Stuart,

Please find below our initial response to the issues raised at our recent meeting.

1. Pink Plume reported 13:32 23/10/13

As discussed please can you investigate the cause of the pink plume and provide a report of your findings Today I received a further report of a pink plume witnessed around midday Sunday 27/10/13.

Please include as a minimum;

- Coal sample analysis results collected 23/10/13 & comparison against typical chemistry

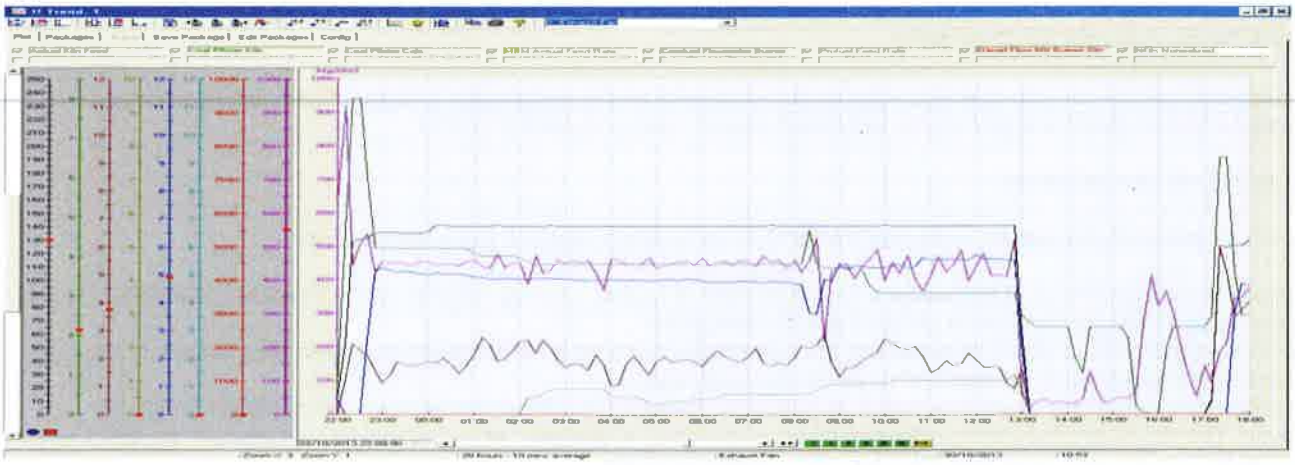
Ongoing coal analysis is used to monitor a limited number of factors, such as calorific value, volatiles and sulphur. These regular samples are put together to create a weekly composite.
Overall coal quality is as would be expected, the only observable change in chemistry has been the increase in sulphur content, which is related to the blend of coals we currently have.
A slightly more detailed analysis is supplied as part of the purchasing / delivery procedure, covered under EUETS scheme. This more detailed analysis does not give a full chemical analysis, as is undertaken for Cemfuel; as such we have taken samples and have sent them for more detailed analysis.

Weekly composite coal sampling results – recent weeks

Date	Week No.	MOISTURE %	ASH %	VOLATILE %	SULPHUR %	GROSS CV cal/g	GROSS CV kJ/Kg	NET CV cal/g	NET CV KJ/Kg
01/07/13	26	1.8	22.4	26.4	1.5	6166.2	25818	5939	24865
08/07/13	27	2.7	29.1	20.1	1.0	6168.0	25825	5931	24834
15/07/13	28	2.2	23.0	26.2	1.5	6274.3	26270	6044	25306
22/07/13	29	2.3	19.9	28.3	1.6	6341.5	26552	6112	25593
02/09/13	35	1.5	20.2	24.2	0.9	5575.1	23343	5351	22403
09/09/13	36	1.6	21.4	25.6	0.9	6255.3	26191	6029	25245
16/09/13	37	1.8	22.0	24.8	1.0	6501.1	27220	6274	26268
23/09/13	38	1.7	19.9	27.6	1.2	6423.5	26895	6198	25951
30/09/13	39	2.1	21.0	27.5	1.6	6300.6	26381	6072	25424
28/10/13	43	1.8	22.8	25.0	2.1	6239.3	26124	6011	25170

- Confirmation of fuels in use during and prior to incident

Prior to incident kiln inputs as shown below. Fuels included coal to main burner (3tph), coal to calciner (1.5 to 2.5 tph), MBM (1tph). No SRF or diesel were in use.



