



Licence number	L8870/2014/1
Licence holder	Tronox Pigment Bunbury Ltd
ACN	008 683 627
Registered business address	Lot 350 Old Coast Road, AUSTRALIND WA 6233
DWER file number	DER2014/003202-1
Duration	30/12/2014 to 29/12/2029
Date of amendment	17/06/2024
Premises details	Kemerton Pigment Plant 869 Marriott Road, WELLESLEY WA 6233 Legal description - Part of Lot 1 on Plan 73196 As defined by the premises map in Schedule 1

Prescribed premises category description (Schedule 1, <i>Environmental Protection Regulations 1987</i>)	Assessed production capacity
Category 31: Chemical manufacturing: premises (other than premises within category 32) on which chemical products are manufactured by a chemical process.	125 000 tonnes per annual period
Category 87: Fuel burning: premises on which gaseous, liquid or solid fuel with a sulphur content of less than 0.25% is burnt in a boiler for the supply of steam or in power generation equipment.	1 140 kg per hour on natural gas; 1 180 kg per hour on diesel
Category 61: Liquid waste facility: premises on which liquid waste produced on other premises (other than sewerage waste) is stored, reprocessed, treated or irrigated.	605,000 tonnes per annual period

This licence is granted to the licence holder, subject to the attached conditions, on 17 June 2024, by:

MANAGER, PROCESS INDUSTRIES

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Licence history

Date	Reference number	Summary of changes
14/10/1987	W32	Works approval to authorise plant construction. Issued by the Environmental Protection Authority (EPA) following ratification of the Pigment Factory Agreement Act and Ministerial Statement 001 on 25/08/1987.
21/12/1988	L1002	Interim licence issued to allow commissioning of the plant. Issued to SCM Chemicals Ltd (SCM).
20/01/1989	L1023	First full operating licence issued to SCM. Issued for one year.
19/12/1989	L1697	New 2-part licence, incorporating water discharge conditions originally issued by WAWA under the revoked pt 111(a) of the <i>Rights in Water and Irrigation Act 1914</i> . Issued for one year.
19/03/1990	L1697	Licence amendment to rectify EPA concerns with original licence conditions.
27/06/1991	L2876	Licence renewal.
12/08/1991	W687	Works approval for trial feedstock tests addressing the effects of coke sulphur content on discharges to the atmosphere.
27/11/1991	L3347	Licence renewal.
20/12/1991	W749	Works approval for construction of a solids recycling system.
23/09/1992	L3771	Licence renewal. Issued for one year.
11/10/1993	L4606	Licence renewal. Issued for one year.
16/09/1994	L5223	Licence renewal. Issued for one year. First licence issued by DER, the former Department of Environmental Protection.
21/09/1994	W1135	Works approval for upgrades to the sand mills (de-bottlenecking).
27/09/1995	L6078	Licence renewal. Issued for one year.
11/11/1997	L6078/1	Licence renewal. Issued for one year. First licence issued to Millennium Inorganic Chemicals Ltd and first licence to combine water discharge conditions with the EPA licence.
15/01/1998	L6078/2	Licence renewal. Issued for one year.
27/10/1998	L6078/3	Licence renewal. Issued for one year.
30/09/1999	L6078/4	Licence renewal. Issued for one year.
11/09/2000	L6078/5	Licence renewal. Issued for one year.
27/12/2000	W3263/1	Works approval for de-bottlenecking to increase production capacity to 95,000 tpa.
26/09/2001	L6078/6	Licence renewal. Issued for one year.
25/09/2002	L6078/7	Licence renewal. Issued for one year.
10/11/2003	L6078/8	Licence renewal. Issued for one year.
11/11/2004	L6078/9	Licence renewal. Issued for one year.
14/11/2005	L6078/10	Licence renewal. Issued for one year.
09/11/2006	L6078/11	Licence renewal. Issued for one year.
15/11/2007	L6078/1988/12	Licence renewal. First non-annual licence - issued for three years.
11/11/2010	L6078/1988/13	Licence renewal following full review. Issued in Welker format for three years. Addition of CEMS requirements and updated air modelling.
14/05/2012	L6078/1998/13	Licence amendment to update biomonitoring program at the Kemerton Ocean Outfall and a 12 month extension for compliance with the CEMS Code.
08/02/2013	L6078/1998/13	Licence amendment to change occupier to Cristal Pigment Australia Ltd.
26/04/2013	L6078/1998/13	Licence amendment to remove requirements for CEMS on carbon monoxide, carbonyl sulfide and sulfur dioxide emissions; extend the deadline for CEMS compliance for chlorine to August 2013, such that more realistic and

