



PHIL-27709

January 31, 2023

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 - December 1 to December 31, 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 December 1 to December 31, 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, January 13, 2022, and July 1, 2022 (modified on August 12, 2022). PADEP approved a request to extend the permit equivalency duration for 180 more days on December 28, 2022.

Full-time operation of the Hangar 680 PFAS pilot test system was initiated on March 2, 2020. A total of 27,491,723 gallons of water have been treated and discharged to Outfall 8 as of December 27, 2022. The discharge for the reporting period complied with the effluent limitations and monitoring requirements as summarized in the following bullets:

- Influent samples were collected weekly on December 5, December 12, December 19, and December 27, 2022. These samples were collected from shallow extraction well HA-EW-1S, first intermediate extraction well HA-EW-1I, second intermediate extraction well HA-EW-2I, and the combined influent of these extraction wells. 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 4.9 gallons per minute (gpm), the first intermediate extraction well HA-EW-1I was operated at approximately 7.0 gpm, and the second intermediate extraction well HA-EW-2I was operated at approximately 8.8 gpm.

- Effluent samples were collected weekly on December 5, December 12, December 19, and December 27, 2022. These samples were analyzed for PFOA and PFOS. Effluent samples for tetrachloroethene (PCE), trichloroethene (TCE), carbon tetrachloride (CTC), 1,2-dichloroethane (1,2-DCA), total phenols, and total lead were collected on December 5, 2022. All effluent analytical sample results for this reporting period are provided in Table 2. Field blank QA/QC samples were collected weekly on December 5, December 12, December 19, and December 27, 2022. These samples were analyzed for PFOA, PFOS, and their analytical results are provided in Table 2.
- A trip blank QA/QC sample was collected on December 5, 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 and the December 28, 2022 permit equivalency extension, 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 before the next reporting period.

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 December 1, 2022 through December 31, 2022

Table 2 – NPDES Permit Equivalency Effluent Sample Results from December 1, 2022 through December 31, 2022

c: Brian Helland (Navy BRAC PMO)  
Dawn DeFreitas (Navy BRAC PMO)  
Colin Wade (PADEP)  
Sarah Kloss (EPA Region 3)  
Navy Caretaker Office  
Horsham Library  
NIRIS RDM

## TABLES

**Table 1: NPDES Permit Equivalency Influent Sample Results from December 1, 2022 through December 31, 2022  
Hangar 680 PFAS Pilot Test  
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent 2	Combined Influent
Operation Week		145			
Sample ID		HA-EW-1S-20221205	HA-EW-1I-20221205	HA-EW-2I-20221205	HA-CombinedINF-20221205
Sample Date		12/5/2022	12/5/2022	12/5/2022	12/5/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.587 D	2.100 D	2.230 D	2.280 D
Perfluorooctanesulfonic acid (PFOS)	NA	32.800 D	8.940 D	51.700 TD	31.200 D
PFOA + PFOS	0.07	33.387	11.040	53.930	33.480

Notes:

<sup>(1)</sup>: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (December 28, 2022).

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

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

**Bold value indicates result is above applicable maximum effluent limit.**

PFAS data from 12/19/22 are preliminary and not final.

PADEP: Pennsylvania Department of Environmental Protection.

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

P: Results pending.

E: Estimate, result is greater than the highest concentration level in the calibration.

T: Holding time (HT) exceeded.

D: Dilution Run. Initial run outside the initial calibration range of the instrument.

**Table 1: NPDES Permit Equivalency Influent Sample Results from December 1, 2022 through December 31, 2022  
Hangar 680 PFAS Pilot Test  
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent 2	Combined Influent
Operation Week		146			
Sample ID		HA-EW-1S-20221212	HA-EW-1I-20221212	HA-EW-2I-20221212	HA-CombinedINF-20221212
Sample Date		12/12/2022	12/12/2022	12/12/2022	12/12/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.480 Q	2.570 D	2.270 D	1.860 D
Perfluorooctanesulfonic acid (PFOS)	NA	24.800 D	10.500 D	23.000 D	34.400 D
PFOA + PFOS	0.07	25.280	13.070	25.270	36.260

Notes:

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Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent 2	Combined Influent
Operation Week		147			
Sample ID		HA-EW-1S-20221219	HA-EW-1I-20221219	HA-EW-2I-20221219	HA-CombinedINF-20221219
Sample Date		12/19/2022	12/19/2022	12/19/2022	12/19/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.555	2.910 D	2.880 D	2.600 D
Perfluorooctanesulfonic acid (PFOS)	NA	36.400 D	13.400 D	62.400 D	38.500 D
PFOA + PFOS	0.07	36.955	16.310	65.280	41.100

Notes:

<sup>(1)</sup>: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (December 28, 2022).

