

SUPPLEMENTARY MATERIAL

Table S1. pH, Electrical Conductivity (CE), Loss on Ignition (LOI) and CaCO₃ for Draa Sfar Mine Area Samples

Sample	pH	CE	CaCO ₃	LOI
1	8.6	135	34.0	15.6
2	9.6	172	26.1	12.7
3	8.7	205	11.2	14.3
4	8.7	294	21.2	24.4
5	9.1	337	24.5	20.6
6	8.5	1152	30.8	31.7
7	8.5	1708	28.5	27.9
8	9.0	747	38.2	32.1
9	8.0	4599	39.3	56.4
10	8.4	779	39.3	63.5
11	8.1	3452	27.6	26.2
12	8.6	536	31.5	22.4
13	8.3	489	25.3	17.8
14	8.4	2651	20.2	25.9
15	8.9	171	33.7	34.9
16	8.2	983	33.2	37.3
17	7.8	2034	43.9	64.5
18	8.9	451	32.0	13.3
19	8.2	3376	30.8	23.3
20	8.3	852	15.8	24.5
21	7.9	1838	26.1	26.5
22	8.2	2210	26.2	17.9
23	8.2	1659	41.4	22.6
24	8.4	922	23.7	14.6
25	8.1	1098	25.4	14.1
26	8.3	1797	209.9	54.4
27	8.6	775	128.1	32.5
28	8.5	576	79.1	36.8
29	8.2	3152	21.9	21.7
30	8.0	5460	19.1	22.8
31	7.6	14160	16.5	27.4
32	8.8	199	16.6	13.3
33	7.8	6940	29.7	52.6
34	8.6	779	33.0	38.6
35	8.4	375	29.7	40.1
36	8.2	373	33.7	38.2
37	8.6	278	37.1	28.4
38	8.5	345	24.4	24.4
39	8.5	415	57.3	44.7
40	8.5	552	35.6	42.8
41	9.0	214	72.9	39.5
42	8.6	371	55.1	46.7
43	8.5	493	61.7	48.5

Sample	pH	CE	CaCO ₃	LOI
44	8.0	2565	118.6	64.4
45	7.5	8632	55.1	75.8
46	8.1	2151	58.4	39.3
47	8.2	2095	34.0	25.1
48	3.5	4873	25.8	56.0
49	7.3	124	15.7	18.3
50	8.0	102	7.9	19.1
51	8.3	107	25.8	17.4
52	8.7	125	18.4	28.2
53	8.8	96	47.4	25.6
54	8.6	136	48.3	21.2
55	8.8	132	79.8	23.0
56	8.7	203	36.8	24.3
57	7.8	102	24.9	20.5
58	7.9	655	24.9	23.5
59	8.2	5275	55.2	32.7
60	8.7	212	44.9	35.5
61	8.1	274	55.1	34.0
62	8.2	240	52.8	48.3
63	7.9	456	37.1	61.8
64	8.2	299	45.9	33.6
65	8.4	261	43.8	27.2
66	8.5	1663	20.7	25.6
67	8.5	106	20.0	22.3
68	8.3	163	22.5	26.8
69	7.9	2120	25.0	28.7
70	8.1	2570	93.3	29.5
71	8.3	1616	149.4	49.7
72	8.5	692	98.9	40.7
73	8.0	2699	62.9	44.9
74	8.8	517	112.7	44.0
75	8.6	879	35.6	32.2
76	8.1	2330	23.7	31.8
77	8.2	1298	36.8	27.9
78	8.1	1339	41.5	39.6
79	8.3	559	36.8	36.3
80	8.3	333	28.5	33.5
81	8.3	425	39.1	29.4
82	8.7	113	21.3	23.5
83	8.1	805	26.1	29.1
84	8.6	145	24.9	39.9
85	8.6	151	27.3	30.1

Table S2. Concentration and CER Values of Pollutants As, Cu, Pb and Zn along with CER Reference Element Zr

