



Aspen Environmental Ltd,
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Mr Rob Hunter
United Fish Industries Ltd,
Gilbey Road,
Grimsby
DN31 2SL.

Ref: L.2303

Date: 04/03/2016

Dear Rob,

Emissions Testing at Grimsby:

I am pleased to present my report of the emissions testing from your drier and grinder, undertaken on your site on the 19th February 2016.

If you have any queries on any part of this report, please do not hesitate to contact me.

Yours sincerely
For Aspen Environmental Ltd,

Dr Geoff Buck,
Director.

**Emissions Testing Report:
Part 1, Executive Summary:**



UKAS Report

Emissions Testing from Meal Cooler & Grinder Stacks

Permit Number: NE Lincs Council July 2005
United Fish Industries (UK) Ltd
Monitoring Date: 19/02/2016
Aspen Reference Number: J.1253

**Monitoring of:
Meal Cooler and Grinder**

United Fish Industries (UK) Ltd, Gilbey Road, Grimsby, DN13 2SL.

Contact Details
Mr Rob Hunter
01472 263342

**by:
Aspen Environmental Ltd,
25A Church St, Uttoxeter, Staffordshire, ST14 8AG.**

Report Date: 4th March 2016

Prepared for Aspen Environmental Ltd by
Dr G.W.Buck (Director)
MCerts Registered MM 02 001 Level 2, TE1, TE3, TE4.

A handwritten signature in black ink, which appears to read 'Geoff Buck', is written over a horizontal dotted line.

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Monitoring Objectives

United Fish Industries run a fish meal processing plant at their site in Grimsby. The site imports fish offal from various other sites around the country. The site is regulated as a schedule B process by NE Lincolnshire Council, under the Pollution Prevention and Control (England and Wales) Regulations 2000.

The emissions from the meal grinder and drier were tested, from a permanent platform into the vertical exhaust.

Sampling was undertaken by Dr G Buck & Mr J Buck of Aspen Environmental on the 19th February 2016.

Monitored Substances

Particulates were collected following Aspen Environmental's UKAS accredited isokinetic sampling methodology A5 (to EN 13284-1). Samples were collected onto preweighed 25 mm glass fibre filters, which were subsequently reweighed by a UKAS accredited weighing laboratory, to determine the weight of particulates collected. Isokinetic sampling rate was maintained using a rotameter flowmeter, and gas volume sampled was determined using a gas meter traceable to National Standards.

Monitoring Results

A standard reporting table is inserted overleaf:

A detailed summary for the Meal Cooler MF01 is included in Appendix 2.

A detailed summary for the Meal Grinder MF02 is included in Appendix 3.

The laboratory analytical results are included as Appendix 4.

The Uncertainty calculations on the Measurements are included as Appendix 5

Operating Information

Plant throughput was normal throughout the sampling day.

There is no abatement in place on either exhaust.

No CEMS are in place.


Monitoring Deviations

Both stacks were sampled using centre point methodology.

Only one traverse was used on each of the two stacks.

There were no other deviations from the standard method.

One of the isokinetic flow results was marginally too high

 Aspen Environmental Ltd											
United Fish Industries, Grimsby											
Emissions Testing February 2016											
Emission Point Reference	Substance to be Monitored	Emission Limit Value	Periodic Monitoring Result	Uncertainty	Units	Reference Conditions 273 K, 1013 mb	Date of Sampling	Start & End Times	Monitoring Method Reference	Accreditation for use of Method	Operating Status
Mcal Cooler MF01	Particulates	20	3.8	± 6.1 %	mg/Nm ³	Wet Gas	19/02/2016	10:20 - 10:51 11:00 - 11:30	EN 13284-1	MCerts	Normal Running
Meal Grinder MF02	Particulates	20	10.3	± 6.1 %	mg/Nm ³	Wet Gas	19/02/2016	11:44 - 12:14 12:22 - 12:54	EN 13284-1	MCerts	Normal Running
Notes Dr G.W Buck is personally MCerted to Level 2 with Technical Endorsements TE1 (Isokinetic Sampling), TE3 (Gases by manual techniques), & TE4 (Gases by Instrumental Methods) Aspen Environmental Ltd is a UKAS accredited Testing Laboratory No. 2395											

