Supplementary figures and tables
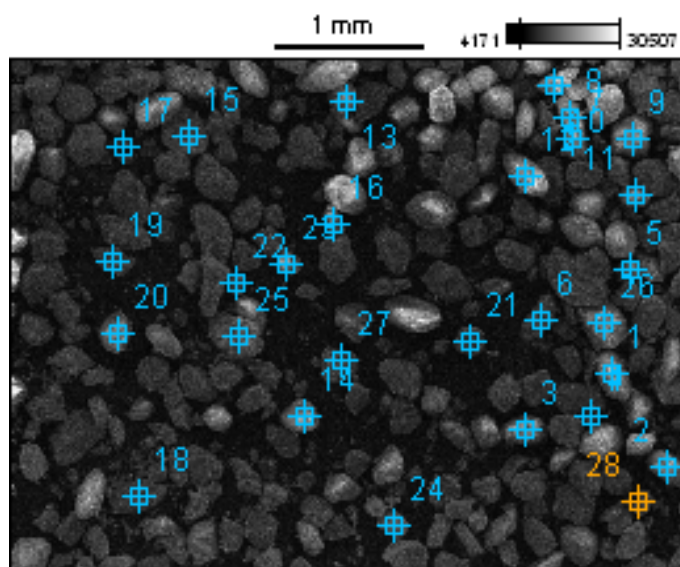

Figure S1 – SEM image of the tailings sample with targeted spots represented in points where EDS analysis was performed.

Table S1 - Analytical parameters of mercury determination

	F1	F2	F3	F4
Curve's equation	y = 300.23x + 199.62	y = 252.95 + 66.41	y = 323.64 - 419.7	326.78x + 43.58
Coefficient of determination (R²)	0.999	0.999	0.995	0.999
LD	0.2 µg.L^{-1}	0.3 µg.L^{-1}	1.3 µg.L^{-1}	0.08 ng
Linear range of work	0.2 to 80 µg.L^{-1}	0.3 to 80 µg.L^{-1}	1.3 to 80 µg.L^{-1}	0.08 to 25.23 ng

Concentrations in F1, F2 and F3 were determined by cold vapor atomic absorption spectroscopy (CVAAS). Concentrations in F4 were determined by thermal desorption atomic absorption spectroscopy (TDAAS).

Table S2 - EDS results in % weight of each element.

Point	O	F	Mg	Al	Si	P	K	Ti	Fe	Zr	Sn	La	Ce	Hg	Th
1	**40.31**	**0**	**0**	**1.81**	**15.13**	**4.88**	**0**	**0.67**	**4.69**	**29.02**	**0**	**0**	**0.51**	**1.51**	**1.49**
2	37.69	0	0	5.98	14.31	11.12	0	0.61	16.41	9.11	0	0	2.06	0	2.72
3	32.63	0	0	0.25	14.33	2.14	0	0.75	3.49	36.88	0.65	3.35	0.81	0	4.7
4	0	0	0	0	11.62	3.45	0	10.28	49.17	25.48	0	0	0	0	0
5	27.74	0	0	0	22.83	3.29	0	2.52	0	43.62	0	0	0	0	0
6	30.18	0	0	0	1.17	0	0	31.8	30.4	0	0.59	2.19	3.67	0	0
7	**41.46**	**0**	**0**	**21.12**	**14.68**	**1.58**	**0**	**0.6**	**15.58**	**3.18**	**0**	**0.87**	**0**	**0.94**	**0**
8	**42.93**	**0**	**0**	**3.76**	**11.97**	**2.86**	**0**	**0**	**14.38**	**19.53**	**0**	**0**	**2.92**	**1.64**	**0**
9	**33.89**	**0**	**0**	**0.31**	**13.34**	**3.77**	**0**	**0.55**	**2.1**	**45.17**	**0**	**0**	**0.5**	**0.29**	**0.08**
10	38.01	0	0	1.38	2.25	11.55	0	1.57	17.05	0	0	2.71	20.35	0	5.12
11	38.57	0	0	3.42	12.64	1.63	0	0.77	18.17	21.99	0	1.51	1.31	0	0
12	38.97	0	0	0.33	12.08	2.77	0	0	2.09	43.76	0	0	0	0	0
13	32.48	0	0	1.14	2.87	12.36	0	0	6.1	0	1.33	12.67	28.23	0	2.82

