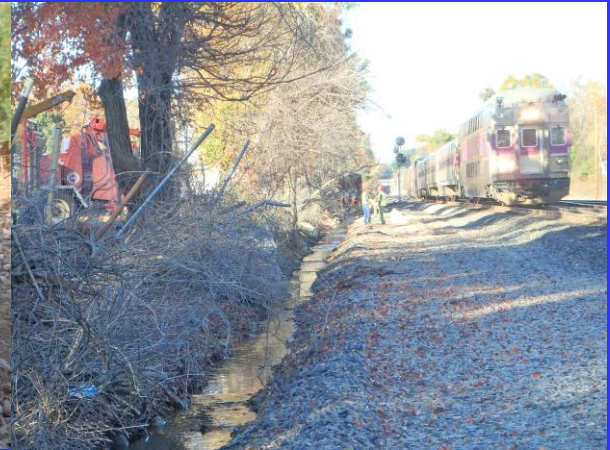


Nyanza Chemical Waste Dump Superfund Site – Operable Unit 2 Public Meeting/Hearing January 23, 2020



Agenda

- Site History
- Overview of Nyanza Operable Units, Site Features.
- Operable Unit 2 (OU2) – background, remedial work completed.
- Remedial Alternatives Evaluated for OU2.
- Outline of EPA's Proposed Remedy for OU2.
- Potential Site Challenges.

Site History

- Manufacturing operations: Textile dyes, dye intermediates.
- Several companies operated on the Megunko Rd. property from 1917 to 1978, (*including the former Nyanza, Inc.*).
- Chemical wastes were disposed on the property in lagoons, a vault, and on Megunko Hill (now the capped landfill).
- Manufacturing wastewater discharged to adjacent wetlands, Trolley Brook, Chemical Brook and Sudbury River.
- Site added to the National Priorities List (NPL) on December 30, 1982.
- Several removal and remedial actions have been performed for the Site from 1987 through 2016.

Nyanza Operable Units

- OU1 - On-site Soil Remediation/capping
 - Remedial work completed.
 - State Operations & Maintenance (O&M).

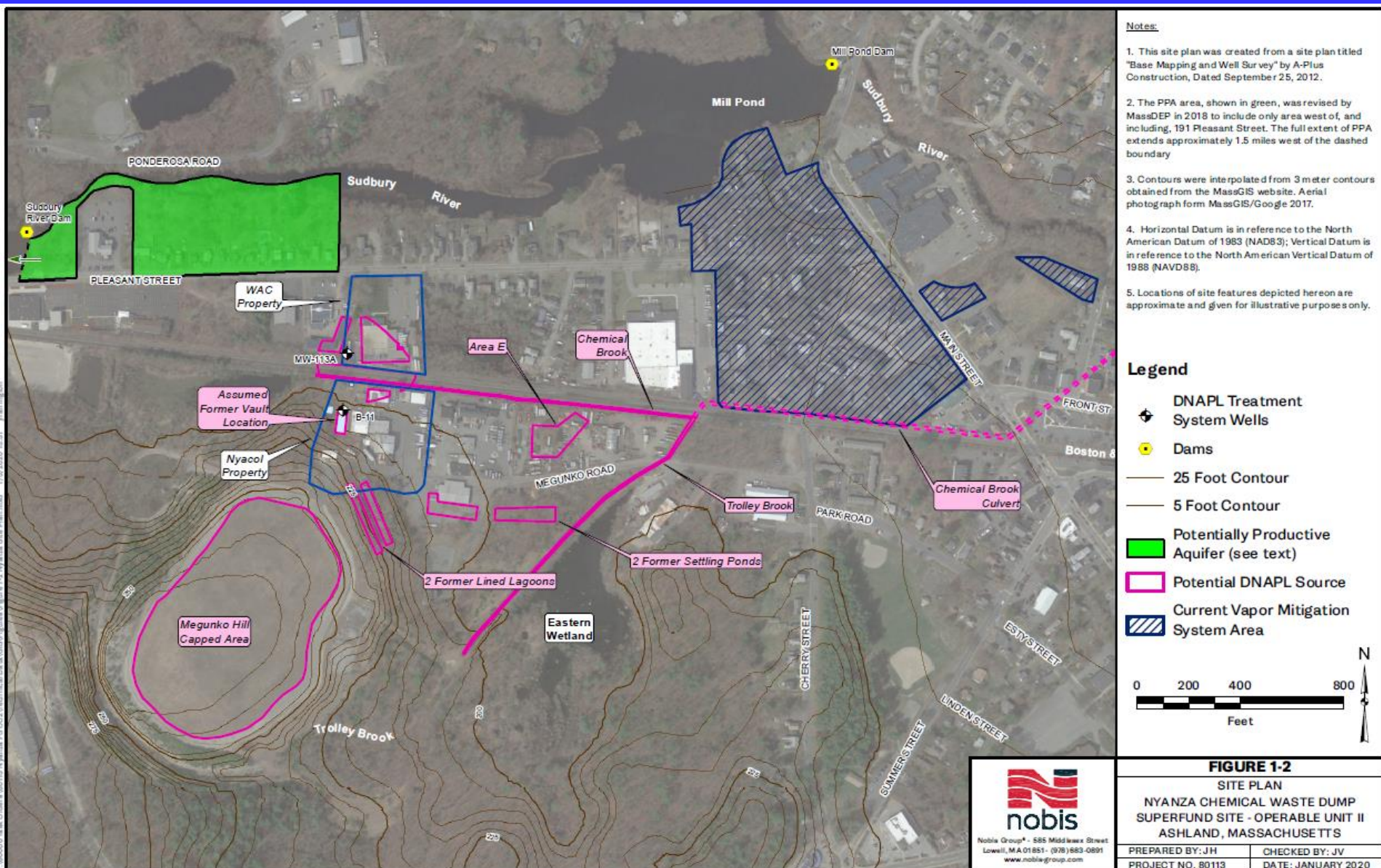
- **OU2 - Groundwater Contamination ****
 - Interim remedial work completed.
 - Interim State O&M in progress.

