



PHIL-27632

August, 25, 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 - July 1 to July 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 July 1 to July 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, and January 13, 2022. A request to extend the permit equivalency duration was approved by PADEP on July 1, 2022.

A system modification to add intermediate extraction well HA-EW-2I (boring X6I) to the treatment system, as described in the January 27, 2021 modification request approval, has been completed. HA-EW-2I was brought online on November 30, 2021, and operated until December 4, 2021. However, the well was subsequently taken offline due to electrical issues with the pump controls. As a result, no samples were collected from HA-EW-2I or the treatment system when HA-EW-2I was operational at that time. An investigation into the electrical issues with the pump has been ongoing, and HA-EW-2I was brought back online following electrical repairs and equipment replacement. The well went back online on August 12, 2022. Please note that the August 2022 DMR will represent a partial month of samples with HA-EW-2I online.

Full-time operation of the Hangar 680 PFAS pilot test system was initiated on March 2, 2020. A total of 23,583,807 gallons of water have been treated and discharged to Outfall 8 as of July 25, 2022.

- Influent samples were collected weekly from shallow extraction well HA-EW-1S, intermediate extraction well HA-EW-1I, and the combined influent from HA-EW-1S and HA-EW-1I on July 5, July 11, July 18, and July 25, 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, shallow extraction well HA-EW-1S was operated at approximately 4.4 gallons per minute (gpm), and intermediate extraction well HA-EW-1I was operated at approximately 14.8 gpm.

- Effluent samples were collected weekly for PFAS, specifically PFOA and PFOS, on July 5, July 11, July 18, and July 25, 2022. Effluent samples for tetrachloroethene (PCE), trichloroethene (TCE), carbon tetrachloride (CTC), 1,2-dichloroethane (1,2-DCA), total phenols, bis (2-ethylhexyl) phthalate (BEHP), and total lead were collected on July 25, 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 July 5, July 11, July 18, and July 25, 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 July 25, 2022. This sample was analyzed for PCE, TCE, CTC, and 1,2-DCA. The results are provided in Table 2.
- 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.
- The aqueous investigation-derived waste (IDW) treatment system operated on July 6, 2022 at a rate of approximately 18.5 gpm. A total of 175,000 gallons of aqueous IDW have been treated and discharged to Outfall 8 as of July 7, 2022. A round of samples were collected from the aqueous IDW system on July 6, 2022. Results are provided in Table 3.

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/ss

Attachments:

Table 1 – NPDES Permit Equivalency Influent Sample Results from July 1, 2022 through July 31, 2022
Table 2 – NPDES Permit Equivalency Effluent Sample Results from July 1, 2022 through July 31, 2022
Table 3 – NPDES Permit Equivalency Aqueous IDW System Sample Results from July 6, 2022 through July 31, 2022

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TABLES

**Table 1: NPDES Permit Equivalency Influent Sample Results from July 1, 2022 through July 31, 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	Combined Influent	Shallow Influent	Intermediate Influent	Combined Influent
Operation Week		123			124		
Sample ID		HA-EW-1S-20220705	HA-EW-1I-20220705	HA-CombinedINF-20220705	HA-EW-1S-20220711	HA-EW-1I-20220711	HA-CombinedINF-20220711
Sample Date		7/5/2022	7/5/2022	7/5/2022	7/11/2022	7/11/2022	7/11/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.910	2.120	2.500	0.813	2.570	2.220
Perfluorooctanesulfonic acid (PFOS)	NA	63.300	22.400	36.500	50.000	26.100	34.900
PFOA + PFOS	0.07	64.210	24.520	39.000	50.813	28.670	37.120

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) and intermediate (HA-EW-1I) influent locations are not validated.

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]).

**Table 1: NPDES Permit Equivalency Influent Sample Results from July 1, 2022 through July 31, 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	Combined Influent	Shallow Influent	Intermediate Influent	Combined Influent
Operation Week		125			126		
Sample ID		HA-EW-1S-20220718	HA-EW-1I-20220718	HA-CombinedINF-20220718	HA-EW-1S-20220725	HA-EW-1I-20220725	HA-CombinedINF-20220725
Sample Date		7/18/2022	7/18/2022	7/18/2022	7/25/2022	7/25/2022	7/25/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.914	3.060	2.930	1.140	3.500	2.970
Perfluorooctanesulfonic acid (PFOS)	NA	56.800	31.400	31.800	69.800	33.400	33.100
PFOA + PFOS	0.07	57.714	34.460	34.730	70.940	36.900	36.070

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) and intermediate (HA-EW-1I) influent locations are not validated.

