Quarterly Coordination Meeting

NYSDEC / USEPA Region 2
Northrop Grumman Systems Corporation
NAVFAC

December 14, 2016

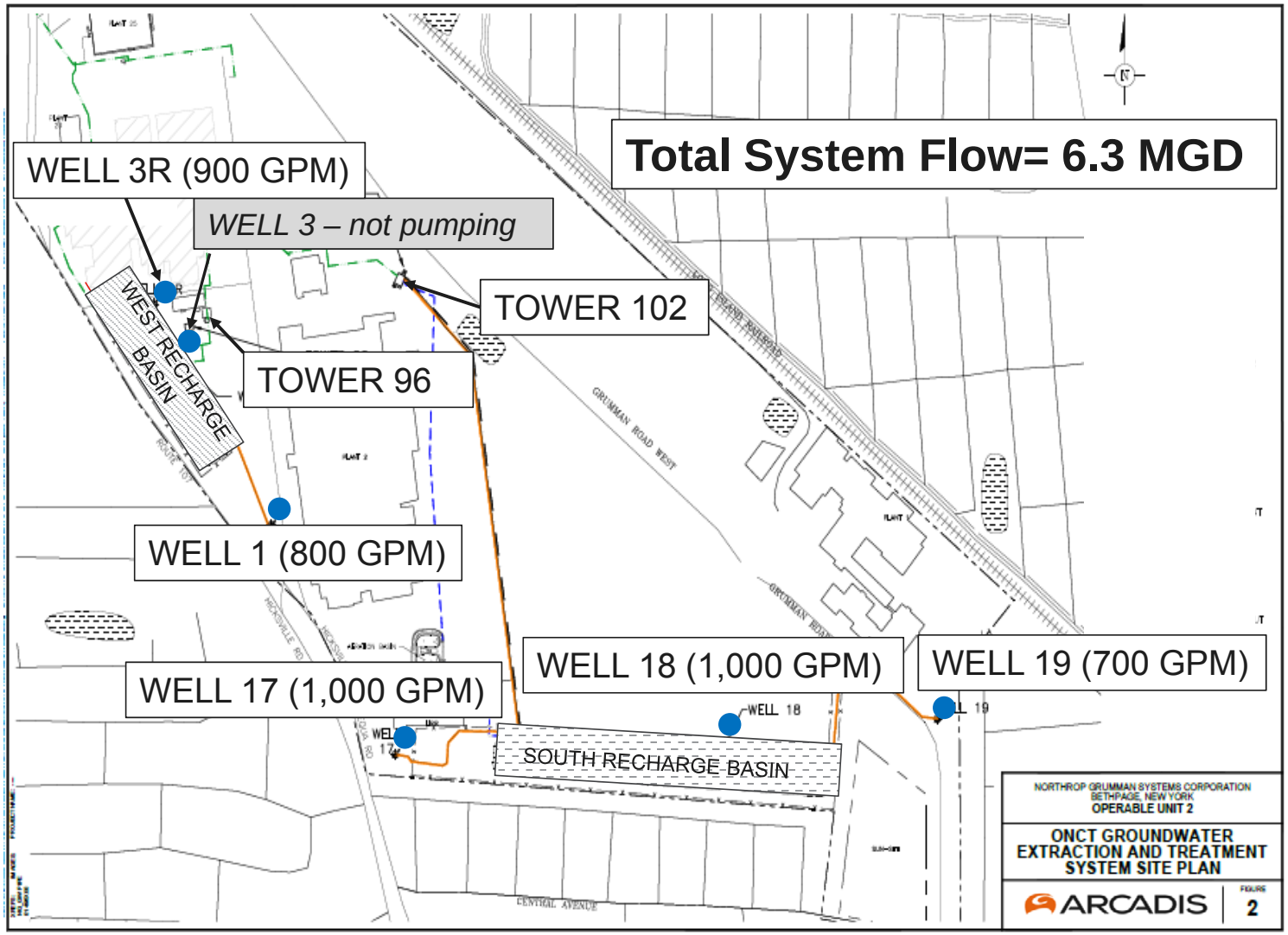
Northrop Grumman Discussion Topics

- Status of Northrop Grumman/Navy Cooperation
  - Technical Exchange Meeting was held on November 16, 2016
  - Navy Wells sampled by Northrop Grumman
- Update on Northrop Grumman OU2 Activities
  - ONCT System OM&M/Effectiveness
- Update on Northrop Grumman OU3 Activities
  - Off-Site RW-21 Project Area Groundwater Investigation/Remediation
  - Park Soils
  - Hydraulic Effectiveness Study
  - Residential Properties

