Mr. Jason Pelton
Project Manager, Division of Environmental Remediation
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ENVIRONMENT

Subject:
Work Plan for Environmental Baseline Study at Treatment Facility for RW-21
Operable Unit 3 (Former Grumman Settling Ponds)
Bethpage, New York.

Date:
December 3, 2020

Contact:
David Stern

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David.Stern@arcadis.com

Our ref:
30064146.PLNE3

Dear Mr. Pelton:

Arcadis is providing this scope of work (SOW) in support of planning and performance of an environmental baseline study (EBS) at the proposed Building 109 Treatment System, which will treat groundwater from the RW-21 Project Area. The purpose of this effort is to pre-characterize soil quality and to use the data to assess worker H&S actions (if any) as well as facilitate soil waste management during future construction of the Building 109 treatment system and ancillary structures.

The proposed scope of work consists of:

- Perform soil boring and collect soil samples for waste characterization analysis per New York State Department of Environmental Conservation (NYSDEC) DER-10.
- Identify and expose several sections of existing below-grade transite pipes. Perform inspection and collect samples for asbestos analysis if needed.

SUMMARY OF RW-21 SYSTEM

In accordance with the Record of Decision (ROD) for Operable Unit 3 (OU3), Arcadis is designing a groundwater remedial system on behalf of Northrop Grumman to capture and treat Volatile Organic Compounds (VOCs) from groundwater in a portion of the OU3 off-site plume referred to as the RW-21 project area. The RW-21 system remedial design includes three remedial wells, designated as RW-20, RW-21 and RW-22. Water pumped from these wells will be transmitted via underground pipes to a new RW-21 system treatment plant,

which will be constructed on Northrop Grumman property. Existing on-site recharge basins will be used for the recharge of treated water.

TASK 1: SOIL BORING AND SAMPLING

Scope of Work

The current 90% design shows that approximate 4,000 cubic yard of soil will be disturbed during construction, including excavation for building foundation and other site work (piping and manholes etc.). Based on NYSDEC DER-10, a minimum of 13 grab samples for VOCs analysis and 5 composite samples for SVOCs/PCBs/Pesticides/Herbicides/Metals will be collected.

Proposed soil boring locations are shown on **Figure 1**. Boring locations and depths are proposed within the areas of expected disturbance and provide spatial and depth coverage of the excavation volume, based on the excavation locations and depths in the 90% design of the treatment system. Actual drilling locations may be adjusted in the field based on access restrictions or the presence of utilities.

The sampling scope of work consists the following activities:

- Drilling of fourteen (14) soil borings using direct push method (**Figure 1**). Continuous soil cores will be collected from land surface to proposed boring depth and will be screened in the field using a PID. Upon completion, the borings will be grouted from the bottom up to land surface and the surface will be restored with cold patch asphalt. A total of 13 grab samples and 7 composite samples will be collected. Additional composite samples can be collected based on the visual observation. **Table 1** provides soil sampling details. **Table 2** provides details on compositing samples.
- Submit soil samples to a New York State Department of Health (NYSDOH) accredited laboratory for the laboratory analysis. Sample analyses will follow the NYSDEC Analytical Services Protocol (ASP) and will include quality assurance/quality control (QA/QC) samples consisting of trip blanks, equipment blanks, matrix spike/matrix spike duplicate (MS/MSD), and field duplicate samples, in accordance with the NYSDEC-approved Quality Assurance Project Plan (QAPP). Analytical results will be reported using NYSDEC ASP Category B data deliverables. Data obtained from the analytical laboratory will be validated in accordance with the QAPP

Field Program Logistics

Prior to any intrusive work, underground utilities will be located in the field using a minimum of three lines of evidence (e.g., One Call, soft dig, review of utility maps and previous geophysical survey data, site inspection) in accordance with the existing site-specific health and safety plan (HASP). Boring locations will then be marked out in the field using a portable Global Positioning System (GPS) unit (coordinates and approximate land surface elevation).

The drilling operations will be overseen continuously by an Arcadis field geologist. Soil core logging, sample collection, coordination with the analytical laboratory and sample shipment will be conducted by Arcadis personnel. Community air monitoring will be conducted continuously during working hours in accordance with the NYSDEC-approved Community Air Monitoring Plan (CAMP).

Investigation-derived waste (IDW) management, equipment decontamination, and site control will be performed consistent with previous Site work. Soil cuttings and other IDW (e.g., personal protective equipment [PPE], decontamination water, etc.) will be segregated by waste type and placed in appropriate waste containers (e.g., Department of Transportation [DOT]-approved 55-gallon steel drums).

