AIR EMISSION RELEASES MANAGEMENT PROGRAM

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1. INTRODUCTION

1.1. Purpose

The purpose of this Air Emission Releases Management Program is to define the environmental management practices and air quality monitoring program that are required for the control of environmental releases to air generated by Tomago Aluminium Company.

The objectives of the program are to:

- Ensure compliance with legal requirements
- Promote a systematic approach in environmental releases management through the effective use of management systems and continual improvement in environmental performance;
- Minimise potential impacts associated with environmental air releases; and
- Minimise material losses and operational costs.

The program identifies the legal requirements that apply to air emissions at Tomago Aluminium Company, and summarises TAC standards and operational controls that are implemented by the production areas. In addition the program references the air quality monitoring conducted by Tomago Aluminum to assess performance.

This Air Emission Releases Management Program has been developed to fit the framework of the TAC (ISO14001 accredited) Environment Management System.

1.2. Scope

This program addresses the management of environmental releases to air at Tomago Aluminium Company. It does not apply to accidental releases to the environment, which is covered by the Emergency Response Plan. The management of Greenhouse Gases are also covered in a separate program.

This program is applicable to Tomago Aluminium personnel and contractors working on site. It outlines both legal and internal plant standards associated with air emissions, the monitoring, assessment and reporting of air emissions.

1.3. Background

Tomago Aluminium (TAC) is located in the industrial suburb of Tomago, which is part of the Port Stephens Local Government Area. Production of aluminum commenced in September 1983, and smelter reached full operating capacity in 1984.

In 1993, Potline No 3 was commissioned and additional pots were installed on the original two potlines in 1998. In recent years production expansion has occurred through upgrades in the aluminum smelter cell design.

2. PLANNING

2.1 Characteristics of Air Quality at Tomago Aluminium

The process of Aluminum smelting generates a number of air emissions. Emissions from pot cells are collected and transported to a number of gas treatment centres (known as pot gas dry scrubbers) before being released into the environment.

At each pot gas dry scrubber, fresh alumina is injected into the stream of pot gases, the alumina reacts with the gaseous fluoride present in the pot gases. Once reacted, the fluoride and alumina mix is collected with other particulate emissions in baghouses and recycled back into the potrooms as pot feed. The scrubbing efficiency of the pot gas dry scrubbers for fluoride is greater than 99% and is a world-wide recognised technology used in aluminium smelters. In regards to infrastructure in this part of the smelter, each pot is vented into a dry scrubber, with seven dry scrubbing centres serving a total of 840 pots in the existing three potlines. Similar dry scrubbing systems are also employed to control emissions from three anode baking furnaces and the dross processing area where secondary fluoride emissions are also present.

Tomago Aluminium smelter undertakes monitoring of 15 stacks on the site and 6 potline roof vents. Most stacks emit air pollutants including: Sulfur Dioxide (SO2) Oxides of Nitrogen (NOX), Hydrogen Fluoride (HF) and Particulates. Poly Aromatic Hydrocarbons (PAH’s) are emitted from only the anode baking furnace and paste plant stacks.

2.2 Air Quality Impact Assessment at Tomago Aluminium

Air quality impact assessments were completed for the original smelter consent application, Potline 3 expansion consent application, the AP22 and AP2X consent applications and the secondary dross processing plant modification. The more recent minor production increases and the secondary dross processing plant modification have been made while respecting the previous established AP2X load limits.

As part of the original development consent a “buffer zone” was established based on air modelling results and Tomago Aluminium were required to negotiate with landholders of residential and rural zoned land and purchase the property if the landowner and smelter could agree on the property value. TAC owns all residential land in the buffer zone and owned the portion of rural holdings to the south east of the smelter before this parcel was sold to the NSW State Government. **Figure 1** details the Buffer Zone and Neighbouring non industrial/manufacturing facilities receptors.

The AP2X air quality impact assessment of pollutants modelled predicted that NO2, Total Particulate, PM10 and PAH all fall below assessment criteria.

The EPA assessment criteria for fluorides apply for the protection of sensitive vegetation. Fluoride modelling predicted exceedances of the EPA assessment criteria for fluoride would be limited to within the buffer zone and the area of affectation is small, so exceedances of ambient fluoride assessment criteria are permissible within the established buffer zone. No exceedances of the criteria for fluoride are seen outside the buffer zone.

Modelling indicated that 24-hour average and annual average SO_2 concentrations complied with EPA and NEPM assessment criteria in place at the time. Short-term SO_2 concentrations occasionally exceed current EPA assessment and NEPM criteria within the buffer zone. The exceedances generally occur as a result of short term, low frequency meteorological events mostly to the south-east of the smelter site. Three additional ambient sulfur dioxide monitoring stations were installed as part of the AP2X approval.

Figure 1: Buffer Zone and neighbouring non-industrial/ manufacturing facilities

3. LEGAL REQUIREMENTS

An ***Environmental Legal and Other Requirements Register*** is maintained as part of the Environment Management System. A summary of the key legal requirements relating to air emissions for the TAC site are provided below.