ARCADIS Design & Consultancy for natural and built assets

Update on Northrop Grumman OU2 Activities

- ONCT System OM&M
- ONCT System Effectiveness



ONCT System OM&M

- Uptime & Performance for 3Q 2016

  - **T96 System: 99.5% uptime**

	% Uptime	% Design Flow Volume
• Well 1:	97	100
• Well 3R:	97	138

  - **T102 System: 99.9% uptime**

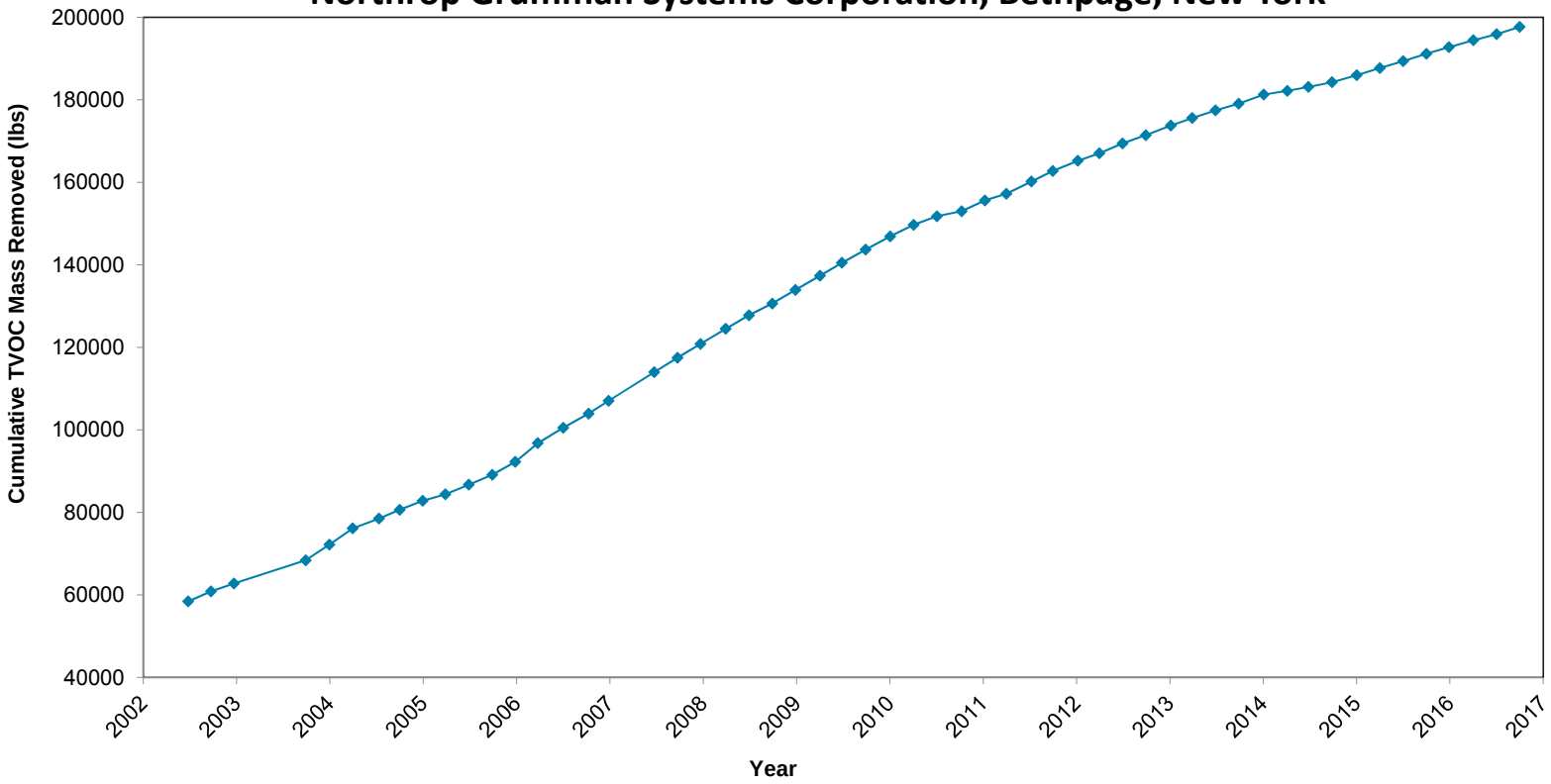
	% Uptime	% Design Flow Volume
• Well 17:	95	100
• Well 18:	94	157
• Well 19:	90	99

