Direct reuse of two deep-dewatered sludge cakes without solidifying agent as landfill cover: Geotechnical properties and heavy metals leaching characteristics

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Table S1 Chemical compositions of the skeleton builders (wt.%)

Skeleton builders	SiO_2	CaO	Al_2O_3	MgO	Na_2O+K_2O	Fe_2O_3	SO_3	Cl^-	LOI^a
Quick lime	7.2	62.0	-	1.7	-	-	-	-	24.1
Red mud	20.4	12.9	24.5	1.0	12.3	9.5	0.7	0.1	4.0

[a] LOI = loss of ignition at 1200 °C.

Reference from the previous research (Li et al., 2015):

Li, C., Zhang, S., Yang, J., Shi, Y., Yu, W., Liang, S., Song, J., Xu, Q., Chen, Y., Hu, J., Li, Y., Yang, C., 2015. Distribution and speciation of heavy metals in two different sludge composite conditioning and deep-dewatering processes. RSC Adv. 5, 102332-102339.

Table S2 The scheme of sludge conditioning (DS = dry solid)

Conditioning system	Reagent dosage		Conditioning method
	Chemical agents	Skeleton builders	
Fe-Lime	$FeCl_3$ (50 mg/g DS)	Quick lime (500 mg/g DS)	Quick lime (rapid mixing/15 min) → $FeCl_3$ (slow mixing/5 min)
Fenton-RM	H_2SO_4 (adjust pH to 5) Fe^{2+} (32 mg/g DS) H_2O_2 (34 mg/g DS)	Red mud (275 mg/g DS)	H_2SO_4 (rapid mixing /3 min) → Fe^{2+} solutions (rapid mixing /3 min) → H_2O_2 (slow mixing /30 min) → red mud (slow mixing /10 min)

Reference from the previous research (Li et al., 2015):

Li, C., Zhang, S., Yang, J., Shi, Y., Yu, W., Liang, S., Song, J., Xu, Q., Chen, Y., Hu, J., Li, Y., Yang, C., 2015. Distribution and speciation of heavy metals in two different sludge composite conditioning and deep-dewatering processes. RSC Adv. 5, 102332-102339..
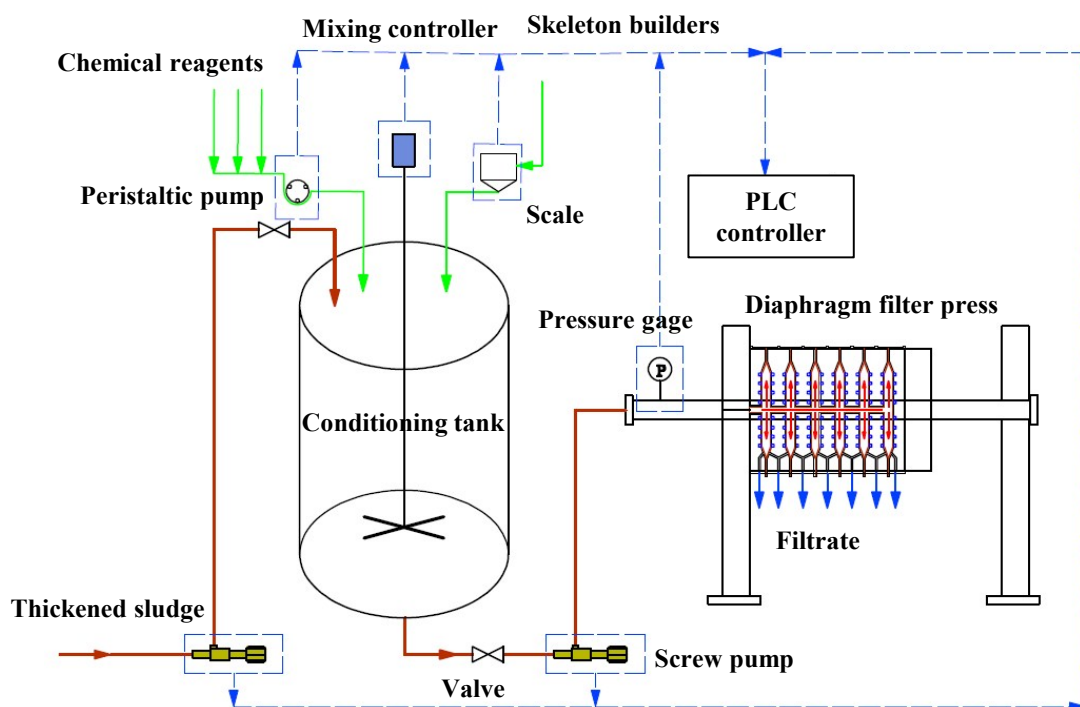
Fig. S1 Process flow diagram of conditioning and dewatering.

Reference from the previous research (Li et al., 2015):

Li, C., Zhang, S., Yang, J., Shi, Y., Yu, W., Liang, S., Song, J., Xu, Q., Chen, Y., Hu, J., Li, Y., Yang, C., 2015. Distribution and speciation of heavy metals in two different sludge composite conditioning and deep-dewatering processes. RSC Adv. 5, 102332-102339..
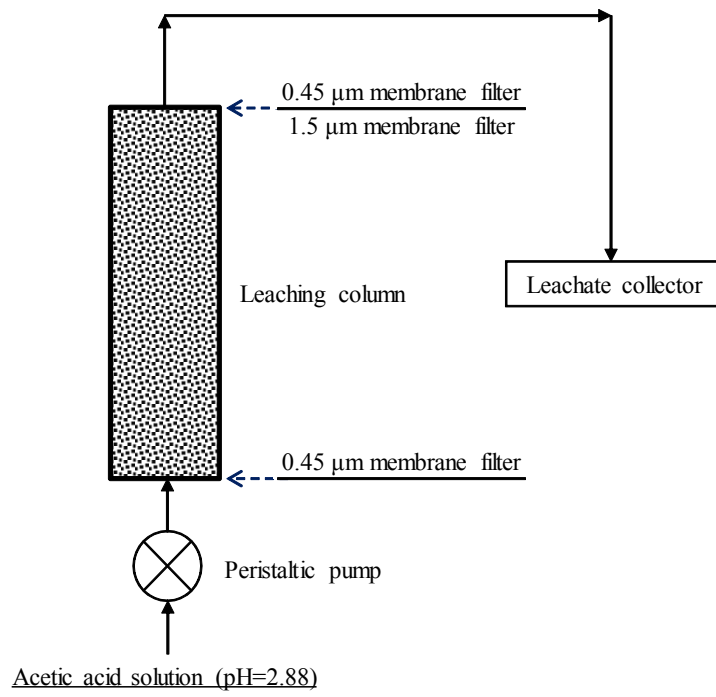
Fig. S2 The schematic of the column leaching test.