NORTHROP GRUMMAN

Northrop Grumman Corporation
Integrated Systems

Airborne Early Warning and
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ESH&M-06L-58
September 26, 2006

Steven M. Scharf, P.E.
Project Engineer
Division of Environmental Remediation
Remedial Action Bureau A, 11th Floor
New York State Department of Environmental Conservation
625 Broadway
Albany, NY 12233-7015

Re: **Town of Oyster Bay Bethpage Community Park**
Phase 2A Remedial Investigation
Work Plan Addendum No. 5

Dear Mr. Scharf:

Northrop Grumman Corporation (NGC) has prepared this Work Plan Addendum No. 5 for Phase 2A of the Remedial Investigation (RI) of the Former Grumman Settling Ponds (Operable Unit 3 - Bethpage Community Park) located in Bethpage, New York. The purpose of this Work Plan Addendum is to present the findings of the Cone Penetrometer Testing (CPT)/Membrane Interface Probe (MIP) investigation program conducted within the B-43 Area and to provide a description of the additional field activities necessary to complete the investigation of that area. The methodology utilized during the CPT/MIP investigation was presented in Work Plan Addendum No. 3 dated July 13, 2006.

Background

Boring B-43 was advanced in the north central portion of the Park parking lot by Dvirka and Bartilucci Consulting Engineers (D&B) in May 2006 to determine the vertical extent of the elevated polychlorinated biphenyl (PCB) concentration detected by H2M (on behalf of the Town of Oyster Bay) in a soil sample collected from the 8 to 10-foot depth interval below grade as part of their Interim Remedial Measure investigation program. The 10 to 12-foot depth interval soil sample collected by D&B indicated volatile organic compound (VOC) concentrations as well as some other compounds in excess of the TAGM 4046 Recommended Soil Cleanup Objectives (RSCOs). In addition, photoionization detector (PID) readings of other samples from the borehole indicated readings above background concentrations to a depth of approximately 16 feet below grade. As a result, ARCADIS submitted Work Plan Addendum No. 3 that presented a program to further investigate this area utilizing CPT/MIP. Following NYSDEC approval of the Work Plan Addendum, the field activities were conducted between July 17 and 19, 2006.

- Boring O-7, which was located approximately 50 ft to the south of O-8, was advanced to 58 ft bls. The lithology of the boring consisted of sand from land surface to 34 ft bls, silty sand from 34 to 48 ft bls, and sand from 45 to 58 ft bls. No response on the FID, PID or ECD was detected above background.

- Boring N-8, which was located approximately 50 ft to the west of O-8, was advanced to 48 ft bls. The lithology of the boring consisted of a low permeable zone from land surface to 9 ft bls and sand from 9 to 48 ft bls. No response on the FID, PID or ECD was detected above background.

- Boring O-9, which was located approximately 50 ft to the north of O-8, was advanced to 46 ft bls. The lithology of the boring consisted of a silty sand from land surface to 10 ft bls and sand from 10 to 46 ft bls. No response on the FID, PID or ECD was detected above baseline.

- Boring Q-8, which was located approximately 110 ft to the east of O-8, was advanced to 44 ft bls. The lithology of the boring consisted of sand from land surface to 30 ft bls, clayey silt from 30 to 34 ft bls, and sand from 34 to 44 ft bls. No response on the FID, PID or ECD was detected above baseline.

Findings and Conclusions

Based on the findings of the CPT/MIP, the VOCs identified at and near Boring B-43 consist of benzene, toluene and xylenes, coincident with PCE, TCE and cis-1,2-DCE. Based on the response from the perimeter CPT/MIP borings N-8, O-7, O-9 and Q-8, the impacts at and near B-43 were successfully delineated in the horizontal direction, with elevated VOC concentrations apparently limited to an area less than 10,000 square feet in size (i.e., less 50 ft in each compass direction around Boring B-43 [CPT/MIP Boring O-8]). Based on the results from all CPT/MIP borings, elevated concentrations of VOCs in soil appear to be limited in the vertical direction to the low permeability zones identified above, with the vertical extent of impacts potentially as deep as 18 ft bls.

