

Table S1. List of PPCPs determined in Poland and their concentrations in environmental samples.

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water		
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	
Alkylphenols	Bisphenol A	787.6–5927.5 10–12,060 1465 1194 782 <LOD–<LOQ	Kraków, [71,85] not given, [50,78] Gdańsk, [90] Gniewino, [90] Swarzewo, [90] Gdynia, [69]	30.2–190 <LOD–10,840 42 16 61	Kraków, [71,85,92] not given, [50,78] Gdańsk, [90] Gniewino, [90] Swarzewo, [90]	<LOD–115,810 <LOQ–2,202,000	NE Poland, [50] NW Poland, [69]	<LOQ 1–427 107 3113 798 207 71.6–514.9 16.3–30.1	Warta, [81] Southern Poland Streams, [106] Oruński Stream, [90] Kozacki Stream, [90] Świątokrzyska I reservoir, [90] Świątokrzyska II reservoir, [90] Drwina, [71] Vistula, [71]			<LOQ 1–629 <LOD–6880	Krajkowo, [81] South Poland, [106] NE Poland, [50,111]	6–53	South Poland, [106]	
	Bisphenol S	1249 595 1045	Gdańsk, [90] Gniewino, [90] Swarzewo, [90]	10 <LOD <LOD	Gdańsk [90] Gniewino, [90] Swarzewo, [90]			<LOQ 122 >LOD 1584 >LOD	Warta, [81] Oruński Stream, [90] Kozacki Stream, [90] Świątokrzyska I reservoir, [90] Świątokrzyska II reservoir, [90]			<LOQ	Krajkowo, [81]			
	Nonylphenol	1190–9560 <LOD–102,540	Silesia region, [89] not given, [78]	<LOD–1550 <LOD–880	Silesia region, [89] not given, [78]											
	Octylphenol	930–6600 <LOD–2350	Silesia region, [89] not given, [78]	150–2380 <LOD–2280	Silesia region, [89] not given, [78]											
Alpha1–blockers	Alfuzosin							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]			
	Carvedilol			<LOD	Bielsko– Biała,[75,91]			<LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD	Vistula [75,91] Odra, [75,91] Warta, [75,91] Brda, [75,91] Kłodnica, [75,91] Krzywa, [75,91] Mała Panew, [75,91] Troja, [75,91] Toszecki Stream, [75,91]							
Antiarrhythmic drugs	Amiodarone							<LOD	Vistula, [70]					<LOD	Warsaw, [70]	
	Diltiazem							<LOQ <LOD–24	Warta, [81,98] Vistula, [70]			<LOQ	Krajkowo, [81]	<LOD–1.4	Warsaw, [70]	
	Propafenone							<LOD–87	Vistula, [70]					<LOD–4	Warsaw, [70]	
Antibacterial agents	Triclocarban							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]			
	Triclosan	166–6721.7 <LOD–1330	Kraków, [71,84,85] not given, [50,78]	49.8–430 <LOD–910	Kraków, [71,84,85] not given, [50,78]	<LOD–260	NE Poland, [50]	<LOQ <LOQ–47.50 <LOD–144 <LOQ–45.12 29.08–92.10 32.99–87.36 52.5–271.5	Warta, [81] Wierzyca, [80] Vistula, [71,74,80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80] Drwina, [71]			<LOQ <LOD–210	Krajkowo, [81] NE Poland, [50,111]	<LOD–11	Warsaw, [74]	
Antibiotics	Amoxicillin							<LOQ <LOQ <LOQ–19.66 14.69–35.67 <LOQ–45.87 28.15–34.10 <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Warta, [97,98] Wierzyca, [80] Vistula, [80,97] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]							
	Ampicillin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]							
	Azithromycin	87 360	Tychy, [97] Olsztyn, [97]	230 650	Tychy, [97] Olsztyn, [97]			<LOQ 25–441 5.2–36 <LOQ–1520	Warta, [81] Gostynia, [72] Łyna, [72] Vistula, [74]			<LOQ	Krajkowo, [81]	<LOQ–193	Warsaw, [74]	

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Antibiotics (cont.)	Carbadox							10.80–28.31 <LOQ–14.87 <LOQ–97.12 <LOQ–98.19 <LOQ–64.37	Wierzycza, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]						
	Cefadroxil							<LOD–34	Vistula, [74]					<LOD	Warsaw, [74]
	Cefalonium							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Cefapirin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Cefazolin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Cefoperazone							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Cefotaxime							<LOD–71	Vistula, [74]					<LOD	Warsaw, [74]
	Cefquinome							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Ceftazidime							<LOD–1150	Vistula, [74]					<LOD	Warsaw, [74]
	Ceftiofur							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Antibiotics (cont.)	Cephalexin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Chloramphenicol	9.2–38.1	Gdańsk, [73]	3.2–16.2	Gdańsk, [73]			<LOQ <LOQ–14.86 <LOQ–24.36 <LOQ–17.60 <LOQ–24.15 <LOQ	Warta, [81,98] Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]			<LOQ 0.9–12.8	Krajkowo, [81] Gdańsk, [80]	0.9–0.9	Gdańsk, [73]
	Chlortetracycline							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Ciprofloxacin	1260 4300	Tychy, [72] Olsztyn, [72]	184 312	Tychy, [72] Olsztyn, [72]			95–108 12–182 <LOD–277 <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Gostynia, [72] Łyna, [72] Vistula, [74,97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]					<LOD	Warsaw, [74]
	Clarithromycin	904–1416 480 560	Gdańsk, [88] Tychy, [72] Olsztyn, [72]	185–761 160 143	Gdańsk, [88] Tychy, [72] Olsztyn, [72]			<LOQ 37–79 12.2–20.5 <LOD–1430	Warta, [81] Gostynia, [72] Łyna, [72] Vistula, [74]			<LOQ	Krajkowo, [81]	<LOD–52	Warsaw, [74]
	Clindamycin	134 106	Tychy, [72] Olsztyn, [72]	166 290	Tychy, [72] Olsztyn, [72]			<LOQ–12.7 78–34 2.3–25.4 <LOD–369	Warta, [81] Gostynia, [72] Łyna, [72] Vistula, [74]			<LOQ	Krajkowo, [81]	<LOD–8.1	Warsaw, [74]
	Cloxacillin							<LOD <LOD <LOD	Drwęca, [100] Wkra, [100] Mławka, [100]						
	Danofloxacin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Dicloxacillin							<LOD <LOD <LOD <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Drwęca, [100] Wkra, [100] Mławka, [100] Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Antibiotics (cont.)	Difloxacin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Dihydrostreptomycin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [44]						
	Doxycycline							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Enoxacin							<LOD <LOD <LOD	Drwęca, [100] Wkra, [100] Mławka, [100]						
	Enrofloxacin							<LOQ–21.62 <LOQ–18.69 <LOQ <LOQ–15.32 <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Wierzyca, [80] Vistula, [80,97] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]	207.7 <LOD–<LOQ	Southern Baltic Sea,[108] Gulf of Gdańsk, [107]	<LOD–7	not given, [28,109,110]		
	Erythromycin	<LOD–141.8 51 26 58 28	Gdańsk, [17,73,88] Lublin, [17] Szczecin, [17] Tychy, [72] Olsztyn, [72]	11.9–98.1 21 16	Gdańsk, [73,88] Tychy, [72] Olsztyn, [72]			<LOQ 7–10 <LOD <LOD–1020 <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Warta, [81,97] Gostynia, [72] Łyna, [72] Vistula, [74,97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz lae, [97] Rybnik reservoir, [97]			<LOQ 1–14	Krajkowo, [81] Gdańsk, [73]	2.1–6 <LOD–57	Gdańsk, [73] Warsaw, [74]
	Fleroxacin							<LOD–3.5	Vistula, [74]					<LOD–0.38	Warsaw, [74]
	Flumequine							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Fluraltadone							<LOD <LOD <LOD	Drwęca, [100] Wkra, [100] Mławka, [100]						

