ARCADIS Design & Consultancy for natural and built assets

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ENVIRONMENT

Subject:
January to June 2020 Semi-Annual Progress Report
Northrop Grumman Systems Corporation
Operable Unit 3 (OU3), NYSDEC Site ID # 1-30-003A,
Bethpage, New York

Date:
July 10, 2020

Contact:
Arnas Nemickas

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631.391.5212

Email:
arnas.nemickas@arcadis.com

Our ref:
30037969.LARA5

Dear Jason:

In accordance with Section III of Administrative Order on Consent (AOC) Index # W1-0018-04-01, and the May 2011 Work Plan for Modification of AOC Progress Report (work plan), this letter report describes OU3 activities performed by Northrop Grumman Systems Corporation (Northrop Grumman) from January through June 2020. Activities planned for July through December 2020 are also summarized. In accordance with the approved work plan, these reports will be submitted to the NYSDEC on a semi-annual basis until it is determined that the reports are no longer necessary. The site plan showing well locations is provided on **Figure 1**.

OU3 ACTIVITIES CONDUCTED DURING JANUARY THROUGH JUNE 2020

Bethpage Park Soil Gas Containment System (Formerly Soil Gas IRM)

- Continued Operation, Maintenance, and Monitoring (OM&M) of the Bethpage Park Soil Gas Containment System (BPSGCS)
- Submitted the BPSGCS 2019 Annual and First Quarter 2020 OM&M Reports (March and May 2020, respectively) to the NYSDEC

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- The BPSGCS had no significant shutdowns for the January through end of June 2020 period.

Bethpage Park Groundwater Containment System (Formerly Groundwater IRM)

- Continued OM&M of the Bethpage Park Groundwater Containment System (BPGWCS)
- Submitted BPGWCS 2019 Annual and First Quarter 2020 Quarterly OM&M Reports (March and May 2020, respectively) to the NYSDEC
- Significant shutdown instances this period are summarized below. In each instance the system was fully restored following shutdown.
    - January 2020 System shutdown for nine days due to broken fan on blower.
    - May 2020 System operated at a reduced flowrate for three days due to RW-2 pump maintenance.

Other

- Performed quarterly monitoring rounds for Monitoring Wells MW109-3 and MW111-4 January through June 2020. Validated analytical results obtained from the January through June 2020 period are provided in **Table 1**.

OU3 ACTIVITIES SCHEDULED DURING JULY THROUGH DECEMBER 2020

Bethpage Park Soil Gas Containment System

- Continue OM&M of the BPSGCS
- Submit the OU3 BPGWCS Second and Third Quarter 2020 Reports (August and November 2020, respectively) to the NYSDEC

Bethpage Park Groundwater Containment System

- Continue OM&M of the BPGWCS
- Submit the OU3 BPGWCS Second and Third Quarter 2020 Reports (August and November 2020, respectively) to the NYSDEC
- Perform annual monitoring round for BPGWCS system in July 2020

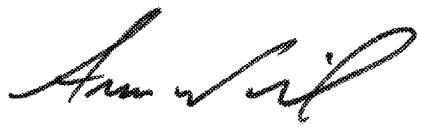
Other

- Perform quarterly monitoring rounds for Monitoring Wells MW109-3 and MW111-4 and monthly monitoring rounds for Monitoring Well MW116-5.

Feel free to call us if you have any questions.

Sincerely,

Arcadis of New York, Inc.



Arnas Nemickas
Senior Hydrogeologist/ Project Manager

Copies:
J. Sullivan – NYSDOH
D. Hesler – NYSDEC
W. Parrish - NYSDEC
E. Hannon, Northrop Grumman
F. Weber, Northrop Grumman
C. Henry, EMAGIN
C. Stein – USEPA
Bethpage Public Library – Public Repository
C. San Giovanni, Arcadis
D. Stern, Arcadis
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Enclosures:

Table

1 Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells

Figure

1 Site Plan Showing OU3 Well Locations

TABLES

Table 1.
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells,
Northrop Grumman Systems Corporation,
Bethpage, New York.

