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NCBC DAVISVILLE
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MINUTES FROM BASE REALIGNMENT AND CLOSURE CLEANUP TEAM MEETING HELD
17 MARCH 2011 NCBC DAVISVILLE RI
03/17/2011
NAVFAC MID ATLANTIC

**NOTES FROM THE 17 MARCH 2011 DAVISVILLE BCT MEETING
QDC CONFERENCE CENTER
95 CRIPE STREET
NORTH KINGSTOWN, RHODE ISLAND**

The objective of this meeting was to discuss the Revision 1 Feasibility Study for NCBC Davisville Site 16, submitted by the Navy for EPA and RIDEM review on February 25, 2011. Representing the Navy at this meeting were David Barney and Jeff Dale. Representing EPA at this meeting were Christine Williams, Dave Peterson, and Bill Brandon. Representing RIDEM was Rich Gottlieb.

The Navy prepared a presentation in advance of the meeting and provided it to EPA and RIDEM for review via email on Tuesday March 15. The presentation slides are provided as an attachment to these minutes. The presentation concludes with a statement that the Navy's preferred alternative for Site 16 includes the following:

- Soil Alternative S-4: Excavate vadose zone soil in north-central area exceeding leachability criteria, cover remaining soil in north-central area exceeding industrial direct contact criteria, excavate and replace some soil at the marina, and impose land-use controls to prevent direct exposure to contaminants in soil.
- Groundwater Alternative G-2: Monitored natural attenuation of the groundwater plume with land-use restrictions to prevent exposure to contaminated groundwater.

EPA and RIDEM both expressed concern with the projected cleanup time for natural attenuation of the groundwater plume (300 years). EPA likes to see cleanup times on the order of 40 years, but considering this site is within a GB groundwater area, would consider 100 years to be acceptable. RIDEM would not accept a 100 year restoration period without a "reasonable" effort being made to remediate the groundwater.

EPA cited the National Contingency Plan (NCP) preference for treatment and requested the Navy to consider treatment as a component of the site-wide remedy to reduce cleanup times. If not, EPA could only agree with a monitored natural attenuation (MNA)-only groundwater remedy if the Navy followed the EPA's MNA guidance and was able to conclude MNA was appropriate for this site. Alternatively, EPA recommended the Navy could make a stronger case that reducing the cleanup time to 100 years would be technically impracticable (TI) and then pursue a TI waiver. Barring a convincing argument that MNA is the best remedy for the site (per the MNA guidance) or that remediation within 100 years is technically impracticable, EPA stated they could not support the Navy's preferred groundwater alternative.

Navy noted that institutional controls would protect all potential receptors, therefore the MNA remedy would be protective. EPA responded that institutional control (IC)-only remedies are "not preferred" if there are technically practicable options available to address contamination. The EPA guidance expresses a preference for active remediation in source zones. EPA noted there is precedent at NCBC Davisville of an IC-only remedy (Calf Pasture Point), but that they consider Calf Pasture Point to be different from Site 16 since Calf Pasture Point is a recreational area that will not be developed.

Navy noted that the extremely long time to reach groundwater cleanup goals was driven, in part, by the EPA's requirement to achieve MCLs throughout the plume. Navy offered a compromise position whereby the shallow groundwater in the vapor intrusion hotspots would be remediated to address the portions of the plume that present the greatest risk. EPA felt this would not be a viable solution due to the risk of these areas being re-contaminated in the future.

EPA introduced the concept of a "soil management unit" (in this case, the area underneath a soil cover within the north-central area or a non-contiguous combination of soil covers and the interstitial areas would be considered a soil management unit). Remediation of groundwater to MCLs is not required within the soil management unit unless groundwater was migrating from below the soil management unit

and creating a risk. According to the human health and ecological risk assessments for Site 16, groundwater contamination emanating from the north-central area does not pose a risk upon discharge to Allen Harbor. Therefore, rendering this area a soil management unit would release the Navy from restoring the groundwater to MCLs. EPA proposed that the Navy could limit or abandon plans to excavate the BTEX hotspot soils and alternatively cover a larger portion of the north-central area, therefore reducing the area where MCLs need to be attained.