- OU3 -Eastern Wetlands/Trolley Brook
 - Remedial work completed.
 - State O&M in progress.

- OU4 - Sudbury River
 - Remedial work completed.
 - State O&M in progress.

*** Focus of the Proposed Plan.*

Site Overview



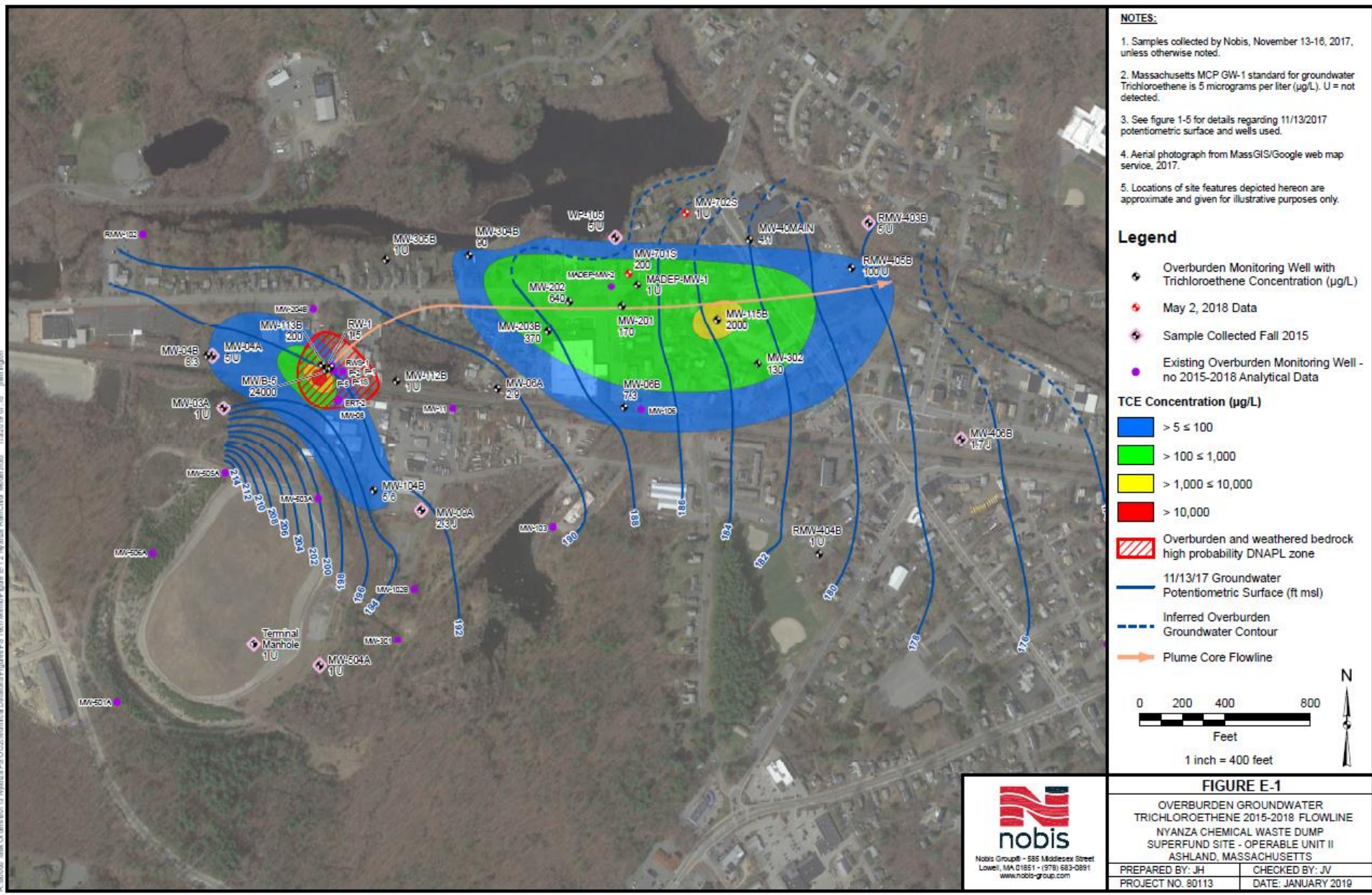
Site Contaminants of Concern

- Volatile Organic Compounds (VOCs) in Groundwater:
 - **Trichloroethene (TCE)**
 - cis-1,2-dichloroethene (cis-1,2-DCE)
 - vinyl chloride
 - 1,4-Dichlorobenzene (1,4-DCB)
 - 1,2-Dichlorobenzene (1,2-DCB)
 - Chlorobenzene
 - Trichlorobenzene (1,2,4-TCB)
- Semi-Volatile Organic Compounds (SVOCs) in Groundwater:
 - Nitrobenzene
 - Naphthalene
- Mercury (in soil, sediment, Sudbury River fish tissue)

