

TOMAGO ALUMINIUM CO. PTY. LTD.



ENVIRONMENT REPORT

FOURTH QUARTER 2022

CONTENTS

INTRODUCTION:	3
EMISSION MONITORING SUMMARY REPORT	4
AMBIENT AIR REPORT	10
1. FLUORIDE CONCENTRATION IN AMBIENT AIR	11
2. SULFUR DIOXIDE CONCENTRATIONS IN AMBIENT AIR	15
METEOROLOGICAL REPORT	18
VEGETATION MONITORING REPORT	20
WATER MONITORING REPORT	22
INSTRUMENT AVAILABILITY REPORT	28
APPENDICES	30
APPENDIX 1 – SAMPLE SITES.....	31
APPENDIX 2 - EMISSION MONITORING DATA.....	32
APPENDIX 3 - FLUORIDE IN AMBIENT AIR DATA.....	33
APPENDIX 4 - METEOROLOGICAL DATA.....	34
APPENDIX 5 - VEGETATION MONITORING DATA.....	35
APPENDIX 6 – WATER MONITORING DATA	36
APPENDIX 7 – SAMPLING PROCEDURES	37
APPENDIX 8 - CUSTOMER FEEDBACK FORM	39
APPENDIX 9 - VEGETATION HEALTH SURVEY 2022	41

INTRODUCTION:

This document details results from the environmental monitoring program conducted at the Tomago Aluminium Smelter for the fourth quarter of 2022. The document is prepared to comply with the Environmental reporting conditions set out in the development consents.

The report is forwarded to the following government departments and statutory authorities:

NSW Environment Protection Authority
Office of Environment and Heritage - National Parks and Wildlife Service
Department of Primary Industries (NSW Fisheries)
Port Stephens Council
Hunter Water Corporation
Department of Planning
Hunter Region Botanic Gardens

For procedures used in the sampling and/or analyses contained in this report, please refer to Appendix 7.

Any statements of conformity contained within this report are based purely on the result obtained, without consideration of any associated measurement uncertainties.

All enquiries should be directed to Ms Robyn Parker (robyn.parker@tomago.com.au) in the first instance.

EMISSION MONITORING SUMMARY REPORT

OCTOBER - DECEMBER

2022

1. FLUORIDE EMISSION MONITORING

All monitoring as required under the Protection of the Environment Operations Act Licence 6163 and Development Consent was carried out. No exceedances of licence conditions occurred during the reporting period. A map showing the location of site source monitoring points appears in Appendix 1.

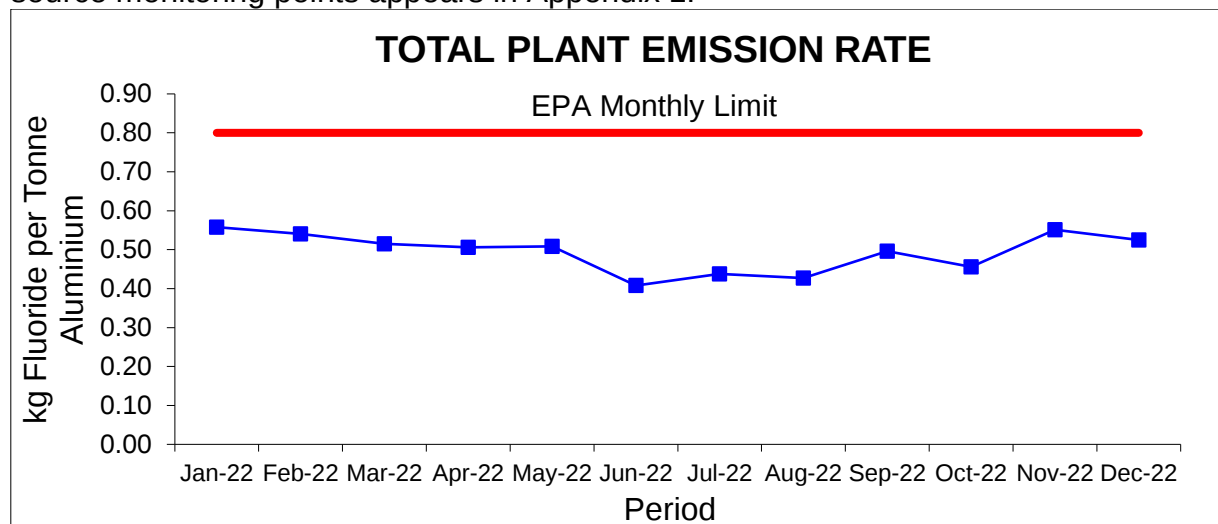


Figure 1: Total Plant Fluoride Emission Rate for last 12 months. This is defined as the sum of the average fluoride emissions for Potline Stacks, Bake Ovens Stacks and Potline Roof Vents.

1.1 STACK COMPLIANCE MONITORING

1.1.1 Potline Stacks

Detailed results of the Potline Stack compliance tests performed during the reporting period are presented in Appendix 2. There are no applicable limits for the potline stack concentrations as they are included in the Total Plant Emission Rate.

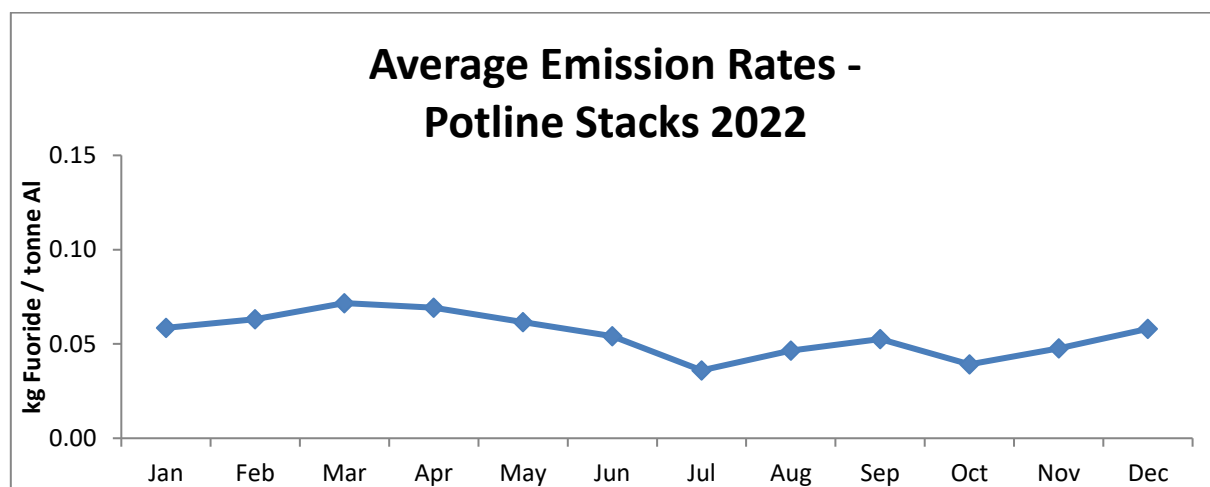


Figure 2: Average Potline Stack Fluoride Emission Rates – 2022

1.1.2 Carbon Bake Oven Stacks

Detailed results of the Bake Oven Stack compliance tests performed during the reporting period are presented in Appendix 2. There are no applicable limits for the Bake Ovens Stack concentrations as they are included in the Total Plant Emission Rate.

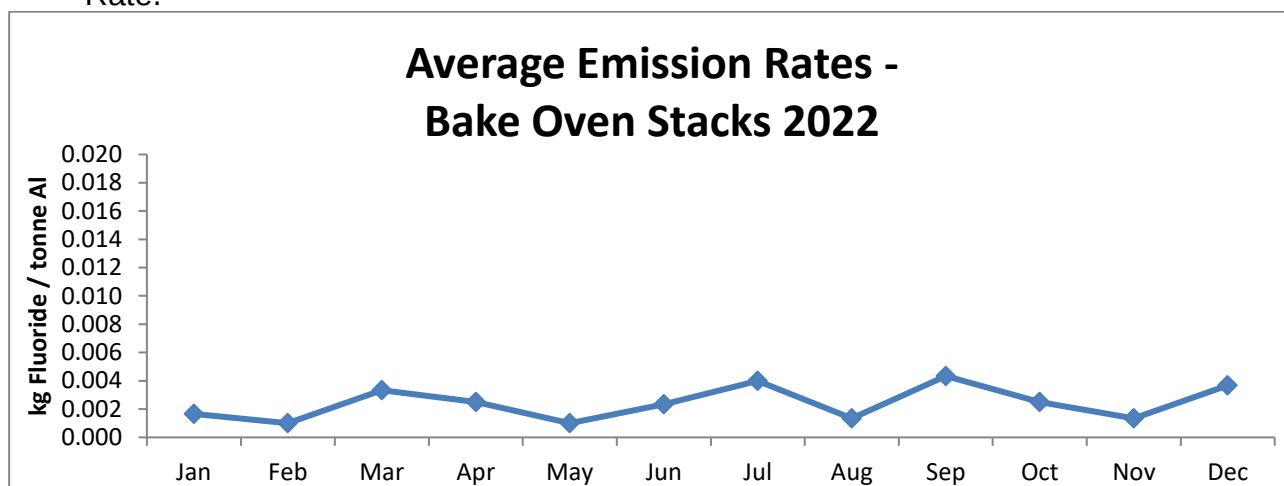


Figure 3: Average Bake Ovens Stack Fluoride Emission Rates – 2022

1.2 STACK CONTINUOUS GASEOUS FLUORIDE MONITORING

Detailed results on the continuous gaseous fluoride monitoring performed during the reporting period are presented in Appendix 2. The continuous monitoring of gaseous fluoride at the stacks is a condition of EPL 6163, however there are no applicable licence limits. The live monitoring data is used by plant operations to optimise emission control equipment.

Table 1: Average monthly stack gaseous fluoride emissions from continuous monitoring – 2022

mg/m3												
STACK	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
POTLINE 1 West	0.43	0.37	0.37	0.30	0.42	0.22	0.23	0.27	0.34	0.32	0.33	0.37
POTLINE 1 East	0.37	0.32	0.38	0.33	0.34	0.25	0.22	0.29	0.26	0.28	0.18	0.26
POTLINE 2 West	0.41	0.29	0.34	0.32	0.29	0.21	0.21	0.24	0.31	0.26	0.25	0.40
POTLINE 2 East	0.33	0.30	0.39	0.25	0.18	0.16	0.17	0.18	0.21	0.21	0.21	0.25
POTLINE 1 & 2 EXT	0.32	0.30	0.45	0.39	0.34	0.24	0.32	0.33	0.34	0.23	0.29	0.35
POTLINE 3 West	0.45	0.35	0.39	0.35	0.34	0.26	0.27	0.29	0.40	0.32	0.35	0.42
POTLINE 3 East	0.47	0.45	0.45	0.46	0.57	0.28	0.24	0.26	0.35	0.28	0.30	0.30
CARBON BAKE OVEN No. 1	0.33	0.29	0.21	0.17	0.21	0.32	0.49	0.66	0.39	0.37	0.53	0.39
CARBON BAKE OVEN No. 2&3	0.33	0.31	0.47	0.37	0.49	0.69	0.68	1.73	0.62	0.36	0.67	0.42

1.3 POTLINE ROOF VENTS

The detailed results of the Roof Vent compliance tests performed during the reporting period are presented in Appendix 2. There are no applicable limits for the Potline Roof Vent concentrations as they are included in the Total Plant Emission Rate.

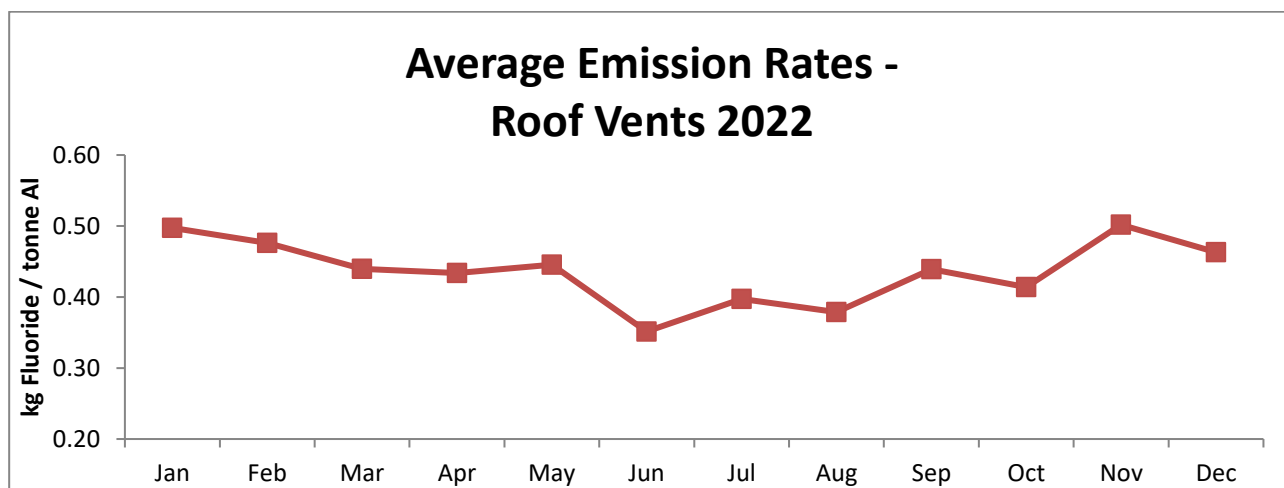


Figure 4: Average Potline Roof Vent Fluoride Emission Rates – 2022

2. SULFUR DIOXIDE EMISSION MONITORING

2.1 RAW MATERIALS

The sulfur content in the coke used for anode manufacture met the Environment Protection Licence limit of 3.5%. There is no applicable Environment Protection Licence limit for sulfur in pitch. Trends in sulfur levels in the coke and pitch are shown below.

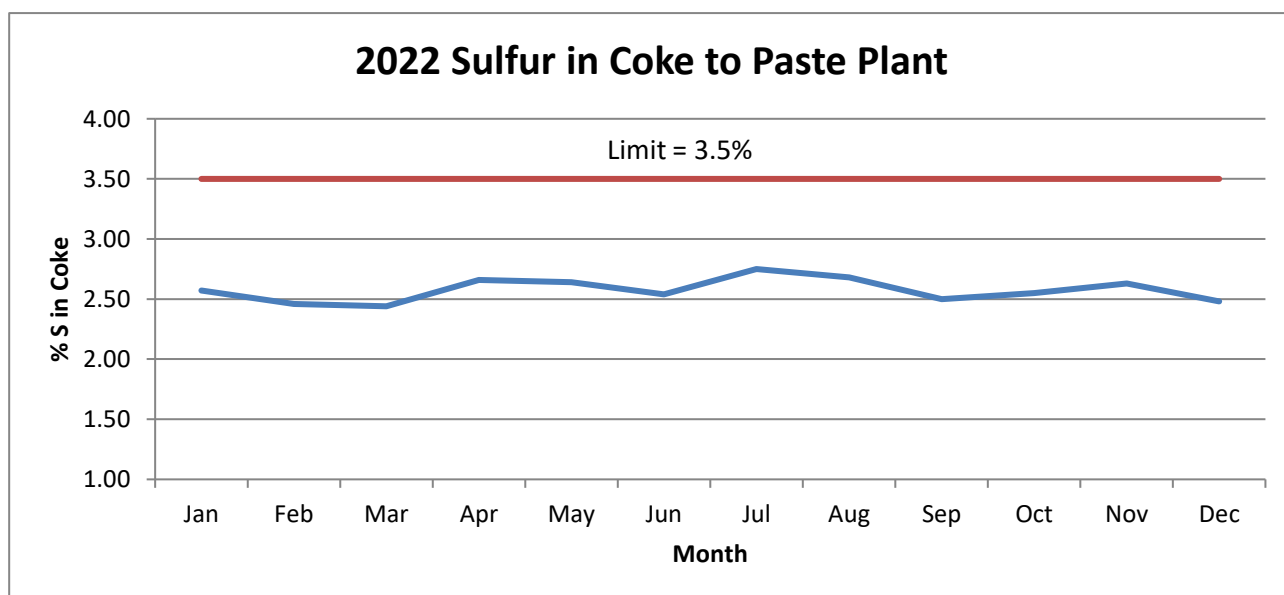


Figure 5: 2022 Sulfur in Coke to paste plant

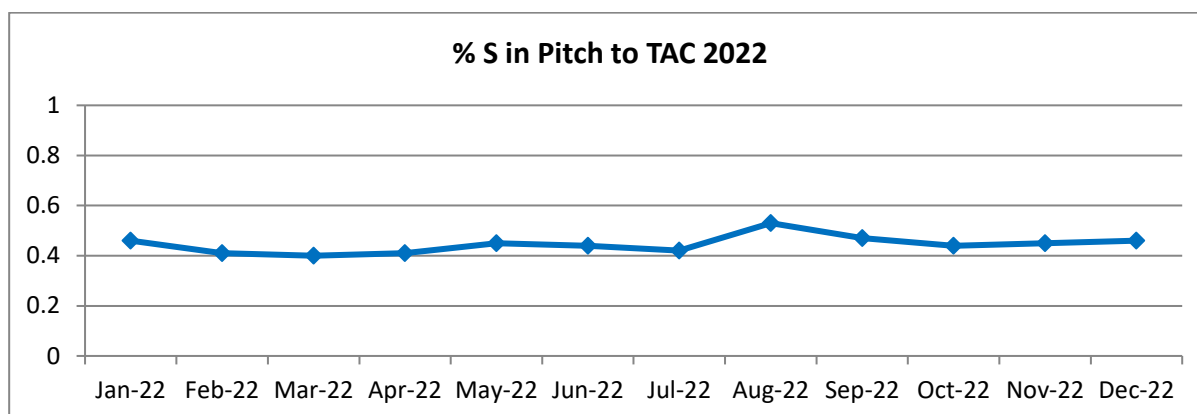


Figure 6: 2022 Sulfur in Pitch received

2.2 SULFUR DIOXIDE MONITORING

Sulfur dioxide emission rates measured for the 2021 - 2022 EPA licence year met the annual sulfur dioxide load limit for the site, with the total load being 9685 tonnes against a limit of 11900 tonnes/annum.

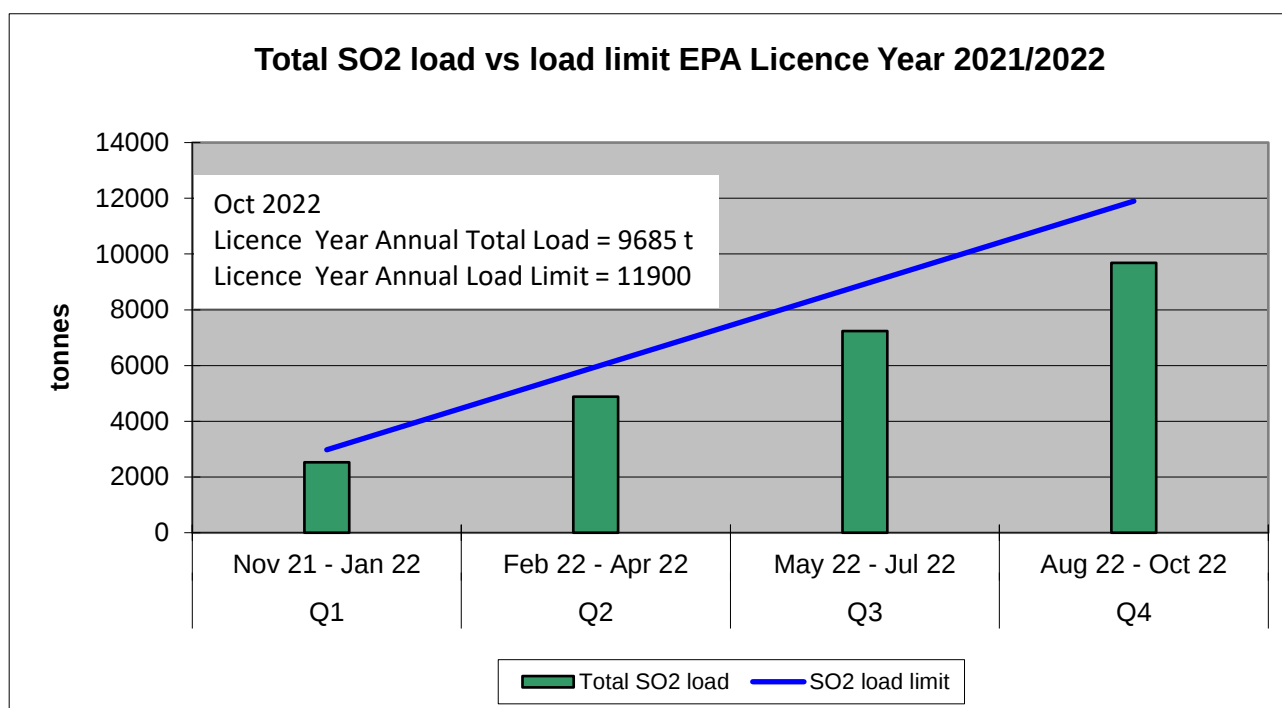


Figure 7: Sulfur Dioxide Load for the 2021 – 2022 EPA Licence Year

This page intentionally left blank

AMBIENT AIR REPORT

OCTOBER - DECEMBER

2022

SECTION

- 1 AMBIENT AIR RESULTS (FLUORIDE)**
- 2 AMBIENT AIR RESULTS (SULFUR DIOXIDE)**

AMBIENT AIR QUALITY REPORT

FOURTH QUARTER 2022

All monitoring as required under the Protection of the Environment Operations Act Licence 6163 and Development Consent was carried out. The monthly data summaries for ambient air sampled in the vicinity of Tomago Aluminium smelter appear below. The concentrations of fluoride in ambient air were determined in accordance with AS/NZS 3580.13. 2. The concentrations of sulfur dioxide were determined in accordance with AS 3580.4.1.

1. FLUORIDE CONCENTRATION IN AMBIENT AIR

The weekly average gaseous fluoride results are illustrated in this section where they are compared to 7 day National Goals established by the Australian and New Zealand Environment Conservation Council (ANZECC).

The ANZECC guidelines state (in part) that:

“...goals for ambient air fluoride are designed to protect against injury to plants and grazing animals rather than to protect human health. This is because fluoride can injure vegetation at one-thousandth the level of concern to human health.”

“The goals set for General Land Use (including residential) are designed to protect most of the sensitive species in the natural environment.

The goals set for Specialised Land Use apply when commercially valuable plants, which are demonstrated to be very sensitive to fluoride are being considered.”

“The ambient air goals for fluoride are intended for areas of commercial or conservation value and not intended for comparison with airborne or foliar fluoride levels within industrial areas or buffer zones associated with fluoride emitting industries.”

“Air quality objectives will generally be applied at the outer limits of an industrial buffer zone.” (ANZECC 1990).

The concentrations of gaseous fluoride in ambient air are compared to these guidelines, with sites within the designated buffer zone compared to the general land use goals while sites outside the buffer zone are compared to the specialised land use goals. There were exceedances of the general land use goal at Site 83 (Correctional Services Training Facility) and Site 181 (Tomago Farm) during the fourth quarter. These sites are to the South and South East of the smelter, inside the designated buffer zone.

Results in tabular form for each site are displayed in Appendix 3.

A map showing the location of the ambient air monitoring points appears in Appendix 1.

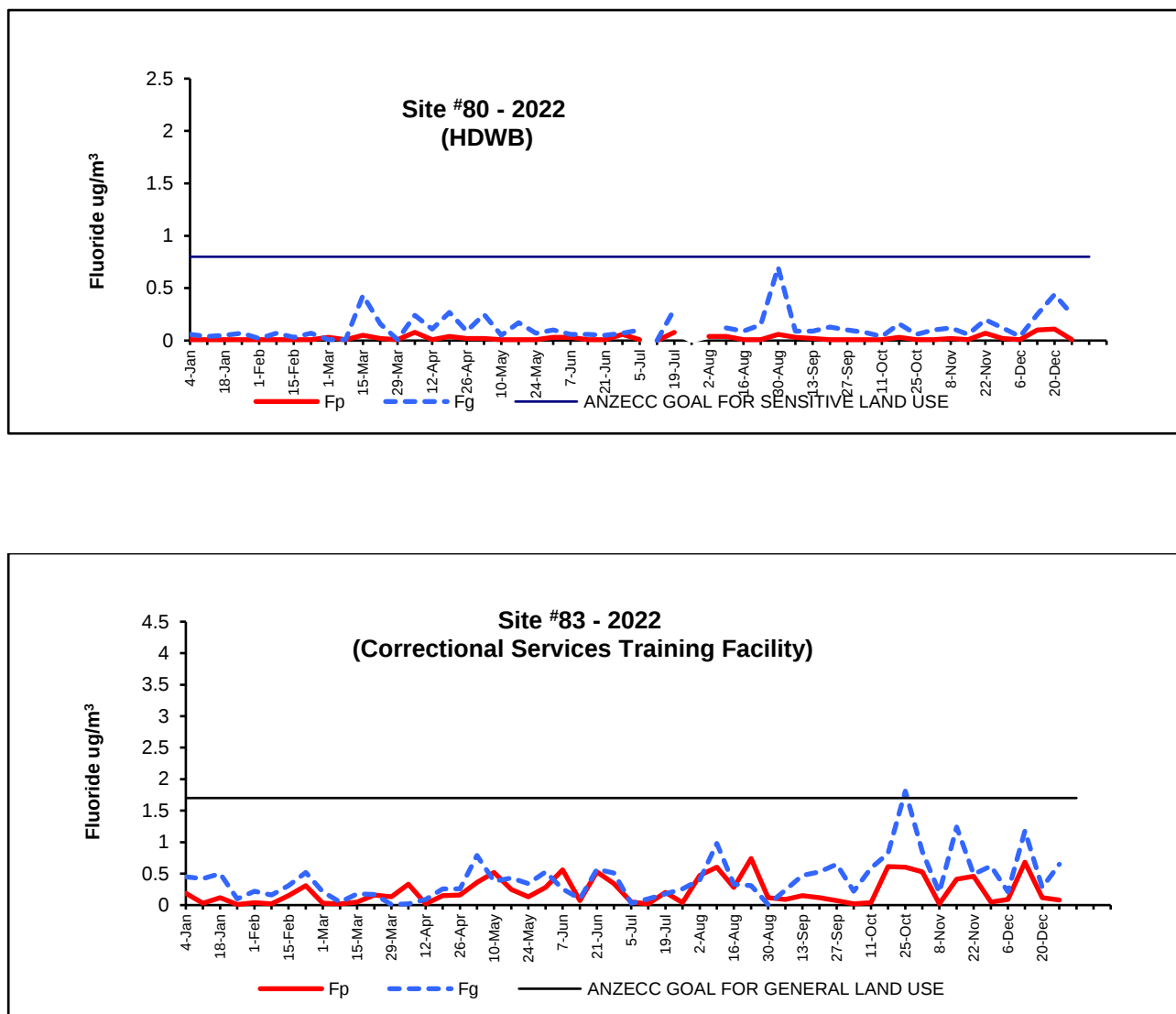


Figure 8: Ambient Fluoride measured concentrations – 2022

Note: Fp = particulate fluoride

Fg = gaseous fluoride

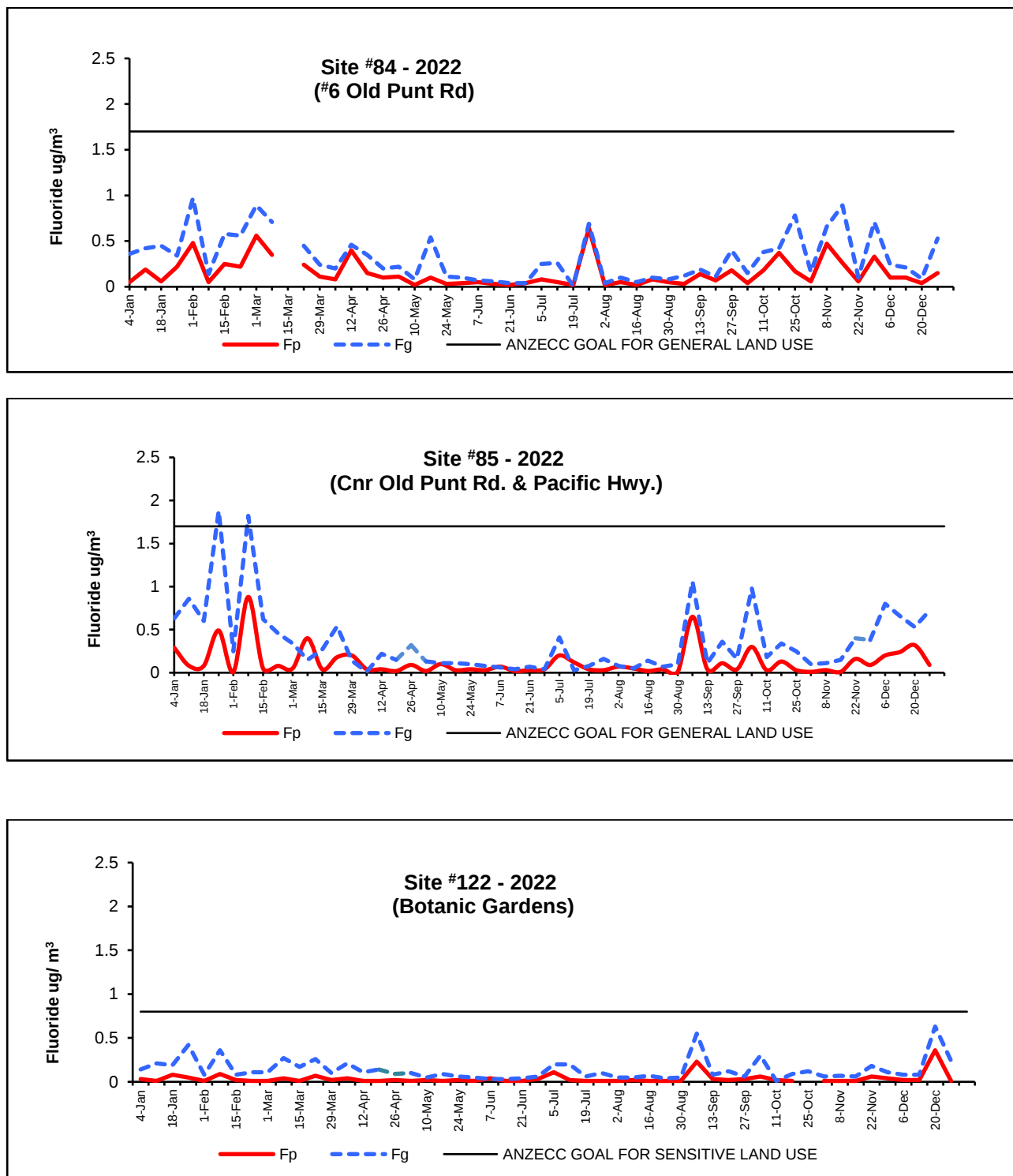


Figure 8: Ambient Fluoride measured concentrations – 2022

Note: Fp = particulate fluoride

Fg = gaseous fluoride

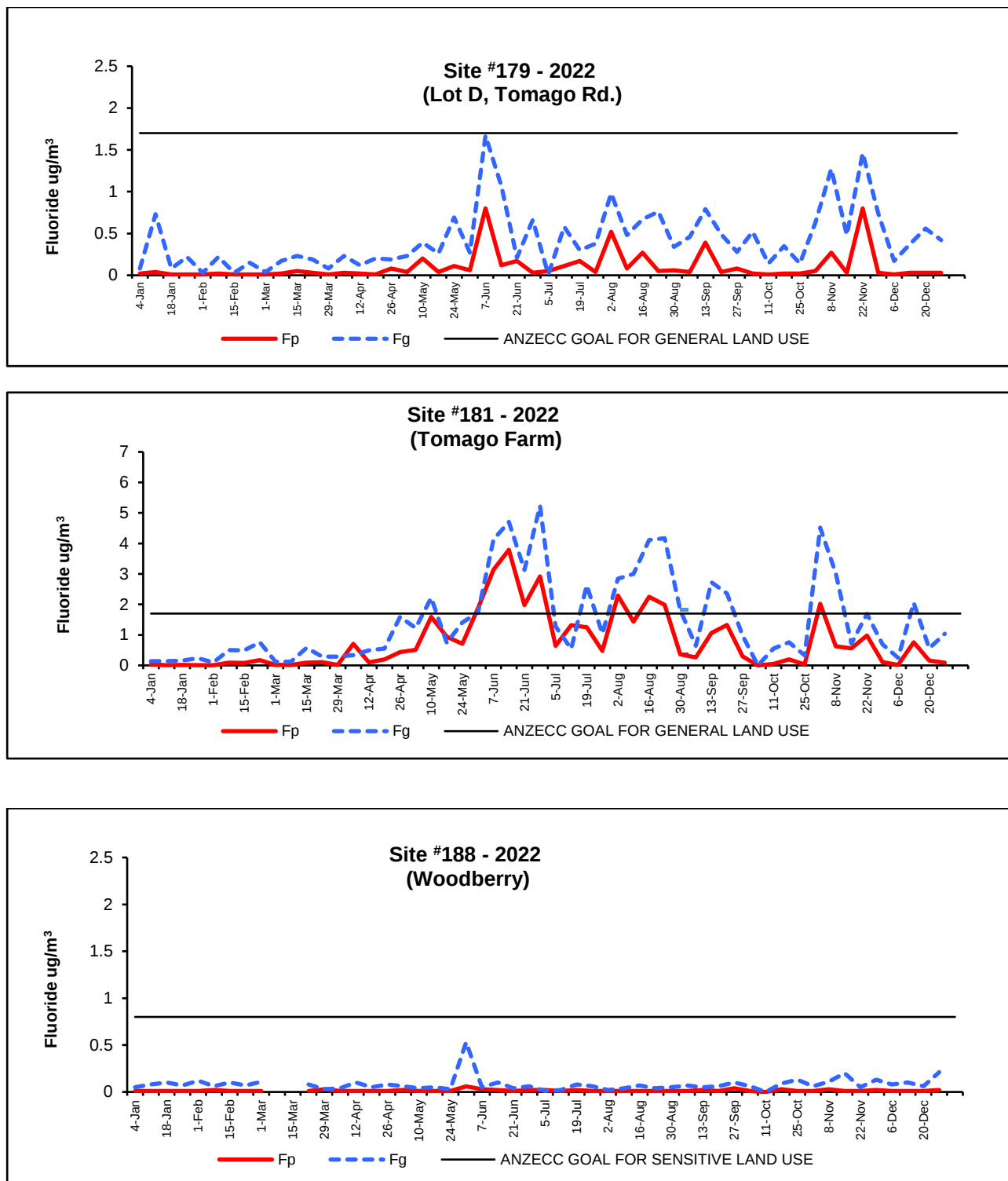


Figure 8: Ambient Fluoride measured concentrations – 2022

Note: Fp = particulate fluoride

Fg = gaseous fluoride

2. SULFUR DIOXIDE CONCENTRATIONS IN AMBIENT AIR

Tomago Aluminium operates five ambient Sulfur Dioxide monitoring stations in accordance with POEO Licence 6163. A map of the sites is located in Appendix 1.

