NORTHROP GRUMMAN

Northrop Grumman Corporation
925 South Oyster Bay Road
Bethpage, NY 11714

northropgrumman.com

December 18, 2020

Jason M. Pelton, P.G.
Project Manager
Remedial Section B, Remedial Bureau D
Division of Environmental Remediation
New York State Department of Environmental Conservation
625 Broadway, 12th Floor
Albany, NY 12233-7013

Subject: Request for Modification to the August 21, 2020 Revised Remedial Action Work Plan for Management of Treated Liquid Effluent
Operable Unit 3, Former Grumman Settling Ponds, Bethpage, New York

Electronic transmission only. Hard copy available upon request.

Dear Mr. Pelton,

On behalf of Northrop Grumman Systems Corporation (Northrop Grumman), REUS Engineers, PC (formerly Environ Engineers of North Carolina, PC), a New York licensed professional corporation, and Environmental Management and Global Innovations, Inc. (EMAGIN) propose a modification to the Remedial Action Work Plan (RAWP) for the Volatile Organic Compound (VOC) Source Area at the Bethpage Community Park (the Park) in Bethpage, New York (Site). The RAWP was last revised on and approved by NYSDEC on August 21, 2020.

The proposed modification relates to the management of treated effluent from the ISTR liquid treatment system, as described in Section 4.4 of the RAWP. The RAWP indicates that the liquid effluent, which is treated by filtration, gravity separation, and granular activated carbon, will meet SPDES or TOGS criteria prior pumping it through the existing OU3 groundwater treatment system for additional polishing treatment by air stripping prior to discharge. Since startup of operations, the ISTR liquid effluent has been batch discharged from a holding tank to the OU3 treatment system approximately every 3 weeks (approximately 15,000 gallons pumped over 4-5 hours per event). The ISTR liquid effluent during a discharge event (60 gpm), however, represents only about 25 percent of the total flow (240 gpm) through the OU3 treatment system. The balance of the flow (180 gpm) originates from OU3 groundwater recovery wells RW-2, -3, and -4. Thus, the ISTR liquid effluent discharge limits identified in the RAWP do not account for the moderating effect of the flow from the OU3 ONCT remedial wells, particularly for iron and manganese, which are present in the subsurface as naturally occurring compounds.

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On October 5, 2020, Northrop Grumman submitted a request to DEC to discharge the first batch of ISTR treated liquid effluent (discharge event on October 6, 2020). This batch had an iron concentration of 801 ug/L (see **Attachment A**, sample FRAC1-2949 by Method 200.7), which exceeded the SPDES equivalency daily maximum limit of 600 ug/L. Historical data from 2019 indicated that the combined iron concentration in the flow from the OU3 remedial wells was less than 200 ug/L (see **Attachment B**). Following NYSDEC's approval of Northrop Grumman's request on October 5, 2020 (see **Attachment C**), the ISTR liquid effluent was combined with the flow from the OU3 remedial wells, and the resulting iron concentration in the OU3 treatment system discharge was less than 100 ug/L (see **Attachment D**), which is well below the SPDES criterion.

Attachment E contains proposed revisions (shown in underline/strikeout) to Section 4.4 of the RAWP and Section 4.2.6 of the BOD (Appendix B) for this RAWP modification to properly account for the combined flow from the ISTR liquid treatment system and the OU3 ONCT remedial wells, which is treated at and discharged from the OU3 treatment system.

Feel free to contact us should you have any questions.

Thank you,

Edward J. Hannon
Director ESHM
925 South Oyster Bay Road
Bethpage, NY 11714
516-575-2333

cc:
Don Hesler, NYSDEC
Jim Sullivan, NYSDOH
Richard Lenz, TOB
Matt Russo, TOB
Aaron Gershonowitz, Esq.

Attachments

ATTACHMENT A

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Sample Summary

EMAGIN, Inc.

Job No: JD13479

OU3 ISTR Monitoring, Bethpage, NY
Project No: 7as301101, phase74

Sample Number	Collected Date	Time	By	Received	Matrix Code	Type	Client Sample ID
This report contains results reported as ND = Not detected. The following applies:							
Organics ND = Not detected above the MDL							
* JD13479-1	09/22/20	11:30	CM	09/22/20	AQ	Influent	LGAC-INF-20200922
* JD13479-3	09/22/20	12:00	CM	09/22/20	AQ	Water	FRAC1-A2949-20200922

* The following report applies to these samples only (3 day TAT).

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID: LGAC-INF-20200922
Lab Sample ID: JD13479-1
Matrix: AQ - Influent
Method: SW846 8260C
Project: OU3 ISTR Monitoring, Bethpage, NY

Date Sampled: 09/22/20
Date Received: 09/22/20
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 [a]	2E164256.D	5	09/24/20 13:49	KC	n/a	n/a	V2E8230
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	92.4	50	30	ug/l	
71-43-2	Benzene	2.2	2.5	2.1	ug/l	J
74-97-5	Bromochloromethane	ND	5.0	2.4	ug/l	
75-27-4	Bromodichloromethane	ND	5.0	2.3	ug/l	
75-25-2	Bromoform	ND	5.0	3.2	ug/l	
74-83-9	Bromomethane	ND	10	8.2	ug/l	
78-93-3	2-Butanone (MEK)	ND	50	34	ug/l	
75-15-0	Carbon disulfide	ND	10	2.3	ug/l	
56-23-5	Carbon tetrachloride	ND	5.0	2.8	ug/l	
108-90-7	Chlorobenzene	ND	5.0	2.8	ug/l	
75-45-6	Chlorodifluoromethane	ND	25	14	ug/l	
75-00-3	Chloroethane	ND	5.0	3.6	ug/l	
67-66-3	Chloroform	ND	5.0	2.5	ug/l	
74-87-3	Chloromethane	ND	5.0	3.8	ug/l	
110-82-7	Cyclohexane	ND	25	3.9	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	10	6.0	ug/l	
124-48-1	Dibromochloromethane	ND	5.0	2.8	ug/l	
106-93-4	1,2-Dibromoethane	ND	5.0	2.4	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	5.0	2.7	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	5.0	2.7	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	5.0	2.5	ug/l	
75-71-8	Dichlorodifluoromethane	ND	10	6.8	ug/l	
75-34-3	1,1-Dichloroethane	5.2	5.0	2.8	ug/l	
107-06-2	1,2-Dichloroethane	ND	5.0	3.0	ug/l	
75-35-4	1,1-Dichloroethene	ND	5.0	3.0	ug/l	
156-59-2	cis-1,2-Dichloroethene	779	5.0	2.5	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	5.0	2.7	ug/l	
78-87-5	1,2-Dichloropropane	ND	5.0	2.5	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	5.0	2.4	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	5.0	2.2	ug/l	
100-41-4	Ethylbenzene	ND	5.0	3.0	ug/l	
76-13-1	Freon 113	ND	25	9.7	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID:	LGAC-INF-20200922		
Lab Sample ID:	JD13479-1	**Date Sampled:**	09/22/20
Matrix:	AQ - Influent	**Date Received:**	09/22/20
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	OU3 ISTR Monitoring, Bethpage, NY		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
591-78-6	2-Hexanone	ND	25	10	ug/l	
98-82-8	Isopropylbenzene	ND	5.0	3.2	ug/l	
79-20-9	Methyl Acetate	ND	25	4.0	ug/l	
108-87-2	Methylcyclohexane	ND	25	3.0	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	5.0	2.5	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	25	9.3	ug/l	
75-09-2	Methylene chloride	ND	10	5.0	ug/l	
100-42-5	Styrene	ND	5.0	2.4	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	5.0	3.3	ug/l	
127-18-4	Tetrachloroethene	ND	5.0	4.5	ug/l	
108-88-3	Toluene	76.6	5.0	2.7	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	5.0	2.5	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	5.0	2.5	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	5.0	2.7	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	5.0	2.7	ug/l	
79-01-6	Trichloroethene	110	5.0	2.6	ug/l	
75-69-4	Trichlorofluoromethane	ND	10	2.0	ug/l	
75-01-4	Vinyl chloride	45.0	5.0	3.9	ug/l	
	m,p-Xylene	ND	5.0	3.9	ug/l	
95-47-6	o-Xylene	3.6	5.0	3.0	ug/l	J
1330-20-7	Xylene (total)	3.6	5.0	3.0	ug/l	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	99%		80-120%
17060-07-0	1,2-Dichloroethane-D4	103%		81-124%
2037-26-5	Toluene-D8	99%		80-120%
460-00-4	4-Bromofluorobenzene	103%		80-120%