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Antibiotics (cont.)	Josamycin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Levofloxacin							<LOD–80	Vistula, [74]					<LOD–6.9	Warsaw, [74]
	Lincomycin	20 102	Tychy, [72] Olsztyn, [72]	48 56	Tychy, [72] Olsztyn, [72]			3–9 <LOD–4 <LOQ–61 <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Gostynia, [72] Łyna, [72] Vistula, [97,74] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]					<LOD–0.67	Warsaw, [74]
	Lomefloxacin							<LOD–1.4	Vistula, [74]					<LOD–0.39	Warsaw, [74]
	Marbofloxacin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Metronidazole	250 7400	Tychy, [72] Olsztyn, [72]	69 88	Tychy, [72] Olsztyn, [72]			<LOD <LOD <LOD <LOQ 9–21 <LOD–9.4 <LOD–350	Drwęca, [100] Wkra, [100] Mławka, [100] Warta, [98] Gostynia, [72] Łyna, [72] Vistula, [74]					<LOD–3.4	Warsaw, [74]
	Nafcillin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Nalidixic acid							<LOD–1.7 <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [74,97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]					<LOD	Warsaw, [74]
	Neomycin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Nitrofurantoin							<LOD <LOD <LOD	Drwęca, [100] Wkra, [100] Mławka, [100]						

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Antibiotics (cont.)	Norfloxacin	240 80	Tychy, [72] Olsztyn, [72]	31 10	Tychy, [72] Olsztyn, [72]			<LOD–95 <LOD <LOD–164 <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Gostynia, [72] Łyna, [72] Vistula, [74,97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]					<LOD	Warsaw, [74]
	Ofloxacin	39.4–363.9 135 195	Gdańsk, [73] Tychy, [72] Olsztyn, [72]	9.5–203.4 26 40	Gdańsk, [73] Tychy, [72] Olsztyn, [72]			4–32 8.4–31 <LOD–89	Gostynia, [72] Łyna, [72] Vistula, [74]			<LOD	Gdańsk, [73]	<LOD <LOD–7.9	Gdańsk, [73] Warsaw, [74]
	Oleandomycin							<LOD <LOD <LOD	Drwęca, [100] Wkra, [100] Mławka, [100]						
	Oxacillin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Oxolinic acid							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]	1026	Southern Baltic Sea,[108]				
	Oxytetracycline	0.7 <LOD	Tychy, [72] Olsztyn, [72]	0.1 <LOD	Tychy, [72] Olsztyn, [72]			<LOQ–14.34 <LOQ–19.91 <LOQ–15.34 <LOQ–9.43 <LOQ <LOD–1 <LOD <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Wierzycza, [80] Vistula, [80,97] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80] Gostynia, [72] Łyna, [72] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Penicillin G							<LOQ–17.1 <LOD <LOD–<LOQ <LOD <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Warta, [81,97] Drwęca, [100] Wkra, [97,100] Mławka, [100] Vistula, [97] Odra, [97] Brda, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [8] Rybnik reservoir, [89]			<LOQ	Krajkowo, [81]		
	Rifampicin	5.2 5.3	Tychy, [72] Olsztyn, [72]	<LOD 2.9	Tychy, [72] Olsztyn, [72]			<LOD <LOD <LOD–3.3	Gostynia, [78] Łyna, [78] Vistula, [90]					<LOD	Warsaw, [74]
	Roxithromycin	105–161 18 6.2	Gdańsk, [88] Tychy, [72] Olsztyn, [72]	55–132 6.6 6.2	Gdańsk, [88] Tychy, [72] Olsztyn, [72]			<LOQ 4–5 <LOD <LOD–33	Warta, [95] Gostynia, [78] Łyna, [78] Vistula, [90]			<LOQ	Krajkowo, [81]	<LOD–0.59	Warsaw, [74]

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Antibiotics (cont.)	Sulfamethazine	<LOD	Zabrze, [76]					<LOQ <LOD–14 <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Warta, [81,97] Vistula, [74,97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]	114 <LOD–<LOQ	Southern Baltic Sea,[108] Gulf of Gdańsk, [107]	<LOD–>LOD <LOQ	not given, [28,109,110] Krajkowo, [81]	<LOD–<LOQ	Warsaw, [74]
	Sulfamethizole							<LOD <LOD <LOD	Drwęca, [100] Wkra, [100] Mławka, [100]	65.79 <LOD	Southern Baltic Sea,[108] Gulf of Gdańsk, [107]				
	Sulfamethoxazole	>LOD–2000 1225–146 1300 3000	Zabrze, [76] Gdańsk, [88] Tychy, [72] Olsztyn, [72]	508–642 630 770	Gdańsk, [88] Tychy, [72] Olsztyn, [72]			<LOQ–306 <LOD <LOD–<LOQ <LOD 451–644 <LOD–76.1 <LOD–1770 <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ 6 6.2 5.9	Warta, [63,81,97,98,99] Drwęca, [100] Wkra, [97,100] Mławka, [100] Gostynia, [72] Łyna, [72] Vistula, [74,97] Odra, [97] Brda, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97] Reda, [101] Zagórska Struga, [101] Płutnica, [101]	311 <LOD–10.8 <LOD	Southern Baltic Sea,[108] Gulf of Gdańsk, [107] Bay of Puck, [101]	<LOD–66 <LOQ–27.1 <LOD–16.1	not given, [28,109,110] Krajkowo, [63,81,99] Bay of Puck area, [101]	<LOD–5.9	Warsaw, [74]
	Sulfamethoxypyridazine							<LOD <LOD <LOD	Drwęca, [100] Wkra, [100] Mławka, [100]						
	Sulfamonomethaxine							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Sulfanilamide							<LOD–350	Vistula, [74]					<LOD–<LOQ	Warsaw, [74]
	Sulfapyridine							<LOQ–39 21.7 <LOD <LOD	Warta, [81,98] Reda, [101] Zagórska Struga, [101] Płutnica, [101]	<LOD <LOD–<LOQ <LOD–28.2	Southern Baltic Sea,[108] Gulf of Gdańsk, [107] Bay of Puck, [101]	<LOD–23 <LOQ–14.2 <LOD–177.1	not given, [28,109,110] Krajkowo, [81] Bay of Puck area, [101]		
	Sulfasalazine	111–2266.8	Kraków, [71]	1.3–44.5	Kraków, [71]			14.1–31.2	Drwina, [71]						
	Sulfathiazole	94 180	Tychy, [72] Olsztyn, [72]	21 36	Tychy, [72] Olsztyn, [72]			7–29 <LOD <LOQ–103 <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Gostynia, [72] Łyna, [72] Vistula, [74,97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]	128.4 <LOD–<LOQ	Southern Baltic Sea,[108] Gulf of Gdańsk, [107]	<LOD–<LOQ	not given, [28,109,110]	<LOD–0.52	Warsaw, [74]
	Sulfisoxazole									79.57 <LOD	Southern Baltic Sea,[108] Gulf of Gdańsk, [107]				
	Tetracycline	190 210	Tychy, [72] Olsztyn, [72]	39 61	Tychy, [72] Olsztyn, [72]			<LOD <LOD–7.2 <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Gostynia, [72] Łyna, [72] Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Antibiotics (cont.)	Tiamulin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Warta, [81,97] Vistula, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]			<LOQ	Krajkowo, [81]		
	Tilmicosin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Trimethoprim	441–482 254 900	Gdańsk, [88] Tychy, [72] Olszyn, [72]	269–445 160 220	Gdańsk, [88] Tychy, [72] Olszyn, [72]			<LOQ–27 36–38 9.1–24.4 <LOQ–247 <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Warta, [81,97,98] Gostynia, [72] Łyna, [72] Vistula, [74,97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]	279 <LOD–3.4	Southern Baltic Sea,[108] Gulf of Gdańsk, [107]	<LOD <LOQ	not given, [28,109,110] Krajkowo, [81]	<LOD–2.1	Warsaw, [74]
	Tylosin							<LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ <LOQ	Vistula, [97] Warta, [97] Odra, [97] Brda, [97] Wkra, [97] Dunajec, [97] Lanskie Lake, [97] Maroz Lake, [97] Rybnik reservoir, [97]						
	Vancomycin	350 3200	Tychy, [72] Olsztyn, [72]	114 162	Tychy, [72] Olsztyn, [72]			27–62 <LOD–10.7 <LOD–117	Gostynia, [72] Łyna, [72] Vistula, [74]					<LOD	Warsaw, [74]
Antidementia agents	Memantine							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
Antidepressants	Amitriptyline							<LOQ	Warta, [98]			<LOD	not given, [109]		
	Citalopram							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	Clomipramine											<LOD	not given, [28,109,110]		
	Desvenlafaxine							131–590.5 13–71.5	Drwina, [71] Vistula, [71]						
	Diazepam	<LOD–214 96 531 <LOQ <LOD	Gdańsk, [17,95] Lublin, [17] Szczecin, [17] Kraków, [71] Zabrze, [76]	<LOD–114 163 <LOQ	Gdańsk, [17,95] Szczecin, [17] Kraków, [71]			<LOD <LOD <LOQ–31.14 <LOQ–16.23 27.61–52.64 <LOQ–64.15 36.74–46.13	Radunia, [95] Kacza, [95] Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]			<LOD	Gdańsk, [95]	<LOD	Gdańsk, [95]
	Doxepin											<LOD–<LOQ	not given, [28,109,110]		
	Fluoxetine							<LOQ <LOQ–67.50 <LOQ–38.94 <LOQ–87.16 <LOQ–21.83 <LOQ–67.16	Warta, [81] Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]			<LOQ	Krajkowo, [81]		
	Fluvoxamine	<LOD	Gdańsk, [73]	<LOD	Gdańsk, [73]							5.6–5.6	Gdańsk, [73]	<LOD	Gdańsk, [73]
	Imipramine											<LOD–<LOQ	not given, [28,109,110]		
	Mirtazapine							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	Sertraline	<LOD	Gdańsk, [95]	<LOD	Gdańsk, [95]			<LOD <LOD <LOQ	Radunia, [95] Kacza, [95] Warta, [81]			<LOD <LOQ	Gdańsk, [95] Krajkowo, [81]	<LOD	Gdańsk, [95]

