



PHIL-27666

October 31, 2022

Project Number 08005-WE04

Mr. Thomas Magge
Clean Water Environmental Program Manager
Pennsylvania Department of Environmental Protection
Southeast Regional Office
2 East Main Street
Norristown, Pennsylvania 19401

Reference: Contract No. N6247016D9008
Contract Task Order No. WE04

Subject: Temporary Discharge Monitoring Report - September 1 to September 30, 2022
Hangar 680 Per- and Polyfluoroalkyl Substances Pilot Test System
Former Naval Air Station Joint Reserve Base Willow Grove
Horsham Township, Pennsylvania

Dear Mr. Magge:

On behalf of the United States (U.S.) Navy, Tetra Tech is pleased to submit the Temporary Discharge Monitoring Report (DMR) for the Hangar 680 per- and polyfluoroalkyl substances (PFAS) pilot test system at the Former Naval Air Station Joint Reserve Base Willow Grove in Horsham Township, Pennsylvania. This DMR includes available influent, effluent, and field quality assurance/quality control (QA/QC) results for sampling from September 1 to September 30, 2022.

The temporary discharge was first approved by the Pennsylvania Department of Environmental Protection (PADEP) on February 10, 2020, as requested by the U.S. Navy under a Federal Facility Agreement permit equivalency. PADEP approved subsequent modifications to the permit equivalency in letters dated August 5, 2020, January 27, 2021, July 23, 2021, and January 13, 2022. PADEP approved a request to extend the permit equivalency duration for 180 more days on July 1, 2022.

A system modification to add intermediate extraction well HA-EW-2I (boring X6I) to the treatment system has been completed, as described in the January 27, 2021 modification request approval. HA-EW-2I was brought online on November 30, 2021 and operated until December 4, 2021. The well went back online on August 11, 2022 after overhauling its electrical layout and replacing faulty system equipment. Since the restart of EW-2I, this well has operated with no malfunctions or faults through the end of this reporting period.

Full-time operation of the Hangar 680 PFAS pilot test system was initiated on March 2, 2020. A total of 25,271,421 gallons of water have been treated and discharged to Outfall 8 as of September 28, 2022.

- Influent samples were collected weekly from shallow extraction well HA-EW-1S, first intermediate extraction well HA-EW-1I, second intermediate extraction well HA-EW-2I, and combined influent of these extraction wells on September 6, September 12, September 22, and September 28, 2022. These samples were analyzed for PFAS, specifically perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS), and the results are provided in Table 1. During the operational period, the shallow extraction well HA-EW-1S was operated at approximately 4.8 gallons per minute (gpm), the first intermediate extraction well HA-EW-1I was operated at approximately 8.9 gpm, and the second intermediate extraction well HA-EW-2I was operated at approximately 8.4 gpm. Note that these influent flow rates will be adjusted as part of system optimization activities in the upcoming reporting periods.



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- Effluent samples were collected weekly for PFAS, specifically PFOA and PFOS, on September 6, September 12, September 22, and September 28, 2022. Effluent samples for tetrachloroethene (PCE), trichloroethene (TCE), carbon tetrachloride (CTC), 1,2-dichloroethane (1,2-DCA), total phenols, and total lead were collected on September 22, 2022. All effluent results from samples collected within this reporting period are provided in Table 2.
- Field blank QA/QC samples were collected weekly on September 6, September 12, September 22, and September 28, 2022. These samples were analyzed for PFAS (specifically PFOA and PFOS), and the results are provided in Table 2.
- A trip blank QA/QC sample was collected on September 22, 2022. This sample was analyzed for PCE, TCE, CTC, and 1,2-DCA. The results are provided in Table 2.
- Per the August 12, 2022 permit equivalency modification, weekly monitoring of PFOA and PFOS shall be conducted at discharge sampling port HA-Mid2IX to determine if maintenance actions are needed. During this reporting period, all weekly PFOA and PFOS sampling results at HA-Mid2IX were below the maintenance levels described in the permit equivalency modification (0.014 µg/L PFOA and 0.018 µg/L PFOS). Therefore, no maintenance actions are planned.
- All effluent and associated field duplicate sample parameters were below the maximum discharge effluent limits established by PADEP in the Temporary Discharge Request – Extension dated July 1, 2022.

