Ektimo

Impact Fertilisers Pty Ltd, Derwent Park

Quarterly Monitoring Program

Emission Testing Report - July 2022

Report Number R013182

Document Information

Template Version 270622

Client Name:	Impact Fertilisers Pty Ltd
Report Number:	R013182
Date of Issue:	2 August 2022
Attention:	Robert Felusch
Address:	171 Derwent Park Road Derwent Park TAS 7009
Testing Laboratory:	Ektimo Pty Ltd, ABN 86 600 381 413

Report Authorisation

Glenn Trenear
Senior Air Monitoring Consultant

NATA Accredited Laboratory
No. 14601

Accredited for compliance with ISO/IEC 17025 - Testing. NATA is a signatory to the ILAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration, and inspection reports.

Please note that only numerical results pertaining to measurements conducted directly by Ektimo are covered by Ektimo's terms of NATA accreditation as described in the Test Methods table. This does not include calculations that use data supplied by third-parties, comments, conclusions, or recommendations based upon the results. Refer to 'Test Methods' for full details of testing covered by NATA accreditation.

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1 Executive Summary

1.1 Background

Ektimo was engaged by Impact Fertilisers Pty Ltd to perform emission monitoring as part of ongoing environmental compliance monitoring. The sampling conducted constituted the quarterly monitoring program.

1.2 Project Objective

The objective of the project was to conduct a monitoring programme to quantify emissions from various locations to determine whether they were compliant with Impact Fertilisers Pty Ltd's EPN licence 7316/2.

Monitoring was performed as follows:

Location	Test Date	Test Parameters
Broadfield Mixer Scrubber Stack (Den Stack)*	1 July 2022	Total particulate matter Total gaseous and particulate fluoride
Mill Baghouse*		Total particulate matter
Ambient Site: Birch Rd **	30 June to 1 July 2022	Ambient fluoride (as HF)

* Flow rate, velocity, temperature, and moisture were also determined.
** Flow rate, velocity, temperature, and moisture were not determined.

All results are reported on a dry basis at STP.

1.3 Licence Comparison

The following licence comparison table shows that all analytes highlighted in green are within the licence limit set by the Tasmanian Environmental Protection Notice (EPN) as per licence 7316/2 (last amended on 8 July 2019).

Location Description	Pollutant	Units	Licence limit	Detected values 30 June to 1 July 2022
Broadfield Mixer Scrubber Stack	Fluoride (as F)	mg/m^3	50	32
	Particulates	mg/m^3	100	11
Mill Baghouse Stack	Particulates	mg/m^3	250	19
Birch Road	Ambient fluoride (as HF)	$\mu g/m^3$ 24 hour average	2.9	0.66

Please note that the measurement uncertainty associated with the test results was not considered when determining whether the results were compliant or non-compliant.

Refer to the Test Methods table for the measurement uncertainties.

2 Results

2.1 Broadfield Mixer Scrubber Stack (Den Stack)

Date	1/07/2022	**Client**	Impact Fertilisers Pty Ltd
Report	R013182	**Stack ID**	Broadfield Mixer Scrubber Stack
Licence No.	7316/2	**Location**	Derwent Park
Ektimo Staff	G Trenear & V Liu	**State**	TAS
Process Conditions	Feed rate: 23 t/hr	Rock type: Nauru 79.2%, Vietnamese 20.1%, Bauxite 0.7%	*220628*

Sampling Plane Details	
Sampling plane dimensions	900 mm
Sampling plane area	0.636 m²
Sampling port size, number	4" BSP (x2)
Duct orientation & shape	Horizontal Circular
Downstream disturbance	Centrifugal fan 1 D
Upstream disturbance	Bend 1 D
No. traverses & points sampled	1 10
Sample plane conformance to AS 4323.1	Non-conforming

Comments

The number of traverses sampled is less than the requirement
The number of points sampled is less than the requirement
The discharge is assumed to be composed of dry air and moisture

The sampling plane is deemed to be non-conforming due to the following reasons:

The highest to lowest gas velocity ratio exceeds 1.6:1
The upstream disturbance is <2D from the sampling plane
The stack or duct does not have the required number of access holes (ports)
The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D

Stack Parameters		
Moisture content, %v/v	12 (saturated)	
Gas molecular weight, g/g mole	27.7 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.24 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	1.04	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0844 & 1015	
Temperature, °C	52	
Velocity at sampling plane, m/s	18	
Volumetric flow rate, actual, m³/min	680	
Volumetric flow rate (wet STP), m³/min	570	
Volumetric flow rate (dry STP), m³/min	510	
Mass flow rate (wet basis), kg/hour	43000	

Isokinetic Results	Results	
Sampling time	0855-0955	
	Concentration mg/m³	Mass Rate g/min
Total particulate matter	11	5.4
Particulate fluoride (as F)	1.3	0.68
Gaseous fluoride (as F)	30	15
Total fluoride (as F)	32	16
Isokinetic Sampling Parameters		
Sampling time, min	60	
Isokinetic rate, %	101	
Gravimetric analysis date (total particulate)	08-07-2022	

2.2 Mill Baghouse

Date	1/07/2022	**Client**	Impact Fertilisers Pty Ltd
Report	R013182	**Stack ID**	Mill Baghouse
Licence No.	7316/2	**Location**	Derwent Park
Ektimo Staff	G Trenear & V Liu	**State**	TAS
Process Conditions	Feed rate: 23 t/hr	Rock type: Nauru 79.2%, Vietnamese 20.1%, Bauxite 0.7%	*220628*

Sampling Plane Details	
Sampling plane dimensions	600 mm
Sampling plane area	0.283 m²
Sampling port size, number	1 Holes (x2)
Duct orientation & shape	Vertical Circular
Downstream disturbance	Exit 2 D
Upstream disturbance	Centrifugal fan 2 D
No. traverses & points sampled	2 12
Sample plane conformance to AS 4323.1	Conforming but non-ideal

Comments

The discharge is assumed to be composed of dry air and moisture

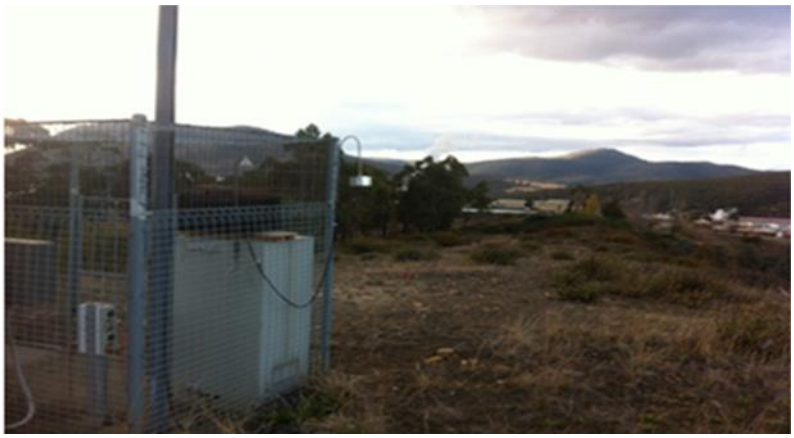
The sampling plane is deemed to be non-ideal due to the following reasons:

The sampling plane is too near to the downstream disturbance but is greater than or equal to 1D
The sampling plane is too near to the upstream disturbance but is greater than or equal to 2D

Stack Parameters		
Moisture content, %v/v	4.1	
Gas molecular weight, g/g mole	28.5 (wet)	29.0 (dry)
Gas density at STP, kg/m³	1.27 (wet)	1.29 (dry)
Gas density at discharge conditions, kg/m³	1.02	
Gas Flow Parameters		
Flow measurement time(s) (hhmm)	0905 & 1018	
Temperature, °C	73	
Velocity at sampling plane, m/s	15	
Volumetric flow rate, actual, m³/min	260	
Volumetric flow rate (wet STP), m³/min	200	
Volumetric flow rate (dry STP), m³/min	200	
Mass flow rate (wet basis), kg/hour	16000	

