From: Brian <Brian@envirowales.com>
Sent: 26 June 2019 10:59
To: Griffiths, David <David.Griffiths@cyfoethnaturiolcymru.gov.uk>
Subject: EP3230BW - IC3 submission

Hi Dave
Please find attached our response to permit improvement condition IC3, as requested.
Brian

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Trial Report and conclusions for Steelworks material

The waste is a dust that is extracted from local exhaust ventilation (LEV) systems within two continuous casting plants at British Steel's Scunthorpe steelworks. The air is extracted in order to protect workers within the plant, and the dust must be removed from the air flow using bag filters in order for British Steel to meet their permit emission limits.

The chemical composition of the material is included below as table 1

Table 1

Sample/Source	Date	Na2O	Al2O3	SiO2	S	Cl	K2O	CaO	Cr2O3	FeO	CuO	ZnO	As2O3	SeO2	SnO	Sb2O3	BaO	PbO	SUM
British steel A	2/7/2018	2.61	0.12	1.74	0.78	0.42	0.07	0.32	0	48.2	0.03	0.31	0	0	0.58	0.13	0	43.7	98.98
British steel B	2/7/2018	0	0.05	1.73	0.51	0.33	0.08	0.23	0	48.5	0.02	0.33	0	0	0.1	0.02	0	47	98.94

The material is rich in iron and lead and low in sulphur. These characteristics suggest that the iron content could replace all or some of the mill scale traditionally added to a smelting charge in order to 'fix' sulphur in the slag thereby reducing potential for SO_2 emissions from stack A2 as a result. The high lead content suits our process in terms of lead recovery which is the main function of the smelting process. The low sulphur levels match the levels we experience following the usual de-sulphurisation of battery paste.

A single trial load was accepted on site and was prepared for inclusion in our smelting process as a trial designed to ascertain the success of lead recovery and the other potential benefits already discussed above. We utilised our CEMS array on stack A2 in order to monitor any changes to the normal emissions to air profile of the process. (please see graph 1).

The graph displays emissions over the whole period during which the trial was conducted and shows no deviations from what would be considered normal operations.

The trial was conducted over a number of charges with an average input of 500kg of the trial material per charge, totalling an input of 21 tonnes total.

Due to the high concentration of iron in the material the normal mill scale addition was reduced to almost zero and normal sulphur and lead content was found in the slag. This would suggest benefits in the use of raw material and indicates that lead recovery of the material was also of a high rate of success.

Reception, handling and charge preparation of the material is essentially no different to other similar materials, (flue dust etc), and presents no issues from an occupational health perspective.

Conclusions

The trial material is of a relatively consistent composition, is easily handled and included in current process methodologies with no changes required. The composition of the material is suitable for our process, particularly in view of the two main constituents iron and lead. The iron content presents benefits in replacing mill scale as a raw material, and the recovery of the lead is ultimately the whole purpose of our process which has also proven to be successful.

