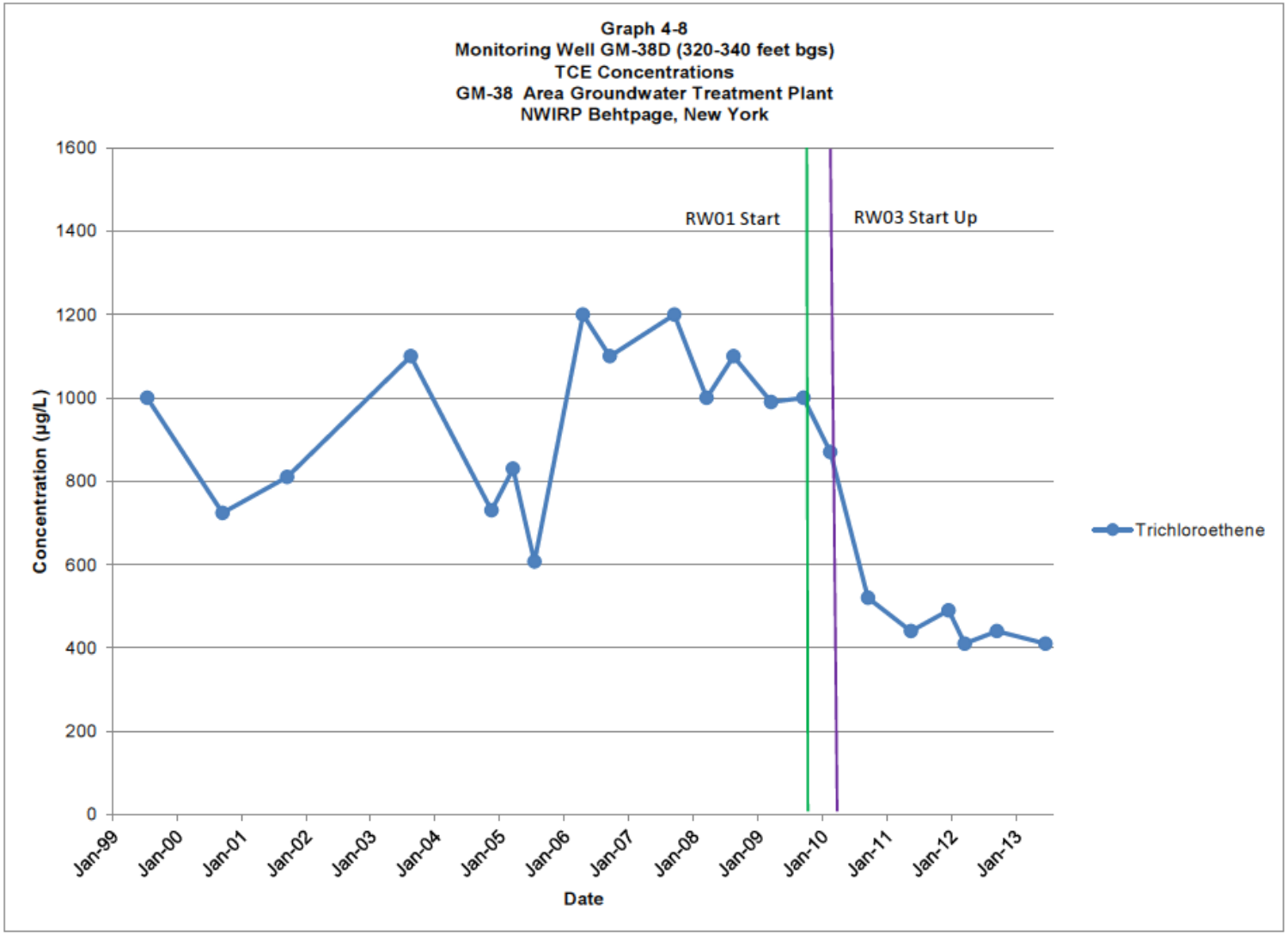


Operation – Recovery Well RW03

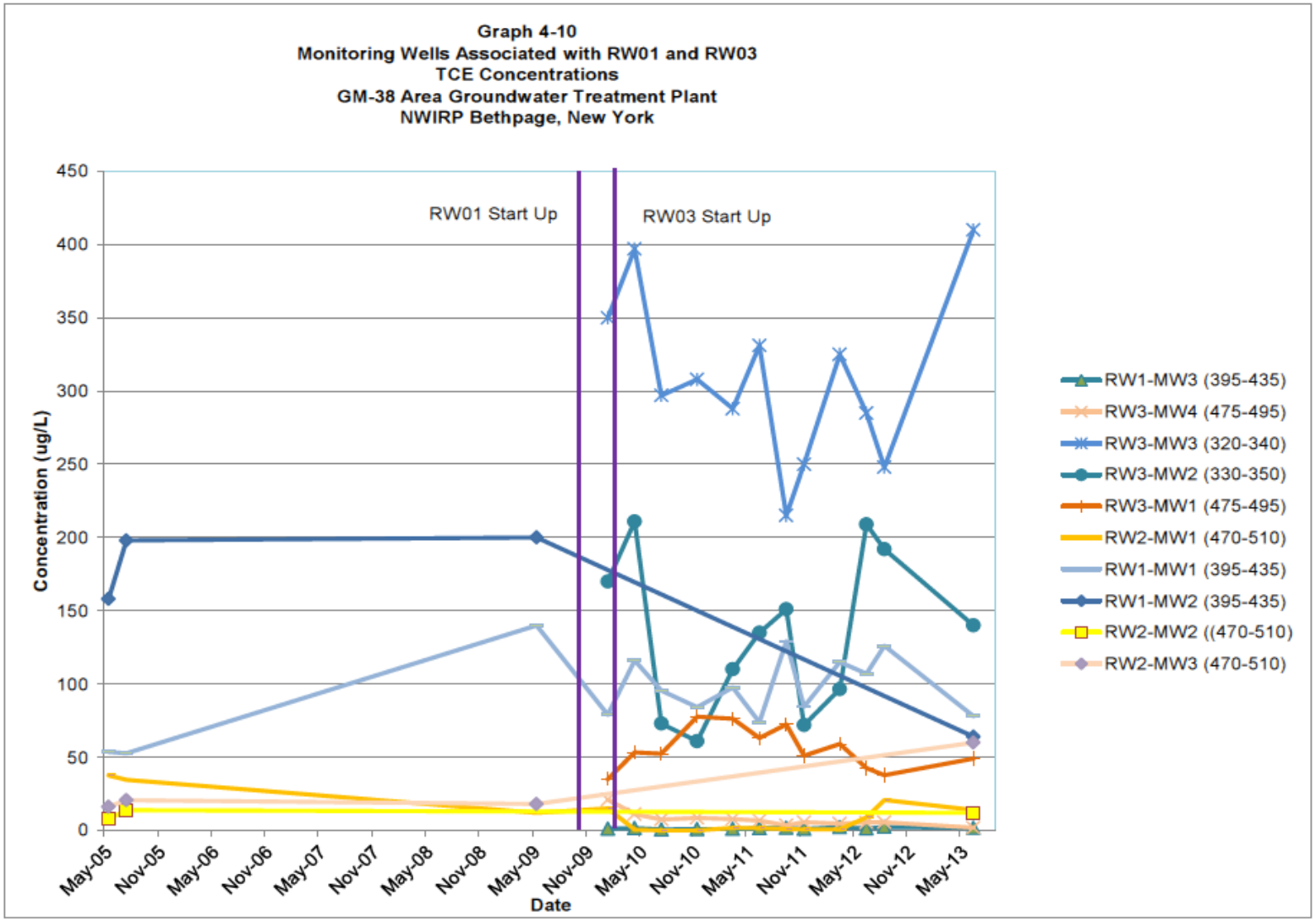
- Well extracts from middle and lower portion of Hotspot – 392 to 504 feet
- 75% Reduction in Trichloroethene (TCE) since startup