ONCT System OM&M – cont'd

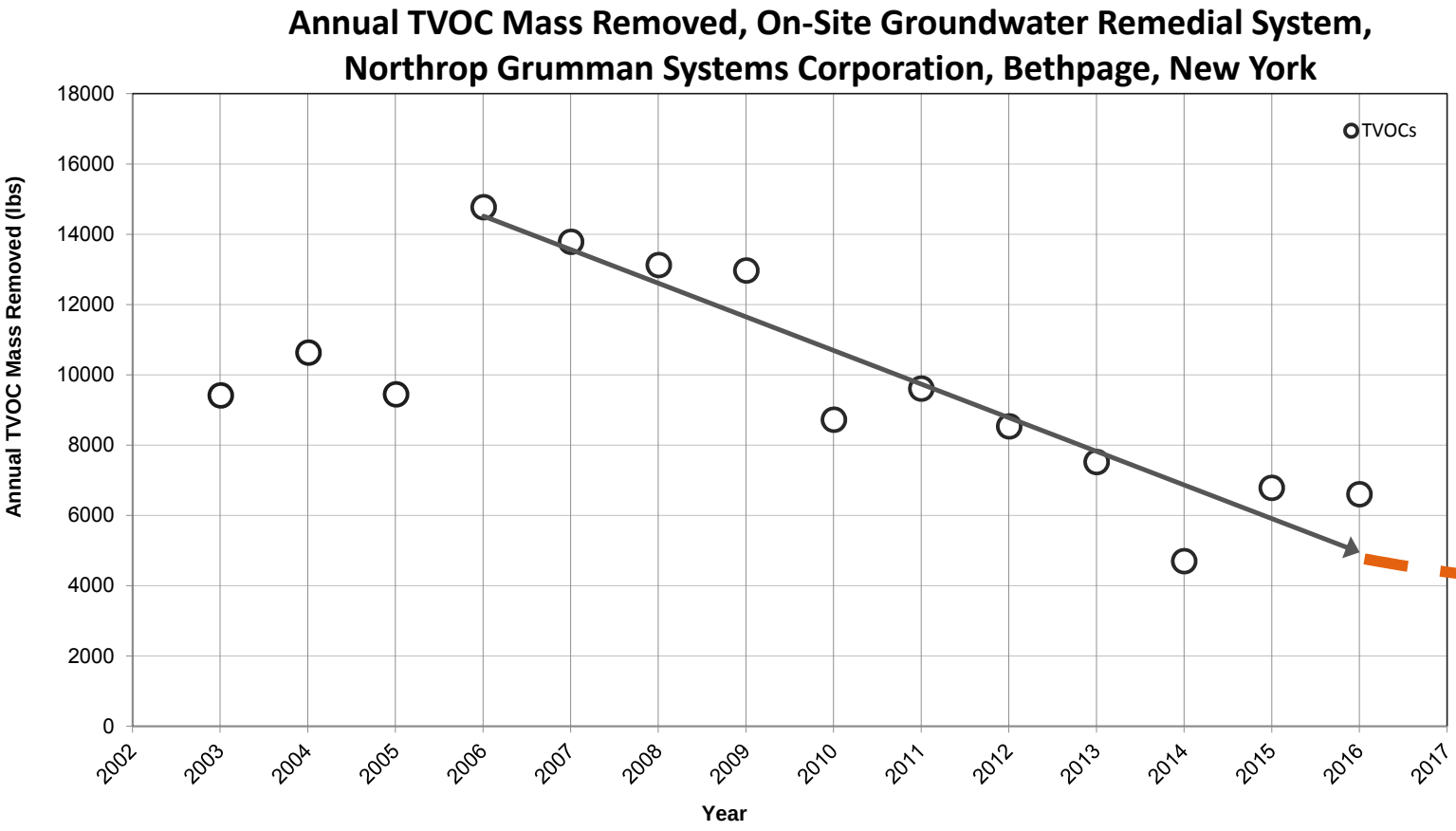
- Downtime due to alarm conditions, periodic system/well maintenance, and electrical and communications disruptions
  - Maintenance activities included: T96 blower repair and meter calibration, Well 19 VFD fan replacement
  - Repair of treated water distribution pipeline
  - Northrop Grumman has installed new communications system for more reliable and uninterrupted communications (August)
  - >99% treatment efficiency, discharge is compliant
- Cumulative Mass Removal
  - ~197,700 lbs VOCs removed from start up of ONCT System in 4Q 1998 through 3Q 2016

ARCADIS Design & Consultancy for natural and built assets

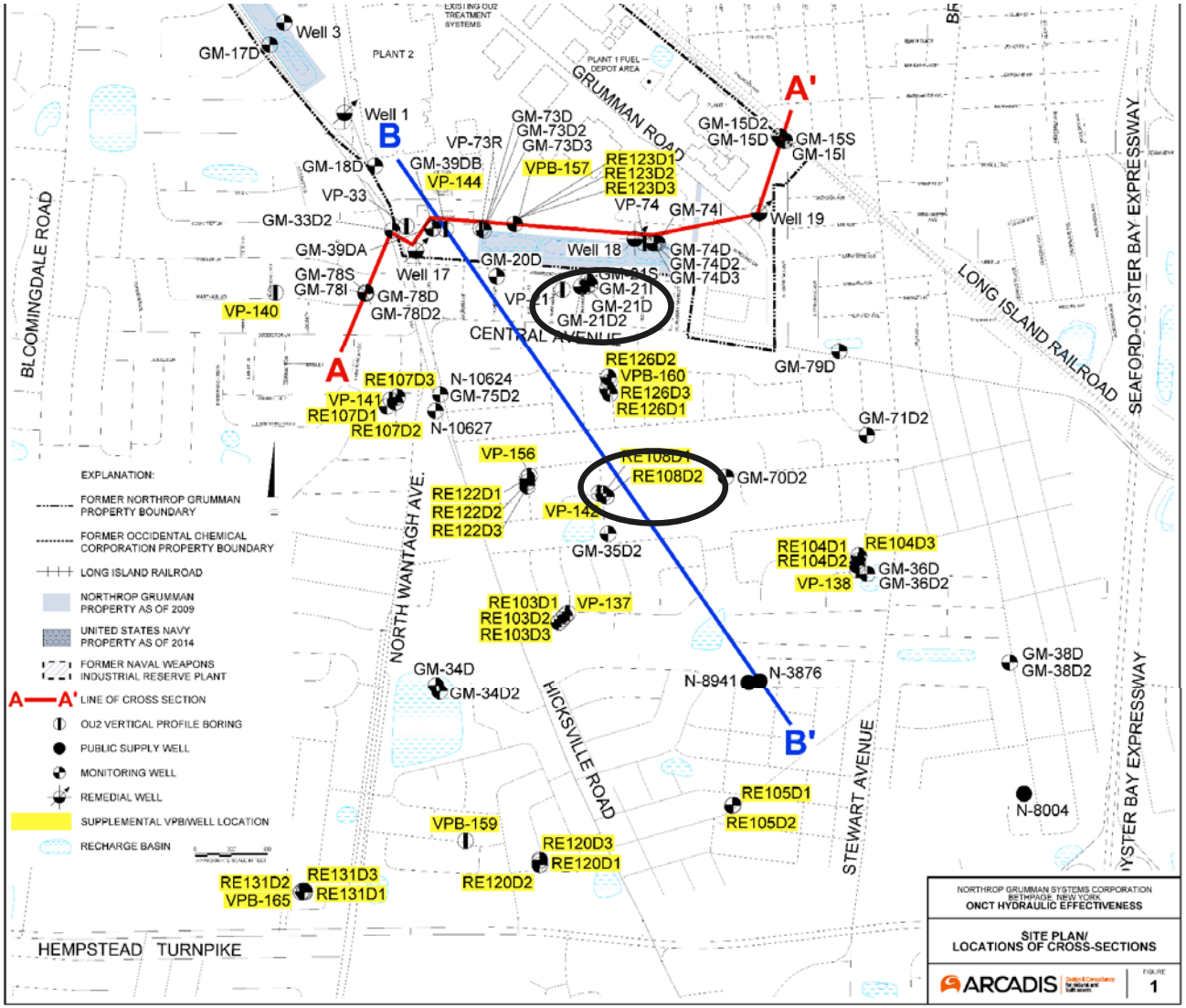
Cumulative TVOC Mass Removed, On-Site Groundwater Remedial System, Northrop Grumman Systems Corporation, Bethpage, New York