Appendix 1: Personnel, Methodologies & Equipment

Part 2 Supporting Information

Aspen Personnel

Dr G.W.Buck	MCerts Reg. MM 02 001	Level 2	TE1, TE3, TE4 Team Leader (to Nov 2017)
Mr J Buck	MCerts Reg. MM 06 783	Level 1	(to June 2017)

Relevant Tests for which Aspen is MCerts & UKAS accredited

- (A1) Duct Pressure, Temperature & Velocity to EN 16911-1: 2002
- (A5) Total Particulate Matter in Stacks to EN 13284-1: 2013

General Description of Aspen Sampling Equipment:

Aspen Method A1

Pressure, Temperature & Velocity in Stacks & Ducts to EN 13284-1:2002.

Velocity & Static Pressure measuring equipment.

A UKAS calibrated UK (BS 1042) type Pitot tube (Aspen Ref 445), is used to calibrate other UK & US type pitot tubes (Aspen Refs 198, 200, 201, 236, 331, 472).

A UKAS calibrated Airflow PVM620 electronic micromanometer (Aspen Ref 501).

All pitot tubes are vacuum checked before usage.

Temperature measuring equipment.

UKAS calibrated thermocouple (Annually changed).

A UKAS calibrated Digitron 3208 IS thermocouple reader (Aspen Ref 328).

Aspen Method A5

Particulates in stacks & ducts

Exhaust gas is drawn isokinetically through custom made stainless steel sampling tips to a stainless steel or delrin in line filter holder, containing a suitable preweighed & conditioned glass or quartz fibre filter. A pitot tube and thermocouple can be attached to the filter to allow continuous readings of velocity pressure. The whole assembly is supported on a stainless steel probe, the whole being attached to the sampling port. The filter tip is accurately positioned & held in several places (as required), within the exhaust by a compression joint with teflon ferrules. Post filtration the gas is carried down a heavy duty hose to ground level, where it passes through a large silica gel trap and a fine filter to a vacuum pump. The exhaust from the vacuum pump passes through a flowmeter (indicative) via a thermocouple to a calibrated dry gas meter (Aspen Ref 97 & 102), and thence direct to atmosphere. The whole line is constructed to EN 13284-1.

The line is flexible such that it can be reconfigured to allow the filter unit to be heated inside the flue, or located outside the flue with the line to the filter unit being heated also.

Aspen Method Statement

A1 & A5 Particulate Testing to EN 13284-1:2002.

Testing is isokinetic to collect particulates onto 47mm glass fibre filter papers.

The filter papers are pre conditioned at 180 ° C and uniquely numbered.

The first requirement is to measure the exhaust velocity, stack size & geometry to determine the suitability of the location for sampling.

The sampling line is a modified Italian system, using numbered 4, 6 & 8 mm diameter tips, a 47 mm in line filter holder, and a supported probe to allow correct positioning. A pitot tube and thermocouple can be attached to the probe tip to allow continuous monitoring of the stack conditions.

A hose connects the high level probe to the low level equipment, which consists of a large in line silica gel trap, containing dry silica gel with a colour indicator. From here the line passes through an in line stainless steel mesh filter, (to prevent silica gel granules migrating into the sampling pump), to a sealed 110 (or 240V) diaphragm pump. The exhaust from the pump passes through a rotameter flow meter, to a calibrated dry gas meter with an attached thermocouple, the final exhaust from the DGM is to atmosphere, so that the DGM reads at atmospheric pressure.

Sampling time is a minimum of 30 minutes per sample, and the system is arranged such that the maximum volume of sample air is collected.