3.1 Protection of the Environment Operations (POEO) Act Licence

TAC's POEO Act Licence limits the annual load of pollutants that can be discharged from the premises. In addition, concentration limits are set on key emission points that must not be exceeded. These limits are defined in the **Table 1** and **Table 2** below:

Table 1: Annual Load limits

Assessable Pollutant	**Load limit (kg)**
Coarse Particulates	192,045
Fine Particulates	174,685
Fluoride	298,000
Nitrogen Oxides	186,620
Sulfur Oxides	11,900,000

Fluoride emissions rates are also specifically controlled. The POEO Environment Protection Licence (EPL) indicates that total fluoride emissions from the smelter must not exceed:

- The equivalent of 0.8 kilogram of total fluoride per tonne of aluminium produced as a monthly average.
- The equivalent of 0.56 kilograms of total fluoride per tonne of aluminium produced as an annual average., and
- The equivalent of 0.6 kilograms of total fluoride per tonne of aluminium produced, as an annual average, for more than one year out of every five years.

In addition to the annual load limits, concentration limits are set for key emission discharge points. The discharge point limits are detailed below:

Table 2: Concentration Limits for EPA Emission Points

EPA Emission Point identification number	Description	Nitrogen Oxides (g/m^3)	Total Solid Particles (mg/m^3)	Fine Particles (mg/m^3)	Total PAHs as Benzo (a) pyrene equivalent (mg/m^3)
1	1 West GTC stack	2.0	50		
2	1 East GTC stack	2.0	50		
3	2 West GTC Stack	2.0	50		
4	2 East GTC Stack	2.0	50		
5	Bake Ovens 1 FTC stack	2.0	50		0.005
6	Bake Ovens 2 FTC stack	2.0	50		0.005
7	3 West GTC Stack	2.0	50		
8	3 East GTC Stack	2.0	50		
9	1 & 2 Ext GTC Stack	2.0	50		
31	Paste Plant 1 Pitch circuit stack		50		0.005
32	Paste Plant 1 Proportioning circuit Stack		50		0.005
33	Paste Plant 2 Pitch circuit stack		50		0.005
34	Paste Plant 2 Proportioning circuit stack		50		0.005
38	Deline/Regain Spent Potliner Dust Filter		20	10	

The EPL also details the requirements of a comprehensive Air Quality Monitoring Program that includes monitoring of source and ambient emissions. Details of the air quality monitoring program are specified in section 7.3.

The maximum sulfur level in petroleum coke is also stipulated in the EPL as a second level of control for sulfur dioxide emissions.

3.2 Protection of the Environment Operation (Clean Air) Regulation 2010

The Protection of the Environment Operations (Clean Air) Regulation sets limits on the concentrations of contaminants that are allowable from other emission point sources that are not covered in the POEO licence. These limits are documented in the *Environment Legal and Other Requirements Register*.

In accordance with the above regulation it is prohibited to burn the following items in the open at the TAC smelter:

- Tyres, Coated wire, Paint containers and residues, Solvent containers and residue

3.3 Development Consent Conditions

Development consents (DA 391-80 and DA 4908-90) were granted by the Minister for Planning on March 6 1981 and 11th January 1991 respectively, for the construction and operation of an aluminium smelter at Tomago, and as modified by the Minister on 11 January 1991, 14th February 1995, 23rd August 2001,7th December 2009,12th October 2015, 9th November 2016, 23rd October 2020 and 26th May 2023. Conditions relating to air quality and this management Plan are defined in **Table 3** below.

Table 3: Development Consent Conditions relating to Air Quality

Development consent condition #	Development consent condition	Air emissions releases program reference
DA 391-80 Condition 50 DA 4908-90 Condition 58	The Applicant shall prepare and implement an air Quality monitoring Program for the development to the satisfaction of the Director General. This program must (a) be prepared in consultation with DECCW (b) be submitted to the Director-general for approval by 1 May 2010 (c) include: 1. three additional SO2 monitoring sites, ensuring sufficient monitoring points around the “Farm” precinct; 2. mapping of all monitoring points 3. a description of the monitoring to be undertaken including pollutants, unit of measure, frequency and sampling method; 4. a program to monitor the ongoing performance of the development; and 5. a description of the contingency measures that would be implemented should the monitoring identify any non-compliances/exceedances.	EPA correspondence attached in Appendix 1 Submitted on the 23rd 2010, resubmitted 25th August 2017. Network expanded with stations at Laverick Ave, Site 85 and Site 179 Figure 2 and Figure 3 Table 4 and Table 5 Section 7: Air emission Release Management Program. Section 10:Non-Compliance and exceedance action.
DA 391-80 Condition 50A DA 4908-90 Condition 58A	The applicant shall prepare and submit an Air Quality Verification Report to the satisfaction of the director general and the DECCW by the 30th May 2013 or once the facility is operational at full capacity, whichever comes sooner. The air quality verification report shall include: 1. a validation of the predictions made in the SEE titled “Production Capacity Increase Statement of Environmental Effects Tomago Aluminium Smelter”, prepared by ENSR Australia Pty Ltd, dated May 2009 2. monitoring data required by the EPL 3. comparison of monitoring results with any limits or conditions in the EPL; and if necessary 4. additional measures that would be implemented to comply with the requirements of the EPL.	Submitted 29th May 2013