Isokinetic Results	Results	
Sampling time	0910-1012	
	Concentration mg/m³	Mass Rate g/min
Total particulate matter	19	3.8
Isokinetic Sampling Parameters		
Sampling time, min	60	
Isokinetic rate, %	99	
Gravimetric analysis date (total particulate)	08-07-2022	

2.3 Ambient Site: Birch Rd



Ambient Fluoride Sampling Location	Birch Rd
Co-ordinates	**S 42°50'09 E 147°18'45**
Siting in compliance with AS2922	**Yes**
Start Date and Time	30/06/2022 16:40
Finish Date and Time	1/07/2022 16:40
Average Temp (°C)	13
Barometric pressure (mBar)	1010
Particulate Fluoride Concentration (as HF) (µg/m^3) at Wet NTP (average per day)	**0.65**
Gaseous Fluoride Concentration (as HF) (µg/m^3) at Wet NTP (average per day)	**0.010**
Total Fluoride Concentration (as HF) (µg/m^3) at Wet NTP (average per day)	**0.66**

Refer to "WEATHER OBSERVATIONS" in the appendix.
Refer to "AMBIENT FLUORIDE SAMPLING LOCATIONS" in the appendix.

3 Test Methods

All sampling and analysis performed by Ektimo unless otherwise specified. Specific details of the methods are available upon request.

Parameter	Sampling method	Analysis method	Uncertainty*	NATA accredited Sampling	NATA accredited Analysis
Sampling points - Selection	AS 4323.1	NA	NA	✓	NA
Flow rate and velocity	AS 4323.1	AS 4323.1	8%, 7%	✓	✓
Moisture	USEPA Method 4	USEPA Method 4	8%	✓	✓
Moisture (stacks <60°C)	Ektimo 050	Ektimo 050	not specified	✓	✓
Total particulate matter	AS 4323.2	AS 4323.2	7%	✓	✓††
Total fluoride	USEPA Method 13B	ALS in-house method EA144C & Ektimo 235	17%	✓	✓#,†
Ambient gaseous and acid soluble particulate fluoride	AS 3580.13.2	AS 3580.13.2 and ALS in-house method EA144C	not specified	✓	✓#

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* Uncertainties cited in this table are estimated using typical values and are calculated at the 95% confidence level (coverage factor = 2).

† Analysis conducted at the Ektimo Mitcham, VIC laboratory, NATA accreditation number 14601. Results were reported on :
12 July 2022in report LV-003056.
12 July 2022 in report LV-003057.

†† Gravimetric analysis conducted at the Ektimo Mitcham, VIC laboratory, NATA accreditation number 14601.

Analysis (solid fluoride only) performed by Australian Laboratory Services Pty Ltd, NATA accreditation number 825. Results were reported to Ektimo on:
27 July 2022 in report EN2206639.
14 July 2022 in report EN2206640.

4 Quality Assurance/Quality Control Information

Ektimo is accredited by the National Association of Testing Authorities (NATA) for the sampling and analysis of air pollutants from industrial sources. Unless otherwise stated test methods used are accredited with the National Association of Testing Authorities. For full details, search for Ektimo at NATA's website www.nata.com.au.

Ektimo is accredited by NATA to ISO/IEC 17025 - Testing. ISO/IEC 17025 - Testing requires that a laboratory have adequate equipment to perform the testing, as well as laboratory personnel with the competence to perform the testing. This quality assurance system is administered and maintained by the Quality Director.

NATA is a member of APAC (Asia Pacific Accreditation Co-operation) and of ILAC (International Laboratory Accreditation Co-operation). Through mutual recognition arrangements with these organisations, NATA accreditation is recognised worldwide.