The results for the year to date 2022 are presented in this section.

The NSW EPA's "Approved Methods for the Modelling and Assessment of Air Pollutants in NSW" contains impact assessment criteria for sulfur dioxide. Prior to August 2022, the hourly, daily and annual criteria were adopted from the National Environment Protection Measure (NEPM) for Ambient Air Quality (AAQ) that was established originally in 1998 to be "a representative measure of the air quality likely to be experienced by the general population in the region or sub-region", based on an average population of 25,000.

In August 2022 the impact assessment criteria were changed to reflect the change in the NEPM for AAQ that was varied in April 2021.

The impact assessment criteria for sulfur dioxide referenced here are:

<u>Averaging Period</u>	Prior to Aug 2022	Aug 2022 onwards	
1 hour	20	10	pphm
1 day	8	2	pphm
1 year	2	N/A	pphm

It should be noted that the assessment criteria are designed to be applied at the nearest off-site sensitive receptor, and all five monitoring stations are within the company buffer zone; however, the levels have been used as a point of reference here.

Sulfur Dioxide - Parts per Hundred Million (pphm)

24-hour average: 2.0 pphm

1-hour average: 10.0 pphm

Meteorological Station (Grid Reference 812 681)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
% Sampling Time	98	98	98	96	92	95	99	99	99	97	99	99
Monthly Average	0.05	0.2	0.3	0.3	0.4	0.3	0.5	0.5	0.2	0.1	0.3	0.4
Maximum 24 Hour Value	0.6	1.1	2.1	5.8	1.0	2.8	2.9	4.6	1.2	1.2	2.7	2.0
Maximum 1 Hour Value	4.4	5.7	6.9	8.6	1.5	9.6	8.5	9.3	4.3	5.9	7.4	10.4
90 %ile Value (1 Hr)	0.2	0.4	0.3	0.4	0.8	0.6	1.5	1.7	0.3	0.1	0.6	0.9
EXCEEDANCE OF ASSESSMENT CRITERIA												
24 Hour	0	0	0	0	0	0	0	2	0	0	1	1
1 Hour	0	0	0	0	0	0	0	0	0	0	0	1

Tomago Road Farm (Grid Reference 813 665)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
% Sampling Time	99	99	97	93	96	97	99	97	99	96	99	83
Monthly Average	0.05	0.1	0.05	0.4	0.8	2.7	1.0	2.1	1.2	0.8	0.8	0.5
Maximum 24 Hour Value	0.05	0.6	0.3	4.9	5.6	5.6	4.6	10.7	6.9	5.3	5.8	4.6
Maximum 1 Hour Value	0.9	5.6	2.7	12.1	13.4	12.9	12.1	16.8	17.1	14.2	12.3	13.1
90 Percentile Value (1 Hr)	0.05	0.1	0.05	0.8	2.1	7.7	99	97	99	2.4	3.6	1.4
EXCEEDANCE OF ASSESSMENT CRITERIA												
24 Hour	0	0	0	0	0	0	0	13	5	4	6	2
1 Hour	0	0	0	0	0	0	0	56	24	8	7	7

Highway (Grid Reference 793 688)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
% Sampling Time	99	95	84	82	96	97	99	99	95	94	98	93
Monthly Average	0.6	0.7	0.3	0.1	0.1	0.3	0.3	0.2	0.3	0.2	0.4	0.5
Maximum 24 Hour Value	3.9	3.0	1.2	1.2	0.3	0.7	1.3	0.5	3.1	1.6	2.7	1.8
Maximum 1 Hour Value	8.2	7.7	5.2	4.8	2.5	6.8	9.5	2.6	8.1	5.9	10.1	5.4
90 % ile Value (1 Hr)	1.3	2.3	0.5	0.3	0.3	0.5	99	99	95	0.3	0.7	1.7
EXCEEDANCE OF ASSESSMENT CRITERIA												
24 Hour	0	0	0	0	0	0	0	0	1	0	1	0
1 Hour	0	0	0	0	0	0	0	0	0	0	1	0

Laverick Ave (Grid Reference 784 667)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
% Sampling Time	99	99	97	92	96	97	99	99	100	97	99	99
Monthly Average	0.8	0.5	0.3	0.3	0.2	0.1	0.3	0.5	0.8	0.9	0.8	0.7
Maximum 24 Hour Value	5.4	3.3	0.8	1.5	2.0	0.3	1.0	0.9	3.0	2.8	1.8	1.6
Maximum 1 Hour Value	11.3	9.6	3.3	6.2	5.6	0.9	4.6	3.4	17.9	9.8	6.1	8.8
90 % ile Value (1 Hr)	3.0	1.0	0.5	0.6	0.3	0.3	0.5	0.6	1.8	1.5	1.3	1.2
EXCEEDANCE OF ASSESSMENT CRITERIA												
24 Hour	0	0	0	0	0	0	0	0	2	3	0	0
1 Hour	0	0	0	0	0	0	0	0	1	0	0	0

Site 179 (Grid Reference 817 671)												
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
% Sampling Time	99	99	98	95	96	94	99	99	99	96	99	99
Monthly Average	0.05	0.05	0.05	0.2	0.5	1.0	0.4	0.5	0.4	0.3	0.5	0.2
Maximum 24 Hour Value	0.1	0.3	0.2	1.2	3.6	3.4	2.0	2.3	1.9	1.3	2.9	1.1
Maximum 1 Hour Value	0.4	2.3	1.4	5.9	14.1	11.1	9.5	7.0	7.4	9.3	10.5	7.3
90 Percentile Value (1 Hr)	0.05	0.2	0.1	0.4	1.1	2.6	1.3	1.5	1.2	0.6	2.0	0.3
EXCEEDANCE OF ASSESSMENT CRITERIA												
24 Hour	0	0	0	0	0	0	0	1	0	0	4	0
1 Hour	0	0	0	0	0	0	0	0	0	0	1	0

This page intentionally left blank

METEOROLOGICAL REPORT

OCTOBER - DECEMBER

2022

METEOROLOGICAL REPORT

FOURTH QUARTER 2022

- Detailed statistics can be found in Appendix 4.
- A summary of this data is found in Table 4 below.

		OCT	NOV	DEC
Predominant Wind Directions, % (at 30m)		NE 14.4	WSW 16.4	E 14.9
		WSW 14.1	E 15.1	ESE 13.9
		NNE 10.8	ENE 12.9	SE 10.4
Wind Speed (m/s) (at 30m)	Maximum	8.5	10.0	7.9
	Average	3.3	3.9	3.7
Rainfall (mm)				
	Total Monthly	129.0	45.0	22.0
	Maximum Daily	34.0	15.5	5.0
Temperature (°C)				
	Average Daily Max	21.6	23.2	24.3
	Average Daily Min	13.4	13.1	14.6

Table 4: Meteorological data summary – Quarter 4, 2022

VEGETATION MONITORING REPORT

OCTOBER - DECEMBER

2022

VEGETATION MONITORING REPORT

FOURTH QUARTER 2022

An extensive vegetation monitoring program is conducted around the smelter with sites that are situated at varying distances from the smelter sampled on a monthly or quarterly basis. To complement this program an annual visual inspection of the condition of vegetation is conducted. The inspection report for 2022 appears in Appendix 9 of this report.

Gaseous fluoride concentrations in the air can affect the condition of vegetation. Gaseous fluoride is absorbed by plants via the leaf stomata during normal respiration processes. The gaseous fluoride is preferentially absorbed instead of carbon dioxide and can reduce the capacity of the plant to photosynthesize. The extent to which fluoride accumulates in vegetation depends upon a number of variables including exposure regimes, meteorological conditions and plant species characteristics. Specific plant characteristics are an important variable as plants can vary in their sensitivity to fluoride. Sensitive species often display foliar damage at tissue concentrations of 50 µg/g. Intermediate species may be damaged at 200 µg/g and resistant species can tolerate tissue concentrations above 500 µg/g before exhibiting symptoms. Background concentrations are typically around 20 µg/g. Historical data shows that fluoride concentration and visible damage to vegetation decreases very rapidly with increasing distance from the smelter.

The monthly data from the Tomago Aluminium vegetation monitoring program for year to date 2022 is found in Appendix 5.

Vegetation data collected for October to December of 2022, including overstorey and cultivated vegetation, exhibits similar concentrations and trends to previous years on a monthly basis and from species to species.

The average year to date 2022 overstorey results for sites 111, 112, 113, 114, 115, 116, 117, 118 and 119 have a combined average of 460 ug/g fluoride. These sites are close to the smelter with most sites being within 0.5 km of the potlines.

The average year to date 2022 overstorey results for sites 120, 121, 123, 126, 168, 174, 182 and 194 have a combined average of 63 ug/g fluoride. These sites are within 3 km of the smelter.

Maps of the vegetation monitoring sites can be found in Appendix 1.

WATER MONITORING REPORT

FOR

OCTOBER - DECEMBER

2022

WATER MONITORING SUMMARY

- 1 SEWERAGE TREATMENT OPERATIONS REPORT**
- 2 STORMWATER RETENTION ANALYSIS REPORT**
 - i. Controlled Discharge**
 - ii. Monitoring**
 - iii. Heavy Metal and Cyanide results**
- 3 SURFACE AND GROUNDWATER REPORT**

WATER MONITORING SUMMARY

1. SEWAGE TREATMENT

The sewage treatment system operated without down time and all treated effluent was used for site irrigation. The volume of sewage treated and the quantity and quality of effluent used for irrigation are presented in specific reports in Appendix 6.

2. STORMWATER SYSTEM

i. Controlled Discharge (EPA Licence Point 16)

To allow for the collection of 'first flush' stormwater originating from the site, stormwater pond capacity is maintained by discharging water from the stormwater pond to the Hunter River under controlled conditions. Water samples are taken daily during the discharge. Table 5 below shows the monitoring parameters and limits for stormwater discharged under controlled conditions from Licence Point 16 during Quarter 4, 2022.

Date of discharge start	Total Volume Discharged (ML)	PAH (mg/L)	TRH (mg/L)	Maximum daily discharge volume (ML)	Ave pH	Ave Fluoride (mg/L)	Ave conductivity (uS/cm)	Ave Suspended Solids (mg/L)
13/10/2022	1462	<0.001	<0.1	1462	6.7	38	190	15
Applicable Limits	N/A	N/A	N/A	4.32	6.5-8.5	40	N/A	50

Table 5: Controlled stormwater discharge results and comparison to applicable limits.

ii. Continuous monitoring of weir overflow (EPA Licence Point 35)

On-site stormwater is collected in the sedimentation basin. This water then may overflow via a v-notch weir to the Hunter River once the capacity of the stormwater pond has been reached. Daily overflow results for this quarter can be found in Appendix 6, whilst the monthly averages are presented in Table 6 below. There are no applicable EPL limits to stormwater overflow.

Month – Averages during days of overflow			Oct	Nov	Dec
Weir v-notch	pH		6.1	6.0	6.1
	Conductivity	uS/cm	246	244	340
	Soluble Fluoride*	mg/L	46	65	78
	PAH	mg/L	<0.001	<0.001	<0.001
	TRH	mg/L	<0.1	<0.1	0.13
Flow to Hunter River		L/sec	39	32	13
		kL/day	3362	2761	782
Rainfall	Total monthly	mm.	129.0	45.0	22.0
Number of days with v-notch flow			29	8	6

NF= No Flow over weir

*Volume weighted average

Table 6: Average Monthly Stormwater Overflow Results for Fourth Quarter 2022

iii. Other monitoring of weir overflow (EPA Licence Point 35)

Samples from the v-notch sampling point above (EPA Licence Point 35) are taken at least once per discharge and dispatched to external testing facilities for total heavy metals, free cyanide, Polycyclic Aromatic Hydrocarbons (PAH) and Total Recoverable Hydrocarbons (TRH) determination.

The results of these analyses are found below in Table 7.

Table 7: *Stormwater Heavy Metals, Cyanide, PAH and TRH – Fourth Quarter 2022

	mg/L (dissolved)																			
Sample Date	Fe	Ag	Al	As	Be	Cd	Co	Cr	Cu	Mn	Ni	Pb	Sb	Se	Tl	Zn	Hg	Free CN	PAH	TRH
4/10/2022	<0.05	<0.005	16	0.001	0.003	0.0009	0.001	<0.001	0.004	0.130	0.18	<0.001	0.005	<0.001	<0.005	1.0	<0.0001	<0.005	<0.001	<0.1
10/10/2022	<0.05	<0.005	11	0.001	0.001	0.0004	<0.001	<0.001	0.002	0.083	0.10	<0.001	<0.005	<0.001	<0.005	0.8	<0.0001	<0.005	<0.001	<0.1
17/10/2022	<0.05	<0.005	11	0.001	0.002	0.0006	<0.001	<0.001	0.006	0.100	0.13	0.001	0.008	<0.001	<0.005	0.7	<0.0001	<0.005	<0.001	<0.1
24/10/2022	0.05	<0.005	16	0.001	0.002	0.0007	<0.001	0.001	0.007	0.120	0.17	0.002	<0.005	<0.001	<0.005	0.9	<0.0001	<0.005	<0.001	<0.1
28/10/2022	<0.05	<0.005	17	0.001	0.003	0.0009	0.001	<0.001	0.006	0.130	0.20	<0.001	0.006	<0.001	<0.005	1.0	<0.0001	<0.005	<0.001	<0.1
31/10/2022	<0.05	<0.005	16	0.001	0.003	0.0007	<0.001	<0.001	0.005	0.110	0.19	<0.001	<0.005	<0.001	<0.005	0.9	<0.0001	<0.005	<0.001	<0.1
14/11/2022	<0.05	<0.005	18	<0.001	0.003	0.0009	0.001	<0.001	0.005	0.110	0.16	<0.001	<0.005	0.003	<0.005	1.2	<0.0001	<0.005	<0.001	<0.1
13/12/2022	<0.05	<0.005	25	0.001	0.004	0.0018	0.002	<0.001	0.004	0.140	0.27	<0.001	0.006	<0.001	<0.005	2.1	<0.0001	<0.005	<0.001	0.1
16/12/2022	<0.05	<0.005	24	0.001	0.005	0.0013	0.002	0.002	0.007	0.14	0.22	<0.001	0.006	<0.001	<0.005	1.5	<0.0001	<0.005	<0.001	<0.1
21/12/2022	<0.05	<0.005	23	<0.001	0.005	0.0012	0.001	0.001	0.006	0.140	0.22	<0.001	0.005	<0.001	<0.005	1.4	<0.0001	<0.005	<0.001	0.25

*Analysis performed by Eurofins I mgt, NATA accreditation No. 1261

3. SURFACE AND GROUNDWATER MONITORING

Surface water and groundwater monitoring in the vicinity of the smelter was carried out during the quarter. The groundwater monitoring includes sites monitored by both the Hunter Water Corporation and Tomago Aluminium. Analysis of the fluoride levels for the quarter revealed no abnormalities to normal trends. A detailed analysis of the groundwater and surface water monitoring is provided in the Annual Report.

The results of surface water and groundwater monitoring in the vicinity of the smelter are presented in Appendix 6.

Sites are displayed in Appendix 1, Maps 5 and 6.

This page intentionally left blank

INSTRUMENT AVAILABILITY REPORT

FOR

OCTOBER - DECEMBER

2022

INSTRUMENT AVAILABILITY – FOURTH QUARTER 2022

AMBIENT FLUORIDE MONITORING

		% DATA RECOVERY		
		Oct	Nov	Dec
Site	80	100	100	100
	83	100	100	100
	84	100	100	100
	85	100	100	100
	122	100	100	100
	179	100	100	100
	181	92	100	100
	188	92	100	100

STORMWATER MONITORING

Stream 3
(at V Notch)

		% DATA RECOVERY		
		Oct	Nov	Dec
pH		100	100	100
FLUORIDE		100	100	100
PAH		100	100	100
TRH		100	100	100

NF = No Flow

CONTINUOUS STACK GASEOUS FLUORIDE MONITORING

		% DATA RECOVERY		
		Oct	Nov	Dec
Stack 1 West		100	100	100
1 East		100	100	100
2 West		100	90	100
2 East		100	100	100
3 West		100	100	100
3 East		100	100	100
1 & 2 Ext.		100	100	100
Bake Ovens 1		100	100	100
Bake Ovens 2 & 3		100	100	100

APPENDICES

APPENDIX 1 - SAMPLE SITES

APPENDIX 2 - EMISSION MONITORING DATA

APPENDIX 3 - FLUORIDE IN AMBIENT AIR DATA

APPENDIX 4 - METEOROLOGICAL DATA

APPENDIX 5 - VEGETATION MONITORING DATA

APPENDIX 6 - WATER MONITORING DATA

APPENDIX 7 - SAMPLING PROCEDURES

APPENDIX 8 - CUSTOMER FEEDBACK FORM

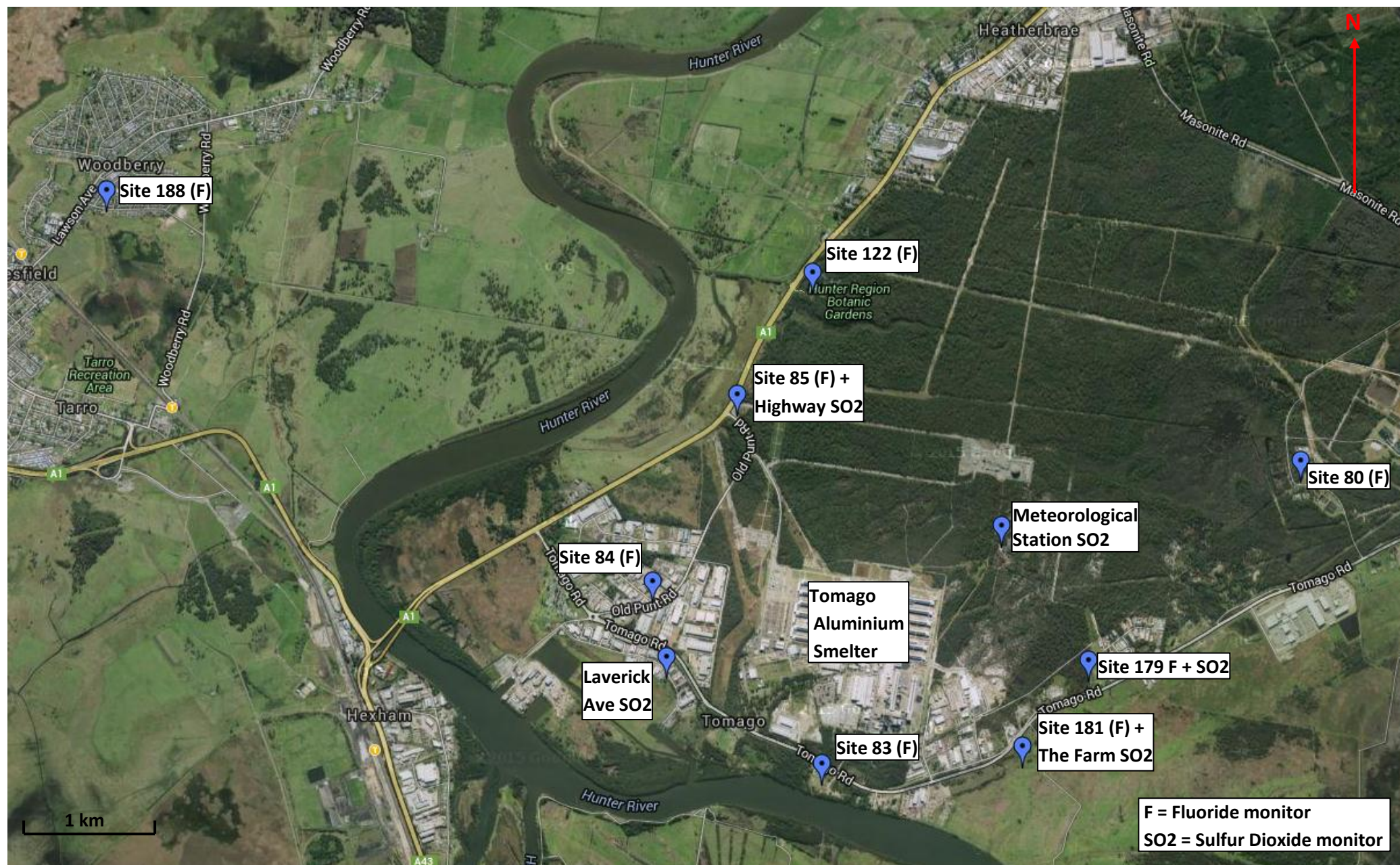
APPENDIX 9 - VEGETATION HEALTH SURVEY 2022

APPENDIX 1 –

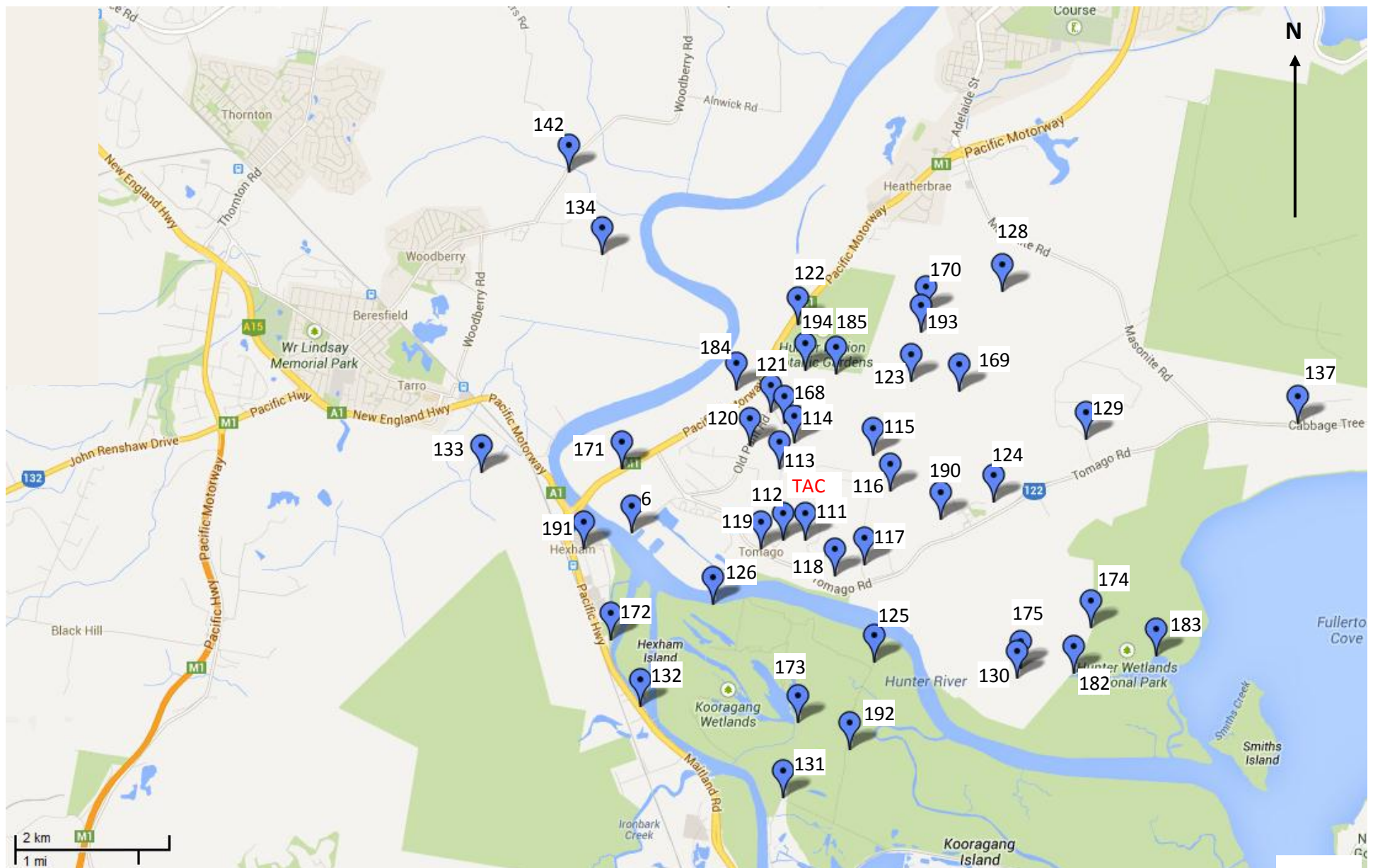
SAMPLE SITES

Map 1	Ambient Air monitoring sites.
Map 2	Overstorey monitoring sites.
Map 3	Forage monitoring sites.
Map 4	Surface Water monitoring sites.
Map 5	Groundwater sites monitored by HWC.
Map 6	Groundwater sites monitored by TAC.
Map 7	TAC Emission Source monitoring sites.