Monitoring Well Results



Monitoring Well Results



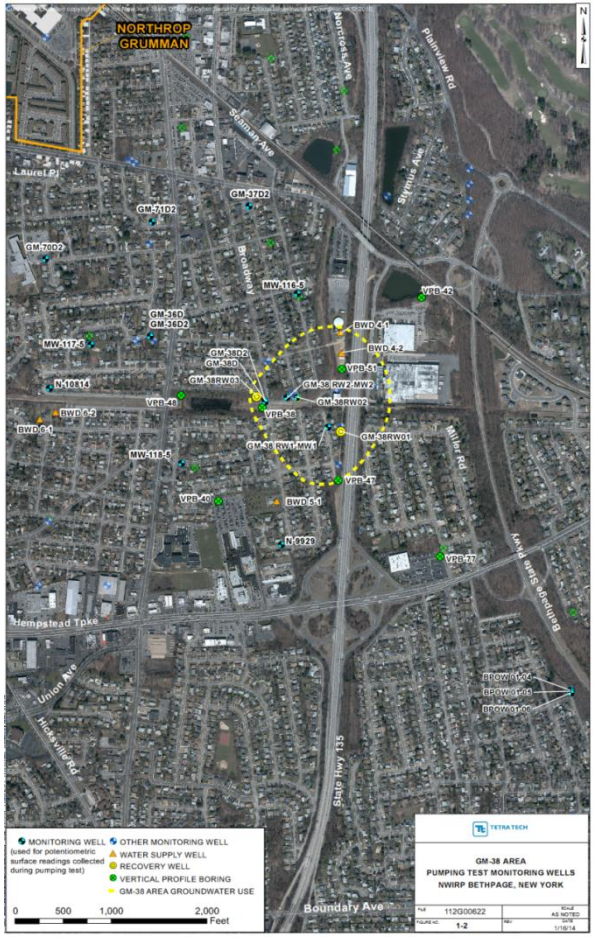
Monitoring Well Results Summary

- Deeper groundwater (greater than 450 feet)
  - –TCE concentrations were originally greater 1,200 micrograms per liter (µg/L) (GM-38D2)
  - –TCE concentrations are currently less than 50 µg/L

- Shallower groundwater (320 to 435 feet)
  - –TCE concentrations decrease shortly after startup of the GM-38 System
  - –TCE concentrations have remained relatively steady since startup (GM-38D2)
  - –Sustained concentration in up-gradient wells suggest continuing source of volatile organics to the north