TASK 2: TRANSITE PIPE INSPECTION

Based on historical information provided by Northrop Grumman, a section of transite pipe may exist within the area of disturbance, as shown on **Figure 1**. The transite pipe is anticipated to be buried less than 4 ft below grade. Therefore, it is likely that the pipe will need to be removed during construction excavation activities. Soft dig methods will be used to determine the location and depth of the transite pipe. Should the soft dig method reveal the presence of the pipe within the area of excavation, a backhoe will be used to expose sections of transite pipe for inspection by a New York State certified Asbestos Building Inspector. Sampling locations and number of samples to be collected will be determined by the inspector based on visual observation of the transite pipes. Up to six (6) samples will be collected and will be analyzed for asbestos under normal turnaround time. Transite pipe will be removed as needed during construction activities using proper protocol, based on the sampling results.

ESTIMATED SCHEDULE

We anticipate commencing the investigation activities within two weeks of NYSDEC's approval of this work plan, contingent on subcontractor availability and site access. Field work is anticipated to require 5 days to complete and will be performed Monday to Friday from 8 a.m. to 5 p.m.

The investigation results will be provided in a summary report at the end of the investigation program and after the data have been evaluated and validated.

Please contact me if you have any questions or need additional information.

Sincerely,

Arcadis of New York, Inc.

David E. Stern
Project Manager

Copies:
Ed Hannon, Northrop Grumman
James Sullivan, NYSDOH
Donald Irwin, Nassau County DOH

Enclosures:

Figures

1 Figure 1: Locations of the proposed borings and transit pipe

Tables

1 Table 1: Soil Sampling Detail

2 Table 2: Composite Soil Sample Detail

TABLES

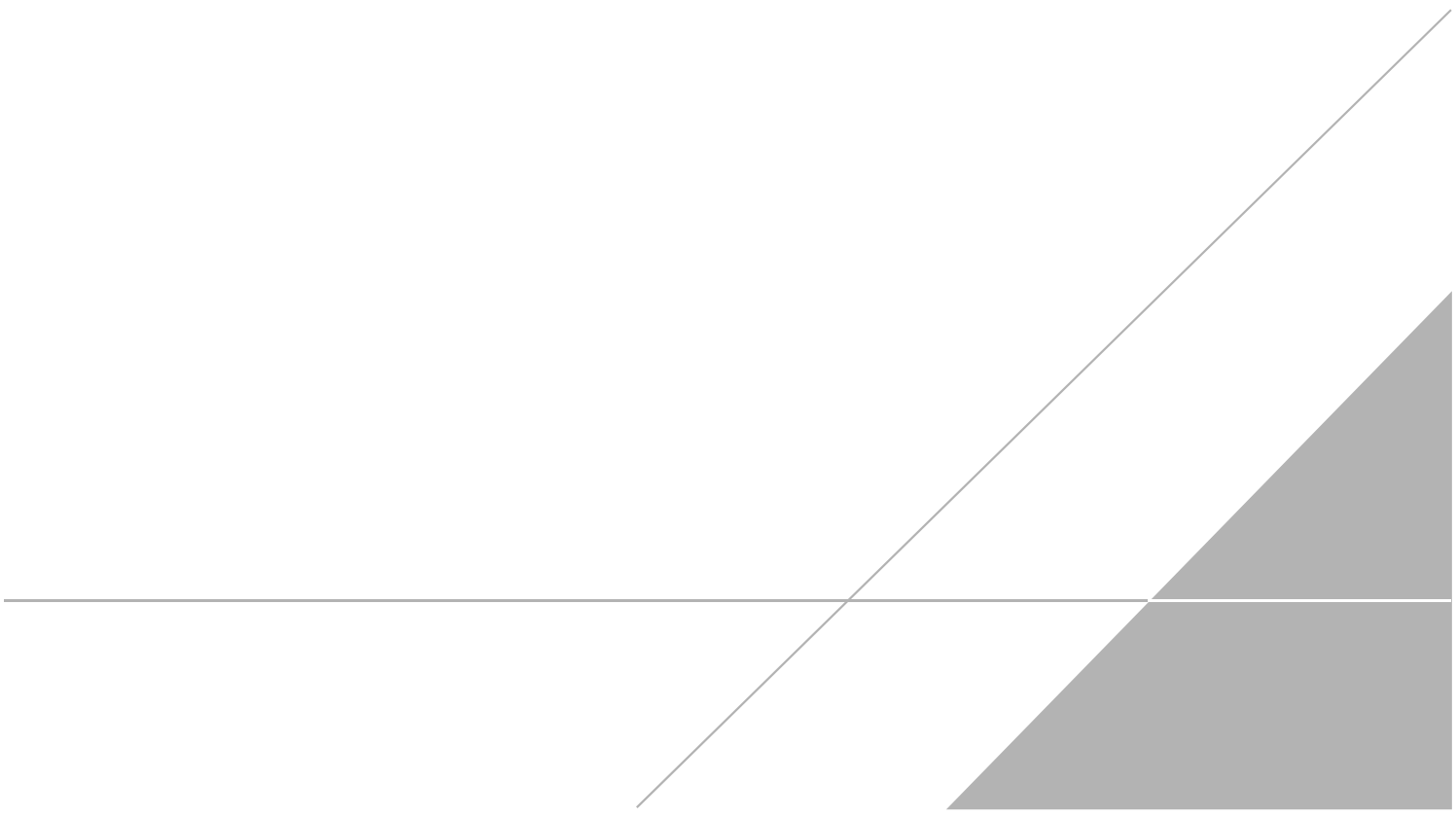

Table 1
Soil Sampling Detail
Builidng 109 Treatment System Environmental Baseline Study
Northrop Grumman Systems Corporation, Bethpage New York