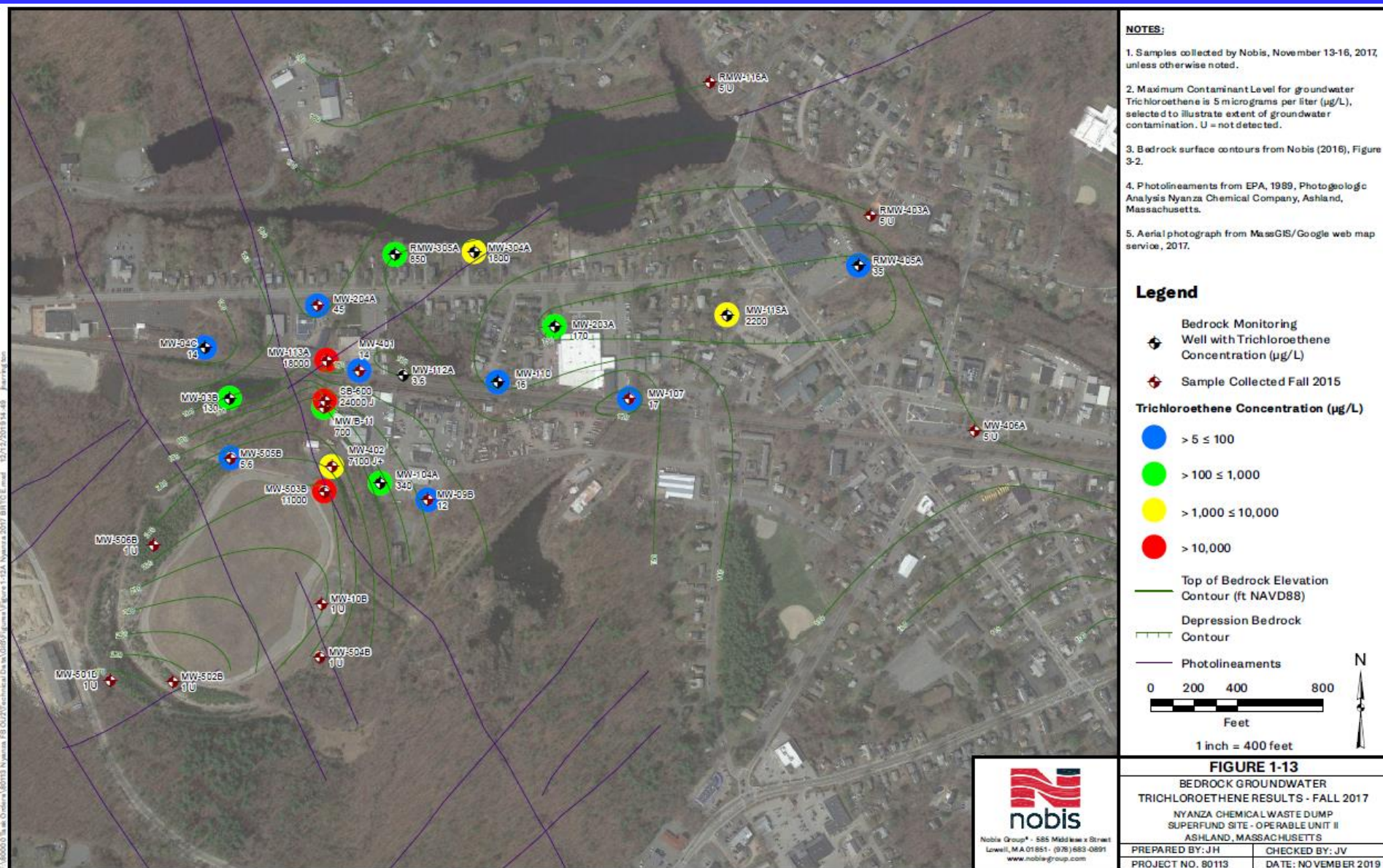
OU2 - Groundwater

- DNAPL (mix of residual chemicals/contaminants) was discovered at the Site in 1994, and contributes to groundwater contamination.
- A plume of dissolved VOCs in groundwater originates from contaminant source areas at the Site.
- Groundwater flows north/northeast toward Sudbury River, below downtown Ashland.
- Groundwater contaminants (such as TCE) create a vapor intrusion (VI) risk in buildings above the plume:
 - Vapors can migrate through soils into indoor air (i.e. basements and first floors).
 - EPA installed vapor mitigation systems in 41 buildings to address VI risk.

Overburden Aquifer TCE Concentrations



Bedrock Aquifer TCE Concentrations



OU2 Remedial Work

- 1991 Interim Record of Decision (ROD).
- 1998-2004: Semi-Annual Groundwater monitoring.
- 1998 - 2004: Voluntary Indoor Air Monitoring Events
- 1999 – 2003: Ecological risk evaluation of the groundwater VOC plume on the Sudbury River.
- 2005: Human health risk assessment for indoor air.
- 2006: Explanation of Significant Differences (ESD):
 - Expansion of monitoring well network.
 - 41 vapor mitigation systems installed in buildings over the plume.
 - 2 DNAPL extraction systems installed.

OU2 Remedial Work (con't)

- 2013: Installation of two “pilot” DNAPL extraction wells:
 1. On Worcester Air Conditioning (WAC) property, (*Pleasant Street, north of the railroad tracks*).
 2. On Nyacol property, (*west end of Megunko Road*).
- 2014 - 2018: Expanded indoor air sampling in residential and commercial buildings without vapor mitigation systems.
- 2018 - 2019: Feasibility Study completed to evaluate remedial alternatives for a final remedy and ROD for OU2.
- 2020: Prepared a Proposed Plan for OU2.

OU2 Proposed Plan

- EPA prepared a Proposed Plan for a final remedy and ROD for Operable Unit 2 based on many factors, including:
 - Successful results from the 2 pilot DNAPL extraction systems;
 - Residual groundwater VOC concentrations which remain elevated;
 - Vapor intrusion risk and risk of exposure to shallow groundwater (particularly for TCE).
 - Goal to eliminate the need for vapor mitigation systems in existing or new buildings.
- A total of 9 remedial alternatives were proposed, and 6 alternatives were selected for evaluation in more detail.