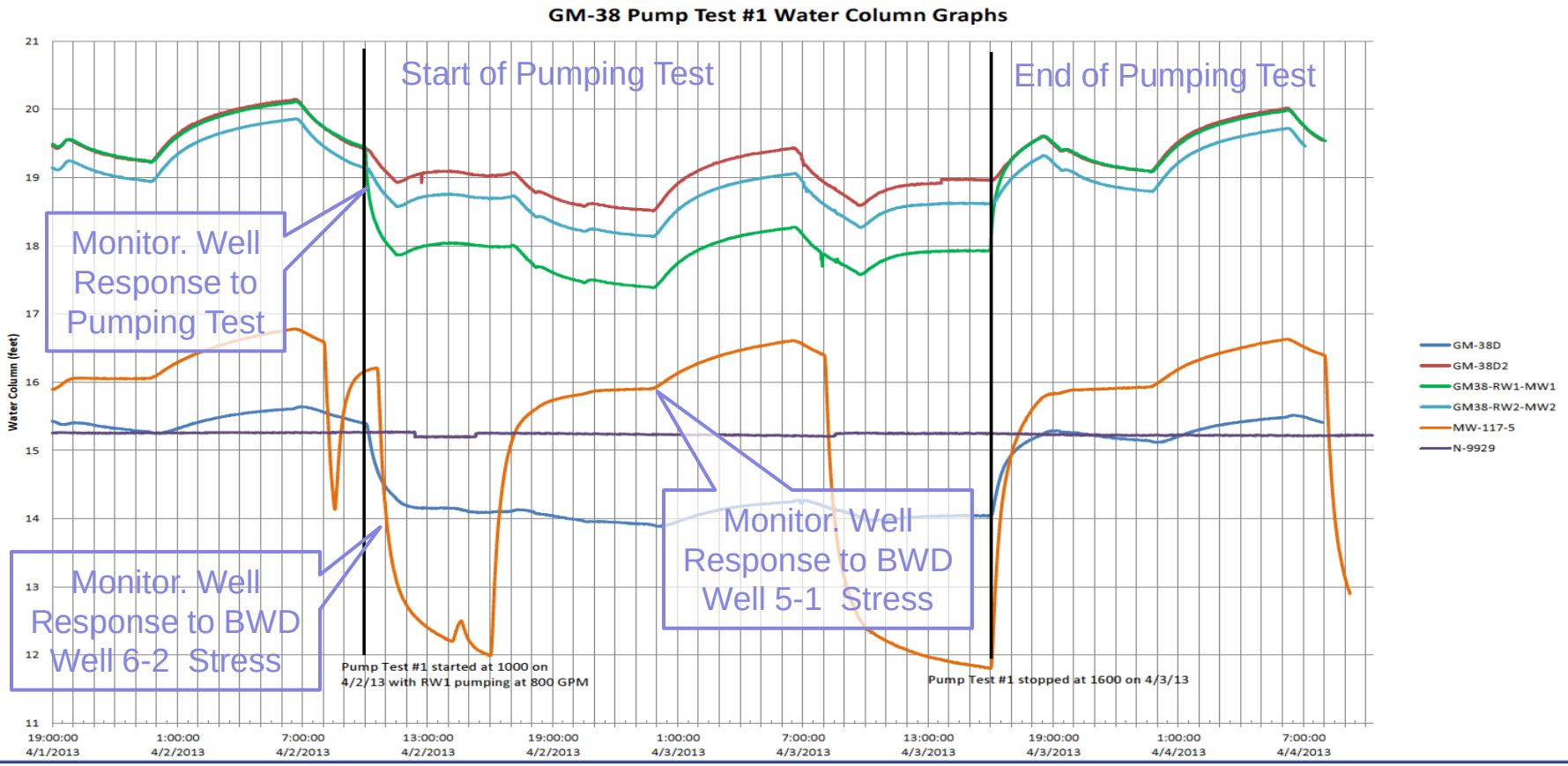
Capture Zone Analysis

- Objective is to evaluate whether the system is capturing the hotspot groundwater as designed
- Conducted four pumping tests at the GM-38 Area in April 2013 – coordinated with Bethpage Water District (BWD)
- Monitored 18 wells with screen depths of 50 to 757 feet below ground surface
- Water levels were recorded over a two-week period
- United States Geological Survey (USGS) is supporting evaluation – and recently issued it own evaluation report
- Also, a year-long area-wide evaluation is ongoing