RIDEM needs to review internally the concept of leaving the leachable soils in place since RIDEM regulations are designed to restore groundwater rather than allow it to continue to be contaminated.

The comments on the FS are due April 18. There was discussion over whether EPA/RIDEM should provide comments on the existing FS or if the Navy should issue an FS addendum with new alternatives (as discussed at this meeting) and then solicit comments on the addendum. The Navy agreed to consider an FS addendum but needs time to evaluate the viability of the proposed alternative:

- Soil: Cover the north-central area, remove some soils from the marina, and impose land-use restrictions as necessary to prevent exposure to contaminated soils.
- Groundwater: In-situ treatment in the Building 41 area with MNA for the rest of the plume.

Navy will develop a strategy for including this alternative in the FS and propose a path forward to EPA and RIDEM.

After a sidebar discussion, Navy agreed to remove the implementability text in the pump-and-treat alternative stating that BRAC PMO approval is needed prior to selecting the pump-and-treat alternative.

The meeting closed with a discussion about the Calf Pasture Point Source Area Investigation. Navy provided the preliminary schedule for field events:

- April 11: Mobilize for DPT drilling and geophysical survey
- Early May: Off-shore investigation in Entrance Channel
- May/June: DPT soil boring, field screening, and lab analysis review period
- July/August: Install and develop monitoring wells
- September/October: Next long-term monitoring event

EPA requested some flexibility on the Navy's part to move soil boring locations based on EPA data being collected next week. Navy agreed this data would be considered in the selection of monitoring well locations.

EPA will not send a concurrence letter for the Source Area Investigation SAP, nor will they send comments. RIDEM has already sent a letter acknowledging the Navy's adequate response to comment. Navy will interpret EPA's no response as approval to proceed with the investigation.

Navy requested EPA and RIDEM concurrence to delay the spring long-term monitoring event at Calf Pasture Point until after the Source Area Investigation wells have been installed. The event will be conducted during the fall. Navy agreed to include arsenic analysis for this round of monitoring in addition to the chlorinated VOC target analyte list. EPA and RIDEM concurred that this would be acceptable. Navy will send a letter to formalize the agreement.

NCBC Davisville Site 16 FS BCT Meeting March 17, 2011

- Purpose – Overview of FS and discuss Navy's preferred alternative
- Goal – refine schedule/timeline for PRAP, ROD, RD, and RA