5 Definitions

The following symbols and abbreviations may be used in this test report:

% v/v	Volume to volume ratio, dry or wet basis
~	Approximately
<	Less than
>	Greater than
≥	Greater than or equal to
AS	Australian Standard
CEM/CEMS	Continuous emission monitoring/Continuous emission monitoring system
CTM	Conditional test method
D	Duct diameter or equivalent duct diameter for rectangular ducts
Disturbance	A flow obstruction or instability in the direction of the flow which may impede accurate flow determination. This includes centrifugal fans, axial fans, partially closed or closed dampers, louvres, bends, connections, junctions, direction changes or changes in pipe diameter.
EPA	Environment Protection Authority
FTIR	Fourier transform infra-red
ISC	Intersociety Committee, Methods of Air Sampling and Analysis
ISO	International Organisation for Standardisation
ITE	Individual threshold estimate
Lower bound	When an analyte is not present above the detection limit, the result is assumed to be equal to zero.
Medium bound	When an analyte is not present above the detection limit, the result is assumed to be equal to half of the detection limit.
NA	Not applicable
NATA	National Association of Testing Authorities
NT	Not tested or results not required
OM	Other approved method
STP	Standard temperature and pressure. Gas volumes and concentrations are expressed on a dry basis at 0 °C, at discharge oxygen concentration and an absolute pressure of 101.325 kPa.
TM	Test method
TOC	Total organic carbon. This is the sum of all compounds of carbon which contain at least one carbon-to-carbon bond, plus methane and its derivatives.
USEPA	United States Environmental Protection Agency
VDI	Verein Deutscher Ingenieure (Association of German Engineers)
Velocity difference	The percentage difference between the average of initial flows and after flows.
Vic EPA	Victorian Environment Protection Authority
Upper bound	When an analyte is not present above the detection limit, the result is assumed to be equal to the detection limit.
95% confidence interval	Range of values that contains the true result with 95% certainty. This means there is a 5% risk that the true result is outside this range.

6 Appendix 1: Weather Observations

Hobart Tasmania June 2022

Date	Day	Temps		Rain	Max wind gust			9:00 AM						3:00 PM					
		Min	Max		Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
30	Th	7.1	12.5	1	SSW	41	4:17	7.7	73	3	SW	17	1025.5	10.2	53	6	SW	24	1026.0
Statistics for June 2022																			
Mean		5.8	12.5					8	76	5		14	1012.4	11.1	63	5		16	1011.4
Lowest		2.4	8	0				4.4	58	1	Calm		987.6	5.1	48	1	Calm		988.6
Highest		10.2	16.2	13.2	WNW	106		11.3	99	8	NNW	30	1032.1	15.6	85	8	WSW	39	1029.2
Total			58.2	33.6															

IDCJDW7021.202206 Prepared at 13:03 UTC on Thursday 21 July 2022

Hobart Tasmania July 2022

Date	Day	Temps		Rain	Max wind gust			9:00 AM						3:00 PM					
		Min	Max		Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
1	Fr	2.5	11.9	0	NNW	30	10:27	5.2	81	1	NW	17	1030.7	11.7	57	1	N	9	1028.5
Statistics for July 2022																			
Mean		4.7	12.8					7	81	4		13	1021.7	11.8	60	4		15	1019.6
Lowest		1.1	7.3	0				2.5	59	1	Calm		990.9	6.1	46	1	WSW	2	991.9
Highest		8.4	16.8	11.8	NW	61		11.3	99	8	NNW	30	1038.6	16.4	83	8	NW	26	1035.7
Total			25.4	31.4															

IDCJDW7021.202207 Prepared at 06:20 UTC on Sunday 31 July 2022

7 Appendix 2: Ambient Fluoride Sampling Locations

Ektimo

ektimo.com.au
1300 364 005

MELBOURNE (Head Office)
26 Redland Drive
Mitcham
VIC 3132
AUSTRALIA

SYDNEY
6/78 Reserve Road
Artarmon
NSW 2064
AUSTRALIA

WOLLONGONG
1/251 Princes Highway
Unanderra
NSW 2526
AUSTRALIA

PERTH
52 Cooper Road
Cockburn Central
WA 6164
AUSTRALIA

BRISBANE
3/109 Riverside Place
Morningside
QLD 4170
AUSTRALIA