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]).

**Table 2: NPDES Permit Equivalency Effluent Sample Results from July 1, 2022 through July 31, 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		123			124		
Sample ID		HA-GEFF-20220705	HA-DUP-127-20220705	HA-FB-20220705	HA-GEFF-20220711	HA-DUP-128-20220711	HA-FB-20220711
Sample Date		7/5/2022	7/5/2022	7/5/2022	7/11/2022	7/11/2022	7/11/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00220 U	0.00226 U	0.00241 U	0.00239 U	0.00230 U	0.00255 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00220 U	0.00226 U	0.00241 U	0.00239 U	0.00230 U	0.00255 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		123			124		
Sample ID		--	--	--	--	--	--
Sample Date		--	--	--	--	--	--
Units	µg/L	µg/L	µg/L	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	--	--	--	--	--	--
Bis (2-Ethylhexyl) Phthalate	1.2	--	--	--	--	--	--
Lead (total)	3.2	--	--	--	--	--	--

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.

**Table 2: NPDES Permit Equivalency Effluent Sample Results from July 1, 2022 through July 31, 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		125			126		
Sample ID		HA-GEFF-20220718	HA-DUP-129-20220718	HA-FB-20220718	HA-GEFF-20220725	HA-DUP-130-20220725	HA-FB-20220725
Sample Date		7/18/2022	7/18/2022	7/18/2022	7/25/2022	7/25/2022	7/25/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00247 U	0.00228 U	0.00235 U	0.00219 U	0.00219 U	0.00238 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00247 U	0.00228 U	0.00235 U	0.00219 U	0.00219 U	0.00238 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		125			126		
Sample ID		--	--	--	HA-GEFF-20220725	HA-DUP-130-20220725	HA-TB-20220725
Sample Date		--	--	--	7/25/2022	7/25/2022	7/25/2022
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
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	0.20 U	0.20 U
Total Phenols	5	--	--	--	3.40 U	3.40 U	--
Bis (2-Ethylhexyl) Phthalate	1.2	--	--	--	0.32 J	0.29 J	--
Lead (total)	3.2	--	--	--	0.70 U	0.70 U	--

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.

**Table 3: NPDES Permit Equivalency Aqueous IDW System Sample Results from July 6, 2022 through July 31, 2022
Hangar 680 PFAS Pilot Test
Former Naval Air Station Joint Reserve Base Willow Grove**

Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			
		Influent	Effluent	Effluent Field Duplicate	Field Blank
Sample ID		AIDWSYS-INF-20220706	AIDWSYS-EFF-20220706	AIDWSYS-DUP-06-20220706	AIDWSYS-FB-20220706
Sample Date		7/6/2022	7/6/2022	7/6/2022	7/6/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	1.490	0.00231 U	0.00230 U	0.00251 U
Perfluorooctanesulfonic acid (PFOS)	NA	4.500	0.00231 U	0.00230 U	0.00251 U
PFOA + PFOS	0.07	5.990	ND	ND	ND
Parameter	Maximum Effluent Limit ⁽¹⁾	Sample			
		Influent	Effluent	Effluent Field Duplicate	Field Blank
Sample ID		AIDWSYS-INF-20220706	AIDWSYS-EFF-20220706	AIDWSYS-DUP-08-20220706	AIDWSYS-TB-20220706
Sample Date		7/6/2022	7/6/2022	7/6/2022	7/6/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L
Tetrachloroethylene (PCE)	0.69	0.20 U	0.20 U	0.20 U	0.20 U
Trichloroethylene (TCE)	2.5	0.20 U	0.20 U	0.20 U	0.20 U
Carbon Tetrachloride	0.23	0.20 U	0.20 U	0.20 U	0.20 U
1,2-Dichloroethane	0.38	0.20 U	0.20 U	0.20 U	0.20 U
Total Phenols	5	3.40 U	3.40 U	3.40 U	--
Lead (total)	3.2	3.10	0.70 U	0.18 J	--

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.
 Influent and quality assurance/quality control sample (field blank and trip blank) results are not validated.
 PADEP: Pennsylvania Department of Environmental Protection
 µg/L: Micrograms per liter (also referred to parts per billion [ppb]).
 U: Analyte not detected or detected below the detection limit value. Value reported to limit of detection.
 P: Results pending.
 J: Analyte detected below the Limit of Quantitation.