ARCADIS

Constituents (units in µg/L)	Location ID: Sample Date:	MW-109-3 2/28/2020	MW-109-3 5/15/2020	MW-111-4 2/28/2020	MW-111-4 5/15/2020
1,1,1-Trichloroethane		< 1.0	< 1.0	< 2.0	< 5.0
1,1,2,2-Tetrachloroethane		< 1.0	< 1.0	< 2.0	< 5.0
1,1,2-trichloro-1,2,2-trifluoroethane		< 5.0	< 5.0	< 10	< 25
1,1,2-Trichloroethane		< 1.0	< 1.0	< 2.0	< 5.0
1,1-Dichloroethane		**2.3**	**2.5**	**8.0**	**8.4**
1,1-Dichloroethene		< 1.0	**0.67 J**	**4.0**	**4.7 J**
1,2-Dichloroethane		**0.83 J**	**0.93 J**	**2.4**	< 5.0
1,2-Dichloropropane		< 1.0	< 1.0	< 2.0	< 5.0
1,3-Butadiene		< 5.0	< 5.0	< 10	< 25
1-Chloro-1,1-difluoroethane		< 5.0	< 5.0	< 10	< 25
2-Butanone (MEK)		< 10	< 10	< 20	< 50
4-Methyl-2-Pentanone		< 5.0	< 5.0	< 10	< 25
Acetone		< 10	< 10	< 20	< 50
Benzene		< 0.50	< 0.50	< 1.0	< 2.5
Bromodichloromethane		< 1.0	< 1.0	< 2.0	< 5.0
Bromoform		< 1.0	< 1.0	< 2.0	< 5.0
Bromomethane		< 2.0	< 2.0	< 4.0	< 10
Carbon Disulfide		< 2.0	< 2.0	< 4.0	< 10
Carbon Tetrachloride		< 1.0	< 1.0	< 2.0	< 5.0
CFC-12		< 2.0	< 2.0	< 4.0	< 10
Chlorobenzene		< 1.0	< 1.0	< 2.0	< 5.0
Chlorodibromomethane		< 1.0	< 1.0	< 2.0	< 5.0
Chlorodifluoromethane		< 5.0	< 5.0	< 10	< 25
Chloroethane		< 1.0	< 1.0	< 2.0	< 5.0
Chloroform		**6.6**	**7.0**	**3.0**	**4.0 J**
Chloromethane		< 1.0	< 1.0	< 2.0	< 5.0
cis-1,2-Dichloroethene		**176**	**177**	**642**	**673**
cis-1,3-Dichloropropene		< 1.0	< 1.0	< 2.0	< 5.0
Dichloromethane		< 2.0	< 2.0	< 4.0	< 10
Ethylbenzene		< 1.0	< 1.0	< 2.0	< 5.0
m&p-Xylenes		< 1.0	< 1.0	< 2.0	< 5.0
Methyl N-Butyl Ketone (2-Hexanone)		< 5.0	< 5.0	< 10	< 25
o-Xylene		< 1.0	< 1.0	< 2.0	< 5.0
Styrene (Monomer)		< 1.0	< 1.0	< 2.0	< 5.0
Tetrachloroethene		**1.6**	**1.5**	**8.3**	**8.2**
Toluene		< 1.0	< 1.0	< 2.0	< 5.0
trans-1,2-Dichloroethene		**1.2**	**1.2**	**7.3**	**7.9**
trans-1,3-Dichloropropene		< 1.0	< 1.0	< 2.0	< 5.0
Trichloroethene		**243**	**209**	**1060**	**1060**
Vinyl chloride		< 1.0	< 1.0	< 2.0	< 5.0
Total VOCs		**430**	**400**	**1,700**	**1,800**
1,4-Dioxane		**6.2**	**5.6**	**21**	**17**

Notes and abbreviations on Last Page

Table 1.
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells,
Northrop Grumman Systems Corporation,
Bethpage, New York.