ARCADIS Design & Consultancy for natural and built assets

Boring ID	Total Boring Depth(ft bls)	Grab Sample	Grab Sample Depths (ft bls)	Grab Sample ID	Composite Sample (1)	Composite Sample Depths (ft bls) (1)
BLD109-EBS1	6	x	4-6	BLD109-G1 (4-6)	x	6-8
BLD109-EBS2	8	x	6-8	BLD109-G2 (6-8)	x	6-8
BLD109-EBS3	10	x	8-10	BLD109-G3 (8-10)	x	4-6 8-10
BLD109-EBS4	4	x	2-4	BLD109-G4 (2-4)	x	2-4
BLD109-EBS5	12	x	10-12	BLD109-G5 (10-12)	x	2-4
BLD109-EBS6	12	x	8-10 10-12	BLD109-G6 (8-10) BLD109-G6 (10-12)	x	8-10 2-4 8-10
BLD109-EBS7	6	x	4-6	BLD109-G7 (4-6)	x	2-4
BLD109-EBS8	3	x	1-3	BLD109-G8 (1-3)	x	2-4
BLD109-EBS9	8	x	6-8	BLD109-G9 (6-8)	x	2-4
BLD109-EBS10	12	x	8-10 10-12	BLD109-G10 (8-10) BLD109-G10 (10-12)	x	4-6
BLD109-EBS11	8	x	6-8	BLD109-G11 (6-8)	x	4-6
BLD109-EBS12	8	--	--	--	x	4-6
TLR- EBS1	2	--	--	--	x	0-2
TLR- EBS2	2	--	--	--	x	0-2

Notes and Abbreviations:
Grab samples and composite samples will be collected following procedures in NYSDEC DER-10.
Sample depth and sample ID may change based on field observation.
Grab samples will be analyzed for VOCs only using USEPA Method 8260.
Composite samples will be analyzed for SVOCs using USEPA Method 8270, TAL Metals using USEPA Method 6010/7470, Pesticide/Herbicide using USEPA Method 8081/8151, and PCBs using USEPA Method 8082.

(1) See Table 2 for details of compositing samples.

ft bls Feet below land surface

Table 2
Composite Soil Sample Detail
Builidng 109 Treatment System Environmental Baseline Study
Northrop Grumman Systems Corporation, Bethpage New York

Composite Sample ID	Composite Sample Composition
BLD109-C1 (6-8)	BLD109-EBS1 (6-8), EBS-2 (6-8)
BLD109-C2 (8-10)	BLD109-EBS3 (8-10), EBS-5 (8-10), EBS-6 (8-10)
BLD109-C3 (4-6)	BLD109-EBS3(4-6), EBS11(4-6), EBS10 (4-6)
BLD109-C4 (2-4)	BLD109-EBS4(2-4), EBS5 (2-4), EBS6 (2-4)
BLD109-C5 (2-4)	BLD109-EBS7(2-4), EBS8 (2-4) and EBS9 (2-4)
BLD109-C6 (4-6)	BLD109-EBS9 (4-6) and EBS12 (4-6)
TLR-C1 (0-2)	TLR-EBS1 (0-2) and TLR-EBS2 (0-2)

Notes and Abbreviations:
Grab samples and composite samples will be collected following procedures in NYSDEC DER-10.
Sample depth and sample ID may change based on field observation.

FIGURES

EBS1
EBS2
EBS3
EBS4
EBS5
EBS6
EBS7
EBS8
EBS9
EBS10
EBS11
EBS12
TLR-EBS1
TLR-EBS2

CONTROL POINT #67
N 209844.56
E 1124736.16
ELEV. 105.38

CONTROL POINT #68
N 209741.68
E 1124404.35
ELEV. 103.71

Minimum Elevation	Maximum Elevation
-11.656'	-11.000'
-11.000'	-10.000'
-10.000'	-9.000'
-9.000'	-8.000'
-8.000'	-7.000'
-7.000'	-6.000'
-6.000'	-5.000'
-5.000'	-4.000'
-4.000'	-3.000'
-3.000'	-2.000'
-2.000'	-1.000'
-1.000'	0.000'

LEGEND:
Proposed Borings
Existing Transite Pipe

0 25 50 Feet

NORTHROP GRUMMAN SYSTEMS CORPORATION
RW-21 PROJECT AREA TREATMENT SYSTEM DESIGN
BETHPAGE, NEW YORK

CONCEPTUAL EXCAVATION ISOPACH AND PROPOSED SOIL BORING LOCATIONS

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FIGURE 1