VOC Mass Removal ONCT (OU2)



Steady decreases in VOC mass recovery reflect improvements in onsite groundwater



NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK
ONCT HYDRAULIC EFFECTIVENESS

SITE PLAN/
LOCATIONS OF CROSS-SECTIONS

ARCADIS

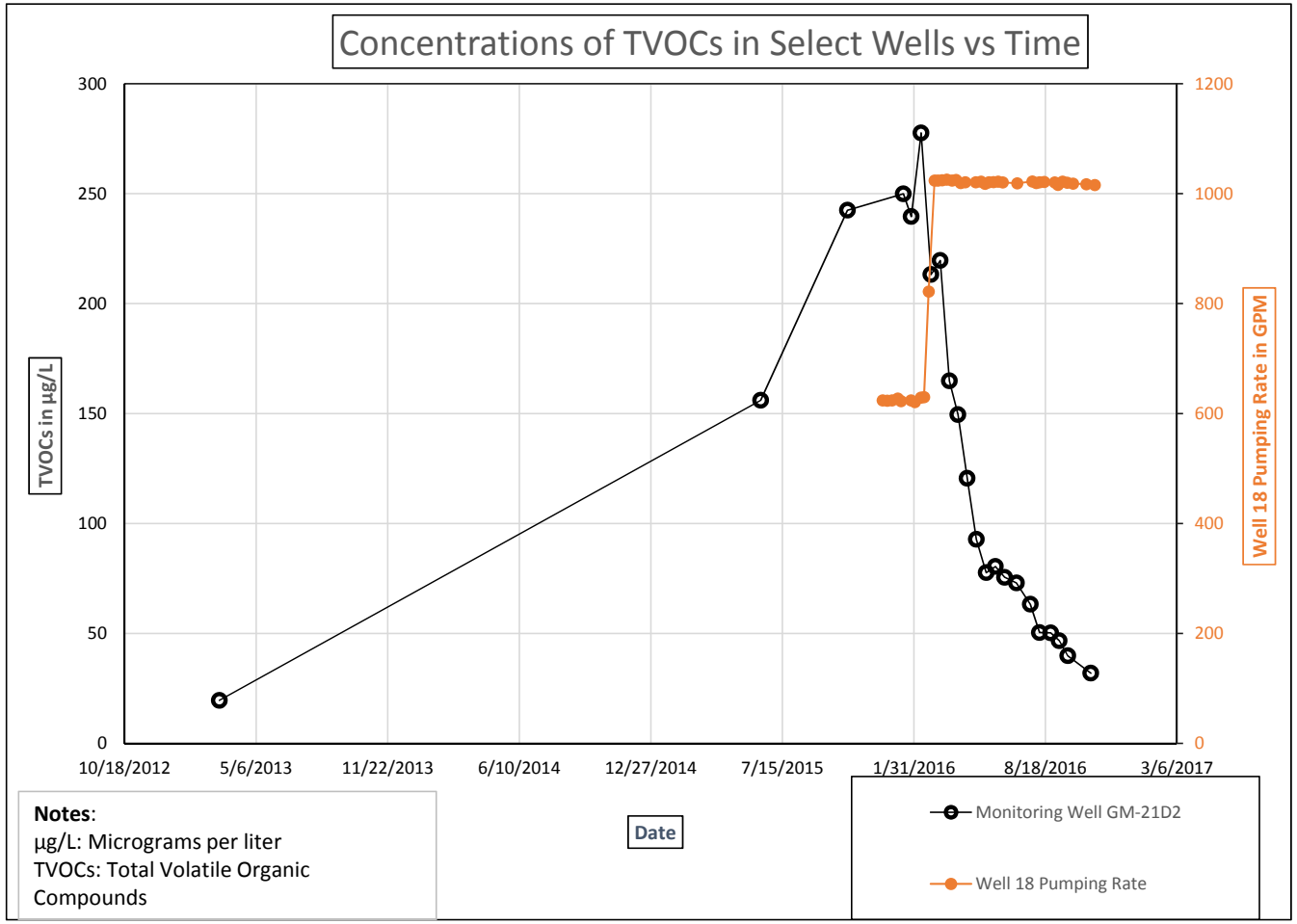
FIGURE
1

ARCADIS Design & Consultancy for natural and built assets

GM-21D2 Study

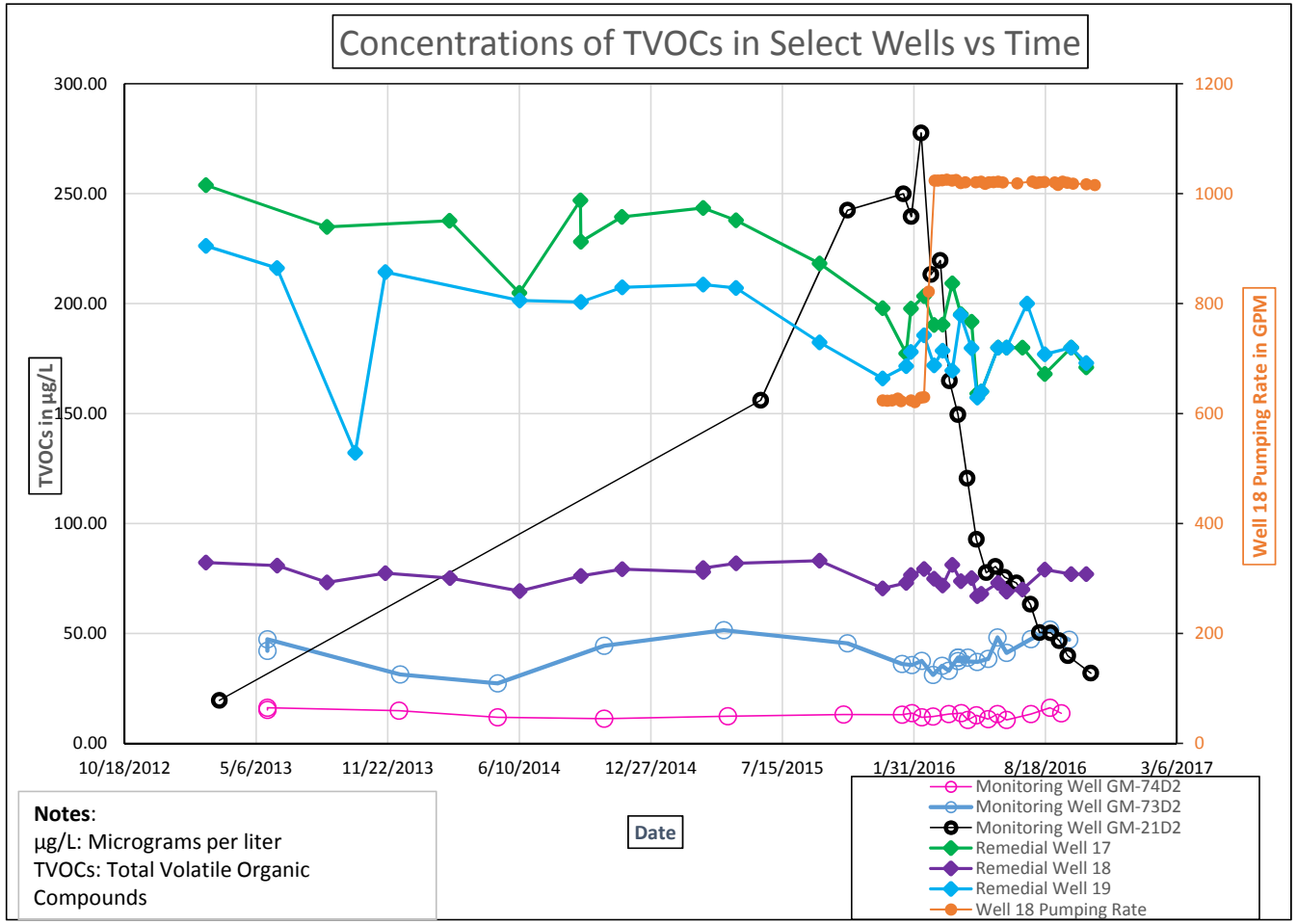
- Well GM-21D2 (January – October 2016)
  - GM-21D2 TVOCs continuing to decrease since February 2016
  - Since July 2016, rate of decline is less but still decreasing
  - Variability in GM-21D2 TVOCs inconsistent with nearby wells and is localized
  - GM-21D2 within ONCT capture zone
- Study results support continuing ONCT Effectiveness

TVOC Trends in GM-21D2



- TVOCs in GM-21D2 continuing to decrease since February 2016
- Since June 2016, rate of TVOC decline is less but still decreasing