		appropriate limits and targets for chlorine can be derived from actual continuous monitoring data.
14/11/2013	L6078/1988/14	Licence renewal. Conversion to REFIRE licence. Issued for 5 years.
27/11/2014	L6078/1988/14	Licence amendment to increase the volumetric flow rate limit for treated effluent discharged to the ocean.
30/12/2014	L8870/2014/1	New licence issued following previous licence ceasing to have effect.
08/10/2015	L8870/2014/1	Licence amendment to include Category 61: Liquid Waste Facility on the licence and revise groundwater monitoring locations.
09/05/2024	L8870/2014/1	Licence amendment application to install a new ocean outfall diffuser and other administrative changes
17/06/2024	L8870/2014/1	Licence amendment application to install a filter press plant and increase the amount of slurry residue accepted at the premises. Administrative amendment to update licence format and conditions set, including addition of infrastructure table.

Interpretation

In this licence:

- (a) the words ‘including’, ‘includes’ and ‘include’ in conditions mean “including but not limited to”, and similar, as appropriate;
- (b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;
- (c) where tables are used in a condition, each row in a table constitutes a separate condition;
- (d) any reference to an Australian or other standard, guideline, or code of practice in this licence:
 - (i) if dated, refers to that particular version; and
 - (ii) if not dated, refers to the latest version and therefore may be subject to change over time;
- (e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and
- (f) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This licence requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this licence.

Licence conditions

The licence holder must ensure that the following conditions are complied with:

Infrastructure and equipment

2. The licence holder must ensure that the site infrastructure and equipment listed in Table 1 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 1.

Table 1: Infrastructure and equipment requirements

	Site infrastructure and equipment	Operational requirement	Infrastructure location Schedule 1: Maps
1.	<p>Neutralisation plant including containment infrastructure:</p> <ul style="list-style-type: none"> - Dirty effluent pond - Clean effluent pond - Effluent overflow sump - Enclosed wastewater tank (D561) 	<ol style="list-style-type: none"> a) All liquid waste streams from pigment production, the air separation plant and adjacent Chlor-Alkali Plant must be directed into the neutralisation plant for treatment prior to discharge of the resulting effluent via the ocean outfall pipeline. b) Potentially contaminated stormwater must be treated as necessary prior to being discharged from the premises. c) Ponds and sump must be lined to maintain a permeability of less than 1×10^{-9} m/s or equivalent. d) Minimum top of embankment freeboard of 500 mm must be maintained. e) Overtopping of containment infrastructure must not occur except as a result of an extreme rainfall event (greater than 1 in 100 year event of 72 hours duration). f) Wastewater must only be stored and/or treated within the containment infrastructure. 	<p>As depicted in Figure 2 and labelled as 'Dirty effluent pond', 'Clean effluent pond', 'Effluent overflow sump', and 'D561'.</p>
2.	<p>Filter press plant comprising:</p> <ul style="list-style-type: none"> - Shed with two filter presses; - Three walled concrete filter cake bunker; - Bunded concrete front-end loader pad; <p>and containment infrastructure:</p> <ul style="list-style-type: none"> - Enclosed feed tank (D562); - Enclosed filtrate return tank (D5153); - Front-end loader pad sump (D5154); - Culvert sump (D5155) 	<ol style="list-style-type: none"> a) The filter press plant floor and front-end loader pad must slope towards a collection sump to capture fugitive liquids. b) Filter cake must be deposited straight into the bunker from the filter presses. c) Filter cake bunker must be covered to prevent rain ingress. d) Tanks (D562 and D5153), pipes and pumps must be located in a bunded area for secondary containment. e) Filtrate return tank (D5153) level must be measured continuously and fit with an alarm that sounds when at 90% capacity. f) Any spills and run-off must be directed to the sumps. <p>Sumps must be fitted with:</p> <ol style="list-style-type: none"> g) pumps to pump back to the feed tank; h) level indicators and alarms in event of overtopping; and i) be lined to maintain a permeability of less than 1×10^{-9} m/s or equivalent. <ol style="list-style-type: none"> j) Wastewater must only be stored and/or treated within containment infrastructure. 	<p>As depicted in Figure 5 and labelled as 'Proposed filter press plant'.</p>
3.	<p>Kemerton ocean outfall pipeline; and Kemerton ocean outfall diffuser with three ports (T1)</p>	<ol style="list-style-type: none"> a) Neutralised process effluent must be discharged from the clean effluent pond to the Indian Ocean via the Kemerton ocean outfall pipeline and through T1. b) Discharge from the clean effluent pond must be monitored continuously within the pipeline. c) Approximate location of T1 is 376974 E, 6325754 N. 	<p>As depicted in Figure 3 and labelled as 'T1'.</p>

Emissions and discharges

3. The licence holder must record and investigate the exceedance of any descriptive or numerical limit specified in any part of Section “Emissions and discharges” of this licence.
4. The licence holder must ensure that the emissions specified in Table 2, are discharged only from the corresponding discharge point and only at the corresponding discharge point location.