It should be noted that according to the Town of Oyster Bay's "Investigation Report & Remedial Action Plan" (dated November 2005), soil surrounding the B-43 Area will be excavated to a depth of approximately 12 feet below grade. Based on this fact and the information presented above, further investigation of the horizontal extent of impact appears unwarranted while confirmation of the vertical extent of impact is warranted. As a result, in order to verify that the vertical extent of impact has been determined, soil sampling will be conducted in the B-43 Area.

Methodology

The CPT/MIP borings advanced in the B-43 Area are shown on Figure 1 in Attachment 1 and were performed in a portion of the existing CPT/MIP alphanumeric grid previously developed by ARCADIS. A total of six CPT/MIP borings were completed (Borings N-8, O-7, O-8, O-9, Q-8 and P-8). The goal was to advance each boring to the water table (approximately 55 ft bls) and continuously profile soil type using the CPT and screen for VOCs using the MIP. In most cases, the CPT/MIP rig encountered refusal prior to reaching the water table. Prior to and during drilling, the background response from the various MIP instrumentation (i.e., flame ionization detector [FID]; photoionization detector [PID]; and electron capture detector [ECD]) in the borehole) was determined at each location. The background data were used to compare with downhole MIP readings to determine the presence and magnitude of the types of VOCs identified. In zones where elevated FID, PID and/or ECD response were detected, the MIP operator obtained a sample of soil gas and analyzed for VOCs using the on-board gas chromatograph and preliminarily speciated the VOCs present (referred to below as "gas trapping").

Results

ARCADIS's interpretation of the CPT/MIP investigation is summarized below by location:

- Boring O-8, which was located approximately 15 feet south of Boring B-43, was advanced to 35 feet below land surface (ft bls). The lithology of the boring identified the following sequences: sands were encountered from land surface to 5 ft bls; a low permeable zone from 5 to 12 ft bls (characterized as ranging from a clayey silt to silty clay, with interbedded thin clay stringers); silty sand from 12 to 16 ft bls; and sand from 16 to 35 ft bls. A FID response was recorded from 2 to 7 ft bls and a PID response was recorded at 13 to 18 ft bls. A gas trap collected at 13 ft bls identified the presence of benzene, toluene, xylenes, trichloroethene (TCE) and cis-1,2-dichloroethene (cis-1,2-DCE).

- Boring P-8, which was completed approximately 50 ft east of Boring O-8, was advanced to 36 ft bls. The lithology of the boring consisted of sands encountered from land surface to 5 ft bls, the low permeable zone (see above) from 5 to 7 ft bls, silty sand from 7 to 12 ft bls and sand from 12 to 36 ft bls. An ECD response was recorded at 8 ft bls, a FID response was recorded at 9 ft bls, and a PID response was recorded at 12 ft bls. A gas trap collected at 9 ft bls identified the presence of benzene, toluene, xylenes and cis-1,2-DCE. A gas trap collected at 12 ft bls identified benzene, toluene, xylenes, tetrachloroethene (PCE), cis-1,2-DCE and TCE.

Technical Work Plan

In order to verify the vertical extent of impact, eight soil borings will be advanced within the B-43 Area. As shown on Figure 1 in Attachment 1, borings will be located as follows: adjacent to the O-8 and P-8 locations (B-43D and B-43E, respectively); midway between boring B-43 and the O-9 location (B-43A); 25 feet west of the O-8 location (B-43C); 25 feet east of the P-8 location (B-43F); 25 feet south and 10 feet west of the O-8 location (B-43G); and, 25 feet north and south of the midpoint between the O-8 and P-8 locations (B-43B and B-43H, respectively). The soil borings will be advanced to 22 feet below grade with continuous sampling at 2-foot intervals from 10 to 22 feet below grade. The borings will continue beyond 22 feet below grade if visual evidence of staining/discoloration or PID readings above background concentrations are present. In this event, the boring will continue until two visually clean intervals are encountered which do not exhibit PID readings above background. Regardless, boring B-43E will continue to the water table interface with a groundwater sample collected from the water table.

