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Site Status Update

June 10, 2009

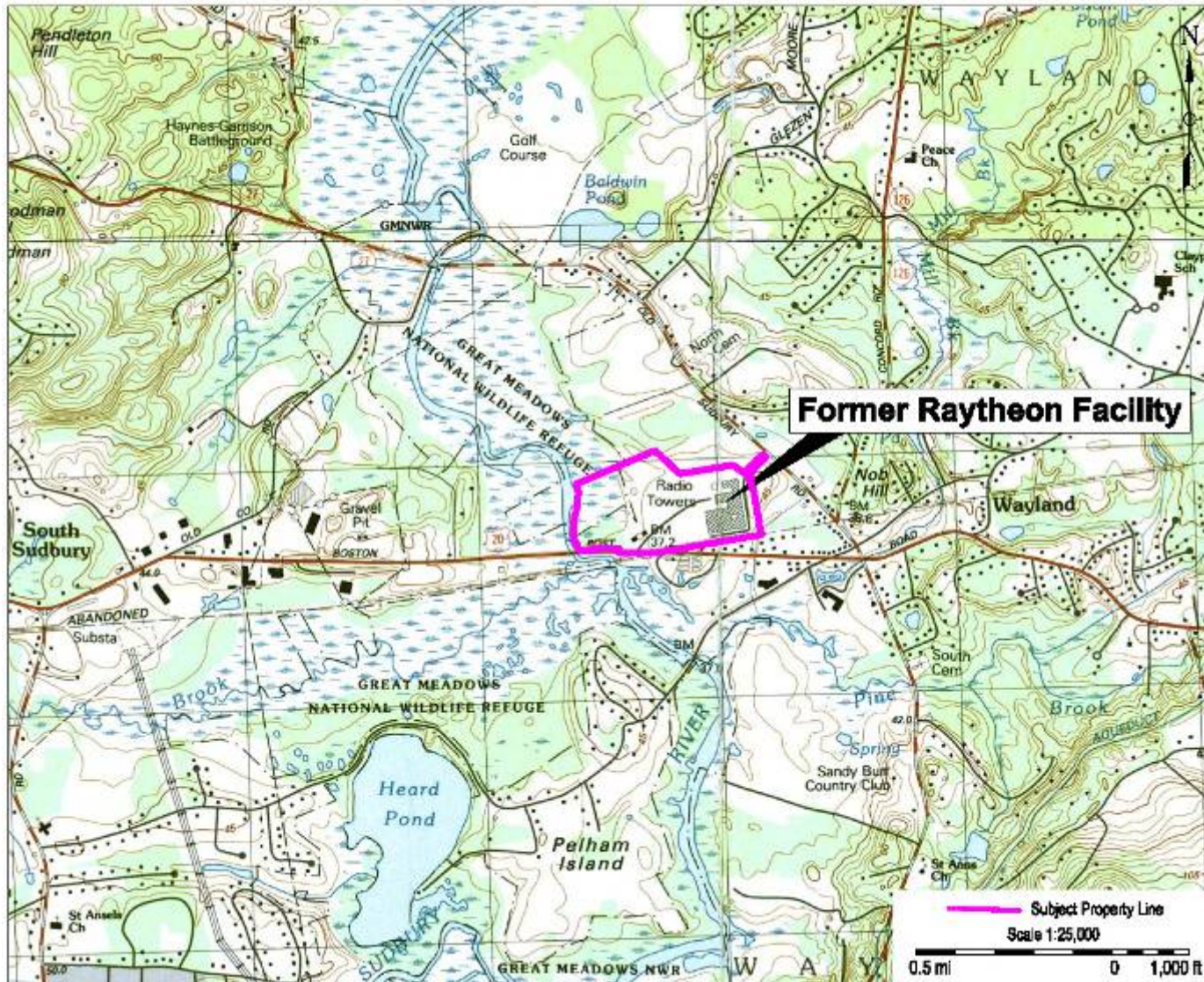
**Former Raytheon Facility
Wayland, Massachusetts**

Presented by:

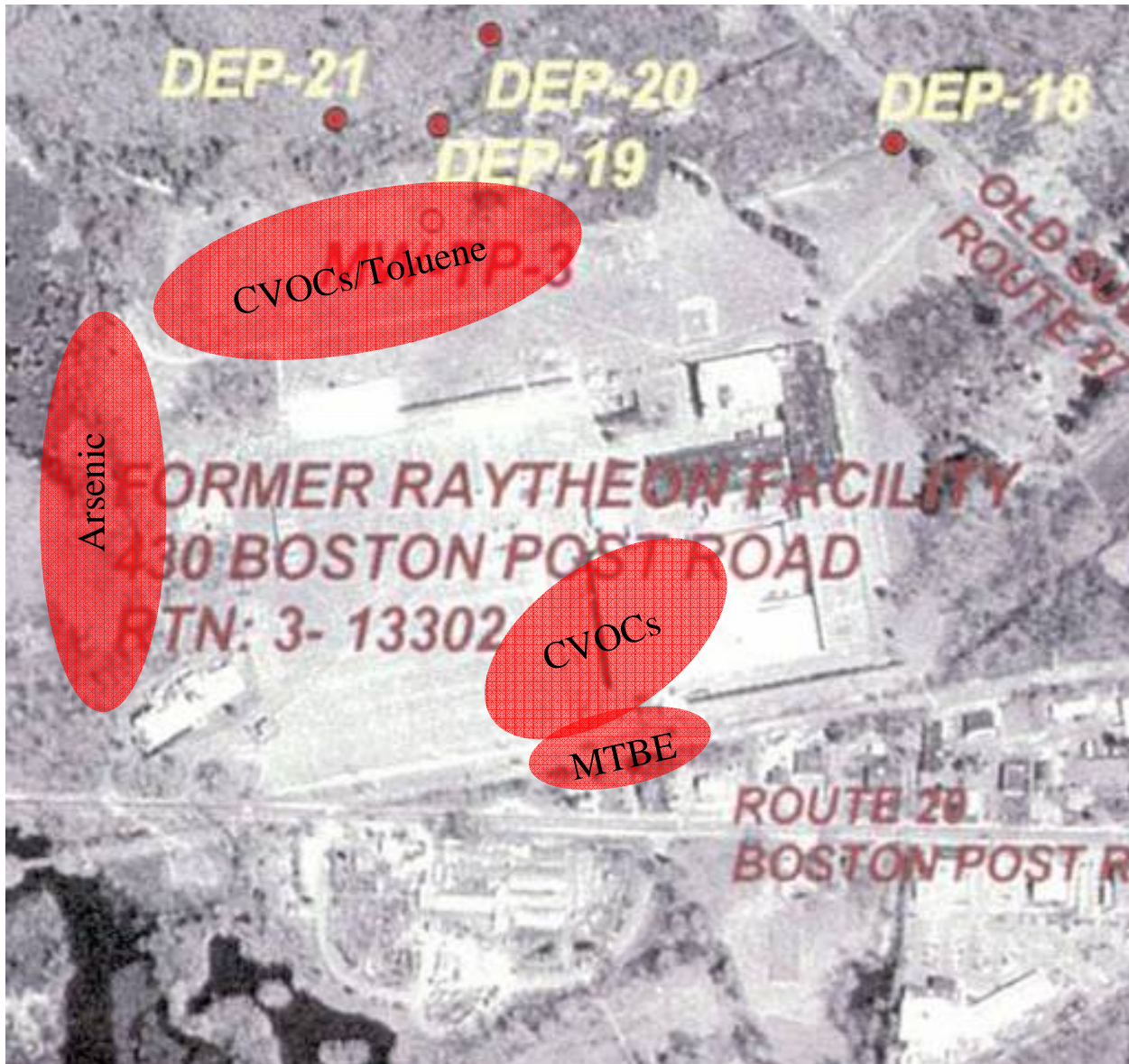
Louis “Chip” Burkhardt, P.G. –
Raytheon

Outline

- Update on Site Activities
 - Northern Area Bioremediation
 - Injection Well Installation
 - November 2008 Injection
 - General Site Activities
 - Site-wide groundwater gauging and sampling
 - Wetland Monitoring
 - RTN Linking – 3-22408 linked to 3-13302
- Question and Answer Period



Compounds of Concern



Compounds of concern encountered:

- Chlorinated Volatile Organic Compounds (CVOCs)
- Toluene
- Arsenic (RAO-P - Submitted)
- Methyl Tertiary Butyl Ether (DPS - Submitted)