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Constituents (units in µg/L)	Location ID: Sample Date:	MW-116-5 12/3/2019	MW-116-5 1/17/2020	MW-116-5 2/18/2020	MW-116-5 3/27/2020
1,1,1-Trichloroethane		**3.6 J**	**3.3 J**	**3.4 J**	< 5.0
1,1,2,2-Tetrachloroethane		< 5.0	< 5.0	< 5.0	< 5.0
1,1,2-trichloro-1,2,2-trifluoroethane		< 25	< 25	< 25	< 25
1,1,2-Trichloroethane		**4.3 J**	**5.0**	**4.5 J**	**3.9 J**
1,1-Dichloroethane		**13.5**	**12.9**	**13.5**	**10.3**
1,1-Dichloroethene		**16.9**	**13.2**	**15.2**	**12.0**
1,2-Dichloroethane		**29.5**	**29.6**	**30.6**	**22.5**
1,2-Dichloropropane		**9.3**	**7.8**	**9.0**	**7.9**
1,3-Butadiene		< 25	< 25	< 25	< 25
1-Chloro-1,1-difluoroethane		< 25	< 25	< 25	< 25
2-Butanone (MEK)		< 50	< 50	< 50	< 50
4-Methyl-2-Pentanone		< 25	< 25	< 25	< 25
Acetone		< 50	< 50	< 50	< 50
Benzene		< 2.5	< 2.5	< 2.5	< 2.5
Bromodichloromethane		< 5.0	< 5.0	< 5.0	< 5.0
Bromoform		< 5.0	< 5.0	< 5.0	< 5.0
Bromomethane		< 10	< 10	< 10	< 10
Carbon Disulfide		< 10	< 10	< 10	< 10
Carbon Tetrachloride		**3.7 J**	**3.3 J**	**3.4 J**	< 5.0
CFC-12		< 10	< 10	< 10	< 10
Chlorobenzene		< 5.0	< 5.0	< 5.0	< 5.0
Chlorodibromomethane		< 5.0	< 5.0	< 5.0	< 5.0
Chlorodifluoromethane		< 25	< 25	< 25	< 25
Chloroethane		< 5.0	< 5.0	< 5.0	< 5.0
Chloroform		**24.8**	**24.5**	**27.1**	**20.1**
Chloromethane		< 5.0	< 5.0	< 5.0	< 5.0
cis-1,2-Dichloroethene		**622**	**603**	**652**	**491**
cis-1,3-Dichloropropene		< 5.0	< 5.0	< 5.0	< 5.0
Dichloromethane		< 10	< 10	< 10	< 10
Ethylbenzene		< 5.0	< 5.0	< 5.0	< 5.0
m&p-Xylenes		< 5.0	< 5.0	< 5.0	< 5.0
Methyl N-Butyl Ketone (2-Hexanone)		< 25	< 25	< 25	< 25
o-Xylene		< 5.0	< 5.0	< 5.0	< 5.0
Styrene (Monomer)		< 5.0	< 5.0	< 5.0	< 5.0
Tetrachloroethene		< 5.0	< 5.0	< 5.0	< 5.0
Toluene		< 5.0	< 5.0	< 5.0	< 5.0
trans-1,2-Dichloroethene		**4.4 J**	**5.3**	**6.0**	**5.9**
trans-1,3-Dichloropropene		< 5.0	< 5.0	< 5.0	< 5.0
Trichloroethene		**3870**	**4090**	**4040**	**3530**
Vinyl chloride		< 5.0	< 5.0	< 5.0	< 5.0
Total VOCs		**4,600**	**4,800**	**4,800**	**4,100**
1,4-Dioxane		**93**	**55**	**110**	**85**

Notes and abbreviations on Last Page

Table 1.
Concentrations of Volatile Organic Compounds and 1,4-Dioxane in Groundwater Samples Collected from Monitoring Wells,
Northrop Grumman Systems Corporation,
Bethpage, New York.

