

## HOPE CEMENT WORKS SO<sub>2</sub> ELV COMPLIANCE AND SHALE REPLACEMENT PROJECT UPDATE

### Introduction

As agreed with the Environment Agency, this document will provide a progress report for the shale replacement project at Hope Cement Works as well as a summary of compliance with the current reduced sulphur dioxide (SO<sub>2</sub>) 400 mg/Nm<sup>3</sup> emission limit value (ELV) for the Q4 reporting period (1<sup>st</sup> October 2019 – 31<sup>st</sup> December 2019).

### SO<sub>2</sub> ELV Compliance Summary

Please see the below tabular summary of compliance with the current SO<sub>2</sub> 400 mg/Nm<sup>3</sup> ELV for Kiln 1 and Kiln 2, and against the 695 mg/Nm<sup>3</sup> ELV proposed in the outstanding derogation. This information will also be submitted as part of the end of quarter permit reporting requirements. Please also refer to appendices 1, 2 & 3.

Kiln 1				
	Days Less than 400 mg/Nm <sup>3</sup> ELV	% compliance with 400 mg/Nm <sup>3</sup> ELV	Days Less than 695 mg/Nm <sup>3</sup> ELV	% compliance with requested 695 mg/Nm <sup>3</sup> ELV
<b>October</b>	5	16%	20	65%
<b>November</b>	16	53%	30	100%
<b>December</b>	7	23%	30	97%

Kiln 2				
	Days Less than 400 mg/Nm <sup>3</sup> ELV	% compliance with 400 mg/Nm <sup>3</sup> ELV	Days Less than 695 mg/Nm <sup>3</sup> ELV	% compliance with requested 695 mg/Nm <sup>3</sup> ELV
<b>October</b>	26	84%	31	100%
<b>November</b>	18	60%	29	97%
<b>December</b>	8	26%	30	97%

### Shale Replacement Project Update

Environmental impact assessment work has been continuing since the last update with no issues identified. Extensive ground contamination surveys have taken place in areas of potential excavation alongside demolition and asbestos surveys. Timescales are currently projecting that the planning application submission will be made early in Q2 2020.

The F10 notification to the HSE has been submitted for the project with Principal Designers (WSP CEL Ltd) instructed and the basic engineering design of the plant is progressing well, flowsheets are in draft and the constructability review has now taken place.

The project thus far has not deviated from the timelines agreed within the derogation submission.

