

Chapter 3 PFAS Results

3.1 CONTAMINANT COMPARISON LEVELS

PFAS compounds are emerging contaminants and do not have promulgated state or federal screening criteria. Drinking water health advisories for PFOA and PFOS were established by EPA based on recent peer-reviewed studies which determined that certain levels may result in adverse health effects. PFOA and PFOS are the most extensively produced and most studied of the PFAS compounds. The health advisory level is 70 parts per trillion (nanograms per liter [ng/L]) cumulative of PFOS and PFOA combined. Lab detection limits are typically below 1.00 ng/L with the exception of NEtFOSAA and NMeFOSAA which are 15 ng/L (Parsons, 2017, UFP-QAPP, Table 15.9). EPA health advisories are developed to provide information on contaminants that may cause human health effects and may occur in drinking water. The advisory levels are non-enforceable and non-regulatory and, in the case of the Seneca sites, provide a conservative comparison value as the groundwater at the three sites at Seneca is prohibited for use as drinking water.

3.2 SEAD 25 PFAS RESULTS

The groundwater from 12 existing wells was analyzed for PFAS compounds at SEAD 25. Twelve of 14 PFAS compounds were detected at SEAD 25 (**Exhibit 3-1, Table 1, Figure 2**). NEtFOSAA and NMeFOSAA were not detected. Some of the compounds were only detected in one or two locations and at concentrations near the detection limit (e.g., PFDA, PFTriA, PFUnA were detected one to two times at concentrations less than 5 ng/L). PFOS and PFOA were detected in all 12 wells sampled at SEAD 25. The combined concentrations of PFOS and PFOA exceeded the EPA advisory level in all 12 wells (**Figure 3, Table 1**). The maximum detection of PFOS was 8,300 ng/L in well MW25-8. The maximum detection of PFOA was 89,000 ng/L in well MW25-2 (Note: Based on LTM results, MW25-2 is considered the main source well for BTEX and chlorinated solvents at SEAD 25). The concentration of PFOA was greater than PFOS in all wells (**Figure 3, Table 1**).

Exhibit 3-1 SEAD 25 PFAS Detection Summary

						EPA PFOA & PFOS DRINKING WATER HEALTH ADVISORY	
PARAMETER	UNIT	MAX DETECTED VALUE	FREQUENCY OF DETECTS	NUMBER OF DETECTS	NUMBER OF ANALYSES	ADVISORY LEVEL	NUMBER OF DETECTS ABOVE HA
Perfluorobutanesulfonic acid (PFBS)	NG/L	1,600	100%	14	14	N/A	N/A
Perfluorodecanoic acid (PFDA)	NG/L	65	79%	11	14	N/A	N/A
Perfluorododecanoic acid (PFDoA)	NG/L	0.56	7%	1	14	N/A	N/A
Perfluoroheptanoic acid (PFHpA)	NG/L	3,200	100%	14	14	N/A	N/A
Perfluorohexanesulfonic acid (PFHxS)	NG/L	36,000	100%	14	14	N/A	N/A
Perfluorohexanoic acid (PFHxA)	NG/L	14,000	100%	14	14	N/A	N/A
Perfluorononanoic acid (PFNA)	NG/L	140	86%	12	14	N/A	N/A
Perfluorooctanesulfonic acid (PFOS)	NG/L	8,300	100%	14	14	N/A	11*
Perfluorooctanoic acid (PFOA)	NG/L	89,000	100%	14	14	N/A	13*
PFOS/PFOA total	NG/L	92,900	N/A	N/A	14	70	14
Perfluorotetradecanoic acid (PFTeA)	NG/L	0.67	21%	3	14	N/A	N/A
Perfluorotridecanoic Acid (PFTrIA)	NG/L	2.1	7%	1	14	N/A	N/A
Perfluoroundecanoic acid (PFUnA)	NG/L	5.2	14%	2	14	N/A	N/A

* Individual concentrations above the combined Drinking Water Health Advisory (HA).

3.3 SEAD 26 PFAS RESULTS

The groundwater from eight temporary one-inch wells was analyzed for PFAS compounds at SEAD 26. Nine of 14 PFAS compounds were detected at SEAD 26 (Exhibit 3-2, Table 2, Figure 4). PFDoA, PFTrIA, PFUnA, NtFOSAA and NMeFOSAA were not detected at SEAD 26. PFOS and PFOA were detected in all eight wells sampled at SEAD 26. Combined PFOS/PFOA concentrations exceeded the EPA advisory level in four wells (TMW-26-2, -3, -6 and -7) with a maximum concentration of 580 ng/L in well TMW-26-3. Well locations TMW-26-3, -6, and -7 are located directly downgradient of the main former fire training area at SEAD 26 (Figure 5). Similar to SEAD 25, the PFOA concentrations were higher than the PFOS concentrations with the exception of the concentrations at TMW-26-1.

