

## Investigation of Per- and Polyfluoroalkyl Substances (PFAS) in Michigan's Escanaba River watershed: Surface Sampling Update December 2020

In November 2020, EGLE Water Resources Division (WRD), Surface Water Assessment Section (SWAS) and the Upper Peninsula District staff conducted surface water sampling in the Escanaba River watershed to determine if PFAS contamination exists throughout the watershed. This watershed was selected for PFAS monitoring as part of EGLE's five-year rotating watershed system [strategy](#). Additional samples were collected from the Chocolay River watershed near Gwinn to collect additional samples from Silver Lead Creek downstream of the [former K.I. Sawyer Air Force Base](#). Finally, a sample was collected from the Tacoosh-Whitefish watershed from the Portage Creek upstream of its confluence with Lake Michigan to determine if AFFF use at the [Delta County airport](#) resulted in PFAS contamination of the creek. Surface water samples were collected in accordance with the Michigan Per- and Polyfluoroalkyl Substances (PFAS) Sampling Guidance document (MDEQ 2018) and tested for 28 different PFAS following the Michigan Surface Water PFAS Investigation 2019 QAPP (EGLE 2019).

Overall, 11 of the 18 surface water samples had non-detectable PFOS concentrations and 12 of the 18 were non-detect for PFOA. No samples exceeded the Rule 57 Human Noncancer Value (HNV) for PFOA which is 12,000 parts per trillion (ppt). As depicted in Table 1 (bold and italicized text), three samples exceeded the HNV for PFOS of 12 ppt. Two of these samples were in Silver Lead Creek of the Chocolay River watershed near the former K.I. Sawyer Air Force Base (23 to 28 ppt PFOS). These concentrations are nominally higher than the sample collected from the creek in 2017 at Base Lake Rd (14 ppt). The other sample exceeding the PFOS HNV was collected from Portage Creek which discharges into Portage Bay of Lake Michigan downstream of the Delta County airport (18 ppt PFOS). Figure 1 depicts the sampling locations and surface water PFOS concentrations (in ppt).

Brook trout were collected from Silver Lead Creek in 2017. PFOS and PCBs in the trout resulted in a MDHHS fish consumption advisory of 2 meals per month for brook trout from Silver Lead Creek. Brook trout were collected from Halfway Creek in September 2020 and those data are expected back in 2022. EGLE will be collecting additional trout from Silver Lead Creek in 2021 for a PFHxS and PFNA bioaccumulation study.

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Table 1. Surface water PFOS and PFOA concentrations (in ppt) in surface water samples in the Escanaba, Tacoosh-Whitefish, and Chocolay watersheds of Michigan in November 2020. As these water bodies are non-drinking water sources, Results are compared to the Rule 57 Human Noncancer Value (HNV) of 12 ppt for PFOS and 12,000 ppt for PFOA. Results exceeding the Rule 57 HNV are bolded and italicized.

Sample ID	Watershed	Waterbody	Description	Latitude	Longitude	Collection Date	PFOS (ppt)	PFOS Flag	PFOA (ppt)	PFOA Flag
PRC-0010	Tacoosh-Whitefish	Portage Creek	M35	45.7114	-87.0925	11/7/2020	<b>17.9</b>		3.43	J
ESC-0010	Escanaba	Escanaba River	d/s of Dam 1	45.7939	-87.0777	11/7/2020	1.05	K	1.05	K
ESC-0050	Escanaba	Escanaba River	Impoundment 3	45.8406	-87.0890	11/7/2020	1.06	K	1.06	K
ESC-0200	Escanaba	Escanaba River	Boney Falls Basin	45.9923	-87.2687	11/7/2020	1.01	K	1.01	K
ESC-2000	Escanaba	Escanaba River	d/s Gwinn WWSL	46.2509	-87.4539	11/7/2020	1.06	K	1.06	K
EBR-0010	Escanaba	E. Br. Escanaba River	d/s Halfway Creek confluence	46.2781	-87.4434	11/7/2020	1.09	J, Q	1.01	K
HC-0010	Escanaba	Halfway Creek	u/s E. Branch Escanaba	46.2791	-87.4347	11/7/2020	1.02	K	1.02	K
EBR-0020	Escanaba	E. Br. Escanaba River	u/s Halfway Creek confluence	46.2788	-87.4361	11/7/2020	1.03	K	1.03	K
EBR-0100	Escanaba	E. Br. Escanaba River	Near Co Rd NNR	46.3737	-87.4732	11/10/2020	1.02	K	1.02	K
UNT-0010	Escanaba	Goose Lake Inlet	M35	46.4726	-87.5409	11/10/2020	1.04	K	1.04	K
UNS-0010	Escanaba	Unnamed Trib (south)	M476	46.4233	-87.6704	11/10/2020	1.03	K	1.03	J
ELY-0050	Escanaba	Ely Creek	d/s Dyno Nobel Inc	46.4344	-87.6888	11/10/2020	1.02	K	1.02	K
NNC-0010	Escanaba	Unnamed Trib to Warner	M565	46.4257	-87.6027	11/10/2020	2.35	J	1.05	K
WAC-0010	Escanaba	Warner Creek	M35	46.4341	-87.5989	11/10/2020	1.81	J	1.02	K
CR-0020	Chocolay	Chocolay River	Green Bay Rd	46.4958	-87.3504	11/10/2020	2.81	J, Q	3.55	J
BIG-0010	Chocolay	Big Creek	Karen Rd / HQ	46.4305	-87.3260	11/10/2020	1.06	K	2.05	J
SLC-0050	Chocolay	Silver Lead Creek	d/s SAFB	46.34292	-87.364	11/10/2020	<b>28.3</b>		40	
SLC-0090	Chocolay	Silver Lead Creek	at SAFB / Voodoo Ave	46.3345	-87.3725	11/10/2020	<b>23.3</b>		26.8	