NCBC Davisville Site 16 FS

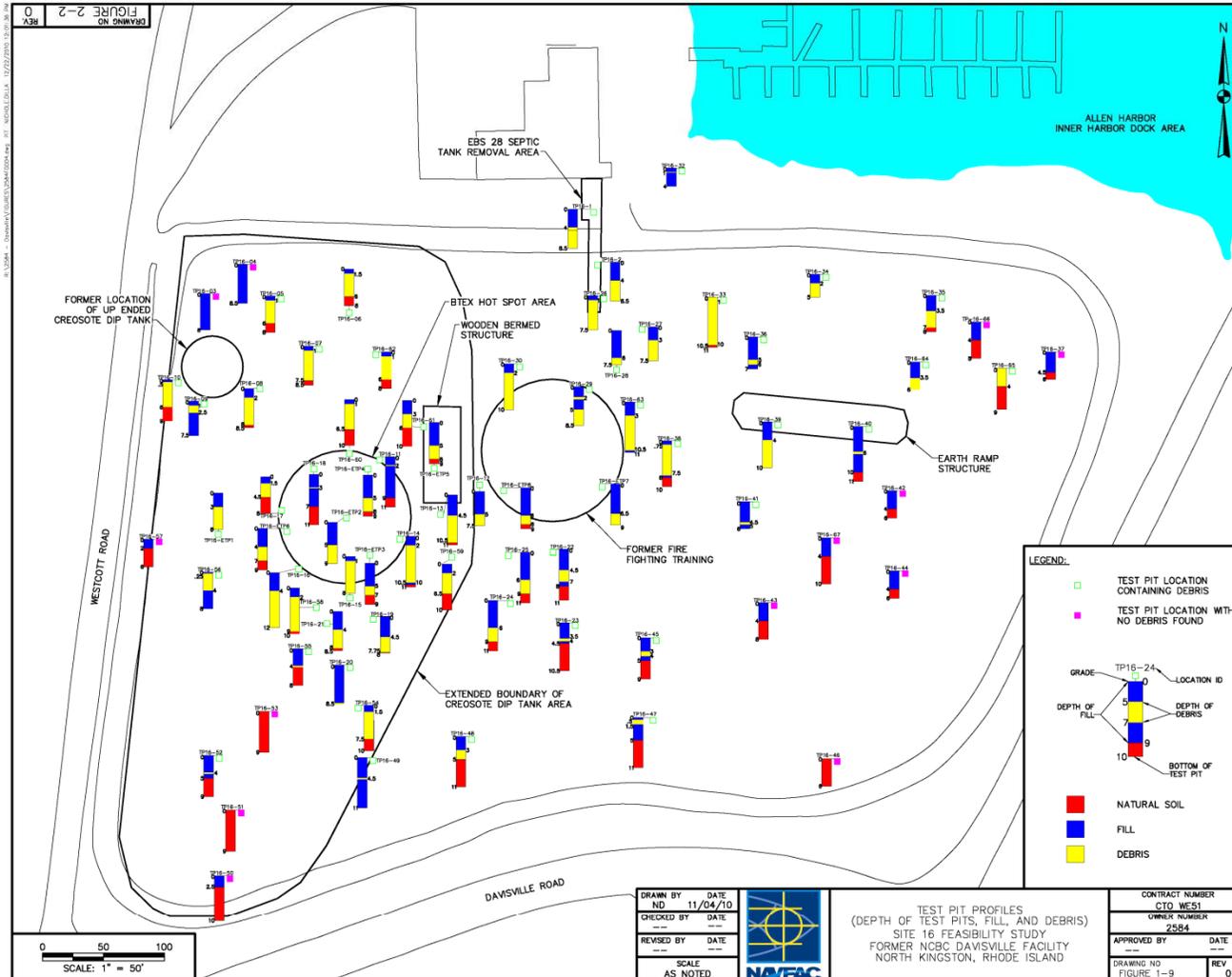
What we agree on/know

- Site 16 is a complex “multi-site”.
- Property will have significant environmental land use restrictions (ELUR).
- Property has use restrictions based on transfer mechanism (MARAD).
- ELUR and MARAD restrictions are compatible.