- The certificate of analysis (as per permit requirements) for SRF & CEM fuel being burnt. Also analysis of MBM if it's available.

Certificates are available and analysis results are included as appendix 1. All analysis specifications have been complied with throughout the period.

- Raw meal chemistry at time of incident

Kiln Feed tonnage was 140 tph. Chemistry below

Date	Time	Si	Al	Fe	Ca	NaEq	SO3
23-Oct	00:00	13.28	3.59	1.25	43.40	0.42	0.44
	02:00	13.24	3.70	1.28	43.39	0.43	0.45
	04:00	13.43	3.77	1.31	43.23	0.44	0.44
	06:00	14.30	3.81	1.31	42.76	0.44	0.41
	08:00	13.41	3.63	1.29	43.45	0.42	0.40
	10:00	13.10	3.61	1.36	43.57	0.42	0.38

(Full oxide analysis to follow)

- Assessment of possible causes based on inventory of kiln inputs

Potential sources of pink appearance

Iodine was suggested as a potential source of pink vapour. Based on the kiln inputs below, halide determination has been requested from Ceram.
Other known substances giving a pink colour on combustion are Potassium salts. The theory behind this is being investigated.

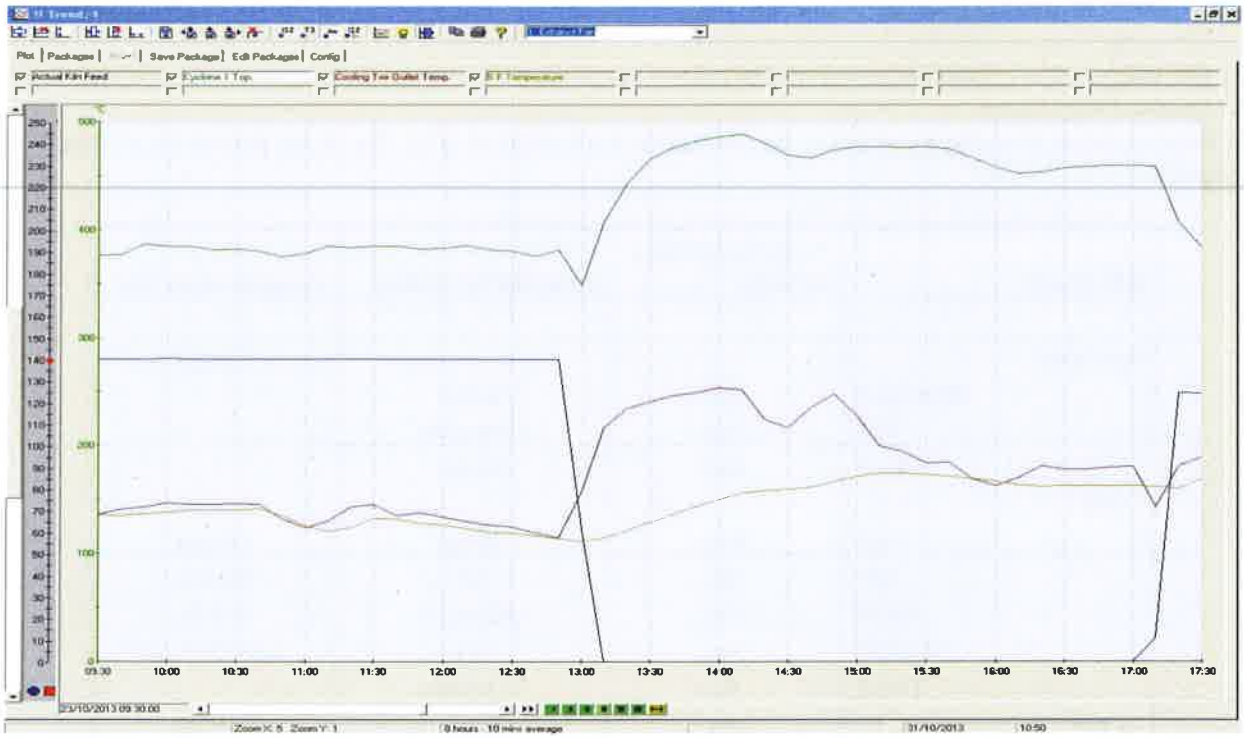
Kiln Inputs	***Present preceding incident***	***Potential for Iodine***	***Analysis requested***
Raw Meal			Halides
Limestone	Yes	None	
PFA	Yes	Unknown	
Sand	Yes	None	
Fuels			
Coal	Yes	None	Halides
SRF	No	Yes	Halides
MBM	Yes	Unknown	Halides
Cemfuel	Yes	Yes	Already have
Diesel	No	Unknown	
Water	Yes	None	Halides
Ammonia	Yes	Unknown	
Air	Yes	None	