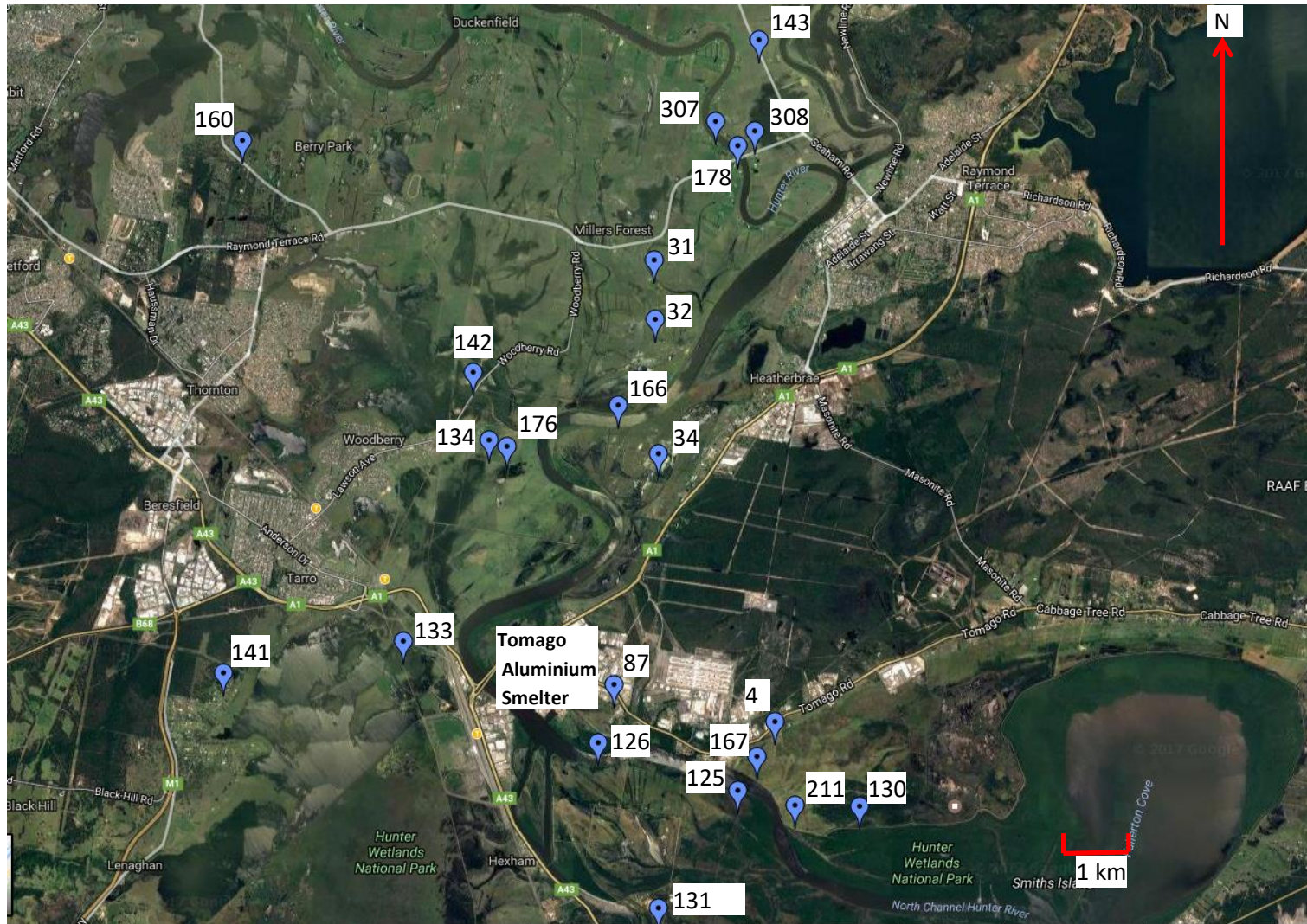
Map 1 Ambient Air Monitoring Sites



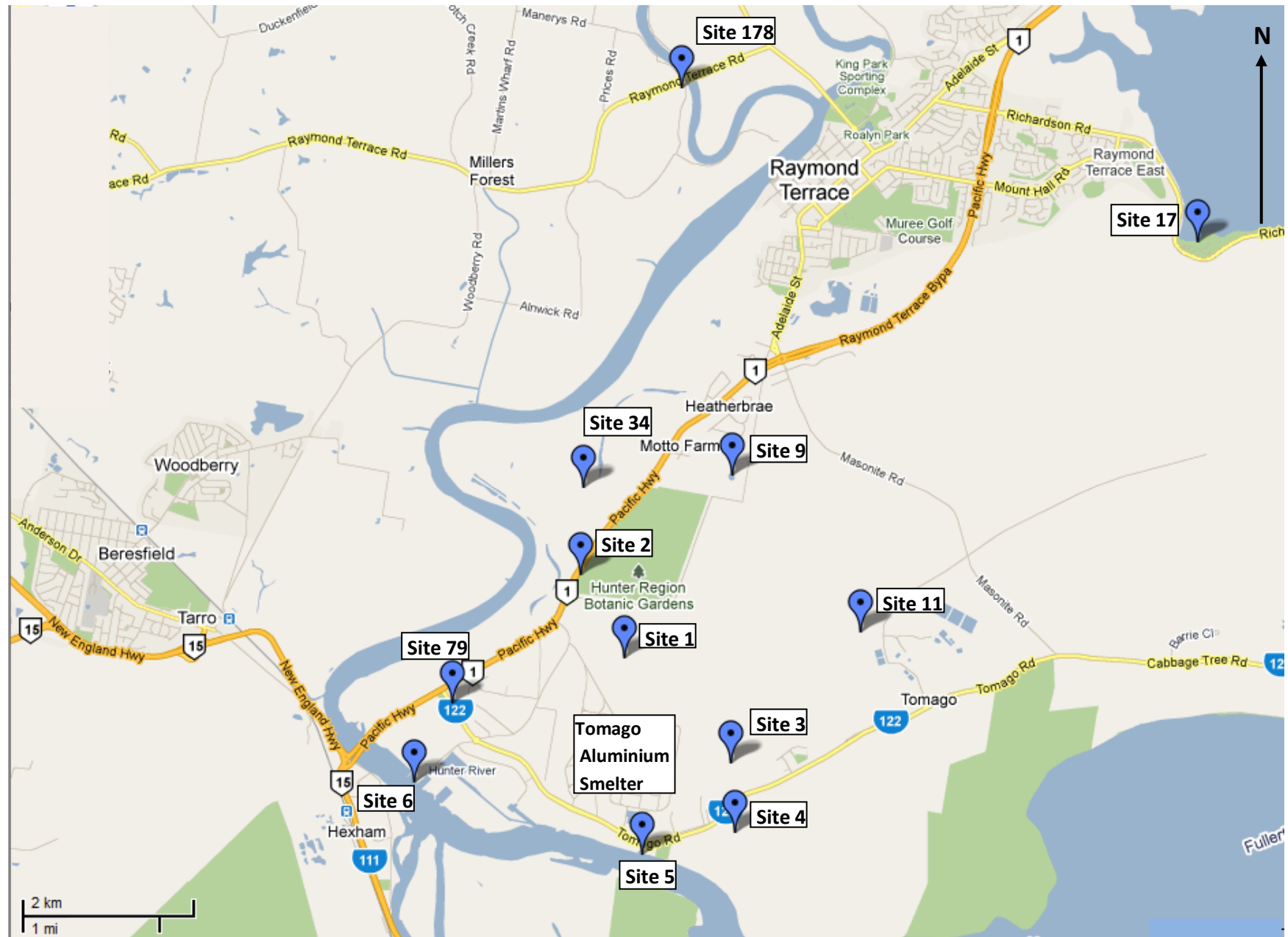
Map 2 Overstorey Sites



Map 3 Forage Sites



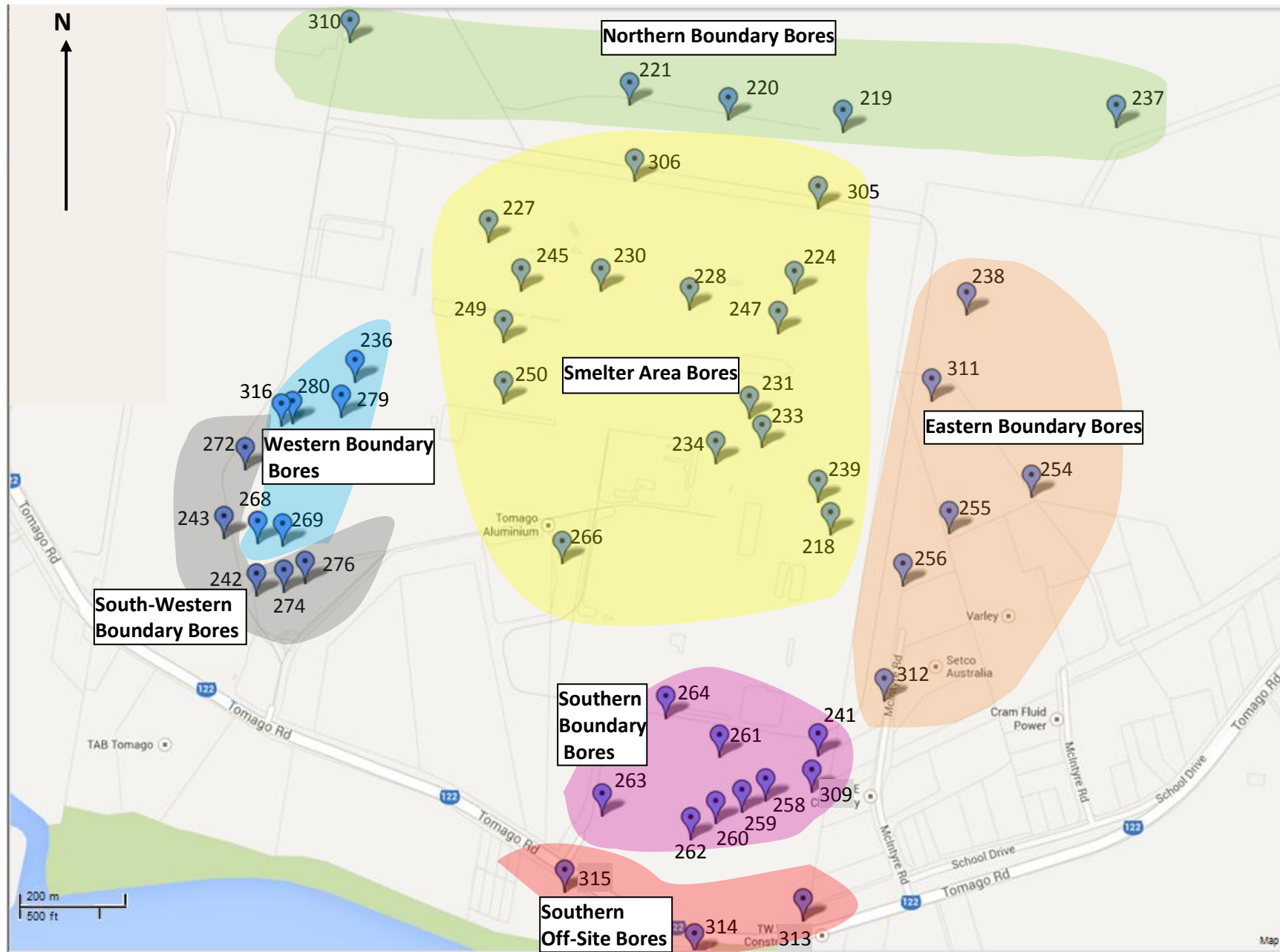
Map 4 Surface Water Sites



Map 5 Groundwater Sites Monitored by Hunter Water

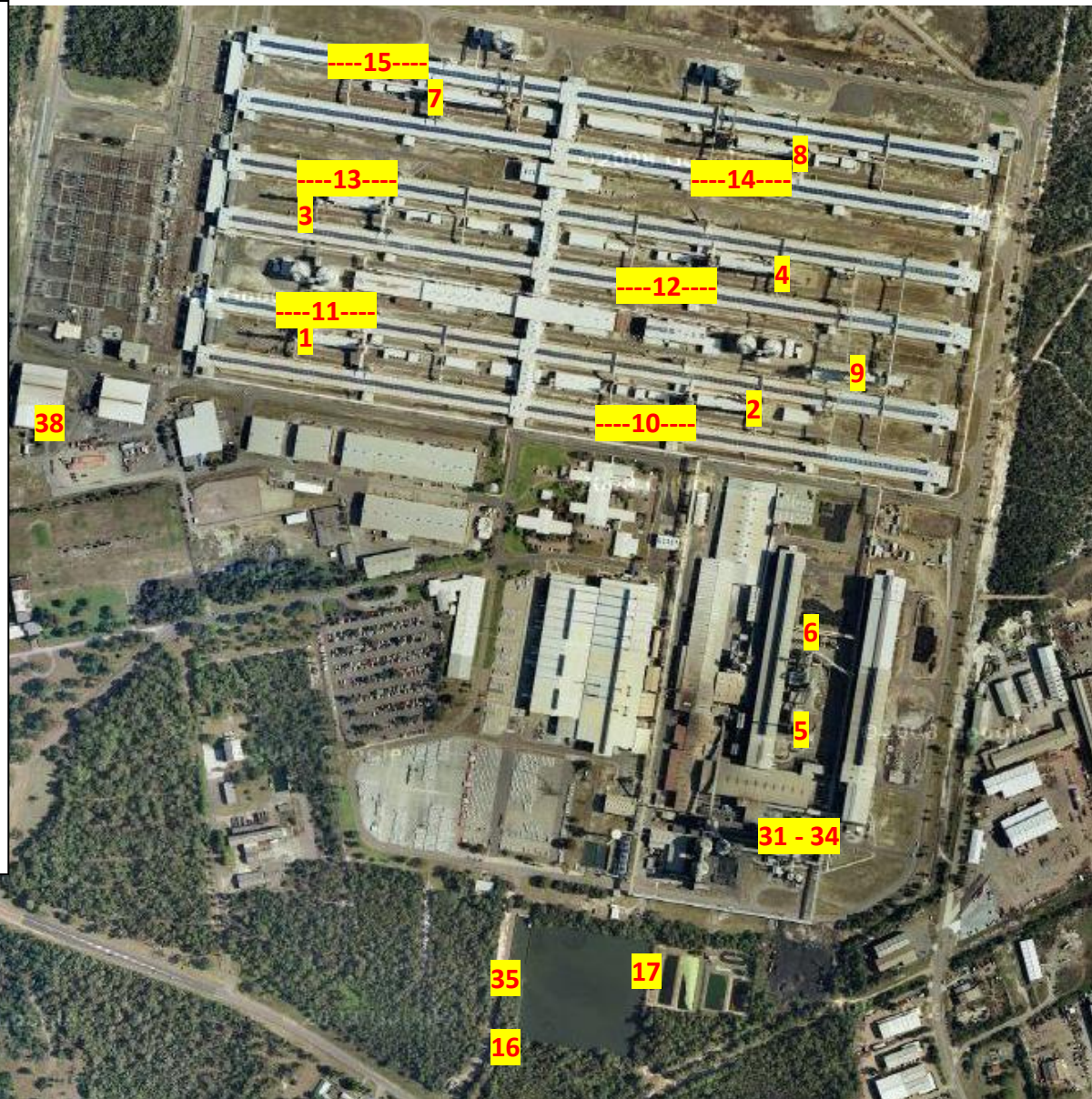


Map 6 Plant Groundwater Sites



Map 7: TAC Source Monitoring Locations

EPA Point	Location
1	Potline Stack 1 West
2	Potline Stack 1 East
3	Potline Stack 2 West
4	Potline Stack 2 East
5	Potline Stack Bake Ovens 1
6	Potline Stack Bake Ovens 2&3
7	Potline Stack Line 3 West
8	Potline Stack Line 3 East
9	Potline Stack Lines 1&2 Extension
10	Potroom A Pots A074-A080
11	Potroom B Pots B018-B024
12	Potroom C Pots C074-C080
13	Potroom D Pots D018-D024
14	Potroom E Pots E074-E080
15	Potroom F Pots F020-F026
16	Stormwater controlled discharge point
17	Effluent to on site irrigation system
31-34	Paste plants stacks
35	Overflow from 1 st flush stormwater system
38	Deline dedust filter



APPENDIX 2 -

EMISSION MONITORING DATA

Tomago Aluminium Co. Pty Ltd
Fluoride Emissions Summary Report

AVERAGE GASEOUS FLUORIDE - mg/m3 - 2022															
STACK				Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
POTLINE 1 West				0.43	0.37	0.37	0.30	0.42	0.22	0.23	0.27	0.34	0.32	0.33	0.37
POTLINE 1 East				0.37	0.32	0.38	0.33	0.34	0.25	0.22	0.29	0.26	0.28	0.18	0.26
POTLINE 2 West				0.41	0.29	0.34	0.32	0.29	0.21	0.21	0.24	0.31	0.26	0.25	0.40
POTLINE 2 East				0.33	0.30	0.39	0.25	0.18	0.16	0.17	0.18	0.21	0.21	0.21	0.25
POTLINE 1 & 2 EXT				0.32	0.30	0.45	0.39	0.34	0.24	0.32	0.33	0.34	0.23	0.29	0.35
POTLINE 3 West				0.45	0.35	0.39	0.35	0.34	0.26	0.27	0.29	0.40	0.32	0.35	0.42
POTLINE 3 East				0.47	0.45	0.45	0.46	0.57	0.28	0.24	0.26	0.35	0.28	0.30	0.30
CARBON BAKE OVEN No. 1				0.33	0.29	0.21	0.17	0.21	0.32	0.49	0.66	0.39	0.37	0.53	0.39
CARBON BAKE OVEN No. 2				0.33	0.31	0.47	0.37	0.49	0.69	0.68	1.73	0.62	0.36	0.67	0.42

EMISSION RATE - Kg FLUORIDE / t ALUMINIUM - 2022															
SOURCE	ALY	Avg last 12 months	AYTD	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
POTROOM A, Roof Vent	0.41	0.45	0.45	0.49	0.46	0.38	0.38	0.54	0.36	0.43	0.42	0.54	0.44	0.50	0.50
POTROOM B, Roof Vent	0.39	0.44	0.44	0.49	0.43	0.56	0.50	0.47	0.40	0.41	0.31	0.41	0.37	0.45	0.42
POTROOM C, Roof Vent	0.50	0.49	0.49	0.66	0.65	0.42	0.48	0.47	0.37	0.41	0.43	0.43	0.54	0.56	0.46
POTROOM D, Roof Vent	0.48	0.50	0.50	0.60	0.53	0.48	0.53	0.46	0.29	0.44	0.47	0.48	0.50	0.58	0.59
POTROOM E, Roof Vent	0.35	0.40	0.40	0.32	0.39	0.39	0.30	0.38	0.36	0.41	0.41	0.42	0.36	0.55	0.47
POTROOM F, Roof Vent	0.34	0.35	0.35	0.43	0.39	0.42	0.41	0.35	0.33	0.30	0.23	0.35	0.28	0.38	0.35
AVERAGE ROOF VENT	0.41	0.44	0.44	0.50	0.48	0.44	0.43	0.45	0.35	0.40	0.38	0.44	0.41	0.50	0.46
POTLINE 1, West Stack	0.06	0.07	0.07		0.06	0.09		0.06	0.05		0.06	0.05		0.07	0.08
POTLINE 1, East Stack	0.06	0.05	0.05	0.06		0.07	0.08		0.04	0.03		0.05	0.04		0.04
POTLINE 2, West Stack	0.05	0.05	0.05	0.05	0.07		0.07	0.07		0.04	0.05		0.05	0.04	
POTLINE 2, East Stack	0.05	0.05	0.05	0.05		0.04	0.05		0.07	0.03		0.06	0.04		0.07
POTLINE 1 & 2 EXT	0.04	0.05	0.05		0.06	0.07		0.05	0.04		0.04	0.05		0.05	0.04
POTLINE 3, West Stack	0.05	0.06	0.06	0.07	0.07		0.09	0.07		0.04	0.06		0.03	0.04	
POTLINE 3, East Stack	0.06	0.06	0.06		0.06	0.09		0.06	0.07		0.04	0.05		0.04	0.06
AVERAGE STACK	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.06	0.05	0.04	0.05	0.05	0.04	0.05	0.06
CARBON BAKE OVEN STACK No. 1	0.001	0.002	0.002	0.001	0.001		0.001	0.001		0.003	0.001		0.002	0.001	
CARBON BAKE OVEN STACK No. 2	0.004	0.003	0.003	0.002		0.003	0.004		0.002	0.005		0.004	0.003		0.004
AVERAGE BAKE OVENS	0.003	0.002	0.002	0.002	0.001	0.003	0.003	0.001	0.002	0.004	0.001	0.004	0.003	0.001	0.004
AVERAGE PLANT	0.47	0.49	0.49	0.56	0.54	0.515	0.51	0.51	0.41	0.44	0.43	0.50	0.46	0.55	0.52



Continuous Gaseous Fluoride (mg/m³)

From 01/10/22 to 31/10/22

Date	1WF	1EF	2WF	2EF	3WF	3EF	12E	BO1	BO2
01/10/22	0.46	0.28	0.28	0.14	0.28	0.26	0.21	0.33	0.35
02/10/22	0.34	0.35	0.25	0.13	0.17	0.16	0.18	0.33	0.35
03/10/22	0.72	0.35	0.25	0.13	0.21	0.30	0.19	0.55	0.42
04/10/22	0.24	0.27	0.25	0.13	0.23	0.36	0.21	0.43	0.39
05/10/22	0.20	0.21	0.27	0.16	0.27	0.35	0.19	0.34	0.42
06/10/22	0.22	0.14	0.30	0.17	0.32	0.38	0.22	0.35	0.49
07/10/22	0.26	0.20	0.31	0.20	0.38	0.39	0.26	0.36	0.36
08/10/22	0.30	0.32	0.37	0.20	0.48	0.40	0.33	0.31	0.27
09/10/22	0.22	0.29	0.23	0.31	0.27	0.34	0.31	0.55	0.17
10/10/22	0.29	0.31	0.19	0.20	0.39	0.24	0.23	0.85	0.18
11/10/22	0.26	0.30	0.19	0.19	0.40	0.19	0.20	0.32	0.29
12/10/22	0.28	0.31	0.43	0.17	0.33	0.28	0.22	0.31	0.24
13/10/22	0.27	0.30	0.56	0.18	0.33	0.24	0.20	0.30	0.16
14/10/22	0.25	0.30	0.27	0.16	0.35	0.17	0.21	0.30	0.30
15/10/22	0.22	0.26	0.17	0.19	0.17	0.18	0.17	0.26	0.64
16/10/22	0.26	0.26	0.21	0.24	0.17	0.22	0.21	0.26	0.41
17/10/22	0.22	0.32	0.22	0.25	0.26	0.23	0.21	0.35	0.34
18/10/22	0.32	0.34	0.23	0.19	0.33	0.18	0.21	0.35	0.30
19/10/22	0.48	0.37	0.24	0.22	0.42	0.31	0.27	0.55	0.26
20/10/22	0.53	0.39	0.27	0.21	0.41	0.22	0.27	0.27	0.27
21/10/22	0.42	0.38	0.29	0.35	0.33	0.24	0.28	0.25	0.31
22/10/22	0.44	0.31	0.30	0.32	0.33	0.21	0.26	0.31	0.33
23/10/22	0.28	0.27	0.25	0.23	0.24	0.33	0.20	0.32	0.25
24/10/22	0.27	0.22	0.21	0.22	0.24	0.31	0.18	0.28	0.28
25/10/22	0.30	0.17	0.17	0.24	0.33	0.60	0.17	0.23	0.24
26/10/22	0.28	0.15	0.19	0.44	0.45	0.45	0.20	0.23	0.22
27/10/22	0.18	0.22	0.20	0.30	0.54	0.28	0.35	0.34	0.21
28/10/22	0.16	0.26	0.19	0.21	0.52	0.22	0.30	0.35	0.25
29/10/22	0.38	0.24	0.21	0.15	0.41	0.22	0.30	0.35	0.35
30/10/22	0.44	0.25	0.26	0.14	0.28	0.17	0.25	0.38	0.97
31/10/22	0.48	0.44	0.37	0.16	0.22	0.26	0.28	0.77	1.09
Average	0.32	0.28	0.26	0.21	0.32	0.28	0.23	0.37	0.36

ENVIRONMENT SYSTEM

PAGE 1

EMISSION MONITORING PROGRAM

STACK EMISSION REPORT FOR OCTOBER 2022

Stack	----- S A M P L E -----				Sample Vol m3 N.T.P. (Dry)	Gaseous Particulate Total			Exit Temp. deg.C	Exit Velocity m/Sec	Volumetric Flow Rate 1000 m3/hr	Al Prod	Emission Rate kg F/t Al
	--- Start --- Date	Time	---- End ---- Date	Time		Fluoride (as F) mg/m3	Fluoride (as F) mg/m3	Fluoride (as F) mg/m3					
POTLINE 1, EAST	04/10/22	07:50	04/10/22	14:50	6.78	0.26	0.14	0.40	94	20.6	729	69.2	0.03
	05/10/22	07:20	05/10/22	14:20	6.97	0.22	0.38	0.60	90	20.8	745	60.0	0.05
	06/10/22	07:30	06/10/22	14:30	6.39	0.22	0.17	0.39	94	18.9	670	69.3	0.03
	Average				6.71	0.23	0.23	0.46	92	20.1	715	66.2	0.04
POTLINE 2, WEST	10/10/22	07:40	10/10/22	14:40	7.78	0.17	0.22	0.39	96	21.2	745	68.6	0.03
	12/10/22	07:15	12/10/22	14:15	7.50	0.31	0.29	0.60	100	22.3	779	68.6	0.05
	13/10/22	07:20	13/10/22	14:20	7.71	0.52	0.30	0.82	102	22.6	782	68.6	0.07
	Average				7.66	0.33	0.27	0.60	99	22.0	769	68.6	0.05
POTLINE 2,EAST S	04/10/22	07:30	04/10/22	14:30	6.77	0.14	0.32	0.46	92	19.3	686	61.7	0.04
	05/10/22	07:15	05/10/22	14:15	7.65	0.17	0.40	0.57	89	19.0	680	68.6	0.04
	06/10/22	07:20	06/10/22	14:20	7.75	0.19	0.34	0.53	93	20.4	725	68.6	0.04
	Average				7.39	0.17	0.35	0.52	91	19.6	697	66.3	0.04
BAKE OVEN NO.1 S	14/10/22	07:25	14/10/22	13:25	4.48	0.40	0.06	0.46	99	14.6	121	203.5	<0.01
	17/10/22	07:25	17/10/22	13:25	4.40	0.33	0.13	0.46	98	14.5	121	203.5	<0.01
	19/10/22	07:20	19/10/22	13:20	4.39	0.38	0.04	0.43	100	14.8	122	203.5	<0.01
	Average				4.43	0.37	0.08	0.45	99	14.6	121	203.5	<0.01
BAKE OVEN NO.2 S	18/10/22	07:12	18/10/22	13:12	6.99	0.46	0.29	0.75	103	21.4	176	241.1	<0.01
	19/10/22	06:59	19/10/22	13:59	6.64	0.31	0.29	0.60	103	20.9	171	241.1	<0.01
	20/10/22	06:58	20/10/22	12:58	6.40	0.27	0.42	0.70	105	21.3	174	241.1	<0.01
	Average				6.67	0.35	0.33	0.68	104	21.2	174	241.1	<0.01
POTLINE 3 WEST S	11/10/22	07:05	11/10/22	14:05	7.74	0.33	0.12	0.45	97	22.7	1001	80.3	0.04
	12/10/22	07:20	12/10/22	14:20	7.90	0.29	0.11	0.40	97	22.5	994	80.1	0.03
	17/10/22	07:02	17/10/22	14:02	7.81	0.18	0.11	0.29	97	21.4	944	65.6	0.03
	Average				7.82	0.27	0.11	0.38	97	22.2	980	75.3	0.03

END OF REPORT

EMISSION MONITORING PROGRAM

ROOF VENT MONITORING REPORT FOR OCTOBER 2022

POTLINE 1

	S	A	M	P	L	E	Sample Vol	Fluoride	Exit Temperatures	Exit Velocity	Volumetric	Al	Emission	Average
Manifold	Start			End			m3 N.T.P.	mg/m3	degrees Celsius	metres/hour	Flow Rate	Prod	Rate	Rate
Location	Date	Time		Date	Time	(Dry)		as F	Avg	Avg	1000 m3/hr		kg F/t Al	kgF/tAl
Cassette Location														
A074	10/10/22	07:50		13/10/22	07:50		9.86	0.49						}
A076	10/10/22	07:50		13/10/22	07:50		9.86	0.58						}
A078	10/10/22	07:50		13/10/22	07:50		9.86	0.49						}
A080	10/10/22	07:50		13/10/22	07:50		9.86	0.56						}
Total	10/10/22	07:50		13/10/22	07:50		39.46	0.53	32	4674	5535	468.0	0.45	}
A074	17/10/22	07:50		20/10/22	07:50		8.54	0.52						}
A076	17/10/22	07:50		20/10/22	07:50		8.54	0.48						}
A078	17/10/22	07:50		20/10/22	07:50		8.54	0.46						}
A080	17/10/22	07:50		20/10/22	07:50		8.54	0.50						}
Total	17/10/22	07:50		20/10/22	07:50		34.15	0.49	34	4846	5630	467.3	0.43	}
B018	21/10/22	07:40		24/10/22	07:40		8.16	0.41						}
B020	21/10/22	07:40		24/10/22	07:40		8.16	0.41						}
B022	21/10/22	07:40		24/10/22	07:40		8.16	0.47						}
B024	21/10/22	07:40		24/10/22	07:40		8.16	0.75						}
Total	21/10/22	07:40		24/10/22	07:40		32.66	0.51	38	4448	3737	350.1	0.39	}
B018	25/10/22	07:33		28/10/22	07:33		8.51	0.36						}
B020	25/10/22	07:33		28/10/22	07:33		8.51	0.45						}
B022	25/10/22	07:33		28/10/22	07:33		8.51	0.51						}
B024	25/10/22	07:33		28/10/22	07:33		8.51	0.56						}
Total	25/10/22	07:33		28/10/22	07:33		34.03	0.47	39	4464	3702	351.7	0.36	}

EMISSION MONITORING PROGRAM

ROOF VENT MONITORING REPORT FOR OCTOBER 2022

POTLINE 2

Manifold Location	Start Date	Start Time	End Date	End Time	Sample Vol m3 N.T.P. (Dry)	Fluoride mg/m3 as F	Exit Temperatures degrees Celsius Avg	Exit Velocity metres/hour Avg	Volumetric Flow Rate 1000 m3/hr	Al Prod	Emission Rate kg F/t Al	Average Rate kgF/tAl
C074	04/10/22	07:51	07/10/22	07:51	8.98	0.52						}
C076	04/10/22	07:51	07/10/22	07:51	8.98	0.62						}
C078	04/10/22	07:51	07/10/22	07:51	8.98	0.40						}
C080	04/10/22	07:51	07/10/22	07:51	8.98	0.56						}
Total	04/10/22	07:51	07/10/22	07:51	35.94	0.53	31	4909	5764	461.7	0.47	}
C074	11/10/22	07:45	14/10/22	07:45	8.71	0.58						}
C076	11/10/22	07:45	14/10/22	07:45	8.71	0.72						}
C078	11/10/22	07:45	14/10/22	07:45	8.71	0.68						}
C080	11/10/22	07:45	14/10/22	07:45	8.71	0.83						}
Total	11/10/22	07:45	14/10/22	07:45	34.85	0.70	33	4867	5665	473.0	0.60	}
D018	04/10/22	08:20	07/10/22	08:20	8.55	0.51						}
D020	04/10/22	08:20	07/10/22	08:20	8.55	0.58						}
D022	04/10/22	08:20	07/10/22	08:20	8.55	0.45						}
D024	04/10/22	08:20	07/10/22	08:20	8.55	0.38						}
Total	04/10/22	08:20	07/10/22	08:20	34.20	0.48	35	4417	3799	344.8	0.38	}
D018	10/10/22	07:30	13/10/22	07:30	9.35	0.51						}
D020	10/10/22	07:30	13/10/22	07:30	9.35	0.74						}
D022	10/10/22	07:30	13/10/22	07:30	9.35	0.80						}
D024	10/10/22	07:30	13/10/22	07:30	9.35	0.71						}
Total	10/10/22	07:30	13/10/22	07:30	37.42	0.69	35	5007	4320	349.3	0.62	}

ENVIRONMENT SYSTEM

PAGE 3

EMISSION MONITORING PROGRAM

ROOF VENT MONITORING REPORT FOR OCTOBER 2022

POTLINE 3

----- S A M P L E -----					Sample Vol	Fluoride	Exit Temperatures	Exit Velocity	Volumetric	Al	Emission	Average
Manifold	Start	Time	End	Time	m3 N.T.P.	mg/m3	degrees Celsius	metres/hour	Flow Rate	Prod	Rate	Rate
Location	Date		Date		(Dry)	as F	Avg	Avg	1000 m3/hr		kg F/t Al	kgF/tAl
Cassette												
Location												
E074	04/10/22	09:15	07/10/22	09:15	8.01	0.40						}
E076	04/10/22	09:15	07/10/22	09:15	8.01	0.42						}
E078	04/10/22	09:15	07/10/22	09:15	8.01	0.39						}
E080	04/10/22	09:15	07/10/22	09:15	8.01	0.50						}
Total	04/10/22	09:15	07/10/22	09:15	32.03	0.43	32	4093	4842	467.4	0.32	}
												}
E074	10/10/22	07:25	13/10/22	07:25	8.94	0.37						}
E076	10/10/22	07:25	13/10/22	07:25	8.94	0.43						}
E078	10/10/22	07:25	13/10/22	07:25	8.94	0.51						}
E080	10/10/22	07:25	13/10/22	07:25	8.94	0.54						}
Total	10/10/22	07:25	13/10/22	07:25	35.74	0.46	33	4630	5492	464.0	0.39	}
												0.36
F020	04/10/22	08:55	07/10/22	08:55	7.97	0.30						}
F022	04/10/22	08:55	07/10/22	08:55	7.97	0.27						}
F024	04/10/22	08:55	07/10/22	08:55	7.97	0.45						}
F026	04/10/22	08:55	07/10/22	08:55	7.97	0.29						}
Total	04/10/22	08:55	07/10/22	08:55	31.87	0.33	34	4458	3843	352.0	0.26	}
												}
F020	10/10/22	07:51	13/10/22	07:51	8.74	0.31						}
F022	10/10/22	07:51	13/10/22	07:51	8.74	0.34						}
F024	10/10/22	07:51	13/10/22	07:51	8.74	0.38						}
F026	10/10/22	07:51	13/10/22	07:51	8.74	0.34						}
Total	10/10/22	07:51	13/10/22	07:51	34.96	0.34	31	4971	4322	352.4	0.30	}
												0.28

END OF REPORT

Continuous Gaseous Fluoride (mg/m³)
From 01/11/22 to 30/11/22

Date	1WF	1EF	2WF	2EF	3WF	3EF	12E	BO1	BO2
01/11/22	0.38	0.28	0.29	0.21	0.46	0.37	0.34	0.62	0.89
02/11/22	0.27	0.14	0.17	0.20	0.22	0.26	0.21	0.61	1.48
03/11/22	0.29	0.10	0.13	0.14	0.23	0.25	0.18	0.65	0.53
04/11/22	0.26	0.16	0.17	0.15	0.27	0.33	0.28	0.53	1.23
05/11/22	0.32	0.15	0.15	0.16	0.22	0.22	0.33	0.66	0.76
06/11/22	0.39	0.14	0.18	0.16	0.26	0.16	0.20	0.55	0.48
07/11/22	0.28	0.16	0.20	0.13	0.29	0.20	0.19	0.45	0.72
08/11/22	0.35	0.16	0.17	0.14	0.45	0.21	0.16	0.42	1.56
09/11/22	0.30	0.18	0.25	0.14	0.60	0.27	0.20	0.63	0.57
10/11/22	0.24	0.17	0.27	0.18	0.43	0.22	0.26	0.85	0.39
11/11/22	0.25	0.14	nra	0.22	0.43	0.25	0.36	0.67	0.30
12/11/22	0.30	0.13	nra	0.41	0.37	0.32	0.51	0.69	0.49
13/11/22	0.29	0.21	nra	0.45	0.38	0.34	0.43	0.52	0.31
14/11/22	0.34	0.26	0.33	0.30	0.36	0.35	0.45	0.48	0.49
15/11/22	0.30	0.21	0.31	0.20	0.18	0.31	0.34	0.54	0.47
16/11/22	0.25	0.19	0.17	0.14	0.21	0.28	0.21	0.34	2.44
17/11/22	0.17	0.17	0.16	0.12	0.34	0.27	0.17	0.39	0.52
18/11/22	0.25	0.20	0.21	0.15	0.23	0.28	0.26	0.68	0.97
19/11/22	0.32	0.22	0.30	0.21	0.26	0.33	0.34	0.48	0.66
20/11/22	0.39	0.15	0.34	0.23	0.22	0.37	0.46	0.48	0.34
21/11/22	0.38	0.11	0.27	0.17	0.20	0.29	0.34	0.35	0.48
22/11/22	0.37	0.12	0.28	0.16	0.27	0.17	0.21	0.28	0.43
23/11/22	0.42	0.14	0.37	0.19	0.58	0.26	0.24	0.55	0.41
24/11/22	0.39	0.18	0.30	0.19	0.43	0.29	0.26	0.73	0.42
25/11/22	0.39	0.23	0.31	0.22	0.53	0.45	0.30	0.38	0.90
26/11/22	0.40	0.13	0.29	0.25	0.58	0.34	0.32	0.53	0.60
27/11/22	0.48	0.10	0.29	0.28	0.37	0.27	0.32	0.74	0.43
28/11/22	0.47	0.25	0.23	0.27	0.48	0.31	0.37	0.43	0.28
29/11/22	0.37	0.32	0.25	0.30	0.40	0.38	0.37	0.45	0.29
30/11/22	0.34	0.33	0.24	0.26	0.37	0.37	0.29	0.43	0.47
Average	0.33	0.18	0.25	0.21	0.35	0.29	0.30	0.54	0.68

