LANGAN

Technical Memorandum

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
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To: Jane O'Connell (DEC), Sondra Martinkat (DEC)

From: Mimi Raygorodetsky, Gregory Wyka

Info: Charles S. Warren (Kramer Levin), Paula Kirby (Plaxall), Matt Quigley (Plaxall), Tony Phofl (Plaxall), Cary Hirschstein (HR&A)

Date: November 3, 2015

Re: Anable Basin – Upland NAPL Study
ABC Block 25 (BCP Site No. C241173)
ABC Block 26 (BCP Site No. C241174)
Long Island City, New York
Langan Project No.: 170340201

A subsurface investigation will be performed at the above referenced sites to evaluate the presence and characteristics of non-aqueous phase liquid (NAPL) adjacent to the Anable Basin and East River bulkheads. This investigation was developed based on discussions at the meeting with the DEC in Albany, NY on October 26, 2015.

Objectives

- Evaluate the presence and thickness of NAPL in monitoring wells above and/or below the meadow mat layer proximate to the Anable Basin and East River bulkheads; and
- Evaluate characteristics of the identified NAPL, including mobility and forensic signature.

Sampling Plan and Methodology

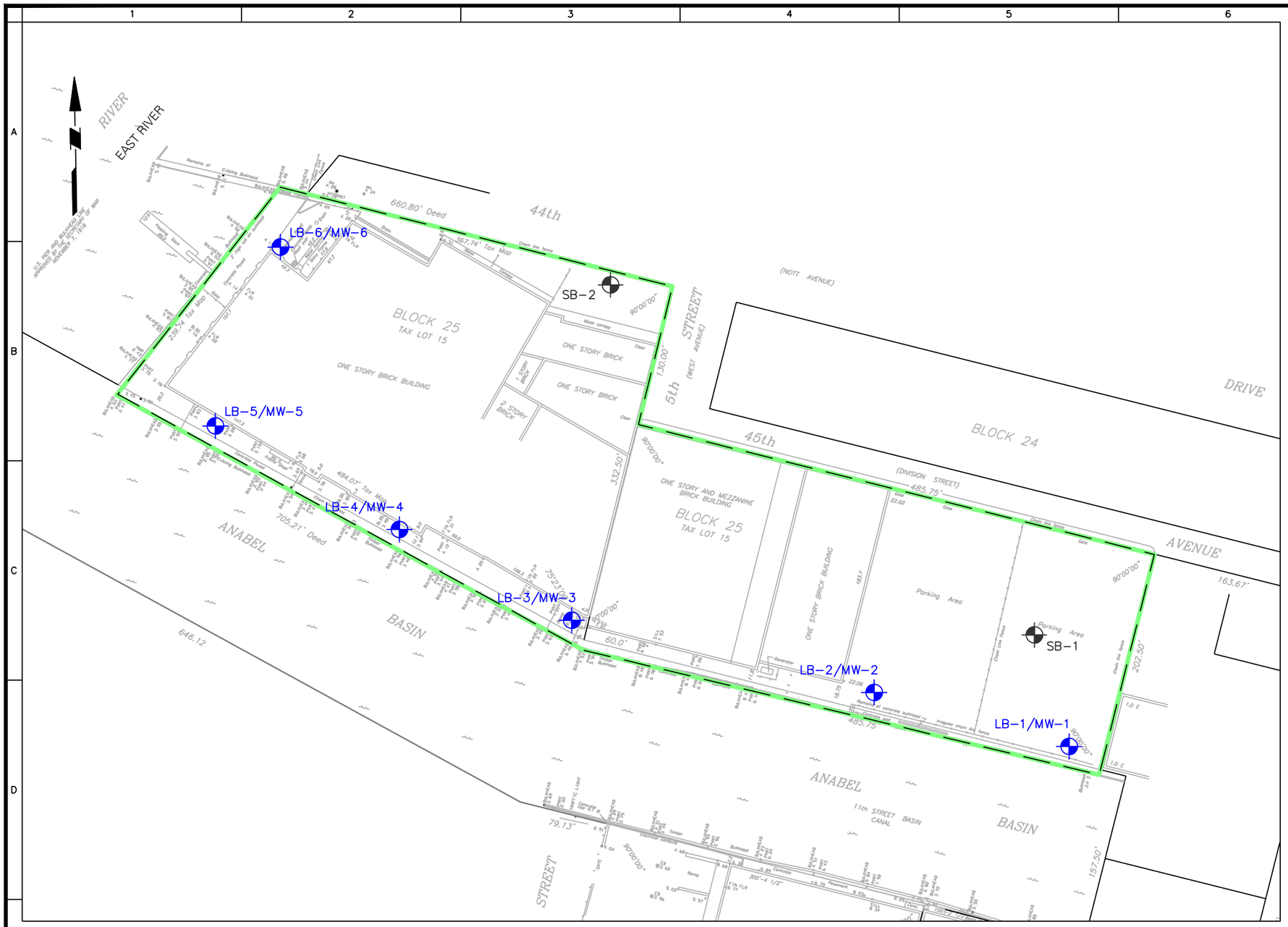
- Soil Borings (LBs)
  - Install soil borings using a track-mounted Sonic rig as close to the bulkhead along the East River and Anable Basin as practical given access constraints and presence of subsurface components of new/old bulkhead systems. The proposed soil boring locations are shown in the attached figures (Figure 1 [C241173] and Figure 2 [C241174]).
  - Soil borings will be advanced beyond the groundwater table and the organic clay/silt layer (i.e., the "meadow mat"), if present. If present, borings will terminate about 10 feet below the organic clay/silt layer. If not, borings will terminate about 10 feet below the water table. Water table is expected about 5 to 7 feet below ground surface.
  - If no evidence of petroleum contamination is encountered, one soil sample will be collected from the groundwater interface. No monitoring well will be installed. Completed boreholes will be filled to the surface with a cement grout.
  - If evidence of petroleum is encountered (odors, staining, PID readings and/or NAPL), one soil sample from the interval exhibiting the highest degree of contamination will be collected for laboratory analysis. Odors, staining and PID

