

## Supplementary Materials

**Table S1.** Classification of Modified Contamination Factor (MCF).

MCF classification	Contamination
$MCF < 1.5$	No pollution
$1.5 \leq MCF < 2$	Low pollution
$2 \leq MCF < 4$	Moderate pollution
$4 \leq MCF < 8$	High pollution
$8 \leq MCF < 16$	Higher pollution
$16 \leq MCF < 32$	Heavy pollution
$MCF \geq 32$	Ultra-severe pollution

**Table S2.** Geoaccumulation index ( $I_{geo}$ ) classification.

$I_{geo}$	Grade	Level of pollutant
$0 <$	0	Almost no pollution
$0-1$	1	No pollution to moderate pollution
$1-2$	2	Moderate pollution
$2-3$	3	Moderate to heavy pollution
$3-4$	4	Heavy pollution
$4-5$	5	Heavy to seriously polluted
$\geq 5$	6	Seriously polluted

**Table S3.** Potential ecological risk assessment indicators and grading standards.

Risk grade	$E_r^i$	RI	Degree of ecological risk
I	$E_r^i < 40$	$RI < 150$	Low
II	$40 \leq E_r^i < 80$	$150 \leq RI < 300$	Moderation
III	$80 \leq E_r^i < 160$	$300 \leq RI < 600$	High
IV	$160 \leq E_r^i < 320$	$600 \leq RI < 1200$	Relatively high
V	$E_r^i \gg 320$	$RI \gg 1200$	Pole height

**Table S4.** Heavy metal toxicity response coefficient.

Heavy metal	Cd	Cu	Zn	Pb	As	Cr	Ni
$Tr$	30	5	1	5	10	2	5

**Table S5.** Parameter value of heavy metal exposure evaluation model.

Exposure hole parameter	Meaning / unit	Parameter value	
		child	adult
SA	Exposed skin area /(cm <sup>2</sup> /d)	2800	5700
AF	Skin adhesion /(mg·cm <sup>2</sup> /d)	0.2	1
ABS	Skin adsorption coefficient	0.001	0.001
EF	Exposed frequency /(d/a)	350	350
ED	Exposure duration /a	6	24
BW	Recipient weight /kg	29	63
AT (non-carcinogenic)	Average exposure time /d	365d×ED	365d×ED
AT (carcinogenic burden)	Average exposure time /d	365d×72a	365d×70a
PEF	Particulate emission factor (mg <sup>3</sup> /kg)	1.36×10 <sup>9</sup>	1.36×10 <sup>9</sup>
IR <sub>i</sub>	Respiratory inhalation volume /(m <sup>3</sup> /d)	7.6	16
IR <sub>s</sub>	Soil dust intake rate /(mg/d)	20	50

**Table S6.** RfD (mg/kg/day) and SF for seven heavy metals.

	Zn	Ni	Cu	Cr	Pb	As	Cd
RfD <sub>uptake</sub>	3.00E-01	2.00E-02	4.00E-02	3.00E-03	3.50E-03	3.00E-04	1.00E-03
RfD <sub>skin</sub>	6.00E-02	5.40E-03	1.20E-02	6.00E-05	5.25E-04	1.23E-04	1.00E-05
RfD <sub>inhalation</sub>	3.00E-01	9.00E-05	1.43E-02	2.86E-05	3.50E-03	-	1.00E-05
SF <sub>uptake</sub>	-	4.30E+01	-	5.00E-01	8.50E-03	1.50E+00	-
SF <sub>skin</sub>	-	1.70E+00	-	-	-	3.66E+00	-
SF <sub>inhalation</sub>	-	8.40E-01	-	4.20E+01	-	1.51E+01	6.30E+00