ENVIRONMENT SYSTEM

PAGE 1

EMISSION MONITORING PROGRAM

STACK EMISSION REPORT FOR NOVEMBER 2022

Stack	S A M P L E				Sample Vol m3 N.T.P. (Dry)	Gaseous Particulate Total			Exit Temp. deg.C	Exit Velocity m/Sec	Volumetric Flow Rate 1000 m3/hr	Al Prod	Emission Rate kg F/t Al
	Start Date	Time	End Date	Time		Fluoride (as F) mg/m3	Fluoride (as F) mg/m3	Fluoride (as F) mg/m3					
POTLINE 1 WEST S	01/11/22	07:45	01/11/22	14:45	7.35	0.49	0.44	0.94	98	22.4	783	66.4	0.08
	02/11/22	06:50	02/11/22	13:50	8.26	0.30	0.44	0.74	91	23.4	833	68.5	0.06
	03/11/22	07:15	03/11/22	14:15	8.44	0.37	0.43	0.80	94	24.1	854	68.5	0.07
	Average				8.02	0.39	0.44	0.82	94	23.3	824	67.8	0.07
POTLINE 2, WEST	15/11/22	07:15	15/11/22	14:15	7.07	0.33	0.48	0.81	102	21.9	758	68.2	0.06
	16/11/22	06:25	16/11/22	13:25	7.32	0.13	0.28	0.40	96	22.0	774	58.8	0.04
	17/11/22	06:50	17/11/22	13:50	7.40	0.17	0.26	0.43	94	21.8	771	68.2	0.03
	Average				7.26	0.21	0.34	0.55	97	21.9	768	65.1	0.04
BAKE OVEN NO.1 S	08/11/22	07:04	08/11/22	13:04	3.89	0.23	0.05	0.27	99	13.5	112	202.6	<0.01
	15/11/22	06:36	15/11/22	12:36	4.58	0.47	0.03	0.50	100	16.2	134	202.6	<0.01
	17/11/22	07:04	17/11/22	13:04	4.62	0.22	0.04	0.26	97	14.2	119	202.6	<0.01
	Average				4.37	0.31	0.04	0.34	99	14.7	122	202.6	<0.01
POTLINE 3 WEST S	15/11/22	07:30	15/11/22	14:30	7.94	0.24	0.19	0.43	100	22.9	1004	80.6	0.04
	16/11/22	07:24	16/11/22	14:24	8.25	0.15	0.18	0.33	98	23.0	1011	80.6	0.03
	17/11/22	06:55	17/11/22	13:55	8.38	0.36	0.27	0.63	93	21.9	975	80.6	0.05
	Average				8.19	0.25	0.21	0.46	97	22.6	997	80.6	0.04
POTLINE 3 EAST S	22/11/22	07:32	22/11/22	14:32	7.02	0.23	0.17	0.40	96	20.5	906	79.7	0.03
	23/11/22	06:40	23/11/22	13:40	7.07	0.29	0.18	0.47	99	20.0	879	79.7	0.04
	24/11/22	06:25	24/11/22	13:25	6.67	0.42	0.19	0.61	100	18.3	803	79.7	0.04
	Average				6.92	0.32	0.18	0.49	98	19.6	863	79.7	0.04
1+2 EXP STACK	08/11/22	07:10	08/11/22	14:10	5.62	0.31	0.26	0.57	93	15.9	486	45.4	0.04
	09/11/22	06:45	09/11/22	13:45	5.75	0.29	0.34	0.63	94	16.2	492	45.4	0.05
	10/11/22	06:15	10/11/22	13:15	5.63	0.31	0.43	0.74	92	16.0	490	45.3	0.06
	Average				5.67	0.30	0.35	0.65	93	16.0	489	45.4	0.05

 END OF REPORT

EMISSION MONITORING PROGRAM

ROOF VENT MONITORING REPORT FOR NOVEMBER 2022

POTLINE 1

Manifold Location	Start Date	Start Time	End Date	End Time	Sample Vol m3 N.T.P. (Dry)	Fluoride mg/m3 as F	Exit Temperatures degrees Celsius Avg	Exit Velocity metres/hour Avg	Volumetric Flow Rate 1000 m3/hr	Al Prod	Emission Rate kg F/t Al	Average Rate kgF/tAl
Cassette Location												
A074	14/11/22	08:25	17/11/22	08:25	8.16	0.43						}
A076	14/11/22	08:25	17/11/22	08:25	8.16	0.48						}
A078	14/11/22	08:25	17/11/22	08:25	8.16	1.04						}
A080	14/11/22	08:25	17/11/22	08:25	8.16	0.59						}
Total	14/11/22	08:25	17/11/22	08:25	32.64	0.63	34	4942	5739	466.3	0.56	}
}												
A074	18/11/22	07:02	21/11/22	07:02	8.96	0.48						}
A076	18/11/22	07:02	21/11/22	07:02	8.96	0.53						}
A078	18/11/22	07:02	21/11/22	07:02	8.96	0.57						}
A080	18/11/22	07:02	21/11/22	07:02	8.96	0.50						}
Total	18/11/22	07:02	21/11/22	07:02	35.82	0.52	34	4755	5485	466.4	0.44	}
0.50												
B018	01/11/22	06:23	04/11/22	06:23	7.70	0.51						}
B020	01/11/22	06:23	04/11/22	06:23	7.70	0.53						}
B022	01/11/22	06:23	04/11/22	06:23	7.70	0.39						}
B024	01/11/22	06:23	04/11/22	06:23	7.70	0.46						}
Total	01/11/22	06:23	04/11/22	06:23	30.80	0.47	32	4752	4069	353.3	0.39	}
}												
B018	07/11/22	06:52	10/11/22	06:52	8.44	0.61						}
B020	07/11/22	06:52	10/11/22	06:52	8.44	0.63						}
B022	07/11/22	06:52	10/11/22	06:52	8.44	0.55						}
B024	07/11/22	06:52	10/11/22	06:52	8.44	0.63						}
Total	07/11/22	06:52	10/11/22	06:52	33.74	0.61	38	4886	4127	354.8	0.51	}
0.45												

EMISSION MONITORING PROGRAM

ROOF VENT MONITORING REPORT FOR NOVEMBER 2022

POTLINE 2

Manifold Location	----- --- Start Date	S A M P L E --- Time	----- ---- End Date	----- ---- Time	Sample Vol m3 N.T.P. (Dry)	Fluoride mg/m3 as F	Exit Temperatures degrees Celsius Avg	Exit Velocity metres/hour Avg	Volumetric Flow Rate 1000 m3/hr	Al Prod	Emission Rate kg F/t Al	Average Rate kgF/tAl
C074	01/11/22	06:47	04/11/22	06:47	8.14	0.55						}
C076	01/11/22	06:47	04/11/22	06:47	8.14	0.57						}
C078	01/11/22	06:47	04/11/22	06:47	8.14	0.59						}
C080	01/11/22	06:47	04/11/22	06:47	8.14	0.65						}
Total	01/11/22	06:47	04/11/22	06:47	32.58	0.59	31	5051	5855	464.5	0.54	}
C074	07/11/22	07:21	10/11/22	07:21	8.61	0.46						}
C076	07/11/22	07:21	10/11/22	07:21	8.61	0.63						}
C078	07/11/22	07:21	10/11/22	07:21	8.61	0.55						}
C080	07/11/22	07:21	10/11/22	07:21	8.61	0.91						}
Total	07/11/22	07:21	10/11/22	07:21	34.44	0.64	34	4982	5775	459.1	0.58	}
D018	01/11/22	07:00	04/11/22	07:00	8.28	0.64						}
D020	01/11/22	07:00	04/11/22	07:00	8.28	0.63						}
D022	01/11/22	07:00	04/11/22	07:00	8.28	0.65						}
D024	01/11/22	07:00	04/11/22	07:00	8.28	0.67						}
Total	01/11/22	07:00	04/11/22	07:00	33.11	0.64	31	4986	4302	346.9	0.58	}
D018	18/11/22	07:10	21/11/22	07:10	8.87	0.69						}
D020	18/11/22	07:10	21/11/22	07:10	8.87	0.66						}
D022	18/11/22	07:10	21/11/22	07:10	8.87	0.72						}
D024	18/11/22	07:10	21/11/22	07:10	8.87	0.69						}
Total	18/11/22	07:10	21/11/22	07:10	35.50	0.69	38	4912	4084	348.0	0.58	}

ENVIRONMENT SYSTEM

EMISSION MONITORING PROGRAM

ROOF VENT MONITORING REPORT FOR NOVEMBER 2022

POTLINE 3

----- S A M P L E -----					Sample Vol	Fluoride	Exit Temperatures	Exit Velocity	Volumetric	Al	Emission	Average
Manifold	Start	Time	End	Time	m3 N.T.P.	mg/m3	degrees Celsius	metres/hour	Flow Rate	Prod	Rate	Rate
Location	Date		Date		(Dry)	as F	Avg	Avg	1000 m3/hr		kg F/t Al	kgF/tAl
Cassette												
Location												
E074	07/11/22	07:50	10/11/22	07:50	8.00	0.47						}
E076	07/11/22	07:50	10/11/22	07:50	8.00	0.60						}
E078	07/11/22	07:50	10/11/22	07:50	8.00	0.71						}
E080	07/11/22	07:50	10/11/22	07:50	8.00	0.93						}
Total	07/11/22	07:50	10/11/22	07:50	32.02	0.68		36	4516	5286	472.8	0.55 }
E074	15/11/22	07:15	18/11/22	07:15	7.94	0.58						}
E076	15/11/22	07:15	18/11/22	07:15	7.94	0.59						}
E078	15/11/22	07:15	18/11/22	07:15	7.94	0.67						}
E080	15/11/22	07:15	18/11/22	07:15	7.94	0.65						}
Total	15/11/22	07:15	18/11/22	07:15	31.78	0.62		34	4952	5803	471.9	0.55 }
F020	14/11/22	08:45	17/11/22	08:45	6.56	0.50						}
F022	14/11/22	08:45	17/11/22	08:45	6.56	0.49						}
F024	14/11/22	08:45	17/11/22	08:45	6.56	0.46						}
F026	14/11/22	08:45	17/11/22	08:45	6.56	0.45						}
Total	14/11/22	08:45	17/11/22	08:45	26.23	0.48		34	4567	3865	353.9	0.37 }
F020	18/11/22	07:30	21/11/22	07:30	8.34	0.46						}
F022	18/11/22	07:30	21/11/22	07:30	8.34	0.67						}
F024	18/11/22	07:30	21/11/22	07:30	8.34	0.51						}
F026	18/11/22	07:30	21/11/22	07:30	8.34	0.42						}
Total	18/11/22	07:30	21/11/22	07:30	33.34	0.51		35	4361	3672	353.9	0.38 }

 END OF REPORT



Continuous Gaseous Fluoride (mg/m³)

From 01/12/22 to 31/12/22

Date	1WF	1EF	2WF	2EF	3WF	3EF	12E	BO1	BO2
01/12/22	0.42	0.41	0.28	0.24	0.29	0.27	0.23	0.46	0.42
02/12/22	0.39	0.38	0.42	0.22	0.32	0.26	0.26	0.43	0.40
03/12/22	0.44	0.23	0.30	0.26	0.32	0.23	0.30	0.49	0.33
04/12/22	0.36	0.25	2.04	0.23	0.42	0.20	0.22	0.60	0.24
05/12/22	0.33	0.29	0.38	0.30	0.38	0.30	0.31	0.59	0.29
06/12/22	0.30	0.29	0.31	0.34	0.40	0.33	0.31	0.34	0.38
07/12/22	0.25	0.25	0.22	0.26	1.09	0.37	0.24	0.44	1.52
08/12/22	0.37	0.24	0.21	0.21	1.49	0.24	0.18	0.42	1.64
09/12/22	0.38	0.21	0.22	0.19	0.36	0.17	0.18	0.32	0.34
10/12/22	0.38	0.18	0.23	0.21	0.30	0.19	0.18	0.34	0.44
11/12/22	0.34	0.32	0.28	0.28	0.24	0.22	0.22	0.43	0.54
12/12/22	0.42	0.24	0.30	0.32	0.31	0.36	0.39	0.41	0.68
13/12/22	0.43	0.22	0.28	0.25	0.27	0.42	0.25	0.33	0.55
14/12/22	0.29	0.24	0.42	0.21	0.25	0.30	0.28	0.49	0.53
15/12/22	0.29	0.25	0.36	0.17	0.25	0.51	0.26	0.34	0.46
16/12/22	0.35	0.23	0.17	0.14	0.30	0.26	0.25	0.36	0.31
17/12/22	0.29	0.23	0.20	0.13	0.28	0.20	0.34	0.26	0.40
18/12/22	0.40	0.23	0.23	0.17	0.26	0.19	0.31	0.32	0.41
19/12/22	0.29	0.19	0.23	0.15	0.21	0.16	0.19	0.27	0.19
20/12/22	0.32	0.18	0.25	0.17	0.27	0.24	0.29	0.37	0.20
21/12/22	0.37	0.17	0.32	0.17	0.47	0.41	0.39	0.47	0.24
22/12/22	0.35	0.23	0.39	0.19	0.56	0.40	0.35	0.35	0.24
23/12/22	0.41	0.25	0.52	0.27	0.57	0.45	1.83	0.37	0.25
24/12/22	0.45	0.32	0.48	0.32	0.49	0.40	0.48	0.35	0.25
25/12/22	0.43	0.31	0.45	0.36	0.42	0.32	0.36	0.35	0.22
26/12/22	0.40	0.33	0.50	0.36	0.32	0.22	0.38	0.32	0.21
27/12/22	0.48	0.30	0.40	0.29	0.28	0.20	0.40	0.31	0.18
28/12/22	0.45	0.29	0.42	0.26	0.38	0.27	0.28	0.33	0.22
29/12/22	0.44	0.31	0.54	0.24	0.62	0.38	0.29	0.43	0.27
30/12/22	0.40	0.26	0.58	0.45	0.54	0.38	0.30	0.42	0.34
31/12/22	0.38	0.25	0.56	0.27	0.43	0.47	0.49	0.44	0.35
Average	0.37	0.26	0.40	0.25	0.42	0.30	0.35	0.39	0.42

ENVIRONMENT SYSTEM

PAGE 1

EMISSION MONITORING PROGRAM

STACK EMISSION REPORT FOR DECEMBER 2022

Stack	S A M P L E				Sample Vol m3 N.T.P. (Dry)	Gaseous Particulate Total			Exit Temp. deg.C	Exit Velocity m/Sec	Volumetric Flow Rate 1000 m3/hr	Al Prod	Emission Rate kg F/t Al
	Start Date	Time	End Date	Time		Fluoride (as F) mg/m3	Fluoride (as F) mg/m3	Fluoride (as F) mg/m3					
POTLINE 1 WEST S	06/12/22	07:05	06/12/22	14:05	6.90	0.32	0.67	0.99	103	20.1	696	68.8	0.07
	07/12/22	07:05	07/12/22	14:05	7.09	0.26	0.70	0.97	101	19.6	683	68.8	0.07
	08/12/22	06:40	08/12/22	13:40	7.31	0.39	0.91	1.30	100	19.9	693	68.8	0.09
Average					7.10	0.32	0.76	1.09	101	19.9	691	68.8	0.08
POTLINE 1, EAST	06/12/22	06:41	06/12/22	13:41	6.50	0.22	0.22	0.44	102	21.0	727	68.1	0.03
	07/12/22	06:31	07/12/22	13:31	5.96	0.32	0.28	0.60	103	21.1	729	68.1	0.04
	08/12/22	06:22	08/12/22	13:22	7.26	0.25	0.35	0.60	101	21.0	728	68.1	0.04
Average					6.57	0.26	0.29	0.55	102	21.0	728	68.1	0.04
POTLINE 2, EAST S	12/12/22	07:50	12/12/22	14:50	6.74	0.54	0.83	1.37	104	20.2	696	68.2	0.10
	14/12/22	07:30	14/12/22	14:30	6.98	0.27	0.59	0.86	99	20.0	697	68.2	0.06
	15/12/22	06:25	15/12/22	13:25	7.75	0.19	0.55	0.74	99	19.9	694	68.2	0.05
Average					7.16	0.34	0.65	0.99	101	20.0	696	68.2	0.07
BAKE OVEN NO.2 S	01/12/22	07:25	01/12/22	13:25	6.36	0.41	0.53	0.94	102	21.0	173	240.4	<0.01
	02/12/22	07:10	02/12/22	13:10	6.20	0.47	0.45	0.92	99	20.4	170	240.4	<0.01
	05/12/22	07:00	05/12/22	13:00	6.17	0.30	0.41	0.71	100	20.0	166	240.4	<0.01
Average					6.24	0.39	0.46	0.86	100	20.5	169	240.4	<0.01
POTLINE 3 EAST S	14/12/22	06:35	14/12/22	13:35	7.10	0.32	0.35	0.66	101	21.1	919	80.3	0.05
	15/12/22	06:40	15/12/22	13:40	7.08	0.45	0.46	0.91	99	20.9	918	80.3	0.07
	16/12/22	06:15	16/12/22	13:15	7.16	0.35	0.48	0.83	96	20.8	922	80.3	0.07
Average					7.11	0.37	0.43	0.80	99	20.9	920	80.3	0.06
1+2 EXP STACK	01/12/22	07:50	01/12/22	14:50	5.28	0.32	0.19	0.51	96	16.3	494	45.9	0.04
	02/12/22	07:25	02/12/22	14:25	5.60	0.35	0.15	0.50	94	16.9	513	45.2	0.04
	05/12/22	07:25	05/12/22	14:25	5.62	0.48	0.14	0.62	101	16.3	487	45.8	0.05
Average					5.50	0.38	0.16	0.54	97	16.5	498	45.6	0.04

 END OF REPORT

EMISSION MONITORING PROGRAM

ROOF VENT MONITORING REPORT FOR DECEMBER 2022

POTLINE 1

Manifold Location	Start Date	Start Time	End Date	End Time	Sample Vol m3 N.T.P. (Dry)	Fluoride mg/m3 as F	Exit Temperatures degrees Celsius Avg	Exit Velocity metres/hour Avg	Volumetric Flow Rate 1000 m3/hr	Al Prod	Emission Rate kg F/t Al	Average Rate kgF/tAl
Cassette Location												
A074	05/12/22	08:45	08/12/22	08:45	8.66	0.55						}
A076	05/12/22	08:45	08/12/22	08:45	8.66	0.52						}
A078	05/12/22	08:45	08/12/22	08:45	8.66	0.52						}
A080	05/12/22	08:45	08/12/22	08:45	8.66	0.52						}
Total	05/12/22	08:45	08/12/22	08:45	34.62	0.53	40	4811	5409	468.1	0.44	}
A074	09/12/22	07:50	12/12/22	07:50	9.18	0.54						}
A076	09/12/22	07:50	12/12/22	07:50	9.18	0.58						}
A078	09/12/22	07:50	12/12/22	07:50	9.18	0.65						}
A080	09/12/22	07:50	12/12/22	07:50	9.18	0.73						}
Total	09/12/22	07:50	12/12/22	07:50	36.71	0.63	35	4866	5644	460.0	0.55	}
B018	02/12/22	06:50	05/12/22	06:50	8.79	0.36						}
B020	02/12/22	06:50	05/12/22	06:50	8.79	0.51						}
B022	02/12/22	06:50	05/12/22	06:50	8.79	0.44						}
B024	02/12/22	06:50	05/12/22	06:50	8.79	0.46						}
Total	02/12/22	06:50	05/12/22	06:50	35.15	0.44	37	4823	4066	353.3	0.37	}
B018	05/12/22	09:10	08/12/22	09:10	8.21	0.57						}
B020	05/12/22	09:10	08/12/22	09:10	8.21	0.57						}
B022	05/12/22	09:10	08/12/22	09:10	8.21	0.63						}
B024	05/12/22	09:10	08/12/22	09:10	8.21	0.68						}
Total	05/12/22	09:10	08/12/22	09:10	32.83	0.61	40	4572	3760	353.2	0.47	}

EMISSION MONITORING PROGRAM

ROOF VENT MONITORING REPORT FOR DECEMBER 2022

POTLINE 2

Manifold Location	Start Date	Start Time	End Date	End Time	Sample Vol m3 N.T.P. (Dry)	Fluoride mg/m3 as F	Exit Temperatures degrees Celsius Avg	Exit Velocity metres/hour Avg	Volumetric Flow Rate 1000 m3/hr	Prod Al	Emission Rate kg F/t Al	Average Rate kgF/tAl
C074	02/12/22	07:16	05/12/22	07:16	8.51	0.39						}
C076	02/12/22	07:16	05/12/22	07:16	8.51	0.54						}
C078	02/12/22	07:16	05/12/22	07:16	8.51	0.50						}
C080	02/12/22	07:16	05/12/22	07:16	8.51	0.58						}
Total	02/12/22	07:16	05/12/22	07:16	34.04	0.51	35	5030	5769	470.3	0.45	}
C074	05/12/22	08:10	08/12/22	08:10	8.54	0.50						}
C076	05/12/22	08:10	08/12/22	08:10	8.54	0.59						}
C078	05/12/22	08:10	08/12/22	08:10	8.54	0.52						}
C080	05/12/22	08:10	08/12/22	08:10	8.54	0.55						}
Total	05/12/22	08:10	08/12/22	08:10	34.16	0.54	38	4870	5493	463.0	0.46	}
D018	09/12/22	07:30	12/12/22	07:30	8.33	0.60						}
D020	09/12/22	07:30	12/12/22	07:30	8.33	0.74						}
D022	09/12/22	07:30	12/12/22	07:30	8.33	0.69						}
D024	09/12/22	07:30	12/12/22	07:30	8.33	0.67						}
Total	09/12/22	07:30	12/12/22	07:30	33.31	0.68	39	4630	3883	348.0	0.55	}
D018	16/12/22	07:37	19/12/22	07:37	7.63	0.57						}
D020	16/12/22	07:37	19/12/22	07:37	7.63	0.77						}
D022	16/12/22	07:37	19/12/22	07:37	7.63	0.70						}
D024	16/12/22	07:37	19/12/22	07:37	7.63	0.81						}
Total	16/12/22	07:37	19/12/22	07:37	30.52	0.71	35	5043	4307	348.0	0.64	}

ENVIRONMENT SYSTEM

PAGE 3

EMISSION MONITORING PROGRAM

ROOF VENT MONITORING REPORT FOR DECEMBER 2022

POTLINE 3

----- S A M P L E -----					Sample Vol	Fluoride	Exit Temperatures	Exit Velocity	Volumetric	Al	Emission	Average
Manifold	Start	Time	End	Time	m3 N.T.P.	mg/m3	degrees Celsius	metres/hour	Flow Rate	Prod	Rate	Rate
Location	Date		Date		(Dry)	as F	Avg		1000 m3/hr		kg F/t Al	kgF/tAl
Cassette												
Location												
E074	09/12/22	06:57	12/12/22	06:57	8.45	0.46						}
E076	09/12/22	06:57	12/12/22	06:57	8.45	0.54						}
E078	09/12/22	06:57	12/12/22	06:57	8.45	0.56						}
E080	09/12/22	06:57	12/12/22	06:57	8.45	0.54						}
Total	09/12/22	06:57	12/12/22	06:57	33.80	0.53	36	4514	5191	465.9	0.42	}
												}
E074	13/12/22	07:50	16/12/22	07:50	8.08	0.52						}
E076	13/12/22	07:50	16/12/22	07:50	8.08	0.74						}
E078	13/12/22	07:50	16/12/22	07:50	8.08	0.60						}
E080	13/12/22	07:50	16/12/22	07:50	8.08	0.59						}
Total	13/12/22	07:50	16/12/22	07:50	32.31	0.61	36	4824	5560	471.8	0.52	}
												0.47
F020	05/12/22	07:50	08/12/22	07:50	7.56	0.38						}
F022	05/12/22	07:50	08/12/22	07:50	7.56	0.39						}
F024	05/12/22	07:50	08/12/22	07:50	7.56	0.43						}
F026	05/12/22	07:50	08/12/22	07:50	7.56	0.44						}
Total	05/12/22	07:50	08/12/22	07:50	30.23	0.41	38	4435	3684	350.3	0.31	}
												}
F020	09/12/22	07:21	12/12/22	07:21	6.85	0.49						}
F022	09/12/22	07:21	12/12/22	07:21	6.85	0.52						}
F024	09/12/22	07:21	12/12/22	07:21	6.85	0.49						}
F026	09/12/22	07:21	12/12/22	07:21	6.85	0.43						}
Total	09/12/22	07:21	12/12/22	07:21	27.38	0.48	36	4635	3902	353.9	0.38	}
												0.35

END OF REPORT

APPENDIX 3 -

FLUORIDE IN AMBIENT AIR DATA

ENVIRONMENT SYSTEM
FLUORIDE IN AMBIENT AIR REPORT FOR OCTOBER 2022

PAGE: 1

WEEKLY RESULTS :

SITE	WEEK ENDING	CORRECTED AIR VOLUME	FLUORIDE CONCENT. (ug/m3)		
			Fp	Fg	Ft
----	-----	-----m3	-----	-----	-----
080	04/10	377.0	<0.01	0.08	0.09
	11/10	343.8	<0.01	0.04	0.05
	18/10	371.2	0.03	0.16	0.19
	25/10	371.5	<0.01	0.06	0.07
	MONTH AVG.	365.9	0.02	0.09	0.10
083	04/10	369.1	0.02	0.22	0.24
	11/10	368.5	0.04	0.59	0.63
	18/10	348.3	0.61	0.82	1.43
	25/10	354.5	0.60	1.81	2.41
	MONTH AVG.	360.1	0.32	0.86	1.18
084	04/10	370.5	0.04	0.15	0.19
	11/10	359.9	0.18	0.38	0.56
	18/10	359.8	0.37	0.42	0.79
	25/10	366.7	0.17	0.78	0.95
	MONTH AVG.	364.2	0.19	0.43	0.62
085	04/10	351.0	0.30	0.98	1.28
	11/10	345.4	0.03	0.18	0.21
	18/10	344.3	0.13	0.34	0.47
	25/10	346.2	0.03	0.25	0.28
	MONTH AVG.	346.7	0.12	0.44	0.56
122	04/10	391.6	0.06	0.30	0.36
	11/10	377.6	0.02	0.01	0.03
	18/10	397.3	0.01	0.09	0.10
	25/10	383.5	0.01	0.12	0.13
	MONTH AVG.	387.5	0.03	0.13	0.16
179	04/10	395.0	0.02	0.52	0.54
	11/10	354.8	0.01	0.14	0.15
	18/10	382.4	0.02	0.35	0.37
	25/10	347.8	0.02	0.14	0.16
	MONTH AVG.	370.0	0.02	0.29	0.31

WEEKLY RESULTS :

SITE	WEEK ENDING	CORRECTED AIR VOLUME ----m3	FLUORIDE CONCENT. (ug/m3)		
			Fp	Fg	Ft
----	-----	-----	-----	-----	-----
181	04/10	247.5	nra	nra	nra
	11/10	406.9	0.05	0.55	0.60
	18/10	395.7	0.20	0.76	0.96
	25/10	405.3	0.03	0.33	0.36
	MONTH AVG.	363.9	0.09	0.55	0.64
188	04/10	343.3	0.01	0.06	0.07
	11/10	277.0	nra	nra	nra
	18/10	401.2	0.03	0.09	0.12
	25/10	410.9	0.01	0.13	0.14
	MONTH AVG.	358.1	0.02	0.09	0.11

Site	Grid	Ref.
080	834	687
083	799	664
084	788	676
085	794	689
122	798	697
179	818	671
181	813	665
188	748	703

nra = No Result Available

Fp = Fluoride Particulate

Fg = Fluoride Gas

Ft = Fluoride Total

Samples collected to A.S. 3580.13.2

ReportComments

Comments dated - 04/10/2022

SITE 181 - FLOW RATE DROPPED BY >30%

Comments dated - 11/10/2022

SITE 188 - FLOW RATE DROPPED >30%

END OF REPORT

ENVIRONMENT SYSTEM
FLUORIDE IN AMBIENT AIR REPORT FOR NOVEMBER 2022

PAGE: 1

WEEKLY RESULTS :

SITE	WEEK ENDING	CORRECTED		FLUORIDE CONCENT. (ug/m3)		
		AIR VOLUME	Fp	Fg	Ft	
----	-----	-----m3	-----	-----	-----	
080	01/11	362.9	0.01	0.10	0.11	
	08/11	365.3	0.02	0.12	0.14	
	15/11	317.3	0.01	0.06	0.07	
	22/11	423.3	0.07	0.20	0.27	
	29/11	424.1	0.02	0.12	0.14	
	MONTH AVG.	378.6	0.03	0.12	0.15	
083	01/11	343.6	0.53	0.85	1.38	
	08/11	361.7	0.02	0.20	0.22	
	15/11	353.8	0.41	1.24	1.65	
	22/11	361.2	0.46	0.49	0.95	
	29/11	361.4	0.05	0.62	0.67	
	MONTH AVG.	356.3	0.29	0.68	0.97	
084	01/11	347.7	0.06	0.16	0.22	
	08/11	376.8	0.47	0.66	1.13	
	15/11	354.8	0.26	0.89	1.15	
	22/11	377.3	0.06	0.10	0.16	
	29/11	356.2	0.33	0.71	1.04	
	MONTH AVG.	362.5	0.24	0.50	0.74	
085	01/11	330.5	0.01	0.10	0.11	
	08/11	358.7	0.03	0.11	0.14	
	15/11	342.9	0.01	0.15	0.16	
	22/11	350.4	0.16	0.40	0.56	
	29/11	335.6	0.09	0.38	0.47	
	MONTH AVG.	343.6	0.06	0.23	0.29	
122	01/11	388.1	<0.01	0.06	0.07	
	08/11	375.2	0.01	0.07	0.08	
	15/11	377.3	<0.01	0.06	0.07	
	22/11	371.1	0.06	0.18	0.24	
	29/11	361.3	0.04	0.11	0.15	
	MONTH AVG.	374.6	0.03	0.10	0.12	
179	01/11	384.6	0.05	0.63	0.68	
	08/11	344.2	0.27	1.27	1.54	
	15/11	398.0	0.03	0.48	0.51	
	22/11	343.2	0.80	1.46	2.26	
	29/11	391.1	0.03	0.74	0.77	
	MONTH AVG.	372.2	0.24	0.92	1.15	

WEEKLY RESULTS :

SITE	WEEK ENDING	CORRECTED		FLUORIDE CONCENT. (ug/m3)		
		AIR VOLUME		Fp	Fg	Ft
----	-----	----m3		-----	-----	-----
181	01/11	389.0		2.02	4.52	6.54
	08/11	410.3		0.63	3.02	3.65
	15/11	423.8		0.56	0.72	1.28
	22/11	407.7		0.98	1.69	2.67
	29/11	409.1		0.11	0.69	0.80
	MONTH AVG.	408.0		0.86	2.13	2.99
188	01/11	390.1		0.01	0.06	0.07
	08/11	421.6		0.03	0.11	0.14
	15/11	417.1		0.01	0.20	0.21
	22/11	430.8		0.01	0.05	0.06
	29/11	406.2		0.02	0.13	0.15
	MONTH AVG.	413.2		0.02	0.11	0.13

Site	Grid	Ref.
080	834	687
083	799	664
084	788	676
085	794	689
122	798	697
179	818	671
181	813	665
188	748	703

nra = No Result Available

Fp = Fluoride Particulate

Fg = Fluoride Gas

Ft = Fluoride Total

Samples collected to A.S. 3580.13.2

ReportComments

END OF REPORT

ENVIRONMENT SYSTEM
FLUORIDE IN AMBIENT AIR REPORT FOR DECEMBER 2022

PAGE: 1

WEEKLY RESULTS :

SITE	WEEK ENDING	CORRECTED AIR VOLUME	FLUORIDE CONCENT. (ug/m3)		
			Fp	Fg	Ft
----	-----	-----m3	-----	-----	-----
080	06/12	407.5	<0.01	0.04	0.05
	13/12	403.6	0.10	0.25	0.35
	20/12	383.5	0.11	0.44	0.55
	27/12	400.0	0.01	0.25	0.26
	MONTH AVG.	398.6	0.06	0.25	0.30
083	06/12	354.7	0.09	0.21	0.30
	13/12	362.2	0.68	1.18	1.86
	20/12	394.5	0.12	0.28	0.40
	27/12	354.2	0.08	0.65	0.73
	MONTH AVG.	366.4	0.24	0.58	0.82
084	06/12	410.1	0.10	0.24	0.34
	13/12	361.5	0.10	0.21	0.31
	20/12	348.3	0.04	0.09	0.13
	27/12	358.6	0.15	0.53	0.68
	MONTH AVG.	369.6	0.10	0.27	0.37
085	06/12	349.5	0.20	0.80	1.00
	13/12	346.9	0.24	0.66	0.90
	20/12	332.9	0.32	0.53	0.85
	27/12	342.5	0.09	0.72	0.81
	MONTH AVG.	342.9	0.21	0.68	0.89
122	06/12	382.4	0.02	0.08	0.10
	13/12	367.5	0.02	0.08	0.10
	20/12	363.1	0.36	0.63	0.99
	27/12	383.3	0.01	0.24	0.25
	MONTH AVG.	374.1	0.10	0.26	0.36
179	06/12	347.5	0.01	0.17	0.18
	13/12	402.4	0.03	0.37	0.40
	20/12	388.6	0.03	0.56	0.59
	27/12	396.3	0.03	0.42	0.45
	MONTH AVG.	383.7	0.03	0.38	0.41

WEEKLY RESULTS :

SITE	WEEK ENDING	CORRECTED AIR VOLUME ----m3	FLUORIDE CONCENT. (ug/m3)		
			Fp	Fg	Ft
----	-----	----	-----	-----	-----
181	06/12	428.2	0.02	0.25	0.27
	13/12	424.1	0.76	2.05	2.81
	20/12	406.3	0.16	0.56	0.72
	27/12	413.5	0.09	1.04	1.13
	MONTH AVG.	418.0	0.26	0.98	1.23
188	06/12	388.1	0.01	0.08	0.09
	13/12	371.4	0.01	0.10	0.11
	20/12	355.5	<0.01	0.06	0.07
	27/12	363.0	0.02	0.21	0.23
	MONTH AVG.	369.5	0.01	0.11	0.13