Lastly, analytical results from samples collected since the start of the Hangar 680 PFAS pilot test system and intermittent operation of the aqueous IDW treatment system have demonstrated that both systems effectively reduce the compounds identified in the permit equivalency to below the established limits.

Please do not hesitate to contact me if you have any questions.

Sincerely,

Tricia E. Moore, PG
Senior Project Manager

TM/nfs

Attachments:

Table 1 – NPDES Permit Equivalency Influent Sample Results from September 1, 2022 through September 30, 2022

Table 2 – NPDES Permit Equivalency Effluent Sample Results from September 1, 2022 through September 30, 2022

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TABLES

**Table 1: NPDES Permit Equivalency Influent Sample Results from September 1, 2022 through September 30, 2022
Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample				Sample			
		Shallow Influent	Intermediate Influent 1	Intermediate Influent 2	Combined Influent	Shallow Influent	Intermediate Influent 1	Intermediate Influent 2	Combined Influent
Operation Week		132				133			
Sample ID		HA-EW-1S-20220906	HA-EW-1I-20220906	HA-EW-2I-20220906	HA-CombinedINF-20220906	HA-EW-1S-20220912	HA-EW-1I-20220912	HA-EW-2I-20220912	HA-CombinedINF-20220912
Sample Date		9/6/2022	9/6/2022	9/6/2022	9/6/2022	9/12/2022	9/12/2022	9/12/2022	9/12/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.672	2.980 D	2.700 D	2.490 D	0.485 D	2.890 D	2.680 D	2.210 D
Perfluorooctanesulfonic acid (PFOS)	NA	36.200 D	18.600 D	73.900 D	40.000 D	27.700 D	16.500 D	43.600 D	33.200 D
PFOA + PFOS	0.07	36.872	21.580	76.600	42.490	28.185	19.390	46.280	35.410

Notes:
⁽¹⁾ Maximum effluent limits per PADEP Temporary Discharge Request - Extension (July 1, 2022).
 Combined influent (HA-CombinedINF) results have not yet been validated.
 Results from the shallow (HA-EW-1S), first intermediate (HA-EW-1I), and second intermediate (HA-EW-2I) influent locations are not validated.
 Influent results from 9/28/22 are reported as preliminary data and not final data due to laboratory delays.
Bold value indicates result is above applicable maximum effluent limit.
 PADEP: Pennsylvania Department of Environmental Protection.
 µg/L: Micrograms per liter (also referred to as parts per billion [ppb]).
 P: Results pending.

**Table 1: NPDES Permit Equivalency Influent Sample Results from September 1, 2022 through September 30, 2022
Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample				Sample			
		Shallow Influent	Intermediate Influent 1	Intermediate Influent 2	Combined Influent	Shallow Influent	Intermediate Influent 1	Intermediate Influent 2	Combined Influent
Operation Week		134				135			
Sample ID		HA-EW-1S-20220922	HA-EW-1I-20220922	HA-EW-2I-20220922	HA-CombinedINF-20220922	HA-EW-1S-20220928	HA-EW-1I-20220928	HA-EW-2I-20220928	HA-CombinedINF-20220928
Sample Date		9/22/2022	9/22/2022	9/22/2022	9/22/2022	9/28/2022	9/28/2022	9/28/2022	9/28/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.534 Q	3.050 D	3.780 D	2.420 D	0.671 Q	2.490 D	3.090 D	2.010 D
Perfluorooctanesulfonic acid (PFOS)	NA	33.300 D	21.500 D	90.000 D	34.100 D	28.500 D	16.500 D	91.800 D	28.700 D
PFOA + PFOS	0.07	33.834	24.550	93.780	36.520	29.171	18.990	94.890	30.710

Notes:

⁽¹⁾ Maximum effluent limits per PADEP Temporary Discharge Request - Extension (July 1, 2022).

Combined influent (HA-CombinedINF) results have not yet been validated.

Results from the shallow (HA-EW-1S), first intermediate (HA-EW-1I), and second intermediate (HA-EW-2I) influent locations are not validated.

Influent results from 9/28/22 are reported as preliminary data and not final data due to laboratory delays.