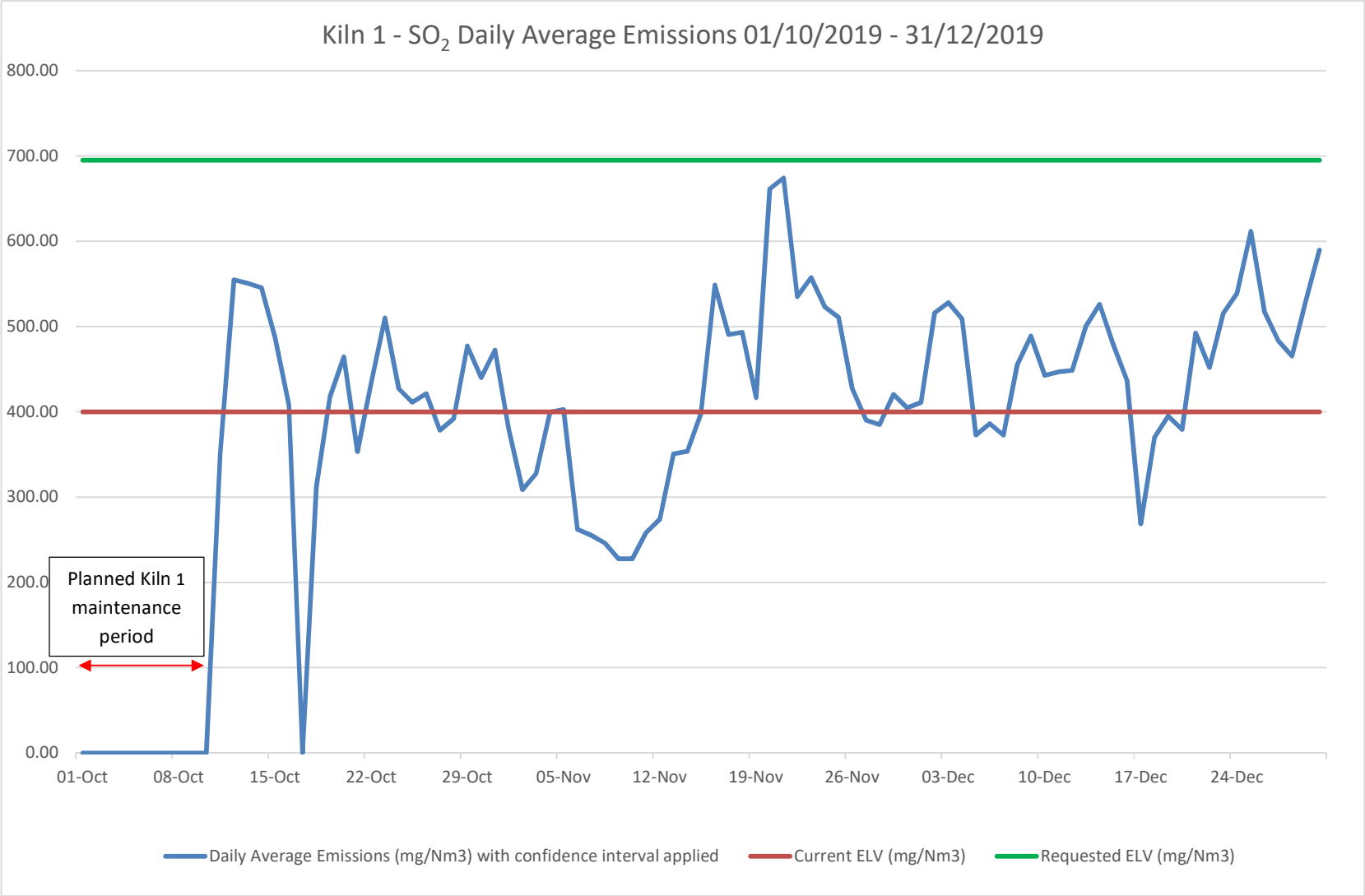
Hope Cement Works continues to seek out a wide spectrum of substitute raw materials from locations with suitable quality material, site access and capacity for bulk transport and many site visits have been completed. This assessment is nearing completion, all options have been evaluated both technically and economically to select the most preferable source or sources of such materials. Commercial negotiations regarding the preferred material sources are being conducted and are on-going as appropriate. They are commercially sensitive and some subject to non-disclosure agreements.

In addition to the above, Hope Cement Works continues to receive up to 12 loads of conditioned quality PFA per day by road as part of a trial agreement with the Peak District National Park. Contractually Hope Cement Works retains the right to utilise all run of station PFA generated at one particular power station as and when it becomes available and, more recently, has signed a second contract for further supplies of ash from a second power station. This has helped enable some higher raw mix substitution rates towards the end of the year. The table below reflects the monthly rates of shale substitution in the raw mix by weight for the whole of 2019.