Site	Grid	Ref.
080	834	687
083	799	664
084	788	676
085	794	689
122	798	697
179	818	671
181	813	665
188	748	703

nra = No Result Available

Fp = Fluoride Particulate

Fg = Fluoride Gas

Ft = Fluoride Total

Samples collected to A.S. 3580.13.2

ReportComments

END OF REPORT

APPENDIX 4 -

METEOROLOGICAL DATA

Wind Speed and Direction at 30 meters - Percent of Total Readings

Direction From	To	0.5 2.0	2.1 3.5	3.6 5.0	5.1 6.5	6.6 8.0	8.1 9.5	9.6 11.0	11.1 12.5	12.6 14.0	14.1 15.5	15.6 17.0	17.1 18.5	18.6 50.0	Total	Total Readings
N	S	0.9	2.8	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.6	34
NNE	SSW	2.4	3.8	3.4	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	80
NE	SW	2.8	7.1	3.5	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.4	107
ENE	WSW	1.6	5.6	1.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	70
E	W	0.8	3.8	4.2	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	75
ESE	WNW	1.6	3.0	2.3	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.9	59
SE	NW	0.5	2.3	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	32
SSE	NNW	0.7	1.1	1.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.5	26
S	N	0.5	0.7	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	15
SSW	NNE	0.7	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	10
SW	NE	0.7	0.8	1.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	22
WSW	ENE	1.3	4.2	3.8	2.4	1.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.1	105
W	E	0.9	4.7	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	51
WNW	ESE	0.9	2.3	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.9	29
NW	SE	1.2	1.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	19
NNW	SSE	0.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	10
Total		18.1	44.4	26.2	8.7	2.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	744.0

Calm Readings (<0.5 mps):	0	WIND SPEED (m/sec)		TEMPERATURE (°C)		RAINFALL (mm)	
Calm Readings %:	0.0	Average:	3.3	Ave Daily Max:	21.6	Total Month:	129.00
Tot. Readings Expected (ALL):	2976	Maximum:	8.5	Ave Daily Min:	13.4	Max. Daily:	34.00
Tot. Readings Accepted (ALL):	2976	Not Validated:	0	Not Validated:	0	Not Validated:	0
Percent Accepted (ALL):	100.0	Accepted:	744	Accepted:	744	Accepted:	744
Wind Direction Accepted:	744	% Accepted:	100.0	% Accepted:	100.0	% Accepted:	100.0
Wind Direction % Accepted:	100.0						

ENVIRONMENT SYSTEM
METEOROLOGICAL MONITORING FOR OCTOBER 2022

AVERAGE DAILY READINGS FROM DATA LOGGER (RAINFALL IS ACTUAL) - all times are EASTERN STANDARD TIME (EST)

Parameter:	Wind Speed	Wind Speed	Wind Direct'n	Wind Direct'n	Dry B Temp.	Delta T	Rainfall
Height:	10	30	10	30	5	5 - 30M	
Units:	Meters	Meters	Meters	Meters	Meters	Degrees	MM. /Day
1 AVE	1.60	3.78	167.14	126.48	14.16	-0.14	0.00
1 MIN	0.40	1.10	112.20	103.80	9.00	-3.20	0.00
1 MAX	3.20	5.60	334.10	215.20	17.80	0.80	0.50
2 AVE	1.03	2.40	166.27	167.67	11.77	-0.82	0.00
2 MIN	0.40	1.20	6.50	37.00	6.80	-4.20	0.00
2 MAX	2.80	4.50	353.40	275.50	17.90	0.90	0.50
3 AVE	1.12	2.75	197.95	154.29	11.64	-1.14	0.00
3 MIN	0.40	1.40	2.40	19.30	4.80	-4.40	0.00
3 MAX	2.60	4.30	357.80	274.10	19.20	1.40	0.00
4 AVE	1.19	2.76	186.23	130.07	13.61	-1.13	0.00
4 MIN	0.40	1.00	18.90	0.50	5.40	-4.50	0.00
4 MAX	2.90	4.80	355.80	286.00	22.80	1.30	0.00
5 AVE	0.86	2.30	75.23	59.45	13.15	-0.72	0.00
5 MIN	0.40	0.60	3.40	16.30	9.50	-4.00	0.00
5 MAX	2.00	3.60	348.70	99.80	16.10	1.00	34.00
6 AVE	1.79	3.42	69.85	52.31	16.36	0.73	0.00
6 MIN	0.50	2.10	56.30	40.20	13.30	-0.10	0.00
6 MAX	3.20	5.00	91.50	71.20	20.20	2.00	1.50
7 AVE	0.64	2.07	150.55	90.47	16.35	-0.08	0.00
7 MIN	0.40	1.20	18.60	2.10	10.20	-2.70	0.00
7 MAX	1.40	3.70	358.60	326.50	21.00	1.10	17.00
8 AVE	0.82	2.44	235.73	212.73	17.49	0.52	0.00
8 MIN	0.40	0.60	15.60	40.60	14.70	-0.50	0.00
8 MAX	2.30	4.80	347.60	342.70	22.00	1.40	30.50
9 AVE	1.82	3.95	187.63	172.90	13.74	0.30	0.00
9 MIN	0.40	1.30	33.90	132.60	10.50	-2.40	0.00
9 MAX	3.20	6.00	345.40	286.20	16.10	1.50	11.00

ENVIRONMENT SYSTEM
METEOROLOGICAL MONITORING FOR OCTOBER 2022

AVERAGE DAILY READINGS FROM DATA LOGGER (RAINFALL IS ACTUAL) - all times are EASTERN STANDARD TIME (EST)

Parameter:	Wind Speed	Wind Speed	Wind Direct'n	Wind Direct'n	Dry B Temp.	Delta T	Rainfall
Height:	10	30	10	30	5	5 - 30M	
Units:	Meters	Meters	Meters	Meters	Meters	Degrees	MM. /Day
10 AVE	1.13	2.56	165.23	147.66	13.25	-0.09	0.00
10 MIN	0.40	0.50	11.60	45.80	7.60	-2.30	0.00
10 MAX	2.40	4.80	351.10	273.70	17.10	1.30	3.50
11 AVE	1.41	3.16	73.30	63.33	15.32	-0.32	0.00
11 MIN	0.40	1.50	18.90	14.60	10.00	-3.40	0.00
11 MAX	3.50	5.70	118.70	93.70	19.70	0.90	0.00
12 AVE	1.64	3.29	103.44	69.34	15.14	-0.41	0.00
12 MIN	0.40	1.10	22.00	15.60	8.70	-3.50	0.00
12 MAX	3.90	6.20	318.30	280.80	20.60	1.20	0.00
13 AVE	2.09	4.41	57.49	37.93	17.11	0.01	0.00
13 MIN	0.40	2.00	25.80	23.00	9.60	-3.00	0.00
13 MAX	3.70	6.70	132.80	55.00	22.60	1.50	0.00
14 AVE	1.44	4.35	200.71	174.06	18.85	0.00	0.00
14 MIN	0.50	2.40	1.20	0.30	13.80	-2.80	0.00
14 MAX	3.10	7.10	355.20	354.80	25.00	2.50	2.00
15 AVE	1.30	3.19	172.28	146.96	15.07	-1.18	0.00
15 MIN	0.40	2.10	4.20	36.10	8.20	-3.80	0.00
15 MAX	3.00	4.70	357.40	274.10	21.60	1.20	0.00
16 AVE	1.30	2.85	171.85	150.50	16.17	-0.73	0.00
16 MIN	0.40	1.40	13.40	52.60	8.40	-3.90	0.00
16 MAX	3.20	5.20	349.80	342.80	23.10	1.10	0.00
17 AVE	1.82	4.13	150.95	126.23	17.36	0.44	0.00
17 MIN	0.60	2.60	100.00	92.80	14.70	-1.30	0.00
17 MAX	3.00	5.50	215.20	184.10	20.40	1.30	0.50
18 AVE	1.48	3.00	105.12	94.15	17.76	0.00	0.00
18 MIN	0.40	0.80	0.50	35.10	11.30	-2.30	0.00
18 MAX	3.10	5.60	254.10	169.10	22.10	0.90	0.00

ENVIRONMENT SYSTEM
METEOROLOGICAL MONITORING FOR OCTOBER 2022

AVERAGE DAILY READINGS FROM DATA LOGGER (RAINFALL IS ACTUAL) - all times are EASTERN STANDARD TIME (EST)

Parameter:	Wind Speed	Wind Speed	Wind Direct'n	Wind Direct'n	Dry B Temp.	Delta T	Rainfall
Height:	10	30	10	30	5	5 - 30M	
Units:	Meters	Meters	Meters	Meters	Meters	Degrees	MM. /Day
19 AVE	0.95	2.52	176.43	158.06	18.80	0.17	0.00
19 MIN	0.40	1.10	6.70	68.70	15.70	-1.20	0.00
19 MAX	2.40	4.20	359.20	321.60	23.50	0.80	0.50
20 AVE	0.99	2.32	92.35	63.10	18.72	0.37	0.00
20 MIN	0.40	1.00	2.40	3.50	16.90	-0.30	0.00
20 MAX	2.10	4.00	347.20	127.00	22.30	0.90	13.00
21 AVE	1.26	3.12	88.30	73.96	19.01	0.31	0.00
21 MIN	0.40	1.20	16.10	3.50	15.70	-1.30	0.00
21 MAX	2.60	4.80	359.00	353.90	21.90	1.10	0.50
22 AVE	1.38	3.84	35.39	19.20	20.18	0.40	0.00
22 MIN	0.50	2.20	19.00	3.10	17.60	-0.30	0.00
22 MAX	3.10	6.50	61.20	39.80	24.40	1.50	1.50
23 AVE	1.40	3.25	55.46	59.80	19.59	0.55	0.00
23 MIN	0.40	1.00	6.90	4.70	16.60	-0.10	0.00
23 MAX	2.60	5.50	277.10	359.20	23.90	1.40	1.50
24 AVE	0.90	2.40	140.13	111.79	17.88	0.65	0.00
24 MIN	0.40	0.70	38.20	27.20	16.10	-0.40	0.00
24 MAX	2.60	4.40	341.90	241.80	20.30	1.90	4.50
25 AVE	0.73	2.73	245.77	245.94	19.77	-0.10	0.00
25 MIN	0.40	1.60	7.60	0.30	14.80	-2.30	0.00
25 MAX	1.70	4.20	359.20	353.50	28.10	1.00	0.00
26 AVE	1.38	4.07	226.40	264.34	21.63	-0.75	0.00
26 MIN	0.40	1.90	1.70	3.50	13.80	-4.40	0.00
26 MAX	3.20	7.40	357.10	356.50	28.10	1.30	0.00
27 AVE	1.20	3.59	244.95	224.14	19.94	-0.45	0.00
27 MIN	0.40	1.90	24.80	19.70	14.40	-3.60	0.00
27 MAX	2.70	6.10	358.60	346.60	28.60	1.20	6.00

AVERAGE DAILY READINGS FROM DATA LOGGER (RAINFALL IS ACTUAL) - all times are EASTERN STANDARD TIME (EST)

Parameter:	Wind Speed	Wind Speed	Wind Direct'n	Wind Direct'n	Dry B Temp.	Delta T	Rainfall
Height:	10	30	10	30	5	5 - 30M	
Units:	Meters	Meters	Meters	Meters	Meters	Degrees	MM. /Day
28 AVE	1.78	5.28	307.60	246.61	18.22	-0.85	0.00
28 MIN	0.50	3.00	288.50	227.00	12.00	-3.50	0.00
28 MAX	3.80	8.50	346.60	257.20	25.10	1.30	0.00
29 AVE	1.92	5.25	299.29	243.57	19.10	-0.15	0.00
29 MIN	0.50	3.40	286.70	225.00	13.20	-3.20	0.00
29 MAX	3.30	7.10	330.80	251.80	25.70	1.60	0.00
30 AVE	1.49	3.43	159.82	148.44	16.64	-0.47	0.00
30 MIN	0.50	2.30	2.40	23.50	10.80	-3.60	0.00
30 MAX	3.00	5.00	344.10	273.40	21.90	1.30	0.00
31 AVE	1.02	3.15	279.02	277.03	20.83	0.04	0.00
31 MIN	0.40	1.70	5.50	9.70	12.70	-1.90	0.00
31 MAX	2.20	5.30	358.30	359.30	27.90	0.90	0.50

Readings Not Validated: 0

END OF DATA LOGGER DAILY AVERAGES
REPORT

Wind Speed and Direction at 30 meters - Percent of Total Readings

Direction From	To	0.5 2.0	2.1 3.5	3.6 5.0	5.1 6.5	6.6 8.0	8.1 9.5	9.6 11.0	11.1 12.5	12.6 14.0	14.1 15.5	15.6 17.0	17.1 18.5	18.6 50.0	Total	Total Readings
N	S	0.7	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	16
NNE	SSW	1.1	1.0	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.9	21
NE	SW	0.7	3.3	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	38
ENE	WSW	1.5	6.1	2.8	2.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.9	93
E	W	1.0	3.9	5.0	3.8	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.1	109
ESE	WNW	1.0	1.8	2.5	1.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	51
SE	NW	0.8	1.9	0.8	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	35
SSE	NNW	1.1	2.9	1.7	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	44
S	N	0.4	1.1	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	16
SSW	NNE	0.3	0.8	0.6	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	16
SW	NE	1.1	0.8	2.2	2.6	1.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	8.9	64
WSW	ENE	2.1	2.8	3.6	2.5	1.9	2.8	0.7	0.0	0.0	0.0	0.0	0.0	0.0	16.4	118
W	E	2.2	3.3	0.8	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	52
WNW	ESE	3.2	1.5	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.1	37
NW	SE	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	5
NNW	SSE	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	5
Total		17.8	33.7	22.5	16.0	6.1	3.1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	100.0	720.0

Calm Readings (<0.5 mps):	0	WIND SPEED (m/sec)		TEMPERATURE (°C)		RAINFALL (mm)	
Calm Readings %:	0.0	Average:	3.9	Ave Daily Max:	23.2	Total Month:	45.00
Tot. Readings Expected (ALL):	2880	Maximum:	10.0	Ave Daily Min:	13.1	Max. Daily:	15.50
Tot. Readings Accepted (ALL):	2880	Not Validated:	0	Not Validated:	0	Not Validated:	0
Percent Accepted (ALL):	100.0	Accepted:	720	Accepted:	720	Accepted:	720
Wind Direction Accepted:	720	% Accepted:	100.0	% Accepted:	100.0	% Accepted:	100.0
Wind Direction % Accepted:	100.0						

AVERAGE DAILY READINGS FROM DATA LOGGER (RAINFALL IS ACTUAL) - all times are EASTERN STANDARD TIME (EST)

Parameter:	Wind Speed	Wind Speed	Wind Direct'n	Wind Direct'n	Dry B Temp.	Delta T	Rainfall
Height:	10	30	10	30	5	5 - 30M	
Units:	Meters	Meters	Meters	Meters	Meters	Degrees	MM. /Day
1 AVE	2.58	6.70	295.13	258.14	18.33	0.41	0.00
1 MIN	0.57	2.86	4.83	238.50	12.22	-2.12	0.00
1 MAX	4.07	9.61	333.90	295.70	23.06	1.82	6.00
2 AVE	2.64	6.53	281.88	233.33	14.55	0.70	0.00
2 MIN	1.10	3.90	254.20	214.90	10.50	-0.50	0.00
2 MAX	3.70	8.60	309.10	256.10	19.80	1.70	0.00
3 AVE	1.53	3.85	210.93	179.32	13.97	0.02	0.00
3 MIN	0.40	1.90	7.90	71.10	8.50	-3.10	0.00
3 MAX	2.50	5.40	315.80	255.90	20.60	1.50	0.50
4 AVE	1.35	2.95	139.66	122.25	15.17	-0.43	0.00
4 MIN	0.40	1.10	27.30	30.60	10.00	-3.90	0.00
4 MAX	3.00	4.80	329.10	294.30	20.00	0.70	0.00
5 AVE	1.77	3.36	159.40	129.37	15.23	-0.89	0.00
5 MIN	0.40	0.90	4.40	30.70	7.30	-4.20	0.00
5 MAX	4.30	6.90	347.60	269.90	22.30	1.10	0.00
6 AVE	1.74	3.48	112.85	96.90	16.67	-0.69	0.00
6 MIN	0.40	1.00	1.40	26.90	9.20	-4.10	0.00
6 MAX	3.90	6.60	356.80	351.10	23.20	1.60	0.00
7 AVE	2.00	3.64	101.70	61.40	17.68	-0.23	0.00
7 MIN	0.40	0.50	24.10	1.20	10.50	-3.40	0.00
7 MAX	4.30	6.80	338.60	121.50	23.80	1.70	0.00
8 AVE	1.89	3.76	89.45	69.25	17.29	-0.65	0.00
8 MIN	0.40	1.90	45.00	31.10	11.00	-3.60	0.00
8 MAX	4.20	7.00	136.60	95.20	23.20	1.30	0.00
9 AVE	1.83	3.70	93.10	80.96	16.97	-0.74	0.00
9 MIN	0.40	0.70	53.90	40.40	9.80	-3.90	0.00
9 MAX	4.10	6.70	148.90	108.70	23.10	1.60	0.00

ENVIRONMENT SYSTEM
METEOROLOGICAL MONITORING FOR NOVEMBER 2022

AVERAGE DAILY READINGS FROM DATA LOGGER (RAINFALL IS ACTUAL) - all times are EASTERN STANDARD TIME (EST)

Parameter:	Wind Speed	Wind Speed	Wind Direct'n	Wind Direct'n	Dry B Temp.	Delta T	Rainfall
Height:	10	30	10	30	5	5 - 30M	
Units:	Meters	Meters	Meters	Meters	Meters	Degrees	MM. /Day
10 AVE	1.72	3.40	100.85	122.35	16.27	-1.13	0.00
10 MIN	0.40	0.80	4.80	32.40	8.00	-4.80	0.00
10 MAX	3.90	6.60	352.40	359.30	23.20	1.70	0.00
11 AVE	0.97	2.42	196.76	210.41	16.63	-1.20	0.00
11 MIN	0.40	1.40	1.30	35.30	7.80	-4.90	0.00
11 MAX	2.50	4.40	357.40	350.30	25.00	1.00	0.00
12 AVE	1.10	2.61	222.36	197.07	19.31	-0.09	0.00
12 MIN	0.40	1.30	28.50	51.60	11.60	-2.40	0.00
12 MAX	3.60	5.60	358.10	300.20	27.50	1.30	2.50
13 AVE	0.64	2.05	162.98	168.10	19.10	0.17	0.00
13 MIN	0.40	1.00	1.40	1.90	15.10	-1.20	0.00
13 MAX	1.20	3.50	355.10	356.60	24.60	1.00	15.50
14 AVE	1.60	4.57	263.48	247.09	22.01	-0.01	0.00
14 MIN	0.40	1.00	8.60	8.00	15.20	-3.20	0.00
14 MAX	3.80	8.90	353.60	358.00	28.20	2.30	8.50
15 AVE	1.28	3.60	232.84	191.27	18.48	-0.49	0.00
15 MIN	0.50	2.40	63.30	53.00	12.80	-3.30	0.00
15 MAX	2.10	4.60	333.30	266.80	24.50	1.30	0.00
16 AVE	1.84	4.37	212.73	180.49	15.86	0.36	0.00
16 MIN	0.50	2.30	169.10	147.80	9.90	-1.60	0.00
16 MAX	2.80	6.50	271.00	223.00	20.50	1.70	0.50
17 AVE	1.67	3.85	221.13	181.91	13.99	-0.01	0.00
17 MIN	0.40	1.80	144.30	121.70	5.90	-1.70	0.00
17 MAX	3.30	6.10	344.70	267.40	19.40	1.20	0.00
18 AVE	1.54	3.18	151.49	177.99	15.40	-0.19	0.00
18 MIN	0.40	1.10	4.80	86.80	9.20	-3.10	0.00
18 MAX	3.30	5.80	341.80	317.00	20.70	1.20	0.00

ENVIRONMENT SYSTEM
METEOROLOGICAL MONITORING FOR NOVEMBER 2022

AVERAGE DAILY READINGS FROM DATA LOGGER (RAINFALL IS ACTUAL) - all times are EASTERN STANDARD TIME (EST)

Parameter:	Wind Speed	Wind Speed	Wind Direct'n	Wind Direct'n	Dry B Temp.	Delta T	Rainfall
Height:	10	30	10	30	5	5 - 30M	
Units:	Meters	Meters	Meters	Meters	Meters	Degrees	MM. /Day
19 AVE	1.48	3.06	152.47	116.70	17.95	-0.45	0.00
19 MIN	0.40	0.70	24.70	13.30	7.10	-3.30	0.00
19 MAX	3.40	5.60	339.10	294.20	26.60	1.80	0.00
20 AVE	2.04	5.48	267.43	233.93	22.68	-0.08	0.00
20 MIN	0.50	1.30	18.60	12.20	16.00	-1.90	0.00
20 MAX	4.30	9.60	360.00	351.80	29.00	1.50	0.00
21 AVE	2.42	6.38	267.86	242.03	19.65	-0.35	0.00
21 MIN	0.40	2.30	1.40	214.10	11.00	-3.60	0.00
21 MAX	4.50	10.00	347.00	274.20	26.70	1.70	0.00
22 AVE	2.10	5.09	249.04	212.33	17.37	0.27	0.00
22 MIN	0.60	2.00	70.60	79.30	12.10	-2.00	0.00
22 MAX	3.30	8.00	320.90	258.20	23.00	1.90	0.00
23 AVE	1.46	3.95	254.95	202.08	18.01	-0.61	0.00
23 MIN	0.40	1.50	104.70	72.20	9.00	-3.40	0.00
23 MAX	2.50	5.70	341.70	255.10	27.30	1.70	0.00
24 AVE	1.53	3.28	167.69	149.43	18.12	-0.32	0.00
24 MIN	0.40	1.20	7.80	70.80	10.70	-4.40	0.00
24 MAX	3.10	5.50	322.80	288.50	23.70	1.40	0.00
25 AVE	1.45	3.00	130.91	107.48	20.06	0.17	0.00
25 MIN	0.40	0.90	69.00	44.90	15.20	-2.10	0.00
25 MAX	3.60	5.70	288.20	256.80	24.80	0.80	0.00
26 AVE	1.95	3.82	138.49	116.89	18.60	0.30	0.00
26 MIN	0.50	2.10	64.80	45.60	14.90	-2.30	0.00
26 MAX	3.00	5.20	201.90	176.50	21.50	1.10	0.50
27 AVE	1.07	2.88	236.75	184.49	21.66	-0.11	0.00
27 MIN	0.40	0.70	17.60	7.40	12.00	-2.30	0.00
27 MAX	1.80	4.80	335.60	335.00	32.60	1.20	1.50

AVERAGE DAILY READINGS FROM DATA LOGGER (RAINFALL IS ACTUAL) - all times are EASTERN STANDARD TIME (EST)

Parameter:	Wind Speed	Wind Speed	Wind Direct'n	Wind Direct'n	Dry B Temp.	Delta T	Rainfall
Height:	10	30	10	30	5	5 - 30M	
Units:	Meters	Meters	Meters	Meters	Meters	Degrees	MM. /Day
28 AVE	1.48	3.12	157.47	128.09	19.38	0.50	0.00
28 MIN	0.40	1.40	91.90	3.20	16.20	-1.60	0.00
28 MAX	3.20	5.50	350.80	290.70	22.10	1.70	9.50
29 AVE	1.88	3.85	167.69	146.27	19.10	0.32	0.00
29 MIN	0.40	0.90	31.30	88.10	14.70	-1.10	0.00
29 MAX	3.80	7.10	348.40	277.10	23.40	1.20	0.00
30 AVE	1.98	3.93	95.99	82.58	17.82	-0.14	0.00
30 MIN	0.40	2.10	68.40	58.30	10.40	-4.30	0.00
30 MAX	4.00	6.50	118.10	105.20	21.60	1.20	0.00

Readings Not Validated: 0

END OF DATA LOGGER DAILY AVERAGES
REPORT

Wind Speed and Direction at 30 meters - Percent of Total Readings

Direction From	To	0.5 2.0	2.1 3.5	3.6 5.0	5.1 6.5	6.6 8.0	8.1 9.5	9.6 11.0	11.1 12.5	12.6 14.0	14.1 15.5	15.6 17.0	17.1 18.5	18.6 50.0	Total	Total Readings
N	S	0.1	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	8
NNE	SSW	0.5	1.1	2.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	29
NE	SW	1.1	4.2	1.1	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.2	53
ENE	WSW	1.6	3.7	1.9	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	63
E	W	2.0	3.1	4.8	3.8	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.9	109
ESE	WNW	0.7	4.1	4.8	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.9	102
SE	NW	1.2	1.6	1.8	3.5	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.4	76
SSE	NNW	0.4	3.0	3.5	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0	59
S	N	0.3	3.3	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	35
SSW	NNE	0.8	1.6	0.7	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	28
SW	NE	0.8	0.5	1.2	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.7	27
WSW	ENE	1.4	1.9	3.4	1.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	61
W	E	1.1	4.1	1.0	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8	50
WNW	ESE	0.7	1.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	20
NW	SE	0.1	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	7
NNW	SSE	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	6
Total		13.4	36.0	28.0	18.3	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	733.0

Calm Readings (<0.5 mps): 5

Calm Readings %: 0.7

Tot. Readings Expected (ALL): 2976

Tot. Readings Accepted (ALL): 2970

Percent Accepted (ALL): 99.8

Wind Direction Accepted: 733

Wind Direction % Accepted: 98.5

WIND SPEED (m/sec)

Average: 3.7

Maximum: 7.9

Not Validated: 6

Accepted: 738

% Accepted: 99.2

TEMPERATURE (°C)

Ave Daily Max: 24.3

Ave Daily Min: 14.6

Not Validated: 6

Accepted: 738

% Accepted: 99.2

RAINFALL (mm)

Total Month: 22.00

Max. Daily: 5.00

Not Validated: 6

Accepted: 738

% Accepted: 99.2

AVERAGE DAILY READINGS FROM DATA LOGGER (RAINFALL IS ACTUAL) - all times are EASTERN STANDARD TIME (EST)

Parameter:	Wind Speed	Wind Speed	Wind Direct'n	Wind Direct'n	Dry B Temp.	Delta T	Rainfall
Height:	10	30	10	30	5	5 - 30M	
Units:	Meters	Meters	Meters	Meters	Meters	Degrees	MM. /Day
1 AVE	1.69	3.61	134.18	109.38	18.48	0.31	0.00
1 MIN	0.40	0.60	96.70	85.00	12.80	-3.30	0.00
1 MAX	2.90	5.40	243.80	197.80	20.80	0.80	0.00
2 AVE	2.04	4.55	135.59	113.09	18.70	0.55	0.00
2 MIN	0.50	2.50	120.50	106.50	15.00	-0.90	0.00
2 MAX	3.30	6.10	183.20	148.90	22.10	1.10	1.50
3 AVE	1.65	3.35	146.98	122.45	17.49	-0.65	0.00
3 MIN	0.40	1.00	59.80	58.50	11.70	-3.70	0.00
3 MAX	3.40	5.70	355.70	271.00	22.40	1.10	0.00
4 AVE	1.67	3.03	73.05	63.26	17.52	-0.78	0.00
4 MIN	0.40	0.40	26.40	22.20	9.60	-4.30	0.00
4 MAX	3.40	5.40	156.30	117.50	23.20	1.10	0.00
5 AVE	1.22	2.90	201.26	184.27	22.51	-0.25	0.00
5 MIN	0.40	0.80	38.60	5.50	10.60	-3.50	0.00
5 MAX	2.10	4.40	347.70	356.40	32.80	1.50	0.00
6 AVE	1.99	4.13	152.22	127.34	20.35	0.57	0.00
6 MIN	0.40	0.40	97.20	70.00	17.30	-0.30	0.00
6 MAX	3.30	6.10	192.60	170.80	22.60	1.10	0.00
7 AVE	1.29	3.71	308.01	243.16	19.82	-0.11	0.00
7 MIN	0.40	0.40	60.70	40.90	12.10	-2.70	0.00
7 MAX	2.50	6.70	354.20	293.70	26.50	1.10	0.50
8 AVE	2.14	4.78	208.62	182.80	18.81	0.25	0.00
8 MIN	0.40	1.20	14.20	114.30	13.10	-2.40	0.00
8 MAX	3.60	7.30	341.80	260.10	23.80	1.40	0.00
9 AVE	1.64	3.45	162.20	142.68	15.94	-0.12	0.00
9 MIN	0.40	1.30	33.70	98.30	9.50	-3.30	0.00
9 MAX	3.30	5.90	348.40	268.30	20.70	1.20	0.00

ENVIRONMENT SYSTEM
METEOROLOGICAL MONITORING FOR DECEMBER 2022

AVERAGE DAILY READINGS FROM DATA LOGGER (RAINFALL IS ACTUAL) - all times are EASTERN STANDARD TIME (EST)

Parameter:	Wind Speed	Wind Speed	Wind Direct'n	Wind Direct'n	Dry B Temp.	Delta T	Rainfall
Height:	10	30	10	30	5	5 - 30M	
Units:	Meters	Meters	Meters	Meters	Meters	Degrees	MM. /Day
10 AVE	1.44	2.95	120.99	103.45	17.30	0.29	0.00
10 MIN	0.50	1.60	62.20	40.50	13.90	-1.30	0.00
10 MAX	2.60	4.30	229.90	202.00	20.30	0.70	0.00
11 AVE	1.45	3.25	169.95	150.38	20.81	-0.44	0.00
11 MIN	0.40	1.00	3.40	17.90	10.80	-3.30	0.00
11 MAX	3.60	5.90	359.10	306.70	30.30	1.40	0.00
12 AVE	1.25	4.10	243.87	280.53	22.66	-0.09	0.00
12 MIN	0.50	2.30	3.00	201.50	17.70	-1.00	0.00
12 MAX	2.90	6.80	358.30	358.70	27.10	0.80	5.00
13 AVE	1.77	4.48	232.62	189.93	19.18	-0.32	0.00
13 MIN	0.40	1.90	20.80	12.60	9.30	-3.80	0.00
13 MAX	3.80	6.70	335.80	264.20	27.80	1.60	0.00
14 AVE	1.55	4.31	260.07	236.65	18.46	-0.48	0.00
14 MIN	0.40	1.30	11.10	199.90	9.20	-3.60	0.00
14 MAX	3.10	6.90	338.70	333.60	25.90	1.50	0.00
15 AVE	2.01	4.53	217.65	171.44	16.68	-0.40	0.00
15 MIN	0.50	2.90	104.40	90.90	8.50	-4.20	0.00
15 MAX	3.50	6.50	348.70	260.00	22.20	1.60	0.00
16 AVE	2.18	4.58	181.48	155.18	15.72	0.65	0.00
16 MIN	1.10	2.80	154.70	129.40	10.60	0.10	0.00
16 MAX	3.60	7.30	221.40	195.60	19.60	2.40	4.50
17 AVE	2.23	4.63	191.97	162.10	16.15	0.68	0.00
17 MIN	0.70	2.30	162.10	134.30	13.20	0.10	0.00
17 MAX	4.10	7.40	250.10	209.00	18.80	1.50	3.50
18 AVE	1.94	4.04	202.62	169.42	15.77	0.92	0.00
18 MIN	0.50	1.80	165.80	136.90	12.80	0.20	0.00
18 MAX	3.70	7.40	314.90	239.90	18.30	2.30	1.50

ENVIRONMENT SYSTEM
METEOROLOGICAL MONITORING FOR DECEMBER 2022

AVERAGE DAILY READINGS FROM DATA LOGGER (RAINFALL IS ACTUAL) - all times are EASTERN STANDARD TIME (EST)