TVOC Trends in GM-21D2/nearby wells

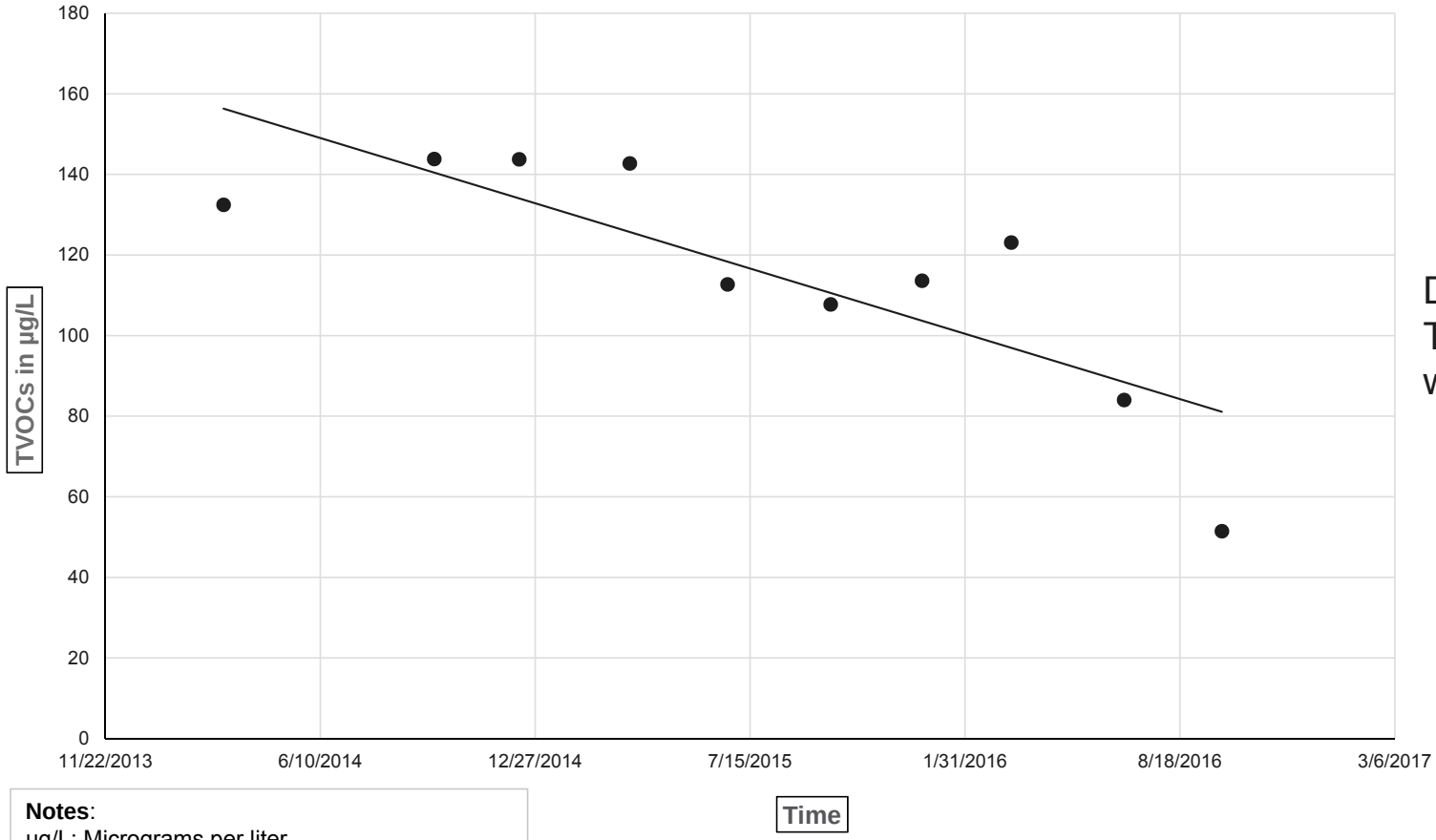


- TVOCs in GM-21D2 continuing to decrease since February 2016
- Since June 2016, rate of TVOC decline is less but still decreasing
- Water Quality Changes in GM-21D2 inconsistent with nearby wells and are localized
- GM-21D2 within ONCT capture zone

GM-21D2 – Continued Monitoring

- Plan for continued monitoring following study
  - Changes in monitoring frequency:
    - Return to quarterly for Remedial Wells 17, 18, and 19
    - Return to semiannually for Monitoring Wells GM-73D2 and GM-74D2
    - Adjust GM-21D2 from biweekly to monthly
  - Well 18 flow rate maintained at 1000 gpm at this time