Post sampling the filter paper is carefully extracted from the filter holder and returned to its uniquely labelled sample pot. Any residual filter fibres and pre filter probe contamination are rinsed out of the filter holder & probe into a clean bottle, using deionised water & an acetone final rinse.

The filter is reconditioned and reweighed by a UKAS accredited laboratory, and the retained rinse solution is evaporated and the residue weighed.

Results are presented as milligrams of particulates per cubic metre of sample air.

Appendix 2

Meal Cooler Data MF01

United Fish Industries Ltd, Grimsby										Aspen Environmental Ltd			
Particulate Emissions (18/02/2016)													
References		Dry Gas Meter:			Temperature °C		Time		Particulates				
Filter	Acetone Rinse	DGM Correction Factor = 1.03		Stack	Gas Meter	Normal Sample Volume Litres	Initial	Final	Elapsed minutes	Filter mg	Acetone mg	Concentration mg/m ³	
		Initial	Final										Elapsed
Meal Cooler MF01													
Barometric Pressure =													
126617	G11136	589421.6	589820.8	37	11	374.0	10:20	10:51	31	0.080	1.4	3.96	
126625	G11138	589827.8	590208.6	37	11	356.8	11:00	11:30	30	<0.040	1.27	3.67	
						Dry Gas Volume				Dry Gas Mean 3.81			
						Wet Gas Volume				Wet Gas Mean 3.79			
Percentage Isokinetic Sampling Efficiency													
Meal Cooler MF01													
Normal Duct Velocity		6.08 Nm / s		Sample Volume in Litres		Theoretical		628.9					
Sampling Tip Diameter		6 mm		Actual		730.8							
Sampling Time		61 minutes		% Isokinetic		116.2							

Pitot Flow Measurements			Aspen Environmental Ltd				
Client: United Fish Industries Address: Grimsby			Date: 18/02/2016 Operator: GB & JB Job Number: 1253 Location: Meal Cooler MF01				
Details of Duct			Atmospheric Pressure (Pa) millibars				
			Instrument			Correction	Corrected
Duct Shape:	Vertical	Circular	Initial:	1020	-3	1017	
Dimension / Diameter: (cm)			Final:	1020	-3	1017	
Area: sq metres			Mean:			1017	
			Axis 1:			Axis 2:	
Pitot Tube stance into Duct			Velocity			Static	
Position: % Diameter	cm		Pressure	Pressure	Pressure	Pressure	Temp
			Pv	Ps	° Celsius	Pv	Ps
			Pascals	Pascals		Pascals	Pascals
3	15.3	6.1	47.5	170	37	36.1	170
Centre	50	20.0	30				
8	84.7	33.9	40.8	170	37	58.7	170
RMS & Means:			40.09	170.00	37.00	48.73	170.00
Mean Pv (Pascals)			44.41	Thermo & Reader		545 & 328	
Static Pressure (Pa)			170	Pitot Tube & Manometer		472 & 501	
						Mean T in K (°C + 273)	
						310	
						K Factor	
						1	
Duct Velocity (V) @ Temperature (T) in metres per second							8.81
Duct Velocity (V) @ 273K, 1013mb, in metres per second							7.79
Duct Volume Flow @ T in cubic metres per second							1.11
Duct Volume Flow @ 273K, 1013mb, in cubic metres per second							0.98
Duct Volume Flow @ 273K, 1013mb, in cubic feet per minute							2074
Duct Volume Flow @ Temperature (T) in cubic feet per minute							2346
© Aspen Environmental Form 20 Version 7 (May 2013)							