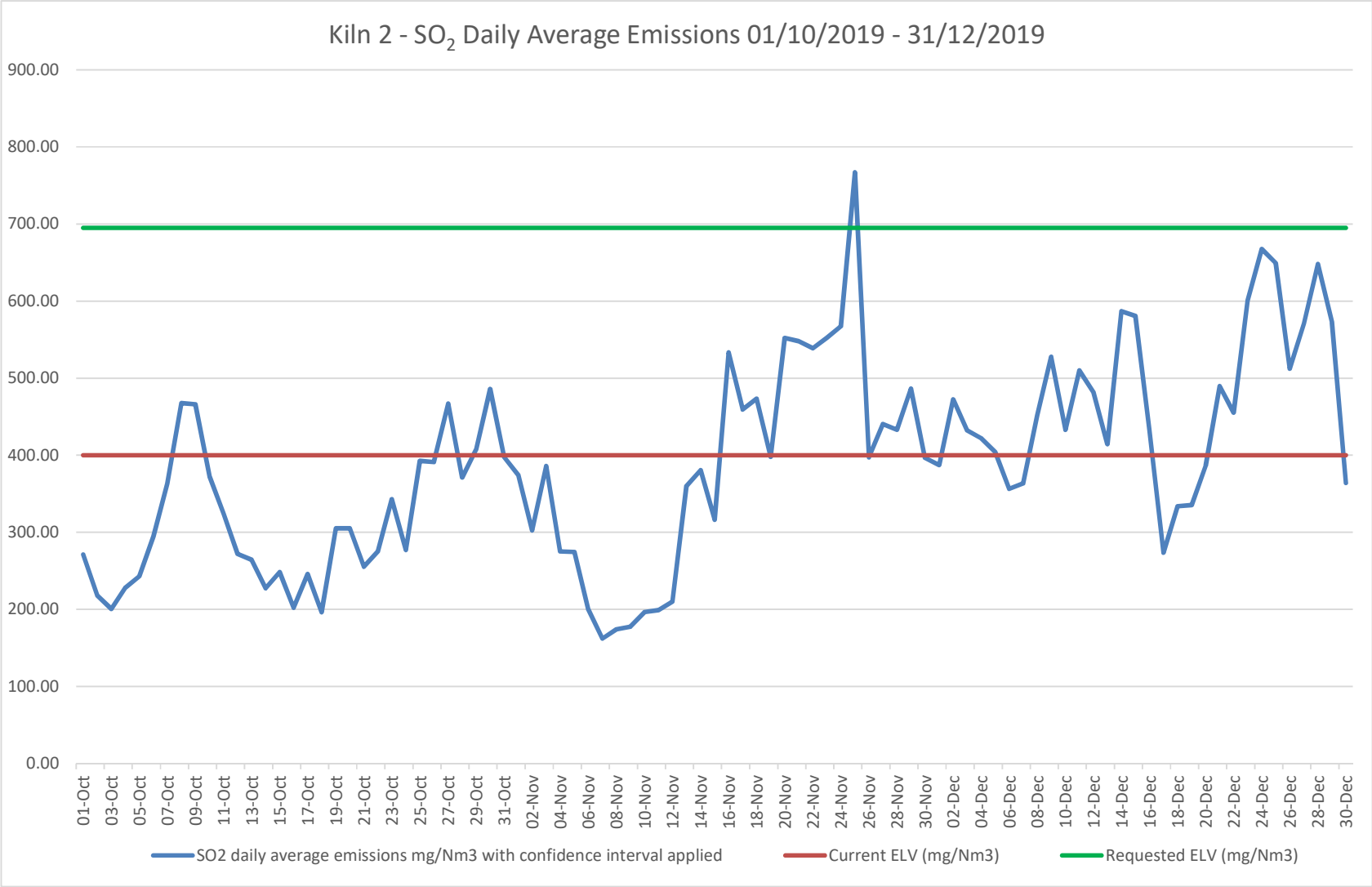
<b>% Raw mix substitution</b>	
<b>Jan-19</b>	4.10
<b>Feb-19</b>	2.42
<b>Mar-19</b>	2.89
<b>Apr-19</b>	3.49
<b>May-19</b>	4.81
<b>June-19</b>	3.64
<b>July-19</b>	3.82
<b>Aug-19</b>	5.42
<b>Sept-19</b>	3.67
<b>Oct-19</b>	5.84
<b>Nov-19</b>	5.01
<b>Dec-19</b>	5.60
<b>YTD Average</b>	4.24