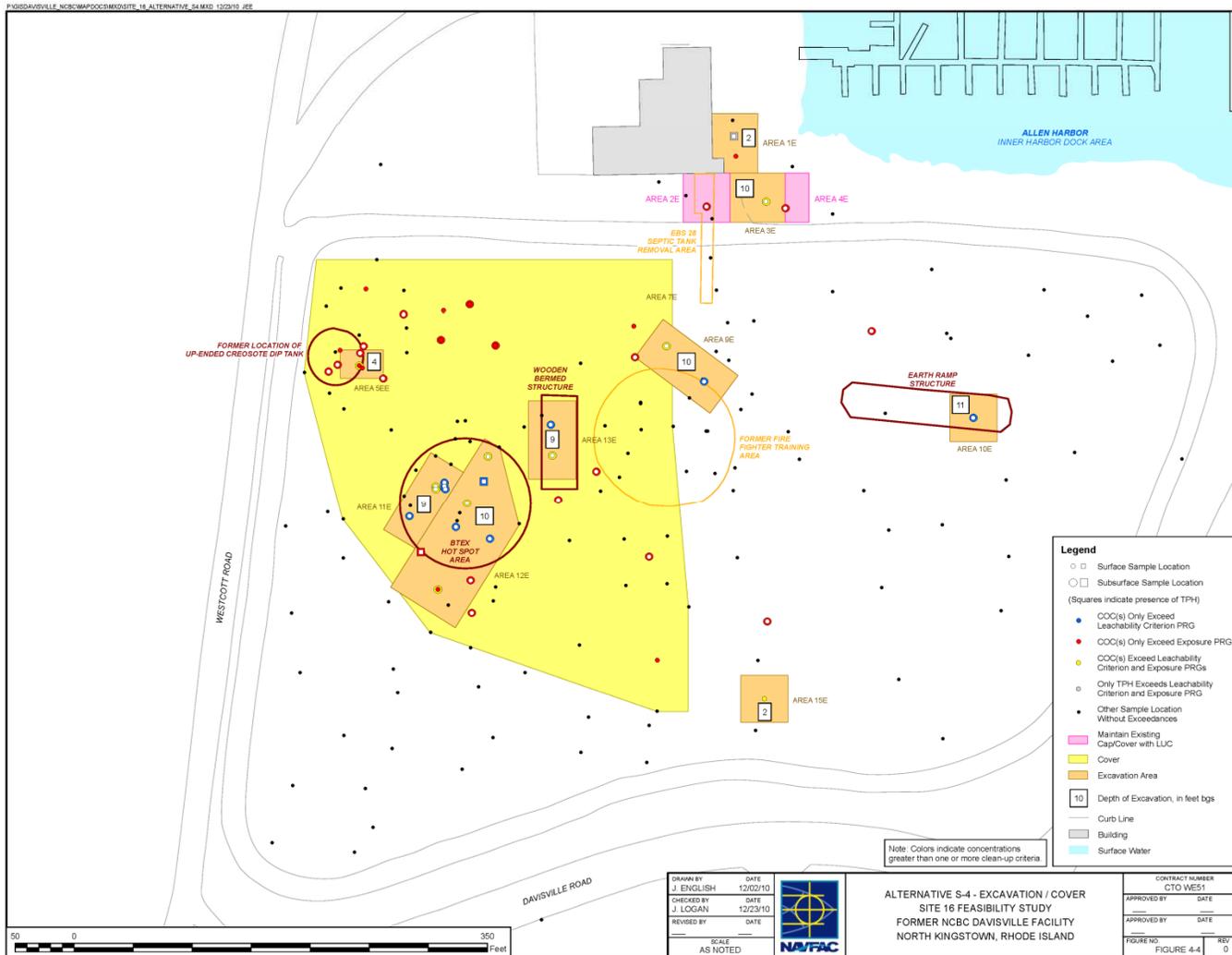
Site 16 Soil Risks

- Widespread debris/fill not always co-located with contamination or unacceptable risks.
- Leachability: naphthalene, benzene
- Direct Contact – industrial: As, Pb, cPAHs, RIDEM TPH

Test Pit Profiles



Alternative S-4 – Excavation/Cover



Revised FS

- Assumption #1 – All of the alternatives considered will meet threshold criteria (be protective of human health and the environment and will comply with ARARs) (except S-1 and G-1)...
 - therefore, rely on balancing and modifying criteria.
- Assumption #2 – Any alternative will have land use controls (soil and groundwater).
 - Details to be finalized later in LUC/RD or LUCIP.

Revised FS (cont.)

- Conclusion #1 for soil– The S-5 alternative for unrestricted use would pose implementation challenges with no additional risk reduction since the land use will be industrial:
 - Estimate 7,100 trucks
 - Disruption of tenants
 - Emission of greenhouse gases and pollutants from equipment

Revised FS (cont.)

- Conclusion #2 for soil – Alternatives S-2, S-3, and S-4 offer similar implementation challenges but some differences:
 - S-2 cap (all > leaching) and cover (all > direct contact exposure) [no excavation]
 - S-3 excavate (all > leaching) and excavate to 2 feet (where surface soils > industrial direct contact exposure PRGs) [replace soil]
 - S-4 excavate (all > leaching) add 2 feet of cover (where > direct contact exposure)