Pitot & Isokinetic Sampling Data Form		Aspen Environmental Ltd						
Site & Stack Location <u>1/11/10</u> <u>1784</u> <u>MWH (ASBEST)</u> <u>MFO1</u>		Sheet Number <u>1</u> of <u>4</u> .	Job Ref <u>1253</u>					
Date <u>12/16</u>		Pitot Tube & Micromanometer <u>472 + 501</u>						
Thermocouple & Reader <u>528 + 525</u>	Deformed? <input checked="" type="checkbox"/>	Clean? <input checked="" type="checkbox"/>	Straight? <input checked="" type="checkbox"/>					
Pitot Checks:	Blocked? <input checked="" type="checkbox"/>	Barometric Pressure mb <u>1020</u>						
Leak Check: Vacuum leak check: (GB) <input checked="" type="checkbox"/>	Ambient Temperature °C <u>11.2</u>							
S type pitot: Static Pressure must be < 10 Pa on each side								
1st Traverse	1	2	3	4	5	6	7	8
Velocity pressure Pv	<u>47.5</u>	<u>40.8</u>	<u>~30</u>					
Static Pressure Ps	<u>4170</u>							
Temp °C	<u>37</u>							
Swirl Angle °								
Velocity m/s								
Sampling l/min								
Tip Diam mm								
Uncertainty Pv:								
2nd Traverse	1	2	3	4	5	6	7	8
Velocity pressure Pv	<u>36.1</u>	<u>56.7</u>						
Static Pressure Ps								
Temp °C								
Swirl Angle °								
Velocity m/s								
Sampling l/min								
Tip Diam mm								
Site Diagram, Sampling Details & Comments		<p style="text-align: right;">7.79 N_m/s 0.9N N_m³/s</p> <p style="text-align: center;">Operator GB + JB</p>						

Aspen Environmental Ltd		Sheet No: 2 of 4		Sampling Data Form		
Location & Drawing MFK COOL MF01		Date 19/2/16		Location Time		
		Barometric Pressure mb		1020		
		Temperature °C		Exhaust		
		Gas Meter		Ambient		
		9.9				
Stack Dimensions (cm) & Aspect		Aspen Job Number		1253		
Sample Reference	Position	Time		Vacuum %	Sampling Points	Notes
		Initial	Final			
	VAC	10.18	11.6	<2		SG1 959.9
12647		10.20	58921.6	✓		
	VAC	10.55	58920.6			Is the SiGel >50 % Fresh ✓
	VAC	10.58	24.0	✓		Stack Gas Homogeneity N/A
		11.00	27.8	✓		Equipment & Blank
		11.00	58927.8			Pump
		11.52	51020.6			Flowmeter
			12.1	✓		Gasmeter
						Gas Temp
						Silica Gel
						Thermocouple
						Field Blank
						Operator
						Gbr JB
						Normal Flow
						See 1
Aspen Environmental Ltd Form 1C Sampling Data Form v1 (Dec 2014)						

Appendix 3

Meal Grinder Data MF02

United Fish Industries Ltd, Grimsby										Aspen Environmental Ltd				
Particulate Emissions (18/02/2016)														
References		Dry Gas Meter:			Temperature °C		Time		Particulates					
Filter	Acetone Rinse	DGM Correction Factor =	Initial	Final	Elapsed	Stack	Gas Meter	Normal Sample Volume Litres	Initial	Final	Elapsed	Filter	Acetone	Concentration
											minutes	mg	mg	mg/m3
Meal Grinder MF02														
Barometric Pressure = 1017 mb														
126639	G11140	590215.5	590598.8	583.3	1017	24	15	354.1	11:44	12:14	30	2.080	2.4	12.65
126624	G11137	590605.4	591013.0	407.6		24	15	376.6	12:22	12:54	32	1.900	1.13	8.05
								Dry Gas Volume				Dry Gas Mean		10.35
								Wet Gas Volume				Wet Gas Mean		10.27
126626	G11139	Field Blank						736.1				<0.040	0.77	
Percentage Isokinetic Sampling Efficiency														
Meal Grinder MF02										Sample Volume in Litres				
Normal Duct Velocity		3.58 Nm / s							Theoretical		670.4			
Sampling Tip Diameter		8 mm							Actual		730.7			
Sampling Time		62 minutes							% Isokinetic		109.0			