- Confirmation of plant operating status during plume (what plant was running / down inc conditioning tower)

Kiln 4 had been operational and steady from midnight. The tertiary duct was partially blocked, which affects overall kiln fuel efficiency but does not change inputs or outputs.
The kiln stopped at approx 13.10 for a suspected blockage in the tower; this stops the main kiln fan and immediately stops all raw material and fuel feed to the calciner. The raw mill and coal mill will also stop. The chimney fan, which moves the exhaust gases up the stack, will continue to operate at a much reduced speed so as to maintain suction throughout the system. Coal feed is maintained to the main burner in the kiln, at a much reduced rate, until any decision is made to stop the kiln for cooling. The gas conditioning tower water pump will stop as there is insufficient gas flow in this state to absorb the water therefore there will be a moderate increase in stack gas temperature.

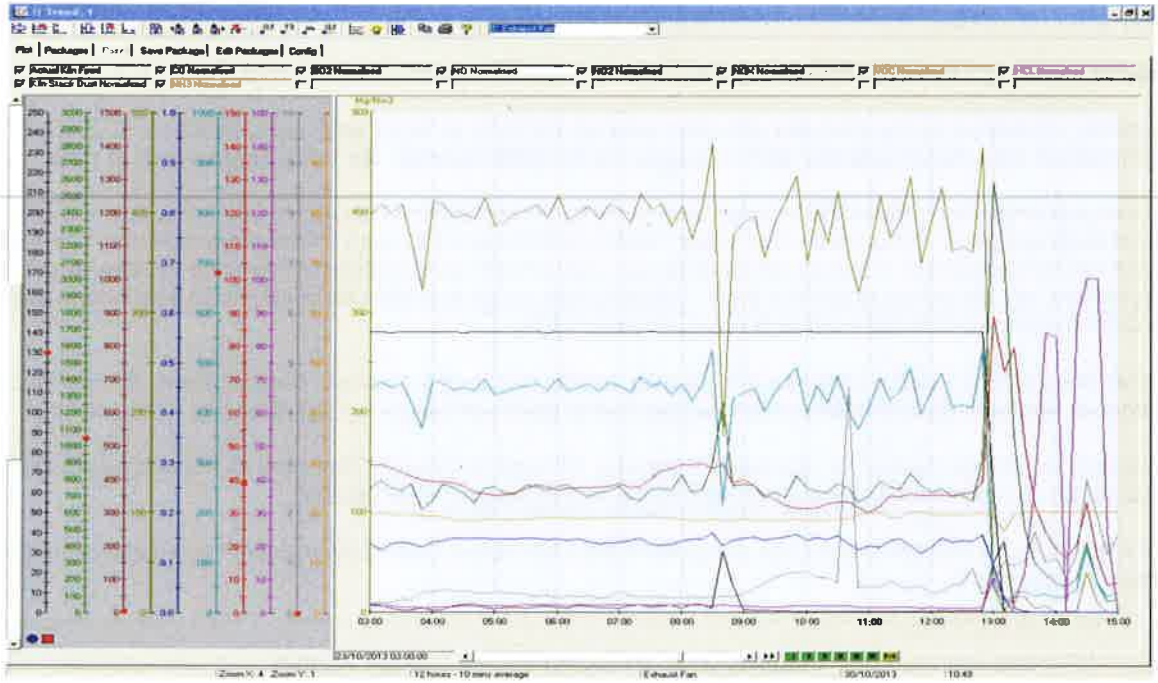
Emissions data and other process data are provided below