(a) Dilution required due to high concentration of target compound.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID: LGAC-INF-20200922
Lab Sample ID: JD13479-1
Matrix: AQ - Influent
Method: SW846 8270D SW846 3510C
Project: OU3 ISTR Monitoring, Bethpage, NY

Date Sampled: 09/22/20
Date Received: 09/22/20
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5P71501.D	1	09/25/20 07:06	CS	09/24/20 17:00	OP29652	E5P3371
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List (SOM0 2.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.0	0.82	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	0.89	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.0	1.3	ug/l	
105-67-9	2,4-Dimethylphenol	3.7	5.0	2.4	ug/l	J
51-28-5	2,4-Dinitrophenol	ND	5.0	1.6	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.0	1.3	ug/l	
95-48-7	2-Methylphenol	2.8	2.0	0.89	ug/l	
	3&4-Methylphenol	3.4	2.0	0.88	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	0.96	ug/l	
100-02-7	4-Nitrophenol	ND	10	1.2	ug/l	
87-86-5	Pentachlorophenol	ND	4.0	1.4	ug/l	
108-95-2	Phenol	0.42	2.0	0.39	ug/l	J
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.0	1.5	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.3	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	0.92	ug/l	
83-32-9	Acenaphthene	0.21	1.0	0.19	ug/l	J
208-96-8	Acenaphthylene	ND	1.0	0.14	ug/l	
98-86-2	Acetophenone	1.3	2.0	0.21	ug/l	J
120-12-7	Anthracene	0.51	1.0	0.21	ug/l	J
1912-24-9	Atrazine	ND	2.0	0.45	ug/l	
100-52-7	Benzaldehyde	ND	5.0	0.29	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.0	0.20	ug/l	
50-32-8	Benzo(a)pyrene	ND	1.0	0.21	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.0	0.21	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.0	0.34	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.0	0.21	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	0.40	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.0	0.46	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.21	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.0	0.24	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	0.34	ug/l	
86-74-8	Carbazole	ND	1.0	0.23	ug/l	

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N = Indicates presumptive evidence of a compound

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID: LGAC-INF-20200922
Lab Sample ID: JD13479-1
Matrix: AQ - Influent
Method: SW846 8270D SW846 3510C
Project: OU3 ISTR Monitoring, Bethpage, NY

Date Sampled: 09/22/20
Date Received: 09/22/20
Percent Solids: n/a

ABN TCL List (SOM0 2.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	1.6	2.0	0.65	ug/l	J
218-01-9	Chrysene	ND	1.0	0.18	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.0	0.28	ug/l	
111-44-4	bis(2-Chloroethyl)ether	0.28	2.0	0.25	ug/l	J
108-60-1	2,2'-Oxybis(1-chloropropane)	ND	2.0	0.40	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.0	0.37	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.0	0.55	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.0	0.48	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.0	0.51	ug/l	
123-91-1	1,4-Dioxane	1.3	1.0	0.66	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	1.0	0.33	ug/l	
132-64-9	Dibenzofuran	0.40	5.0	0.22	ug/l	J
84-74-2	Di-n-butyl phthalate	ND	2.0	0.50	ug/l	
117-84-0	Di-n-octyl phthalate [a]	ND	2.0	0.23	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.26	ug/l	
131-11-3	Dimethyl phthalate	ND	2.0	0.22	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.0	1.7	ug/l	
206-44-0	Fluoranthene	2.5	1.0	0.17	ug/l	
86-73-7	Fluorene	0.26	1.0	0.17	ug/l	J
118-74-1	Hexachlorobenzene	ND	1.0	0.33	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.0	0.49	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	10	2.8	ug/l	
67-72-1	Hexachloroethane	ND	2.0	0.39	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.0	0.33	ug/l	
78-59-1	Isophorone	ND	2.0	0.28	ug/l	
91-57-6	2-Methylnaphthalene	0.34	1.0	0.21	ug/l	J
88-74-4	2-Nitroaniline [a]	ND	5.0	0.28	ug/l	
99-09-2	3-Nitroaniline	ND	5.0	0.39	ug/l	
100-01-6	4-Nitroaniline	ND	5.0	0.44	ug/l	
91-20-3	Naphthalene	0.42	1.0	0.23	ug/l	J
98-95-3	Nitrobenzene	ND	2.0	0.64	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.0	0.48	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	0.22	ug/l	
85-01-8	Phenanthrene	7.3	1.0	0.18	ug/l	
129-00-0	Pyrene	1.9	1.0	0.22	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.0	0.37	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	18%		10-73%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID:	LGAC-INF-20200922		
Lab Sample ID:	JD13479-1	**Date Sampled:**	09/22/20
Matrix:	AQ - Influent	**Date Received:**	09/22/20
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	OU3 ISTR Monitoring, Bethpage, NY		

ABN TCL List (SOM0 2.0)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	13%		10-64%
118-79-6	2,4,6-Tribromophenol	38%		31-130%
4165-60-0	Nitrobenzene-d5	36%		28-126%
321-60-8	2-Fluorobiphenyl	33%		26-114%
1718-51-0	Terphenyl-d14	40%		16-122%

(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
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N = Indicates presumptive evidence of a compound

ATTACHMENT A

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID: LGAC-INF-20200922
Lab Sample ID: JD13479-1
Matrix: AQ - Influent
Method: SW846 8270D BY SIM SW846 3510C
Project: OU3 ISTR Monitoring, Bethpage, NY