Parameter:	Wind Speed	Wind Speed	Wind Direct'n	Wind Direct'n	Dry B Temp.	Delta T	Rainfall
Height:	10	30	10	30	5	5 - 30M	
Units:	Meters	Meters	Meters	Meters	Meters	Degrees	MM. /Day
19 AVE	2.33	4.85	196.66	163.59	16.75	0.49	0.00
19 MIN	0.60	2.00	159.00	134.00	12.70	-0.10	0.00
19 MAX	4.30	7.90	286.50	215.20	20.10	1.00	0.50
20 AVE	1.76	3.65	188.55	152.90	16.98	0.13	0.00
20 MIN	0.40	1.50	132.50	115.20	12.50	-2.60	0.00
20 MAX	3.60	6.30	317.00	201.30	21.00	1.10	0.00
21 AVE	1.47	3.05	154.38	152.90	16.23	-0.10	0.00
21 MIN	0.40	1.10	0.40	41.60	10.90	-4.10	0.00
21 MAX	3.20	5.50	349.50	296.00	21.50	2.30	2.50
22 AVE	1.23	2.52	136.10	83.56	16.80	-0.82	0.00
22 MIN	0.40	0.50	1.20	10.20	8.00	-4.70	0.00
22 MAX	3.10	5.40	356.20	294.60	25.00	1.70	0.00
23 AVE	1.02	2.40	251.47	198.42	21.11	0.20	0.00
23 MIN	0.40	0.50	97.80	79.30	15.40	-1.30	0.00
23 MAX	2.20	4.00	353.90	271.30	28.80	0.90	2.00
24 AVE	1.13	3.08	241.49	195.45	22.55	-0.04	0.00
24 MIN	0.40	1.80	8.30	11.60	17.30	-3.30	0.00
24 MAX	2.10	4.30	357.40	356.00	30.30	1.20	0.50
25 AVE	1.62	3.22	147.90	133.11	22.47	-0.30	0.00
25 MIN	0.40	1.50	68.20	52.00	16.00	-3.00	0.00
25 MAX	3.00	4.90	342.00	296.90	26.90	1.30	0.00
26 AVE	1.72	3.18	135.68	107.26	23.00	-0.58	0.00
26 MIN	0.40	0.60	20.20	43.50	14.00	-4.00	0.00
26 MAX	4.10	6.60	358.40	346.50	32.50	1.30	0.00
27 AVE	2.12	3.90	95.54	66.96	22.03	0.03	0.00
27 MIN	0.40	1.10	31.70	23.20	14.20	-3.20	0.00
27 MAX	4.20	7.20	257.60	90.90	27.80	1.80	0.00

ENVIRONMENT SYSTEM
METEOROLOGICAL MONITORING FOR DECEMBER 2022

AVERAGE DAILY READINGS FROM DATA LOGGER (RAINFALL IS ACTUAL) - all times are EASTERN STANDARD TIME (EST)

Parameter:	Wind Speed	Wind Speed	Wind Direct'n	Wind Direct'n	Dry B Temp.	Delta T	Rainfall
Height:	10	30	10	30	5	5 - 30M	
Units:	Meters	Meters	Meters	Meters	Meters	Degrees	MM. /Day
28 AVE	2.01	3.77	89.25	82.74	23.59	0.34	0.00
28 MIN	0.80	2.00	7.40	11.60	16.30	-1.30	0.00
28 MAX	3.80	6.10	352.70	337.50	30.90	1.60	0.00
29 AVE	1.70	3.54	138.58	103.67	21.54	-0.03	0.00
29 MIN	0.40	1.40	61.40	40.40	15.40	-2.40	0.00
29 MAX	3.50	6.10	250.70	137.40	26.70	0.80	0.00
30 AVE	2.18	4.15	102.45	84.07	22.64	0.64	0.00
30 MIN	0.50	2.00	83.50	68.50	19.30	-0.20	0.00
30 MAX	3.90	6.50	134.40	97.80	26.50	1.70	0.00
31 AVE	1.98	3.76	96.87	79.67	21.92	0.34	0.00
31 MIN	0.40	1.80	76.40	65.10	17.10	-1.60	0.00
31 MAX	3.90	6.60	113.90	92.50	27.10	1.10	0.00

Readings Not Validated: 186

END OF DATA LOGGER DAILY AVERAGES
REPORT

APPENDIX 5 -

VEGETATION MONITORING DATA

ENVIRONMENT SYSTEM
WATER AND VEGETATION MONITORING FOR DECEMBER 2022

PAGE: 1

RESULTS BY SAMPLING GROUP

100 - OVERSTOREY

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	006	AVICENNIA MARINA	FLUORIDE (ug/g)	13	22	20	45	10	10	30	25	25	15	30	15	15	25
2	111	ANGOPHORA COSTATA	FLUORIDE (ug/g)	1053	1412	1145	1295	1945	1455	1865	1745	540	880	1880	960	1295	1935
3	112	ANGOPHORA COSTATA	FLUORIDE (ug/g)	480	707	515	365	165	975	1040	620	210	95	600	1495	1800	600
4	113	EUCALYPTUS MACULATA	FLUORIDE (ug/g)	114	178	215	75	50	230	245	nra	nra	375	65	245	nra	105
5	114	MELALEUCA QUINQUENERVIA	FLUORIDE (ug/g)	655	777	390	180	720	nra	nra	550	250	875	830	2670	1140	165
6	115	EUCALYPTUS PARRAMATENSIS	FLUORIDE (ug/g)	119	176	120	420	35	35	90	610	nra	105	nra	105	185	50
7	116	ANGOPHORA COSTATA	FLUORIDE (ug/g)	91	84	20	30	20	70	225	35	45	100	185	130	70	75
8	117	ANGOPHORA COSTATA	FLUORIDE (ug/g)	437	267	20	50	25	660	65	1010	75	515	610	105	45	20
9	118	MELALEUCA QUINQUENERVIA	FLUORIDE (ug/g)	240	364	100	165	255	720	195	550	820	450	600	255	125	135
10	119	ANGOPHORA FLORIBUNDA	FLUORIDE (ug/g)	163	178	200	75	110	125	230	150	105	50	240	400	240	215
11	120	EUCALYPTUS MACULATA	FLUORIDE (ug/g)	66	75	85	60	125	145	90	115	25	15	20	95	25	105
12	121	EUCALYPTUS PILULARIS	FLUORIDE (ug/g)	53	47	40	35	75	75	65	35	30	55	25	50	25	55
13	122	ANGOPHORA FLORIBUNDA	FLUORIDE (ug/g)	28	26	30	35	20	35	15	55	15	30	20	20	20	20
14	123	EUCALYPTUS HAEMASTOMA	FLUORIDE (ug/g)	20	30	5	10	5	15	30	100	40	25	30	70	10	20
15	124	ANGOPHORA COSTATA	FLUORIDE (ug/g)	28	27	5	5	5	5	20	25	20	25	160	15	15	20
16	126	CASUARINA GLAUCA	FLUORIDE (ug/g)	45	60	10	135	70	45	125	15	nra	5	90	15	140	10
17	128	EUCALYPTUS ROBUSTA	FLUORIDE (ug/g)	23	34	10	10	5	nra	10	95	20	nra	120	20	20	30
18	129	ANGOPHORA COSTATA	FLUORIDE (ug/g)	13	19	15	5	10	10	25	50	10	15	55	10	5	15
19	130	AVICENNIA MARINA	FLUORIDE (ug/g)	26	31	20	15	60	10	10	95	20	20	65	15	30	15
20	131	AVICENNIA MARINA	FLUORIDE (ug/g)	10	7	10	5	5	5	5	10	5	5	5	5	10	10
21	132	AVICENNIA MARINA	FLUORIDE (ug/g)	7	7	5	5	5	5	5	10	5	5	15	10	5	5
22	133	CASUARINA GLAUCA	FLUORIDE (ug/g)	10	20	5	10	5	15	15	70	15	25	15	15	15	35
23	134	CASUARINA GLAUCA	FLUORIDE (ug/g)	18	20	65	20	10	10	10	15	30	20	15	15	15	15
24	136	EUCALYPTUS HAEMASTOMA	FLUORIDE (ug/g)	11	8	q	5	q	q	15	q	q	5	q	q	5	q
25	137	ANGOPHORA COSTATA	FLUORIDE (ug/g)	22	17	35	5	15	10	15	10	20	15	55	10	5	10
26	138	AVICENNIA MARINA	FLUORIDE (ug/g)	5	8	q	5	q	q	15	q	q	5	q	q	5	q
27	139	EUCALYPTUS MACULATA	FLUORIDE (ug/g)	5	11	q	5	q	q	10	q	q	25	q	q	5	q
28	141	EUCALYPTUS MACULATA	FLUORIDE (ug/g)	5	31	q	90	q	q	5	q	q	25	q	q	5	q
29	142	CASUARINA GLAUCA	FLUORIDE (ug/g)	11	10	q	10	q	q	5	q	q	15	q	q	10	q
30	144	EUCALYPTUS HAEMASTOMA	FLUORIDE (ug/g)	11	15	q	20	q	q	5	q	q	25	q	q	10	q
31	147	AVICENNIA MARINA	FLUORIDE (ug/g)	5	6	q	10	q	q	5	q	q	5	q	q	5	q
32	149	EUCALYPTUS MACULATA	FLUORIDE (ug/g)	5	5	q	5	q	q	5	q	q	5	q	q	5	q
33	151	EUCALYPTUS PILULARIS	FLUORIDE (ug/g)	5	9	q	10	q	q	5	q	q	10	q	q	10	q
34	168	EUCALYPTUS ROBUSTA	FLUORIDE (ug/g)	160	166	180	95	150	300	225	285	25	45	110	55	290	235
35	169	EUCALYPTUS GLOBOIDEA	FLUORIDE (ug/g)	25	23	10	5	10	20	30	20	15	30	65	50	5	10
36	170	EUCALYPTUS PILULARIS	FLUORIDE (ug/g)	14	11	5	5	5	10	15	15	10	25	10	15	15	5
37	171	CASUARINA GLAUCA	FLUORIDE (ug/g)	15	13	5	15	5	5	35	15	5	10	25	10	10	10
38	172	CASUARINA GLAUCA	FLUORIDE (ug/g)	11	11	10	5	5	5	20	10	20	10	20	10	10	10
39	173	CASUARINA GLAUCA	FLUORIDE (ug/g)	9	9	5	5	5	35	5	10	5	10	10	10	5	5

40	174	CASUARINA GLAUCA	FLUORIDE (ug/g)	50	40	30	45	20	15	nra	50	60	nra	35	50	60	35
41	175	CASUARINA GLAUCA	FLUORIDE (ug/g)	56	38	20	45	5	20	20	65	65	45	55	20	70	20
42	190	ANGOPHORA COSTATA	FLUORIDE (ug/g)	26	22	25	15	15	20	10	35	nra	nra	35	25	15	25
43	191	CASUARINA GLAUCA	FLUORIDE (ug/g)	18	14	5	20	5	5	25	10	25	20	30	5	10	5

nra = No Result Available

tba = To Be Analysed

c = Result Being Checked

q = Samples collected quarterly

ALY = Average Last Year

AYTD = Average Year To Date

WATER AND VEGETATION MONITORING FOR DECEMBER 2022

RESULTS BY SAMPLING GROUP

130 - POTLINE 3 VEGETATION

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	182	CASUARINA GLAUCA	FLUORIDE (ug/g)	56	40	15	40	25	5	15	65	35	45	65	35	115	25
2	183	CASUARINA GLAUCA	FLUORIDE (ug/g)	45	38	20	15	10	10	15	55	55	65	65	75	45	25
3	184	CASUARINA GLAUCA	FLUORIDE (ug/g)	31	60	20	10	60	15	50	35	65	75	225	30	75	60
4	185	ANGOPHORA COSTATA	FLUORIDE (ug/g)	25	30	25	20	20	35	10	30	35	50	45	35	45	10
5	193	ANGOPHORA COSTATA	FLUORIDE (ug/g)	22	14	15	10	10	10	15	45	10	15	15	10	10	5
6	194	ROUGH BARK APPLE	FLUORIDE (ug/g)	49	43	30	15	65	55	20	25	35	65	85	95	5	20

nra = No Result Available

tba = To Be Analysed

c = Result Being Checked

q = Samples collected quarterly

ALY = Average Last Year

AYTD = Average Year To Date

WATER AND VEGETATION MONITORING FOR DECEMBER 2022

RESULTS BY SAMPLING GROUP

350 - FORAGE

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	004	FORAGE	FLUORIDE (ug/g)	220	152	10	40	15	165	115	455	175	240	140	55	195	220
2	031	FORAGE	FLUORIDE (ug/g)	5	10	q	5	q	q	15	q	q	15	q	q	5	q
3	032	FORAGE	FLUORIDE (ug/g)	9	10	5	5	5	15	5	5	20	20	10	15	5	5
4	034	FORAGE	FLUORIDE (ug/g)	7	19	20	nra	10	nra	10	10	20	nra	10	5	70	15
		FODDER FEED MIX	FLUORIDE (ug/g)	7	24	5	nra	40	nra	20	5	10	nra	5	15	90	25
5	087	FORAGE	FLUORIDE (ug/g)	59	62	15	15	35	80	35	130	10	20	165	120	65	50
6	126	FORAGE	FLUORIDE (ug/g)	15	18	q	5	q	q	10	q	q	25	q	q	30	q
7	130	FORAGE	FLUORIDE (ug/g)	45	37	5	5	5	55	25	130	40	30	40	30	40	35
8	131	FORAGE	FLUORIDE (ug/g)	10	16	q	5	q	q	15	q	q	20	q	q	25	q
9	133	FORAGE	FLUORIDE (ug/g)	14	36	q	5	q	q	20	q	q	25	q	q	95	q
10	134	FORAGE	FLUORIDE (ug/g)	9	21	80	5	35	25	5	5	15	25	15	15	5	25
11	141	FORAGE	FLUORIDE (ug/g)	5	9	q	5	q	q	10	q	q	15	q	q	5	q
12	142	FORAGE	FLUORIDE (ug/g)	7	18	55	5	5	55	5	5	10	20	15	15	5	20
13	143	FORAGE	FLUORIDE (ug/g)	5	15	q	5	q	q	10	q	q	25	q	q	20	q
14	160	FORAGE	FLUORIDE (ug/g)	29	23	q	55	q	q	10	q	q	20	q	q	5	q
15	166	FORAGE	FLUORIDE (ug/g)	7	14	30	nra	nra	nra	5	5	nra	nra	15	nra	10	20
16	167	FORAGE	FLUORIDE (ug/g)	33	27	5	5	5	45	25	60	15	45	60	25	10	25
17	176	FORAGE	FLUORIDE (ug/g)	6	17	5	5	5	30	10	5	20	20	55	25	5	20
18	178	FORAGE	FLUORIDE (ug/g)	7	10	5	5	5	15	5	5	10	10	25	20	5	10
19	211	FORAGE	FLUORIDE (ug/g)	15	20	5	10	5	20	15	45	15	30	35	25	25	15
20	307	FORAGE	FLUORIDE (ug/g)	6	9	5	5	5	5	5	5	15	10	30	10	5	5
21	308	FORAGE	FLUORIDE (ug/g)	6	10	5	40	5	5	5	5	10	15	20	5	5	5

nra = No Result Available

tba = To Be Analysed

c = Result Being Checked

q = Samples collected quarterly

ALY = Average Last Year

AYTD = Average Year To Date

 *** END OF WATER AND VEGETATION BY GROUP REPORT ***

APPENDIX 6 –

WATER MONITORING DATA

- 1. Sewer Treatment Works and Irrigation System Report**
- 2. Stormwater Drain Monitor Report**
- 3. Surface Water and Groundwater Reports**

Day	S.P	Settleable	Pasveer	Effl.	MLSS	Ammonia	Nitrate	Volat	D.O	BOD	Colour	Condition
	Hours	Solids ml	pH	pH	Wkly.	Wkly.	Wkly.	SS	Effl.	Effl.		
		.5hr	1hr		mg/l	mg/l	mg/l	mg/l		mg/l		
1												
2												
3												
4	0.49	170	130	6.6	6.8	2650	0.30	50	1815	6.8	BROWN	CLEAR
5	0.10	160	120	6.7	6.8					5.6	BROWN	CLEAR
6												
7	0.24	160	130	6.8	6.9					6.1	BROWN	CLEAR
8												
9												
10	0.36	180	120	6.7	6.8	2190	0.22	50		3.9	BROWN	CLEAR
11												
12	0.26	180	130	6.7	6.7					4.9	BROWN	CLEAR
13												
14	0.27	160	120	6.6	6.7					6.3	BROWN	CLEAR
15												
16												
17	0.40	200	140	6.5	6.8	1895	0.45	50		7.2	BROWN	CLEAR
18												
19	0.30	100	50	6.3	6.4					2.0	BROWN	SCUM
20												
21	0.26	100	50	6.2	6.3					3.2	BROWN	CLEAR
22												
23												
24	0.44	120	50	6.3	6.5	2485	0.63			4.2	BROWN	CLEAR
25												
26	0.30	100	50	6.4	6.6					4.6	BROWN	CLEAR
27												
28	0.26	120	100	6.5	6.5					4.8	BROWN	CLEAR
29												
30												
31	0.38	140	100	6.4	6.6	2425	0.45			4.1	BROWN	CLEAR

Comments

End of report

TOMAGO ALUMINIUM COMPANY PTY. LIMITED (A.C.N. 001 862 228)
 ENVIRONMENT SYSTEM
 MATURATION POND AND IRRIGATION SYSTEM REPORT
 FOR OCTOBER 2022

EPA point 17

	Maturation Pond						Irrigation System		
	pH	Cond uS/cm	Fluoride mg/L	BOD Effl. mg/L	Suspend. Solids mg/L	E-Coli Count/ 100mL	Avg kL/day to sewer	Total kL Irrigated	mm/week Irrigated
1								0	
2								0	
3								0	
4	7.0	790	5.0			0		1788	
5							8	434	19
6								0	
7								1197	
8								0	
9								0	
10	6.9	690	4.8			0		1520	
11								0	
12							9	1377	28
13								0	
14								974	
15								0	
16								0	
17	7.0	750	5.1			55		1449	
18								0	
19							10	1039	24
20								0	
21								1078	
22								0	
23								0	
24	6.9	730	5.1			225		1339	
25								0	
26							10	1462	26
27								0	
28								1035	
29								0	
30								0	
31	7.0	780	5.4			0		1190	
Total								15882.00	

BOD = Biological Oxygen Demand
 nra = No result available

End of report

TOMAGO ALUMINIUM COMPANY PTY. LIMITED (A.C.N. 001 862 228)
 ENVIRONMENT SYSTEM 13:17:56 08-02-23 Page 1
 SEWAGE TREATMENT WORKS MONITORING RESULTS
 FOR NOVEMBER 2022

Day	S.P	Settleable		Pasveer	Effl.	MLSS	Ammonia	Nitrate	Volat	D.O	BOD	Colour	Condition
	Hours	Solids ml		pH	pH	Wkly.	Wkly.	Wkly.	SS	Effl.	Effl.		
		.5hr	1hr			mg/l	mg/l	mg/l	mg/l		mg/l		
1													
2	0.28	150	140	6.5	6.4					3.4		BROWN	CLEAR
3													
4	0.27	160	140	6.6	6.6					4.6		BROWN	CLEAR
5													
6													
7	0.35	170	160	6.6	6.7	720	0.35	50	540	4.7		BROWN	CLEAR
8													
9	0.25	180	150	6.5	6.7					5.3		BROWN	CLEAR
10	0.13	190	160	6.7	6.8					6.9		BROWN	CLEAR
11													
12													
13													
14	0.50	190	140	6.9	6.7	1400	1.98	50		4.7		BROWN	CLEAR
15													
16	0.25	150	130	6.6	6.6					5.4		BROWN	CLEAR
17	0.14	200	160	6.5	6.6					4.9		BROWN	CLEAR
18													
19													
20													
21	0.53	180	120	6.4	6.6	2465	0.63	50		3.8		BROWN	CLEAR
22													
23	0.27	200	180	6.5	6.5					5.4		BROWN	CLEAR
24													
25	0.24	200	150	6.6	6.6					8.5	6	BROWN	CLEAR
26													
27													
28	0.38	200	170	6.5	6.6	1100	0.39	50		5.0		BROWN	CLEAR
29													
30	0.26	190	130	6.2	6.2					5.0		BROWN	CLEAR

Comments

End of report

EVR860

TOMAGO ALUMINIUM COMPANY PTY. LIMITED (A.C.N. 001 862 228)
 ENVIRONMENT SYSTEM
 MATURATION POND AND IRRIGATION SYSTEM REPORT
 FOR NOVEMBER 2022

13:02:38 08-02-23 Page 1

EPA point 17

	Maturation Pond						Irrigation System		
	pH	Cond uS/cm	Fluoride mg/L	BOD Effl. mg/L	Suspend. Solids mg/L	E-Coli Count/ 100mL	Avg kL/day to sewer	Total kL Irrigated	mm/week Irrigated
1								0	
2							9	1637	26
3								0	
4								807	
5								0	
6								0	
7	6.7	790	5.2			0		981	
8								0	
9							9	956	19
10								0	
11								0	
12								0	
13								0	
14	6.7	790	5.5			420		1961	
15								0	
16							9	1573	24
17								671	
18								0	
19								0	
20								0	
21	6.8	770	5.2			28		1887	
22								0	
23							10	1230	26
24								0	
25				3	<5			481	
26								0	
27								0	
28	7.5	800	5.1			320		720	
29								0	
30							9	1285	17
Total								14189.00	

BOD = Biological Oxygen Demand
 nra = No result available

End of report

TOMAGO ALUMINIUM COMPANY PTY. LIMITED (A.C.N. 001 862 228)
 ENVIRONMENT SYSTEM 13:18:03 08-02-23 Page 1
 SEWAGE TREATMENT WORKS MONITORING RESULTS
 FOR DECEMBER 2022

Day	S.P	Settleable		Pasveer	Effl.	MLSS	Ammonia	Nitrate	Volat	D.O	BOD	Colour	Condition
	Hours	Solids ml		pH	pH	Wkly.	Wkly.	Wkly.	SS	Effl.	Effl.		
		.5hr	1hr			mg/l	mg/l	mg/l	mg/l		mg/l		
1													
2	0.22	180	120	6.2	6.4					4.8		BROWN	CLEAR
3													
4													
5	0.34	200	140	6.3	6.4	2280	0.22	50	1600	4.6		BROWN	CLEAR
6													
7	0.29	200	130	6.2	6.3					6.1		BROWN	CLEAR
8													
9	0.24	220	170	6.3	6.6					4.1		BROWN	CLEAR
10													
11													
12	0.34	210	160	6.4	6.5	1960	0.63	50		4.6		BROWN	CLEAR
13													
14													
15	0.40	100	80	6.6	6.6					6.8		BROWN	CLEAR
16	0.12	100	50	6.5	6.6					5.4		BROWN	CLEAR
17													
18													
19	0.32	120	80	6.3	6.5	1505	0.45	50		3.6		BROWN	CLEAR
20													
21	0.24	120	100	6.5	6.5					3.2		BROWN	CLEAR
22													
23	0.25	150	140	6.5	6.6					3.2		BROWN	CLEAR
24													
25													
26													
27	0.54	150	140	6.5	6.7					4.9		BROWN	CLEAR
28													
29	0.23	140	120	6.5	6.6	1580	0.56	50		4.0		BROWN	CLEAR
30	0.12	150	140	6.4	6.6					3.6		BROWN	CLEAR
31													

Comments

End of report

TOMAGO ALUMINIUM COMPANY PTY. LIMITED (A.C.N. 001 862 228)
 ENVIRONMENT SYSTEM
 MATURATION POND AND IRRIGATION SYSTEM REPORT
 FOR DECEMBER 2022

EPA point 17

	Maturation Pond						Irrigation System		
	pH	Cond uS/cm	Fluoride mg/L	BOD Effl. mg/L	Suspend. Solids mg/L	E-Coli Count/ 100mL	Avg kL/day to sewer	Total kL Irrigated	mm/week Irrigated
1								0	
2								1038	
3								0	
4								0	
5	7.1	800	4.9			580		161	
6								0	
7							9	1687	20
8								0	
9								1296	
10								0	
11								0	
12	7.0	810	5.1			0		2401	
13								0	
14							6	0	25
15								1331	
16								228	
17								0	
18								0	
19	6.9	770	5.0			140		1780	
20								0	
21							11	693	27
22								0	
23								1086	
24								0	
25								0	
26								0	
27								703	
28							8	0	12
29	7.0	770	4.9			185		1317	
30								564	
31								0	
Total								14285.00	

BOD = Biological Oxygen Demand
 nra = No result available

End of report

TOMAGO ALUMINIUM COMPANY PTY. LTD.
DRAIN TO HUNTER RIVER
MONITORING REPORT
Oct 2022 (Point 35)

DATE	pH Ave	Cond uS/cm Av.	SoL F mg/L Av.	PAH mg/L	TRH mg/L	FLOW (to Hunter River)		Rainfall mm
						L/sec Av.	kL/day Av.	
1-Oct	6.1	270	54	NR	NR	34	2902	0.5
2-Oct	6.1	270	52	NR	NR	16	1374	0.5
3-Oct	6.2	270	52	NR	NR	9	812	0.0
4-Oct	6.3	270	54	0.0005	0.05	6	544	0.0
5-Oct	6.2	160	48	NR	NR	188	16219	34.0
6-Oct	6.1	160	44	NR	NR	69	5951	1.5
7-Oct	6.1	160	44	NR	NR	83	7201	17.0
8-Oct	6.0	160	43	NR	NR	220	18972	30.5
9-Oct	5.9	160	37	NR	NR	165	14238	11.0
10-Oct	5.9	160	39	0.0005	0.05	38	3240	3.5
11-Oct	6.0	270	39	NR	NR	24	2098	0.0
12-Oct	6.0	270	39	NR	NR	14	1248	0.0
13-Oct	6.1	270	41	NR	NR	9	739	0.0
14-Oct	6.1	270	44	NR	NR	3	237	2.0
15-Oct	6.0	270	45	NR	NR	3	284	0.0
16-Oct	6.1	270	44	NR	NR	4	334	0.0
17-Oct	6.1	270	44	0.0005	0.05	4	383	0.5
18-Oct	6.2	250	46	NR	NR	5	390	0.0
19-Oct	6.2	250	45	NR	NR	5	395	0.5
20-Oct	6.2	250	48	NR	NR	2	196	13.0
21-Oct	6.0	250	60	NR	NR	24	2097	0.5
22-Oct	6.0	250	52	NR	NR	22	1896	1.5
23-Oct	6.0	250	65	NR	NR	16	1410	1.5
24-Oct	6.0	250	69	0.0005	0.05	13	1111	4.5
25-Oct	NF	NF	NF	NF	NF	0	0	0.0
26-Oct	NF	NF	NF	NF	NF	0	0	0.0
27-Oct	6.2	290	53	NR	NR	3	249	6.0
28-Oct	6.0	290	59	0.0005	0.05	32	2746	0.0
29-Oct	6.1	290	58	NR	NR	49	4246	0.0
30-Oct	6.1	290	52	NR	NR	50	4358	0.0
31-Oct	6.2	290	52	0.001	0.05	19	1614	0.5
Monthly Av.	6.1	246	46	<0.001	<0.1	39	3362	129.0 (total)

NF = No Flow Over Weir
 NRA = No Result Available
 NR = Not Required

Indicates 1/2 LOR used
 Volume weighted average

Days of overflow

29

TOMAGO ALUMINIUM COMPANY PTY. LTD.
DRAIN TO HUNTER RIVER
MONITORING REPORT
Nov 2022 (Point 35)

DATE	pH Ave	Cond uS/cm Av.	SoL F mg/L Av.	PAH mg/L	TRH mg/L	FLOW (to Hunter River)		Rainfall mm
						L/sec Av.	kL/day Av.	
1-Nov	6.0	300	60	NR	NR	31	2640	6.0
2-Nov	5.9	300	62	NR	NR	1	67	0.0
3-Nov	NF	NF	NF	NF	NF	0	0	0.5
4-Nov	NF	NF	NF	NF	NF	0	0	0.0
5-Nov	NF	NF	NF	NF	NF	0	0	0.0
6-Nov	NF	NF	NF	NF	NF	0	0	0.0
7-Nov	NF	NF	NF	NF	NF	0	0	0.0
8-Nov	NF	NF	NF	NF	NF	0	0	0.0
9-Nov	NF	NF	NF	NF	NF	0	0	0.0
10-Nov	NF	NF	NF	NF	NF	0	0	0.0
11-Nov	NF	NF	NF	NF	NF	0	0	0.0
12-Nov	6.2	160	65	NR	NR	6	549	2.5
13-Nov	6.0	160	82	NR	NR	91	7875	15.5
14-Nov	5.8	160	54	0.0005	0.05	79	6840	8.5
15-Nov	5.9	290	54	NR	NR	25	2149	0.0
16-Nov	5.9	290	55	NR	NR	18	1593	0.5
17-Nov	6.0	290	59	NR	NR	4	372	0.0
18-Nov	NF	NF	NF	NF	NF	0	0	0.0
19-Nov	NF	NF	NF	NF	NF	0	0	0.0
20-Nov	NF	NF	NF	NF	NF	0	0	0.0
21-Nov	NF	NF	NF	NF	NF	0	0	0.0
22-Nov	NF	NF	NF	NF	NF	0	0	0.0
23-Nov	NF	NF	NF	NF	NF	0	0	0.0
24-Nov	NF	NF	NF	NF	NF	0	0	0.0
25-Nov	NF	NF	NF	NF	NF	0	0	0.0
26-Nov	NF	NF	NF	NF	NF	0	0	0.5
27-Nov	NF	NF	NF	NF	NF	0	0	1.5
28-Nov	NF	NF	NF	NF	NF	0	0	9.5
29-Nov	NF	NF	NF	NF	NF	0	0	0.0
30-Nov	NF	NF	NF	NF	NF	0	0	0.0
Monthly Av.	6.0	244	65.3	<0.001	<0.1	32	2761	45.0 (total)

NF = No Flow Over Weir
 NRA = No Result Available
 NR = Not Required

Indicates 1/2 LOR used
 Volume weighted average

Days of overflow 8

TOMAGO ALUMINIUM COMPANY PTY. LTD.
DRAIN TO HUNTER RIVER
MONITORING REPORT
Dec 2022 (Point 35)

DATE	pH Ave	Cond uS/cm Av.	SoL F mg/L Av.	PAH mg/L	TRH mg/L	FLOW (to Hunter River)		Rainfall mm
						L/sec Av.	kL/day Av.	
1-Dec	NF	NF	NF	NF	NF	0	0	0.0
2-Dec	NF	NF	NF	NF	NF	0	0	1.5
3-Dec	NF	NF	NF	NF	NF	0	0	0.0
4-Dec	NF	NF	NF	NF	NF	0	0	0.0
5-Dec	NF	NF	NF	NF	NF	0	0	0.0
6-Dec	NF	NF	NF	NF	NF	0	0	0.0
7-Dec	NF	NF	NF	NF	NF	0	0	0.5
8-Dec	NF	NF	NF	NF	NF	0	0	0.0
9-Dec	NF	NF	NF	NF	NF	0	0	0.0
10-Dec	NF	NF	NF	NF	NF	0	0	0.0
11-Dec	NF	NF	NF	NF	NF	0	0	0.0
11-Dec	NF	NF	NF	NF	NF	0	0	0.0
11-Dec	NF	NF	NF	NF	NF	0	0	0.0
12-Dec	6.1	380	78	NR	NR	23	1971	5.0
13-Dec	6.0	340	86	0.0005	0.1	0	1	0.0
14-Dec	NF	NF	NF	NF	NF	0	0	0.0
15-Dec	NF	NF	NF	NF	NF	0	0	0.0
16-Dec	6.1	340	68	0.0005	0.05	11	968	4.5
17-Dec	6.1	340	69	NR	NR	15	1293	3.5
18-Dec	6.0	340	67	NR	NR	5	430	1.5
19-Dec	NF	NF	NF	NF	NF	0	0	0.5
20-Dec	NF	NF	NF	NF	NF	0	0	0.0
21-Dec	6.1	300	71	0.0005	0.3	0	31	2.5
22-Dec	NF	NF	NF	NF	NF	0	0	0.0
23-Dec	NF	NF	NF	NF	NF	0	0	2.0
24-Dec	NF	NF	NF	NF	NF	0	0	0.5
25-Dec	NF	NF	NF	NF	NF	0	0	0.0
26-Dec	NF	NF	NF	NF	NF	0	0	0.0
27-Dec	NF	NF	NF	NF	NF	0	0	0.0
28-Dec	NF	NF	NF	NF	NF	0	0	0.0
29-Dec	NF	NF	NF	NF	NF	0	0	0.0
30-Dec	NF	NF	NF	NF	NF	0	0	0.0
31-Dec	NF	NF	NF	NF	NF	0	0	0.0
Monthly Av.	6.1	340	78	<0.001	0.13	13	782	22.0 (total)

NF = No Flow Over Weir
 NRA = No Result Available
 NR = Not Required

Indicates 1/2 LOR used
 Volume weighted average

Days of overflow

6

Q4 2022 Stormwater Discharge Data (EPA Point 16)

Discharge Date	pH	F (mg/L)	Cond. (uS/cm)	Suspended Solids (mg/L)	kL	PAH (mg/L)	TRH (mg/L)
13/10/2022	6.7	38	190	15	1462	<0.001	<0.1