**PFAS Laboratory Codes**

K: Result is below detection limit; therefore, the method detection limit is displayed

J: Result is above detection limit, below the reporting limit

Q: The ion transition ratio is outside of the acceptance criteria.

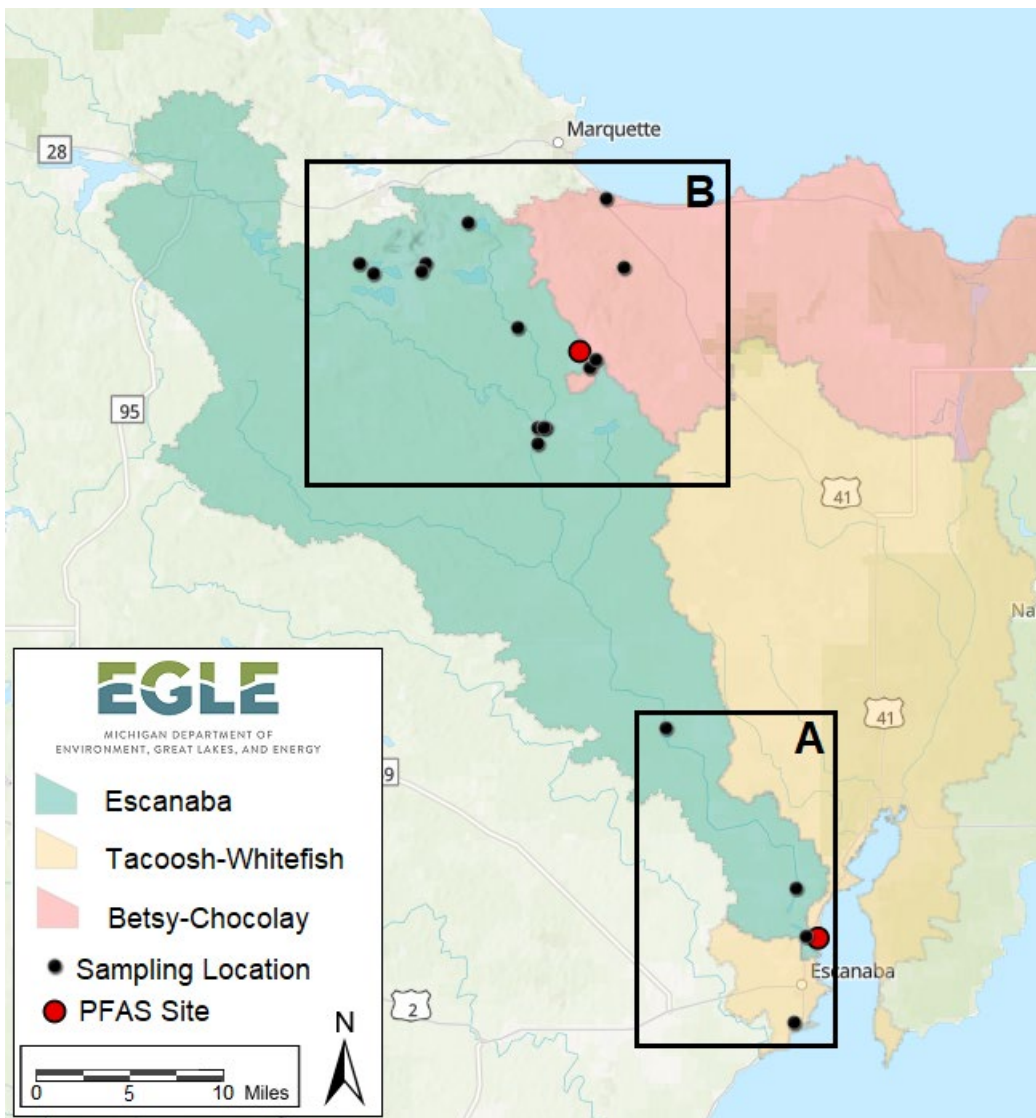


Figure 1. Surface water PFAS sampling locations in the Escanaba, Tacoosh Whitefish, and Chocolay River watersheds in November 2020. See insets in Figures 1A and 1B for PFOS concentrations in parts per trillion (ppt).