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Antidepressants (cont.)	Venlafaxine	89.8–153.5	Kraków, [71]	110.8–190.3	Kraków, [71]			<LOQ–12.1 24.5–170 <LOQ–16	Warta, [81] Drwina, [71] Vistula, [71]			<LOQ	Krajkowo, [81]		
Antidiabetic drugs	Gilbenclamide	<LOD	Zabrze, [76]												
	Metformin	3818.7–16,790.7	Gdańsk, [73]	7.5–62.9	Gdańsk, [73]			55–88	Warta, [99]			<LOQ 0.5–13.2	Krajkowo, [99] Gdańsk, [73]	1.7–8	Gdańsk, [73]
Antiepileptics	Carbamazepine	525 <LOD–980 >LOD–1600 <LOD–1230 695.6–3217.1	Kraków, [84] Silesia region, [89] Zabrze, [76] not given, [50] Gdańsk, [73]	485 <LOD–1665. 90–190 <LOD–2680 1665.6–5127.8	Kraków, [82] Bielsko–Biała, [75,91] Silesia region, [89] not given, [50] Gdańsk, [73]	<LOD	NE Poland, [50]	<LOD–28.16 0.3–0.9 <LOD–2.5 1–2.5 0.3–1.7 <LOD–0.2 <LOD–794 <LOD <LOD <LOD <LOD <LOD <LOD <LOD 29.84–51.91 <LOQ–43.97 <LOQ <LOD <LOD <LOD 20–133 1798.1–2704.4 31–5260 <LOD	Vistula, [43,75,80,91] Pszczynka, [43] Czarna Przemsza, [43] Rawa, [43] Brynica, [43] Biała Przemsza, [43] Warta, [63,75,81,91,98,99] Odra, [75,91] Brda, [75,91] Kłodnica, [75,91] Krzywa, [75,91] Mała Panew, [75,91] Troja, [75,91] Toszecki Stream, [75,91] Wierzycza, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80] Reda, [101] Zagórska Struga, [101] Płutnica, [101]	<LOD	Bay of Puck, [101]	<LOD–869 <LOQ–179 <LOD 1–56.5 <LOD	not given, [28,109,110] Krajkowo, [63,81,99] NE Poland, [50] Gdańsk, [73] Bay of Puck area, [101]	2.1–6	Gdańsk, [73]
	Gabapentin							42–97	Warta, [81,98]			<LOQ–61.7	Krajkowo, [81]		
	Lamotrigine							35.8–45.1	Warta, [81]			<LOQ–54	Krajkowo, [81]		
	Lorazepam	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]										
	Phenytoin							<LOQ–17.62 <LOQ <LOQ <LOQ <LOQ	Wierzycza, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]						
	Primidone							<LOQ	Warta, [81]			<LOQ–12.4	Krajkowo, [81]		
Antifungal agents	Fluconazole							32.5–51.7 5.1–636	Warta, [81] Vistula, [74]			<LOQ–51.6	Krajkowo, [81]	2–8.9	Warsaw, [74]
	Thiabendazole	18.4 11	Tychy, [72] Olsztyn, [72]	22.3 25.5	Tychy, [72] Olsztyn, [72]			12–16 <LOD–4.3 0.72–104	Gostynia, [72] Łyna, [72] Vistula, [74]					<LOD–1.9	Warsaw, [74]
Antihistamines and histamine receptor modulators	Cimetidine							<LOQ	Warta, [98]						
	Fexofenadine	153.3–1853.2	Kraków, [71]	374.6–748.4	Kraków, [71]			28.9–40.7 102.7–391.4 25.1–49.2	Warta, [81] Drwina, [71] Vistula, [71]			<LOQ	Krajkowo, [81]		
	Ranitidine	312–5702.2	Gdańsk, [73]	274–982.5	Gdańsk, [73]			<LOQ	Warta, [81,98]			<LOQ 1.3–5.9	Krajkowo, [81] Gdańsk, [73]	4.9–5.6	Gdańsk, [73]
Antihypertensives	Almodipine							<LOD–19	Vistula, [70]					<LOD–3.5	Warsaw, [70]
	Enalapril							<LOD	Vistula, [70]					<LOD	Warsaw, [70]
	Irbesartan	9.3–3142.3	Kraków, [71]	4.9–2863.1	Kraków, [71]			<LOQ 43.5–6558.8 4.5–167.7	Warta, [81] Drwina, [71] Vistula, [71]			<LOQ	Krajkowo, [81]		
	Labetalol							<LOD–0.7	Vistula, [70]					<LOD	Warsaw, [70]
	Losartan	299.9–1708.8	Gdańsk, [73]	75.6–265.2	Gdańsk, [73]			4.5–610	Vistula, [70]			6.3–16.3	Gdańsk, [73]	<LOD <LOD–5	Gdańsk, [73] Warsaw, [70]
	Nifedipine							<LOD–0.5	Vistula, [70]					<LOD	Warsaw, [70]
	Quinapril							<LOQ–155	Vistula, [70]					<LOD–1.8	Warsaw, [70]
	Ramipril	43.9–125.8	Gdańsk, [73]	29.1–90.4	Gdańsk, [73]			0.4–73	Vistula, [70]			2.3–3	Gdańsk, [73]	2.2–2.8 <LOD–0.8	Gdańsk, [73] Warsaw, [70]
	Telmisartan							132–140 8–1130	Warta, [81] Vistula, [70]			<LOQ–62.5	Krajkowo, [81]	<LOD–23	Warsaw, [70]
	Valsartan	9137.2–92,532.7	Kraków, [71]	3868.9–8157.7	Kraków, [71]			20–133 1798.1–2704.4 31–5260	Warta, [81,98] Drwina, [71] Vistula, [70,71]			<LOQ	Krajkowo, [81]	<LOD–27	Warsaw, [70]
	Verapamil							<LOD	Vistula, [70]					<LOD	Warsaw, [70]