**Wetlands Remediation
and Restoration
Completed**

**Northern Area Source Area Soil
Excavation Completed &
Groundwater Remediation
Conducted**

**Groundwater
Remediation
Conducted**

Northern Area Bioremediation

Enhanced Reductive Dechlorination

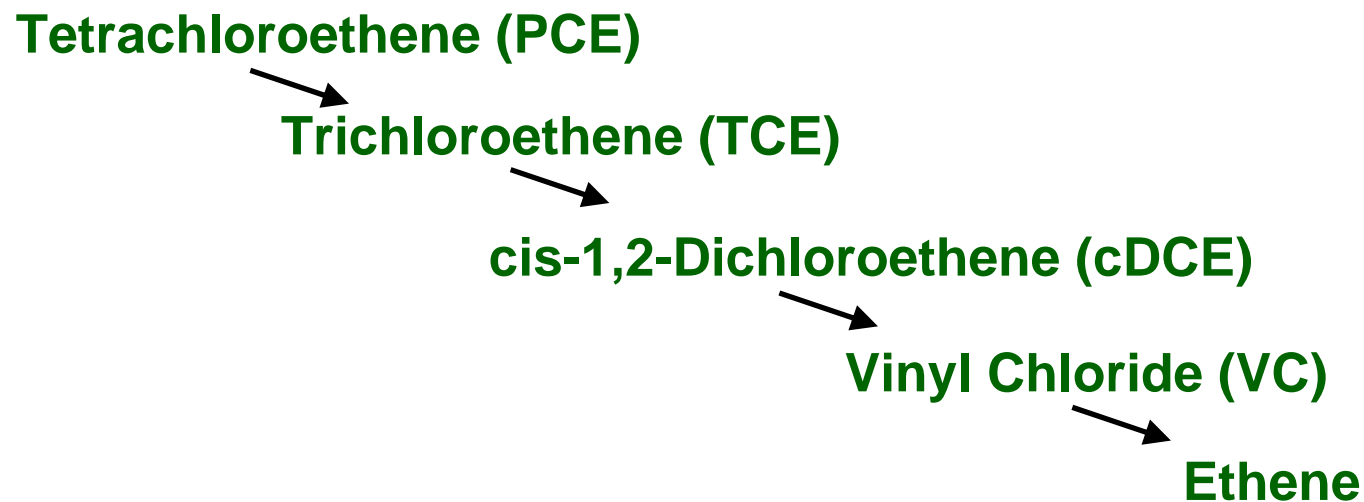
Northern Area Bioremediation



Groundwater Remediation

Enhanced Reductive Dechlorination

- Use sodium lactate to provide carbon source to naturally occurring microbes in subsurface to jump-start metabolic processes
 - Reductive Dechlorination: Process by which a consortia of microbes remove chlorine atoms from chlorinated solvents until all that is left is harmless ethene gas



Northern Area Bioremediation

- 6 additional injection wells installed in November 2008
 - IW-9, -10, -11, -12, -13, -14, -15
- Strategy
 - Placed in 2 transects of 3 wells each between existing transects
 - Screened in same geologic unit as existing IWs