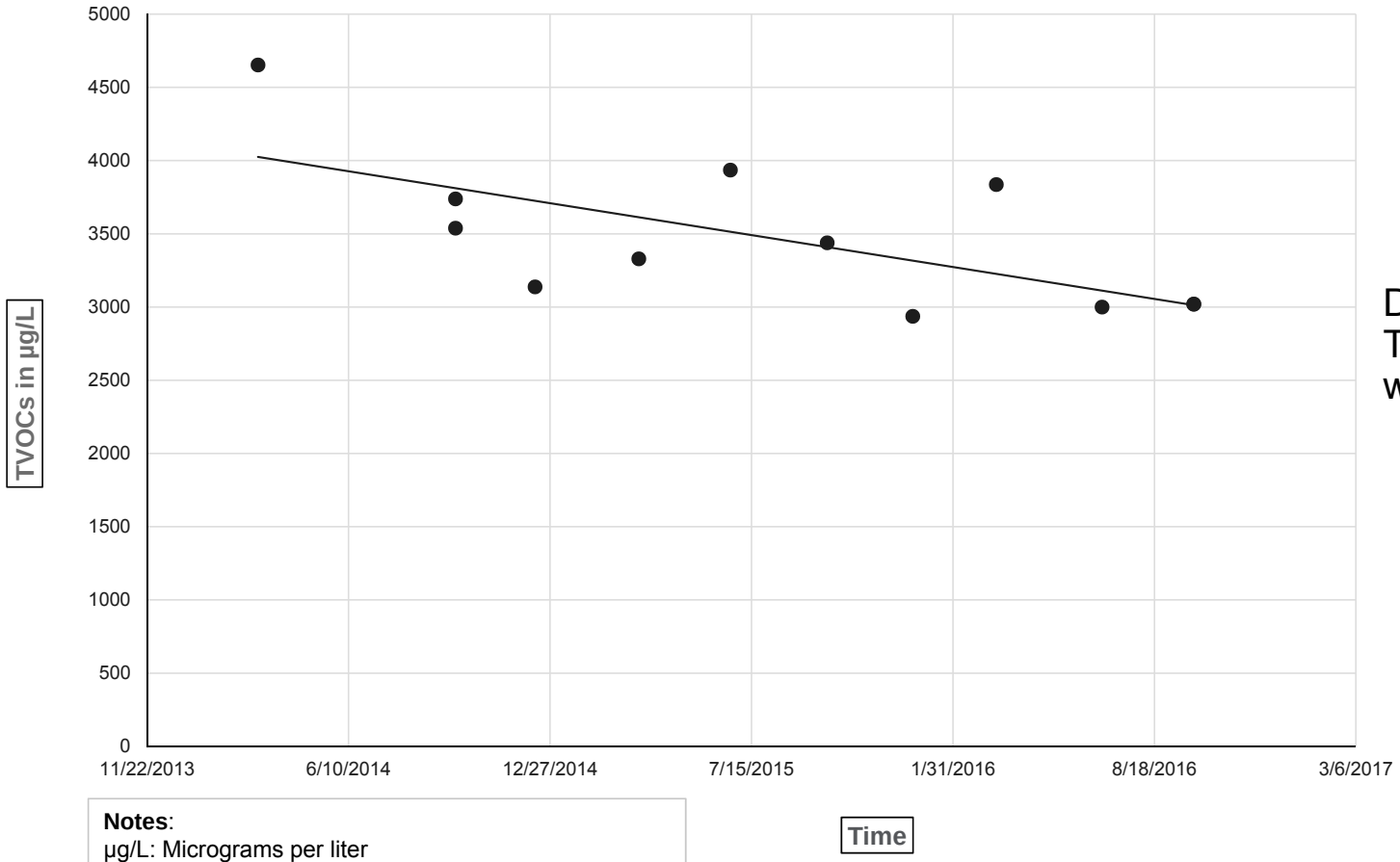
RE108 D1 TVOCs vs Time



Notes:
µg/L: Micrograms per liter
TVOCs: Total Volatile Organic Compounds

Declining trend of TVOCs at RE-108D1 well location

RE108 D2 TVOCs vs Time



Notes:
µg/L: Micrograms per liter
TVOCs: Total Volatile Organic Compounds

Declining trend of TVOCs at RE-108D2 well location

Groundwater Monitoring

- Summary of TVOCs and 1,4-dioxane results for 2Q-2016 by Hydrogeologic Zone (73 wells sampled)

Range of TVOCs and 1,4-dioxane in samples collected in Second Quarter 2016		
