

Supplementary Information

Table S1: Abbreviation of polymers.

Polymer	Abbreviation	Polymer	Abbreviation
Polyamide	PA	polyhexadecyl methacrylate	PHM
Polyacrylamide	PAM	Polymethyl methacrylate	PMMA
Polycarbonate	PC	Polyoctadecyl acrylate	POA
Polycaprolactone	PCL	Polypropylene	PP
Polyethylene	PE	Polyphenylene oxide	PPO
Polyethylene: ethyl acrylate	PE:PEA	Polystyrene	PS
Polyethylene: propylene	PE:PP	Polysulfide rubber	PSR
Polyethylene: vinyl acetate: vinyl chloride	PE:PVA:PVC	polytetrafluoroethylene	PTFE
Polyethyl methacrylate	PEMA	Polyurethane	PU
Polyester	PEST	Polyvinyl chloride	PVC
Polyethylene terephthalate	PET	Polyvinyl stearate	PVS
Polyamide	PA	polyhexadecyl methacrylate	PHM

Table S2: Properties of sludge collected from a community WSP.

Sampling date	Moisture content	Organic matter content
7 Aug. 2020	22.2 ± 4.4 %	2.2 ± 0.2 %
12 Dec. 2020	25.6 ± 1.6 %	1.5 ± 0.1 %
6 Sep. 2021	43.4 ± 1.4 %	2.4 ± 0.03 %

Table S3: Changes in mass of the tested plastic particles following wet peroxidation treatment.

Polymer types	Color	Numbers	Pretreatment weight (g)	Post-treatment weight (g)	Mass change (%)
PETG	Green	10	0.1262	0.1260	0.16
PLA	Orange	10	0.1698	0.1694	0.24
CPE	Blue	10	0.1601	0.1601	0.00
ABS	Red	10	0.1631	0.1623	0.49
PETG	Green (Fiber)	20	0.0142	0.0141	0.71

Table S4: Recovery of 500-1000 µm of microplastics spiked into lagoon wastewater and final effluent.

Polymer types	Sample item	Spiked number	Detected number	Recovery (%)	Average recovery (%)
Virgin PMMA	Lagoon wastewater	15	14	93.3	93.3
	Treated effluent	15	14	93.3	
Virgin PP	Lagoon wastewater	15	12	80.0	83.3
	Treated effluent	15	13	86.7	
Weathered PP	Lagoon wastewater	15	9	60.0	60.0
	Treated effluent	15	9	60.0	



Figure S1. Photos showing our sampling scheme and sampling sites at Wellsgate Lake (top left), the waste stabilization pond effluent (bottom left), and the waste stabilization pond itself (top and bottom right). Note the 50 L carboy emptying through a stack of sieves with mesh sizes of 1 mm, 125 μm , and 45 μm and the extensive surface duckweed in the pond. The water transfer pump and intake (just below the buoy in the top left) are also shown.