Sample	As (mg/kg)	CER	Cu (mg/kg)	CER	Pb (mg/kg)	CER	Zn (mg/kg)	CER	Zr (mg/kg)
1	BDL	-	16.7	0.3	13.2	0.5	39.7	0.3	302.6
2	BDL	-	16.6	0.5	9.4	0.6	31.6	0.4	204.8
3	9.2	0.5	24.6	0.5	7.6	0.3	40.1	0.4	272.8
4	BDL	-	37.8	1.1	9.6	0.6	44.2	0.6	199.5
5	13.2	0.7	31.9	0.6	11.2	0.4	46.2	0.4	308.0
6	12.4	0.7	26.3	0.6	10.5	0.4	48.8	0.4	285.8
7	BDL	-	BDL	-	13.0	0.6	44.0	0.4	263.1
8	11.3	0.6	38.2	0.8	12.8	0.5	46.9	0.4	283.1
9	11.3	0.6	24.2	0.5	12.8	0.5	58.4	0.5	315.0
10	20.2	1.8	52.7	1.7	20.1	1.3	98.1	1.3	182.1
11	14.1	1.0	29.2	0.8	15.8	0.9	76.1	0.9	222.5
12	36.4	3.0	41.4	1.3	23.1	1.5	126.1	1.6	192.3
13	BDL	-	24.1	0.5	8.4	0.4	36.0	0.3	277.5
14	BDL	-	23.7	0.5	12.1	0.5	48.3	0.4	276.3
15	BDL	-	33.9	0.7	18.4	0.8	58.3	0.5	291.1
16	15.1	1.1	30.1	0.8	15.5	0.8	70.2	0.8	229.1
17	18.1	1.6	50.3	1.6	17.6	1.2	96.8	1.3	185.5
18	13.8	1.4	28.9	1.1	12.1	0.9	65.9	1.0	157.3
19	BDL	-	30.5	0.6	14.5	0.6	50.9	0.4	289.7
20	125.4	10.9	79.9	2.6	54.8	3.6	627.9	8.5	184.6
21	71.5	7.1	50.5	1.9	61.8	4.6	143.9	2.2	162.4
22	BDL	-	BDL	-	BDL	-	29.7	0.7	111.5
23	14.5	0.9	21.8	0.5	9.0	0.4	47.7	0.5	254.8
24	9.6	0.8	17.9	0.6	12.0	0.8	39.2	0.5	191.4
25	12.0	1.2	17.7	0.7	11.1	0.9	43.7	0.7	158.3
26	19.4	1.9	23.5	0.9	7.4	0.6	45.6	0.7	163.6
27	19.2	1.6	28.9	0.9	14.9	1.0	100.0	1.3	188.2
28	22.5	2.1	34.1	1.2	16.4	1.2	80.2	1.2	169.6
29	12.4	1.2	23.1	0.9	12.4	0.9	48.6	0.8	162.0
30	12.7	1.3	22.5	0.8	10.5	0.8	51.4	0.8	161.0
31	203.3	19.4	43.1	1.5	179.7	13.0	480.7	7.2	167.8
32	14.7	0.9	22.1	0.5	6.7	0.3	49.4	0.5	274.4
33	14.4	1.3	46.2	1.6	18.0	1.3	76.1	1.1	172.8
34	18.1	1.5	25.9	0.8	12.4	0.8	72.7	1.0	190.0
35	16.8	1.6	34.1	1.2	16.6	1.2	79.3	1.2	168.6
36	14.2	1.3	39.4	1.3	14.2	1.0	74.8	1.0	179.5
37	15.2	1.4	30.3	1.0	11.6	0.8	72.8	1.0	175.3
38	16.5	1.6	18.8	0.7	13.3	1.0	78.5	1.2	162.7
39	25.2	2.7	42.8	1.7	17.6	1.4	102.9	1.7	151.4
40	16.4	1.3	25.6	0.8	16.8	1.0	85.4	1.1	199.3
41	12.6	1.1	40.6	1.3	15.2	1.0	77.6	1.0	190.2

(Table S2) Contd.....