DA 391-80 Condition 58D DA 4908-90 Condition 58D	The Applicant must update its Air Quality Monitoring Program required by Condition 58, prior to the commencement of operation of DA 391/80 Mod 9 (and DA 4908/90 Mod 8) and to the satisfaction of the Secretary	Version 27 of this document, submitted October 2024
DA 391-80 Condition 58E DA 4908-90 Condition 58E	Applicant must prepare and submit an Air Quality Verification Report within three months following commencement of operation of DA 391/80 Mod 9 to the satisfaction of the Planning Secretary. The Air Quality Verification Report must include: a) a validation of the predictions made in the Air Quality Impact Assessment titled "Tomago Aluminium Smelter: Secondary Dross Processing Plant – Air Quality Assessment", prepared by Katestone Environmental Pty Ltd, dated April 2023; b) comparison of monitoring results with any limits or conditions in the EPL; c) an outline of management and mitigation measures to address any exceedances of the criteria; and d) a description of contingency measures in the event the management and mitigation measures are not effective in reducing air quality impacts to meet the criteria and timing for implementing and validating the effectiveness of these measures.	Not yet triggered as at October 2024
DA 391-80 Condition 58F DA 4908-90 Condition 58F	The Applicant must fit all flue gas discharge points for 391/80 Mod 9 (and 4908/90 Mod 8) with air emission sampling ports to allow for discharge air pollutant monitoring in accordance with Australian Standard AS4323.	Document *ES.REG.0010 "Dross Plant Stack Conformance to AS4323 – Condition 58F"* DMS 130000001683 (currently in draft as at October 2024 as still under construction)

4. DEFINITIONS

4.1 Direct emissions to air – release of contaminants from the Tomago site directly to air.

4.2 Accidental release – a non-routine fugitive or point source release which results from a disturbance to standard operating conditions which may have the potential to endanger human health or the environment, inside or outside the installation.

4.3 Air Emission – a gas, vapour, fume, mist, fog or dust that is released from process equipment, emission control equipment or from any material (e.g. raw or finished products) to the environment.

4.4 Environmental performance – measurable results of the Environmental Management System (EMS) related to the installation's control of its environmental hazards, based on its environmental policy, objectives and targets.

4.5 Environmental release – any release to air or water of a substance, which is or can be harmful to humans and/or the environment.

4.6 Point source release – an emission from a discrete release point e.g. filter discharge stack.

4.7 Fugitive emission to air – environmental releases that are emitted into the general workspace and are not directly captured e.g. emissions that are not released through a specific stack.

5. ROLES & RESPONSIBILITIES

Tomago Aluminium Company's management is committed to the success of the Air Emission Releases Management Program. Management and individuals are held accountable for the successful implementation of this programme. Key personnel and responsibilities for the execution of the Air Emission Releases Management Program are defined below:

Responsibilities	**CEO**	**Environment Superintendent**	**Environmental Services Team**	**Managers, Superintendents,**	**HSE Manager**	**Employees and Contractors**	**TAC engineering Alliance Supplier**	**Maintenance**
Ensure that an AER program is established and maintained that meets all applicable legal requirements	X							
Co-ordination of the programs implementation, maintenance, auditing and review		X						
Ensuring sampling and monitoring program is operational			X					
Ensure that employees & contractors under their control meet the AER requirements				X				
Ensuring mechanisms are in place for inspection and maintenance of air pollution control equipment				X				
Ensure monitoring samples are taken in accordance with licence requirements and to verify emission performance		X	X					
Ensure monitoring samples taken under the AER program are analysed to appropriate quality standards		X	X		X			
Investigate incidents and implement corrective actions		X		X				
Co-operate with AER program related investigations, audits and compliance reviews						X		
Provision of technical assistance and identification of issues in the planning phase, equipment and process projects		X	X	X			X	
Conduct routine inspections and observations to assess compliance		X		X				
Correct abnormal operations dust filters				X				
Report conditions and practices that do not conform to the Plant AER standards						X		
Complete required maintenance of emission control equipment.								X
Ensuring employees and contractors are adequately trained in an understanding of potential environmental releases		X						

The Environment Superintendent is required to have completed tertiary qualifications in science, environmental science or engineering and extensive experience in the management of environmental matters in large industries.

Members of the environment services team are required to have tertiary qualifications in science, environmental science or related discipline with relevant experience in environmental monitoring and management.

6. PROCESS DESCRIPTION

As a major industrial facility TAC generates air emissions that need to be managed. The major air emissions associated with the operation include fluoride, sulfur dioxide, nitrogen oxides and dust. To ensure that these emissions are controlled and the impact is minimised a number of different control technologies and systems are employed on site. These include:

- The use dry scrubber filter technology to remove fluoride from major emission generating production areas such as Liquid Metals, Bake Ovens and dross processing. This technology has proven to be very effective in reducing fluoride concentrations in gas streams. Concentration reduction efficiencies greater than 99% are achieved.
- Dust collection filters are installed on material handing circuits and transfer points to collect generated dust.
- Hooding enclosures and work practice standards are employed where control technology cannot be employed.