Kin Feed and gas temperatures



As above with values for approximately 13:32hrs

Kiln Feed and Stack Emissions



Kiln Feed and Stack Normalisation

2. Dust releases;

Findings of your investigations into the following observations –

-Dust release witnessed by NRW staff at approx 12.50 on 10/09/13 (details were sent to David by e-mail)

-Dust releases witnessed by me from the kiln inlet area on 23/10/13 at 14:27 and again between 16:30 and 17:00. The latter incident was reported to the shift manager via the 0800 number. No findings provided to date.

As discussed, a potential for visible dust from the area of the kiln/tower interface is created when blockages and/or clearance of build-ups occur in this area of the tower. Control is maintained through effective management of the kiln process and kiln input chemistry however build-ups are an unavoidable consequence of cement manufacture and secondary actions are carried out to remove them. These actions range from the use of automatic Air-Canons, high pressure CO2 discharges ('Cardox') and high-pressure water jetting.

It is therefore likely that any visible release will have been related to one of the above. The air-canons fire continuously at regular intervals, whereas manual interventions are required to carry out Cardox or High-pressure water jetting.

Air-Canons are the primary method for removal of build-ups, followed by Cardox. There are no specific records of Cardox firing; however these actions are generally recorded in the shift manager's daily reports.

Details of High-pressure water jetting actions are given in the table below; both of the incidents noted above coincide with High-pressure water jetting.

POWERCLEAN SITE VISITS FROM SEPTEMBER 1st 2013			
Date	Start Time	Time left site	Reason For Visit
06/09/2013	09:30	15:00	Routine jetting of Down Draught Calciner
09-10/09/2013	09:30	00:10	Routine jetting of Down Draught Calciner/bypass/mixing chamber
13/09/2013	09:30	12:00	Routine jetting of Down Draught Calciner/bypass/mixing chamber
23/09/2013	10:00	14:30	Routine jetting of Down Draught Calciner/bypass/mixing chamber
27/09/2013	10:00	14:30	Routine jetting of Down Draught Calciner
09/10/2013	18:30	01:30	Jetting down Cyclone 4/ blockage/concrete
16/10/2013	15:15	19:45	Jetting Tertiary air Ducting/Feed pipe leg from DGO2
17/10/2013	10:30	21:30	Jetting Tertiary air Ducting/Feed pipe leg from DGO2
23-24/10/2014	14:30	03:15	Jetting Tertiary air Ducting

A revised procedure for management of tower-cleaning is being discussed and developed with a view to minimising the potential for visible releases. The overriding factor in the procedure will remain Health & Safety; therefore containment of materials needs to be maintained within an operational kiln. Full details will be discussed prior to any significant changes to working practices.

- Part B for raw meal silo dust release

This report has been forwarded in the normal method; an outline is given in the table below:

Any more accurate information on the matters for notification under Part A.	A screw conveyor (SC56) transporting meal to the top of the silo snapped near the non-drive end. The rotation monitor that was in place on the screw did not pick up the failure and the preceding equipment continued to feed the screw. Material backed up behind the snapped section forcing a path between the screw casing and the screw lid. The material fell approximately 70ft to ground level inside the building. The momentum of the material carried it out of the building where it was visible.
Measures taken, or intended to be taken, to prevent a recurrence of the incident	Rotation monitor has been re-positioned so that it will more effectively identify a failure in the screw. The feed system is programmed such that the feed system will stop should the screw fail.
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	Clean-up of area commenced immediately in location of spill and affected areas of the ground floor. Now complete.
The dates of any unauthorised emissions from the installation in the preceding 24 months.	

