Supplementary Materials

1. Quality assurance and quality control (QA/QC)

Table S1 The information on method assurance.

Heavy metals	Detection instrument	Detection limit(mg/kg)	MB	DUP RPD%	LCS Recovery%	Standard value(mg/kg)	Testing value(mg/kg)
Hg	AFS8530	0.002	ND	1	94	0.017±0.003	0.019
Pb	PerkinElmer,	10	ND	0	99	21±2	23
Zn	PinAAcle900	1	ND	0	96	68±4	71
Cr		4	ND	3	94	68±6	69
Cu		1	ND	1	99	24.3±1.2	23.4
Ni		3	ND	0	104	31.5±1.8	31
Cd	PerkinElmer, NexION 350	0.01	ND	22	106	0.13±0.02	0.12

MB = method blank.

2. Soil background values (B_n) in Jiangsu Province

Table S2. Soil background values (B_n) in Jiangsu Province [1] (mg/kg).

	Cu	Zn	Pb	Cd	Cr	Ni	Hg	As
B_n	23.4	64.8	22	0.085	75.6	32.8	0.025	9.4

3. Pollution levels associated with the geoaccumulation index (I_{geo}) of the metals in the sediment

Table S3. Pollution levels associated with the geoaccumulation index (I_{geo}) of the metals in sediment [2,3].

I_{geo} class	I_{geo} value	Quality of the sediment
0	$I_{geo} \leq 0$	Not contaminated
1	$0 < I_{geo} \leq 1$	Not contaminated-moderately contaminated
2	$1 < I_{geo} \leq 2$	Moderately contaminated
3	$2 < I_{geo} \leq 3$	Moderately to highly contaminated
4	$3 < I_{geo} \leq 4$	Highly contaminated
5	$4 < I_{geo} \leq 5$	Highly to extremely contaminated
6	$I_{geo} > 5$	Extremely contaminated

4. Screening levels for heavy metals in foreign countries

Table S4. Critical limits (mg/kg) for heavy metals in soils in some foreign countries [4].

Country	Pb	Cd	Cu	Zn	Ni	Cr	Hg
Denmark	40	0.3	30	100	10	50	0.1
Sweden	30-60	--	--	--	--		0.2-0.3

Finland	38	0.3	32	90	40	80	0.2
Netherlands	85	0.8	36	140	35	100	0.3
Germany	40-100	0.4-1.5	20-60	60-200	15-70	30-100	0.1-1.0
Switzerland	50	0.8	50	200	50	75	0.8
Czech Republic	70	0.4	70	150	60	130	0.4
Eastern Europe	32	1	55	100	85	90	2.1
Ireland	50	1.0	50	150	30	100	1.0
Canada	25	0.5	30	50	20	20	0.1

Table S5. Ecological Soil Screening Levels (Eco-SSLs, mg/kg dry weight) for heavy metals in soil from USEPA.

Heavy metals	**Plant**	**Soil Invertebrates**	**Avian**	**Mammalian**
Zn[5]	160	120	46	79
Ni[6]	38	280	210	130
Pb[7]	120	1700	11	56
Cu[8]	70	80	28	48
Cr[9]	NA	NA	Cr(III)-26 Cr(VI)-NA	Cr(III)-34 Cr(VI)-130
Cd[10]	32	140	0.77	0.36
Hg	NA	NA	NA	NA

NA = not available. Data were insufficient to derive an Eco-SSL.

5. Screening levels for heavy metals in China

The heavy metal levels of sediment in the public river were evaluated in accordance with the Chinese regulations (Table S6). *Planting Soil for Greening (CJ/T 340-2016)* (PSG) separated the quality of planting soils into four classes, in which class Ⅲ is suitable for green areas with little contact with people, such as a road green belt, factory attached green belt and other green belt or shelter forest with potential pollution source. *Soil Environmental Quality: Risk Control Standard for Soil Contamination of Agricultural Land (GB15618-2018)* (SEQA) specified the risk screening values and intervention values of agricultural soil for heavy metals, BHC, DDT and benzopyrene. Two soil types were sorted, namely paddy field and others. S*oil Environmental Quality: Risk Control Standard for Soil Contamination of Development Land (GB36600-2018)* (SEQD) stipulated the risk screening values and intervention values of the soil pollution risk of construction land for the protection of human health, categorizing development land into two classes. Class Ⅱ covered the land for industrial use, logistics and storage, commercial service facilities, road and transportation facilities, public facilities, public management and public services, land for green space and squares, etc.

Table S6. Screening values (mg/kg) for heavy metals in soil in the national standard of China.

Species	***《Planting soil for greening》 CJ/T 340-2016; class III; pH>6.5[11]***	***《Soil environmental quality: Risk control standard for soil contamination of agricultural land》 GB15618-2018; others; pH>7.5[12]***	***《Soil environmental quality: Risk control standard for soil contamination of development land》***

			GB36600-2018; type Ⅱ land[13]
Hg	1.5	3.4	38
Pb	450	170	800
Zn	500	300	/
Cr	250	250	/
Cu	400	100	18,000
Ni	150	190	900
Cd	1.2	0.6	65

National standard of China for groundwater and surface water were used to assess the risk of leaching behavior in sediment (Table S7). *Standard for Groundwater Quality (GB/T 14848-2017) (SGQ)* divided the groundwater quality into five grades according to the quality of groundwater and the risk for human health. Grade Ⅳ referred to the high chemical content of groundwater, which is suitable for agriculture and some industrial water and can be used as drinking water after proper treatment. *Standard for surface water quality (GB 3838-2002) (SSQ)* classified surface water into five categories in order of the environmental functions and protection objectives of surface water quality. Grade Ⅳ were mainly applicable to the general industrial water areas and the recreational water areas where the human body is not in direct contact.

Table S7. Screening values (μg/L) for heavy metals in water in the national standard of China.

Species	*《Standard for groundwater quality》 GB/T 14848-2017; grade Ⅳ[14]*	*《Standard for surface water quality》 GB 3838-2002; grade Ⅳ[15]*
Zn	5000	2000
Cr(VI)	100	50
Ni	100	/
Cd	100	5