NR = Not Required

ENVIRONMENT SYSTEM
WATER AND VEGETATION MONITORING FOR DECEMBER 2022

PAGE: 1

RESULTS BY SAMPLING GROUP
500 - SURFACE WATER

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

1	001	Surface Water	PH	6.3	6.2	6.6	7.2	6.1	6.0	6.3	6.3	5.2	6.0	5.9	6.1	6.4	6.5
		Surface Water	SOL F mg/L	4.10	4.27	6.53	6.54	5.29	3.49	2.40	4.34	3.34	2.74	3.14	3.89	4.59	4.89
		Surface Water	COND uS/cm	294	337	330	240	260	110	38	280	1100	220	210	280	390	590
2	002	Surface Water	PH	6.2	6.1	6.1	6.1	6.2	6.3	6.0	6.1	6.7	6.4	5.5	6.2	5.7	5.9
		Surface Water	SOL F mg/L	0.81	0.99	0.98	1.21	1.05	0.90	0.86	0.80	0.91	0.77	0.85	0.89	1.80	0.84
		Surface Water	COND uS/cm	274	290	160	210	250	220	240	240	160	250	210	270	330	940
3	003	Surface Water	PH	5.1	5.5	5.8	5.1	5.2	nra	5.8	4.7	4.8	nra	5.4	5.7	5.8	6.5
		Surface Water	SOL F mg/L	2.49	1.44	1.97	2.17	1.69	nra	1.45	1.76	1.14	nra	1.72	1.36	0.61	0.57
		Surface Water	COND uS/cm	123	236	92	110	81	nra	130	150	150	nra	100	160	91	1300
4	004	Surface Water	PH	6.2	6.7	7.7	6.0	6.2	6.6	6.6	6.6	7.3	7.0	6.9	6.5	nra	6.1
		Surface Water	SOL F mg/L	2.37	2.86	3.44	2.54	2.72	3.04	2.30	2.37	4.09	2.64	2.77	3.31	nra	2.19
		Surface Water	COND uS/cm	255	289	240	210	220	380	370	270	290	380	320	300	nra	200
5	005	Surface Water	PH	7.4	7.5	7.8	8.0	7.2	7.3	7.7	7.5	6.9	8.0	7.2	7.6	6.9	8.1
		Surface Water	SOL F mg/L	0.52	0.54	0.27	0.18	0.43	0.61	0.51	0.88	0.26	0.22	0.45	0.47	1.76	0.38
		Surface Water	COND uS/cm	12455	4362	490	4100	550	990	1000	19500	400	960	520	630	13600	9600
6	006	Surface Water	PH	7.6	7.6	7.8	8.0	7.3	7.5	7.8	7.9	7.0	8.0	7.2	7.9	6.7	8.4
		Surface Water	SOL F mg/L	0.43	0.36	0.25	0.18	0.37	0.43	0.17	0.40	0.30	0.20	0.39	0.34	0.88	0.35
		Surface Water	COND uS/cm	10263	2029	460	4000	640	800	760	7500	400	950	550	590	3600	4100
7	007	Surface Water	PH	6.8	6.9	6.7	6.5	6.8	6.7	6.8	6.9	6.4	7.6	7.0	7.3	6.6	7.0
		Surface Water	SOL F mg/L	0.97	1.03	0.81	1.51	0.97	1.04	0.93	0.91	1.17	0.40	0.95	0.87	1.35	1.43
		Surface Water	COND uS/cm	583	538	460	450	650	280	220	820	500	330	740	770	670	570
8	009	Surface Water	PH	4.1	4.8	4.3	4.7	4.7	4.9	4.7	5.0	4.7	4.8	5.7	4.7	4.8	4.7
		Surface Water	SOL F mg/L	0.26	0.23	0.27	0.16	0.26	0.22	0.15	0.22	0.27	0.22	0.16	0.22	0.33	0.22
		Surface Water	COND uS/cm	199	155	170	160	160	150	150	160	140	160	150	150	150	160
9	011	Surface Water	PH	6.0	6.5	6.8	6.7	6.5	6.4	6.5	6.2	6.3	6.5	6.7	6.9	6.6	6.4
		Surface Water	SOL F mg/L	0.28	0.41	0.37	0.25	0.42	0.23	0.38	0.62	0.60	0.43	0.18	0.52	0.46	0.42
		Surface Water	COND uS/cm	203	229	210	180	260	200	100	290	150	180	160	200	200	620
10	017	Surface Water	PH	7.6	7.2	q	6.6	q	q	8.4	q	q	7.5	q	q	6.4	q
		Surface Water	SOL F mg/L	0.21	0.21	q	0.14	q	q	0.17	q	q	0.12	q	q	0.41	q
		Surface Water	COND uS/cm	225	233	q	220	q	q	210	q	q	200	q	q	300	q
11	034	Surface Water	PH	8.1	7.5	7.1	nra	9.0	nra	7.0	7.3	7.2	nra	7.6	9.2	6.3	6.9
		Surface Water	SOL F mg/L	0.31	0.29	0.17	nra	0.39	nra	0.10	0.11	0.31	nra	0.72	0.21	0.18	0.40
		Surface Water	COND uS/cm	323	309	330	nra	150	nra	300	300	370	nra	310	270	320	430
12	178	Surface Water	PH	8.2	8.3	6.6	8.0	nra	9.0	nra	nra	nra	nra	8.9	9.0	nra	nra
		Surface Water	SOL F mg/L	0.91	0.77	1.09	1.06	nra	0.74	nra	nra	nra	nra	0.10	0.85	nra	nra
		Surface Water	COND uS/cm	153	190	230	240	nra	190	nra	nra	nra	nra	150	140	nra	nra

nra = No Result Available
tba = To Be Analysed
c = Result Being Checked
q = Samples collected quarterly
ALY = Average Last Year
AYTD = Average Year To Date

ENVIRONMENT SYSTEM
BORE WATER REPORTING FOR 2022

PAGE: 1

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	053	DEPTH 5M	PH	5.0	nra	s	s	s	s	s	s	s	s	s	s	s	s
		DEPTH 5M	COND US/CM	160.0	nra	s	s	s	s	s	s	s	s	s	s	s	s
		DEPTH 5M	SOL F MG/L	0.05	nra	s	s	s	s	s	s	s	s	s	s	s	s
		DEPTH 9M	PH	5.1	nra	s	s	s	s	s	s	s	s	s	s	s	s
		DEPTH 9M	COND US/CM	161.0	nra	s	s	s	s	s	s	s	s	s	s	s	s
		DEPTH 9M	SOL F MG/L	0.05	nra	s	s	s	s	s	s	s	s	s	s	s	s
		DEPTH 13.5M	PH	5.2	nra	s	s	s	s	s	s	s	s	s	s	s	s
		DEPTH 13.5M	COND US/CM	163.0	nra	s	s	s	s	s	s	s	s	s	s	s	s
		DEPTH 13.5M	SOL F MG/L	0.05	nra	s	s	s	s	s	s	s	s	s	s	s	s
2	054	DEPTH 6M	PH	6.0	4.9	s	s	s	5.1	s	s	s	s	s	4.7	s	s
		DEPTH 6M	COND US/CM	114.0	131.5	s	s	s	154.0	s	s	s	s	s	109.0	s	s
		DEPTH 6M	SOL F MG/L	0.05	0.05	s	s	s	0.05	s	s	s	s	s	0.05	s	s
		DEPTH 10M	PH	5.1	5.0	s	s	s	5.1	s	s	s	s	s	4.8	s	s
		DEPTH 10M	COND US/CM	198.5	128.5	s	s	s	154.0	s	s	s	s	s	103.0	s	s
		DEPTH 10M	SOL F MG/L	0.05	0.05	s	s	s	0.05	s	s	s	s	s	0.05	s	s
		DEPTH 14M	PH	5.1	5.0	s	s	s	5.1	s	s	s	s	s	4.8	s	s
		DEPTH 14M	COND US/CM	197.5	129.5	s	s	s	155.0	s	s	s	s	s	104.0	s	s
		DEPTH 14M	SOL F MG/L	0.05	0.05	s	s	s	0.05	s	s	s	s	s	0.05	s	s
3	055	DEPTH 7M	PH	5.9	6.0	s	s	s	5.8	s	s	s	s	s	6.2	s	s
		DEPTH 7M	COND US/CM	667.0	725.0	s	s	s	626.0	s	s	s	s	s	824.0	s	s
		DEPTH 7M	SOL F MG/L	0.05	0.05	s	s	s	0.05	s	s	s	s	s	0.05	s	s
4	056	DEPTH 6M	PH	5.7	5.2	s	s	s	s	s	s	s	s	s	5.2	s	s
		DEPTH 6M	COND US/CM	268.5	74.0	s	s	s	s	s	s	s	s	s	74.0	s	s
		DEPTH 6M	SOL F MG/L	0.05	0.05	s	s	s	s	s	s	s	s	s	0.05	s	s
5	057	DEPTH 7M	PH	nra	6.4	s	s	s	s	s	s	s	s	s	6.4	s	s
		DEPTH 7M	COND US/CM	nra	280.0	s	s	s	s	s	s	s	s	s	280.0	s	s
		DEPTH 7M	SOL F MG/L	nra	0.05	s	s	s	s	s	s	s	s	s	0.05	s	s
6	062	DEPTH 6M	PH	5.9	5.7	5.7	5.6	5.7	5.6	5.8	5.9	5.8	5.7	5.6	5.6	5.6	s
		DEPTH 6M	COND US/CM	373.2	474.8	603.0	558.0	586.0	463.0	698.0	345.0	333.0	295.0	400.0	470.0	472.0	s
		DEPTH 6M	SOL F MG/L	0.05	0.13	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.60	0.30	0.10	s
7	063	DEPTH 5M	PH	4.9	4.9	5.0	5.0	5.0	4.9	4.9	4.9	5.1	4.7	4.5	4.6	4.8	s
		DEPTH 5M	COND US/CM	177.2	150.5	142.0	140.0	137.0	151.0	150.0	145.0	145.0	142.0	183.0	168.0	152.0	s
		DEPTH 5M	SOL F MG/L	0.95	0.86	0.80	0.70	0.80	0.80	0.80	0.80	0.50	0.90	1.20	1.30	0.90	s
		DEPTH 10M	PH	4.9	5.0	5.0	5.0	5.0	5.0	5.4	5.0	5.2	5.0	4.6	4.7	4.8	s
		DEPTH 10M	COND US/CM	172.5	151.5	143.0	138.0	138.0	152.0	147.0	144.0	142.0	155.0	182.0	173.0	152.0	s
		DEPTH 10M	SOL F MG/L	0.95	0.78	0.80	0.60	0.90	0.60	0.40	0.70	0.60	0.50	1.30	1.30	0.90	s

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	254	REDUCED LEVEL TOP OF PIPE 7.29m															
		REDUCED LVL GROUNDWATER m		4.2	4.53	4.11	4.13	4.42	4.53	4.58	4.36	5.00	4.73	4.72	4.77	4.57	4.41
		DEPTH TOP PH		5.0	5.2	5.0	5.6	5.2	5.2	5.3	5.2	5.2	5.1	5.2	4.7	5.3	5.4
		DEPTH TOP COND US/CM		120.1	100.4	120	112	99	95	105	110	82	107	90	97	90	98
		DEPTH TOP SOL F mg/L		9.89	9.63	9.62	9.68	9.78	9.33	9.48	9.33	9.78	10.1	8.92	10.3	9.87	9.32
2	255	REDUCED LEVEL TOP OF PIPE 7.36m															
		REDUCED LVL GROUNDWATER m		4.0	4.26	3.91	3.94	4.18	4.22	4.37	4.09	4.70	nra	4.47	4.49	4.38	4.16
		DEPTH TOP PH		5.2	5.4	5.0	4.9	5.3	5.4	5.5	5.3	5.6	nra	5.7	5.4	5.7	5.4
		DEPTH TOP COND US/CM		375.9	301.6	357	379	364	324	315	144	300	nra	284	248	315	288
		DEPTH TOP SOL F mg/L		4.60	4.98	3.79	3.69	4.59	4.24	4.24	5.04	5.04	nra	6.18	6.28	5.88	5.78
3	256	REDUCED LEVEL TOP OF PIPE 5.82m															
		REDUCED LVL GROUNDWATER m		3.7	4.00	3.65	3.71	3.88	3.95	4.07	3.91	4.28	4.26	4.17	4.20	4.05	3.88
		DEPTH TOP PH		6.1	6.1	5.9	5.9	6.2	6.1	6.2	6.0	6.0	6.0	6.5	5.8	6.2	6.2
		DEPTH TOP COND US/CM		501.7	493.6	505	576	530	540	521	504	469	477	476	426	420	479
		DEPTH TOP SOL F mg/L		3.99	4.28	4.54	5.14	4.29	4.24	4.34	3.84	3.89	4.24	3.89	4.44	3.99	4.54
4	258	REDUCED LEVEL TOP OF PIPE 4.04m															
		REDUCED LVL GROUNDWATER m		2.4	2.52	2.36	2.39	2.63	2.52	2.66	2.48	2.66	2.54	2.56	2.57	2.49	2.42
		DEPTH TOP PH		5.6	5.8	5.4	6.1	5.7	5.8	6.0	5.7	6.0	5.8	6.0	5.4	5.7	5.8
		DEPTH TOP COND US/CM		465.3	234.8	370	340	338	226	206	196	158	167	122	231	225	238
		DEPTH TOP SOL F mg/L		3.50	4.67	3.54	3.59	3.79	3.69	3.94	3.79	5.29	5.24	5.09	5.63	6.03	6.43
5	259	REDUCED LEVEL TOP OF PIPE 4.44m															
		REDUCED LVL GROUNDWATER m		2.3	2.38	1.86	2.26	2.85	2.37	2.50	2.40	2.48	2.40	2.42	2.40	2.35	2.30
		DEPTH TOP PH		5.3	5.3	4.9	5.6	5.1	5.3	5.5	5.2	5.4	5.3	5.5	5.0	5.8	5.3
		DEPTH TOP COND US/CM		460.9	468.1	733	739	729	575	528	442	312	326	273	289	301	370
		DEPTH TOP SOL F mg/L		0.11	0.12	<0.10	<0.10	0.19	0.17	0.15	<0.10	<0.10	0.13	<0.10	0.10	<0.10	0.15
6	260	REDUCED LEVEL TOP OF PIPE 4.25m															
		REDUCED LVL GROUNDWATER m		2.2	2.25	2.14	2.19	2.35	2.24	2.32	2.28	2.31	2.25	2.27	2.25	2.21	2.18
		DEPTH TOP PH		5.8	5.6	5.4	6.1	5.5	5.6	5.7	5.4	5.6	5.5	5.6	5.3	5.6	5.7
		DEPTH TOP COND US/CM		353.9	655.6	559	568	560	677	658	685	641	644	690	670	769	746
		DEPTH TOP SOL F mg/L		16.02	17.17	16.5	16.2	16.7	18.3	19.1	19.9	17.1	16.6	17.0	17.0	16.2	15.4
7	261	REDUCED LEVEL TOP OF PIPE 5.22m															
		REDUCED LVL GROUNDWATER m		2.8	2.85	2.70	2.72	2.96	2.88	3.01	2.79	3.04	2.92	2.51	2.99	2.86	2.79
		DEPTH TOP PH		5.7	5.8	5.3	6.0	5.8	5.9	6.0	5.7	5.9	6.3	5.7	5.6	5.6	5.8
		DEPTH TOP COND US/CM		616.1	408.8	758	777	405	361	351	311	330	317	323	320	325	328
		DEPTH TOP SOL F mg/L		1.37	1.56	1.40	1.33	1.57	1.65	1.35	1.57	1.64	1.89	1.62	1.72	1.51	1.48
8	262	REDUCED LEVEL TOP OF PIPE 3.20m															
		REDUCED LVL GROUNDWATER m		2.4	2.47	2.37	2.40	2.58	2.45	2.55	2.52	2.51	2.47	2.47	2.46	2.43	2.40
		DEPTH TOP PH		6.3	6.3	6.0	6.7	6.3	6.4	6.4	6.2	6.5	5.9	6.4	6.0	6.5	6.5
		DEPTH TOP COND US/CM		291.8	275.7	281	286	285	272	273	265	275	266	269	283	280	273
		DEPTH TOP SOL F mg/L		52.19	50.78	54.1	53.9	49.1	51.7	51.5	51.9	50.5	50.9	48.1	51.3	48.3	48.1

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
9	263	REDUCED LEVEL TOP OF PIPE 4.08m															
		REDUCED LVL GROUNDWATER m		2.2	2.27	2.11	2.10	2.38	2.31	2.36	2.22	2.42	2.33	2.28	2.31	2.21	2.17
		DEPTH TOP PH		6.4	6.1	6.2	6.5	6.2	6.2	6.2	6.0	6.1	5.9	6.1	5.7	6.0	6.1
		DEPTH TOP COND US/CM		292.2	398.8	279	289	341	437	466	382	472	421	402	404	436	457
		DEPTH TOP SOL F mg/L		53.43	40.39	57.0	57.3	47.9	37.5	33.9	31.3	39.3	34.9	33.7	34.9	37.3	39.7
10	264	REDUCED LEVEL TOP OF PIPE 6.40m															
		REDUCED LVL GROUNDWATER m		3.1	3.27	3.07	3.08	3.30	3.28	3.36	3.18	3.46	3.33	3.33	3.38	3.27	3.20
		DEPTH TOP PH		5.6	5.7	5.5	6.1	6.1	5.6	5.8	5.5	5.8	5.3	5.9	5.2	5.8	5.6
		DEPTH TOP COND US/CM		277.7	279.5	312	276	344	300	130	280	345	245	282	272	276	292
		DEPTH TOP SOL F mg/L		0.31	0.52	0.32	0.23	0.19	0.25	0.20	<0.10	4.04	0.23	0.13	0.14	0.20	0.23
11	266	REDUCED LEVEL TOP OF PIPE 6.85m															
		REDUCED LVL GROUNDWATER m		4.2	4.52	q	4.22	q	q	4.61	q	q	4.69	q	q	4.56	q
		DEPTH TOP PH		5.7	5.6	q	5.5	q	q	5.6	q	q	5.3	q	q	5.9	q
		DEPTH TOP COND US/CM		237.5	290.0	q	282	q	q	351	q	q	281	q	q	246	q
		DEPTH TOP SOL F mg/L		0.14	0.24	q	<0.10	q	q	0.20	q	q	0.14	q	q	0.53	q
12	268	REDUCED LEVEL TOP OF PIPE 7.44m															
		REDUCED LVL GROUNDWATER m		5.2	5.53	5.12	5.14	5.67	5.70	5.94	5.55	5.91	5.63	5.61	5.66	5.34	5.14
		DEPTH TOP PH		6.6	6.6	6.4	6.2	6.7	6.6	6.7	6.5	6.5	6.7	6.8	6.6	6.8	7.0
		DEPTH TOP COND US/CM		460.5	532.8	639	675	515	488	530	530	515	577	540	484	423	478
		DEPTH TOP SOL F mg/L		6.64	9.50	9.77	9.23	9.23	8.53	9.18	8.73	9.18	10.1	9.82	10.0	10.3	9.92

nra = No Result Available
tba = To Be Analysed
c = Result Being Checked

Reduced Level = Level Relative to Australian Height Datum
Pipe = P.V.C. Pipe in Borehole

ALY = Average Last Year AYTD = Average Year To Date

N.B. Reduced Level Groundwater correct to 0.1 prior to June 1985

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2	218	REDUCED LEVEL TOP OF PIPE 6.57m															
		REDUCED LVL GROUNDWATER m		3.8	4.04	3.72	3.74	3.96	4.03	4.08	3.83	4.33	4.22	4.22	4.28	4.12	4.00
		PH		5.7	5.6	5.5	5.6	5.6	5.6	5.7	5.6	5.6	6.0	5.6	5.2	5.6	5.6
		COND US/CM		376.8	422.9	550.0	601.0	528.0	384.0	350.0	321.0	324.0	413.0	458.0	456.0	370.0	320.0
		SOL F mg/L		0.13	0.17	0.10	0.10	0.18	0.18	0.17	0.12	0.26	0.10	0.38	0.10	0.15	0.19
3	219	REDUCED LEVEL TOP OF PIPE 6.75m															
		REDUCED LVL GROUNDWATER m		5.4	5.88	5.30	5.33	5.63	4.83	6.22	5.70	6.65	6.40	6.30	6.32	6.04	5.85
		PH		4.4	4.4	4.4	4.2	4.4	4.4	4.4	4.3	6.1	4.1	4.4	4.0	4.5	4.1
		COND US/CM		174.8	192.4	176.0	176.0	178.0	179.0	182.0	185.0	210.0	187.0	197.0	201.0	236.0	202.0
		SOL F mg/L		0.20	0.71	0.15	0.23	0.19	0.39	0.44	0.35	5.04	0.75	0.25	0.25	0.24	0.29
4	220	REDUCED LEVEL TOP OF PIPE 7.03m															
		REDUCED LVL GROUNDWATER m		5.1	5.65	5.18	5.23	5.46	5.63	5.86	5.49	6.00	5.88	5.84	5.97	5.73	5.59
		PH		5.3	5.0	5.4	5.1	5.2	5.1	5.1	5.0	5.2	4.7	4.9	4.7	4.9	4.6
		COND US/CM		172.8	178.0	181.0	185.0	188.0	198.0	186.0	207.0	167.0	163.0	163.0	174.0	167.0	157.0
		SOL F mg/L		4.65	3.19	2.76	2.74	2.59	3.39	3.39	4.49	2.79	2.74	3.64	3.34	3.09	3.29
5	221	REDUCED LEVEL TOP OF PIPE 8.73m															
		REDUCED LVL GROUNDWATER m		5.8	6.11	5.81	5.86	6.06	6.13	6.20	6.04	6.35	6.21	6.20	6.23	6.17	6.10
		PH		5.6	5.1	6.1	5.5	5.3	5.3	4.8	4.9	5.5	5.1	4.8	4.7	4.9	4.8
		COND US/CM		229.5	177.5	167.0	186.0	169.0	185.0	203.0	198.0	165.0	160.0	187.0	180.0	174.0	156.0
		SOL F mg/L		9.16	7.62	6.83	7.34	7.73	7.68	8.63	10.10	8.48	6.88	7.53	6.98	6.98	6.23
6	224	REDUCED LEVEL TOP OF PIPE 9.54m															
		REDUCED LVL GROUNDWATER m		4.7	5.25	q	4.81	q	q	5.23	q	q	5.53	q	q	5.42	q
		PH		5.6	5.7	q	5.6	q	q	5.8	q	q	5.7	q	q	5.8	q
		COND US/CM		294.0	275.5	q	205.0	q	q	272.0	q	q	330.0	q	q	295.0	q
		SOL F mg/L		11.83	8.02	q	6.94	q	q	8.98	q	q	9.67	q	q	6.48	q
7	227	REDUCED LEVEL TOP OF PIPE 9.88m															
		REDUCED LVL GROUNDWATER m		5.0	5.47	q	5.15	q	q	5.50	q	q	5.64	q	q	5.61	q
		PH		5.7	5.7	q	5.8	q	q	5.6	q	q	5.5	q	q	5.8	q
		COND US/CM		508.8	614.5	q	655.0	q	q	680.0	q	q	588.0	q	q	535.0	q
		SOL F mg/L		0.75	1.20	q	0.56	q	q	1.01	q	q	1.50	q	q	1.74	q
8	228	REDUCED LEVEL TOP OF PIPE 10.09m															
		REDUCED LVL GROUNDWATER m		4.7	5.13	q	4.80	q	q	5.11	q	q	5.34	q	q	5.28	q
		PH		5.7	5.8	q	5.7	q	q	5.8	q	q	5.7	q	q	5.9	q
		COND US/CM		314.0	290.0	q	313.0	q	q	312.0	q	q	307.0	q	q	228.0	q
		SOL F mg/L		11.45	7.65	q	6.04	q	q	5.49	q	q	8.58	q	q	10.50	q

nra = No Result Available

tba = To Be Analysed

c = Result Being Checked

ALY = Average Last Year

N.B. Reduced Level Groundwater correct to 0.1 prior to June 1985

Reduced Level = Level Relative to Australian Height Datum

Pipe = P.V.C. Pipe in Borehole

AYTD = Average Year To Date

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
9	230	REDUCED LEVEL TOP OF PIPE 10.14m															
		REDUCED LVL GROUNDWATER m		4.9	5.30	q	4.98	q	q	5.29	q	q	5.48	q	q	5.44	q
		PH		5.9	6.0	q	6.0	q	q	6.0	q	q	6.2	q	q	5.9	q
		COND US/CM		342.3	338.0	q	307.0	q	q	299.0	q	q	388.0	q	q	358.0	q
		SOL F mg/L		2.56	3.66	q	2.13	q	q	2.43	q	q	4.99	q	q	5.09	q
10	231	REDUCED LEVEL TOP OF PIPE 9.53m															
		REDUCED LVL GROUNDWATER m		4.3	4.76	q	4.41	q	q	4.74	q	q	4.98	q	q	4.91	q
		PH		5.9	5.8	q	5.7	q	q	5.8	q	q	5.6	q	q	5.9	q
		COND US/CM		349.5	393.3	q	361.0	q	q	411.0	q	q	416.0	q	q	385.0	q
		SOL F mg/L		9.91	11.52	q	9.88	q	q	13.70	q	q	11.00	q	q	11.50	q
11	233	REDUCED LEVEL TOP OF PIPE 9.22m															
		REDUCED LVL GROUNDWATER m		4.3	4.67	q	4.31	q	q	4.67	q	q	4.88	q	q	4.82	q
		PH		5.9	5.9	q	6.0	q	q	6.0	q	q	5.7	q	q	6.0	q
		COND US/CM		379.0	430.5	q	402.0	q	q	475.0	q	q	455.0	q	q	390.0	q
		SOL F mg/L		37.48	41.98	q	58.40	q	q	43.10	q	q	39.70	q	q	26.70	q
12	234	REDUCED LEVEL TOP OF PIPE 7.60m															
		REDUCED LVL GROUNDWATER m		4.2	4.59	q	4.26	q	q	4.59	q	q	4.78	q	q	4.72	q
		PH		5.7	5.7	q	5.6	q	q	5.7	q	q	5.8	q	q	5.8	q
		COND US/CM		350.3	291.5	q	324.0	q	q	302.0	q	q	259.0	q	q	281.0	q
		SOL F mg/L		1.85	3.58	q	0.65	q	q	11.30	q	q	1.13	q	q	1.22	q
13	236	REDUCED LEVEL TOP OF PIPE 9.05m															
		REDUCED LVL GROUNDWATER m		5.2	5.59	5.24	5.25	5.54	5.75	5.83	5.67	5.12	5.90	5.81	5.81	5.64	5.52
		PH		5.6	5.6	5.7	5.5	5.6	5.5	5.8	5.7	5.8	5.5	6.0	5.4	5.7	5.1
		COND US/CM		158.6	191.8	162.0	175.0	187.0	174.0	194.0	356.0	139.0	132.0	194.0	199.0	210.0	180.0
		SOL F mg/L		6.64	7.48	6.63	7.34	8.08	7.44	7.48	8.38	8.38	8.92	8.68	7.23	5.78	5.38
14	237	REDUCED LEVEL TOP OF PIPE 7.94m															
		REDUCED LVL GROUNDWATER m		4.6	5.33	4.63	4.54	4.97	5.23	5.24	5.10	6.10	5.84	5.75	5.80	5.50	5.25
		PH		5.6	5.7	5.4	6.0	5.8	5.7	5.7	5.6	5.4	5.5	5.5	5.4	5.9	5.9
		COND US/CM		226.4	260.8	219.0	255.0	230.0	238.0	275.0	253.0	245.0	277.0	276.0	287.0	314.0	260.0
		SOL F mg/L		0.28	0.23	0.28	0.22	0.15	0.28	0.29	0.20	0.30	0.22	0.14	0.19	0.20	0.24
15	238	REDUCED LEVEL TOP OF PIPE 6.54m															
		REDUCED LVL GROUNDWATER m		4.6	5.11	4.51	4.47	4.83	5.04	5.13	4.87	5.76	5.50	5.44	5.50	5.25	5.07
		PH		5.3	5.5	5.4	6.0	5.7	5.7	5.8	5.6	5.5	5.4	5.3	5.0	5.4	5.4
		COND US/CM		506.7	426.6	609.0	524.0	561.0	492.0	224.0	480.0	438.0	447.0	417.0	330.0	314.0	283.0
		SOL F mg/L		5.43	4.35	1.58	2.75	5.64	5.54	7.09	4.79	4.89	4.74	4.04	4.84	3.84	2.48

nra = No Result Available

Reduced Level = Level Relative to Australian Height Datum

tba = To Be Analysed

Pipe = P.V.C. Pipe in Borehole

c = Result Being Checked

ALY = Average Last Year

AYTD = Average Year To Date

N.B. Reduced Level Groundwater correct to 0.1 prior to June 1985

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
16	239	REDUCED LEVEL TOP OF PIPE 7.36m															
		REDUCED LVL GROUNDWATER m		3.9	4.32	3.94	3.94	4.16	4.36	4.31	4.16	4.62	4.57	4.48	4.56	4.40	4.36
		PH		6.1	6.2	5.9	6.1	6.2	6.3	6.4	6.1	6.2	6.2	6.4	6.1	6.5	5.9
		COND US/CM		675.7	725.1	794.0	715.0	668.0	551.0	609.0	800.0	610.0	808.0	790.0	703.0	739.0	914.0
		SOL F mg/L		28.76	41.35	28.90	30.70	33.10	48.70	44.10	43.50	49.70	42.90	38.70	46.70	49.30	39.90
17	241	REDUCED LEVEL TOP OF PIPE 4.48m															
		REDUCED LVL GROUNDWATER m		2.7	2.81	2.61	2.70	2.80	2.81	2.97	2.70	3.02	2.86	2.84	2.91	2.77	2.73
		PH		5.4	5.5	5.3	5.3	5.5	5.5	5.5	5.5	5.6	5.4	5.7	5.3	5.6	5.7
		COND US/CM		257.5	284.6	2.8	253.0	259.0	306.0	329.0	319.0	273.0	319.0	355.0	313.0	349.0	337.0
		SOL F mg/L		1.19	1.39	1.01	1.09	1.32	1.65	1.65	1.50	1.36	1.59	1.54	1.46	1.41	1.11
18	242	REDUCED LEVEL TOP OF PIPE 6.63m															
		REDUCED LVL GROUNDWATER m		4.7	4.96	4.53	4.46	5.21	5.21	5.32	4.93	5.27	5.08	5.05	5.13	4.74	4.54
		PH		6.2	6.1	6.0	6.2	6.2	6.2	6.4	6.0	6.2	5.6	6.3	5.8	6.3	6.4
		COND US/CM		370.7	299.0	517.0	792.0	283.0	255.0	339.0	231.0	194.0	324.0	232.0	145.0	128.0	148.0
		SOL F mg/L		0.72	0.76	0.60	0.69	0.83	0.95	1.11	0.98	0.72	0.64	0.60	0.59	0.68	0.71
19	243	REDUCED LEVEL TOP OF PIPE 7.41m															
		REDUCED LVL GROUNDWATER m		5.2	5.47	5.07	5.10	5.71	5.56	5.81	5.31	5.81	5.61	5.61	5.71	5.31	5.08
		PH		6.0	6.0	5.9	5.7	6.1	6.1	6.2	6.0	6.0	6.1	6.2	5.7	6.2	6.3
		COND US/CM		208.3	201.1	286.0	238.0	150.0	184.0	161.0	208.0	158.0	156.0	180.0	181.0	248.0	263.0
		SOL F mg/L		6.37	5.82	6.38	7.04	4.39	4.94	5.29	4.94	6.74	6.33	4.99	5.14	6.03	7.63
20	245	REDUCED LEVEL TOP OF PIPE 9.92m															
		REDUCED LVL GROUNDWATER m		4.9	5.37	q	5.07	q	q	5.38	q	q	5.55	q	q	5.50	q
		PH		5.6	5.8	q	5.5	q	q	6.7	q	q	5.4	q	q	5.6	q
		COND US/CM		285.3	332.8	q	355.0	q	q	315.0	q	q	365.0	q	q	296.0	q
		SOL F mg/L		0.62	2.80	q	0.96	q	q	3.39	q	q	4.69	q	q	2.14	q
21	247	REDUCED LEVEL TOP OF PIPE 9.29m															
		REDUCED LVL GROUNDWATER m		4.6	5.10	q	4.67	q	q	5.07	q	q	5.38	q	q	5.29	q
		PH		5.6	5.7	q	5.5	q	q	5.7	q	q	5.7	q	q	5.8	q
		COND US/CM		262.3	376.8	q	285.0	q	q	360.0	q	q	417.0	q	q	445.0	q
		SOL F mg/L		0.82	5.59	q	0.44	q	q	5.79	q	q	3.74	q	q	12.40	q
22	249	REDUCED LEVEL TOP OF PIPE 10.04m															
		REDUCED LVL GROUNDWATER m		4.8	5.18	q	4.90	q	q	5.25	q	q	5.24	q	q	5.32	q
		PH		5.9	5.8	q	5.7	q	q	5.9	q	q	5.6	q	q	5.9	q
		COND US/CM		355.8	380.5	q	397.0	q	q	309.0	q	q	439.0	q	q	377.0	q
		SOL F mg/L		2.82	3.99	q	3.39	q	q	3.14	q	q	4.39	q	q	5.04	q