Date Sampled: 09/22/20
Date Received: 09/22/20
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4P39498.D	1	09/26/20 04:42	CS	09/25/20 08:00	OP29651A	E4P2107
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	2.09	0.10	0.050	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	57%		29-124%
321-60-8	2-Fluorobiphenyl	60%		23-122%
1718-51-0	Terphenyl-d14	60%		22-130%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID: LGAC-INF-20200922
Lab Sample ID: JD13479-1
Matrix: AQ - Influent
Method: SW846 8082A SW846 3510C
Project: OU3 ISTR Monitoring, Bethpage, NY

Date Sampled: 09/22/20
Date Received: 09/22/20
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2G197793.D	1	09/25/20 01:01	CP	09/24/20 17:00	OP29664	G2G5141
Run #2							

	Initial Volume	Final Volume
Run #1	980 ml	5.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016	ND	0.26	0.10	ug/l	
11104-28-2	Aroclor 1221	ND	0.26	0.21	ug/l	
11141-16-5	Aroclor 1232	ND	0.26	0.13	ug/l	
53469-21-9	Aroclor 1242	ND	0.26	0.12	ug/l	
12672-29-6	Aroclor 1248	ND	0.26	0.064	ug/l	
11097-69-1	Aroclor 1254	ND	0.26	0.21	ug/l	
11096-82-5	Aroclor 1260	ND	0.26	0.078	ug/l	
11100-14-4	Aroclor 1268	ND	0.26	0.088	ug/l	
37324-23-5	Aroclor 1262	ND	0.26	0.098	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	98%		10-155%
877-09-8	Tetrachloro-m-xylene	68%		10-155%
2051-24-3	Decachlorobiphenyl	39%		10-151%
2051-24-3	Decachlorobiphenyl	41%		10-151%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID:	LGAC-INF-20200922		
Lab Sample ID:	JD13479-1	**Date Sampled:**	09/22/20
Matrix:	AQ - Influent	**Date Received:**	09/22/20
		Percent Solids:	n/a
Project:	OU3 ISTR Monitoring, Bethpage, NY		

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Cadmium	< 3.0	3.0	ug/l	1	09/23/20	09/23/20	ND	SW846 6010D [2]	SW846 3010A [3]
Chromium	< 10	10	ug/l	1	09/23/20	09/23/20	ND	SW846 6010D [2]	SW846 3010A [3]
Iron	30300	100	ug/l	1	09/23/20	09/23/20	ND	SW846 6010D [2]	SW846 3010A [3]
Manganese	905	15	ug/l	1	09/23/20	09/23/20	ND	SW846 6010D [2]	SW846 3010A [3]
Mercury	< 0.20	0.20	ug/l	1	09/23/20	09/23/20	LL	SW846 7470A [1]	SW846 7470A [4]

(1) Instrument QC Batch: MA49340
(2) Instrument QC Batch: MA49347
(3) Prep QC Batch: MP22873
(4) Prep QC Batch: MP22883

RL = Reporting Limit

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID:	LGAC-INF-20200922		
Lab Sample ID:	JD13479-1	**Date Sampled:**	09/22/20
Matrix:	AQ - Influent	**Date Received:**	09/22/20
		Percent Solids:	n/a
Project:	OU3 ISTR Monitoring, Bethpage, NY		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate [a]	0.33	0.11	mg/l	1	09/23/20 21:14	EB	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.35	0.10	mg/l	1	09/23/20 21:14	EB	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.021	0.010	mg/l	1	09/22/20 23:15	EB	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	1.3	0.20	mg/l	1	09/25/20 15:10	BM	EPA 351.2/LACHAT

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID: FRAC1-A2949-20200922
Lab Sample ID: JD13479-3
Matrix: AQ - Water
Method: SW846 8260C
Project: OU3 ISTR Monitoring, Bethpage, NY

Date Sampled: 09/22/20
Date Received: 09/22/20
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2E164263.D	1	09/24/20 17:18	KC	n/a	n/a	V2E8230
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
67-64-1	Acetone	ND	10	6.0	ug/l	
71-43-2	Benzene	ND	0.50	0.43	ug/l	
74-97-5	Bromochloromethane	ND	1.0	0.48	ug/l	
75-27-4	Bromodichloromethane	ND	1.0	0.45	ug/l	
75-25-2	Bromoform	ND	1.0	0.63	ug/l	
74-83-9	Bromomethane	ND	2.0	1.6	ug/l	
78-93-3	2-Butanone (MEK)	ND	10	6.9	ug/l	
75-15-0	Carbon disulfide	ND	2.0	0.46	ug/l	
56-23-5	Carbon tetrachloride	ND	1.0	0.55	ug/l	
108-90-7	Chlorobenzene	ND	1.0	0.56	ug/l	
75-45-6	Chlorodifluoromethane	ND	5.0	2.9	ug/l	
75-00-3	Chloroethane	ND	1.0	0.73	ug/l	
67-66-3	Chloroform	ND	1.0	0.50	ug/l	
74-87-3	Chloromethane	ND	1.0	0.76	ug/l	
110-82-7	Cyclohexane	ND	5.0	0.78	ug/l	
96-12-8	1,2-Dibromo-3-chloropropane	ND	2.0	1.2	ug/l	
124-48-1	Dibromochloromethane	ND	1.0	0.56	ug/l	
106-93-4	1,2-Dibromoethane	ND	1.0	0.48	ug/l	
95-50-1	1,2-Dichlorobenzene	ND	1.0	0.53	ug/l	
541-73-1	1,3-Dichlorobenzene	ND	1.0	0.54	ug/l	
106-46-7	1,4-Dichlorobenzene	ND	1.0	0.51	ug/l	
75-71-8	Dichlorodifluoromethane	ND	2.0	1.4	ug/l	
75-34-3	1,1-Dichloroethane	ND	1.0	0.57	ug/l	
107-06-2	1,2-Dichloroethane	ND	1.0	0.60	ug/l	
75-35-4	1,1-Dichloroethene	ND	1.0	0.59	ug/l	
156-59-2	cis-1,2-Dichloroethene	ND	1.0	0.51	ug/l	
156-60-5	trans-1,2-Dichloroethene	ND	1.0	0.54	ug/l	
78-87-5	1,2-Dichloropropane	ND	1.0	0.51	ug/l	
10061-01-5	cis-1,3-Dichloropropene	ND	1.0	0.47	ug/l	
10061-02-6	trans-1,3-Dichloropropene	ND	1.0	0.43	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.60	ug/l	
76-13-1	Freon 113	ND	5.0	1.9	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID:	FRAC1-A2949-20200922		
Lab Sample ID:	JD13479-3	**Date Sampled:**	09/22/20
Matrix:	AQ - Water	**Date Received:**	09/22/20
Method:	SW846 8260C	**Percent Solids:**	n/a
Project:	OU3 ISTR Monitoring, Bethpage, NY		