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Antiischemic agents	Trimetazidine	168–826.7	Gdańsk, [73]	21.8–457.8	Gdańsk, [73]							0.4–2.9	Gdańsk, [73]	0.4–4.2	Gdańsk, [73]
Antiparasitics	Flubendazole							<LOD <LOD <LOD	Drwęca, [100] Wkra, [100] Mławka, [100]						
	Ivermectin							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	Mebendazole							<LOD <LOD <LOD <LOD–9.8	Drwęca, [100] Wkra, [100] Mławka, [100] Vistula, [74]					<LOD	Warsaw, [74]
	Sulfaquinoxalline							<LOD <LOD <LOD	Drwęca, [100] Wkra, [100] Mławka, [100]						
	Tinidazole							<LOD <LOD <LOD	Drwęca, [100] Wkra, [100] Mławka, [100]						
Antiretroviral drugs	Darunavir							<LOD–169	Vistula, [74]					<LOD–3.4	Warsaw, [74]
Antithrombotics	Warfarin							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
Beta-blockers	Acebutolol							<LOQ <LOD 1.7–643	Warta, [81] Radunia, [105] Vistula, [70]			<LOQ <LOD	Krajkowo, [81] Gdańsk, [105]	<LOD 0.2–4	Gdańsk, [105] Warsaw, [70]
	Atenolol	116 97–503.2	Szczecin, [17] Gdańsk, [17,73]	62 51.9–169	Szczecin, [17] Gdańsk, [17,73]			<LOQ–22 <LOD <LOD–205	Warta, [81,98] Radunia, [105] Vistula, [70]			<LOQ <LOD <LOD–2.5	Krajkowo, [81] not given, [109] Gdańsk, [73,105]	<LOD–1 <LOD–1.5	Gdańsk, [73,105] Warsaw, [70]
	Bisoprolol							<LOQ 2–1470	Warta, [81] Vistula, [70]			<LOQ	Krajkowo, [81]	1–17	Warsaw, [70]
	Celiprolol							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	Metoprolol	362	Kraków, [84]	1304 234–270	Kraków, [84] Bielsko–Biała, [75,91]			<LOD–2190 <LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD–155	Vistula [70,75,91] Odra, [75,91] Brda, [75,91] Kłodnica, [75,91] Krzywa, [75,91] Mała Panew, [75,91] Troja, [75,91] Toszecki Stream, [75,91] Radunia, [105] Warta, [75,81,91,98,99]			<LOD→LOD <LOQ <LOD	not given, [28,110] Krajkowo, [81,99] Gdańsk, [105]	<LOD 0.5–14	Gdańsk, [105] Warsaw, [70]
	Nadolol							<LOD	Radunia, [105]			<LOD <LOD	not given, [28,109,110] Gdańsk, [105]	<LOD	Gdańsk, [105]
	Pindolol							<LOD	Radunia, [105]			<LOD <LOD	not given, [28,109,110] Gdańsk, [105]	<LOD	Gdańsk, [105]
	Propranolol	<LOD	Kraków, [84]	<LOD <LOQ	Kraków, [82] Bielsko–Biała, [75,91]			<LOD–69 <LOD <LOD→LOQ <LOQ <LOD <LOD <LOD <LOD <LOD <LOD <LOD	Vistula [70,75,91] Odra, [75,91] Warta, [75,81,91,98] Brda, [75,91] Kłodnica, [75,91] Krzywa, [75,91] Mała Panew, [75,91] Troja, [75,91] Toszecki Stream, [75,91] Radunia, [105]			<LOQ→LOD <LOQ <LOD	not given, [28,109,110] Krajkowo, [81] Gdańsk, [105]	<LOD <LOD–4	Gdańsk, [105] Warsaw, [70]
	Sotalol			<LOD	Bielsko–Biała, [75,91]			14.3–50.3 <LOD–2120 <LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD	Warta, [81] Vistula [70,75,91] Odra, [75,91] Warta, [75,91] Brda, [75,91] Kłodnica, [75,91] Krzywa, [75,91] Mała Panew, [75,91] Troja, [75,91] Toszecki Stream, [75,91]			<LOQ–14.1	Krajkowo, [81]	<LOD–16	Warsaw, [70]
Bet68–adrenergic agonists	Salbutamol							<LOD <LOQ	Radunia, [105] Warta, [98]			<LOD→LOQ <LOD	not given, [28,109,110] Gdańsk, [105]	<LOD	Gdańsk, [105]
	Terbutaline							<LOD	Radunia, [105]			<LOD <LOD	not given, [28,109,110] Gdańsk, [105]	<LOD	Gdańsk, [105]
Chemotherapeutic agents	Cyclophosphamide	9.3–33.3 <LOD	Gdańsk, [73] Zabrze, [76]	1–24	Gdańsk, [73]			<LOQ	Warta, [81]			<LOQ 2.6–3.6	Krajkowo, [81] Gdańsk, [73]	<LOD	Gdańsk, [73]
	Ifosfamide	10.1–27.3 <LOD	Gdańsk, [73] Zabrze, [76]	2.2–28	Gdańsk, [73]							<LOD	Gdańsk, [73]	<LOD	Gdańsk, [73]