-Confirmation on your intentions regarding CCTV coverage of the kiln inlet area

Additional or alternative camera will be provided to allow for improved monitoring of the area between the kiln and pre-heater tower – Order placed and work ongoing

-Confirmation of your intentions regarding fitting a roller shutter door to kiln by pass duct dust collection area.

A roller-shutter door will be fitted to the bypass skip area; this will utilise the door from the current Limestone intake, which is being replaced. The order has been placed for this work under our capital investment program and is due to be completed during the next kiln shutdown at the end of November.

-Dust sample collected from Mr Johnston's car 12/09/13.

This sample analysis indicated that the material was related to cement manufacture. A suitable letter has been drafted and sent to the complainant. The sample has been described as Bypass dust, however low chloride analysis indicates that it is more likely to be a combination of kiln inputs and outputs.

3. Emissions Monitoring

-Report on the causes and subsequent remedial measures taken to address HCL monitor failure and inappropriate kiln operator response.

As discussed, a full Root Cause Investigation was conducted following this incident, details of which are available if requested. The outcome of the investigation is as set out below:

1) Cause Shift Manager was not fully aware of the permit requirements are the need to cease burning alternative fuels
   - Remedial action - Refresher training for shift managers on permit and WID compliance requirements (annual)
   - *Scheduled 13/11/13 (IW)*

2) Cause Alternative fuels do not automatically cease to be burnt four hours after a CEMS equipment failure
   - Remedial Action - Carry out management of change process to assess potential improvements to fuels off protocol
   - *In progress. Completion date 15/11/13 (DQ)*

3) Cause HCl present at stack exit possible due to the dissociation of ammonium chloride
   - Remedial action - Investigate physical properties of NH4Cl
   - *Report by 15/11/13 (SM)*

4) Cause HCl present at stack
   - Remedial Action - Investigate options for HCl reduction by lime injection
   - *Not assigned as yet – requires significant capital investment therefore needs reports as above to be completed*

5) Cause Action taken by kiln controller was slow
   - Remedial Action - Fundamental requirements of role to be reinforced with kiln controller
   - *Completed 17/10/13 (DQ)*

Also, please note routine emissions monitoring data is due before the month end.

e-mailed by Victoria Yesterday

Appendix 1

Cemfuel analysis

		SPEC			20						800		
Date	BX No	TONNES	Sn	Tl	Hg	As	Mo	Sb	Zn	Cd	Pb	Co	Ba
02/10/2013	PH2010	116.6	16	2	2	1	15	29	419	1	42	3	723
09/10/2013	PH2011	43.9	17	2	2	1	11	43	337	1	32	3	805
09/10/2013	PH2012	24.0	32	2	2	1	17	81	563	1	84	3	1480
12/10/2013	PH2013	67.5	1	2	2	1	1	37	675	1	55	3	884
16/10/2013	PH2014	46.9	15	2	2	1	8	38	611	1	55	3	1296
16/10/2013	PH2015	27.4	21	2	2	1	20	49	1127	2	267	3	1920
16/10/2013	PH2016	97.9	24	2	2	1	19	42	677	2	48	3	1358
21/10/2013	PH2017	49.5	46	2	2	1	4	131	625	1	141	3	1136
23/10/2013	PH2018	97.9	41	2	2	1	17	63	1377	1	162	3	2125
23/10/2013	PH2019	24.8	7	2	2	1	1	28	490	1	95	3	385
23/10/2013	PH2020	120.5	24	2	2	1	1	49	720	1	163	3	1039
24/10/2013	PH2021	76.7	28	2	2	1	9	52	555	3	76	3	1278
26/102013	PH2022	53.9	25	2	2	1	21	47	700	1	123	3	1053
27/10/2013	PH2023	48.9	20	2	2	1	6	31	767	3	141	3	753
28/10/2013	PH2024	27.1	10	2	2	1	3	41	733	1	127	3	1040
28/10/2013	PH2025	52.0	31	2	2	1	6	51	1299	2	285	3	1905
29/10/2013	PH2026	101.0	32	2	2	1	3	67	1220	1	273	3	2415
30/10/2013	PH2027		42	2	2	1	1	83	450	1	46	3	1266