All soil samples exhibiting visual evidence of staining/discoloration or PID readings above background concentrations will be analyzed for VOCs utilizing USEPA Method 8260, Polycyclic Aromatic Hydrocarbons (PAHs) utilizing USEPA Method 8270, PCBs utilizing USEPA Method 8082 and chromium utilizing USEPA Method 6010. These samples will be analyzed with an expedited 1-week laboratory turnaround time. Those samples not exhibiting the above will be sent to the laboratory and placed "on-hold" pending the analytical results of the shallower samples. If analysis of the "on-hold" samples is determined to be necessary based on the analytical results of the shallower samples, the deeper samples will be analyzed for the same parameters with an expedited 1-week turnaround time. The groundwater sample will be analyzed for VOCs utilizing USEPA Method 8260 and an expedited 1-week turnaround time.

All of the sampling and quality assurance/quality control procedures specified in the RI/FS Work Plan will be utilized during this portion of the project. In addition, matrix spike/matrix spike duplicate (MS/MSD) samples will be collected at the frequency presented in the RI/FS Work Plan.

Schedule and Logistics

Based on conversations with the NYSDEC, NGC understands that the Town of Oyster Bay is eager for NGC to complete the investigation activities within the B-43 Area. As a result, NGC will expedite the field activities to prevent potential interference with the activities being conducted by the Town of Oyster Bay in and near the B-43 Area.

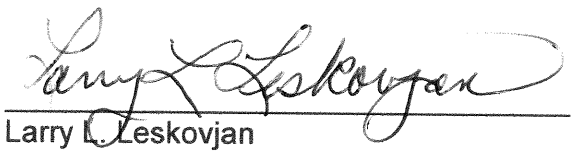
Anticipating quick NYSDEC approval of this Work Plan Addendum, NGC plans to initiate the B-43 Area field activities presented above during the first week of October 2006. It is anticipated that the field activities can be completed within three days. This soil sampling program has been designed to minimize the need for any further field activities to be conducted within the B-43 Area following this next round of sampling.

Following review and validation of the analytical data, NGC will prepare a brief letter report to document the sampling activities conducted in the B-43 Area, present the analytical data, and provide conclusions and recommendations on whether the proposed remediation activities to be conducted by the Town of Oyster Bay in the B-43 Area are sufficient to address the contamination detected in the area. NGC expects that the letter report will be submitted to the NYSDEC in early November 2006.

NGC appreciates the NYSDEC's prompt review and approval of this Work Plan Addendum in order to prevent interference with the activities being conducted by the Town of Oyster Bay within and near the B-43 Area. If you have any questions and/or comments regarding the enclosed, please do not hesitate to give me a call at (516) 575-2333.