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Contrast agents	Diatrizoate	<LOD–6900	Zabrze, [76]												
	Iohexol	<LOD–5800	Zabrze, [76]					<LOQ–485	Warta, [81,99]			<LOQ–184	Krajkowo, [81,99]		
	Iomeprol	<LOD–13,000	Zabrze, [76]					<LOQ–159	Warta, [81,99]			<LOQ	Krajkowo, [81,99]		
	Iopamidol	<LOD–2200	Zabrze, [76]					<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	Iopromide	<LOD–27,000	Zabrze, [76]					<LOQ–413	Warta, [81,99]			<LOQ	Krajkowo, [81,99]		
Corrosion inhibitors	1H–Benzotriazole							<LOQ–140	Warta, [63,99]			<LOQ–180	Krajkowo, [63,99]		
	Tolyltriazole							30	Warta, [63]			<LOQ–40	Krajkowo, [63]		
Corticosteroids	Dexamethasone			<LOD	Bielsko–Biała, [75,91]			<LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD	Vistula [75,91] Odra, [75,91] Warta, [75,91] Brda, [75,91] Kłodnica, [75,91] Krzywa, [75,91] Mała Panew, [75,91] Troja, [75,91] Toszecki Stream, [75,91]						
	Flumetasone							<LOD <LOD <LOD	Drwęca, [100] Wkra, [100] Mławka, [100]						
	Prednisolone			<LOD	Bielsko–Biała, [75,91]			<LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD	Vistula [75,91] Odra, [75,91] Warta, [75,91] Brda, [75,91] Kłodnica, [75,91] Krzywa, [75,91] Mała Panew, [75,91] Troja, [75,91] Toszecki Stream, [75,91]						
Cosmetic and pharmaceutical preservatives	Butylparaben	10–710 68.8–710.7	not given, [50] Kraków, [71]	<LOD–40 <LOQ–4.3	not given, [50] Kraków, [71]	<LOD–6670	NE Poland, [49,50]	2.7–23.6 2.1–7.6	Drwina, [71] Vistula, [71]			<LOD–40	NE Poland, [49,50,111]		
	Ethylparaben	<LOD–4150 791.2–8169.4	not given, [50] Kraków, [71]	<LOD–20 <LOQ	not given, [50] Kraków, [71]	<LOD–9380	NE Poland, [49,50]	0.9–349 0.8–1.7	Drwina, [71] Vistula, [71]			<LOQ–86	NE Poland, [49,50]		
	Methylparaben	<LOD–5030 2235–40,898.6	not given , [50] Kraków, [71]	20–1440 6.2–10.9	not given, [50] Kraków, [71]	<LOD–17,150	NE Poland, [49,50]	10.6–616.9 10.3–29.6	Drwina, [71] Vistula, [71]			<LOD–2880	NE Poland, [49,50]		
	Propylparaben	<LOD–2730 524.2–7803.3	not given, [50] Kraków, [71]	<LOD–390 <LOQ	not given, [50] Kraków, [71]	<LOD–5900	NE Poland, [49,50]	1–165.7 0.9–1.3	Drwina, [71] Vistula, [71]			<LOD–25	NE Poland, [49,50,111]		
Diuretics	Chlorothiazide							<LOQ	Warta, [63]			<LOQ–10	Krajkowo, [63]		
	Furosemide	<LOD–3372.5	Gdańsk, [73,82]	<LOD–1879.2	Gdańsk, [73,82]			<LOQ <LOD <LOD–2670	Warta, [81] Radunia, [82] Vistula, [70]			<LOQ <LOD	Krajkowo, [81] Gdańsk, [73]	<LOD <LOD–29	Gdańsk, [73,82] Warsaw, [70]
	Hydrochlorothiazide	484.6–5072.3	Gdańsk, [73]	207.3–4313.7	Gdańsk, [73]			<LOQ <LOQ–1270	Warta, [81] Vistula, [70]			<LOQ 0.4–27.7	Krajkowo, [81] Gdańsk, [73]	2.5–2.9 19–26	Gdańsk, [73] Warsaw, [70]
Fibrates	Bezafibrate	>LOD–1000 <LOQ–240 <LOD–145.9	Zabrze, [76] Poznań, [44] Kraków, [71,96]	<LOQ–37 20.3–73	Poznań, [44] Kraków, [71,96]			<LOQ–16 9.44–64.15 <LOQ–54.90 <LOQ–19.60 <LOQ–34.50 <LOQ–27.02 20.8–34.5	Warta, [44,81] Wierzyca, [80] Vistula, [70,71,80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80] Drwina, [71]			<LOQ	Krajkowo, [81]	<LOD	Warsaw, [70]
	Ciprofibrate							<LOD–60	Vistula, [70]					<LOD	Warsaw, [70]
	Clofibric acid	<LOD <LOQ–71 <LOD–80	Kraków, [84] Poznań, [44] Zabrze, [76]	395 <LOQ	Kraków, [84] Poznań, [44]			<LOQ–8 <LOD–130	Warta, [44,81] Vistula, [70]			<LOQ	Krajkowo, [81]	<LOD–1.3	Warsaw, [70]
	Etofibrate	<LOD	Zabrze, [76]												
	Fenofibrate							<LOD–0.9	Vistula, [70]					<LOD–1.1	Warsaw, [70]
	Gemfibrozil	<LOD–220	Zabrze, [76]					<LOQ <LOQ–26.34 <LOQ–39.15 <LOQ–43.24 <LOQ–39.37 18.35–24.33	Warta, [81] Wierzyca, [80] Vistula, [70,80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]			<LOQ	Krajkowo, [81]	<LOD	Warsaw, [70]

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Hormones	17 α -Ethinylestradiol	<LOD	Gdańsk, [87]	<LOD	Gdańsk, [87]			<LOQ <LOQ <LOD–19.14 <LOQ–27.15 12.84–36.12 <LOQ–21.05 <LOQ–26.31 10.5–16.5	Odra, [51] Gliwicki Canal, [51] Wierzyca, [80,87] Vistula, [51,71,80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80] Drwina, [71]			<LOD–61	not given, [28,109,110]		
	17 β -Estradiol	<LOD–914 1114 <LOD 4.6–1067.8	Gdańsk, [17,87] Szczecin, [17] not given, [50] Kraków, [71]	<LOD–227 432 <LOD <LOQ	Gdańsk, [17,87] Szczecin, [17] not given, [50] Kraków, [71]	<LOD–280	NE Poland, [49,50]	<LOQ <LOQ <LOD <LOD–34.18 <LOQ–41.50 <LOQ–24.98 14.37–46.15 24.86–28.31	Odra, [51] Kanał Gliwicki, [51] Radunia, [105] Wierzyca, [80,87] Vistula, [51,80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]			<LOD–>LOD <LOD <LOD–48	not given, [28,109,110] Gdańsk, [105] NE Poland, [49,50,111]	<LOD	Gdańsk, [105]
	Androstenedione							<LOQ–81.15 <LOQ <LOQ–78.15 <LOQ <LOQ	Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]						
	Diethylstilboestrol	<LOD <LOD	not given, [50] Gdańsk, [87]	<LOD <LOD	not given, [50] Gdańsk, [87]	<LOD	NE Poland, [50]	<LOD <LOD–39.87 35.98–64.15 15.47–59.18 17.36–84.15 43.61–51.16	Radunia, [105] Wierzyca, [80,87] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]			<LOD <LOD	Gdańsk, [105] NE Poland, [49,111]	<LOD	Gdańsk, [105]
	Estriol	<LOD	Gdańsk, [87]	<LOD	Gdańsk, [87]			<LOD <LOD–28.19 <LOQ–42.60 <LOQ–11.93 <LOQ <LOQ–69.15	Radunia, [105] Wierzyca, [80,86] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]			<LOD–>LOD <LOD	not given, [28,109,110] Gdańsk, [105]	<LOD	Gdańsk, [105]
	Estrone	<LOD–567 732 <LOD 41.4–773.3	Gdańsk, [17,87] Szczecin, [17] not given, [50] Kraków, [71]	<LOD–249 236 <LOD <LOQ	Gdańsk, [17,87] Szczecin, [17] not given, [50] Kraków, [71]	<LOD–1100	NE Poland, [49,50]	1.3 1.1 <LOD–21.60 <LOQ–21.17 <LOQ–14.87 <LOQ–24.18 <LOQ–47.16 22.7–39.1	Odra, [51] Kanał Gliwicki, [51] Wierzyca, [80,86] Vistula, [51,80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80] Drwina, [71]			<LOD–69 <LOD–310	not given, [28,109,110] NE Poland, [49,50,111]		
	Equilin							<LOQ–14.31 <LOQ–9.46 <LOQ–7.91 <LOQ <LOQ	Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]						
	Levonorgestrel	51.1–1529.8	Gdańsk, [73]	<LOD	Gdańsk, [73]							<LOQ	Gdańsk, [73]	20.4–46.4	Gdańsk, [73]
	Norethisterone							<LOQ–37.15 13.17–47.62 24.60–61.37 <LOQ–51.14 <LOQ–49.87	Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]						
	Progesterone	41.3–89.6	Gdańsk, [73]	9.4–13.4	Gdańsk, [73]			<LOQ–30.14 19.19–47.90 <LOQ–52.84 <LOQ–47.03 28.42–58.94	Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]			3.3–4.4	Gdańsk, [73]	4.1–4.8	Gdańsk, [73]
	Testosterone											<LOD–<LOQ	not given, [28,109,110]		
Hypnotics	Nitrazepam	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]										
	Temazepam	57–145.5	Kraków, [71]	54–257	Kraków, [71]			58–109.5 <LOQ–21	Drwina, [71] Vistula, [71]						
Immunosuppressiv e drugs	Mycophenolic acid							<LOD–179.6 1.3–130.4	Vistula, [77] Utrata, [77]					<LOD	Warsaw, [77]
	Tacrolimus							<LOD <LOD	Vistula, [77] Utrata, [77]					<LOD	Warsaw, [77]

