



PHIL-27603

June 23, 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 - May 1 to May 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 May 1 to May 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 submitted to the PADEP for consideration on May 12, 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. An investigation into the electrical issues with the pump is ongoing, and HA-EW-2I will be brought back online following electrical repairs and equipment replacement. The well is anticipated to be online by July 2022.

Full-time operation of the Hangar 680 PFAS pilot test system was initiated on March 2, 2020. A total of 21,847,037 gallons of water have been treated and discharged to Outfall 8 as of May 23, 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 May 3, May 10, May 16, and May 23, 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 5.0 gallons per minute (gpm), and intermediate extraction well HA-EW-1I was operated at approximately 14.3 gpm.

- Effluent samples were collected weekly for PFAS, specifically PFOA and PFOS, on May 3, May 10, May 16, and May 23, 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 May 3, 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 May 3, May 10, May 16, and May 23, 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 May 3, 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 January 13, 2022.
- The aqueous investigation-derived waste (IDW) treatment system was not operated during this reporting period.

Although the CTC concentration was detected below its effluent discharge limit in the effluent sample collected on May 3, 2022, an investigation into the plumbing and circulation of water within the system, and the chemical capability of the granular activated carbon (GAC) material to treat CTC is ongoing due to observations of its increasing concentration trend.

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 May 1, 2022 through May 31, 2022

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

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## TABLES

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

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			Sample		
		Shallow Influent	Intermediate Influent	Combined Influent	Shallow Influent	Intermediate Influent	Combined Influent
Operation Week		114			115		
Sample ID		HA-EW-1S-20220503	HA-EW-1I-20220503	HA-CombinedINF-20220503	HA-EW-1S-20220510	HA-EW-1I-20220510	HA-CombinedINF-20220510
Sample Date		5/3/2022	5/3/2022	5/3/2022	5/10/2022	5/10/2022	5/10/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.579	3.030	2.230	0.388	2.350	1.830
Perfluorooctanesulfonic acid (PFOS)	NA	41.900	28.700	34.900	25.700	23.100	23.300
PFOA + PFOS	0.07	42.479	31.730	37.130	26.088	25.450	25.130

Notes:

<sup>(1)</sup>: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (January 13, 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]).

NA: Not applicable.

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

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			Sample		
		Shallow Influent	Intermediate Influent	Combined Influent	Shallow Influent	Intermediate Influent	Combined Influent
Operation Week		116			117		
Sample ID		HA-EW-1S-20220516	HA-EW-1I-20220516	HA-CombinedINF-20220516	HA-EW-1S-20220523	HA-EW-1I-20220523	HA-CombinedINF-20220523
Sample Date		5/16/2022	5/16/2022	5/16/2022	5/23/2022	5/23/2022	5/23/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.499	3.010	2.390	0.556	3.020	2.300
Perfluorooctanesulfonic acid (PFOS)	NA	25.200	27.000	27.600	28.700	29.900	30.200
PFOA + PFOS	0.07	25.699	30.010	29.990	29.256	32.920	32.500

Notes:

<sup>(1)</sup>: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (January 13, 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]).

NA: Not applicable.

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

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			Sample		
		Effluent	Effluent Field Duplicate	Field Blank	Effluent	Effluent Field Duplicate	Field Blank
Operation Week		114			115		
Sample ID		HA-GEFF-20220503	HA-DUP-118-20220503	HA-FB-20220503	HA-GEFF-20220510	HA-DUP-119-20220510	HA-FB-20220510
Sample Date		5/3/2022	5/3/2022	5/3/2022	5/10/2022	5/10/2022	5/10/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00230 U	0.00219 U	0.00260 U	0.00212 U	0.00218 U	0.00250 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00230 U	0.00219 U	0.00260 U	0.00212 U	0.00218 U	0.00250 U
PFOA + PFOS	0.07	ND	ND	ND	ND	ND	ND

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			Sample		
		Effluent	Effluent Field Duplicate	Trip Blank	Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		114			115		
Sample ID		HA-GEFF-20220503	HA-DUP-118-20220503	HA-TB-20220503	--	--	--
Sample Date		5/3/2022	5/3/2022	5/3/2022	--	--	--
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	0.17 J	0.16 J	0.20 U	-- --	-- --	-- --
Carbon Tetrachloride	0.23	0.19 J	0.19 J	0.20 U	-- --	-- --	-- --
1,2-Dichloroethane	0.38	0.20 U	0.20 U	0.20 U	-- --	-- --	-- --
Total Phenols	5	3.50 U	3.50 U	--	-- --	-- --	--
Lead (total)	3.2	0.70 U	0.70 U	--	-- --	-- --	--

Notes:  
<sup>(1)</sup>: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (January 13, 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.  
 J: Analyte detected below the Limit of Quantitation.

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

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			Sample		
		Effluent	Effluent Field Duplicate	Field Blank	Effluent	Effluent Field Duplicate	Field Blank
Operation Week		116			117		
Sample ID		HA-GEFF-20220516	HA-DUP-120-20220516	HA-FB-20220516	HA-GEFF-20220523	HA-DUP-121-20220523	HA-FB-20220523
Sample Date		5/16/2022	5/16/2022	5/16/2022	5/23/2022	5/23/2022	5/23/2022
Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
Perfluorooctanoic acid (PFOA)	NA	0.00223 U	0.00213 U	0.00231 U	0.00234 U	0.00222 U	0.00228 U
Perfluorooctanesulfonic acid (PFOS)	NA	0.00223 U	0.00213 U	0.00231 U	0.00234 U	0.00222 U	0.00228 U
PFOA + PFOS	0.07	ND	ND	ND	ND	ND	ND

Parameter	Maximum Effluent Limit <sup>(1)</sup>	Sample			Sample		
		Effluent	Effluent Field Duplicate	Trip Blank	Effluent	Effluent Field Duplicate	Trip Blank
Operation Week		116			117		
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	-- --	-- --	--	-- --	-- --	--
Lead (total)	3.2	-- --	-- --	--	-- --	-- --	--

Notes:  
<sup>(1)</sup>: Maximum effluent limits per PADEP Temporary Discharge Request - Extension (January 13, 2022).  
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