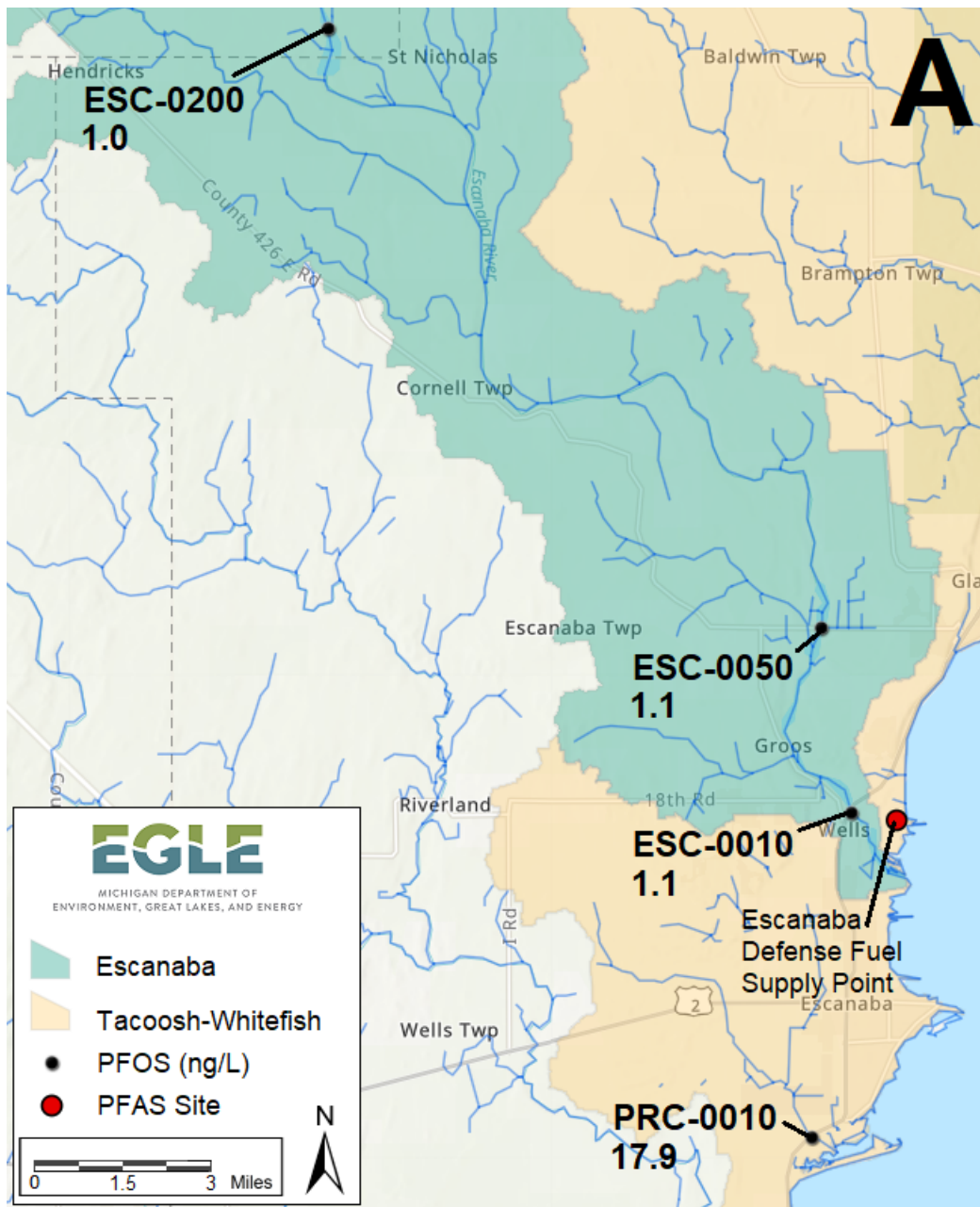


Figure 1A. Surface water PFAS sampling locations in the Escanaba River and Tacoosh-Whitefish River watersheds in November 2020. PFOS concentrations are depicted in parts per trillion (ppt).