Northern Area Bioremediation

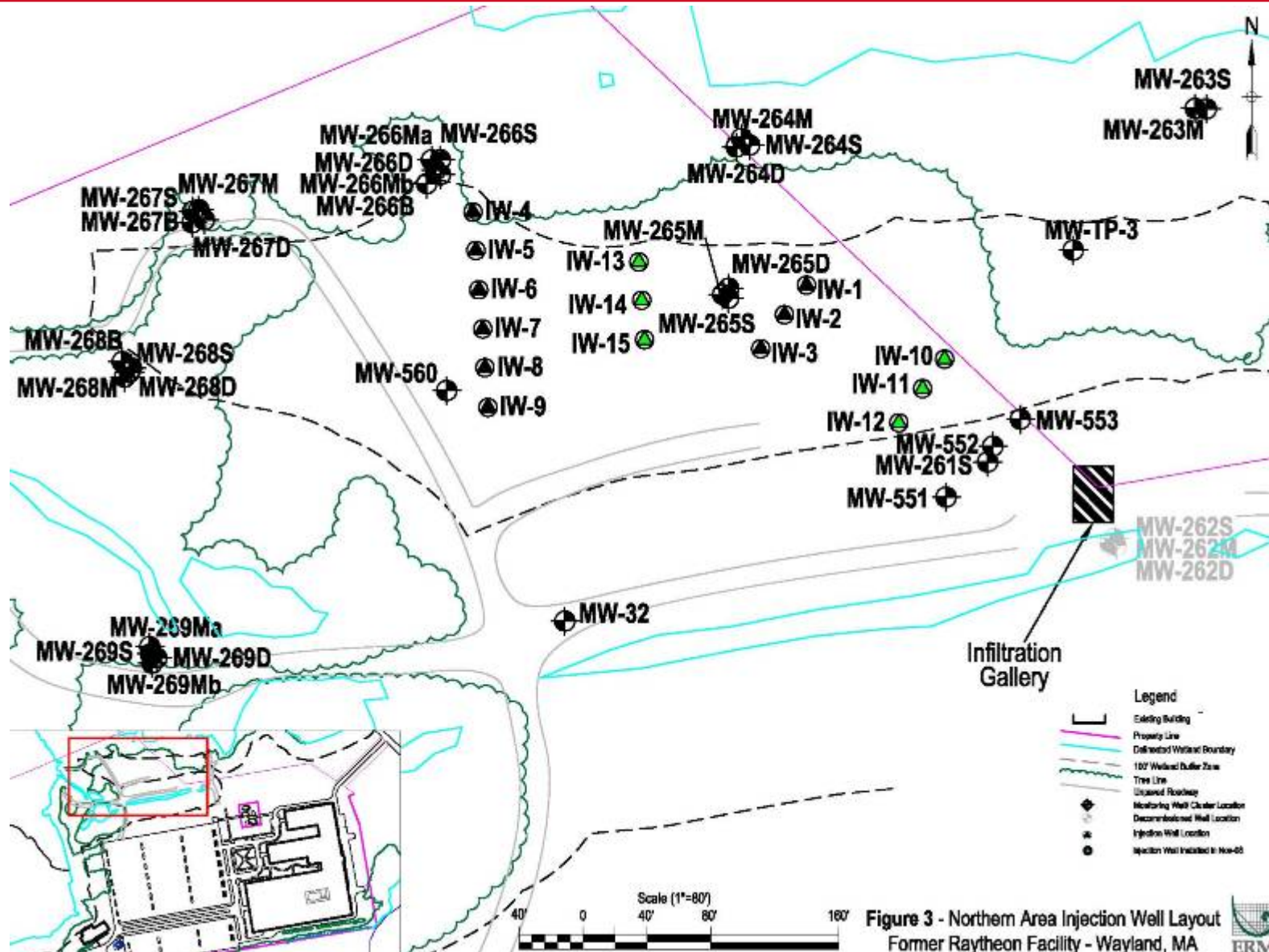


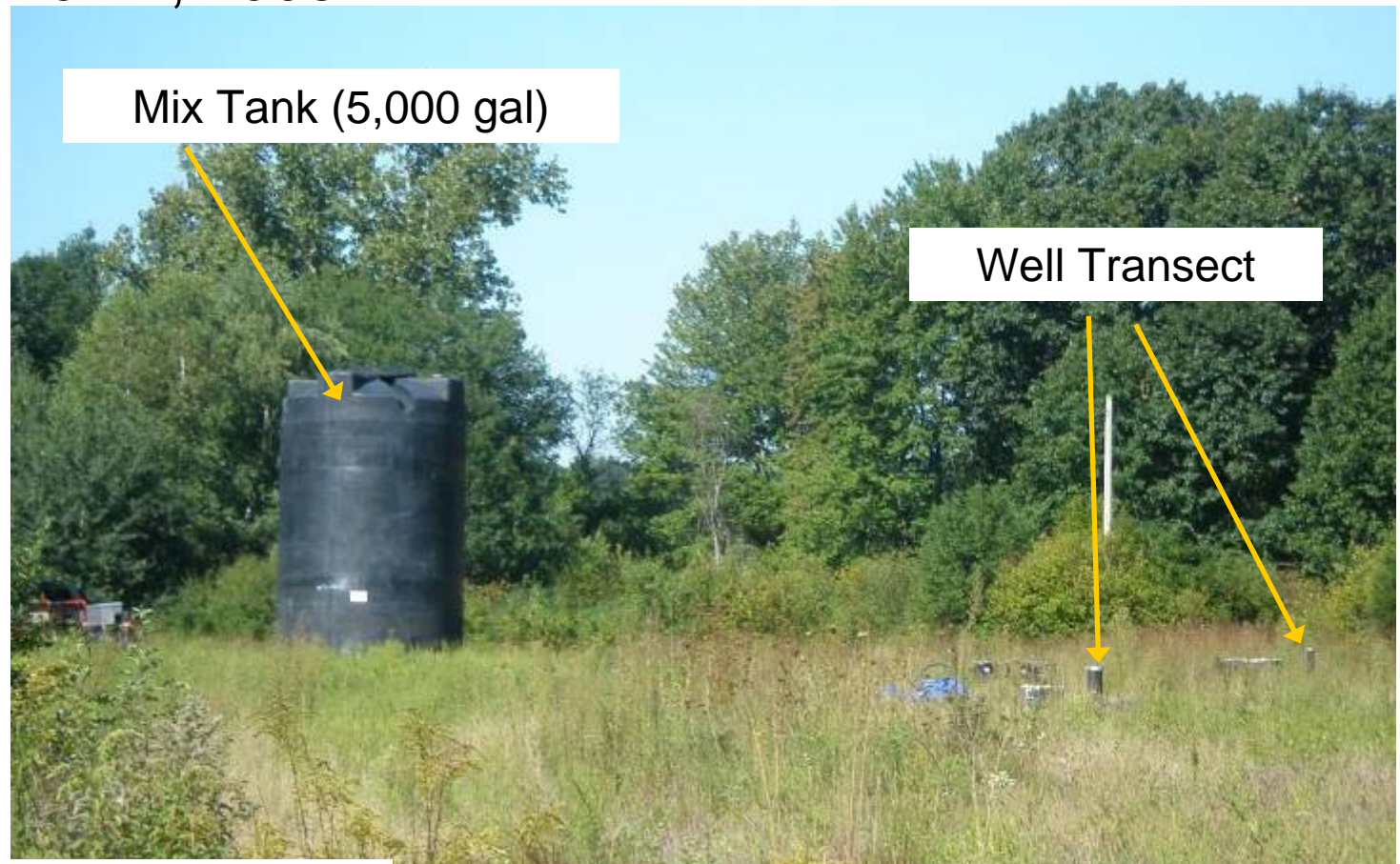
Figure 3 - Northern Area Injection Well Layout
Former Raytheon Facility - Wayland, MA