Sample	As (mg/kg)	CER	Cu (mg/kg)	CER	Pb (mg/kg)	CER	Zn (mg/kg)	CER	Zr (mg/kg)
42	16.0	1.4	38.6	1.2	15.6	1.0	78.8	1.0	187.9
43	18.1	1.4	35.7	1.0	17.8	1.0	90.9	1.1	209.9
44	19.5	1.6	29.9	0.9	23.4	1.5	91.2	1.2	196.1
45	203.3	15.9	172.5	5.1	773.5	45.9	1113.7	13.6	204.7
46	125.4	9.2	60.4	1.7	375.1	20.8	774.3	8.9	218.9
47	19.8	1.4	BDL	-	23.3	1.3	81.8	0.9	225.0
48	3107.6	340.8	144.3	5.9	2309.5	191.8	631.2	10.8	146.3
49	12.7	1.0	30.8	0.9	23.7	1.4	71.5	0.8	212.4
50	13.2	0.8	24.7	0.6	27.3	1.3	89.0	0.9	253.6
51	BDL	-	29.7	0.7	28.9	1.4	78.0	0.8	245.6
52	18.8	1.2	28.4	0.7	30.1	1.4	86.5	0.8	254.8
53	15.4	0.8	24.8	0.5	20.5	0.8	75.8	0.6	315.2
54	12.6	0.7	24.0	0.5	23.4	1.0	80.9	0.7	273.4
55	17.5	1.2	27.9	0.7	25.4	1.3	83.4	0.9	237.5
56	11.7	0.8	BDL	-	19.8	1.1	80.0	0.9	226.2
57	9.2	0.6	28.2	0.7	19.4	0.9	60.1	0.6	251.6
58	113.5	8.5	70.9	2.0	424.6	24.1	925.2	10.8	214.4
59	14.3	1.1	32.0	0.9	15.5	0.9	68.2	0.8	209.0
60	22.7	2.2	39.2	1.4	12.6	0.9	91.2	1.4	168.1
61	16.7	1.4	29.4	0.9	17.7	1.1	80.3	1.0	196.2
62	14.7	1.3	25.5	0.8	20.3	1.3	88.0	1.2	184.3
63	12.1	1.0	37.9	1.1	18.8	1.1	101.0	1.2	203.6
64	BDL	-	24.4	0.7	18.1	1.0	76.4	0.9	221.8
65	10.1	0.7	28.4	0.7	15.3	0.8	68.4	0.7	237.2
66	8.9	0.5	30.3	0.7	13.5	0.6	58.8	0.6	261.0
67	17.5	0.8	17.3	0.3	40.2	1.5	143.6	1.1	334.5
68	10.6	0.6	22.4	0.5	8.4	0.4	46.2	0.4	273.5
69	14.2	1.0	20.3	0.5	61.2	3.2	254.0	2.7	231.2
70	15.2	1.5	33.0	1.2	23.9	1.8	96.9	1.5	164.5
71	17.9	1.7	36.2	1.3	14.4	1.1	86.6	1.3	167.1
72	15.4	1.5	31.8	1.2	20.3	1.5	91.2	1.4	162.8
73	14.1	1.2	23.4	0.8	14.3	0.9	74.7	1.0	186.6
74	13.2	1.1	37.1	1.2	18.9	1.2	92.1	1.2	187.9
75	18.6	1.4	37.3	1.1	17.4	1.0	88.8	1.1	208.7
76	13.8	1.2	30.6	1.0	13.4	0.9	87.5	1.1	190.9
77	12.5	1.1	38.4	1.2	16.5	1.1	82.2	1.1	185.9
78	17.5	1.4	23.3	0.7	28.5	1.7	110.0	1.3	207.7
79	14.9	1.2	26.3	0.8	34.8	2.2	101.9	1.3	192.6
80	18.8	1.4	37.9	1.1	29.6	1.7	121.7	1.4	215.6
81	19.9	1.8	33.4	1.1	31.8	2.2	102.5	1.5	174.7
82	11.3	0.9	26.7	0.8	15.5	0.9	73.8	0.9	200.6

(Table S2) Contd.....