VOA TCL List

CAS No.	Compound	Result	RL	MDL	Units	Q
591-78-6	2-Hexanone	ND	5.0	2.0	ug/l	
98-82-8	Isopropylbenzene	ND	1.0	0.65	ug/l	
79-20-9	Methyl Acetate	ND	5.0	0.80	ug/l	
108-87-2	Methylcyclohexane	ND	5.0	0.60	ug/l	
1634-04-4	Methyl Tert Butyl Ether	ND	1.0	0.51	ug/l	
108-10-1	4-Methyl-2-pentanone(MIBK)	ND	5.0	1.9	ug/l	
75-09-2	Methylene chloride	ND	2.0	1.0	ug/l	
100-42-5	Styrene	ND	1.0	0.49	ug/l	
79-34-5	1,1,2,2-Tetrachloroethane	ND	1.0	0.65	ug/l	
127-18-4	Tetrachloroethene	ND	1.0	0.90	ug/l	
108-88-3	Toluene	ND	1.0	0.53	ug/l	
87-61-6	1,2,3-Trichlorobenzene	ND	1.0	0.50	ug/l	
120-82-1	1,2,4-Trichlorobenzene	ND	1.0	0.50	ug/l	
71-55-6	1,1,1-Trichloroethane	ND	1.0	0.54	ug/l	
79-00-5	1,1,2-Trichloroethane	ND	1.0	0.53	ug/l	
79-01-6	Trichloroethene	ND	1.0	0.53	ug/l	
75-69-4	Trichlorofluoromethane	ND	2.0	0.40	ug/l	
75-01-4	Vinyl chloride	ND	1.0	0.79	ug/l	
	m,p-Xylene	ND	1.0	0.78	ug/l	
95-47-6	o-Xylene	ND	1.0	0.59	ug/l	
1330-20-7	Xylene (total)	ND	1.0	0.59	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	100%		80-120%
17060-07-0	1,2-Dichloroethane-D4	103%		81-124%
2037-26-5	Toluene-D8	100%		80-120%
460-00-4	4-Bromofluorobenzene	103%		80-120%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID: FRAC1-A2949-20200922
Lab Sample ID: JD13479-3
Matrix: AQ - Water
Method: SW846 8270D SW846 3510C
Project: OU3 ISTR Monitoring, Bethpage, NY

Date Sampled: 09/22/20
Date Received: 09/22/20
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5P71502.D	1	09/25/20 07:31	CS	09/24/20 17:00	OP29652	E5P3371
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

ABN TCL List (SOM0 2.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
95-57-8	2-Chlorophenol	ND	5.0	0.82	ug/l	
59-50-7	4-Chloro-3-methyl phenol	ND	5.0	0.89	ug/l	
120-83-2	2,4-Dichlorophenol	ND	2.0	1.3	ug/l	
105-67-9	2,4-Dimethylphenol	ND	5.0	2.4	ug/l	
51-28-5	2,4-Dinitrophenol	ND	5.0	1.6	ug/l	
534-52-1	4,6-Dinitro-o-cresol	ND	5.0	1.3	ug/l	
95-48-7	2-Methylphenol	ND	2.0	0.89	ug/l	
	3&4-Methylphenol	ND	2.0	0.88	ug/l	
88-75-5	2-Nitrophenol	ND	5.0	0.96	ug/l	
100-02-7	4-Nitrophenol	ND	10	1.2	ug/l	
87-86-5	Pentachlorophenol	ND	4.0	1.4	ug/l	
108-95-2	Phenol	ND	2.0	0.39	ug/l	
58-90-2	2,3,4,6-Tetrachlorophenol	ND	5.0	1.5	ug/l	
95-95-4	2,4,5-Trichlorophenol	ND	5.0	1.3	ug/l	
88-06-2	2,4,6-Trichlorophenol	ND	5.0	0.92	ug/l	
83-32-9	Acenaphthene	ND	1.0	0.19	ug/l	
208-96-8	Acenaphthylene	ND	1.0	0.14	ug/l	
98-86-2	Acetophenone	ND	2.0	0.21	ug/l	
120-12-7	Anthracene	ND	1.0	0.21	ug/l	
1912-24-9	Atrazine	ND	2.0	0.45	ug/l	
100-52-7	Benzaldehyde	ND	5.0	0.29	ug/l	
56-55-3	Benzo(a)anthracene	ND	1.0	0.20	ug/l	
50-32-8	Benzo(a)pyrene	ND	1.0	0.21	ug/l	
205-99-2	Benzo(b)fluoranthene	ND	1.0	0.21	ug/l	
191-24-2	Benzo(g,h,i)perylene	ND	1.0	0.34	ug/l	
207-08-9	Benzo(k)fluoranthene	ND	1.0	0.21	ug/l	
101-55-3	4-Bromophenyl phenyl ether	ND	2.0	0.40	ug/l	
85-68-7	Butyl benzyl phthalate	ND	2.0	0.46	ug/l	
92-52-4	1,1'-Biphenyl	ND	1.0	0.21	ug/l	
91-58-7	2-Chloronaphthalene	ND	2.0	0.24	ug/l	
106-47-8	4-Chloroaniline	ND	5.0	0.34	ug/l	
86-74-8	Carbazole	ND	1.0	0.23	ug/l	

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID: FRAC1-A2949-20200922
Lab Sample ID: JD13479-3
Matrix: AQ - Water
Method: SW846 8270D SW846 3510C
Project: OU3 ISTR Monitoring, Bethpage, NY

Date Sampled: 09/22/20
Date Received: 09/22/20
Percent Solids: n/a

ABN TCL List (SOM0 2.0)

