Aspen Environmental Ltd,
25A Church Street, Uttoxeter, ST14 8AG.
Tel: 01889 568124, Fax: 05602 059321.
mail@aspenenvironmental.co.uk

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

Ref: L.2171

Date: 29/01/2014

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 20th December 2013.

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: 20/12/2013
Aspen Reference Number: J.1132

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: 29th January 2014

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

Contents

Monitoring Objectives

United Fish Industries run a fish meal 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 & Control Act 1999.

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 20th December 2013.

Monitored Substances

Particulates were collected following Aspen Environmental's UKAS accredited isokinetic sampling methodology A5 (to EN 13284-1). Samples were collected onto preweighed 47 mm glass fibre filters, which were subsequently reweighed by a UKAS accredited weighing laboratory, to determine 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, and a detailed summary for each parameter is included in Appendix 2.

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.
Both stacks were sampled using a 4 mm sampling tip.
Only one traverse was used on the meal grinder stack, MF02.
There were no other deviations from the standard method.

United Fish Industries, Grimsby

Aspen Environmental Ltd

Emissions Testing 2012

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
Meal Cooler MF01	Particulates	20	< 1.1	± 6.1 %	mg/Nm^3	Wet Gas	20/12/2013	10:13 - 10:53 11:02 - 11:42	EN 13284-1	MCerts	Normal Running
Meal Grinder MF02	Particulates	20	2.1	± 6.1 %	mg/Nm^3	Wet Gas	20/12/2013	11:54 - 12:35 12:43 - 13:23	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 May 2015)
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 13384-1: 2002
(A5) Total Particulate Matter in Stacks to EN 13284-1: 2002

General Description of Aspen Sampling Equipment:

Aspen Method A1
Pressure, Temperature & Velocity in Stacks & Ducts to EN 13284-1:2002 & BS 9096:2003

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 & BS ISO 9096:2003.

Testing is isokinetic to collect particulates onto 47mm glass fibre filter papers.
The filter papers are pre conditioned at 180 º 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 & Grinder Data

Pitot Flow Measurements

Aspen Environmental Ltd

Client:	United Fish Industries	**Time & Date:**	20/12/2013
Address:	Grimsby	**Operator:**	GB +JB
		Job Number:	1132
		Location:	Meal Cooler MF01

Details of Duct			**Absolute Atmospheric Pressure (millibars)**			
				Instrument	**Correction**	**Corrected**
Duct Shape:	Vertical	Circular	**Initial:**	1021	-2	1019
Dimension / Diameter: (cm)		40	**Final:**	1021	-2	1019
Area: sq metres		0.13	**Mean:**			1019

Pitot Tube Position:	**Distance into Duct % Diameter**	**cm**	**Axis 1: Velocity Pressure Pv Pascals**	**Static Pressure Ps Pascals**	**Duct Temp ° Celsius**	**Axis 2: Velocity Pressure Pv Pascals**	**Static Pressure Ps Pascals**	**Duct Temp ° Celsius**
1	**1.9**	0.8	120	250	31	145	238	31
2	**7.7**	3.1	100	256	31	120	260	31
3	**15.3**	6.1	80	254	31	102	248	31
4	**21.7**	8.7	65	257	31	80	244	31
5	**36.1**	14.4	55	262	31	62	242	31
6	**63.9**	25.6	50	258	31	58	241	31
7	**78.3**	31.3	50	254	31	59	245	31
8	**84.7**	33.9	56	254	31	60	255	31
9	**92.3**	36.9	65	252	31	68	262	31
10	**98.1**	39.2	84	240	31	60	255	31
	RMS & Means:		75.81	253.7	31	86.45	249	31

Mean Pv (Pascals)	81.13	**Mean T in K (°C + 273)**			304
Static Pressure (Pa)	251.35	**Pitot Tube & Manometer**	331 & 501	**K Factor**	0.83

Duct Velocity (V) @ Temperature (T) in metres per second	**9.77**
Duct Velocity (V) @ 273K, 1013mb, in metres per second	**8.83**
Duct Volume Flow @ T in cubic metres per second	**1.23**
Duct Volume Flow @ 273K, 1013mb, in cubic metres per second	**1.11**
Duct Volume Flow @ 273K, 1013mb, in cubic feet per minute	**2351**
Duct Volume Flow @ Temperature (T) in cubic feet per minute	**2602**