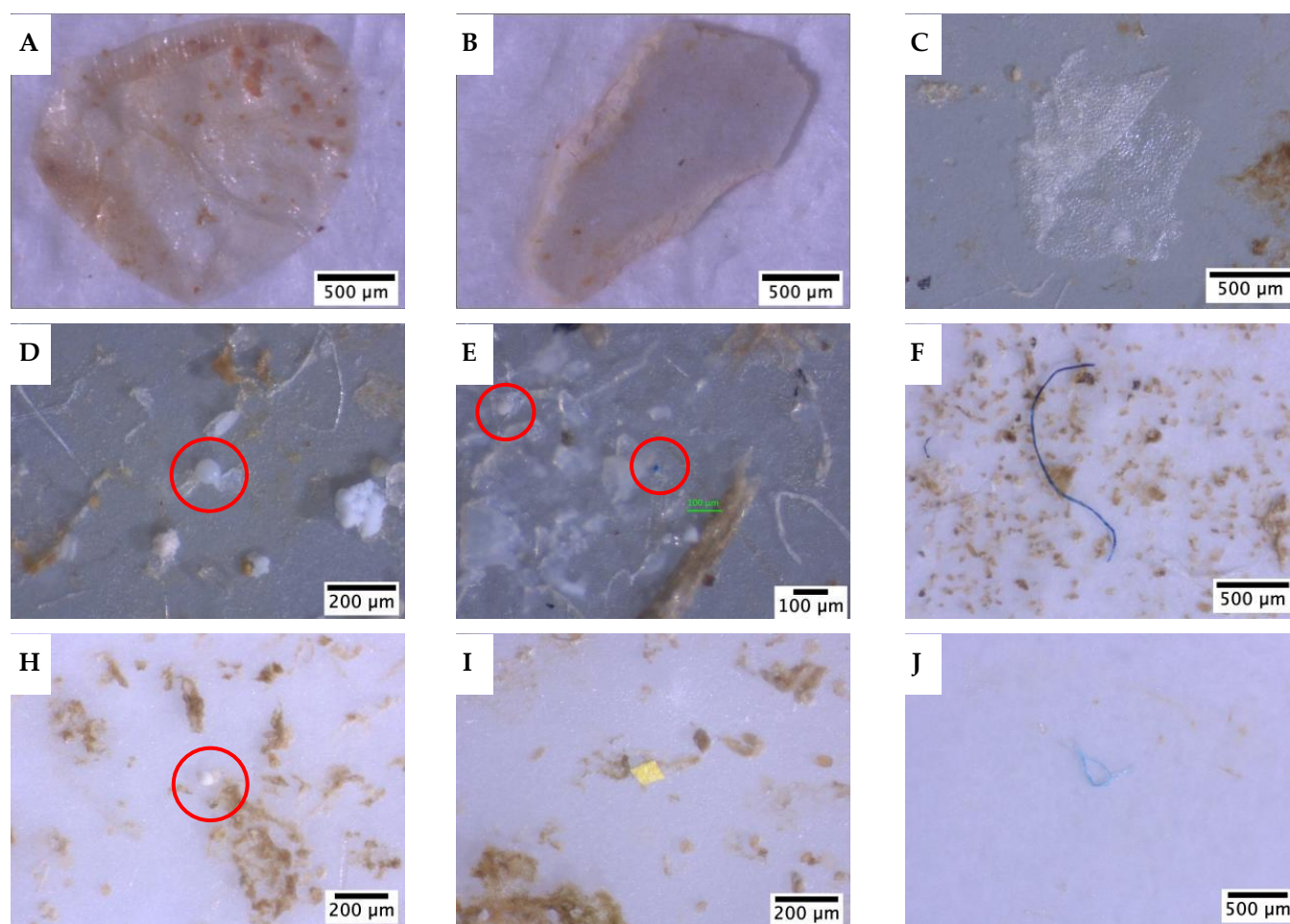


Figure S2: Stereomicrograph of representative microplastics isolated from samples. (A) transparent fragment and (B) white fragment extracted from Wellsgate lake, (C) transparent fragment extracted from pond, (D) white microbead and (E) blue microbead extracted from effluent, (F) blue fiber, (G) white microbead and (H) yellow fragment extracted from duckweed, (I) blue fiber extracted from sludge.