CAS No.	Compound	Result	RL	MDL	Units	Q
105-60-2	Caprolactam	ND	2.0	0.65	ug/l	
218-01-9	Chrysene	ND	1.0	0.18	ug/l	
111-91-1	bis(2-Chloroethoxy)methane	ND	2.0	0.28	ug/l	
111-44-4	bis(2-Chloroethyl)ether	ND	2.0	0.25	ug/l	
108-60-1	2,2'-Oxybis(1-chloropropane)	ND	2.0	0.40	ug/l	
7005-72-3	4-Chlorophenyl phenyl ether	ND	2.0	0.37	ug/l	
121-14-2	2,4-Dinitrotoluene	ND	1.0	0.55	ug/l	
606-20-2	2,6-Dinitrotoluene	ND	1.0	0.48	ug/l	
91-94-1	3,3'-Dichlorobenzidine	ND	2.0	0.51	ug/l	
123-91-1	1,4-Dioxane	ND	1.0	0.66	ug/l	
53-70-3	Dibenzo(a,h)anthracene	ND	1.0	0.33	ug/l	
132-64-9	Dibenzofuran	ND	5.0	0.22	ug/l	
84-74-2	Di-n-butyl phthalate	ND	2.0	0.50	ug/l	
117-84-0	Di-n-octyl phthalate [a]	ND	2.0	0.23	ug/l	
84-66-2	Diethyl phthalate	ND	2.0	0.26	ug/l	
131-11-3	Dimethyl phthalate	ND	2.0	0.22	ug/l	
117-81-7	bis(2-Ethylhexyl)phthalate	ND	2.0	1.7	ug/l	
206-44-0	Fluoranthene	ND	1.0	0.17	ug/l	
86-73-7	Fluorene	ND	1.0	0.17	ug/l	
118-74-1	Hexachlorobenzene	ND	1.0	0.33	ug/l	
87-68-3	Hexachlorobutadiene	ND	1.0	0.49	ug/l	
77-47-4	Hexachlorocyclopentadiene	ND	10	2.8	ug/l	
67-72-1	Hexachloroethane	ND	2.0	0.39	ug/l	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	1.0	0.33	ug/l	
78-59-1	Isophorone	ND	2.0	0.28	ug/l	
91-57-6	2-Methylnaphthalene	ND	1.0	0.21	ug/l	
88-74-4	2-Nitroaniline [a]	ND	5.0	0.28	ug/l	
99-09-2	3-Nitroaniline	ND	5.0	0.39	ug/l	
100-01-6	4-Nitroaniline	ND	5.0	0.44	ug/l	
91-20-3	Naphthalene	ND	1.0	0.23	ug/l	
98-95-3	Nitrobenzene	ND	2.0	0.64	ug/l	
621-64-7	N-Nitroso-di-n-propylamine	ND	2.0	0.48	ug/l	
86-30-6	N-Nitrosodiphenylamine	ND	5.0	0.22	ug/l	
85-01-8	Phenanthrene	ND	1.0	0.18	ug/l	
129-00-0	Pyrene	ND	1.0	0.22	ug/l	
95-94-3	1,2,4,5-Tetrachlorobenzene	ND	2.0	0.37	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
367-12-4	2-Fluorophenol	43%		10-73%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID:	FRAC1-A2949-20200922		
Lab Sample ID:	JD13479-3	**Date Sampled:**	09/22/20
Matrix:	AQ - Water	**Date Received:**	09/22/20
Method:	SW846 8270D SW846 3510C	**Percent Solids:**	n/a
Project:	OU3 ISTR Monitoring, Bethpage, NY		

ABN TCL List (SOM0 2.0)

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-62-2	Phenol-d5	28%		10-64%
118-79-6	2,4,6-Tribromophenol	70%		31-130%
4165-60-0	Nitrobenzene-d5	80%		28-126%
321-60-8	2-Fluorobiphenyl	74%		26-114%
1718-51-0	Terphenyl-d14	82%		16-122%

(a) Associated CCV outside of control limits high, sample was ND.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

ATTACHMENT A

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID:	FRAC1-A2949-20200922		
Lab Sample ID:	JD13479-3	**Date Sampled:**	09/22/20
Matrix:	AQ - Water	**Date Received:**	09/22/20
Method:	SW846 8270D BY SIM SW846 3510C	**Percent Solids:**	n/a
Project:	OU3 ISTR Monitoring, Bethpage, NY		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	4M95260.D	1	09/25/20 04:24	CS	09/24/20 17:00	OP29652A	E4M4412
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
123-91-1	1,4-Dioxane	ND	0.10	0.050	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	62%		29-124%
321-60-8	2-Fluorobiphenyl	61%		23-122%
1718-51-0	Terphenyl-d14	72%		22-130%

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID: FRAC1-A2949-20200922
Lab Sample ID: JD13479-3
Matrix: AQ - Water
Method: SW846 8082A SW846 3510C
Project: OU3 ISTR Monitoring, Bethpage, NY

Date Sampled: 09/22/20
Date Received: 09/22/20
Percent Solids: n/a

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	XX2454184.D	1	09/24/20 03:21	CP	09/23/20 18:30	OP29644	GXX7166
Run #2							

	Initial Volume	Final Volume
Run #1	1000 ml	5.0 ml
Run #2		

PCB List

CAS No.	Compound	Result	RL	MDL	Units	Q
12674-11-2	Aroclor 1016 [a]	ND	0.25	0.098	ug/l	
11104-28-2	Aroclor 1221	ND	0.25	0.21	ug/l	
11141-16-5	Aroclor 1232	ND	0.25	0.13	ug/l	
53469-21-9	Aroclor 1242	ND	0.25	0.11	ug/l	
12672-29-6	Aroclor 1248	ND	0.25	0.063	ug/l	
11097-69-1	Aroclor 1254	ND	0.25	0.21	ug/l	
11096-82-5	Aroclor 1260 [a]	ND	0.25	0.076	ug/l	
11100-14-4	Aroclor 1268	ND	0.25	0.087	ug/l	
37324-23-5	Aroclor 1262	ND	0.25	0.097	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
877-09-8	Tetrachloro-m-xylene	106%		10-155%
877-09-8	Tetrachloro-m-xylene	109%		10-155%
2051-24-3	Decachlorobiphenyl	92%		10-151%
2051-24-3	Decachlorobiphenyl	92%		10-151%

(a) This compound outside control limits biased high in the associated BSD.

ND = Not detected MDL = Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range
J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID:	FRAC1-A2949-20200922		
Lab Sample ID:	JD13479-3	**Date Sampled:**	09/22/20
Matrix:	AQ - Water	**Date Received:**	09/22/20
		Percent Solids:	n/a
Project:	OU3 ISTR Monitoring, Bethpage, NY		

Total Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed	By	Method	Prep Method
Cadmium	< 3.0	3.0	ug/l	1	09/23/20	09/23/20	ND	SW846 6010D [2]	SW846 3010A [3]
Chromium	< 10	10	ug/l	1	09/23/20	09/23/20	ND	SW846 6010D [2]	SW846 3010A [3]
Iron	759	100	ug/l	1	09/23/20	09/23/20	ND	SW846 6010D [2]	SW846 3010A [3]
Manganese	176	15	ug/l	1	09/23/20	09/23/20	ND	SW846 6010D [2]	SW846 3010A [3]
Mercury	< 0.20	0.20	ug/l	1	09/23/20	09/23/20	LL	SW846 7470A [1]	SW846 7470A [4]

(1) Instrument QC Batch: MA49340
(2) Instrument QC Batch: MA49347
(3) Prep QC Batch: MP22873
(4) Prep QC Batch: MP22883

RL = Reporting Limit

SGS LabLink@11:17 28-Sep-2020 Preliminary Data

Report of Analysis

Client Sample ID:	FRAC1-A2949-20200922		
Lab Sample ID:	JD13479-3	**Date Sampled:**	09/22/20
Matrix:	AQ - Water	**Date Received:**	09/22/20
		Percent Solids:	n/a
Project:	OU3 ISTR Monitoring, Bethpage, NY		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Nitrogen, Nitrate [a]	< 0.11	0.11	mg/l	1	09/23/20 21:12	EB	EPA353.2/SM4500NO2B
Nitrogen, Nitrate + Nitrite	0.14	0.10	mg/l	1	09/23/20 21:12	EB	EPA 353.2/LACHAT
Nitrogen, Nitrite	0.066	0.010	mg/l	1	09/22/20 23:23	EB	SM4500NO2 B-11
Nitrogen, Total Kjeldahl	0.31	0.20	mg/l	1	09/25/20 15:10	BM	EPA 351.2/LACHAT