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Hangar 680 PFAS Pilot Test  
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			
		Shallow Influent	Intermediate Influent	Intermediate Influent 2	Combined Influent
Operation Week		148			
Sample ID		HA-EW-1S-20221227	HA-EW-1I-20221227	HA-EW-2I-20221227	HA-CombinedINF-20221227
Sample Date		12/27/2022	12/27/2022	12/27/2022	12/27/2022
Units		µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.376	3.030 D	2.840 D	2.330 D
Perfluorooctanesulfonic acid (PFOS)	NA	30.500 D	13.300 D	56.300 D	38.100 D
PFOA + PFOS	0.07	30.876	16.330	59.140	40.430

Notes:

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**Table 2: NPDES Permit Equivalency Effluent Sample Results from December 1, 2022 through December 31, 2022  
Hangar 680 PFAS Pilot Test  
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample		
		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		145		
Sample ID		HA-GEFF-20221205	HA-DUP-149-20221205	HA-FB-20221205
Sample Date		12/5/2022	12/5/2022	12/5/2022
Units		µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00220 U	0.00235 U	0.00230 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00220 U	0.00235 U	0.00230 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		145		
Sample ID		HA-GEFF-20221205	HA-DUP-149-20221205	HA-TB-20221205
Sample Date		12/5/2022	12/5/2022	12/5/2022
Units		µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	0.20 U	0.20 U	0.20 U
Trichloroethylene (TCE)	2.5	0.20 U	0.20 U	0.20 U
Carbon Tetrachloride	0.23	0.20 U	0.20 U	0.20 U
1,2-Dichloroethane	0.38	0.20 U Q J1 *	0.20 U Q *	0.20 U Q *
Total Phenols	5	0.0035 U	0.0035 U	--
Lead (total)	3.2	0.70 U	0.70 U	--

Notes:

<sup>(1)</sup>: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (December 28, 2022).

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

PFAS data from 12/19/22 are preliminary and not final.

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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.

\*: See case narrative

J1: Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria

Q: One or more quality control criteria failed

--: Not sampled.

P: Results pending.



**Table 2: NPDES Permit Equivalency Effluent Sample Results from December 1, 2022 through December 31, 2022  
Hangar 680 PFAS Pilot Test  
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample		
		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		146		
Sample ID		HA-GEFF-20221212	HA-DUP-150-20221212	HA-FB-20221212
Sample Date		12/12/2022	12/12/2022	12/12/2022
Units	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00239 U	0.00221 U	0.00247 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00239 U	0.00221 U	0.00247 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		146		
Sample ID		--	--	--
Sample Date		--	--	--
Units	µg/L	µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	--	--	--
Trichloroethylene (TCE)	2.5	--	--	--
Carbon Tetrachloride	0.23	--	--	--
1,2-Dichloroethane	0.38	--	--	--
Total Phenols	5	--	--	--
Lead (total)	3.2	--	--	--

Notes:

<sup>(1)</sup>: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (December 28, 2022).

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Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample		
		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		147		
Sample ID		HA-GEFF-20221219	HA-DUP-151-20221219	HA-FB-20221219
Sample Date		12/19/2022	12/19/2022	12/19/2022
Units	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00231 U	0.00215 U	0.00245 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00231 U	0.00215 U	0.00245 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		147		
Sample ID		--	--	--
Sample Date		--	--	--
Units	µg/L	µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	--	--	--
Trichloroethylene (TCE)	2.5	--	--	--
Carbon Tetrachloride	0.23	--	--	--
1,2-Dichloroethane	0.38	--	--	--
Total Phenols	5	--	--	--
Lead (total)	3.2	--	--	--

Notes:

<sup>(1)</sup>: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (December 28, 2022).

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		Effluent	Effluent Field Duplicate	Field Blank
Operation Week		148		
Sample ID		HA-GEFF-20221227	HA-DUP-152-20221227	HA-FB-20221227
Sample Date		12/27/2022	12/27/2022	12/27/2022
Units	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00232 U	0.00217 U	0.00234 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00232 U	0.00217 U	0.00234 U
PFOA + PFOS	0.07	ND	ND	ND

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample		
		Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		148		
Sample ID		--	--	--
Sample Date		--	--	--
Units	µg/L	µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	--	--	--
Trichloroethylene (TCE)	2.5	--	--	--
Carbon Tetrachloride	0.23	--	--	--
1,2-Dichloroethane	0.38	--	--	--
Total Phenols	5	--	--	--
Lead (total)	3.2	--	--	--

Notes:

<sup>(1)</sup>: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (December 28, 2022).

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

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