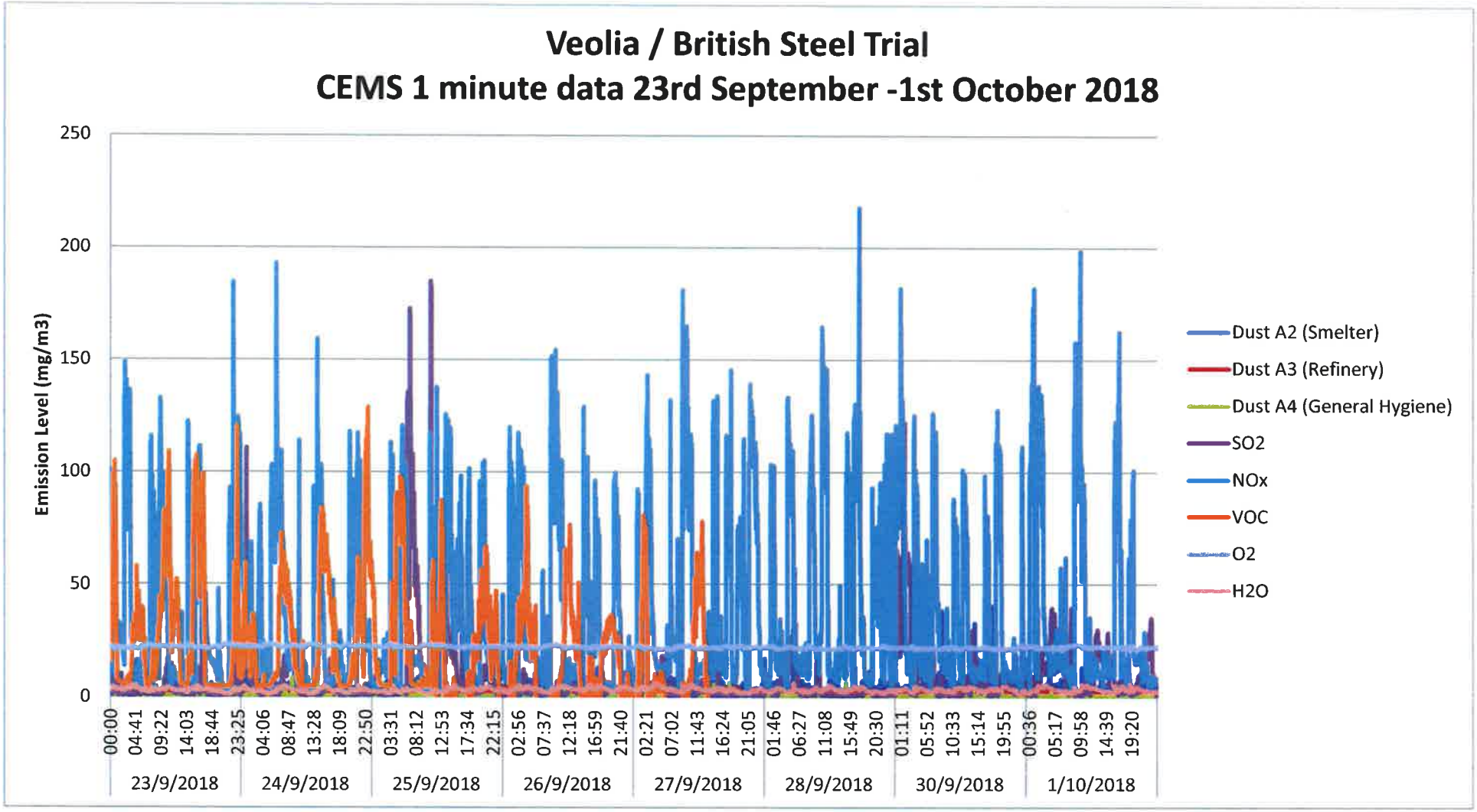
There are no perceived occupational health and safety risks associated with the material other than the usual risks associated with any lead-bearing material. These risks are routine to the company and the required control measures are in place.

The emission s to air profile is not adversely affected by processing this material and there are no other environmental impacts identified.

The overall conclusion is therefore that the material is suitable for acceptance and processing on site with no operational changes necessary.

Brian Kelly Oct 2018

Graph 1


Veolia / British Steel Trial
CEMS 1 minute data 23rd September -1st October 2018
Emission Level (mg/m3)
250
200
150
100
50
0
00:00
04:41
09:22
14:03
18:44
23:25
04:06
08:47
13:28
18:09
22:50
03:31
08:12
12:53
17:34
22:15
02:56
07:37
12:18
16:59
21:40
02:21
07:02
11:43
16:24
21:05
01:46
06:27
11:08
15:49
20:30
01:11
05:52
10:33
15:14
19:55
00:36
05:17
09:58
14:39
19:20
23/9/2018
24/9/2018
25/9/2018
26/9/2018
27/9/2018
28/9/2018
30/9/2018
1/10/2018
Dust A2 (Smelter)
Dust A3 (Refinery)
Dust A4 (General Hygiene)
SO2
NOx
VOC
O2
H2O