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Lipid-modifying agents	Atorvastatin	278.6–2756.5	Kraków, [71]	49.7 –102.2	Kraków, [71]			68.3–132.6 <LOD–114	Drwina, [71] Vistula, [70,71]					<LOD–0.3	Warsaw, [70]
	Lovastatin							<LOQ <LOD	Warta, [81] Vistula, [70]			<LOQ	Krajkowo, [81]	<LOD	Warsaw, [70]
	Pravastatin	<LOD	Gdańsk, [73]	<LOD	Gdańsk, [73]			<LOD	Vistula, [70]			<LOD	Gdańsk, [73]	<LOD <LOD	Gdańsk, [73] Warsaw, [70]
	Simvastatin							<LOQ <LOD	Warta, [81,98] Vistula, [70]			<LOQ	Krajkowo, [81]	<LOD	Warsaw, [70]
Metabolites	17 α -hydroksyprogesteron							<LOQ–27.16 27.46–40.15 <LOQ–17.85 <LOQ–34.15 <LOQ	Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]						
	4–n–nonylphenol	<LOD–690	not given, [50]	<LOD	not given, [50]	<LOD–6120	NE Poland, [50]					<LOD–9	NE Poland, [50,111]		
	4–n–octylphenol	<LOD–850	not given, [50]	<LOD–770	not given, [50]	<LOD–60	NE Poland, [50]					<LOD–25	NE Poland, [50,111]		
	ATH	<LOD	Zabrze, [76]												
	Benzoylcegonine	38.3–87.3	Kraków, [71]	5.8–11.5	Kraków, [71]			<LOQ 6–33.5 1.5–2.5 <LOD	Warta, [98] Drwina, [71] Vistula, [71] Wierzyca, [87]						
	Carbamazepine 10,11–dihydroxy							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	Carbamazepine 2–hydroxy							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	Cocaethylene	<LOQ–3.5	Kraków, [71]	<LOQ	Kraków, [71]										
	Cotinine	821.5–1855	Kraków, [71]	7.3–44	Kraków, [71]			<LOQ–50.8 9–672.5 11.5–1361	Warta, [81] Drwina, [71] Vistula, [71]			<LOQ	Krajkowo, [81]		
	Creatinine							140.5–686 <LOQ–85.5	Drwina, [71] Vistula, [71]						
	DAMI	<LOD–490	Zabrze, [76]												
	Diclofenac–4'–hydroxy							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	Dihydrocodeine	<LOQ	Kraków, [71]	<LOQ–5.8	Kraków, [71]			1.5–3.5 1–3	Drwina, [71] Vistula, [71]						
	Dihydromorphine	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]										
	Dimethyl– aminophenazone	<LOD	Zabrze, [76]												
	EDDP	1.8–4.8	Kraków, [71]	1.8–4	Kraków, [71]			<LOQ–3 <LOQ	Drwina, [71] Vistula, [71]						
	Erythromycin–15O							<LOQ	Warta, [98]						
	HMMA	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]										
	Ibuprofen–2–hydroxy	>LOD–5100	Zabrze, [76]					<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	Ibuprofen–carboxy							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	N–acetyl– sulfamethoxazole	1358–1763	Gdańsk, [88]	<LOD–16	Gdańsk, [88]										
	Naproxene–o–desmethyl							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	Nordiazepam	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]										
	Norephedrine	<LOQ–8	Kraków, [71]	<LOQ–4.8	Kraków, [71]										
	Norketamine	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]			1–62.5 1.5–55	Drwina, [71] Vistula, [71]						
	Normorphine	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]										
	Noroxycodone	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]										
	O–desmethyltramadol	276.8–453	Kraków, [71]	566.8–1167.3	Kraków, [71]			257.5–636 91.5–120.5	Drwina, [71] Vistula, [71]						
	Oxazepam	211.5–269	Kraków, [71]	207.3–274	Kraków, [71]			238–436 260.5–2344	Drwina, [71] Vistula, [71]						
	Oxcarbazepine							<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Metabolites (cont.)	Oxypurinol							388–1050	Warta, [81]			<LOQ–1350	Krajkowo, [81]		
	Paraxanthine	94,035.3–174,336.8	Kraków, [71]	92.5–1881.3	Kraków, [71]			<LOQ–1470 271.5–90,665 582–966	Warta, [81] Drwina, [71] Vistula, [71]			<LOQ	Krajkowo, [81]		
	Salicylic acid	12,765 87.2–27,014.2	Kraków, [84] Gdańsk, [73,87]	236–452 227–270 60.9–470	Kraków, [84,92] Bielsko–Biała, [75,91] Gdańsk, [73,87]			<LOD–368 200–733 <LOD–125 <LOD <LOD <LOD <LOD <LOD–190 <LOD	Vistula [75,91] Odra, [75,91] Warta, [75,91] Brda, [75,91] Kłodnica, [75,91] Krzywa, [75,91] Mała Panew, [75,91] Troja, [75,91] Toszecki Stream, [75,91]			33.3–33.3	Gdańsk, [73]	38.7–38.7	Gdańsk, [73]
Nonsteroidal anti– inflammatory drugs	5–Aminosalicylic acid							<LOQ	Warta, [98]						
	Acetylsalicylic acid			<LOD <LOD	Kraków, [92] Bielsko–Biała, [75,91]			<LOD <LOD <LOD <LOD–400 730 <LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOQ–29.13 19.25–78.24 <LOQ–43.18 37.16–54.36	Drwęca, [100] Wkra, [100] Mławka, [100] Vistula [80,91] Odra, [91] Warta, [91] Brda, [91] Kłodnica, [91] Krzywa, [91] Mała Panew, [91] Troja, [91] Toszecki Stream, [91] Wierzycza, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]						
	Diclofenac	249–40,570.2 >LOD–2000 2500–4410 988 1457 <LOD–11,720 556.2–4001.4	Kraków, [71,84,85] Zabrze, [76] Poznań, [44] Lublin, [17] Szczecin, [17] not given, [50,78] Gdańsk,[17,83,73,87]	525–2905.9 128–160 120–5401.5 1090–2890 <LOD–3180	Kraków,[71,84,85,92,93] Bielsko–Biała, [75,91] Gdańsk, [73,83,87] Poznań, [44] not given, [50,78]	2100–108,340	NE Poland, [50]	<LOD–183.9 0.3–1.3 <LOD–3.1 1.2–1.7 0.4–0.8 1.1–2.6 <LOQ–486 429–470 <LOQ–42 57–70 174–200 <LOD 170–186 305–320 5 <LOD–390 528 <LOD <LOD–20.40 <LOQ–63.98 <LOQ–54.36 <LOQ <LOQ <LOQ 666.3–1352.6 <LOD <LOD <LOD	Vistula, [43,71,75,80,91] Pszczynka, [43] Czarna Przemsza, [43] Rawa, [43] Brynica, [43] Biała Przemsza, [43] Warta, [44,81,91,99,103] Odra, [75,91] Brda, [75,91] Kłodnica, [75,91] Krzywa, [75,91] Mała Panew, [75,91] Troja, [92] Toszecki Stream, [75,91] Cybina, [103] Radunia, [102,105] Gdańsk Lake, [102] Somonino Lake, [102] Wierzycza, [80,87] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80] Czarniawka, [104] Gliwice/Zabrze Lake, [104] Drwina, [71] Reda, [101] Zagórska Struga, [101] Płutnica, [101]	<LOD–102 <LOD–195.7	Gulf of Gdańsk, [83,102] Bay of Puck, [101]	<LOD–42 <LOD–28.6 <LOQ–99 <LOD–2770 <LOD–606.1	not given, [28,109,110] Gdańsk, [105] Krajkowo, [81,99] NE Poland, [50,111] Bay of Puck area, [101]	4 <LOD–114.3	Poznań, [103] Gdańsk, [73,102,105]
	Diffunisal	<LOD	Gdańsk, [87]	<LOD	Gdańsk, [87]			95–123 85 <LOD <LOD	Radunia, [102] Gdańsk Lake, [102] Somonino Lake, [102] Wierzycza, [878]	38–62	Gulf of Gdańsk, [102]			<LOD	Gdańsk, [102]
	Fenoprofen	62.8–62.8 <LOD–81.1 <LOD	Koziegłowy,[86,79] Poznań, [86] Zabrze, [76]	<LOD–28.3	Koziegłowy, [79,86]			55–84 24 20 0.2–58.9	Radunia, [102] Gdańsk Lake, [102] Somonino Lake, [102] Warta, [86]	<LOD	Gulf of Gdańsk, [102]			<LOD	Gdańsk, [102]
	Flurbiprofen	<LOD–4952	Gdańsk, [83,87]	<LOD	Gdańsk, [83,87]			<LOD–<LOQ <LOD	Radunia, [105] Wierzycza, [87]	<LOD–87	Gulf of Gdańsk, [83]	<LOD–22 <LOD–<LOQ	not given, [28,109,110] Gdańsk, [105]	<LOD	Gdańsk, [105]