readings will be used to evaluate degree of contamination in borings without NAPL. Visual evaluation of the relative degree of NAPL saturation will determine sample intervals in borings with NAPL.
    - All samples will be analyzed for the following parameters:
        - VOCs
        - SVOCs
        - TPH (*n*-C_6 to *n*-C_{44})
    - Samples containing NAPL will be further analyzed for:
        - Petroleum Fingerprint
        - MAHs/PAHs and Qualitative Biomarkers
    - Excess soil will be containerized for off-site disposal pending receipt of laboratory data.
    - Drilling equipment will be decontaminated between locations.
- Monitoring Wells (MWs)
    - If the meadow mat is identified, install two permanent 4-inch groundwater monitoring wells in separate and proximate boreholes; one well will be screened above the meadow mat, the other well will be screened below the meadow mat. If meadow mat is not present, install only one well screened across the water table.
    - Monitoring wells will be developed (surged and purged) after installation.
    - Monitoring wells will be gauged for NAPL thickness (at low and high tides) one day, one week, and two weeks following development (as time/schedule allows).
    - If NAPL is present, a sample of NAPL will be collected and analyzed for the following parameters:
        - NAPL density and viscosity
    - Groundwater will not be sampled.
    - If purge/development water exhibits evidence of contamination, it will be containerized for off-site disposal pending receipt of laboratory analysis.
    - Drilling, well development, and well gauging equipment will be decontaminated between locations.
- NAPL Baildown Study
    - If a sufficient quantity of NAPL is present in a well, conduct a baildown study to NAPL transmissivity in general accordance with standard means (i.e., ASTM E2856-11 LNAPL Transmissivity).

Reporting

- A technical report will be prepared at the completion of the testing program to document methodology, results and conclusions.

FIGURES



LEGEND:

- APPROXIMATE BCP SITE BOUNDARY
- APPROXIMATE TAX LOT BOUNDARY
- SB–1 — SOIL BORING LOCATION (LANGAN 2015)
- LB–1/MW–1 — PROPOSED SOIL BORING AND MONITORING WELL LOCATION AND ID

GENERAL NOTES:

1. SOIL BORINGS WERE COMPLETED BY LANGAN DURING A SUBSURFACE INVESTIGATION IN APRIL-MAY 2015.
2. ALL BORING LOCATIONS ARE APPROXIMATE.
3. BASE MAP TAKEN FROM SURVEY PREPARED BY ALBERT W. TAY, DATED SEPTEMBER 6, 2012.
4. ELEVATIONS ARE IN THE BOROUGH PRESIDENT OFFICE OF QUEENS COUNTY DATUM. THIS DATUM IS BASED ON MEAN HIGH WATER WHICH IS 2.725 FEET ABOVE MEAN SEA LEVEL AT SANDY HOOK, N.J.
5. BCP = BROWNFIELD CLEANUP PROGRAM
6. NAPL - NON-AQUEOUS PHASE LIQUID

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SCALE IN FEET

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Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C.
Langan Engineering and Environmental Services, Inc.
Langan CT, Inc.
Langan International LLC
Collectively known as Langan

Project
ABC - BLOCK 25
BCP SITE No.: C241173
BLOCK No. 25, LOT No. 15
QUEENS LONG ISLAND CITY NEW YORK

Figure Title
PROPOSED SAMPLING LOCATION PLAN
UPLAND NAPL STUDY

Project No. 170340201	Figure No. 1
Date 11/6/2015	
Scale 1"=100'	
Drawn By JL / Checked By GW	
Submission Date X	Sheet 1 of 2