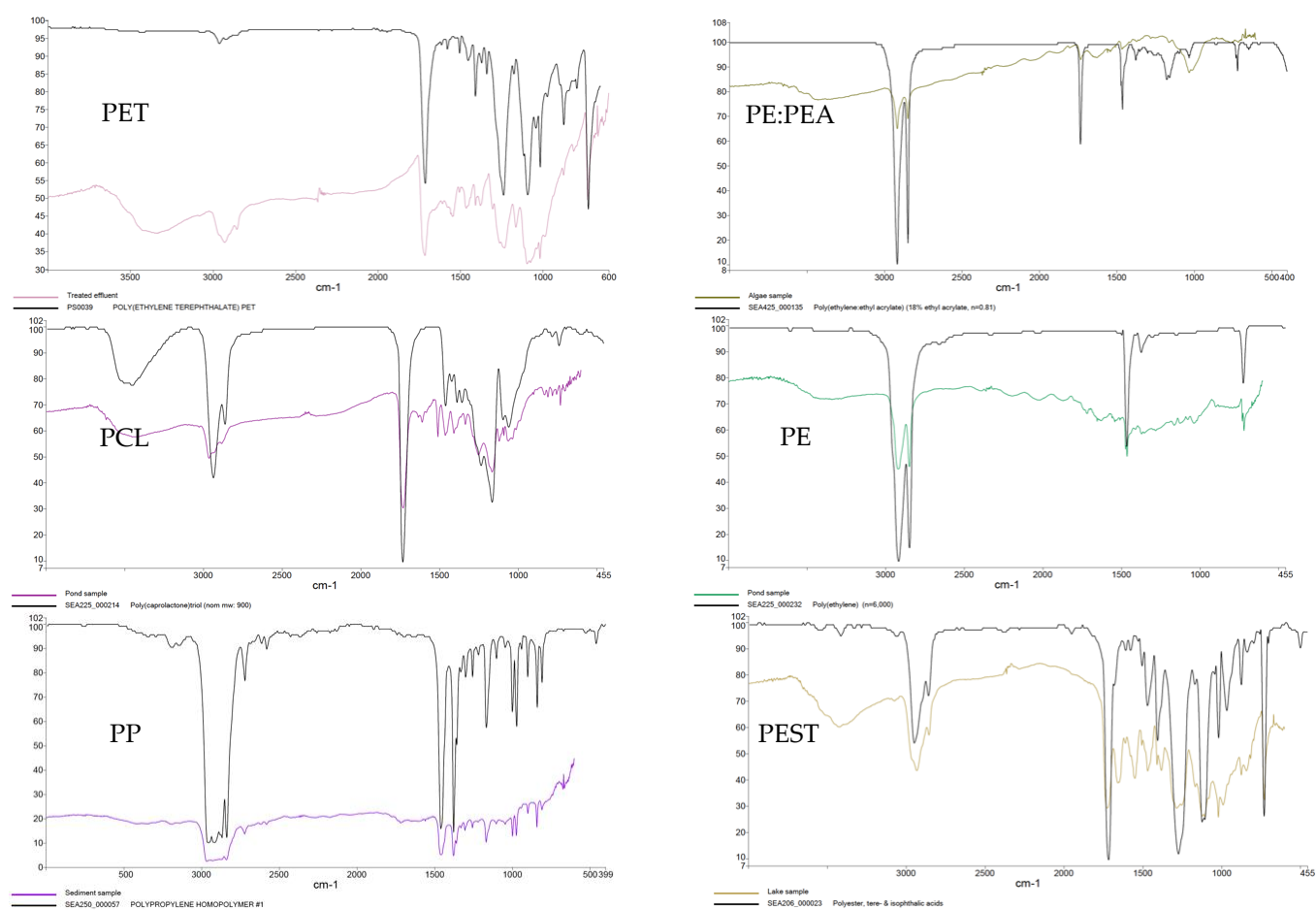


Figure S3: Some spectrum of extracted MPs.

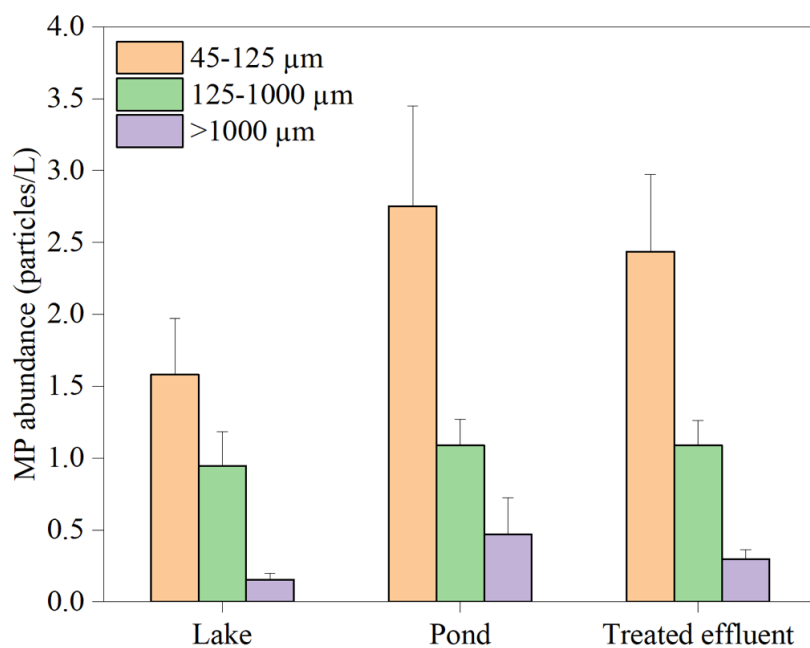


Figure S4: Size distribution of microplastics extracted from Wellsgate lake, the pond, and treated effluent.