Areas of Concern (AOC) for OU2

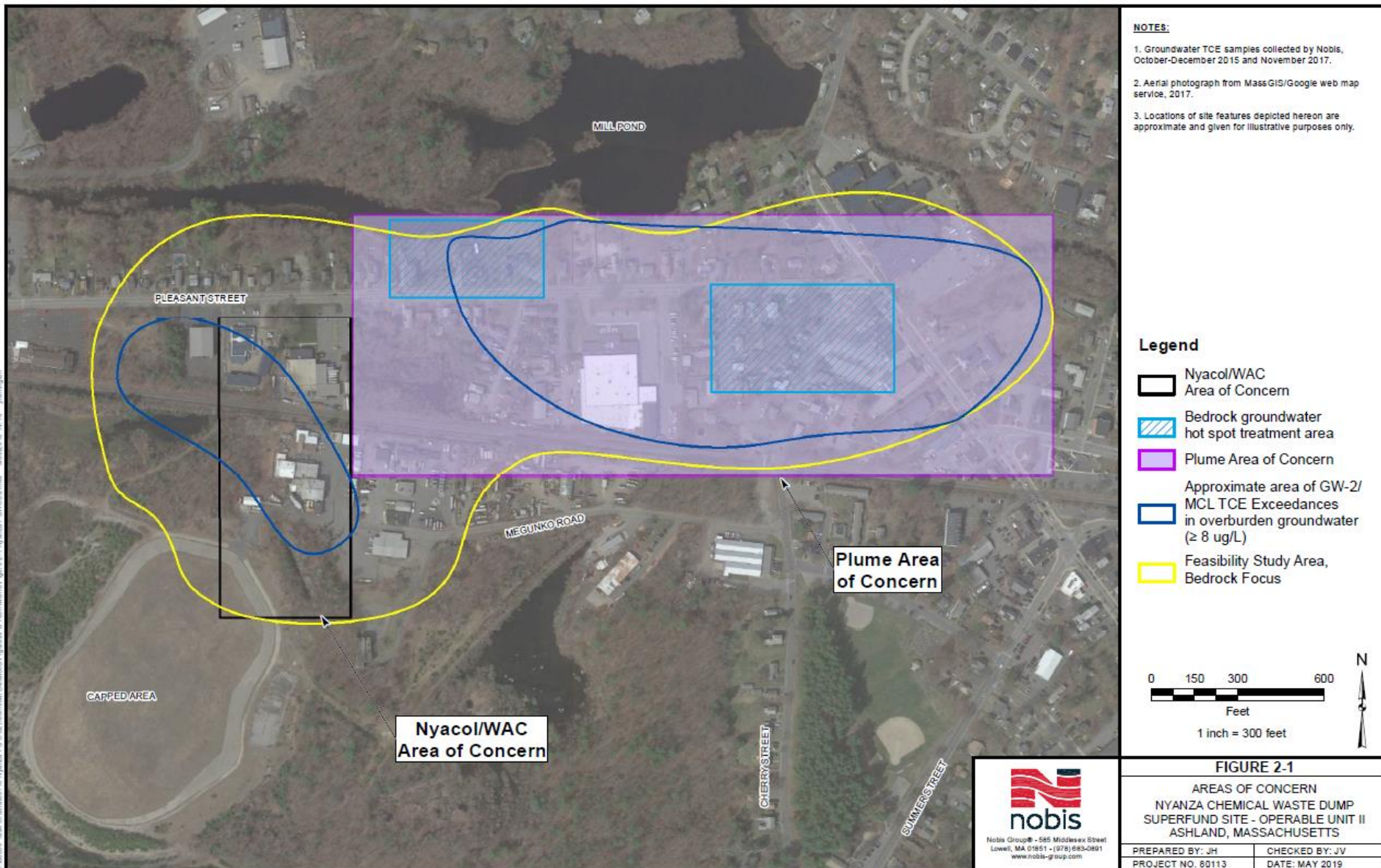
1. Nyacol/WAC AOC:

- Former manufacturing areas / areas of historical releases.
- Sections of the WAC property on Pleasant St., Nyacol property on Megunko Rd., and immediately northeast of the landfill.
- Where residual DNAPL has been discovered.
- Location of the 2 pilot DNAPL extraction systems.
- Elevated groundwater VOC concentrations.

2. Downgradient Plume AOC:

- Areas downgradient of the Nyacol/WAC AOC, with elevated groundwater VOC concentrations.
- Locations where VI risk is being addressed by vapor mitigation systems.
- Where shallow groundwater is flowing toward the Sudbury River.