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Nonsteroidal anti-inflammatory drugs (cont.)	Ibuprofen	2496–11,426.7 >LOD–2800 <LOD–10,864 6040–6450 649 894 4000–4000 <LOD–31,250	Kraków, [71,84] Zabrze, [76] Gdańsk,[17,73,82,83,87] Poznań, [44] Lublin, [17] Szczecin, [17] Koziegłowy, [79,86] not given, [78,86]	<LOD–76.9 <LOD –679 <LOQ–125 412 516 <LOD <LOD–22,610 1,2–101.1	Kraków, [71,84,92] Gdańsk, [17,73,82,83,87] Poznań, [44] Lublin, [17] Szczecin, [17] Bielsko–Biała, [75] not given, [78] Koziegłowy, [79,86]			<LOD–84.5 5–8 1–31 17–25 14–25 3–7 <LOD–496 <LOQ <LOD 104 55 LOD–55.4 <LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD <LOD 48.30 16.97–64.01 39.64–49.35 <LOQ <LOQ 75.9–3730.1	Vistula, [43,71,75,80] Pszczynka, [43] Czarna Przemsza, [43] Rawa, [43] Brynica, [43] Biała Przemsza, [43] Warta, [44,63,75,81,86,103] Cybina, [103] Radunia, [102] Gdańsk Lake, [102] Somonino Lake, [102] Radunia, [82,105] Odra, [75] Brda, [75] Kłodnica, [75] Krzywa, [75] Mała Panew, [75] Troja, [75] Toszecki Stream, [75] Wierzycza, [81,87] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80] Czarniawka, [104] Gliwice/Zabrze Lake, [104] Drwina, [71]	<LOQ–48	Gulf of Gdańsk, [83,102]	<LOD–599 <LOQ–40 <LOD–295.5	not given, [28,109,110] Krajkowo, [63,81] Gdańsk, [73,105]	5 <LOD–223.6	Poznań, [103] Gdańsk,[73,82,102,105]
	Indomethacin	>LOD–420	Zabrze, [76]					<LOQ <LOQ–22.14 <LOQ–27.13 <LOQ–18.06 <LOQ–31.07	Wierzycza, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]						
	Ketoprofen	508–21,679.3 <LOD–4569 >LOD–2300 316 437 2500–2500 <LOD–9200 <LOD–233,630	Kraków, [71,84,85] Gdańsk, [17,73,82,83,87] Zabrze, [76] Lublin, [17] Szczecin, [17] Koziegłowy,[79,86] Poznań, [44,86] not given, [78]	81–485 <LOD–3095 90–220 87 62 52 <LOD <LOD–335.1	Kraków, [71,84,85] Gdańsk, [17,73,82,83,87] Poznań, [44] Lublin, [17] Szczecin, [17] Bielsko–Biała, [75] not given, [78] Koziegłowy, [79,86]			<LOD–44 0.8–1.4 <LOD–3.1 2.9–7.2 1.1–2.9 0.2–0.9 <LOD–47.9 <LOD <LOD <LOD <LOD <LOD–>LOD 258 <LOD <LOD <LOD <LOD <LOD <LOD <LOD 18.09 34.06 19.07 36.02 5.8–100.5 87.7 132.2 81.9	Vistula, [43,71,75,80] Pszczynka, [43] Czarna Przemsza, [43] Rawa, [43] Brynica, [43] Biała Przemsza, [43] Warta, [44,75,86,81,103] Drwęca, [100] Wkra, [100] Mławka, [100] Cybina, [103] Radunia, [82,105] Odra, [75] Brda, [75] Kłodnica, [75] Krzywa, [75] Mała Panew, [75] Troja, [75] Toszecki Stream, [75] Wierzycza, [80,87] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80] Drwina, [71] Reda, [101] Zagórska Struga, [101] Płutnica, [101]	364–616 <LOD	Gulf of Gdańsk, [83] Bay of Puck, [101]	<LOD–>LOD <LOQ <LOD–165.9 <LOD–731.8	not given, [28,109,110] Krajkowo, [81] Gdańsk, [73,105] Bay of Puck, area [101]	<LOD <LOD–166.9	Poznań, [103] Gdańsk,[82,73,105]
	Ketorolac							<LOQ–21.14 <LOQ–37.19 13.99–27.13 <LOQ–24.05 <LOQ–42.15	Wierzycza, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]						

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Nonsteroidal anti-inflammatory drugs (cont.)	Naproxen	696–177,704.2 >LOD–8400 240–7040 0.5–10,380 414 662 2700–2700 <LOD–551,960	Kraków, [71,84,85] Zabrze, [76] Gdańsk, [17,83,87] Poznań, [44,86] Lublin, [17] Szczecin, [17] Koziegłowy,[79,86] not given, [78]	54.8–313 82–110 70–2512 27–145 56 74 <LOD–7760 0.2–156.5	Kraków, [71,84,85] Bielsko–Biała, [75,91] Gdańsk, [17,83,87] Poznań, [44] Lublin, [17] Szczecin, [17] not given, [78] Koziegłowy, [79,86]			<LOQ–143 <LOD–300 128–140 143–180 753–850 <LOQ–40 88–110 187–240 <LOD 14 <LOD <LOD <LOD–37.7 <LOD–47.98 <LOQ–88.01 21.63–80.14 41.19–69.30 233.3–1091.9	Warta,[44,75,81,86,91,99,103] Vistula [71,75,80,91] Odra, [75,91] Brda, [75,91] Kłodnica, [75,91] Krzywa, [75,91] Mała Panew, [75,91] Troja, [75,91] Toszecki Stream, [75,91] Cybina, [103] Gdańsk Lake, [102] Somonino Lake, [102] Radunia, [102,105] Wierzyca, [80,87] Łeba, [80] Dębogórze Canal, [80] Kości Bród, [80] Drwina, [71]	<LOD–171	Gulf of Gdańsk, [83,102]	<LOD–>LOD <LOD–20.8 <LOQ–21	not given, [28,109,110] Gdańsk, [105] Krajkowo, [81,99]	13 <LOD–<LOQ	Poznań, [103] Gdańsk, [102,105]
	Phenazone	<LOD–180	Zabrze, [76]					<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	Propyphenazone	<LOD	Zabrze, [76]					<LOQ	Warta, [81]			<LOQ	Krajkowo, [81]		
	Tolmetin	76	Koziegłowy,[86]	6.6	Koziegłowy, [86]			<LOD <LOD <LOD	Radunia, [102] Gdańsk Lake, [102] Somonino Lake, [102]	<LOD	Gulf of Gdańsk, [102]			<LOD	Gdańsk, [102]
Painkillers	Codeine	68.5–139.5	Kraków, [71]	69.5–89.3	Kraków, [71]			<LOQ–15 <LOQ <LOQ–9.5 <LOQ <LOQ <LOQ 29–81.5	Warta, [98] Wierzyca, [80] Vistula, [71,80] Łeba, [80] Dębogórze Canal, [80] Kości Bród, [80] Drwina, [71]						
	Hydrocodone	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]			<LOQ–9.13 <LOQ–21.05 <LOQ–35.18 <LOQ–18.09 <LOQ–28.91	Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kości Bród, [80]						
	Ketamine	<LOQ–29	Kraków, [71]	1.5–3.5	Kraków, [71]			1–4.5 <LOQ	Drwina, [71] Vistula, [71]						
	Metamizole			<LOD–152	Bielsko–Biała, [75,91]			<LOD 900–902 <LOD <LOD <LOD <LOD <LOD <LOD <LOD	Vistula [75,91] Odra, [75,91] Warta, [75,91] Brda, [75,91] Kłodnica, [75,91] Krzywa, [75,91] Mała Panew, [75,91] Troja, [75,91] Toszecki Stream, [75,91]						
	Methadone	<LOQ–46.3	Kraków, [71]	<LOQ–11	Kraków, [71]			0.5–10.5 <LOQ	Drwina, [71] Vistula, [71]						
	Morphine	38.5–63.5	Kraków, [71]	8.8–17.8	Kraków, [71]			11.5–29 2–3	Drwina, [71] Vistula, [71]						
	Oxycodone	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]										
	Oxymorphone	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]										
	Paracetamol	51400–51,400 2.24–16,350 <LOD–28,254.4	Koziegłowy,[79,86] Poznań, [86] Gdańsk, [73,83,87]	<LOD 1.5–174.8 <LOD–3824	Bielsko–Biała, [75,91] Koziegłowy, [86] Gdańsk, [73,83,86]			<LOD <LOD <LOD <LOD–70.13 <LOD–21 <LOD–337.7 <LOD <LOD <LOD <LOD <LOD <LOD LOD–89.6 <LOD–96.14 15.09–28.94 29.81–52.81 <LOQ–46.92	Drwęca, [100] Wkra, [100] Mławka, [100] Vistula [75,80,91] Odra, [75,91] Warta, [75,86,91,98] Brda, [75,91] Kłodnica, [75,91] Krzywa, [75,91] Mała Panew, [75,91] Troja, [75,91] Toszecki Stream, [75,91] Radunia, [105] Wierzyca, [80,87] Łeba, [80] Dębogórze Canal, [80] Kości Bród, [80]	<LOD–201	Gulf of Gdańsk, [83]	<LOD–>LOD <LOD–113.1	not given, [28,109,110] Gdańsk, [73,105]	<LOD–172.7	Gdańsk, [73,105]

