

7/12/2016

Dear Kevin,

Although you have stated that you will not now consider any further amendments to the information provided by us, we have taken this opportunity to send you the updated process flow diagrams to include the revised information received from our supplier. This amended version clearly shows the correct parameters within which the drum dryer will operate, as well as clarifying some of your recently received questions. We have included the process flow diagrams for the minimum and maximum quantities which the dryer will be processing.

We are disappointed with NRW's reluctance to take this additional, more relevant information into account, as well as your reluctance to consider the raw data received from a similar facility at Swindon and the clear information sent by AQC stating NOx emissions will be considerably lower than predicted. It may also be worth noting that the Swindon facility is not as advanced as our intended development, yet it clearly shows reduced NOx emissions when operating at similar tonnage throughputs (the Swindon plant operates at 15 TPH and you have also received documented information from our suppliers stating that the size of the drum drier will not greatly impact on the NOx emissions). The Swindon plant is also dealing with MSW (higher in moisture content) rather than C+I waste as our development proposes.

Please see the table below comparing the Swindon Facility to the proposed Nine Mile Point Facility

Parameter	SWINDON	NINE MILE POINT (Normal Operating Parameters)	NINE MILE POINT
Waste Throughput to Dryer	10.5TPH	15TPH (normally)	17.5 TPH (Max)
Evaporation Capacity of Dryer	4100Kg/h	2647kg/h	7206kg/h
Maximum water content in	50%	30%	50%
Maximum water content out	20%	15%	15%
Volumetric natural gas flows to dryer	445 Nm ³ /hr	300 Nm ³ /hr	674 Nm ³ /hr
Volumetric natural gas flows to RTO	34 Nm ³ /hr	36 Nm ³ /hr	67 Nm ³ /hr
Stack Height	15m	19m	19m
Stack inside diameter	940mm	1200mm	1200mm
Efflux Velocity	7.0m/s	6.1m/s	11.6m/s
Stack gas temperature	146°C	140°C	150°C
NOx	40.1mg/Nm ³ (actual emissions, over measuring period as per ESG Mcerts certificate)	50mg/Nm ³ (estimated as per Andritz letter dated 29/6/16)	



Hazrem has offered you the opportunity to visit the Swindon Plant where a lot of your questions could most definitely have been answered. Unfortunately, you have stated that you cannot attend because you have no staff available.

The draft permit references annual NOx monitoring. Hazrem are willing to undertake more frequent monitoring to reassure NRW, PHW and the local residents that the NOx emissions from the plant are below the relevant limits. Perhaps NRW would consider issuing the permit subject to agreed levels of NOx emissions not being exceeded.

Throughout the process, you have asked for additional information which has not been clearly stated within a schedule 5 request, which we have provided at short notice. Hazrem has been extremely flexible in requests made by NRW for timescale extensions, granting extra time for determination in both July and September. This we believe has not been reciprocated by NRW.

We would have welcomed the opportunity to further clarify the information submitted, however, NRW now seem to be rigid in wanting to determine this application based on the initial information supplied. It seems to us that NRW could easily have issued another Schedule 5 request, asking for further clarification on the information we supplied.

The amended document will at least give you an opportunity to digest the updated information in readiness for our appeal, should our permit application not be successful.

PROCESS FLOW FOR 15TPH @ 30% Moisture Scenario

Project:	Swansea
Proj. Code:	XXX
Rev.:	0
issued:	SE/TK; 24.11.16
checked:	SE/MW
Program Rev. / Date	Rev. D; 08.04.15



Drum Drying: 15 t/h @ 30%MC

Input		
Feed		
Feed-Type	-	RDF
Feed-Type (appearance)	-	fluff
Feed	t/h	15.0
MC IN	m%	30,00%
bulk density	kg/m3	102
Plant / process		
operating hours	h/a	6,240
MC Product	m%	15,0%
Calculated Evaporation Rate	kg/h	2,647
Evaporation Rate	kg/h	2,647
Recycle / Fresh Air (Once through)	-	Recycle
Drying		
drum outlet temp	°C	105
drum inlet temp	°C	200
thermal loss (% of Pevap)	%	6,0%
leakage inlet [% flow]	%	6,0%

Heatsource: Burner fuel Gas		
massflow Gas	kg/h	0
Temperature	°C	20
Lambda	-	1,4
N2	v%	4,25
O2	v%	0
CO2	v%	0
H2O (v)	v%	0
H2	v%	0
CO	v%	0
CH4	v%	90
C2H2	v%	0
C2H4	v%	0
C2H6	v%	5,75
C3H6	v%	0
C3H8	v%	0
C4H8	v%	0
n-C4H10	v%	0
iso-C4H10	v%	0
H2S	v%	0

Ambient		
T	°C	20
rel. Hum	%	70%
pressure	bar	1,01
Iterations		3,03E-03
Errors		3,40E-02

Feed	
15.000 kg/h	
10.500 kg/h db	
20,0 °C	
147 Bm3/h	
MC= 30,0%	

Legend:
 Am3/h ... actual m3/h (flow @ actual pressure and temperature)
 Nm3/h ... normal m3/h (flow @ 1bar pressure and 0°C)

Note:
 Values in this illustration reflect calculation results and assumptions and are not guarantee figures.