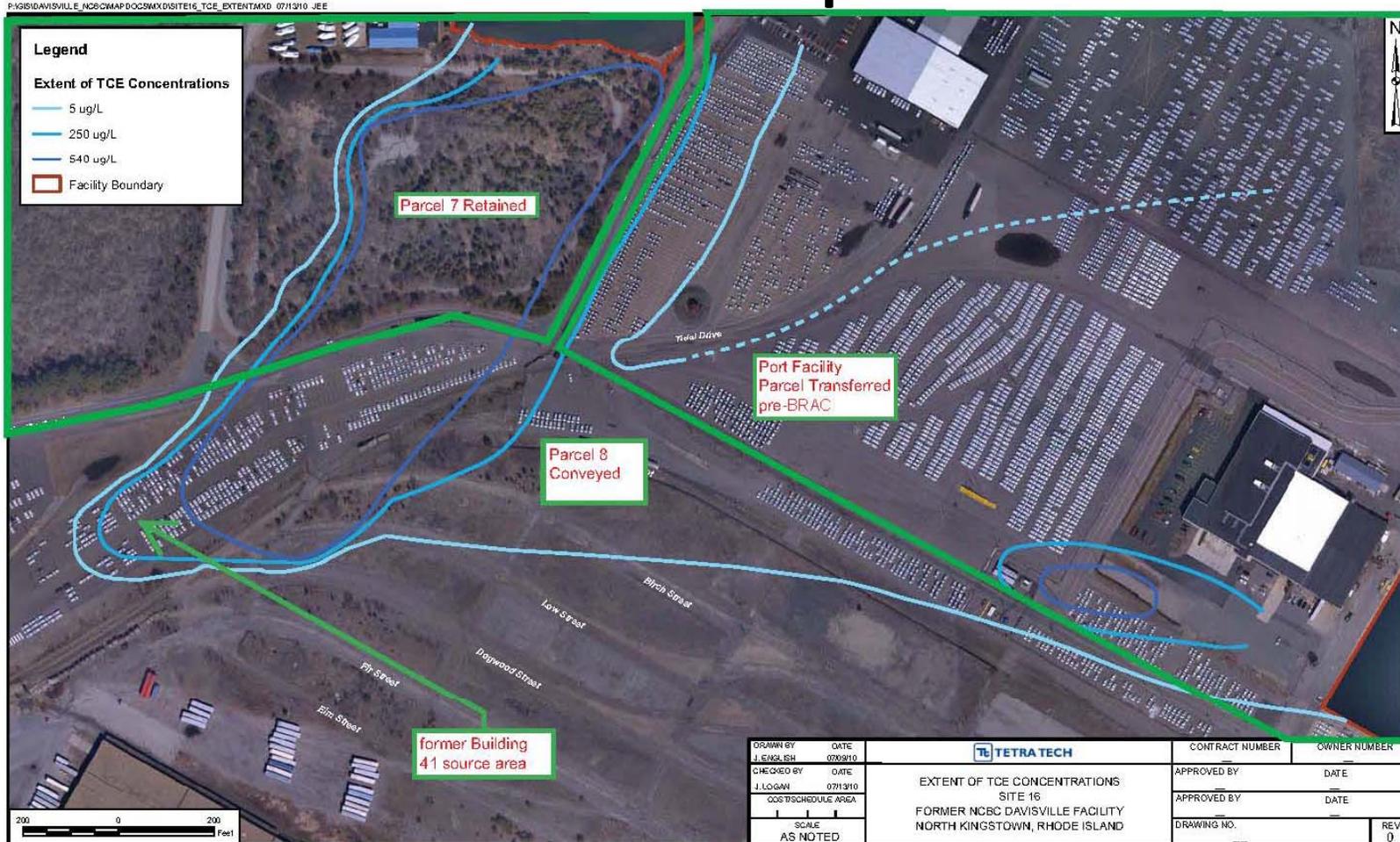
Site 16 soil

- Alternative S-4 is preferred by the Navy
 - It removes soil to the water table that is above leaching criteria.
 - It covers all surface soil above direct contact criteria in NCA (S-3 excavates 2 feet and replaces it).
 - Fewer post implementation maintenance concerns (S-2 has low permeability cap).
 - It removes and replaces some soil around the marina.

Site 16 groundwater

- ~31 acre trichloroethene plume:
 - Coalesced from multiple sources in vicinity of former Building 41.
 - Additional benzene, naphthalene, and likely TCE sources within north central area.
- Two $\frac{3}{4}$ acre arsenic plumes in NCA:
 - As concentration is less than twice the RG of 10 ug/L.
 - Different in situ treatment processes (G-3, G-4, G-6).