Appendix 1



Appendix 2



### Appendix 3 – Daily average values

	Kiln 1			Kiln 2	
	Daily Average (mg/Nm <sup>3</sup> )	Factored Daily Average (mg/Nm <sup>3</sup> )		Daily Average (mg/Nm <sup>3</sup> )	Factored Daily Average (mg/Nm <sup>3</sup> )
01-Oct				338.84	271.07
02-Oct				272.24	217.79
03-Oct				250.49	200.39
04-Oct				285.14	228.11
05-Oct				303.79	243.04
06-Oct				368.19	294.55
07-Oct				453.74	362.99
08-Oct				584.59	467.67
09-Oct				582.46	465.97
10-Oct				465.58	372.46
11-Oct	437.62	350.10		405.47	324.37
12-Oct	693.45	554.76		339.97	271.98
13-Oct	688.21	550.57		330.38	264.31
14-Oct	681.74	545.39		284.09	227.27
15-Oct	608.04	486.43		310.56	248.45
16-Oct	510.28	408.23		252.54	202.03
17-Oct				307.42	245.93
18-Oct	390.18	312.14		245.56	196.45
19-Oct	521.80	417.44		381.46	305.17
20-Oct	580.60	464.48		381.33	305.06
21-Oct	441.67	353.34		319.28	255.42
22-Oct	543.04	434.43		344.22	275.38
23-Oct	637.58	510.06		428.70	342.96
24-Oct	533.93	427.14		346.34	277.07
25-Oct	513.93	411.14		491.13	392.90
26-Oct	526.66	421.33		489.11	391.29
27-Oct	472.97	378.37		583.93	467.15
28-Oct	490.01	392.01		464.00	371.20
29-Oct	596.50	477.20		509.41	407.53
30-Oct	550.17	440.14		607.12	485.69
31-Oct	590.55	472.44		497.07	397.66
01-Nov	474.87	379.89		468.39	374.72
02-Nov	385.99	308.79		378.14	302.51
03-Nov	409.32	327.45		482.48	385.99
04-Nov	499.26	399.41		344.03	275.22
05-Nov	503.36	402.69		343.25	274.60
06-Nov	327.94	262.35		249.65	199.72

07-Nov	319.12	255.30		202.60	162.08
08-Nov	307.42	245.94		217.58	174.06
09-Nov	284.54	227.63		222.05	177.64
10-Nov	284.65	227.72		245.41	196.32
11-Nov	322.76	258.21		248.48	198.78
12-Nov	342.74	274.19		262.46	209.97
13-Nov	438.57	350.86		449.72	359.78
14-Nov	442.23	353.78		475.79	380.64
15-Nov	497.24	397.79		395.36	316.28
16-Nov	685.77	548.61		666.74	533.39
17-Nov	613.11	490.49		574.05	459.24
18-Nov	616.48	493.18		591.80	473.44
19-Nov	520.91	416.73		497.18	397.74
20-Nov	826.69	661.35		690.10	552.08
21-Nov	842.77	674.21		684.82	547.86
22-Nov	668.85	535.08		673.62	538.90
23-Nov	696.71	557.37		690.76	552.61
24-Nov	654.00	523.20		709.48	567.59
25-Nov	638.22	510.58		958.73	766.98
26-Nov	534.55	427.64		496.63	397.31
27-Nov	487.82	390.25		550.87	440.70
28-Nov	481.25	385.00		541.29	433.03
29-Nov	525.53	420.42		608.08	486.47
30-Nov	505.98	404.78		495.72	396.58
01-Dec	513.68	410.94		484.14	387.31
02-Dec	644.97	515.97		590.44	472.35
03-Dec	660.12	528.10		540.24	432.19
04-Dec	636.17	508.94		527.70	422.16
05-Dec	466.03	372.83		505.13	404.11
06-Dec	482.75	386.20		445.32	356.26
07-Dec	465.69	372.56		454.36	363.49
08-Dec	568.92	455.13		565.17	452.14
09-Dec	611.06	488.85		659.52	527.62
10-Dec	553.32	442.66		541.29	433.03
11-Dec	558.50	446.80		637.69	510.15
12-Dec	560.72	448.57		601.95	481.56
13-Dec	625.10	500.08		518.01	414.41
14-Dec	657.47	525.97		733.48	586.79
15-Dec	598.62	478.89		725.94	580.75
16-Dec	545.73	436.59		541.10	432.88
17-Dec	335.87	268.70		342.10	273.68
18-Dec	462.77	370.22		417.13	333.70
19-Dec	493.80	395.04		419.07	335.26
20-Dec	473.87	379.10		483.10	386.48

21-Dec	615.30	492.24		612.01	489.61
22-Dec	565.13	452.10		569.17	455.34
23-Dec	644.33	515.46		751.09	600.87
24-Dec	673.55	538.84		834.58	667.67
25-Dec	764.69	611.75		811.79	649.43
26-Dec	646.71	517.36		640.52	512.42
27-Dec	604.30	483.44		713.80	571.04
28-Dec	581.79	465.43		810.26	648.21
29-Dec	661.91	529.53		715.53	572.42
30-Dec	737.03	589.62		455.27	364.22
31-Dec				338.18	270.54