Bold value indicates result is above applicable maximum effluent limit.

PADEP: Pennsylvania Department of Environmental Protection.

µg/L: Micrograms per liter (also referred to as parts per billion [ppb]).

P: Results pending.

**Table 2: NPDES Permit Equivalency Effluent Sample Results from September 1, 2022 through September 30, 2022
Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			Sample		
		Effluent	Effluent Field Duplicate	Field Blank	Effluent	Effluent Field Duplicate	Field Blank
Operation Week		132			133		
Sample ID		HA-GEFF-20220906	HA-DUP-136-20220906	HA-FB-20220906	HA-GEFF-20220912	HA-DUP-137-20220912	HA-FB-20220912
Sample Date		9/6/2022	9/6/2022	9/6/2022	9/12/2022	9/12/2022	9/12/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00245 U	0.00234 U	0.00241 U	0.00220 U	0.00218 U	0.00237 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00245 U	0.00234 U	0.00241 U	0.00220 U	0.00218 U	0.00237 U
PFOA + PFOS	0.07	ND	ND	ND	ND	ND	ND

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			Sample		
		Effluent	Effluent Field Duplicate	Trip Blank	Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		132			133		
Sample ID		0	0	0	0	0	0
Sample Date		9/6/2022	9/6/2022	9/6/2022	9/12/2022	9/12/2022	9/12/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
Trichloroethylene (TCE)	2.5	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
Carbon Tetrachloride	0.23	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
1,2-Dichloroethane	0.38	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
Total Phenols	5	0.00 0.00	0.00 0.00	0.00	0.00 0.00	0.00 0.00	0.00
Lead (total)	3.2	0.00 0.00	0.00 0.00	0.00	0.00 0.00	0.00 0.00	0.00

Notes:

⁽¹⁾: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (July 1, 2022).

Effluent and effluent field duplicate results have not yet been validated.

PADEP: Pennsylvania Department of Environmental Protection

µg/L: Micrograms per liter (also referred to parts per billion [ppb]).

NA: Not applicable.

U: Analyte not detected. Value reported to limit of detection.

ND: Not detected.

--: Not sampled.

P: Results pending.

**Table 2: NPDES Permit Equivalency Effluent Sample Results from September 1, 2022 through September 30, 2022
Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			Sample		
		Effluent	Effluent Field Duplicate	Field Blank	Effluent	Effluent Field Duplicate	Field Blank
Operation Week		134			135		
Sample ID		HA-GEFF-20220922	HA-DUP-138-20220922	HA-FB-20220922	HA-GEFF-20220928	HA-DUP-139-20220928	HA-FB-20220928
Sample Date		9/22/2022	9/22/2022	9/22/2022	9/28/2022	9/28/2022	9/28/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00222 U	0.00226 U	0.00233 U	0.00217 U	0.00224 U	0.00236 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00222 U	0.00226 U	0.00233 U	0.00217 U	0.00224 U	0.00236 U
PFOA + PFOS	0.07	ND	ND	ND	ND	ND	ND

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			Sample		
		Effluent	Effluent Field Duplicate	Trip Blank	Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		134			135		
Sample ID		HA-GEFF-20220922	HA-DUP-138-20220922	HA-TB-20220922	0	0	0
Sample Date		9/22/2022	9/22/2022	9/22/2022	9/28/2022	9/28/2022	9/28/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	0.20 U	0.20 U	0.20 U	0.00 0.00	0.00 0.00	0.00 0.00
Trichloroethylene (TCE)	2.5	0.20 U	0.20 U	0.20 U	0.00 0.00	0.00 0.00	0.00 0.00
Carbon Tetrachloride	0.23	0.20 U	0.20 U	0.20 U	0.00 0.00	0.00 0.00	0.00 0.00
1,2-Dichloroethane	0.38	0.20 U	0.20 U	0.20 U	0.00 0.00	0.00 0.00	0.00 0.00
Total Phenols	5	3.50 U	3.50 U	--	0.00 0.00	0.00 0.00	0.00
Lead (total)	3.2	0.70 U	0.70 U	--	0.00 0.00	0.00 0.00	0.00

Notes:

⁽¹⁾: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (July 1, 2022).

Effluent and effluent field duplicate results have not yet been validated.

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