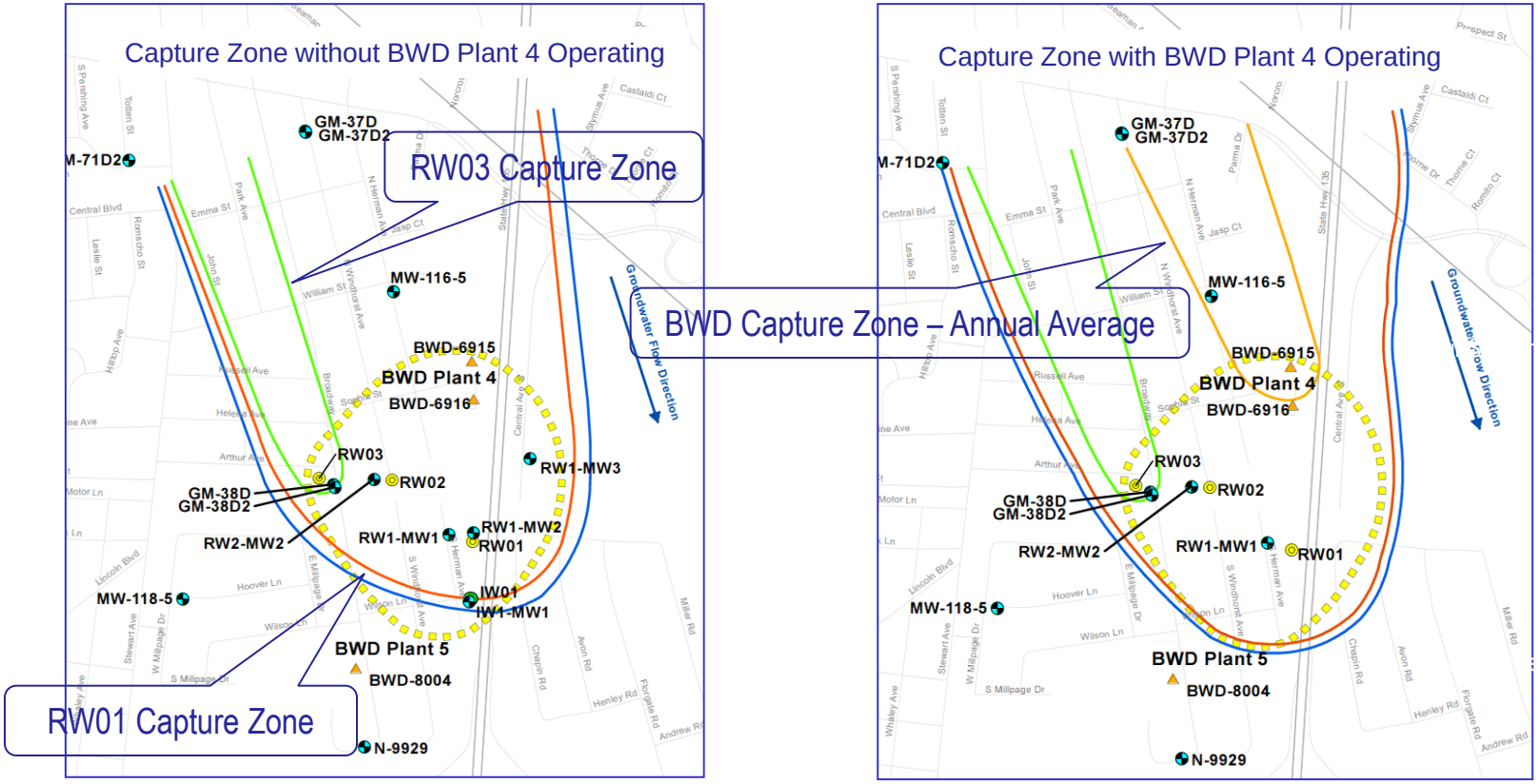
Capture Zone Analysis

- Example of Water Level Readings
- Recovery Well RW01 running at 800 gallons per minute (420 million gallons per year)
- Note response of some wells to BWD Wells 5-1 and 6-2



Capture Zone Analysis

- Evaluation indicates 95 to 100 percent capture of GM-38 Area Groundwater
- Southwest piece of hotspot and capture zone (Without BWP Plant 4 Operating) is within range of accuracy of hotspot delineation and capture calculations



Conclusions and Path Forward

- RW01 provides the vast majority of mass removal
  - Central location, high pumping rate, and screen depth is better matched to GM-38 Area Groundwater
  - Continue operation, but discuss future operation with New York State Department of Environmental Conservation
- RW03 is not optimally located
  - Located near northwest corner of GM-38 Area Groundwater
  - Shallow screen zone is redundant with RW01 and deeper screen zone is no longer located within significant organic mass
  - Discontinue operation
- Navy to consider investigation of shallower groundwater quality north of the GM-38 Area to identify source of continuing organics