In addition, in order to reduce the impact of TAC operations on residential communities, an extensive Buffer Zone of Company owned land surrounds the Smelter, see **Figure 1.** This Buffer Zone is managed in accordance with the *Flora and Fauna Monitoring and Buffer Zone Management Plan ES.EMS.0026.*

An extensive ambient air quality monitoring and impact assessment program is conducted to assess the effectiveness of the environmental controls employed.

7. AIR EMISSION RELEASE MANAGEMENT PROGRAM

7.1 TAC Plant Standards

The air emission management program aims at reducing air emissions through the implementation of the following Plant Standards:

- Fume and dust control equipment will be installed where practical on activities that are deemed to have significant potential impact on the environment.
- Management Systems are established for this equipment that at a minimum will include:
    - Responsibilities for management of the fume and dust control equipment defined in the departments

- Preventative maintenance plans prepared and implemented for the equipment
- Regular performance inspections completed
- Corrective Actions identified in preventative maintenance programs and performance inspections tracked
- Standards established on hood removal and pot sealing condition in the Liquid Metals Department (potlines)

- Dust generating activities are to be conducted within buildings or enclosed areas where possible.
- JSEA's are to be prepared for abnormal activities that are unable to be contained within a building. Dust mitigation methods such as mist spraying or load covering should be considered.
- Regular monitoring and impact assessment of high risk activities are to be completed.

7.2 Operational Control Summary

7.2.1 Gas Treatment Centres (GTC's) and Fume Treatment Centres (FTC's)

To ensure that performance of the gas and fume treatment centres is maintained the following key operational controls are used to manage these areas

- A team of process operators monitor the performance of the treatment centres on a 24 hour / 7 day week basis. These operators are responsible for completing inspections and carrying out tasks associated with maintaining gas scrubbing & filter performance.
- Filter bag replacements are scheduled and implemented.
- Preventative maintenance programs are developed and implemented.
- Treatment centres are rated as critical equipment ensuring spares inventories are maintained and priority is given to breakdown situations.

7.2.2 Small Dust Collection Filters

Dust collection filters are installed on material handling circuits to collect associated dust. To ensure that this equipment is maintained the following processes are used to manage these filters:

- A responsible person is allocated within each department to ensure performance of equipment

- Preventative maintenance programs are developed and implemented
- Filter units are inspected on a regular basis by production personnel

Additional details on small filter management are contained in the *Small Filter Management Procedure PW.EMS.0028.*

7.2.3 Pot Hooding Enclosures

Hooding is employed in the Liquid Metals Department to reduce (fugitive) emissions through the roof vents. To ensure high capture efficiencies:

- Operating Standards and Procedures are established regarding hood removal and replacement
- Regular maintenance activities are undertaken to ensure high quality sealing
- Inspections on hooding quality are regularly performed

7.3 Performance Monitoring Summary

7.3.1 Point Source Monitoring summary

Extensive monitoring of emissions from emission point sources and Potline roof vents allow for performance to be monitored and corrective action to the taken. A map of the Emission point sources is displayed in **Figure 2** and detail of the sampling requirements are displayed in **Table 4.** The monitoring program includes;

- Stack emissions on the GTC's and FTC's are continuously analysed for gaseous fluoride and particulates, providing feedback to the emission control operator, and Roof Vent emissions are continuously analysed for fluorides providing feedback to the Liquid Metals Operator (refer to *Stack Laser Data Collection & Routine Maintenance ES.EMS.0024* and *Roof Vent Laser Data Collection & Routine Maintenance ES.EMS.0038.* for detailed operational procedures)
- Regular monthly compliance monitoring of GTC and FTC stacks and potline roof vents is conducted (refer to *Sampling Stacks for Particulate and Gaseous Fluorides ES.ESM.0001*, *Sampling of stacks for Oxides of Sulfur ES.EMS.0011*, *Sampling Potroom Roof Vents for Gaseous and Particulate Fluorides ES.EMS.0002* and *Sampling Stacks and Ducts For Total Particulate Matter ES.EMS.0012* for detailed sampling procedures).

Compliance monitoring procedures detailed above are established for the sampling and measurement of contaminants at these point sources. These procedures

include quality control processes to ensure representative samples are taken and accurate analyses completed. The Environment Services section and the Laboratory section at TAC are both National Association of Testing Authorities accredited for these tests. The monitoring schedule and standard sampling procedures are detailed in *Environment & Sustainability Services Operations/Quality manual, ES.EQM.0001, Chapter 15 Routine Sampling Schedule.*

Testing for other contaminants (e.g. PAH, metals) and monitoring of additional point emission sources is conducted annually by suitably accredited external monitoring consultants.