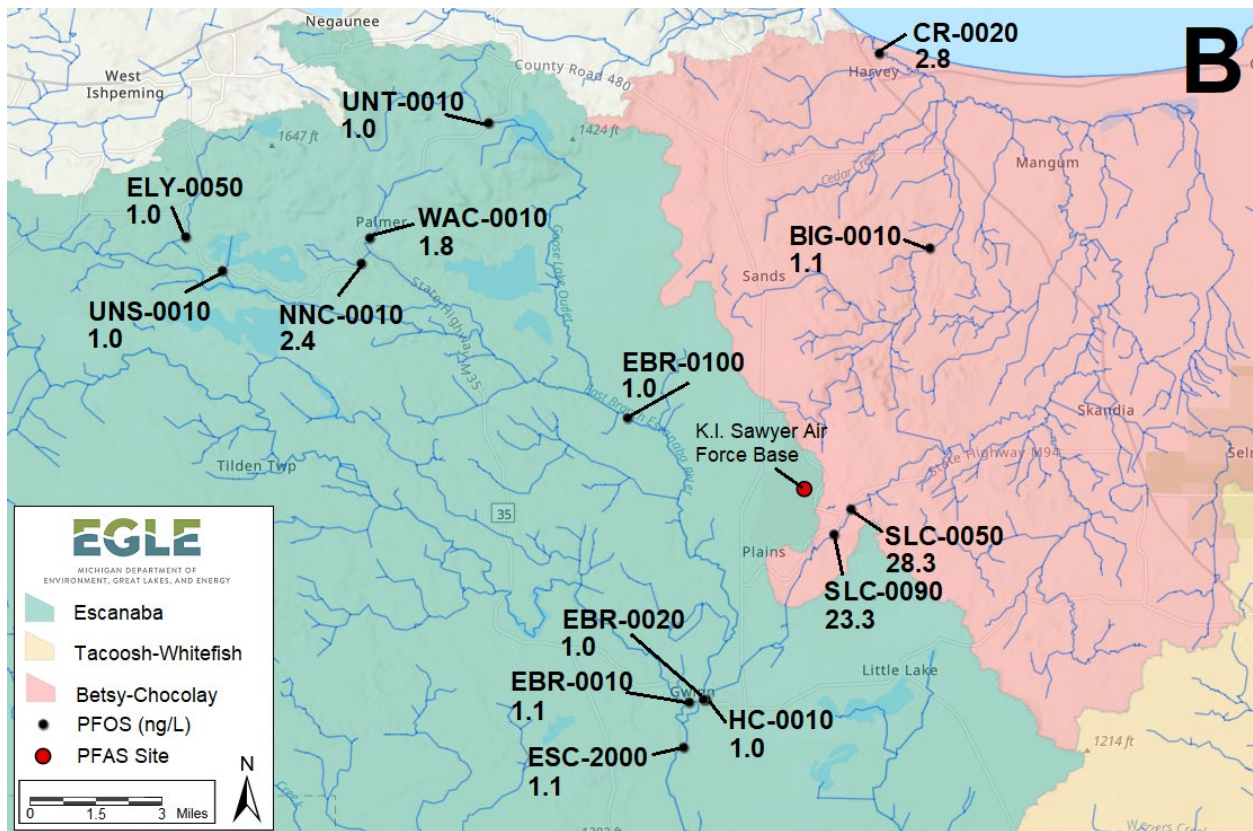


Figure 1B. Surface water PFAS sampling locations in the Escanaba River and Chocolay River watersheds in November 2020. PFOS concentrations are depicted in parts per trillion (ppt).