		SPEC	40	1800	20000	20000	5020				15000	
Date	BX No		CdTl TOT	GIII TOT	Cl	S	CV	ASH	Br	F	I	Br,Fl,I	Ni
02/10/2013	PH2010		3	444	14861	7219	5424	4.3	601	970	123	1694	15
09/10/2013	PH2011		3	337	8164	1609	5865	1.5	2048	1064	411	3523	10
09/10/2013	PH2012		3	548	16283	3123	5219	4.3	1063	774	1616	3453	7
12/10/2013	PH2013		3	472	13219	3354	5479	2.7	1600	1056	477	3133	3
16/10/2013	PH2014		3	426	11925	2997	5376	2.6	1374	1630	380	3383	1
16/10/2013	PH2015		4	951	15661	6219	5332	6.4	1113	1318	315	2746	4
16/10/2013	PH2016		4	537	18027	2821	5616	2.9	1821	2634	500	4955	13
21/10/2013	PH2017		3	750	16013	4845	5195	2.7	139	1516	441	2097	1
23/10/2013	PH2018		3	925	15152	2415	5464	4.5	587	903	318	1808	2
23/10/2013	PH2019		3	514	11879	3257	5369	3.1	523	1010	330	1863	5
23/10/2013	PH2020		3	708	10347	4191	5812	2.6	472	886	750	2107	8
24/10/2013	PH2021		5	466	10412	3271	5346	6.0	626	1786	449	2861	3

26/102013	PH2022		3	636	13561	6636	5709	3.1	1571	834	570	2975	1
27/10/2013	PH2023		5	731	17027	4706	5465	0.4	1913	935	360	3208	6
28/10/2013	PH2024		3	633	14717	4435	5637	3.8	0	1086	0	1086	1
28/10/2013	PH2025		4	1076	13063	4136	5289	5.0	129	1263	420	1812	6
29/10/2013	PH2026		3	1039	8989	4673	5064	4.3	837	2351	379	3567	8
30/10/2013	PH2027		3	388	9481	3445	5919	2.7	694	1413	278	2385	3

Date	BX No	SPEC								1000	
02/10/2013	PH2010	pH	% SOLID	% WATER	VISCOSITY	METHANOL %	Rh	Cr	V	Cu	Mn
09/10/2013	PH2011	7	16	21.8	28	18.7	0	58	5	260	15
09/10/2013	PH2012	5	13	19.7	15	25.2	0	40	5	169	17
12/10/2013	PH2013	5	16	22.3	23	18.3	0	60	5	258	17
16/10/2013	PH2014	4	16	25.4	35	14.7	0	40	5	312	15
16/10/2013	PH2015	5	16	26.2	28	17.4	0	63	5	229	16
16/10/2013	PH2016	6	19	16.6	35	14.0	0	112	5	462	27
21/10/2013	PH2017	6	15	21.5	31	15.8	0	128	5	257	16
23/10/2013	PH2018	7	10	25.2	28	14.4	0	87	5	324	12
23/10/2013	PH2019	7	14	21.0	25	13.6	0	63	5	555	30
23/10/2013	PH2020	6	11	20.6	22	23.5	0	61	57	240	17
24/10/2013	PH2021	7	15	20.3	30	13.3	0	95	5	340	21
26/102013	PH2022	7	19	22.3	38	32.1	0	50	5	230	18
27/10/2013	PH2023	4	17	16.0	70	10.6	0	82	5	328	22
28/10/2013	PH2024	4	10	17.4	50	23.4	0	114	5	385	26
28/10/2013	PH2025	7	23	19.0	70	20.8	0	68	9	354	19
29/10/2013	PH2026	6	20	20.0	72	20.8	0	113	5	557	24
30/10/2013	PH2027	6	17	24.7	30	27.7	0	100	5	497	53
		5	15	0.9	19	18.5	0	51	5	128	26