Sample	As (mg/kg)	CER	Cu (mg/kg)	CER	Pb (mg/kg)	CER	Zn (mg/kg)	CER	Zr (mg/kg)
83	9.4	0.8	31.5	1.0	16.8	1.0	87.7	1.1	198.8
84	18.9	1.3	34.0	0.9	20.6	1.1	84.9	0.9	235.3
85	12.7	1.0	44.7	1.3	16.6	1.0	81.6	1.0	204.3

Table S3. Concentration (in mg/kg) and CER Values of Lithogenic Components of the Mine Area Soils

Sample	[Ba]	CER	[Ca]	CER	[Fe]	CER	[K]	CER	[Mn]	CER	[Rb]	CER	[Sr]	CER	[Ti]	CER
1	258	0.4	27289	0.7	20967	0.4	16935	0.4	366	0.4	60.4	0.5	101	0.5	3396	0.4
2	281	0.6	22533	0.9	21316	0.6	15710	0.6	331	0.5	54.3	0.7	111	0.8	3069	0.6
3	221	0.4	19581	0.6	21932	0.5	16496	0.4	359	0.4	58.6	0.6	102	0.6	3533	0.5
4	362	0.8	22154	0.9	26064	0.7	20143	0.7	589	0.9	64.3	0.8	114	0.9	3677	0.7
5	357	0.5	30911	0.8	27227	0.5	21029	0.5	473	0.4	66.5	0.6	114	0.6	4441	0.6
6	357	0.6	28711	0.8	28338	0.6	21479	0.6	509	0.5	70.2	0.6	121	0.7	4563	0.6
7	269	0.5	29235	0.9	24544	0.5	17130	0.5	417	0.5	61.6	0.6	119	0.7	4080	0.6
8	391	0.6	34868	1.0	28881	0.6	21204	0.5	531	0.5	68.7	0.6	140	0.8	4446	0.6
9	309	0.5	30801	0.8	30383	0.6	22375	0.5	536	0.5	73.6	0.6	135	0.7	4730	0.6
10	524	1.3	28820	1.3	45017	1.4	31405	1.3	953	1.5	106.4	1.5	143	1.2	5731	1.2
11	351	0.7	26997	1.0	31924	0.8	24433	0.8	681	0.9	78.6	0.9	142	1.0	5275	0.9
12	390	0.9	32758	1.4	30029	0.9	25208	1.0	552	0.8	76.3	1.0	157	1.3	4855	1.0
13	285	0.5	19025	0.5	22565	0.5	20010	0.5	379	0.4	66.7	0.6	86	0.5	3589	0.5
14	351	0.6	27108	0.8	28183	0.6	22776	0.6	523	0.6	69.0	0.6	119	0.7	4606	0.7
15	395	0.6	29798	0.8	33504	0.7	26127	0.7	622	0.6	82.2	0.7	127	0.7	4865	0.7
16	374	0.8	26120	0.9	34044	0.9	25434	0.8	646	0.8	87.0	1.0	128	0.9	4799	0.8
17	541	1.4	30486	1.3	42132	1.3	30390	1.2	873	1.4	100.9	1.4	137	1.2	5860	1.3
18	425	1.3	22717	1.1	30945	1.1	25338	1.2	560	1.0	71.0	1.2	126	1.3	5105	1.3
19	314	0.5	29023	0.8	27468	0.5	20836	0.5	477	0.5	67.1	0.6	122	0.7	4933	0.7
20	332	0.8	26896	1.2	31008	1.0	24356	1.0	816	1.3	82.4	1.2	163	1.4	4714	1.0
21	504	1.4	32042	1.6	48007	1.7	26530	1.2	1119	2.0	102.8	1.6	168	1.6	5277	1.3
22	268	1.1	23227	1.7	19632	1.0	18323	1.2	290	0.8	56.3	1.3	114	1.6	2802	1.0
23	277	0.5	26142	0.8	26535	0.6	18592	0.5	547	0.6	65.4	0.7	119	0.7	4482	0.7
24	268	0.6	24012	1.0	22180	0.7	17151	0.7	436	0.7	56.3	0.8	148	1.2	3251	0.7
25	282	0.8	26180	1.3	22429	0.8	17945	0.8	424	0.8	54.5	0.9	102	1.0	3351	0.8
26	254	0.7	152754	7.4	21726	0.8	6071	0.3	327	0.6	54.6	0.9	322	3.1	2913	0.7
27	398	1.0	80860	3.4	31861	1.0	20968	0.8	553	0.9	74.0	1.0	250	2.1	3787	0.8
28	489	1.3	57198	2.7	37649	1.3	28488	1.2	577	1.0	96.0	1.5	201	1.9	4614	1.1
29	260	0.7	26920	1.3	24892	0.9	19394	0.9	533	1.0	63.3	1.0	156	1.5	3712	0.9
30	358	1.0	24843	1.2	25017	0.9	18161	0.8	525	1.0	57.9	0.9	213	2.1	3382	0.8
31	400	1.1	31011	1.5	28026	1.0	15913	0.7	542	0.9	62.5	1.0	184	1.7	3211	0.8
32	447	0.8	26868	0.8	28776	0.6	21636	0.6	506	0.5	65.8	0.6	125	0.7	4979	0.7
33	471	1.3	35369	1.6	36671	1.2	27816	1.2	824	1.4	89.4	1.3	181	1.6	4770	1.1