Pitot Flow Measurements			Aspen Environmental Ltd					
Client: United Fish Industries Address: Grimsby			Date: 18/02/2016 Operator: GB & JB Job Number: 1253 Location: Meal Ginder MF02					
Details of Duct			Atmospheric Pressure (Pa) millibars					
			Instrument			Correction		Corrected
Duct Shape:	Vertical	Circular	Initial:	1020		-3		1017
Dimension / Diameter: (cm)			Final:	1020		-3		1017
Area: sq metres			Mean:					1017
Pitot Tube stance into Duct			Axis 1:			Axis 2:		
Position:	% Diameter	cm	Velocity	Static	Duct	Velocity	Static	Duct
			Pressure	Pressure	Temp	Pressure	Pressure	Temp
			Pv	Ps	° Celsius	Pv	Ps	° Celsius
			Pascals	Pascals		Pascals	Pascals	
3	15.3	3.8	12.2	125	24	8.8	125	24
Centre	50	12.5	9					
8	84.7	21.2	8.8	125	24	9.3	125	24
RMS & Means:			10.12	125.00	24.00	9.05	125.00	24.00
Mean Pv (Pascals)		9.59	Thermo & Reader		545 & 328	Mean T in K (°C + 273)		297
Static Pressure (Pa)		125	Pitot Tube & Manometer		472 & 501	K Factor		1
Duct Velocity (V) @ Temperature (T) in metres per second								4.01
Duct Velocity (V) @ 273K, 1013mb, in metres per second								3.70
Duct Volume Flow @ T in cubic metres per second								0.20
Duct Volume Flow @ 273K, 1013mb, in cubic metres per second								0.18
Duct Volume Flow @ 273K, 1013mb, in cubic feet per minute								385
Duct Volume Flow @ Temperature (T) in cubic feet per minute								417
<small>© Aspen Environmental Form 20 Version 7 (May 2013)</small>								

Pitot & Isokinetic Sampling Data Form		Aspen Environmental Ltd	
Site & Stack Location		1702 United Fish Processing GARDER.	
Date	19/2/16	Sheet Number	3 of 4
Thermocouple & Reader		Job Ref	1253
Pitot Checks:		Pitot Tube & Micromanometer	See 1
Deformed? <input checked="" type="checkbox"/>		Clean? <input checked="" type="checkbox"/>	Straight? <input checked="" type="checkbox"/>
Leak Check: Vacuum leak check: (GB) <input checked="" type="checkbox"/>		Barometric Pressure mb	1020
S type pitot: Static Pressure must be < 10 Pa on each side		Ambient Temperature °C	15
1st Traverse		5	6
Velocity pressure Pv	12.2	7	8
Static Pressure Ps	8.8		
Temp °C	24.		
Swirl Angle °			
Velocity m/s			
Sampling l/min			
Tip Diam mm			
Uncertainty Pv:			
2nd Traverse		3	4
Velocity pressure Pv	8.8	5	6
Static Pressure Ps	9.3	7	8
Temp °C			
Swirl Angle °			
Velocity m/s			
Sampling l/min			
Tip Diam mm			
Site Diagram, Sampling Details & Comments			
Stack id. 25cm. Alpha Ue 3.9 m/s. 11/14/16 8 m/s			
			Operator 68 r JD