MBM Analysis

	W/B	CV (gross)	CV (gross)	CV (net)	Moisture	Volatiles	Ash
		cal/g	MJ/Kg	MJ/Kg	%	%	%
Wk 8	27/02/13	4473.9	18.7	17.7	0.1	66.4	25.6
Wk 9	04/03/13	4386.6	18.4	17.3	0.0	68.2	25.1
Wk 10	11/03/13	4581.7	19.2	18.1	0.0	66.2	27.2
Wk 11	18/03/13	4517.0	18.9	17.9	0.1	63.3	29.5
Wk 12	25/03/13		0.0				
Wk 13	01/04/13	4478.9	18.8	17.7	0.0	67.1	25.6
Wk 20	20/05/13	4415.6	18.5	17.4	1.8	63.2	30.9
Wk 21	27/05/13	4232.4	17.7	16.6	4.5	66.9	25.4
Wk 22	03/06/13	4312.2	18.1	17.0	2.5	62.7	30.2
Wk 23	10/06/13	4309.2	18.0	17.0	1.9	63.3	29.0
Wk 26	01/07/13	4309.5	18.0	17.0	2.4	64.5	28.3
Wk 27	08/07/13	4514.6	18.9	17.8	2.5	61.3	31.9
Wk 28	15/07/13	4396.2	18.4	17.3	1.3	64.5	29.0
Wk 29	22/07/13	4413.5	18.5	17.4	1.5	64.6	29.0
Wk 30	29/07/13	4591.2	19.2	18.1	1.2	64.6	28.1
Wk 31	05/08/13	4331.3	18.1	17.1	1.1	63.7	29.1
Wk 38	23/09/13	4581.6	19.2	18.1	2.0	64.9	27.4
Wk 43	28/10/13	4544.5	19.0	17.9	2.5	69.7	20.0

SRF Analysis

	Week No.	CV (gross)	CV (gross)	CV (net)	Moisture	Volatiles	Ash
		cal/g	MJ/Kg	MJ/Kg	%	%	%
27/02/13	8	5515.2	23.1	22.0	4.1	81.3	15.4
04/03/13	9	5658.0	23.7	22.6	0.7	82.4	14.3
11/03/13	10	5179.1	21.7	20.5	7.5	80.3	17.6
18/03/13	11	5630.0	23.6	22.5	2.8	80.1	16.8
25/03/13	12	5086.0	21.3	20.2	1.9	73.4	21.2
01/04/13	13	5532.1	23.2	22.0	4.7	86.2	11.2
06/05/13	18	4924.7	20.6	19.5	5.5	76.4	16.5
13/05/13	19	5276.9	22.1	21.0	2.4	80.3	12.6
20/05/13	20	5502.2	23.0	21.9	3.3	81.2	12.2
27/05/13	21	5806.0	24.3	23.2	6.9	88.7	9.2
03/06/13	22	4898.7	20.5	19.3	7.6	87.2	10.8
10/06/13	23	5011.2	21.0	19.8	6.2	83.9	13.2
01/07/13	26	5134.1	21.5	20.3	7.0	82.8	11.1
08/07/13	27	5088.7	21.3	20.2	5.0	86.2	11.6
15/07/13	28	5200.5	21.8	20.7	4.3	84.0	11.2
22/07/13	29	5324.1	22.3	21.2	5.1	85.3	10.4
29/07/13	30	5465.1	22.9	21.7	6.0	85.7	10.6
05/08/13	31	5365.8	22.5	21.3	6.8	86.0	10.8
12/08/13	32	5488.4	23.0	21.9	3.7	77.1	14.3
02/09/13	35	5620.8	23.5	22.4	3.0	78.1	14.1
09/09/13	36	5416.1	22.7	21.6	3.8	89.4	9.5
16/09/13	37	5433.6	22.8	21.7	2.8	78.4	20.0
23/09/13	38	4799.6	20.1	18.9	11.4	81.0	14.7
30/09/13	39	5748.9	24.1	23.0	4.2	85.5	11.7
21/10/13	42	6045.0	25.3	24.2	4.0	86.1	12.1
28/10/13	43	5993.0	25.1	24.0	4.4	87.2	11.1