Very truly yours,

NORTHROP GRUMMAN CORPORATION



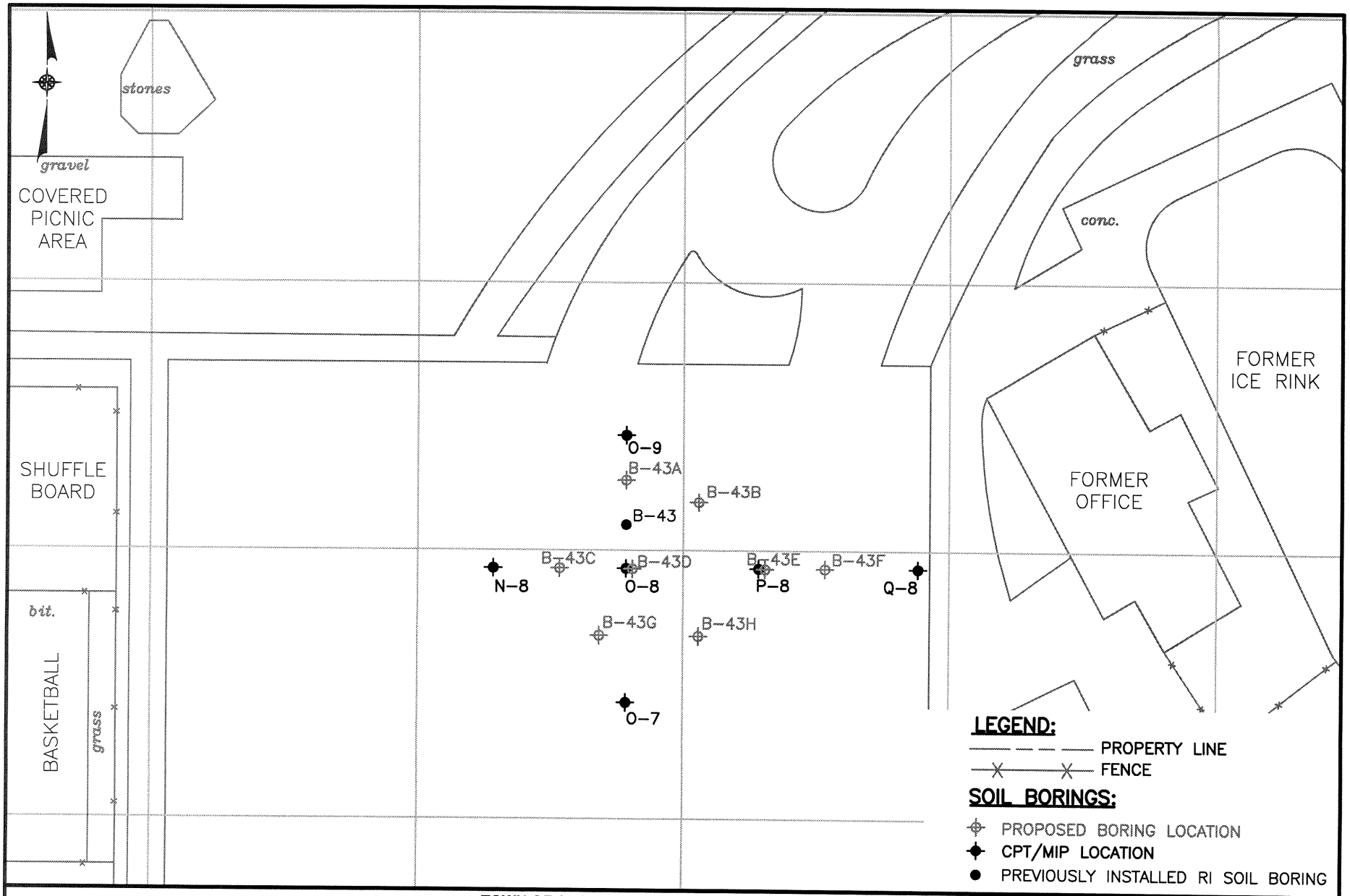
Larry L. Leskovjan
Manager
Environmental, Safety, Health & Medical Services

Attachment

cc: J. Cofman (NGC)
M. Hofgren (D&B)
C. San Giovanni (ARCADIS)
D. Stern (ARCADIS)
B. Veith (D&B)

ATTACHMENT 1

B-43 AREA SAMPLE LOCATION PLAN



Dvirka and Bartilucci CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

TOWN OF OYSTER BAY - BETHPAGE COMMUNITY PARK
BETHPAGE, NEW YORK

SCALE: 1:50

REMEDIAL INVESTIGATION PROGRAM - PHASE 2A ADDENDUM NO. 5
B-43 AREA PROPOSED SOIL BORING LOCATIONS

FIGURE 1

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