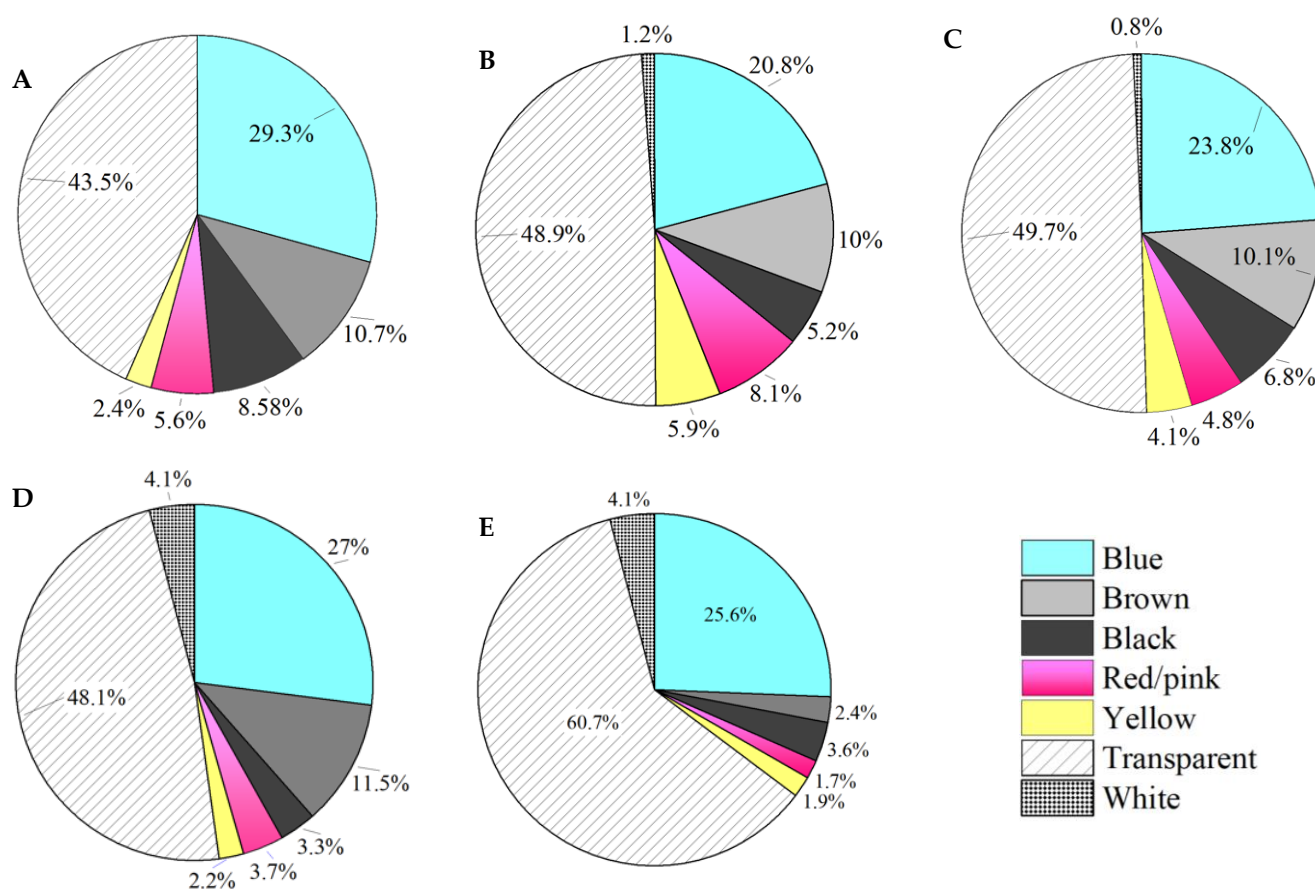


Figure S5: Color distribution of microplastics extracted from (A) Wellsgate lake, (B) the pond, (C) treated effluent, (D) sludge, and (E) duckweed.