Select Iteration **Gas-Burner**

Fuel Gas	
232 kg/h	
300 Nm3/h	
20 °C	
NCV= 35996 kJ/Nm3	
3.002 kW	

Comb. Air	
5.209 kg/h	
4.384 Am3/h	
4.072 Nm3/h	
20 °C	

Mix Drum IN	
85.169 kg/h	
124.789 Am3/h	
200 °C	
1,5% rel. hum.	
14.471 kW	

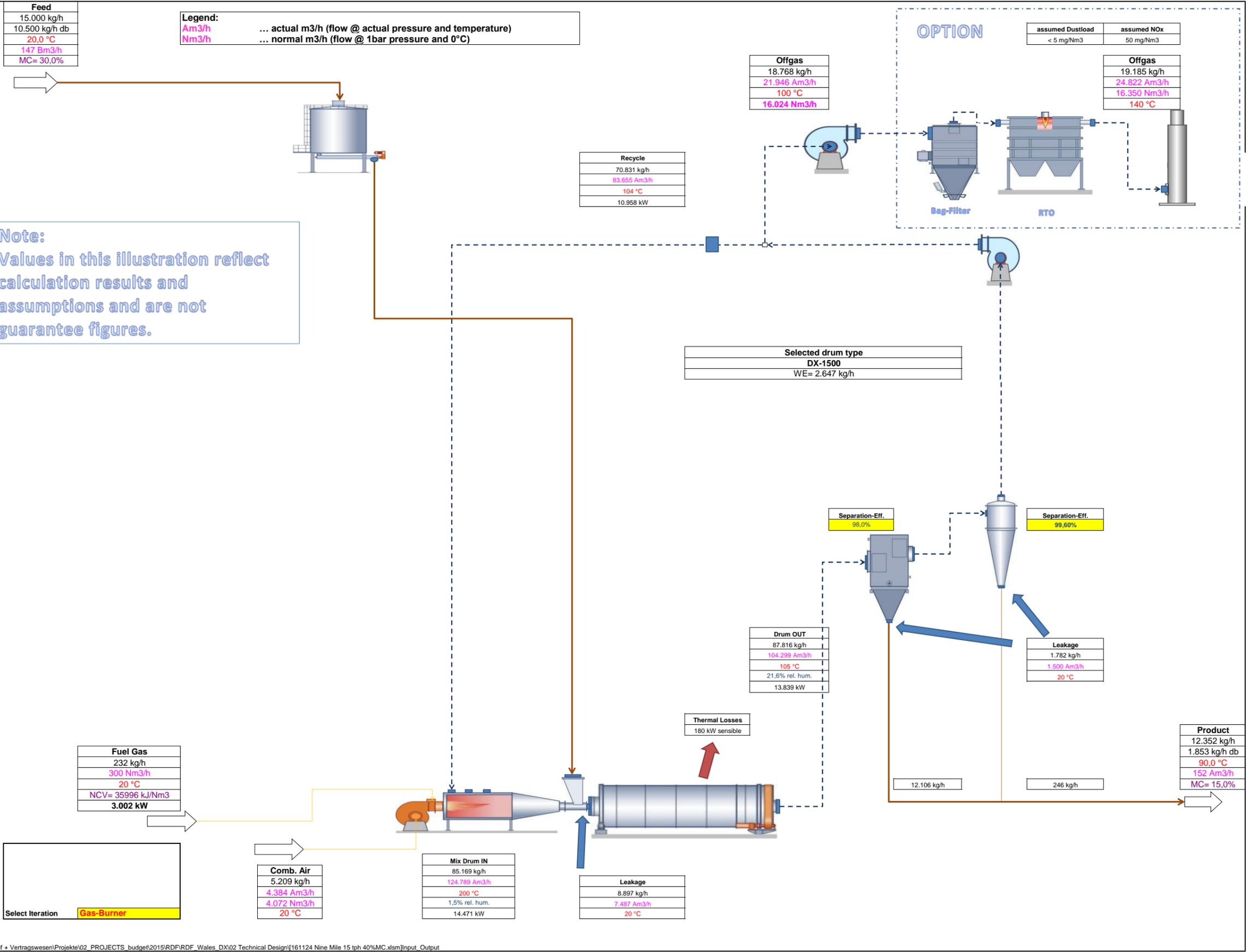
Leakage	
8.897 kg/h	
7.487 Am3/h	
20 °C	

Thermal Losses	
180 kW sensible	

Drum OUT	
87.816 kg/h	
104.299 Am3/h	
105 °C	
21,6% rel. hum.	
13.839 kW	

Leakage	
1.782 kg/h	
1.500 Am3/h	
20 °C	

Product	
12.352 kg/h	
1.853 kg/h db	
90,0 °C	
152 Am3/h	
MC= 15,0%	



OPTION

assumed Dustload	assumed NOx
< 5 mg/Nm3	50 mg/Nm3

Offgas	
18.768 kg/h	
21.946 Am3/h	
100 °C	
16.024 Nm3/h	

Offgas	
19.185 kg/h	
24.822 Am3/h	
16.350 Nm3/h	
140 °C	

Selected drum type	
DX-1500	
WE= 2.647 kg/h	



PROCESS FLOW FOR 17.5TPH @50% Moisture Scenario

Project:	Swansea
Proj. Code:	XXX
Rev.:	0
issued:	SE/TK: 24.11.16
checked:	SE/MW
Program Rev. / Date	Rev. D: 08.04.15



Drum Drying: 17,5t/h @ 50%MC

Input		
Feed		
Feed-Type	-	RDF
Feed-Type (appearance)	-	fluff
Feed	t/h	17,5
MC IN	m%	50,00%
bulk density	kg/m3	130
Plant / process		
operating hours	h/a	6.240
MC Product	m%	15,0%
Calculated Evaporation Rate	kg/h	7.206
Evaporation Rate	kg/h	7.206
Recycle / Fresh Air (Once through)	-	Recycle
Drying		
drum outlet temp	°C	105
drum inlet temp	°C	295
thermal loss (% of Pevap)	%	6,0%
leakage inlet (% flow)	%	6,0%

Heatsource: Burner fuel Gas		
massflow Gas	kg/h	0