Northern Area Bioremediation

Sodium Lactate Injection

- Approximately 9,000 gallons of sodium lactate injected from November 19-21, 2008



* Photograph from Aug/Sep 2008 Injection

Northern Area Bioremediation

- Applied approximately 1,500 gallons per injection point
- Typical injection parameters similar to Aug/Sep Injection
 - Flow rate = 3 – 6 gpm
 - Pressure = 5 – 15 psi (supplied via centrifugal pump)

Northern Area Bioremediation

Performance Monitoring Program

■ Geochemical Parameter Monitoring

- Measure temperature, conductivity, dissolved oxygen concentration, pH, and oxidation-reduction potential in the field
- Monthly monitoring conducted through February 2009

■ Groundwater Sampling Program

- Quarterly Monitoring
 - Samples collected for analysis of a suite of chemicals and parameters (CVOCs, dissolved metals, dissolved gases, etc.)
 - Conducted in February and April 2009

Northern Area Bioremediation

Monitoring Results

- Lactate solution delivery
 - Solution is migrating out of injection wells
 - Solution detected in MW-560
- Subsurface conditions are favorable for bioremediation
 - In areas that are close to injection wells
- Still early in program

Going Forward

- Injection Planned for Summer 2009

Update on Site Activities

Groundwater Gauging & Monitoring

Site-Wide Groundwater Monitoring

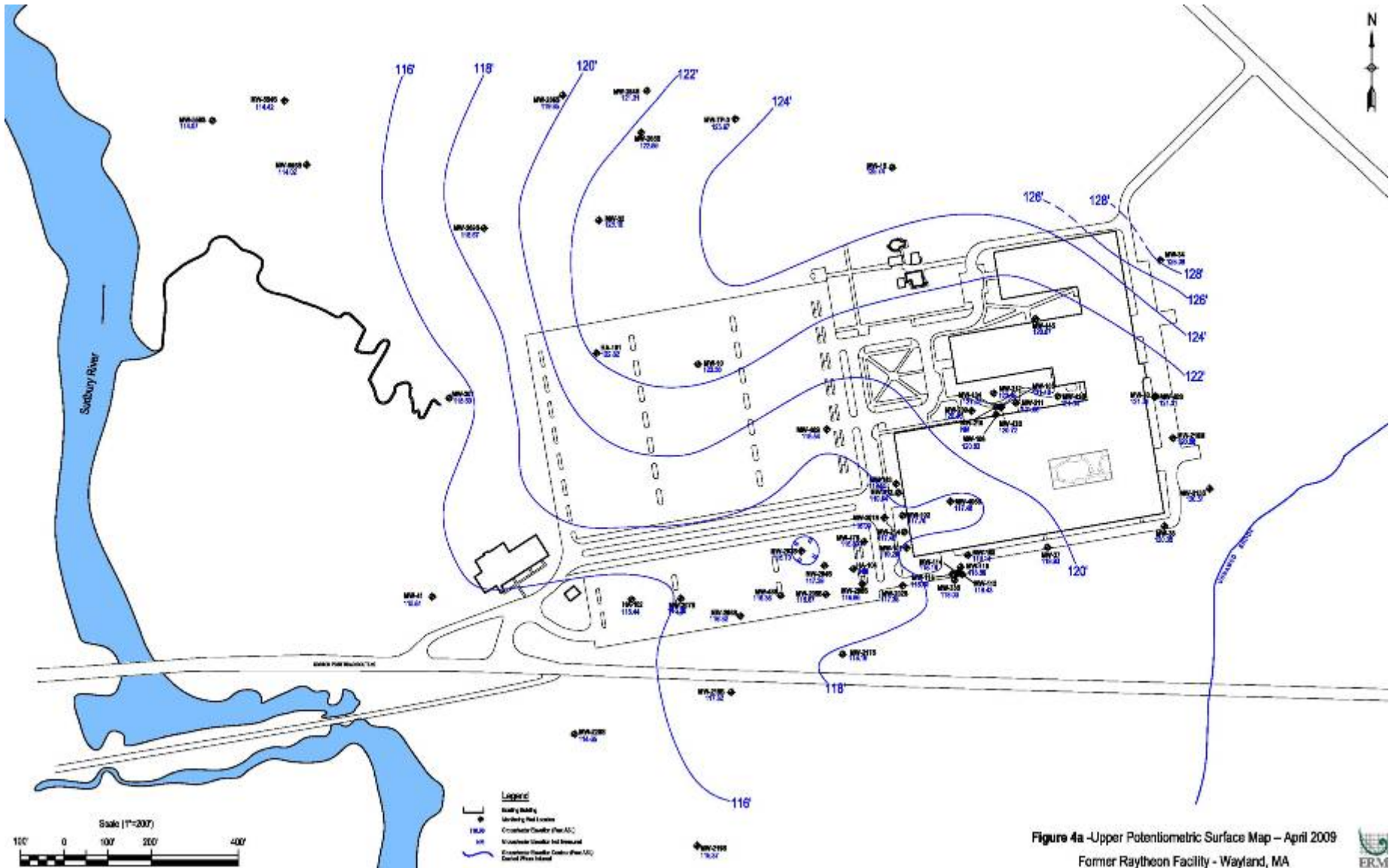
Groundwater Gauging

- Site-wide gauging round conducted on April 13, 2009
 - Water levels measured in > 90 monitoring wells