ARCADIS

Constituents (units in µg/L)	Location ID: Sample Date:	MW-116-5 4/16/2020	MW-116-5 5/14/2020	MW-116-5 6/18/2020
1,1,1-Trichloroethane		< 10	**3.6 J**	**3.8 J**
1,1,2,2-Tetrachloroethane		< 10	< 5.0	< 4.0
1,1,2-trichloro-1,2,2-trifluoroethane		< 50	< 25	< 20
1,1,2-Trichloroethane		< 10	**4.7 J**	**5.2**
1,1-Dichloroethane		**14.2**	**14.0**	**15.0**
1,1-Dichloroethene		**16.1**	**17.8**	**16.5**
1,2-Dichloroethane		**32.4**	**33.2**	**29.0**
1,2-Dichloropropane		**9.5 J**	**10.1**	**10.2**
1,3-Butadiene		< 50	< 25	< 20
1-Chloro-1,1-difluoroethane		< 50	< 25	< 20
2-Butanone (MEK)		< 100	< 50	< 40
4-Methyl-2-Pentanone		< 50	< 25	< 20
Acetone		< 100	< 50	< 40
Benzene		< 5.0	< 2.5	< 2.0
Bromodichloromethane		< 10	< 5.0	< 4.0
Bromoform		< 10	< 5.0	< 4.0
Bromomethane		< 20	< 10	< 8.0
Carbon Disulfide		< 20	< 10	< 8.0
Carbon Tetrachloride		< 10	**3.7 J**	**3.8 J**
CFC-12		< 20	< 10	< 8.0
Chlorobenzene		< 10	< 5.0	< 4.0
Chlorodibromomethane		< 10	< 5.0	< 4.0
Chlorodifluoromethane		< 50	< 25	< 20
Chloroethane		< 10	< 5.0	< 4.0
Chloroform		**25.4**	**25.8**	**26.5**
Chloromethane		< 10	< 5.0	< 4.0
cis-1,2-Dichloroethene		**658**	**624**	**680**
cis-1,3-Dichloropropene		< 10	< 5.0	< 4.0
Dichloromethane		< 20	< 10	< 8.0
Ethylbenzene		< 10	< 5.0	< 4.0
m&p-Xylenes		< 10	< 5.0	< 4.0
Methyl N-Butyl Ketone (2-Hexanone)		< 50	< 25	< 20
o-Xylene		< 10	< 5.0	< 4.0
Styrene (Monomer)		< 10	< 5.0	< 4.0
Tetrachloroethene		< 10	< 5.0	< 4.0
Toluene		< 10	< 5.0	< 4.0
trans-1,2-Dichloroethene		**7.1 J**	**6.0**	**6.6**
trans-1,3-Dichloropropene		< 10	< 5.0	< 4.0
Trichloroethene		**4120**	**4240**	**4290**
Vinyl chloride		< 10	< 5.0	< 4.0
Total VOCs		**4,900**	**5,000**	**5,100**
1,4-Dioxane		**67**	**83**	**73**

Notes and abbreviations on Last Page

Notes and Abbreviations:

Results validated following protocols specified in March 2006 RI/FS Work Plan (ARCADIS G&M, Inc. 2006).

Samples analyzed for TCL VOCs using EPA Method 8260C.

Samples analyzed for 1,4-Dioxane using USEPA Method 8270D SIM.

TVOCs are rounded to two significant figures.

Bold value indicates a detection.

RI/FS	Remedial Investigation/Feasibility Study
NYSDEC	New York State Department of Environmental Conservation
TCL	Target compound list
VOC	Volatile Organic Compound
TVOC	Total Volatile Organic Compounds
ug/L	Micrograms per liter
J	Value is estimated
REP	Blind replicate

FIGURES

EXPLANATION:

- CURRENT NORTHROP GRUMMAN PROPERTY
- CURRENT NAVEL OWNED PROPERTY
- FORMER NORTHROP GRUMMAN PROPERTY BOUNDARY
- FORMER NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
- MONITORING WELL
- REMEDIAL WELL
- INJECTION WELL
- PUBLIC SUPPLY WELL

NAVY AND BETHPAGE WELLS SHOWN FOR REFERENCE PURPOSES

0 500' 1000' 2000'
APPROXIMATE SCALE IN FEET

NORTHROP GRUMMAN SYSTEMS CORPORATION
BETHPAGE, NEW YORK

SITE PLAN
SHOWING OU3 WELL LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE
1