(a) Calculated as: (Nitrogen, Nitrate + Nitrite) - (Nitrogen, Nitrite)

RL = Reporting Limit

ATTACHMENT A

SGS

WW

CHAIN OF CUSTODY

SGS North America Inc. - Dayton
2235 Route 130, Dayton, NJ 08810
TEL. 732-329-0200 FAX: 732-329-3499/3480
www.sgs.com/ehsusa

Page 1 of 1

E

FED-EX Tracking #
SGS Quote #
Bottle Order Control # TM-091720-118
SGS Job # JD 13479

Client / Reporting Information

Company Name: EMAGIN, Inc.
Street Address: 15711 Mapledale Blvd, Ste B
City: Tampa State: FL Zip: 33624
Project Contact: Bill Lais E-mail: wlais@hswengcom
Phone #: 813-363-1451
Sampler(s) Name(s): Carolyn Messer, Phone #: 2671751349

Project Information

Project Name: OU3 ISTR monitoring
Street: Bethpage Comm. Park
City: Bethpage State: NY
Project #: 7AS301101, phase7A
Client Purchase Order #
Project Manager: Bill Lais

Billing Information (if different from Report to)
Company Name
Street Address
City State Zip
Attention:

Requested Analysis: AB8270TCL20; B8270SIM14D10X; MN, HG, FE, CR, CD; P8082FCB11; TKN; VMS+F22, V8260TCL20; XN030

SGS Sample #	Field ID / Point of Collection	MEOH/DI Vial #	Date	Time	Sampled by	Grab (G) Comp (C)	Matrix	# of bottles	HCl	NaOH	HNO3	H2SO4	NONE	DI Water	MEOH	ENCORE	AB8270TCL20	B8270SIM14D10X	MN, HG, FE, CR, CD	P8082FCB11	TKN	VMS+F22, V8260TCL20	XN030	LAB USE ONLY
1	LGAC-INF-20200922		9/22/20	1130	CM	G	WW	13	3		1	2	7				X	X	X	X	X	X	X	F44
2	LGAC-EFF-20200922		9/22/20	1145	CM	G	WW	13	3		1	2	7				H	H	H	H	H	H	H	A39
3	FRAC1-A2944-20200922		9/22/20	1200	CM	G	WW	13	3		1	2	7				X	X	X	X	X	X	X	G43
																								V130

Matrix Codes: DW - Drinking Water; GW - Ground Water; WW - Water; SW - Surface Water; SO - Soil; SL - Sludge; SED - Sediment; OI - Oil; LIQ - Other Liquid; AIR - Air; SOL - Other Solid; WP - Wipe; FB - Field Blank; EB - Equipment Blank; RB - Rinse Blank; TB - Trip Blank

Turn Around Time (Business Days)

- [ ] 10 Business Days
- [ ] 5 Business Days
- [x] 3 Business Days*
- [ ] 2 Business Days*
- [ ] 1 Business Day*
- [ ] Other

All data available via Lablink

Approved By (SGS PM): / Date: Bill Lais 9/22/20

* Approval needed for 1-3 Business Day TAT

Deliverable

- [ ] Commercial "A" (Level 1)
- [ ] Commercial "B" (Level 2)
- [ ] NJ Reduced (Level 3)
- [ ] Full Tier I (Level 4)
- [ ] Commercial "C"
- [ ] NJ DKQP
- [ ] NYASP Category A
- [x] NYASP Category B
- [ ] MA MCP Criteria
- [ ] CT RCP Criteria
- [ ] State Forms
- [ ] EDD Format
- [ ] DOD-QSM5

Commercial "A" = Results only; Commercial "B" = Results + QC Summary
Commercial "C" = Results + QC Summary + Partial Raw data

Comments / Special Instructions

hold analyses on LGAC-EFF-20200922

http://www.sgs.com/en/terms-and-conditions

Sample Custody must be documented below each time samples change possession, including courier delivery.

Relinquished by:	Date / Time:	Received By:	Relinquished By:	Date / Time:	Received By:
1 [signature]	9/22/20 1335	1 Rabin Perep	2 Rabin Perep	9-22-20 1715	2 JS Patel
3		3	4		4
5		5	Custody Seal # 5 6 7	Intact / Not intact; Preserved where applicable / Absent; Therm. ID:	On Ice; Cooler Temp. °C

Initial Assessment 3AOK
Label Verification

4.0C IP 3.8C IP 3.2C IP

EHSA-QAC-0023-02-FORM-Dayton - Standard COC.xlsx

JD13479: Chain of Custody
Page 1 of 2

ATTACHMENT A
SGS Sample Receipt Summary

Job Number: JD13479 **Client:** HSW ENGINEERING **Project:** OU3 ISTR MONITORING, BETHPAGE, NY

Date / Time Received: 9/22/2020 5:15:00 PM **Delivery Method:** **Airbill #'s:**

Cooler Temps (Raw Measured) °C: Cooler 1: (4.0); Cooler 2: (3.8); Cooler 3: (3.3);

Cooler Temps (Corrected) °C: Cooler 1: (3.7); Cooler 2: (3.5); Cooler 3: (3.0);

Cooler Security	Y	or	N		Y	or	N
1. Custody Seals Present:	☑		☐	3. COC Present:	☑		☐
2. Custody Seals Intact:	☑		☐	4. Smpl Dates/Time OK	☑		☐

Cooler Temperature	Y	or	N
1. Temp criteria achieved:	☑		☐
2. Cooler temp verification:	IR Gun		
3. Cooler media:	Ice (Bag)		
4. No. Coolers:	3		

Quality Control Preservation	Y	or	N	N/A
1. Trip Blank present / cooler:	☐		☑	☐
2. Trip Blank listed on COC:	☐		☑	☐
3. Samples preserved properly:	☑		☐	
4. VOCs headspace free:	☑		☐	☐

Sample Integrity - Documentation	Y	or	N
1. Sample labels present on bottles:	☑		☐
2. Container labeling complete:	☑		☐
3. Sample container label / COC agree:	☑		☐

Sample Integrity - Condition	Y	or	N
1. Sample recvd within HT:	☑		☐
2. All containers accounted for:	☑		☐
3. Condition of sample:	Intact		

Sample Integrity - Instructions	Y	or	N	N/A
1. Analysis requested is clear:	☑		☐	
2. Bottles received for unspecified tests	☐		☑	
3. Sufficient volume recvd for analysis:	☑		☐	
4. Compositing instructions clear:	☐		☐	☑
5. Filtering instructions clear:	☐		☐	☑

Test Strip Lot #s: pH 1-12: 229517 pH 12+: 208717 Other: (Specify)

Comments

SM089-03
Rev. Date 12/7/17

JD13479: Chain of Custody
Page 2 of 2

ATTACHMENT B

Table 3
Summary of Effluent Water Sample Analytical Results
Bethpage Park Groundwater Containment System
Operable Unit 3 (Former Grumman Settling Ponds)
Northrop Grumman
Bethpage, New York