Exhibit 3-2 SEAD 26 PFAS Detection Summary

						EPA PFOA & PFOS DRINKING WATER HEALTH ADVISORY	
PARAMETER	UNIT	MAX DETECTED VALUE	FREQUENCY OF DETECTS	NUMBER OF DETECTS	NUMBER OF ANALYSES	ADVISORY LEVEL	NUMBER OF DETECTS ABOVE HA
Perfluorobutanesulfonic acid (PFBS)	NG/L	31	89%	8	9	N/A	N/A
Perfluorodecanoic acid (PFDA)	NG/L	2.4	22%	2	9	N/A	N/A
Perfluoroheptanoic acid (PFHpA)	NG/L	540	100%	9	9	N/A	N/A
Perfluorohexanesulfonic acid (PFHxS)	NG/L	260	100%	9	9	N/A	N/A
Perfluorohexanoic acid (PFHxA)	NG/L	1,500	100%	9	9	N/A	N/A
Perfluorononanoic acid (PFNA)	NG/L	93	56%	5	9	N/A	N/A
Perfluorooctanesulfonic acid (PFOS)	NG/L	240	89%	8	9	N/A	1*
Perfluorooctanoic acid (PFOA)	NG/L	340	100%	9	9	N/A	4*
PFOS/PFOA total	NG/L	580	N/A	N/A	9	70	4
Perfluorotetradecanoic acid (PFTeA)	NG/L	0.91	100%	9	9	N/A	N/A

* Individual concentrations above the combined Drinking Water Health Advisory (HA).

3.4 SEAD-122E PFAS RESULTS

The groundwater from twenty-four temporary one-inch wells installed at SEAD 122E was analyzed for PFAS compounds. 12 of 14 PFAS compounds were detected within SEAD 122E (Exhibit 3-3, Table 3, Figure 6). NtEtFOSAA and NMeFOSAA were not detected at SEAD 122E. Together, PFOS and PFOA were detected in five wells. Individually, PFOS was detected in one well; PFOA was detected in 13 wells. There were no detections of PFOS or PFOA which exceeded the EPA health advisory level separately or combined. The maximum concentrations of PFOS and PFOA were 6.4 ng/L (TMW-122E-24) and 15 ng/L (TMW-122E-14), respectively. Both well locations were adjacent to former refueling pads (Figure 6). The maximum detection of the combined PFOS/PFOA concentrations was 20.2 ng/L (TMW-122E-14). PFOS and PFOA detections were not spatially segregated, but are spread across the site. In general, PFOA was detected at higher concentrations than PFOS throughout the site.

Exhibit 3-3 SEAD 122E PFAS Detection Summary

						EPA PFOA & PFOS DRINKING WATER HEALTH ADVISORY	
PARAMETER	UNIT	MAX DETECTED VALUE	FREQUENCY OF DETECTS	NUMBER OF DETECTS	NUMBER OF ANALYSES	ADVISORY LEVEL	NUMBER OF DETECTS HHA
Perfluorobutanesulfonic acid (PFBS)	NG/L	5.9	73%	19	26	N/A	N/A
Perfluorodecanoic acid (PFDA)	NG/L	0.44	4%	1	26	N/A	N/A
Perfluorododecanoic acid (PFDoA)	NG/L	0.68	4%	1	26	N/A	N/A
Perfluoroheptanoic acid (PFHpA)	NG/L	6.5	65%	17	26	N/A	N/A
Perfluorohexanesulfonic acid (PFHxS)	NG/L	32	42%	11	26	N/A	N/A
Perfluorohexanoic acid (PFHxA)	NG/L	27	85%	22	26	N/A	N/A
Perfluorononanoic acid (PFNA)	NG/L	1.6	15%	4	26	N/A	N/A
Perfluorooctanesulfonic acid (PFOS)	NG/L	6.4	27%	7	26	N/A	0
Perfluorooctanoic acid (PFOA)	NG/L	15	81%	21	26	N/A	0
PFOS/PFOA TOTAL	NG/L	20.2	N/A	N/A	26	70	0
Perfluorotetradecanoic acid (PFTeA)	NG/L	2.5	96%	25	26	N/A	N/A
Perfluorotridecanoic Acid (PFTriA)	NG/L	0.86	4%	1	26	N/A	N/A
Perfluoroundecanoic acid (PFUnA)	NG/L	1.4	4%	1	26	N/A	N/A

3.5 QA/QC RESULTS

QA/QC blanks were collected from each of the three sites and from the equipment brought into contact with the groundwater. PFOA and PFOS were not detected in any of the equipment, field, or trip blanks associated with SEAD 26. Validation qualification was not necessary for any of the QA/QC samples at SEAD 25. SDG-320-28044 associated with SEAD 122E included one validation qualification where PFOS sample results less than validation action concentrations were considered not detected and qualified “U”. This was a result of field blank 122SI01000 containing PFOS > ½ LOQ at a concentration of 2.0 J ng/L. Detected concentration values were not altered based on QA/QC results. Complete sample and QA/QC results are available in **Appendix C**. Laboratory reports are available in **Appendix D**. Data validation sheets are available in **Appendix E**.