Figure 2: Tomago Aluminium Point Source Emission Locations

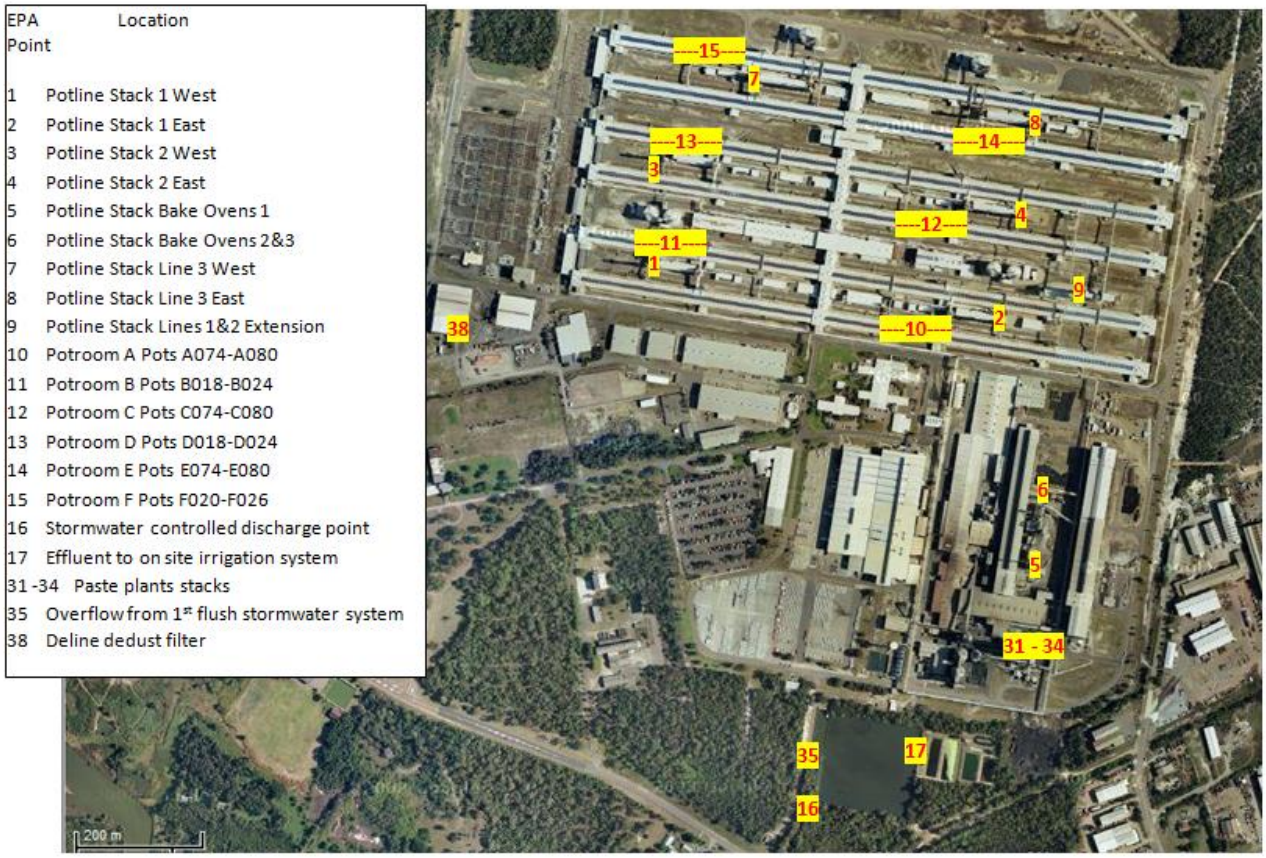


Table 4: Sampling frequency of emission point sources

EPA Identification Number	Description	Pollutant	Frequency	EPA Approved Sampling Method	Monitoring Body
1,2,3,4,7,8,9	Potlines Gas Treatment Centre Stacks	Gaseous Fluoride	Continuous	In- line instrumentation	Tomago Aluminium Environment Team
		Sulfur dioxide	Quarterly	TM-4	
		Total fluoride	Twice per quarter	TM-9	
		Total Solid Particles	Yearly	TM-15	
5,6	Bake Ovens No1 and No2 Fume Treatment Centres	Gaseous Fluoride	Continuous	In- line instrumentation	Tomago Aluminium Environment Team
		Nitrogen Oxides	Yearly	TM-11	External monitoring consultant
		Sulfur Dioxide	Yearly	TM-4	Tomago Aluminium Environment Team
		Total Fluoride	Twice per quarter	TM-9	Tomago Aluminium Environment Team
		Total PAH's as BaP equivalent	Yearly	OM-6	External monitoring consultant
		Total Solid Particles	Yearly	TM-15	External monitoring consultant
10,11,12,13,14, 15	Potline Roof Vents	Total Fluoride	Monthly	TM-10	Tomago Aluminium Environment Team
31,32,33,34	Paste Plant small filters	Total PAH's as BaP equivalent	Yearly	OM-6	External monitoring consultant
		Total Solid Particles	Yearly	TM-15	External monitoring consultant
38	Deline dedust filter	Fine particulates	Yearly	OM-5	External monitoring consultant
		Total Solid particles	Yearly	TM-5	External monitoring consultant

7.3.2 Data Analysis and Inventory

Tomago Aluminium Company maintains an inventory of environmental releases to air in *Emission Point Source Register ES.REG.0004*. The register details the monitoring data collected from the major point sources of air emissions.

The environmental releases inventory identifies the following information:

- Description of environmental release, including specific parameters;
- Environmental media receiving the release;
- Source (i.e. process or support activity);
- Quantity released per year; and
- Regulatory limits (where applicable).