Temperature	°C	20
Lambda	-	1,4
N2	v%	4,25
O2	v%	0
CO2	v%	0
H2O (v)	v%	0
H2	v%	0
CO	v%	0
CH4	v%	90
C2H2	v%	0
C2H4	v%	0
C2H6	v%	5,75
C3H6	v%	0
C3H8	v%	0
C4H8	v%	0
n-C4H10	v%	0
iso-C4H10	v%	0
H2S	v%	0

Ambient		
T	°C	20
rel. Hum	%	70%
pressure	bar	1,01
Iterations		1.79E-03
Errors		2.07E-02

Feed	
17.500 kg/h	
8.750 kg/h db	
20,0 °C	
135 Bm3/h	
MC= 50,0%	

Legend:
 Am3/h ... actual m3/h (flow @ actual pressure and temperature)
 Nm3/h ... normal m3/h (flow @ 1bar pressure and 0°C)

Note:
 Values in this illustration reflect calculation results and assumptions and are not guarantee figures.

Select Iteration **Gas-Burner**

Fuel Gas	
522 kg/h	
674 Nm3/h	
20 °C	
NCV= 35996 kJ/Nm3	
6.741 kW	

Comb. Air	
11.699 kg/h	
9.845 Am3/h	
9.146 Nm3/h	
20 °C	

Mix Drum IN	
94.451 kg/h	
170.537 Am3/h	
295 °C	
0,4% rel. hum.	
22.706 kW	

Leakage	
12.159 kg/h	
10.232 Am3/h	
20 °C	

Recycle	
70.072 kg/h	
86.351 Am3/h	
104 °C	
14.915 kW	

Offgas	
33.368 kg/h	
40.903 Am3/h	
102 °C	
29.704 Nm3/h	

Selected drum type
 DX-1500
 WE= 7.206 kg/h

Drum OUT	
101.657 kg/h	
125.942 Am3/h	
105 °C	
30,2% rel. hum.	
21.995 kW	

Thermal Losses
 404 kW sensible

OPTION	
assumed Dustload	assumed NOx
< 5 mg/Nm3	50 mg/Nm3

Offgas	
34.304 kg/h	
47.266 Am3/h	
30.436 Nm3/h	
150 °C	

Separation-Eff.	
98,0%	

Separation-Eff.	
99,60%	

Leakage	
1.782 kg/h	
1.500 Am3/h	
20 °C	

Product	
10.293 kg/h	
1.544 kg/h db	
90,0 °C	
127 Am3/h	
MC= 15,0%	