Chapter 4 Conclusions and Recommendations

4.1 CONCLUSIONS

The two primary PFAS constituents, PFOA and PFOS, were detected at all three sites at SEDA. Exceedances of the EPA Health Advisory for combined concentrations of PFOS/PFOA were observed at SEAD 25 and SEAD 26, but there were no exceedances observed at SEAD 122E. These data suggest the potential use of AFFF at SEADs 25 and 26, but not at SEAD 122E.

SEAD 25

- PFOA and PFOS were detected in 12 of 12 wells.
- The combined PFOA/PFOS concentration exceeded the EPA advisory health level in all 12 wells sampled.
- PFOA (alone) exceeded the EPA health advisory level in two wells.
- Detections of PFAS components, with elevated concentrations of PFOA and PFOS, indicate the potential use of AFFF or similar material at SEAD 25.

SEAD 26

- PFOA and PFOS were detected in 8 of 8 wells analyzed.
- Combined PFOA/PFOS exceeded the EPA health advisory level in four wells. Three of these locations are downgradient of the former fire training pit.
- PFOA (alone) exceeded the EPA health advisory level in four wells; three wells located downgradient of the former fire training pit and one well located upgradient, but in close proximity, to the pit.
- Four wells had no exceedance above the combined PFOA / PFOS advisory concentration.
- Detections of PFAS components, with elevated concentrations of PFOA and PFOS, indicate the potential use of AFFF or similar material at SEAD 26.

SEAD 122E

- PFOA and PFOS were detected together in the same well in 5 of 24 wells; PFOA was detected alone (no PFOS detection) in 13 of 24 wells; and PFOS was detected alone (no PFOA detection) in 1 of 24 wells.
- Five wells had no detections of PFOA or PFOS.
- Spatially, the PFOA and PFOS detections are scattered around the airfield and generally surround the former fueling pads.
- All of the detections of PFOA or PFOS and combined PFOA/PFOS were below the EPA health advisory level.

4.2 RECOMMENDATIONS

Preliminary data results for SEAD 122E indicated that none of the PFOA or PFOS detections exceeded the EPA health advisory level. These data were presented to EPA and NYSDEC via email on 12 June 2017 with the intention of abandoning the temporary wells at SEAD 122E due to a lack of evidence for PFAS concentrations which exceed the EPA health advisory level and upcoming future development of the site. Approval to abandon the wells was given by both NYSDEC (6/12/17) and EPA (6/13/17)

with the understanding that additional work may be requested if the validated results and site inspection report conclusions were significantly different. Parsons abandoned the SEAD 122E temporary wells on 22 June 2017 in accordance with NYSDEC well decommissioning guidelines (NYSDEC, 2009). Well abandonment logs are provided in **Appendix F**. Subsequent to data validation, no significant changes were found in the magnitude of the PFAS concentrations to affect the decision to abandon the wells at SEAD 122E.

The three sites SEAD 25, SEAD 26, and SEAD 122E are included in two environmental easements that have been recorded against the property on which they are located (**Appendix G**). The first easement, recorded on 10 June 2011 as document number 2011-00006718, is the Planned Industrial Development and Warehouse Area (PID Area) and includes 14 AOCs two of which are SEAD 25 and SEAD 26. This easement stipulates that the controlled property (SEAD 25 and 26 and 18 surrounding properties which comprise the Planned Industrial Development and Warehouse Area [PID area]) shall be solely used for commercial and industrial purposes and not for residential purposes. The easement also states that the groundwater beneath the controlled property shall not be accessed or used for any purpose without the prior written approval of the Army and NYSDEC and with the concurrence of the EPA.

The second environmental easement was signed 08 June 2009 and addresses the Airfield Parcel, which includes SEAD 122E. The Controlled Property is restricted for use solely for commercial and industrial purposes and not for residential purposes (**Appendix G**).

All three SI sites have access to, and use, a potable municipal water source. As confirmed by yearly land use control inspections, none of the three SI sites are being used for residential purposes and there is no groundwater use.

The recommendations are as follows:

- Although PFAS constituents PFOA and PFOS exceed the EPA health advisory level at SEAD 25 and SEAD 26, no future residential use or use of the groundwater is permitted in these areas without approval. No further action is recommended at these two sites.
- Both PFOA and PFOS at SEAD 25 and 26 will be monitored at the next Five Year Review to evaluate protectiveness of the existing land use control remedy.
- The PFAS constituents PFOA and PFOS were detected at SEAD 122E; however, the sum of the two compounds did not exceed the EPA health advisory level. There is no residential use of the property permitted and a municipal water source is provided. No further action is recommended at SEAD 122E.

Chapter 5 References

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- Parsons Engineering Science, Inc., 1998. Final Remedial Investigation Report for the Fire Training and Demonstration Pad (SEAD-25) and the Fire Training Pit and Area (SEAD-26). May 1998.
- Parsons Engineering Science, Inc., 1999. Final Investigation of Environmental Baseline Survey Non-Evaluated Sites [SEAD 119A, SEAD 122 (A, B, C, D, E), SEAD 123 (A, B, C, D, E, F), SEAD 46, SEAD 68, SEAD 120 (A, B, C, D, E, F, G, H, I, J), and SEAD 121 (A, B, C, D, E, F, G, H, I)], May 1999.
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