7.3.3 Ambient Air Quality Monitoring and Impact Assessment

In order to reduce the impact of air emissions from TAC operations an extensive Buffer Zone of TAC owned land surrounds the Smelter. Regular monitoring of impact is assessed in the Buffer Zone and surrounding areas. The monitoring includes:

- Continuous Measurement of ambient air fluoride and sulfur dioxide concentrations at ambient air monitoring stations
- Monitoring and assessment of vegetation condition

The monitoring schedule and standard sampling procedures are detailed in *Environment & Sustainability Services Operations/Quality manual, ES.EQM.0001, Chapter 15 Routine Sampling Schedule.*

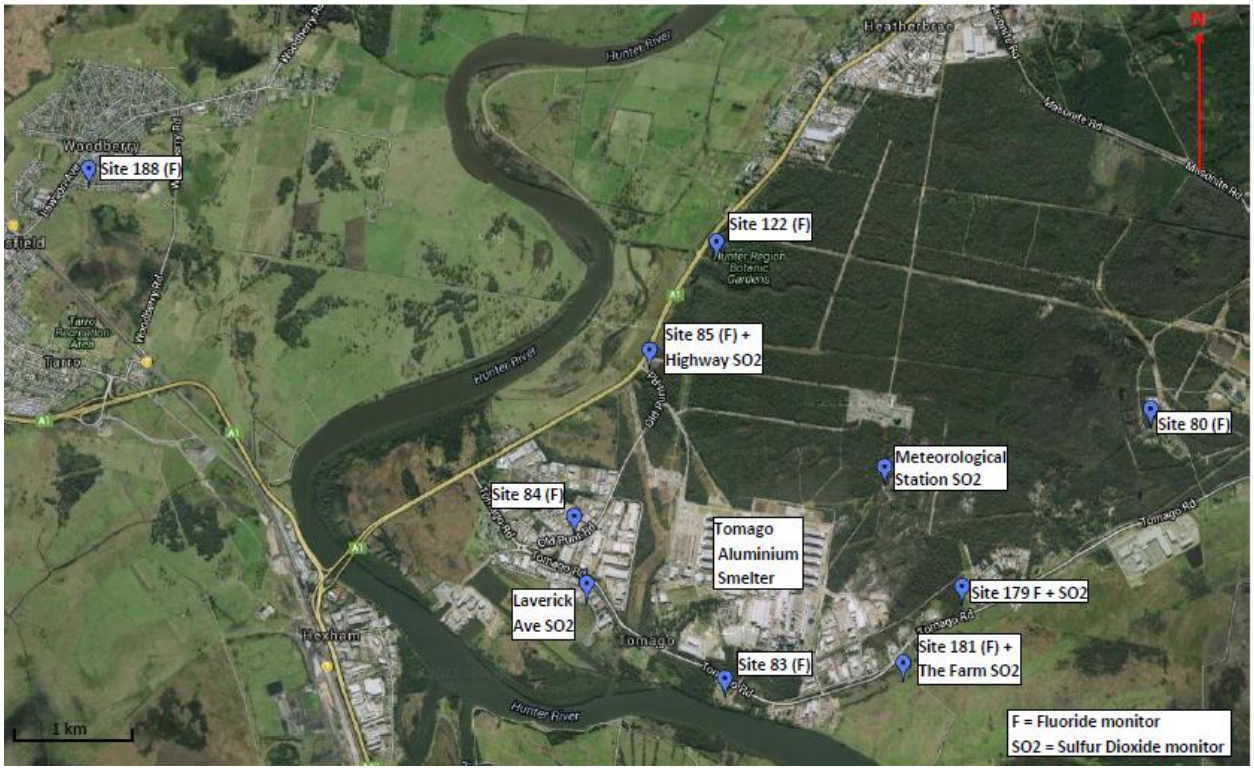
Eight fluoride and five sulfur dioxide ambient air monitoring stations are established around the smelter as well as a meteorological monitoring station. **Table 5** provides details on these stations and **Figure 3** displays the location in relation to the smelter.

Table 5: Details of the Ambient Air monitoring stations

EPA Identification Number	Description	Measurement Parameter	Frequency	EPA Approved Sampling Method	Monitoring Body
18	Meteorological monitoring station	Meteorological data	Continuous	AM-2 &AM-4	Tomago Aluminium Environment Team
		Sulfur Dioxide	Continuous	AM-20	
20	Site 80 HWC offices	Fluoride	Continuous	AM-8	
21	Site 84 – 6 Old Punt Road Tomago (1.25km West of smelter)	Fluoride	Continuous	AM-8	
		Sulfur Dioxide	Continuous	AM-20	
22	Site 179- 374 Tomago Road Tomago (1.75km E of smelter)	Fluoride	Continuous	AM-8	
		Sulfur Dioxide	Continuous	AM-20	
23	Site 188 Woodbury (5km NW of smelter)	Fluoride	Continuous	AM-8	
24	Site 181- The farm (1.5km SE of smelter)	Fluoride	Continuous	AM-8	
		Sulfur Dioxide	Continuous	AM-20	
25	Site 122- Botanic gardens 2.5km N of Smelter	Fluoride	Continuous	AM-8	
26	Site 83 – Detention Centre (1km S of smelter)	Fluoride	Continuous	AM-8	
27	Site 85 – Pacific Highway Tomago (1.5km NW of smelter)	Fluoride	Continuous	AM-8	
		Sulfur Dioxide	Continuous	AM-20	
36	Laverick Ave	Sulfur Dioxide	Continuous	AM-20	

Data collected from the sulfur dioxide ambient air monitoring sites are compared to assessment criteria and the data from the fluoride ambient air monitoring sites are compared to ANZEC goals.