(Table S3) Contd.....

Sample	[Ba]	CER	[Ca]	CER	[Fe]	CER	[K]	CER	[Mn]	CER	[Rb]	CER	[Sr]	CER	[Ti]	CER
34	417	1.0	35113	1.5	35246	1.1	26579	1.0	601	0.9	80.8	1.1	167	1.4	4543	0.9
35	444	1.2	30086	1.4	36326	1.2	28645	1.2	751	1.3	91.8	1.4	139	1.3	4839	1.1
36	478	1.2	31344	1.4	38300	1.2	29693	1.2	795	1.3	97.3	1.4	149	1.3	4924	1.1
37	331	0.9	38313	1.7	34242	1.1	26694	1.1	655	1.1	84.9	1.3	141	1.3	5110	1.2
38	419	1.2	31113	1.5	35236	1.2	30085	1.4	640	1.2	87.8	1.4	146	1.4	5001	1.2
39	460	1.4	47652	2.5	43267	1.6	29429	1.4	897	1.7	98.4	1.7	166	1.7	4876	1.3
40	464	1.1	28833	1.1	37955	1.1	27871	1.0	739	1.1	89.3	1.2	142	1.1	4950	1.0
41	403	1.0	50142	2.1	35597	1.1	24743	1.0	656	1.0	84.6	1.2	193	1.6	4939	1.0
42	391	1.0	45098	1.9	30991	0.9	23222	0.9	671	1.0	75.4	1.0	171	1.4	4097	0.9
43	483	1.1	43702	1.7	37225	1.0	28315	1.0	840	1.2	87.7	1.1	172	1.3	4557	0.9
44	501	1.2	71367	2.9	31805	0.9	19598	0.7	586	0.9	77.6	1.0	224	1.8	3458	0.7
45	370	0.8	45868	1.8	50814	1.4	16688	0.6	882	1.3	70.0	0.9	187	1.4	4497	0.9
46	456	1.0	41987	1.5	36602	1.0	22309	0.7	768	1.0	78.8	0.9	172	1.2	4588	0.8
47	303	0.6	30427	1.1	23885	0.6	17281	0.6	447	0.6	58.7	0.7	133	0.9	3688	0.7
48	336	1.1	24281	1.3	121652	4.8	BDL		564	1.1	47.0	0.8	132	1.4	3471	0.9
49	382	0.8	18375	0.7	30573	0.8	24754	0.9	488	0.7	67.8	0.8	99	0.7	4809	0.9
50	478	0.9	9961	0.3	36278	0.8	25687	0.7	549	0.6	79.5	0.8	93	0.6	4715	0.7
51	375	0.7	21304	0.7	30194	0.7	23103	0.7	524	0.6	67.4	0.7	103	0.7	4870	0.8
52	376	0.7	25823	0.8	30123	0.7	21614	0.6	503	0.6	67.5	0.7	108	0.7	5259	0.8
53	431	0.6	30841	0.8	29506	0.5	20669	0.5	502	0.5	67.2	0.6	108	0.5	4919	0.6
54	386	0.7	30322	0.9	29334	0.6	20068	0.5	470	0.5	66.4	0.6	117	0.7	5190	0.8
55	323	0.6	54544	1.8	27301	0.7	16463	0.5	465	0.6	65.0	0.7	138	0.9	5222	0.9
56	430	0.9	31668	1.1	29771	0.8	23137	0.7	495	0.6	70.9	0.8	108	0.8	4377	0.8
57	439	0.8	21703	0.7	30631	0.7	22118	0.6	493	0.6	70.1	0.7	92	0.6	4685	0.7
58	423	0.9	21702	0.8	40552	1.1	24804	0.8	658	0.9	74.9	0.9	103	0.8	4722	0.9
59	398	0.9	34736	1.3	31449	0.9	22958	0.8	692	1.0	80.7	1.0	229	1.7	4863	0.9
60	473	1.3	28184	1.3	38171	1.3	31414	1.4	660	1.2	96.5	1.5	154	1.4	4929	1.2
61	405	1.0	33259	1.3	34537	1.0	27695	1.0	651	1.0	82.8	1.1	148	1.2	5285	1.1
62	411	1.0	34232	1.5	33698	1.0	26177	1.0	753	1.2	80.8	1.1	148	1.3	4546	1.0
63	450	1.0	27892	1.1	35943	1.0	27599	1.0	702	1.0	85.4	1.1	142	1.1	4933	1.0
64	458	1.0	34855	1.2	30434	0.8	24809	0.8	547	0.7	72.2	0.8	139	1.0	4288	0.8
65	430	0.8	39220	1.3	27891	0.7	23153	0.7	525	0.6	71.6	0.8	147	1.0	3964	0.7
66	434	0.8	19555	0.6	28723	0.6	28953	0.8	562	0.6	76.3	0.8	113	0.7	3673	0.6
67	418	0.6	17613	0.4	29975	0.5	23603	0.5	496	0.4	70.4	0.5	101	0.5	4757	0.6
68	382	0.6	25783	0.7	28280	0.6	22584	0.6	497	0.5	66.7	0.6	120	0.7	4560	0.7
69	330	0.7	19160	0.7	24598	0.6	19955	0.6	439	0.6	66.5	0.7	107	0.7	3465	0.6
70	453	1.3	73693	3.6	34977	1.2	25748	1.1	839	1.5	98.5	1.6	179	1.7	3948	1.0
71	375	1.0	78690	3.7	32739	1.1	20540	0.9	747	1.3	80.9	1.3	190	1.8	3823	0.9
72	473	1.3	61498	3.0	38035	1.3	26637	1.2	689	1.2	92.0	1.5	179	1.7	4257	1.0
73	351	0.9	46338	2.0	28371	0.9	20922	0.8	611	1.0	70.4	1.0	156	1.3	3630	0.8