ARCADIS Design & Consultancy for natural and built assets

Compound	Discharge Limit[1] (µg/L)	10/15/19 (µg/L)	11/05/19 (µg/L)	12/04/19 (µg/L)	01/14/20 (µg/L)	02/06/20 (µg/L)	03/03/20 (µg/L)	04/15/20 (µg/L)	05/14/20 (µg/L)	06/04/20 (µg/L)	07/08/20 (µg/L)	08/18/20 (µg/L)	09/02/20 (µg/L)
Project VOCs													
1,1,1-Trichloroethane	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloroethene	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis 1,2-Dichloroethene	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans 1,2-Dichloroethene	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Subtotal Project VOCs		0	0	0	0	0	0	0	0	0	0	0	0
Compound	**Discharge Limit[1] (µg/L)**	**10/15/19 (µg/L)**	**11/05/19 (µg/L)**	**12/04/19 (µg/L)**	**01/14/20 (µg/L)**	**02/06/20 (µg/L)**	**03/03/20 (µg/L)**	**04/15/20 (µg/L)**	**05/14/20 (µg/L)**	**06/04/20 (µg/L)**	**07/08/20 (µg/L)**	**08/18/20 (µg/L)**	**09/02/20 (µg/L)**
Non-Project VOCs													
Chloroform	5[2]	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dichloromethane	5[2]	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Trichlorotrifluoroethane (Freon 113)	5[2]	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Subtotal Non-Project VOCs		0	0	0	0	0	0	0	0	0	0	0	0
Total VOCs[3]		0	0	0	0	0	0	0	0	0	0	0	0
Treatment Efficiency[4]		> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%	> 99.9%
Compound	**Discharge Limit[1] (µg/L)**	**10/15/19 (µg/L)**	**11/05/19 (µg/L)**	**12/04/19 (µg/L)**	**01/14/20 (µg/L)**	**02/06/20 (µg/L)**	**03/03/20 (µg/L)**	**04/15/20 (µg/L)**	**05/14/20 (µg/L)**	**06/04/20 (µg/L)**	**07/08/20 (µg/L)**	**08/18/20 (µg/L)**	**09/02/20 (µg/L)**
Inorganics													
Total Iron	600	**201**	**110**	< 100	< 100	< 100	**144**	< 100	**144**	**113**	< 100	< 100	< 100
Total Manganese	600	**46.1**	**47.6**	**43.1**	**50.1**	**49.7**	**51.9**	**45.3**	**44.2**	**46.5**	**45.0**	**47.8**	**46.0**
Nitrate and Nitrite	10,000	**2,700**	**2,700**	**2,900**	**2,400**	**2,900**	**2,800**	**2,600**	**2,800**	**2,900**	**2,700**	**2,700**	**2,600**
Toal Kjeldahl Nitrogen	10,000	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200	< 200
Total Nitrogen	10,000	**2,700**	**2,900**	**3,100**	**2,400**	**2,900**	**2,800**	**2,600**	**2,800**	**2,900**	**2,700**	**2,700**	**2,600**
1,4-Dioxane	NE	**0.70**	**0.68**	**0.87**	**0.76**	**1.0**	**0.79**	**1.2**	**1.4**	**1.3**	**1.3**	**1.1**	**1.2**
pH[5]	5.5-8.5	6.2	6.3	6.8	6.3	6.1	6.1	5.9	6.9	6.5	6.5	6.7	6.6

Notes, Abbreviations, Qualifers, and Units on last page.

ATTACHMENT C

From:	Pelton, Jason M (DEC)
To:	edward.hannon@ngc.com; Hesler, Donald (DEC); Sullivan, James (HEALTH)
Cc:	Weber, Fred [US] (AS); Kubasky, Lauren [US] (AS); Bill Lais; Joel Balmat; Jose Sananes; Doug Smolensky
Subject:	RE: ISTR Liquid Effluent Discharge Planned for Tuesday Oct 6
Date:	Monday, October 5, 2020 2:01:53 PM
Attachments:	image002.png image003.png

Ed:

Thanks for providing the analytical results for the influent and the frac tank water samples. Based on my review of the analytical results, and in accordance with our telephone conversation on Friday, October 2, 2020, I approve of the water that is being temporarily stored in the frac tank being further treated with the OU3 Groundwater Treatment facility prior to discharge to the nearby recharge basin.

Thanks,
Jason

Jason Pelton, P.G.
Project Manager, Division of Environmental Remediation

New York State Department of Environmental Conservation
625 Broadway, Albany, NY 12233
P: (518) 402-9478 | C: (518) 669-0424 | F: (518) 402-9773 | jason.pelton@dec.ny.gov
www.dec.ny.gov |

From: Hannon, ED [US] (AS) <Edward.Hannon@ngc.com>
Sent: Monday, October 05, 2020 1:08 PM
To: Pelton, Jason M (DEC) <jason.pelton@dec.ny.gov>; Hesler, Donald (DEC) <donald.hesler@dec.ny.gov>; Sullivan, James (HEALTH) <James.Sullivan@health.ny.gov>
Cc: Weber, Fred [US] (AS) <fred.weber@ngc.com>; Kubasky, Lauren [US] (AS) <Lauren.Kubasky@ngc.com>; Bill Lais <wlais@hsweng.com>; jbalmat@hsweng.com; jsananes@ramboll.com; Doug Smolensky <dsmolensky@emagin-inc.com>
Subject: FW: ISTR Liquid Effluent Discharge Planned for Tuesday Oct 6

Jason,

Attached for your review are the analytical results of the initial batch (18,000 gallons) of ISTR

liquid effluent we are temporarily holding onsite in a frac tank pending discharge through the OU3 groundwater treatment system per the RAWP. Refer to sample ID in the laboratory report “FRAC1-2949”.

As we discussed last Friday, although the iron concentration in this batch (about 800 ug/L) exceeds the SPDES equivalent daily max limit of 600 ug/L, the discharge from the frac tank (at a rate of about 60 gpm) will represent only 25% of the total combined flow through the OU3 system (about 240 gpm total), with the remainder from the OU3 remedial wells. Historical data from 2019 indicates that the combined iron concentrations from the OU3 ONCT remedial wells around 200 ug/L or less, and our estimates indicate that the final system effluent will be substantially lower than 600 ug/L when combining the frac tank discharge with the flow from recovery wells RW-2, 3, and 4 (RW-1 will not be operating during the frac tank discharge).

Our plan is to process the initial batch of ISTR effluent Tuesday October 6. Please let us know if you need further information.