Figure 3: Ambient Air Monitoring Sites



7.3.4 Prioritisation of Environmental Releases for Improvement

TAC prioritises improvements to the environmental air releases through the review of data and utilising the Environment Management System processes. Evaluation of improvements is completed in accordance with procedure *Setting HSE Objectives & Targets EHS.MP.005.*

8. TRAINING

New employees (including contractual employees) receive environmental awareness training in general site and department inductions. Permanent employees receive environmental training in accordance with the requirements detailed in *Training Awareness & Competency Procedure HSE.MP.016.*

9. NOTIFICATION, REPORTING & DOCUMENTATION

Regular reporting of emission and environmental performance to regulatory bodies is required. Emission reports are prepared on a monthly, quarterly and annual basis. Monthly fluoride emission results are reported to the EPA within 30 days of the end of month. This monthly report includes:

1. Summary of Potline Stack and Roof Vent fluoride monitoring results
2. Gas and Fume Treatment Centre operational availability for the month
3. Commentary on the emission performance and any pollution control equipment outages.

Quarterly reports that include both results from point source and ambient emissions are prepared and provided to:

1. Hunter Region Botanical Gardens
2. Hunter Water
3. NSW Department of Primary Industries (Fisheries)
4. NSW Government Water
5. NSW National Parks and Wildlife Services
6. NSW Department of Planning, Housing & Infrastructure
7. Port Stephens Council
8. NSW Environment Protection Authority

Annual reports include data collected from both point source emissions and ambient monitoring, compares data to established air quality standards and reviews trends. Annual reports are provided to:

1. Hunter Region Botanical Gardens
2. Hunter Water
3. NSW Department of Primary Industries (Fisheries)
4. NSW Government Water
5. NSW National Parks and Wildlife Services
6. NSW Department of Planning, Housing & Infrastructure
7. Port Stephens Council
8. NSW Environment Protection Authority
9. NSW Department of Primary Industries

At Tomago Aluminium, environment regulatory reporting is managed by Environmental Services. The environment monitoring program is summarised in *Environment Monitoring and Verification Plan PW.EMS.0013* and the environmental reporting requirements are detailed in *Environment Reporting Program ES.EMS.0014.*

10. NON COMPLIANCE OR EXCEEDANCE REQUIREMENTS

Any instances of non-compliance with TAC standards, legal requirements or licence limits associated with air releases are be reported using the Plant Incident Reporting

System *Event Reporting and Investigation EHS.MP.012*. Dependent upon the nature of the non-compliance, reporting to statutory bodies may be required. The following procedures *Environmental Incident Reporting to Statutory Bodies Procedure ES.EMS.0020* and *Notification of EHS Incidents 110000000298* may be applicable. Any instances of non-compliance are to be investigated and appropriate corrective action determined. The investigation tools may include the use of detailed air modelling and investigation into improved emission control technologies and environment management options.

Any non-compliances with conditions of Environment Protection Licence 6163 must be included in the annual return.

11. CONTRACTORS

Any TAC employee responsible for bringing contractors or visitors on site must ensure that the individual(s) adhere to TAC's air emission releases program.

12. COMMUNICATIONS and CONSULTATION.

The point source and ambient monitoring program highlighted in this management plan has been developed over the operational years of the smelter in consultation with the EPA and is reflected in Environment Protection Licence 6163. A draft of this plan was submitted to the EPA in 2017 and Tomago Aluminium was advised that EPA do not provide comment on such plans. Evidence of the consultation is provided in Appendix 1.

Any changes to the Air Emission Releases Program to reflect changes in regulatory requirements, or in response to recommended changes to facilitate continuous improvement will be communicated in accordance with *EHS Communications EHS.MP.006.*

As this document is required to be approved by the NSW Department of Planning, Housing & Infrastructure, subsequent revisions are required to be submitted for approval.

13. COMPLIANCE / AUDITING

Compliance with the requirements detailed in this Air Emission Releases Program are assessed by

- TAC internal EHS audits
- Line personnel conducting routine inspections to assess compliance
- External audits

14. PROGRAM EVALUATION & MANAGEMENT REVIEW

Program evaluation is conducted annually as part of the Environment Management Review process. The review is to ensure that this program

- Reflects the current site conditions
- Identifies gaps in the program
- Ensure continuous improvement

15. REFERENCES

This Air Emission Releases Management Program references a number of additional documents that are maintained in the Environment Management System and are critical documents for the implementation of the Plan. The table below details these reference documents and provides a precis of their scope and application.