Pitot Flow Measurements

Aspen Environmental Ltd

Client:	United Fish Industries	**Time & Date:**	20/12/2013
Address:	Grimsby	**Operator:**	GB +JB
		Job Number:	1132
		Location:	Meal Grinder MF02

Details of Duct

Duct Shape:	Vertical	Circular
Dimension / Diameter: (cm)		25
Area: sq metres		0.05

Absolute Atmospheric Pressure (millibars)

	Instrument	Correction	Corrected
Initial:	1021	-2	1019
Final:	1021	-2	1019
Mean:			1019

Pitot Tube Position:	Distance into Duct % Diamete	cm	Axis 1: Velocity Pressure Pv Pascals	Static Pressure Ps Pascals	Duct Temp ° Celsius	Axis 2: Velocity Pressure Pv Pascals	Static Pressure Ps Pascals	Duct Temp ° Celsius
1	1.9	0.5	270	110	27			
2	7.7	1.9	260	130	27			
3	15.3	3.8	290	130	27			
4	21.7	5.4	220	150	27			
5	36.1	9.0	220	150	27			
6	63.9	16.0	228	170	27			
7	78.3	19.6	270	180	27			
8	84.7	21.2	300	180	27			
9	92.3	23.1	350	200	27			
10	98.1	24.5	380	220	27			
	RMS & Means:		283.41	162	27	283.41	162	27

Mean Pv (Pascals)	283.41	**Mean T in K (°C + 273)**			300
Static Pressure (Pa)	162	**Pitot Tube & Manometer**	331 & 501	**K Factor**	0.83

Duct Velocity (V) @ Temperature (T) in metres per second	**18.15**
Duct Velocity (V) @ 273K, 1013mb, in metres per second	**16.62**
Duct Volume Flow @ T in cubic metres per second	**0.89**
Duct Volume Flow @ 273K, 1013mb, in cubic metres per second	**0.82**
Duct Volume Flow @ 273K, 1013mb, in cubic feet per minute	**1728**
Duct Volume Flow @ Temperature (T) in cubic feet per minute	**1888**

RPS

UKAS TESTING 0605

Test Certificate

Date 15/01/2014

Client	Aspen Environmental Ltd 25A Church Street Uttoxeter Staffordshire ST14 8AG	**Order No.**	1768
		Certificate No.	WK14-0132
		Issue No.	1
Contact	Dr Geoff Buck	**Date Received**	09/01/2014
Description	5 filters & 5 washes for TPM	**Technique**	Gravimetric Stack

Sample No.	**775040**	**104183**	**Method**
Total particulate matter	<0.04 mg		D9(U)
Sample No.	**775041**	**104184**	**Method**
Total particulate matter	0.85 mg		D9(U)
Sample No.	**775042**	**104185**	**Method**
Total particulate matter	0.58 mg		D9(U)
Sample No.	**775043**	**104186**	**Method**
Total particulate matter	<0.04 mg		D9(U)
Sample No.	**775044**	**104187**	**Method**
Total particulate matter	<0.04 mg		D9(U)
Sample No.	**775045**	**G10340**	**Method**
Total particulate matter	<0.5 mg		D9(U)
Sample No.	**775046**	**G10341**	**Method**
Total particulate matter	0.6 mg		D9(U)
Sample No.	**775047**	**G10342**	**Method**
Total particulate matter	<0.5 mg		D9(U)

RPS Laboratories Ltd. Unit 12. Waters Edge Business Park. Modwen Road. Salford. M5 3EZ
Tel: (0161) 872 2443 Fax: (0161) 877 3959

UKAS TESTING 0605

Date 15/01/2014

Test Certificate

Client	Aspen Environmental Ltd	**Certificate No.**	**WK14-0132**
		Issue No.	1

Sample No.	**775048**	**G10343**	**Method**
Total particulate matter	<0.5 mg		D9(U)
Sample No.	**775049**	**G10344**	**Method**
Total particulate matter	<0.5 mg		D9(U)

Tested By Kirstie Davenport Date 14/01/2014
15/01/2014

Approved By Date 15/01/2014

Joanne Dewhurst
Laboratory 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.