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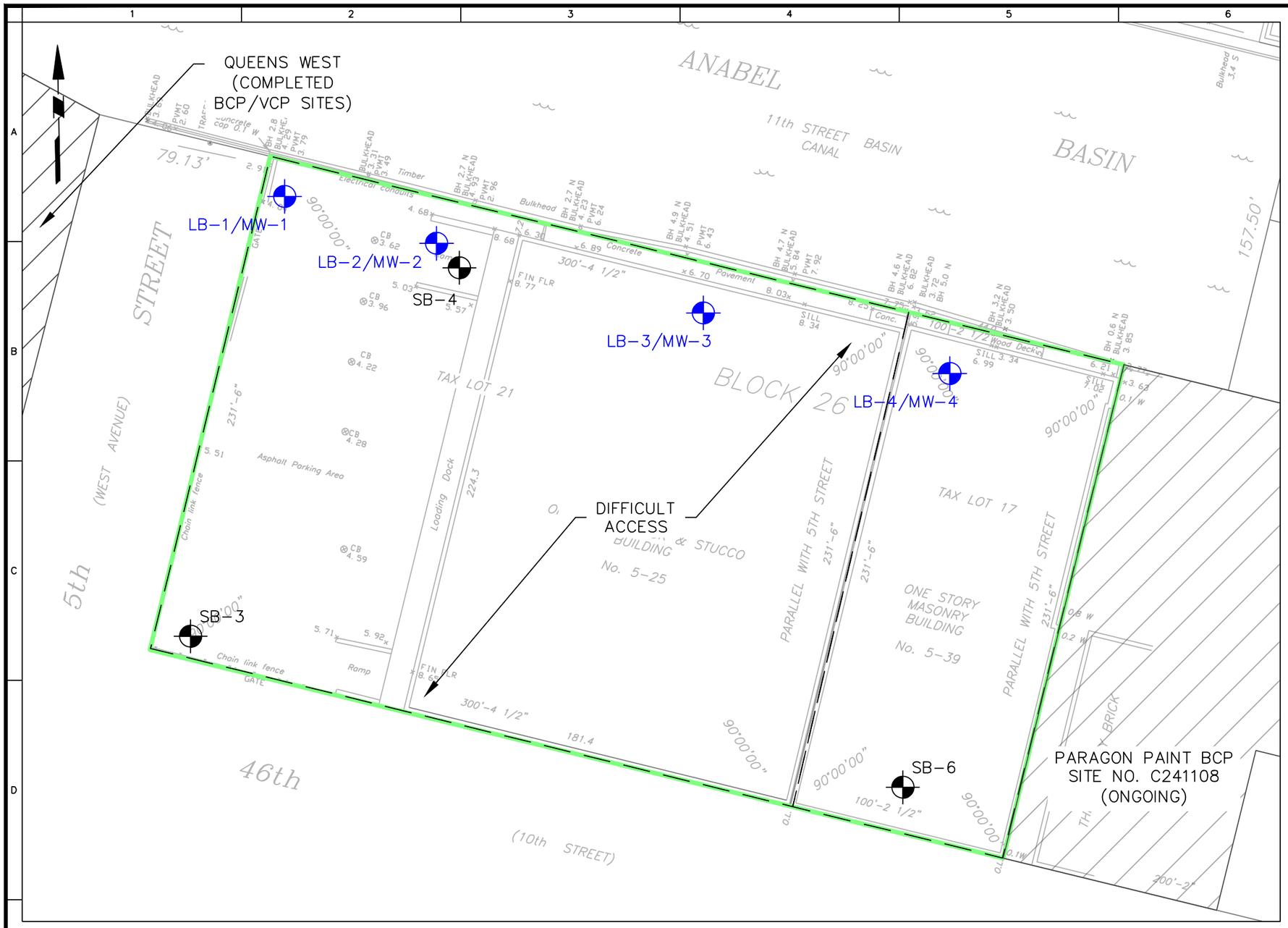

LEGEND:

- APPROXIMATE BCP SITE BOUNDARY
- APPROXIMATE TAX LOT BOUNDARY
- SB-4 — SOIL BORING LOCATION (LANGAN 2015)
- LB-1/MW-1 — PROPOSED SOIL BORING AND MONITORING WELL LOCATION AND ID

GENERAL NOTES:

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Collectively known as Langan

Project
ABC - BLOCK 26
BCP SITE No.: C241174
BLOCK No. 26, LOT Nos. 17 & 21
QUEENS LONG ISLAND CITY NEW YORK

Figure Title
PROPOSED SAMPLING LOCATION MAP
UPLAND NAPL STUDY

Project No. 170340201	Figure No. 2
Date 11/6/2015	
Scale 1"= 50'	
Drawn By JL / Checked By GW	
Submission Date X	Sheet 2 of 2

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