Aspen Environmental Ltd				Sheet No: 4 of 4				Sampling Data Form			
Location & Drawing GRIMSKY UNIMBO FISH MGRK GRIMBOEC. MF02				Location Date 19/2/16 Barometric Pressure mb Temperature °C Exhaust Ambient 15.1 Gas Meter				Aspen Job Number 1253			
Sample Reference	Position	Time		Gas Meter / Counter		Vacuum %	Sampling Points		Notes		
		Initial	Final	Initial	Final		cm	Comments			
126659	VAC.	11.41	+1	5902152	590986	<2			5.921 967.8		
		11.44	+30								
	VAC	12.17	+1	6020	6022				Is the SiGel >50 % Fresh Y Stack Gas Homogeneity N/A		
	VAC	12.19	+1	6052	6052				Equipment & Blank		
					6054						
126624		12.22	+32	590654	591050						
		12.56	+1	16.0	16.1				Pump Flowmeter Gasmeter Gas Temp Silica Gel Thermocouple Field Blank		
126626	Field Blank								Operator CB + JB		
									Normal Flow		

Aspen Environmental Ltd Form IC Sampling Data Form v1 (Dec 2014)

Appendix 4

Laboratory Analytical Results



Test Certificate

Date 03/03/2018

Client
Aspen Environmental Ltd
25A Church Street
Uttoxeter
Staffordshire
ST14 8AG

Order No. 1987
Certificate No. WK15-1096
Issue No. 1

Contact Dr Geoff Buck

Date Received 23/02/2018

Description 5 filters & 5 washes for TPM

Technique Gravimetric Stack

Sample No.	870102	128817	Method
<hr/>			
Total particulate matter	0.08 mg		D9(U)
<hr/>			
Sample No.	870103	128824	Method
<hr/>			
Total particulate matter	1.90 mg		D9(U)
<hr/>			
Sample No.	870104	128825	Method
<hr/>			
Total particulate matter	<0.04 mg		D9(U)
<hr/>			
Sample No.	870105	128828	Method
<hr/>			
Total particulate matter	<0.04 mg		D9(U)
<hr/>			
Sample No.	870106	128839	Method
<hr/>			
Total particulate matter	2.08 mg		D9(U)
<hr/>			
Sample No.	870107	G11136	Method
<hr/>			
Total particulate matter	1.40 mg		D9(U)
<hr/>			
Sample No.	870108	G11137	Method
<hr/>			
Total particulate matter	1.13 mg		D9(U)
<hr/>			
Sample No.	870109	G11138	Method
<hr/>			
Total particulate matter	1.27 mg		D9(U)
<hr/>			



Test Certificate

Date 03/03/2016

Client	Aspen Environmental Ltd		Certificate No.	WK15-1036
			Issue No.	1
Sample No.	670110	G11136	Method	
Total particulate matter		0.77 mg	D9(U)	
Sample No.	870111	G11140	Method	
Total particulate matter		2.40 mg	D9(U)	

Tested By: Simon Doodson Date: 03/03/2016

Approved By: Date: 03/03/2016
 Joanna Dawhurst
 Operational Manager

For and on authority of RPS Laboratories Ltd.

Method Symbols: (U) Analysis is UKAS Accredited
 (N) Analysis is not UKAS Accredited

Concentration values (mg/m³ and ppm) are calculated on the basis of information provided by the customer.
 Results stated as ml are relating to the sample volume.

RPS Laboratories terms and conditions apply - a copy is available on request.
 Analysis carried out on samples as received!

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Appendix 5

Uncertainty Calculations

Uncertainty for Particulate Sampling to EN 13284: 2002				Aspen Environmental Ltd	
Principal Uncertainties for Particulate Sample of 10 mg					
Cahn Balance (PBS) at 100 mg	± 0.022mg	95 %		0.0220	0.0005
Volume Measurement (Schlumberger)(Labcal) 400 L	± 0.5 % of volume	2 litres	4	4.0000	16.0000
	+ resolution	0.2 litres	0.025	0.1200	0.0144
DGM Aspen 97	± 2.3 %			4.6000	21.1600
Change in DGM temperature	± 10/293			0.0341	0.0012
Change in atmospheric pressure	± 2/1013			0.0020	0.0000
No change in humidity (dry gas)					
No change in oxygen (LEV system)					
				Sum Sqs	37.1761
				sq rt	6.0972
				Expanded Result	6.1 %