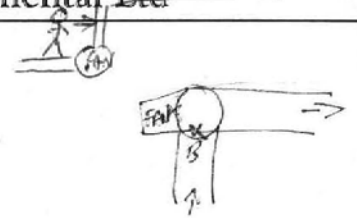
RPS Laboratories terms and conditions apply - a copy is available on request.
Analysis carried out on samples 'as received'

RPS Laboratories Ltd. Unit 12. Waters Edge Business Park. Modwen Road. Salford. M5 3EZ
Tel: (0161) 872 2443 Fax: (0161) 877 3959

Aspen Environmental Ltd ⟹ | Sheet No: 1 of 2 | **General Sampling Data Form**

Location & Drawing

MF01
United Fish
Grimsby
Meal Cooler



Location													
Date 20/12/13	Time												
Barometric Pressure	mb	1021											
Temperature ° C	Exhaust												
	Ambient	6											
	Gas Meter	12											

Pitot Tube Traverses (Measurements in Pa) | **Stack Dimensions (cm) & Aspect** 40cm Ø 10 circ vert 4 | **Aspen Job Number** 1132

Position	Time	1	2	3	4	5	6	7	8	9	10	Mean	Notes
Pv		120	100	80	65	55	0.50	50	56	65	84		949.2
Ps	A	250	256	254	253	262	258	256	254	252	+240		
T		4									31		
Angle													
Pv		145	120	102	80	62	0 58	59	60	68	60		Is the SiGel >50 % Fresh Y
Ps	B	238	260	248	244	242	241	245	255	262	255		Stack Gas Homogeneity N/A
T		4									31		
Angle													

Flow @ Ambient m / s | **Sampling Flow** L / min | **Tip Diameter** mm | **Pitot Tube & Manometer** 331+501 vac'd ✓ | **Equipment & Blank**

Sample Reference	Position	Time Initial	Time Final	Gas Meter / Counter Initial	Gas Meter / Counter Final	Vacuum % <2	Sampling Points ° Centre Point. cm / Comments		
	VAC	10.09	+1	65.4	80.0	✓✓	56 l/m @ 31°C	129	Pump
							8.2 m/s	80 + 82	Flowmeter
104187		10.13	+40	528786.0	529053.5		6.2 L/m @ 4mm.	97	Gasmeter
	VAC	10.56	+1	56.6	56.8	✓✓		83	Gas Temp
								1	Silica Gel
									Thermocouple
	VAC	10.59	+1	60.0	60.2	✓✓			Field Blank
104186		11.02	+40	529060.2	529319.5				
		11.43	+1	23.2	23.4	✓✓			

Operator
GB + JB

Normal Flow
3.83 Nm/s
1.11 Nm³/s

Form 1 | | Version 11 (Dec 2012)

Aspen Environmental Ltd

Sheet No: 2 of 2

General Sampling Data Form

Location & Drawing
United Fish.
Meal Grinder
MF 02

Location						
Date 20/12/13 Time						
Barometric Pressure mb						
Temperature °C Exhaust						
Ambient	12					
Gas Meter	12					

Pitot Tube Traverses (Measurements in Pa) — **Stack Dimensions (cm) & Aspect** 25cm Ø 10 CFC HORIZONTAL. — **Aspen Job Number** 1132

Position	Time	1	2	3	4	5	6	7	8	9	10	Mean	Notes
Pv		270	260	290	260	220	228	270	300	350	380		958.7
Ps		+110	+130	+130	+150	+150	+170	+180	+180	+200	+220		
T		↓									27		
Angle													
Pv													Is the SiGel >50 % Fresh Y
Ps													Stack Gas Homogeneity N/A
T													
Angle													

Flow @ Ambient m / s — Sampling Flow L / min — Tip Diameter mm — Pitot Tube & Manometer 331 + 501 — Equipment & Blank A21

Sample Reference	Position	Time Initial	Time Final	Gas Meter / Counter Initial	Gas Meter / Counter Final	Vacuum % <2	Sampling Points / Comments	cm	
	VAC	11.48	11.49	268270	27.2	✓✓	224 Pa @ 27°C		Pump
							16.3 m/s		Flowmeter
104185		11.54	+41	529327.2	529900.8		123 l/m @ 4mm.		Gasmeter
	VAC	12.37	+1	906.2	906.4	✓			Gas Temp
									Silica Gel
	VAC	12.41	+1	907.8	908.0	✓			Thermocouple
104184		12.43	+40	529908.0	530480.8				Field Blank
	VAC	13.26	+1	84.0	84.2	✓			
									Operator GR + JB
104183	Cyc								Normal Flow 16.62 Nm/s 0.82 Nm²/s

Form 1 © Aspen Environmental Ltd Version 11 (Dec 2012)