(Table S3) Contd.....

Sample	[Ba]	CER	[Ca]	CER	[Fe]	CER	[K]	CER	[Mn]	CER	[Rb]	CER	[Sr]	CER	[Ti]	CER
74	391	1.0	80724	3.4	32023	1.0	21234	0.8	802	1.3	78.2	1.1	171	1.4	4722	1.0
75	346	0.8	29240	1.1	30191	0.8	23764	0.8	615	0.9	77.8	1.0	138	1.0	4660	0.9
76	454	1.1	27167	1.1	33211	1.0	27808	1.1	675	1.0	80.9	1.1	133	1.1	5070	1.1
77	447	1.1	27857	1.2	37287	1.1	27383	1.1	781	1.2	88.7	1.2	143	1.2	5152	1.1
78	343	0.8	46893	1.8	31315	0.9	24632	0.9	628	0.9	74.3	0.9	158	1.2	4283	0.8
79	365	0.9	27641	1.1	32822	1.0	27028	1.0	664	1.0	83.1	1.1	142	1.2	5042	1.0
80	456	1.0	20194	0.7	36070	1.0	29217	1.0	708	1.0	90.3	1.1	128	0.9	4662	0.9
81	463	1.2	19429	0.9	37833	1.2	32976	1.4	688	1.2	92.1	1.4	121	1.1	5018	1.1
82	423	1.0	22577	0.9	30769	0.9	26770	1.0	631	0.9	73.4	0.9	119	0.9	4431	0.9
83	404	0.9	25740	1.0	35658	1.0	28047	1.0	697	1.0	78.8	1.0	130	1.0	5143	1.0
84	440	0.9	28436	1.0	37686	0.9	27896	0.9	730	0.9	86.4	1.0	140	0.9	5741	1.0
85	530	1.2	24581	1.0	38106	1.1	30263	1.1	737	1.1	84.9	1.1	134	1.0	5599	1.1