PPCP group	Compound	Raw wastewater		Treated wastewater		Landfill leachate		Surface water		Seawater		Groundwater		Drinking water	
		ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]	ng/L	Location, [source]
Painkillers (cont.)	Pentoxifylline	>LOD–680	Zabrze, [76]												
	Tramadol							52–2108 167–468.5 50–71	Warta, [81,98] Drwina, [71] Vistula, [71]			<LOQ–73.7	Krajkowo, [81]		
PDE5 inhibitors	Sildenafil	<LOQ–39.8	Kraków, [71]	<LOQ	Kraków, [71]			<LOQ–38.15 <LOQ–32.30 18.14–23.15 <LOQ–19.07 <LOQ–81.17	Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]						
	Vardenafil	<LOQ <LOD–2620	Kraków, [71] not given, [50]	<LOQ <LOD–1150	Kraków, [71] not given, [50]										
Repellents	DEET					<LOD– 202,420	NE Poland, [49,50]	<LOQ–64.17 <LOQ–136.88 <LOQ–66.84 <LOQ–81.97 39.07–69.79	Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]			<LOD–17,280	NE Poland, [49,50,111]		
Stimulants	4–MEC			29.1–41.3	Kraków, [94]										
	Amphetamine	94–270	Kraków, [71]	<LOQ	Kraków, [71]			<LOQ	Warta, [98]						
	Benzylpiperazine	<LOQ	Kraków, [71]	<LOQ–20.3	Kraków, [71]										
	Caffeine	970 764 1262–22,193.8 32,438.3–89,544.5 <LOD	Lublin, [17] Szczecin, [17] Gdańsk, [17,73] Kraków, [71] Zabrze, [76]	94 315 47.2–442.1 20.3–2868.5	Lublin, [17] Szczecin, [17] Gdańsk, [17,73] Kraków, [71]			<LOQ–1350 25.12–1712 367.1 326.4 <LOQ–34.16 <LOQ–19.31 <LOQ–63.74 40.82–59.12 84–29,995.5 92.9 <LOD <LOD	Warta, [63,81] Vistula, [55,80,84] Rudawa, [97] Wilga, [97] Wierzyca, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80] Drwina, [71] Reda, [101] Zagórska Struga, [101] Płutnica, [101]	<LOD	Bay of Puck, [101]	<LOQ–140 <LOD–>LOD 21.9–308 <LOD–873.3	Krajkowo, [81,99] not given, [109] Gdańsk, [73] Bay of Puck area, [101]	12.7–158.7	Gdańsk, [73]
	Cocaine	48.3–188.8	Kraków, [71]	<LOQ–3.8	Kraków, [71]			<LOQ 1.5–37.5 0.5–1	Warta, [98] Drwina, [71] Vistula, [71]						
	mCCP			<LOD	Kraków, [94]										
	MDA	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]										
	MDEA	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]										
	MDMA	16.3–86.3	Kraków, [71]	9.3–44.3	Kraków, [71,94]			12.5–48.5 0.5–102	Drwina, [71] Vistula, [71]						
	MDPV			<LOD	Kraków, [94]										
	Mephedrone	<LOQ–52	Kraków, [71]	<LOQ–29.8	Kraków, [71]										
	Methamphetamine	<LOQ	Kraków, [71]	<LOQ	Kraków, [71]										
	MPD			21.6–42.9	Kraków, [94]										
	Nicotine	19,035–423,978	Kraków, [71]	25.5–2222.5	Kraków, [71]			11–8187 14–614.5	Drwina, [71] Vistula, [71]						
	PMA	147–438.5	Kraków, [71]	15.8–107	Kraków, [71]										
	Theophylline							<LOQ–19.04 <LOQ–34.82 <LOQ <LOQ–21.47 <LOQ	Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]						
Sugar substitutes	Saccharin							<LOQ–360	Warta, [81]			<LOQ	Krajkowo, [81]		
	Sucralose							<LOQ 40	Warta, [81] Warta, [63]			<LOQ–55	Krajkowo, [63]		
Synthetic musks	Galaxolide	>LOD–1200	Zabrze, [76]												
	Tonalide	<LOD	Zabrze, [76]												
UV filters	3–(4–Methylbenzylidene)camphor	<LOD–18,010	not given, [50]	<LOD	not given, [50]	<LOD–16,640	NE Poland, [49,50]					<LOD–3625	NE Poland, [49,50,111]		
	Benzophenone	<LOD–2320	not given, [50]	<LOD–1400	not given, [50]	<LOD–5940	NE Poland, [49,50]					<LOD–3450	NE Poland, [49,50,111]		
	Oxybenzone							<LOQ–26.51 <LOQ–73.15 19.60–47.19 <LOQ–39.08 24.17–64.01	Wierzyca, [80] Vistula, [80] Łeba, [80] Dębogórze Canal, [80] Kozi Bród, [80]						
Vasodilators	Nafronyl	23.5–27.9	Gdańsk, [73]	12.2–13.9	Gdańsk, [73]							0.2–0.3	Gdańsk, [73]	1–3.8	Gdańsk, [73]

Explanations:

- <LOD—below the established limit of detection
- <LOQ—below the established limit of quantification
- >LOD—above the established limit of detection (detailed information on PPCP concentration was not given)

PPCPs concentrations presented in the table are ranges of minimum and maximum values found in the literature.
Locations reported as “not given” imply that the sampling area/region was not specified in the study or the research concerned sampling across Poland.
Locations for “surface water” refer to the names of the rivers or streams.
Blanks in the table imply that no information was found under the review.
Sources are in accordance with the references in the related publication.