Hydrogeologic Zone	**Range of TVOCs (µg/L)**	**Range of 1,4-dioxane (µg/L)**
Shallow	ND - 6.6	ND - 7.34
Intermediate	ND - 49.0	ND - 4.2
Deep	ND - 160	ND - 8.63
Deep 2	ND - 460	ND - 10.9
Deep 3	ND - 67.0	ND - 4.54

Update on Northrop Grumman OU3 Activities

- Off-Site RW-21 Project Area
- OU-3 Activities (Park Soils)
- Other

RW-21 Project Area Overview

NYSDEC- approved, TOB permitted well

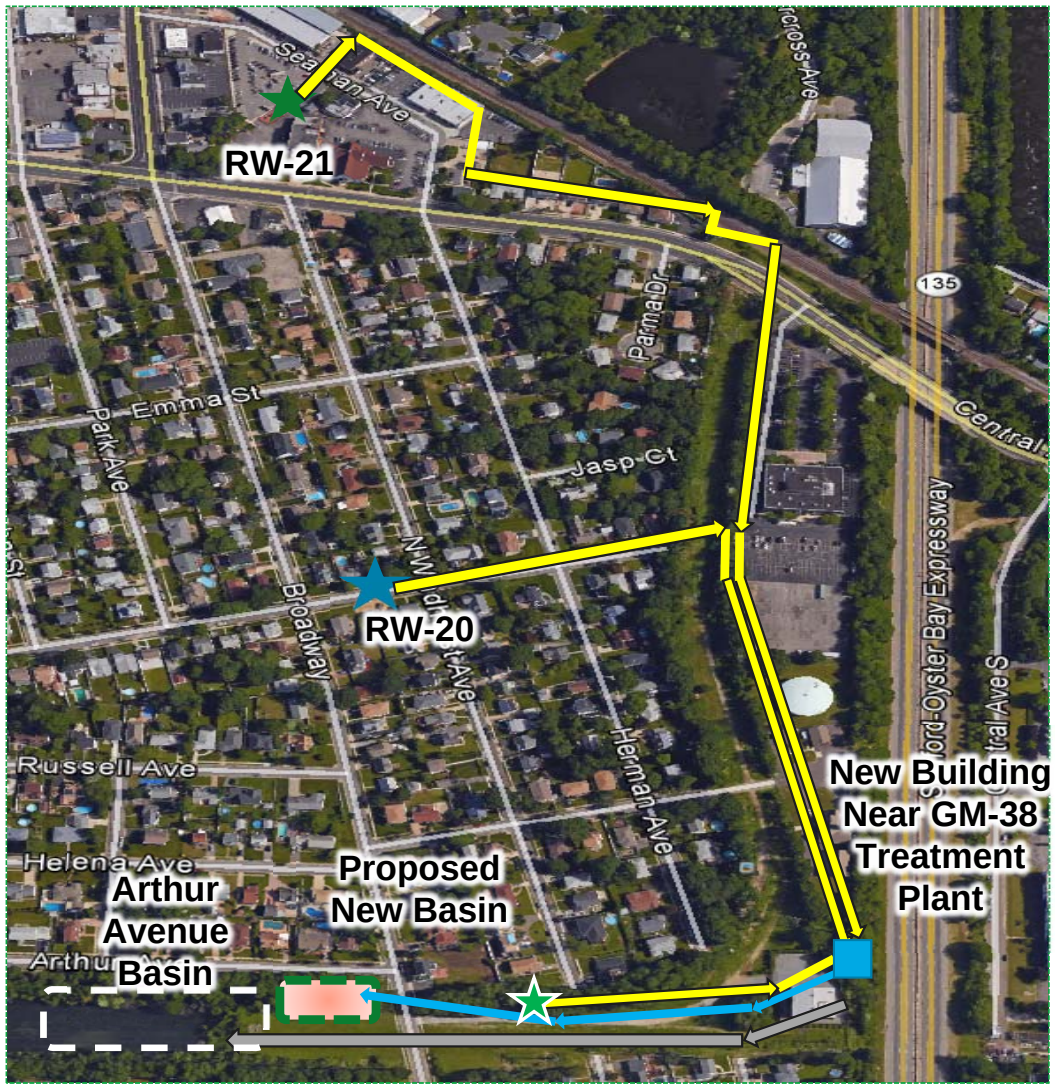
NYSDEC-approved, TOB permit-pending well