Site 16 TCE plume

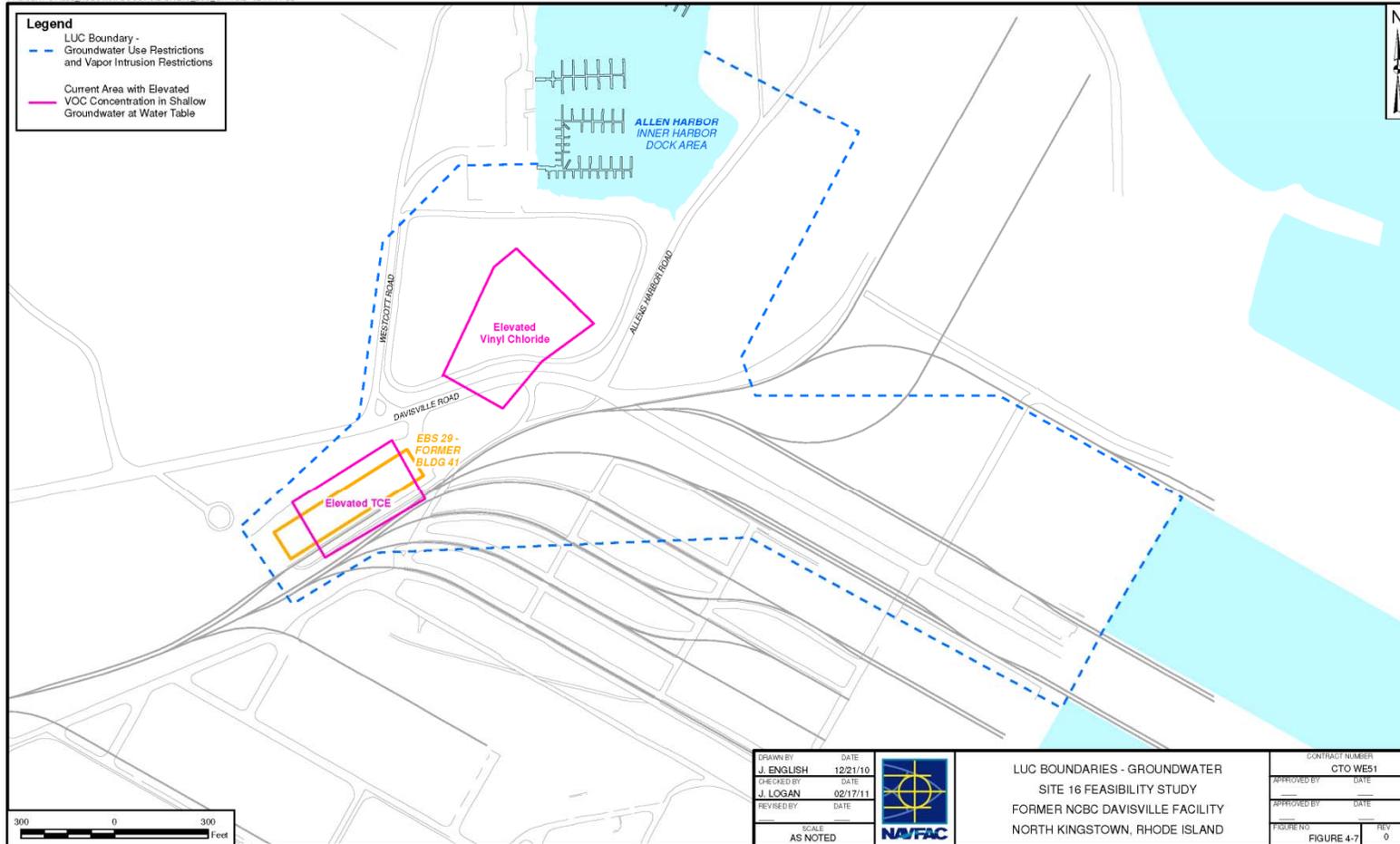


Summary of groundwater risk

- Potential future consumptive use
- Potential contact for construction workers
- Potential for VI in future buildings where plume is present at water table

LUC Boundaries - Groundwater

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Site 16 groundwater

- Conclusion #1 for groundwater– All alternatives rely on LUCs to ensure protectiveness for some time period while active and/or NA processes reduce contaminants to MCLs.