OU2 Areas of Concern



Summary of OU2 Remedial Alternatives

GW-1: No Further Action:

- Required by CERCLA as a baseline to compare with other alternatives.
- No further action would be taken.
- Continued operation of the two DNAPL extraction systems and 41 vapor mitigation systems.
- Periodic five-year reviews would assess remedy protectiveness.
- Estimated cost of this remedy is **\$108,000**

GW-2: Continue Current Limited Action (with Enhancements):

- Continued operation of the two DNAPL extraction systems and 41 vapor mitigation systems.
- Pre-Design Investigation (PDI) in the Nyacol/WAC AOC to locate additional DNAPL, and installation of new extraction wells (if additional sources are *found*)
- Long-term groundwater monitoring in the downgradient plume AOC.
- Institutional Controls (ICs) to prevent exposure to groundwater and VOC vapors.
- Periodic five-year reviews to assess remedy protectiveness.
- Estimated cost of this remedy is **\$5.9 million.**

Summary of OU2 Remedial Alternatives

EPA's Preferred Remedy for OU2:

GW-4: In-Situ Treatment for Nyacol/WAC AOC; No Active Treatment for Downgradient Plume AOC:

- Includes the remedy components of Alternative GW-2.
- In-situ chemical oxidation (ISCO) treatment would be conducted to target groundwater VOC contamination in deep overburden and shallow bedrock.
- ISCO design and treatment zones will be based on PDI results and pilot study.
- Performance monitoring will be done to evaluate remedy effectiveness, (including groundwater monitoring in the downgradient plume AOC).
- This remedy can be implemented and evaluated in phases.
- Estimated cost of this remedy is approximately **\$20.5 million**.

Summary of OU2 Remedial Alternatives

GW-5: In-Situ Treatment Followed by Limited Pump and Treatment for Nyacol/WAC AOC; No Active Treatment for Downgradient Plume AOC:

- Includes the remedy components of Alternative GW-2.
- ISCO treatment followed by groundwater pump and treat as a polishing step.
- Groundwater wells would pump groundwater for treatment in target areas.
- ISCO design, treatment zones, and groundwater pump and treat design will be based on PDI results and pilot studies.
- Groundwater would be discharged after treatment to the local sewer system.
- Performance monitoring will be done to evaluate remedy effectiveness, (including groundwater monitoring in the downgradient plume AOC).
- Estimated cost of this remedy is approximately **\$35.3 million**.

Summary of OU2 Remedial Alternatives

GW-8: In-Situ Treatment and Limited Pump and Treatment for Nyacol/WAC AOC; In-Situ Treatment for Downgradient Plume AOC:

- Includes the remedy components of Alternative GW-2.
- ISCO would target deep overburden and shallow bedrock in Nyacol/WAC AOC.
- ISCO treatment in the downgradient plume AOC would target the overburden only (due to bedrock complexities).
- Groundwater wells would pump groundwater for treatment in target areas.
- ISCO design, treatment zones, and groundwater pump and treat design will be based on PDI results and pilot studies.
- Groundwater would be discharged after treatment to the local sewer system.
- Performance monitoring will be done to evaluate remedy effectiveness.
- Estimated cost of this remedy is approximately **\$56.8 million**.

Summary of OU2 Remedial Alternatives

GW-9: In-Situ Treatment Treatment for Nyacol/WAC AOC and Downgradient Plume AOC:

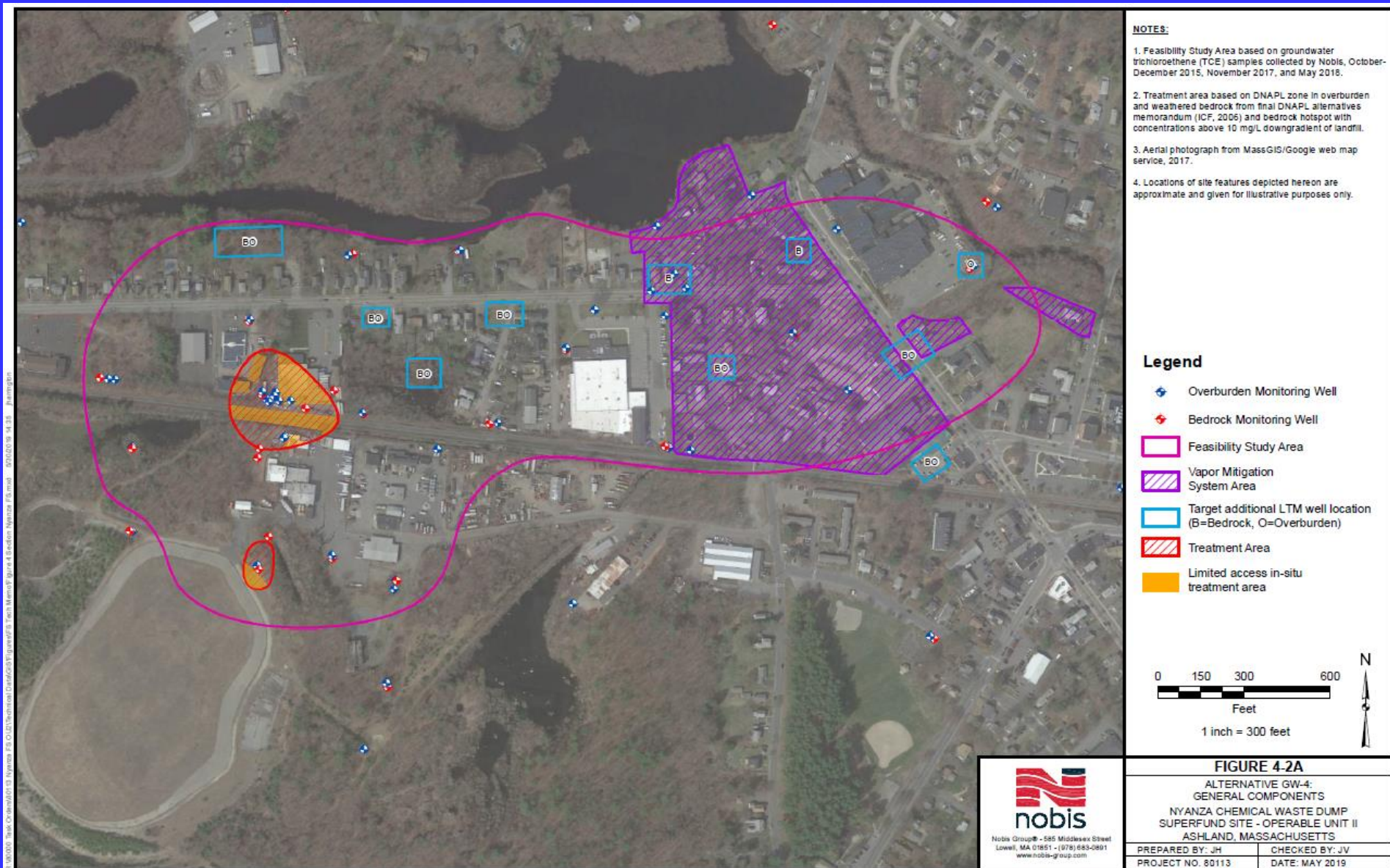
- Includes the remedy components of Alternative GW-2.
- ISCO would target deep overburden and shallow bedrock in Nyacol/WAC AOC.
- ISCO treatment in the downgradient plume AOC would target the overburden only (due to bedrock complexities).
- ISCO design and treatment zones will be based on the results of the PDI and a pilot study.
- Performance monitoring will be done to evaluate remedy effectiveness.
- Estimated cost of this remedy is approximately **\$43 million**.