Reference Document	Precis of Document
ES.EMS.0026 Flora and Fauna and Buffer Zone Management Plan	This document details the flora and fauna monitoring program conducted by Tomago Aluminium Company and the management of the Buffer Zone land surrounding the smelter.
EHS.MP.006 EHS Communications	This document is a part of the Environment Management System and details the process for internal and external communication of EHS issues.
ES.REG.0004 Emission Point Source Register	This register is part of the Environment Management system and is a database of historical emission data from point source locations on the smelter site.
ES.EMS.0014 Environment Reporting	This document is part of the Environment Management System and details the environment reporting and responsibility requirements for Tomago Aluminium Smelter.
ES.REG.0002 Environmental Legal Register	This register is a database in the Environment Management System and details environmental legal requirements for the Tomago Aluminium Smelter. Compliance against conditions are reviewed annually and legislation reviewed six monthly.
EHS.MP.005 Setting HSE Objectives & Targets	This document is part of the Environment Management System and details the process for setting annual EHS objectives for Tomago Aluminium Smelter.
ES.EMS.0028 Small Filter Management Procedure	This document is part of the Environment Management System and this procedure outlines the responsibilities and management requirements for small dust and fume filters Tomago Aluminium Smelter.

Reference Document	Precis of Document
HSE.MP.016 Training Awareness Competency Procedure	This document applies to HSE training requirements for TAC employees and contractors. The document is prepared to ensure that HSE training prepared, delivered and maintained at TAC meets the requirements of AS/NZS ISO 14001 and OHSAS45001
PW.EMS.0013 Environment Monitoring and Verification Plan	This procedure is part of the Environment Management System and summarises the environment monitoring program and environment calibration processes for the TAC site
EHS.MP.012 Event Reporting and Investigation	This procedure is part of the Environment Management system and the objective of the procedure is to - • Ensure all events are classified and managed to prevent a recurrence and eliminate, or minimise risk to environment, health and safety; • Define the investigation process to encourage suggestions & opportunities for improvement to prevent adverse events (including incidents and non-conformance) and improve environment performance; and • Communicate the results of investigations.
ES.EMS.0020 Environmental Incident Reporting To Statutory Bodies Procedure	The document covers the incident reporting required in the Protection of the Environment Operation Act Licence, Hazardous Chemicals Act Licence and Development Consents
ES.EMS.0024 Stack Laser Data Collection & Routine Maintenance	This document is a detailed procedure on the operation and maintenance on the real time laser gaseous fluoride emission monitoring equipment.
ES.EMS.0038 Roof vent Laser Data Collection & Routine Maintenance	This document is the detailed procedure and fault finding guide for the operation of the laser units in the potline roof vents.
ES.EQM.0001, Chapter 15 Routine Sampling Schedule	This document details the sampling program, including sampling frequency and method identification required to ensure compliance with EPA and Department of Planning and Environment requirements.
ES.EMS.0011 Sampling of Stacks for Oxides of Sulfur	This is the detailed sampling procedure for the sampling of sulphur dioxide in stacks and flues in accordance with USEPA method 6B (NSW EPA TM 4).
ES.EMS.0002 Sampling Potroom Roof Vents for Gaseous and particulate Fluorides	This is the detailed sampling procedure for the sampling of gaseous fluoride and particulate fluoride in potline roof vents in accordance with USEPA method 14A (NSW EPA TM10).
ES.ESM.0001 Sampling Stacks for Particulate and Gaseous Fluorides	This is the detailed sampling procedure for the sampling of gaseous and particulate fluoride in stacks in accordance with USEPA method 13B (NSW EPA TM-9).

Reference Document	Precis of Document
ES.EMS.0012 Sampling Stacks, Ducts Total Particulate	This is the detailed sampling method for the sampling of particulate matter in stack emissions in accordance with AS 4223.2 (NSW EPA TM 15).
ES.REG.0010 Dross Plant Stack Conformance to AS4323 – Condition 58F	This is the document containing evidence of compliance with Condition 58F - to allow for discharge air pollutant monitoring in accordance with Australian Standard AS4323

Appendix 1: Evidence of Consultation with the DECCW now NSW EPA

NSW EPA

DOC17/441634, File No. EF13/3725

Tomago Aluminium Company Pty Limited
PO Box 405
RAYMOND TERRACE NSW 2324

Attention: Mr Neil Roser

Neil.Roser@tomago.com.au

Dear Mr Roser

ENVIRONMENT PROTECTION LICENCE 6163 – MANAGEMENT PLANS

Reference is made to your emails to the Environment Protection Authority (EPA) on 28 August 2017 providing updated management plans in respect of Tomago Aluminium. These plans included the:

- Air Emission Release Management Program;
- Water Management Program;
- Flora and Fauna Monitoring & Buffer Zone Management Plan; and
- Waste Management Program.

The EPA encourages the development of such plans to ensure that proponents and licensees have determined how they will meet their statutory obligations and designated environmental objectives.

Being a regulatory authority, the EPA's role is to administer and regulate statutes for environmental management and protection. As such the EPA does not directly get involved in the development of strategies to achieve those objectives and does not review or comment on such plans. Accordingly, the EPA has not reviewed and offers no comments on the above management plans and programs.

If you require any further information regarding this matter, please contact me on (02) 4908 6824.

Yours sincerely

28/8/2017.

HAMISH RUTHERFORD
Senior Operations Officer - Hunter
Environment Protection Authority

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