14	37.19	0	0	0.53	0.68	14.68	0	0	2.76	0	0.63	8.88	29.38	0	5.26
15	**26.52**	**0**	**0**	**0.66**	**1.51**	**0.44**	**0**	**0**	**2.35**	**0.15**	**65.21**	**0**	**0**	**0.71**	**2.45**
16	**39.42**	**0**	**0**	**3.91**	**15.09**	**4.2**	**0**	**0**	**9.39**	**25.93**	**0**	**0**	**0**	**2.06**	**0**
17	25.14	0	0	0.27	15.39	3.29	0	0.77	6.28	42.61	0	3.61	2.64	0	0
18	27.46	1.55	0	1.39	0.31	0.32	0	0.33	65.58	0	1.35	1.7	0	0	0
19	**36.08**	**0**	**0**	**0.97**	**1.76**	**0.45**	**0**	**0.62**	**54.07**	**1.54**	**0.95**	**3.11**	**0**	**0.48**	**0**
20	**40.26**	**0**	**0**	**0**	**11.87**	**2.43**	**0**	**0.27**	**4.35**	**36.84**	**2.27**	**0**	**0**	**1.72**	**0**
21	**25.13**	**0**	**0**	**0.08**	**0.06**	**0**	**0**	**0**	**72.64**	**0**	**0.44**	**0**	**0**	**0.87**	**0.78**
22	**38.21**	**0**	**0**	**0.78**	**12.86**	**3.68**	**0**	**1.31**	**9.52**	**32.02**	**0**	**0**	**0**	**1.47**	**0.15**
23	**27.49**	**0**	**0**	**0.29**	**15.84**	**4.53**	**0**	**0**	**1.68**	**48.59**	**0.82**	**0**	**0**	**0.76**	**0**
24	36.41	0	0	0.75	20.56	2.66	0	2.5	6.83	29.98	0	0	0	0	0.31
25	**52.68**	**0**	**0**	**0.7**	**41.04**	**0.34**	**0**	**0.59**	**0.86**	**0**	**1.1**	**0**	**0**	**1.59**	**1.1**
26	50.79	0	3.08	10.9	20.32	0.05	4.79	0.77	4.11	0	1.76	0	2.28	0	1.17
27	49.61	0	2.81	9.35	22.07	0	4.04	0.37	9.79	0.11	1.39	0.46	0	0	0
28	**47.94**	**0**	**0**	**0**	**39.23**	**0.41**	**0**	**0.11**	**7.03**	**1.98**	**0.46**	**0.72**	**0**	**1.62**	**0.51**

Rows in bold are the points containing Hg in its chemical composition. Points 2, 10, 13 and 14 have chemical compositions close to that of monazite.

Table S3 - Major elements concentration in the ASGM tailings sample

	Concentration (%)
Fe	21.56[1]
Zr	13.92[1]
Si	12.71[1]
Ti	6.33[1]
Al	0.81[1]
P	0.60[1]
Mn	0.32[1]
Ca	0.21[1]
Mg	0.16[1]
K	0.53[2]
Na	0.07[2]

1 – determined by ICP-OES; 2 – determined by ICP-MS.

Table S4 - Elements concentration in the first three sequential extraction procedure steps

	F1 (mg.kg^{-1})	F2 (mg.kg^{-1})	F3 (mg.kg^{-1})
Na	13 ± 1	7 ± 1	2.1 ± 0.7
K	206 ± 7	37 ± 2	<LD
Al	125 ± 4	512 ± 6	385 ± 9
P	12 ± 3	319 ± 2	146 ± 7

Si	119.5 ± 0.3	192 ± 4	164 ± 5
Mg	51 ± 2	209 ± 9	134 ± 3
Mn	65.3 ± 0.4	369 ± 3	62.0 ± 0.4
Ti	<LD	49.0 ± 0.2	154 ± 1
Fe	36.9 ± 0.2	7987 ± 320	22185 ± 107
Zr	<LD	36.3 ± 0.2	10.4 ± 0.1

Concentrations are presented accompanied by their corresponding confidence interval at a 95% confidence level.