nra = No Result Available

Reduced Level = Level Relative to Australian Height Datum

tba = To Be Analysed

Pipe = P.V.C. Pipe in Borehole

c = Result Being Checked

AYTD = Average Year To Date

ALY = Average Last Year

N.B. Reduced Level Groundwater correct to 0.1 prior to June 1985

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
23	250	REDUCED LEVEL TOP OF PIPE 10.10m															
		REDUCED LVL GROUNDWATER m		4.7	5.09	q	4.75	q	q	5.16	q	q	5.27	q	q	5.17	q
		PH		5.8	5.8	q	5.7	q	q	5.8	q	q	5.7	q	q	5.9	q
		COND US/CM		335.5	360.3	q	373.0	q	q	368.0	q	q	371.0	q	q	329.0	q
		SOL F mg/L		9.37	14.78	q	6.54	q	q	7.58	q	q	19.50	q	q	25.50	q
24	269	REDUCED LEVEL TOP OF PIPE 7.285m															
		REDUCED LVL GROUNDWATER m		5.0	5.37	4.96	4.89	5.49	5.55	5.79	5.39	5.77	5.47	5.42	5.49	5.19	5.01
		PH		6.1	6.2	6.4	6.0	6.3	6.2	6.2	6.1	6.1	6.4	6.2	6.2	6.2	6.3
		COND US/CM		462.7	587.0	561.0	610.0	774.0	670.0	527.0	601.0	533.0	588.0	529.0	570.0	556.0	525.0
		SOL F mg/L		4.71	4.69	4.83	4.99	5.34	4.49	4.79	4.19	4.29	4.99	4.19	5.19	4.49	4.49
25	272	REDUCED LEVEL TOP OF PIPE 6.910m															
		REDUCED LVL GROUNDWATER m		5.1	5.37	5.03	4.08	5.61	5.70	5.87	5.43	5.83	5.52	5.50	5.56	5.28	5.07
		PH		5.2	5.6	5.6	5.3	5.4	5.5	5.8	5.6	6.0	5.6	5.7	5.2	5.8	5.8
		COND US/CM		388.0	369.8	306.0	296.0	314.0	323.0	295.0	308.0	343.0	404.0	423.0	453.0	420.0	552.0
		SOL F mg/L		6.29	9.60	3.14	3.69	2.35	4.39	9.78	10.40	22.70	9.77	10.40	12.20	15.10	11.30
26	274	REDUCED LEVEL TOP OF PIPE 6.785m															
		REDUCED LVL GROUNDWATER m		4.7	4.98	4.58	4.54	5.18	5.17	5.37	4.98	5.32	5.11	5.05	5.10	4.77	4.65
		PH		6.2	6.2	6.4	6.2	6.3	6.2	6.3	6.0	6.2	5.9	6.3	6.1	6.3	6.4
		COND US/CM		590.0	559.5	395.0	410.0	465.0	485.0	414.0	561.0	629.0	668.0	706.0	688.0	594.0	699.0
		SOL F mg/L		1.06	1.00	1.24	1.32	0.86	0.90	1.23	0.88	1.09	0.92	0.77	0.94	0.99	0.86
27	276	REDUCED LEVEL TOP OF PIPE 6.272m															
		REDUCED LVL GROUNDWATER m		4.2	4.45	4.09	4.06	4.57	4.65	4.87	4.45	4.85	4.43	4.55	4.50	4.29	4.15
		PH		6.2	6.1	6.3	6.0	6.2	6.2	6.3	6.0	6.2	5.8	6.3	6.0	6.2	6.2
		COND US/CM		618.8	438.3	472.0	471.0	458.0	427.0	435.0	370.0	401.0	308.0	329.0	504.0	557.0	527.0
		SOL F mg/L		1.14	1.30	1.45	1.37	1.21	1.27	1.77	1.27	1.35	1.22	1.03	1.29	1.25	1.09
28	279	REDUCED LEVEL TOP OF PIPE 8.46m															
		REDUCED LVL GROUNDWATER m		5.1	5.53	5.11	5.06	5.43	nra	5.75	5.58	6.03	5.76	5.65	5.66	5.48	5.36
		PH		6.8	6.8	6.6	6.7	7.0	nra	6.8	6.5	6.6	6.7	6.9	6.7	7.0	7.1
		COND US/CM		1201	1245	1471	1380	1388	nra	1043	943.0	1115	1207	1140	1230	1362	1413
		SOL F mg/L		57.88	57.95	77.10	65.40	74.40	nra	51.10	49.10	38.90	49.50	45.10	56.70	72.30	57.90
29	280	REDUCED LEVEL TOP OF PIPE 7.89m															
		REDUCED LVL GROUNDWATER m		5.1	5.43	4.99	4.95	5.36	5.56	5.71	5.45	5.87	5.64	5.54	5.53	5.35	5.21
		PH		6.4	6.7	6.8	6.5	6.7	6.7	6.9	6.6	6.4	6.4	6.8	6.5	6.8	6.8
		COND US/CM		398.9	363.1	403.0	426.0	380.0	346.0	355.0	370.0	306.0	305.0	319.0	342.0	395.0	410.0
		SOL F mg/L		11.16	14.83	16.40	17.60	5.79	14.30	14.70	15.70	13.90	13.00	12.80	14.00	15.00	24.80
30	305	REDUCED LEVEL TOP OF PIPE 8.94m															
		REDUCED LVL GROUNDWATER m		5.0	5.56	q	5.01	q	q	5.65	q	q	5.93	q	q	5.66	q
		PH		5.5	5.5	q	5.3	q	q	5.6	q	q	5.0	q	q	6.0	q
		COND US/CM		216.3	250.3	q	243.0	q	q	246.0	q	q	292.0	q	q	220.0	q
		SOL F mg/L		2.80	5.46	q	4.09	q	q	6.99	q	q	6.13	q	q	4.64	q

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
31	306	REDUCED LEVEL TOP OF PIPE 9.27m															
		REDUCED LVL GROUNDWATER m		5.0	5.38	q	5.14	q	q	5.44	q	q	5.49	q	q	5.47	q
		PH		5.6	5.7	q	5.4	q	q	5.8	q	q	5.5	q	q	6.0	q
		COND US/CM		236.8	264.5	q	205.0	q	q	215.0	q	q	313.0	q	q	325.0	q
		SOL F mg/L		12.01	11.98	q	15.40	q	q	12.40	q	q	8.73	q	q	11.40	q
32	309	REDUCED LEVEL TOP OF PIPE 5.07m															
		REDUCED LVL GROUNDWATER m		2.4	2.59	2.39	2.51	2.56	2.63	2.74	2.55	2.77	2.63	2.60	2.69	2.53	2.47
		PH		5.4	5.2	5.2	5.0	5.3	5.2	5.3	5.1	5.4	5.0	5.5	4.8	5.4	5.5
		COND US/CM		149.3	136.8	128.0	114.0	110.0	143.0	148.0	131.0	112.0	140.0	176.0	163.0	158.0	118.0
		SOL F mg/L		5.25	5.33	6.48	5.19	4.29	5.99	5.69	6.49	4.04	5.29	5.58	5.38	4.99	4.49
33	310	REDUCED LEVEL TOP OF PIPE 7.42m															
		REDUCED LVL GROUNDWATER m		4.9	5.26	4.97	5.04	5.81	5.44	5.37	5.06	5.30	5.14	5.27	5.48	5.26	4.98
		PH		4.5	4.6	4.5	4.3	4.8	4.7	4.8	4.6	4.5	4.8	4.7	4.3	4.6	4.3
		COND US/CM		5550	6504	12030	1259	4830	6950	6120	7150	5850	6730	7005	7980	10700	1443
		SOL F mg/L		0.75	0.53	0.47	1.58	0.25	0.20	0.26	0.37	0.25	0.95	0.35	0.40	0.57	0.76
34	311	REDUCED LEVEL TOP OF PIPE 7.69m															
		REDUCED LVL GROUNDWATER m		4.4	4.85	4.35	4.34	4.63	4.81	4.88	4.65	5.37	5.15	5.11	5.17	4.97	4.82
		PH		5.6	5.6	5.3	6.4	5.7	5.6	5.7	5.4	5.6	5.5	5.3	5.0	5.5	5.6
		COND US/CM		260.5	145.2	143.0	175.0	137.0	114.0	174.0	168.0	100.0	91.0	158.0	185.0	156.0	141.0
		SOL F mg/L		17.09	15.98	19.70	20.30	13.90	14.20	17.20	17.50	12.90	12.40	14.80	17.90	16.50	14.50
35	312	REDUCED LEVEL TOP OF PIPE 4.42m															
		REDUCED LVL GROUNDWATER m		3.0	3.34	3.28	3.14	3.23	3.31	3.54	3.20	3.56	3.50	3.39	3.47	3.29	3.17
		PH		5.8	6.0	6.6	5.6	5.8	6.0	6.2	5.6	5.8	5.8	6.3	6.0	6.2	5.8
		COND US/CM		119.6	291.4	120.0	142.0	134.0	172.0	166.0	197.0	192.0	483.0	411.0	509.0	497.0	474.0
		SOL F mg/L		6.30	9.45	9.62	6.54	7.48	5.74	8.88	9.48	7.34	10.70	9.82	11.50	12.40	13.90
36	313	REDUCED LEVEL TOP OF PIPE 3.29m															
		REDUCED LVL GROUNDWATER m		1.4	1.47	1.39	1.41	1.45	1.49	1.60	1.49	1.51	1.47	1.44	1.49	1.46	1.39
		PH		5.6	5.6	5.5	5.6	5.7	5.7	5.7	5.4	5.6	5.4	5.8	5.3	5.8	5.8
		COND US/CM		293.3	272.8	257.0	248.0	262.0	267.0	265.0	280.0	342.0	291.0	257.0	260.0	282.0	262.0
		SOL F mg/L		0.21	0.13	0.16	0.12	0.10	0.17	0.10	0.10	0.14	0.16	0.10	0.14	0.17	0.10
37	314	REDUCED LEVEL TOP OF PIPE 3.18m															
		REDUCED LVL GROUNDWATER m		1.1	1.18	0.99	1.08	1.26	1.28	1.34	1.33	1.39	1.14	1.08	1.15	1.09	0.99
		PH		6.3	6.4	6.2	7.0	6.5	6.4	6.5	6.2	6.4	6.2	6.4	6.2	6.4	6.5
		COND US/CM		238.8	216.9	175.0	269.0	140.0	218.0	208.0	233.0	251.0	191.0	226.0	203.0	243.0	246.0
		SOL F mg/L		0.68	0.58	0.84	0.70	0.63	0.54	0.67	0.53	0.57	0.51	0.47	0.54	0.51	0.42

nra = No Result Available

Reduced Level = Level Relative to Australian Height Datum

tba = To Be Analysed

Pipe = P.V.C. Pipe in Borehole

c = Result Being Checked

AYTD = Average Year To Date

ALY = Average Last Year

N.B. Reduced Level Groundwater correct to 0.1 prior to June 1985

#	SITE	SPECIES	TEST	ALY	AYTD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
38	315	REDUCED LEVEL TOP OF PIPE 4.98m															
		REDUCED LVL GROUNDWATER m		1.4	1.49	1.28	1.36	1.56	1.51	1.67	1.48	1.79	1.52	1.47	1.51	1.38	1.33
		PH		5.4	5.6	5.5	5.7	5.6	5.6	5.8	5.6	5.7	5.3	5.9	5.4	5.7	5.7
		COND US/CM		186.6	203.8	173.0	238.0	218.0	210.0	189.0	205.0	150.0	179.0	171.0	201.0	276.0	235.0
		SOL F mg/L		0.16	0.12	0.13	0.12	0.10	0.17	0.19	0.10	0.17	0.10	0.10	0.10	0.10	0.10
39	316	REDUCED LEVEL TOP OF PIPE 7.64m															
		REDUCED LVL GROUNDWATER m		5.2	5.66	5.15	5.21	5.53	5.76	5.94	5.74	6.10	5.89	5.75	5.84	5.55	5.48
		PH		5.3	5.3	5.4	5.2	5.3	5.2	5.3	5.2	5.2	5.1	5.5	5.1	5.7	5.5
		COND US/CM		844.6	756.1	730.0	716.0	761.0	980.0	992.0	865.0	845.0	918.0	694.0	507.0	502.0	563.0
		SOL F mg/L		0.15	0.12	0.12	0.10	0.10	0.10	0.19	0.10	0.16	0.10	0.10	0.11	0.16	0.10

nra = No Result Available

tba = To Be Analysed

c = Result Being Checked

ALY = Average Last Year

N.B. Reduced Level Groundwater correct to 0.1 prior to June 1985

Reduced Level = Level Relative to Australian Height Datum
Pipe = P.V.C. Pipe in Borehole

AYTD = Average Year To Date

 *** END OF WATER AND VEGETATION BY GROUP REPORT ***

APPENDIX 7 –

SAMPLING PROCEDURES

The following procedures have been used by Tomago Aluminium for the sampling and/or analysis data contained in this report:

Stack Fluoride	ES.ESM.0001 LMM0006, LMM0026
Roof Vent Fluoride	ES.ESM.0002 LMM0034, LMM0026
Stack Sulfur Dioxide	ES.ESM.0011 LMM0105
Continuous stack gaseous fluoride	ES.ESM.0024
Ambient Fluoride	ES.ESM.0004 LMM0033
Stormwater monitoring	ES.ESM.0009, ES.ESM.0019 LMM0124, LMM0116, LMM0043, LMM0121
**Sewerage	ES.ESM.0021 LMM0132, LMM0043, LMM0116, LMM0124
Vegetation	ES.ESM.0010 LMM0010
Groundwater	ES.ESM.0014 LMM0116, LMM0096
Surface Water	ES.ESM.0008 LMM0116, LMM0096
***Meteorological monitoring	ES.ESM.0023
Ambient Sulfur Dioxide	ES.ESM.0031

NATA Accreditation No. 1904

**NATA accreditation does not cover the performance of the following services contained in this method:

- Ammonia
- Nitrate
- Dissolved Oxygen
- E.coli

*** NATA accreditation does not cover the performance of this service

APPENDIX 8 -

CUSTOMER FEEDBACK FORM

Customer Feedback Survey

Receiving regular feedback from our customers is important to us. It helps us understand if our environmental reporting is presented in a meaningful and clear manner.

Name.....

Organisation.....

Report this feedback relates to.....

Does this report contain all the information required?

.....
.....
.....

Is the report format logical and easy to follow?

.....
.....
.....

Any other comments and / or suggestions?

.....
.....
.....

Please complete the form and either fax to Environment Services Department on 0249 669100 or email robyn.parker@tomago.com.au

APPENDIX 9 -

VEGETATION HEALTH SURVEY 2022

ANNUAL VEGETATION HEALTH SURVEY

TOMAGO ALUMINIUM ANNUAL VEGETATION HEALTH SURVEY



CLIENT: Tomago Aluminium Company Pty Limited

DATE: 21 November 2022

PREPARED BY: Robert Scanlon & Bayley Holborow

07 December 2022

Tomago Aluminium Company Pty Limited

Robyn Parker

robyn.parker@tomago.com.au

Dear Robyn,

Re: Vegetation Health Survey, Tomago Aluminium, Tomago NSW

de Witt Ecology was commissioned by Tomago Aluminium Company Pty Limited (TAC) to complete an annual vegetation health survey report conducted at Tomago Aluminium Company smelter and its adjoining vegetation, (study area). The vegetation health survey visually assessed vegetation immediately adjoining TAC until effects attributable to hydrogen fluoride and sulphur dioxide were not visible.

The purpose of this investigation is to satisfy TAC regulatory requirements to monitor the vegetation surrounding the smelter for foliar fluoride damage. It is intended that content of this report will support TAC with the production of their Annual Environment Report.

An inspection of vegetation in the vicinity of the Tomago Aluminium Company smelter was conducted over 4 days between October 13-19, 2022 (inclusive). Visible injury symptoms attributable to gaseous emissions from the smelter, particularly hydrogen fluoride and sulfur dioxide, were identified and graded. The grading was used to provide a semi-quantitative indication of the occurrence of injury (see Table 1).

Table 1: Symptom codes for visible injury upon vegetation

Injury Category	Symptom expression	
	Visual extent	Percentage of leaf (%)
0	Nil	0
1	Very slight	< 2
2	Slight	< 5
3	Distinct	< 10
4	Marked	< 25
5	Severe	< 50
6	Very severe	< 75
7	Extreme	> 75

Symptoms assessed include: marginal and interveinal chlorosis, undulation, cupping or buckling of the leaf blade, necrosis (death) of tissues at the tip of the leaf, necrosis along the marginal of the leaf, accumulation of anthocyanins (tannin-like materials) in the leaf, leaf chewing insect or browsing injury, sap-sucking insect injury.

Other possible causes of injury, including drought, storm effects, fire or mechanical damage were noted to indicate total injury expression and a separate estimate of injury expression was made for the effects of atmospheric pollutants. As the combinations of these symptoms vary between species for a given level of injury, and between leaf age classes the survey was restricted to current season and one-year old leaves of species of *Corymbia*, *Eucalyptus*, *Angophora* and *Acacia* and for species of other genera that are sensitive to fluoride.

The injury categories for current season and one-year-old leaves were judged according to the criteria set out in Table 2.

Table 2: Criteria for injury categories attributed to gaseous fluoride

Species	Category	Symptoms
All	0	No visible injury
Angophora, Eucalyptus, Corymbia Species	1	No visible injury, or very slight marginal and/or interveinal chlorosis, cupping or undulation < 2%
	2	Very slight or slight marginal and/or interveinal chlorosis and cupping or undulation < 5%
	3	Distinct marginal and/or interveinal chlorosis, cupping or undulation, tip necrosis < 10%
	4	Marked marginal and/or interveinal chlorosis, cupping or undulation, tip necrosis < 25%, scattered marginal necrosis < 3mm
	5	Severe marginal and/or interveinal chlorosis and cupping, tip necrosis < 50%, marginal necrosis 3-5mm
	6	Very severe marginal and/or interveinal chlorosis and cupping, tip necrosis < 75%, marginal necrosis > 5mm
	7	Extreme marginal and/or interveinal chlorosis, cupping; tip necrosis > 90%, marginal necrosis > 5 mm
Acacia Species	1	No visible injury or very slight terminal chlorosis and/or cupping
	2	Slight terminal chlorosis and/or cupping < 5%
	3	Slight terminal chlorosis and/or cupping < 10%
	4	Distinct terminal chlorosis and/or cupping < 25%
	5	Marked terminal chlorosis and/or cupping, distinct anthocyanin accumulation, tip necrosis < 50%
	6	Marked terminal chlorosis and cupping, marked anthocyanin accumulation, tip necrosis < 75%
	7	Extreme marginal and/or interveinal chlorosis, cupping; tip necrosis > 90%, marginal necrosis > 5 mm
Other Species	1	No visible injury or very slight tip chlorosis, tip necrosis occasional, < 2%
	2	Slight tip chlorosis, or tip necrosis occasional, < 5%
	3	Distinct chlorosis, or tip necrosis common, < 10%
	4	Marked chlorosis, or tip necrosis < 25%
	5	Severe chlorosis, or tip necrosis < 50%
	6	Very severe chlorosis, or tip necrosis < 75%
	7	Extreme chlorosis, or tip necrosis > 75%

A total of 390 sites were assessed, at each site the injury category recorded was based on the greatest symptom expression observed in the leaves. Injury attributed at least partly to sulfur dioxide was noted. Sites were created in vegetation at increasing distance from the smelter until the vegetation free from injury attributable to TAC. The location of the sites was recorded by GPS.

The sites were mapped and injury category interpolated to produce a model of vegetation injury around the smelter.

METHOD

DESKTOP SETUP & SAFETY

Desktop setup and safety will involve:

- Locating of all 600 previously recorded sites into a Geographic Information System (GIS) for use in the field, allowing for seamless transition between sites.
- Review of safety documentation to cover risks associated with Tomago Aluminium Company and its surrounds.
- Review of vegetation of the locality to indicate species more suitable for modelling.
- Review of existing literature on hydrogen fluoride and sulphur dioxide effects on Australian native flora (Doley, 1986; Doley, 2010).

FIELD SURVEY

The field assessment consisted of four days of fieldwork between 13th of October to the 19th of October 2022 (inclusive), by de Witt ecologist Robert Scanlon. The survey included:

- Driving and walking to sites.
- Assessment of plant health at each site in reference to Tables 1 & 2, with suitable and representative plants selected for each site.
- Application of identification tags on trees and long-lived acacia species.

GENERATION OF SITE VEGETATIVE HEALTH MODEL

Field collected data was input to QGIS and assessed for data integrity, including minor cleaning of outliers.

The vegetative health model was generated through interpolation using a triangulated irregular network and thin plate spline formula.

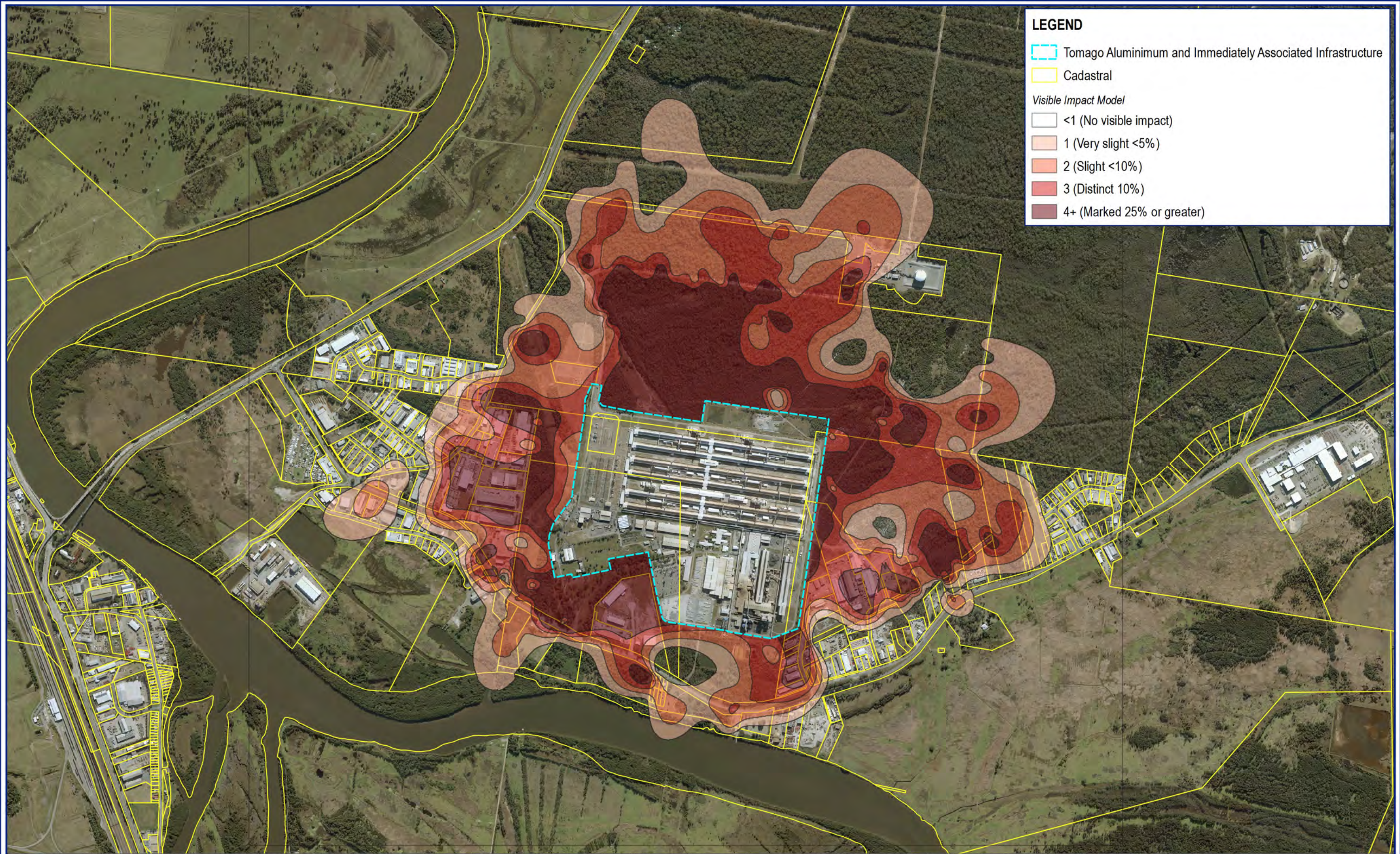
RESULTS

Across the four days of survey, 390 independent sites were surveyed. The location of survey sites measured and examples of injury found at sites have been included within Appendix A. The visual impact model generated from the survey is depicted in Figure 1.

The area of each injury category (0, 1, 2, 3, 4, >4) within the generated model is shown in Table 3, with areas previously recorded in 2019 and 2018 also included.

Table 3: Area of each injury category within the model generated

	2022		2020		2019		2018	
Category	Area (ha)	Area %	Area (ha)	Area %	Area (ha)	Area %	Area (ha)	Area %
0	1584.4	71.2	1784.5	80.1	1781.8	80.0	1770.3	79.5
1	132.0	5.9	185.2	8.3	191.2	8.6	173.6	7.8
2	134.2	6.0	183.4	8.2	173.2	7.8	197.2	8.9
3	126.7	5.7	68.1	3.1	77.0	3.5	82.7	3.7
4	105.4	4.7	5.3	0.2	3.5	0.2	2.9	0.1
> 4	144.1	6.5	0.2	0	0.1	0.0	0.1	0.0
Total	2226.8	100.0	2226.8	100	2226.8	100.0	2226.8	100.0



LEGEND

 Tomago Aluminium and Immediately Associated Infrastructure

 Cadastral

Visible Impact Model

 <1 (No visible impact)

 1 (Very slight <5%)

 2 (Slight <10%)

 3 (Distinct 10%)

 4+ (Marked 25% or greater)

Whilst every care is taken to ensure the accuracy of this data de Witt Ecology makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability for all expenses, losses or damages which might incur as a result of the data being inaccurate or incomplete in any way and for any reason.

de Witt Ecology

• SURVEYING • PLANNING
• GIS • SEWER & WATER
• PROJECT MANAGEMENT

7 Canberra Street
PO Box 850
Charlestown NSW 2290
P 02 4942 5441
F 02 4942 5301

87 Herbert Street
PO Box 232
Gulgong NSW 2852
P 02 6374 2911
F 02 6374 2922

E admin@dewittconsulting.com.au
www.dewittconsulting.com.au
ABN 94 638 012 003

FIGURE 1

VISIBLE IMPACT MODEL

0 500 1,000 1,500 2,000 m

(© Aerometrix: MetroMap; LPI NSW Imagery: NSW Spatial Services 2022)

JOB ADDRESS: TOMAGO				N
NEW SOUTH WALES AUSTRALIA				
CLIENT: TOMAGO ALUMINIUM COMPANY PTY LIMITED				
A3 SCALE:	1:18,000	DRAWN:	RS	JOB REF: EC139
PLAN DATE:	24/11/2022	CHECKED:	AB	ISSUE: 01

\\wcsbs\data\SYNERGY\Projects\EC139\GIS\Figures\Figure_Workspaces

DISCUSSION

The smelter emissions have an impact on vegetation that is limited to an area of approximately 642.4 ha around the smelter perimeter, this is an increase of 197 ha on the previous report. This area varies from 400 m to about 1.55 km wide from the boundary of TAC (widest in the north and east, narrowest in the west and southeast). Within this area the vegetation showing marked or more severe injury (category 4 or greater) covers approximately 249.5 ha. This damage is mostly to the north of TAC and consistent with the Bureau of Meteorology reported wind flow at Williamstown (station number: 061078), with 40.2% of 3pm wind between 1942 and 2019 flowing from either the south or the south-east.

The extent of damage has increased in the current survey compared to the previous survey. While this may be due to emissions, there are also a number of natural processes that may be contributing to differences. This season marks the third of high rainfall years for the area, with rainfall in 2021 being 428.4 mm (38%) above average. This rain may have increased soil nutrient leaching, in particular magnesium which is a common issue in sandy soils (Hazelton and Murphy, 2007). Magnesium deficiency can have similar symptoms to fluoride exposure (Doley, 2010) and therefore may either be contributing to or increasing independently the area of injury around the smelter.

Rainfall and plant stress may have also co-contributed to the notable areas of insect and / or viral damage across much of the landscape surrounding the smelter. As damage from insects and disease can show stress such as cupping (Doley, 2010), this may have contributed to the increase in areas of impact.

Another contributing factor to differences could be the change in contractor between this and previous surveys. It is possible that there would have been differences in the interpretation of injury category due to this change. To reduce differences between ecologists, photos from previous reports were assessed to calibrate injury category; Appendix 2 of this report provides photographs of each injury category encountered. While all attempts were made to standardise between assessments, it is likely that there were still differences. Another related difference is that the survey was performed earlier in the year to previous surveys; plants may have been at different stages of development to previous surveys.

Vegetation in the main parts of the Hunter Region Botanic Gardens, including along southern mapped walks, did not display any symptoms that could be attributed to hydrogen fluoride and sulphur dioxide. There was some trees displaying very slight (<5%) damage in the southern area of the Gardens, however, the non-uniform display of damage suggests that it could be related to other factors such as nutritional deficiencies or insect damage.

Inspection of vegetation across Ash Island did not indicate that there was any damage attributable to hydrogen fluoride or sulphur dioxide.

Currently the surveys are limited to Eucalypts and *Acacia* species, however, the dominant *Acacia* species (*A. longifolia*) does not display damage attributable to hydrogen fluoride and sulphur dioxide very visually. Inclusion of Tree Broom-heath (*Monotoca elliptica*) from the Ericaceae family may assist in future assessments.

CONCLUSION AND RECOMMENDATIONS

Injury attributable to TAC was detected in vegetation around the smelter perimeter. It is noted that there was an increase in damage on previous years and that some of this damage may be attributable to nutritional deficiencies or insect damage. The most impacted area is to the north, consistent with prevailing winds. Though there are areas of high impact in this year's survey, damage does decrease dramatically with distance from TAC.

Yours sincerely,

de Witt Ecology

A handwritten signature in black ink, appearing to read "R. Scanlon".

Dr Robert Scanlon

Ecologist

REFERENCES

- Doley, D. (1986). Plant Fluoride Relationships – An Analysis with Particular Reference to Australian Vegetation, Inkata Press, Melbourne.
- Doley, D. (2010) Rapid quantitative assessment of visible injury to vegetation and visual amenity effects of fluoride air pollution. Environmental Monitoring and Assessment. 160: 181-198
- Hazelton, P. and Murphy, B. (2007). Soil Test Results: What do all the numbers mean? CSIRO Publishing. ISBN 978 0 64309 225 9

APPENDICES

APPENDIX 1 – ADDITIONAL FIGURE



LEGEND

Tomago Aluminium and Immediately Associated Infrastructure

Cadastral

Survey Sites

Whilst every care is taken to ensure the accuracy of this data de Witt Ecology makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability for all expenses, losses or damages which might incur as a result of the data being inaccurate or incomplete in any way and for any reason.

de Witt Ecology

SURVEYING • PLANNING

GIS • SEWER & WATER

PROJECT MANAGEMENT

7 Canberra Street
PO Box 850
Charlestown NSW 2290
P 02 4942 5441
F 02 4942 5301
E admin@dewittconsulting.com.au
www.dewittconsulting.com.au
ABN 94 638 012 003

87 Herbert Street
PO Box 232
Gulgong NSW 2852
P 02 6374 2911
F 02 6374 2922

FIGURE 2

SURVEY SITES

05001,0001,5002,000 m

(© Aerometrix: MetroMap; LPI NSW Imagery: NSW Spatial Services 2022)

JOB ADDRESS: TOMAGO
NEW SOUTH WALES | AUSTRALIA

CLIENT: TOMAGO ALUMINIUM COMPANY PTY LIMITED

A3 SCALE: 1:18,000
PLAN DATE: 24/11/2022

DRAWN: RS
CHECKED: AB

JOB REF: EC139
ISSUE: 01

N

\\wccsbs\data\SYNERGY\Projects\EC139\GIS\Figures\Figure_Workspaces

APPENDIX 2 – PLATES



Plate 1 *Angophora costata* leaf showing extreme chlorosis on the north-eastern boundary of TAC. Injury Category 7.



Plate 2 Young growth (right side) displaying very severe chlorosis, cupping and tip necrosis. Injury Category 6



Plate 3 *Angophora costata* displaying marginal chlorosis and tip necrosis to approximately 40% of the leaf surface. Injury category 5.



Plate 4 Leaves displaying marginal chlorosis and necrosis as well as insect damage. Injury category 4



Plate 5 Leaves displaying <10% marginal chlorosis. Buds are also present on this individual indicating that initial stages of reproduction may continue at this level of injury. Injury Category 3.



Plate 6 A leaf indicating approximately 4% damage as marginal and tip chlorosis and necrosis. Injury Category 2.



Plate 7 Leaf indicating <2% damage highlighted in red circle. Injury Category 1.



Plate 8 This tree is located immediately to the south of the Hunter Region Botanic Gardens and displays no visible injury. Injury Category 0.



Plate 9 Vegetation on Ash Island did not display symptoms of fluoride injury.

End of Report

Tomago Aluminium Company