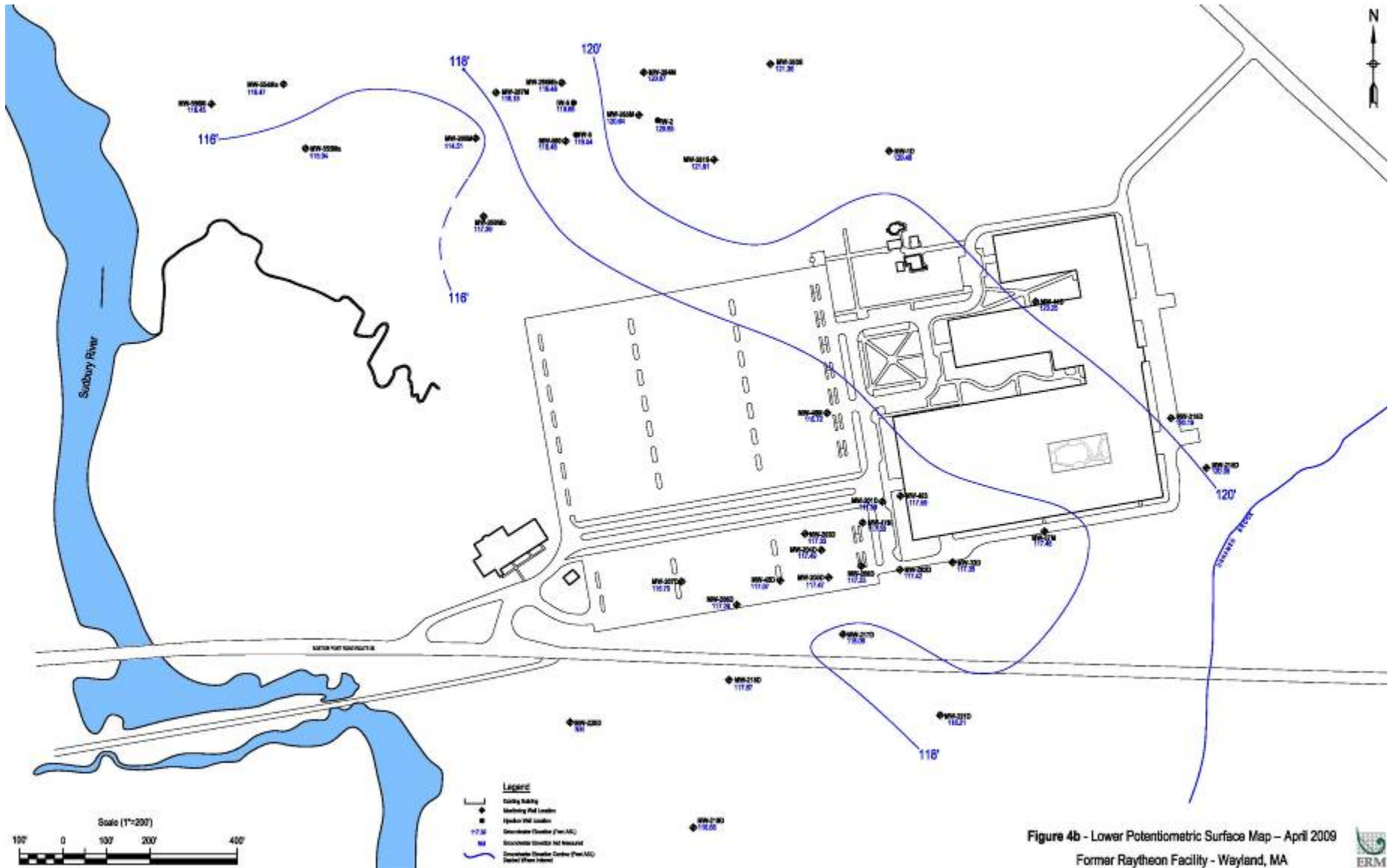
Groundwater Quality Monitoring

- Quarterly monitoring rounds conducted concurrently with Northern Area program in February and April 2009
 - Monitoring data summarized in Remedy Operation Status Submittal

Site-Wide Groundwater Monitoring



Site-Wide Groundwater Monitoring



Site-Wide Groundwater Monitoring

■ 1,4-Dioxane - Background

- On February 15, 2008 the DEP lowered the Reportable Concentration (RCGW-1) for 1,4-Dioxane in groundwater from 1,000 µg/L to 3 µg/L
- Historically used by manufacturers to stabilize solvents (e.g., TCE)
- Given the delineated CVOC concentrations on Site, Raytheon decided to collect samples for 1,4-Dioxane analysis

■ Investigation Program

- 12 wells selected based on 2008 monitoring data
- 3 samples from Southern Area – all below 3 µg/L
- 9 samples from Northern Area – 4 samples greater than 3 µg/L