Thank you.
Ed Hannon
Northrop Grumman

ATTACHMENT D

Table 1
SPDES Permit Equivalency Monthly Report
OU2 and OU3 On-Site Containment Systems
Northrop Grumman Bethpage Facility Site
NYSDEC Site No. 130003A

OU3 Effluent: Outfall 001 (WSP-7)

OU3 Groundwater Remedy Treatment System - Treated Air Stripper and Soil Gas Containment Condensate Discharge to Nassau County Recharge Basins

Parameter[1]	CAS Number	OUTFALL 001 (WSP-7) 10/6/2020	Discharge Limit[2]	Units	Monitoring Frequency	Sample Type	Average Mass Loading[3,7]	Units
Daily Average Flow[4,9]	--	0.29	Monitor	MGD	Continuous	SCADA	--	--
Daily Maximum Flow[4,9]	--	0.33	Monitor	MGD	Continuous	SCADA	--	--
Influent pH[8]	--	6.1	NS	SU	Monthly (1/31) Days	Grab	--	--
Effluent pH[8]	--	6.9	Range: 5.0-8.5	SU	Monthly (1/31) Days	Grab	--	--
Total Nitrogen (as N)	--	**2.6**	10.0	mg/L	Monthly (1/31) Days	Grab	6.29	lbs/day
Total Iron	7439-89-6	< 100	600	µg/L	Monthly (1/31) Days	Grab	--	lbs/day
Total Manganese	7439-96-5	**51.1**	600	µg/L	Monthly (1/31) Days	Grab	0.12	lbs/day
Sum of Total Iron and Manganese	--	**51.1**	1000	µg/L	Monthly (1/31) Days	Calculated	0.12	lbs/day
1.1-Dichloroethylene	75-35-4	< 1.0	5.0	µg/L	Monthly (1/31) Days	Grab	--	lbs/day
Methylene Chloride	75-09-2	< 2.0	5.0	µg/L	Monthly (1/31) Days	Grab	--	lbs/day
Tetrachloroethylene	127-18-4	< 1.0	5.0	µg/L	Monthly (1/31) Days	Grab	--	lbs/day
1,1,1-Trichloroethane	71-55-6	< 1.0	5.0	µg/L	Monthly (1/31) Days	Grab	--	lbs/day
Trichloroethylene	79-01-6	< 1.0	5.0	µg/L	Monthly (1/31) Days	Grab	--	lbs/day
Vinyl Chloride	75-01-4	< 1.0	5.0	µg/L	Monthly (1/31) Days	Grab	--	lbs/day
1,2 (trans)-Dichloroethylene	156-60-5	< 1.0	5.0	µg/L	Monthly (1/31) Days	Grab	--	lbs/day
1,2-(cis)-Dichloroethylene	156-59-2	< 1.0	5.0	µg/L	Monthly (1/31) Days	Grab	--	lbs/day
Chloroform	67-66-3	< 1.0	5.0	µg/L	Monthly (1/31) Days	Grab	--	lbs/day
Trichlorotrifluoroethane (Freon 113)	76-13-1	< 5.0	5.0	µg/L	Monthly (1/31) Days	Grab	--	lbs/day
1,4-Dioxane	123-91-1	**1.1**	Monitor	µg/L	Monthly (1/31) Days	Grab	2.66E-03	lbs/day

Notes and Abbreviations:

XX Bold value indicates the constituent was detected at or above its laboratory quantification limit.
< Compound is not detected above laboratory quantification limit
-- Not Applicable
µg/L micrograms per liter
lbs/day pounds per day
lb/kg pounds per kilogram
MGD million gallons per day
mg/L milligrams per liter
min minutes
SU Standard Units
CAS Chemical Abstracts Service
ND Non Detect
NS None Specified
NYSDEC New York State Department of Environmental Conservation
SCADA Supervisory Control and Data Acquisition
SPDES State Pollution Discharge Elimination System
TKN Total Kjeldahl Nitrogen

1. Samples were analyzed for permit equivalency Volatile Organic Compounds (VOCs) using USEPA Method 624 at OU2 system, and USEPA Method 8260 at OU3 system; 1,4-Dioxane using USEPA Method 8270D-SIM-CLLE; Total Nitrogen is calculated as the sum of Nitrogen, (Nitrate+Nitrite) and Total Kjeldahl Nitrogen (TKN), (CAS number: 14797-55-8, 14797-65-0, and 7727-37-9, respectively) by USEPA Methods 353.2 and 351.2, respectively; Total Iron and Manganese using USEPA Method 200.7.

2. Discharge limits are per the SPDES permit equivalency, dated October 12, 2017, amended on July 30, 2018 and transmitted by the NYSDEC to Northrop Grumman on August 9, 2018.

3. Mass Loading Calculation:

$$Mass\ Loading\ \left(\frac{lb}{day}\right) = Flow\left(\frac{gal}{min}\right) * 1440\left(\frac{min}{day}\right) * concentration\ \left(\frac{\mu g}{liter}\right) \div 10^9\left(\frac{\mu g}{kg}\right) * 3.785\left(\frac{liter}{gal}\right) * 2.2046\left(\frac{lb}{kg}\right)$$

4. Average and daily maximum flow calculated from SCADA reports for the month indicated.

5. Field measurement of pH taken by hand held meter on sample date.

6. When Total Iron and Total Manganese are below their respective detection limits the Sum Total of Iron and Manganese is reported as "ND".

7. Average Mass Loading calculations are based on actual flow rates unless otherwise noted.

8. pH reported was measured on 10/15/20 during the second ISTR tank discharge.

9. Additional OU3 Groundwater discharge due to ISTR Baker Tank.

Date	Gallons	Duration (Hours)
10/6/2020	19,700	5
10/15/2020	13,191	4.8

10. Effluent pH for Outfall 005 and Outfall 006 could not be obtained due to equipment malfunction.

ATTACHMENT E

To properly account for the combined flow from the ISTR liquid treatment system and the OU3 ONCT remedial wells, which is treated at and discharged from the OU3 treatment system, the following revisions (show in redlined/strikeout) are proposed to Section 4.4 of the RAWP and Section 4.2.6 of the BOD (Appendix B):

> *...If the characterization results indicate that the batch meets (a) the 2018 OU3 groundwater treatment system SPDES equivalency discharge criteria (NYSDEC August 9, 2018), ~~or~~ and (b) for compounds not included in the equivalency permit, the NYSDEC Groundwater Effluent Limitations (TOGS 1.1.1 for Class GA), the batch will be pumped to the existing OU3 groundwater treatment system at McKay Field for additional polishing treatment by air stripping prior to discharge. ~~If the batch does not meet the OU3 discharge criteria, the contents of the frac tank(s) will be transported off-site for treatment and disposal at a permitted industrial waste treatment facility.~~ If the characterization results indicate that the batch does not meet the OU3 discharge criteria (items a and b above), the contents of the holding tank will either be:*
>
> - *processed through the OU3 system if a successful demonstration has been made to the State that the combined holding tank discharge and OU3 process flow would meet the OU3 discharge criteria at the outfall; or*
> - *transported for off-site treatment and disposal at a permitted industrial waste treatment facility if a successful demonstration cannot be made to the State that the combined holding tank discharge and OU3 process flow would meet the OU3 discharge criteria at the outfall.*

REUS Engineers, PC
Certificate of Authorization #0015655

Russell S. Kemp. P.E.
New York State PE # 079272-1
Date 18 Dec 2020