Proposed Remedy: GW-4

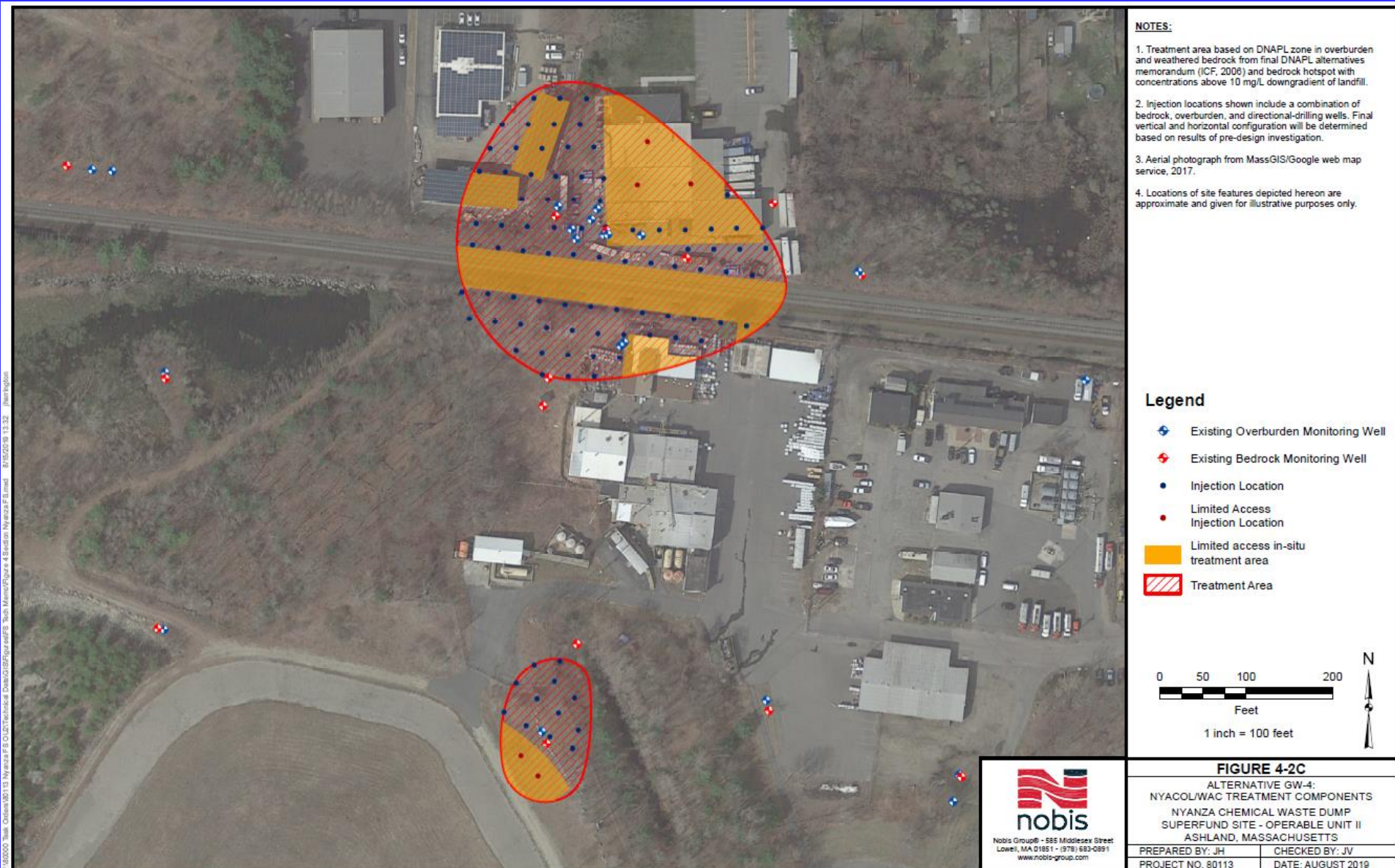
Objectives of the proposed remedy (GW-4):

- Use a combination of DNAPL removal and in-situ treatment to reduce the flux of contaminants from source areas to the groundwater plume migrating toward the Sudbury River.
- Reduce groundwater VOC concentrations to levels such that:
 - Shallow groundwater exposure and vapor intrusion risks are diminished, and
 - Vapor mitigation systems are not required in new or existing buildings located above the plume.

Proposed Remedy: GW-4



Proposed Remedy: GW-4



Proposed Remedy: GW-4

Alternative GW-4 is EPA's preferred alternative for these reasons:

- Addresses key areas of residual DNAPL contamination;
- DNAPL extraction/recovery and ISCO are proven, effective technologies requiring less operation and maintenance compared to groundwater pump and treatment alternatives;
- Can be implemented and progress evaluated in a phased approach;
- Institutional controls will add additional measures to prevent exposure to contaminated groundwater and VOC vapors.

Potential Site Challenges

- Complex, fractured bedrock geology at the Site.
- Two different types of contaminant categories chlorinated ethenes (such as TCE) and chlorinated benzenes (such as 1,4-DCB).
- Areas of DNAPL accumulation must be identified for extraction and recovery.
- Active railroad tracks intersect the Site (under which DNAPL may reside), and buildings are situated over certain proposed treatment areas.
- A majority of land in the downgradient plume area (i.e. below downtown Ashland) is privately-owned.

Public Comment Period on Proposed Plan

- The EPA's 30-day public comment period on the Proposed Plan is January 14, 2020 - February 14, 2020.
- During the public hearing tonight (January 23), the public can provide oral comments to EPA on the Proposed Plan.
- Written comments may also be submitted by email or mail, postmarked no later than February 14, 2020.
- The Proposed Plan is available, along with instructions about submitting comments, at: www.epa.gov/superfund/nyanza.

Questions?

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