Proposed treatment building

Proposed buried treated water line and flow direction

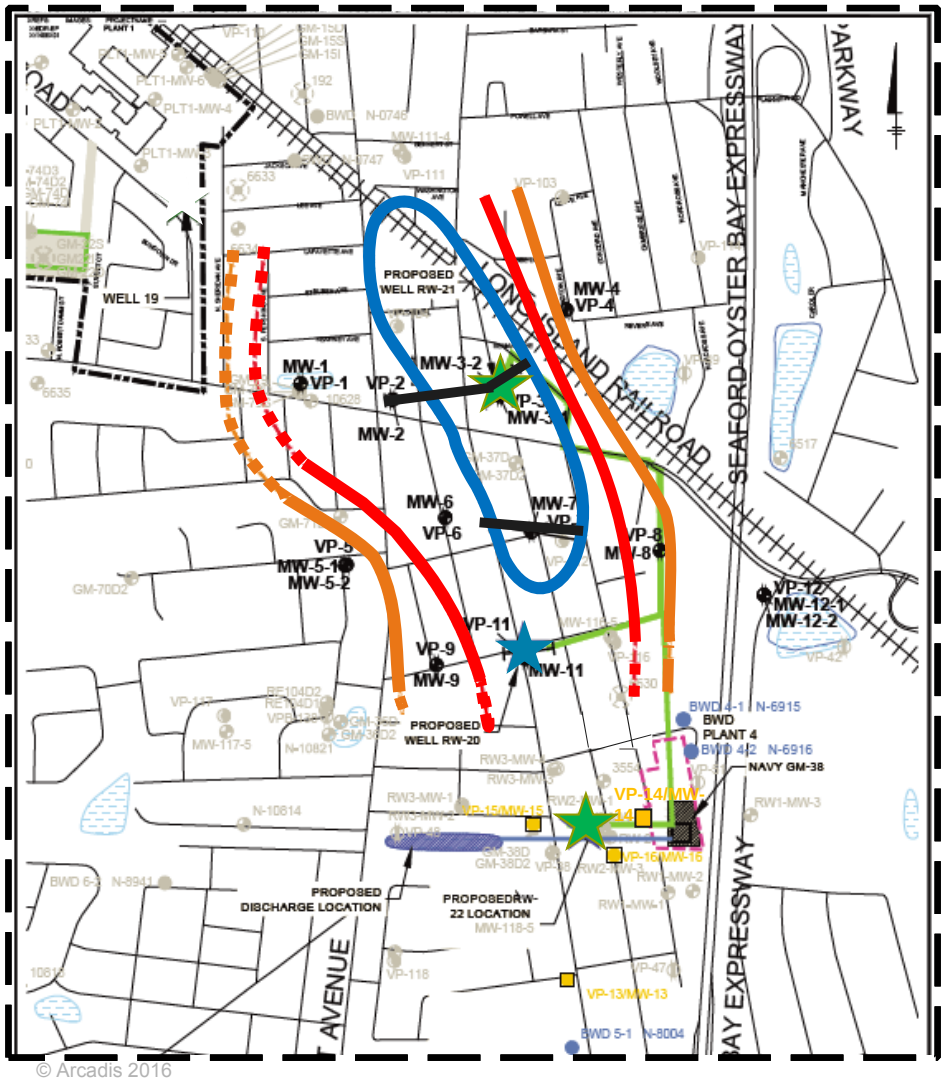
Proposed buried water line and flow direction

Existing Navy GM-38 buried treated water line and flow direction



Additional OU3 Activities (RW-21 Area Groundwater)

- Continue to communicate with residents and Town of Oyster Bay regarding upcoming work
- Remedial Well RW-20 approved by NYSDEC and waiting for TOB permit
- Remedial Well RW-21 installed and developed
- Remedial Well RW-22 installed and being developed
- VPBs 13, 14, 15 and 16 drilled/sampled
- MW 13, 14, 15 and 16 installed and sampled



ARCADIS Design & Consultancy for natural and built assets

RW-21 Project Area

- Width of Area of Highest VOC Mass Discharge
- Proposed Remedial Well
- Approved Remedial Well
- Approved Boring/Monitoring Well

Plume Contours, ug/L

- 500
- 1,000
- 5,000

Key Elements of the RW 21 System

Three Groundwater Remedial Wells	• Below-ground vaults for wells installed to extract groundwater • Groundwater pumped to treatment system in buried pipes
Treatment System	• Removes contamination from the groundwater • Includes water and air treatment, and other required equipment
Discharge Pipe	• Clean water from treatment system pumped to new recharge basin near Arthur Avenue or to the existing basin on Arthur Avenue

Additional OU3 Activities

- Hydraulic Effectiveness Study
  - Inspected two offsite wells, plan to abandon and replace
  - Drill additional VPBs and MWs as a follow up to first phase
- Residential Properties