Site-Wide Groundwater Monitoring

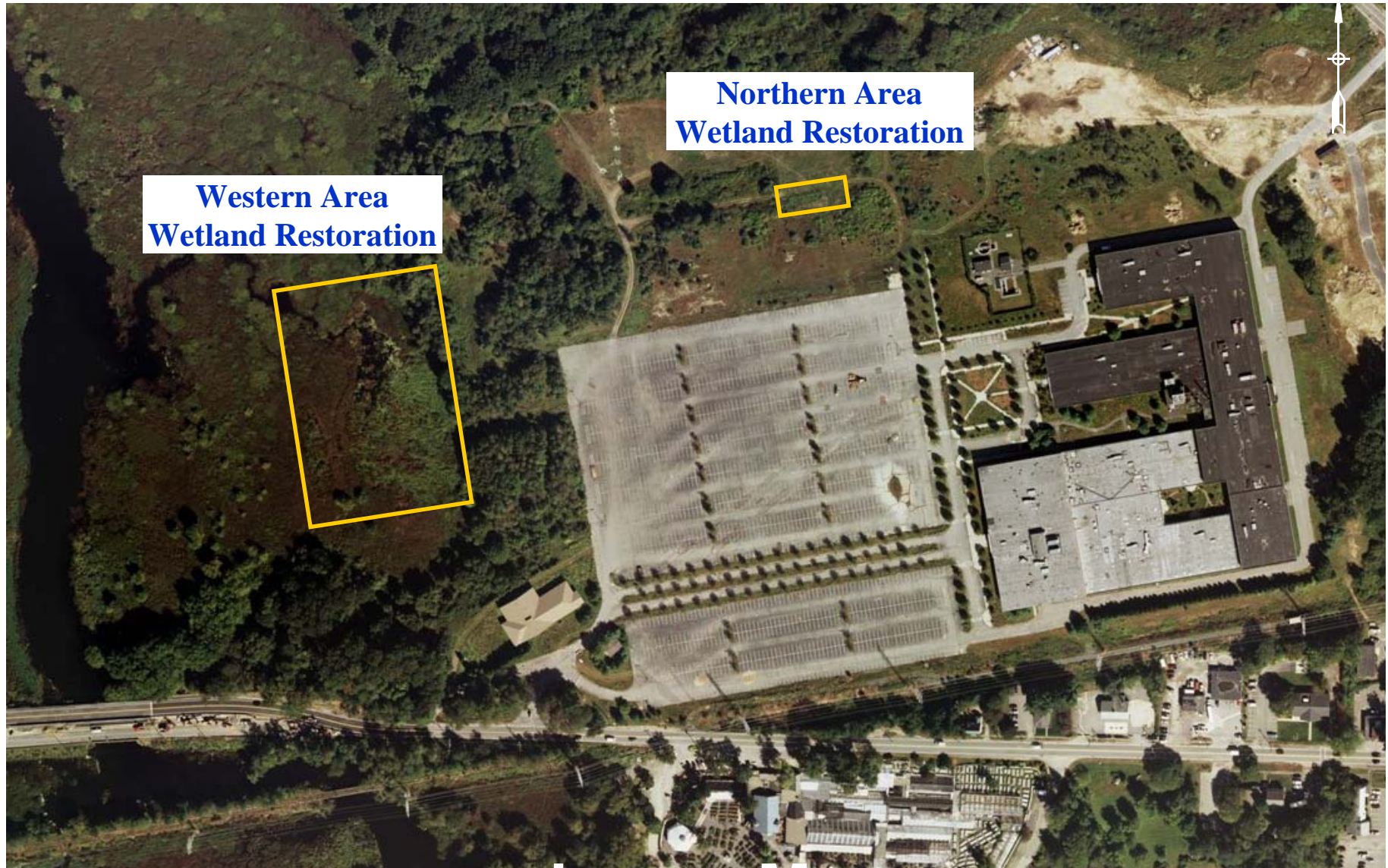
■ Analysis and Response

- Northern Area detections ranged from 6.46 µg/L to 28.2 µg/L
- As with 2008 data, the exceedances of the RCGW-1 standard occurred in wells with the highest CVOC concentrations
- A Release Notification Form is not required because the data suggest 1,4-dioxane was released with the chlorinated solvents already covered under RTN 3-22408
- Monitoring to continue

Update on Site Activities

Wetland Monitoring

Wetland Monitoring



Wetland Monitoring

Western Area Wetland

- Restoration project associated with 2003 Wetland Remediation activities
- 2008 marked the final year of monitoring required by the Order of Conditions
- Request for Certificate of Compliance was submitted to the Wayland Conservation Commission on January 30, 2009

Wetland Monitoring

Northern Area Wetland

- Restoration project associated with 2007 Source Area Soil Excavation
- Monitoring rounds to be conducted in 2009
 - Second year of 3-year monitoring program
- 2009 Annual Wetland Monitoring Report will be submitted in December 2009

Linking RTN 3-22408 to RTN3-13302

RTN Linking

- RTN 3-22408 January 16, 2003
 - Release conditions:
 - CVOCs in Northern Area soil and groundwater
 - Toluene in Northern Area groundwater
 - MTBE in Southern Area groundwater
 - Arsenic in Western Area groundwater
 - Kept separate from existing RTN (3-13302) in order to prevent interruption of ongoing remediation

- Both RTNs are now in Remedy Operation Status
- All site activities now managed under one RTN: 3-13302

PIP Schedule

- Public comments on Draft Phase IV Completion Report due in writing by December 8, 2008:
 - Louis “Chip” Burkhardt
 - Raytheon Company
 - Mail Stop T-3033
 - 880 Technology Park Drive
 - Billerica, MA 01821
 - (978) 436-8238
- Raytheon will continue to make documents available at the information repositories (Public Library and Board of Health) and extranet web site
www.ermne.com; username – raytheon; password – wayland
- Next PIP meeting is likely to be scheduled in Fall 2009

Q & A