Site 16 groundwater

- Conclusion #2 for groundwater – An alternative for immediate remediation was not considered viable.
 - Large diffuse plume to the east towards bay
- Alternative G-6 for reduced-term remediation would be very disruptive and still rely on LUCs.
 - Equipment traffic, greenhouse gas emissions
 - Disruption to tenants

Site 16 groundwater

- Conclusion #3 for groundwater – Alternatives G-3, G-4, and G-5 are similar:
 - active remediation of western arm only
 - share similar remedial timeframe, short term impacts, and 30 year net present value costs
 - rely on LUCs and NA processes (150 years) for eastern arm

Site 16 groundwater

- Conclusion #4 for groundwater
- Alternative G-2:
 - no active remediation, less disruption
 - rely on LUCs and NA processes (300 years) for entire plume
 - lower capital costs and 30 year net present value cost
 - similar total life cycle cost to G-3, G-4, and G-5

NCBC Davisville Site 16 Groundwater FS Supplement
Calculation of Project Costs by Various Methods
March 2011

| Alternative | Summary of the Alternative | Life of Project (1) (years) | 30 Year NPV (2) from Revised FS | Total Cost over Life of Project (3) | 30-Year NORM CTC (4) |
|--------------------|-----------------------------------|--|--|--|---------------------------------|
| G1 | No Action | 300 | \$120,000 | \$1,657,194 | \$172,194 |
| G2 | LUC and MNA | 300 | \$1,124,000 | \$15,190,162 | \$1,557,862 |
| G3 | ISCO MNA and LUC | 150 | \$8,954,000 | \$15,164,612 | \$9,369,812 |
| G4 | ISAB MNA and LUC | 150 | \$9,458,000 | \$15,939,502 | \$10,144,702 |
| G5 | Pump and Treat MNA and LUC | 150 (5) | \$9,932,000 | \$21,532,369 | \$11,924,272 |
| G6 | Aggressive ISAB LUC and MNA | 50 | \$24,186,000 | \$25,818,133 | \$25,171,333 |

Notes

- (1) Life of project estimated by modeling presented in Appendix E of the Revised FS.
(2) 30 Year net present value calculated in 2011 dollars with 2.3% discount rate presented in the Revised FS (rounded to nearest \$1,000).
(3) Total cost over life of project is capital and O&M costs in 2011 dollars over the life of the project in years. This information is not presented in the Revised FS.
(4) 30 Year NORM CTC is the capital and O&M costs in 2011 dollars that would be entered into NORM to calculate CTC over 30 years and is a subset of the "Total Cost over Life of Project". This information is not presented in the Revised FS.
(5) Pump and Treat is assumed to operate for 50 years in the plume area greater than 1,000 ug/L trichlorethene, followed by 100 additional years of MNA.

Abbreviations

NPV - net present value
FS - Feasibility Study
NORM CTC - Normalized database used by the Navy to track environmental liabilities under CERCLA
O&M - operations and maintenance
LUC and MNA - land use controls and monitored natural attenuation
ISCO - in situ chemical oxidation of plume greater than 1,000 ug/L trichloroethene
ISAB - in situ anaerobic bioremediation of plume greater than 1,000 ug/L trichloroethene
Aggressive ISAB - in situ anaerobic bioremediation of plume greater than 500 ug/L trichloroethene

Site 16 groundwater

- Alternative G-2 is preferred:
 - immediate protectiveness via LUCs is the same as G-3 through G-6
 - limited disruption to community or tenants
 - similar total life cycle cost to G-3, G-4, and G-5

Site 16 Preferred Alternative

- S-4/G-2
- Land use controls
- Excavate all vadose zone soil exceeding leachability criteria
- Cover all remaining NCA soil exceeding industrial direct contact criteria
- Excavate and replace soil at marina
- MNA for groundwater