Table 2: Authorised discharge points

Emission source	Discharge point	Discharge point reference	Discharge point location Schedule 1: Maps
Mixed scrubbing system (spray tower, venturi and packed tower) and quench scrubbing circuit	Chlorinator unit process scrubber vent stack (emission point height is 66 m)	A1	As shown in Figure 2
Oxygen heater (F326)	Oxygen heater stack (emission point height is 40 m)	A2	
Titanium tetrachloride heater (F306)	Titanium tetrachloride heater stack (emission point height is 35 m)	A3	
Waste minimisation plant (F5110)	Waste minimisation plant stack (emission point height is 25 m)	A4	
Chlorinator (F204)	Chlorinator light up stack (emission point height is 34 m)	A5	
Chlorinator (F602)	Chlorinator vent stack (emission point height is 53 m)	A6	
Slurry tank (F601)	Slurry tank vent stack (emission point height is 53 m)	A7	
Crude tank (F603)	Crude tank vent stack (emission point height is 53 m)	A8	
Vaporiser (F604)	Vaporiser vent stack (emission point height is 53 m)	A9	
Diesel/natural gas boiler #1	Diesel/natural gas boiler #1 stack (emission point height is 10 m)	A10	
Diesel/natural gas boiler #2	Diesel/natural gas boiler #2 stack (emission point height is 12 m)	A11	
Neutralised process effluent from the clean effluent pond	Kemerton ocean outfall diffuser	T1	As shown in Figure 3

Point source emissions to air

5. The licence holder must ensure that emissions from the discharge point listed in Table 3 for the corresponding parameters does not exceed the corresponding limit when monitored in accordance with Table 6, except in the case of an event in Table 5 and the corresponding management action is taken.

Table 3: Emission and discharge limits

Discharge point	Parameter	Limit ¹	Averaging period
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reference			
A1	Sulfur dioxide	11,400 mg/m ³	Continuous derived measurement (60 minute average) Stack test (min 30 minute average)
	Carbonyl sulfide	26,400 mg/m ³	Continuous derived measurement (60 minute average) Stack test (180 minute average) ²
	Carbon monoxide	229,000 mg/m ³	Continuous derived measurement (8 hour average) Stack test (min 30 minute average)
	Chlorine	500 mg/m ³	CEMS (60 minute average) Stack test (min 30 minute average)
	Hydrogen chloride	100 mg/m ³	Stack test (min 30 minute average)

Note 1: All units are referenced to STP dry.

Note 2: Averaging time may not be applicable to approved alternative methods.

Point source emissions to surface water

6. The licence holder must ensure that emissions from the discharge point listed in Table 4 for the corresponding parameter do not exceed the corresponding limit when monitored in accordance with Table 7, except in the case of an event in Table 5 and the corresponding management action is taken.

Table 4: Emission and discharge limits

Discharge point	Parameter	Limit	Averaging period
T1	Volumetric flow rate	190 m ³ /hour	Continuous
	pH	6 – 10	
	Total suspended solids	80 mg/L	Daily
	Total dissolved solids ¹	55,000 mg/L	Continuous
	Manganese	3.6 mg/L ²	Composited weekly sample

Note 1: Calculated from electrical conductivity @ 25°C.

Note 2: For 80% of samples collected in any 12 consecutive calendar months.

Management actions

7. The licence holder must take the specified management action in the case of an event in Table 5.

Table 5: Management actions

Discharge point reference	Event/action reference	Event	Management action
A1 & A5	EA1	Start-up	The licence holder must take all practical measures to minimise emissions.
A1	EA2	Any time the CEMS is indicating that chlorine emissions do not meet the relevant limit in Table 3.	The licence holder must cease feed within 10 minutes of the start of any event unless chlorine emissions have already returned to levels that meet the relevant limit in Table 3.
	EA3	Failure of both continuous chlorine detectors in the chlorinator unit process scrubber vent	The licence holder must immediately commence manual monitoring of chlorine concentrations in the chlorinator unit process scrubber vent using Dräger tubes or equivalent at intervals of 5 minutes or less. If neither of the continuous chlorine detectors can be repaired or replaced within 4 hours of the start of any event, the licence

			holder must shut down the chlorinator unit.
T1	EA4	Any time the continuous monitor on the Kemerton ocean outfall pipeline measuring discharge from the clean effluent pond is indicating the concentration or flow of any parameter(s) does not meet the relevant limit in Table 4.	The licence holder must cease discharge to the Kemerton ocean outfall within 10 minutes of the start of any event unless concentration(s) or flow have already returned to levels that meet the relevant limit in Table 4.
	EA5	Failure of the continuous monitor on the Kemerton ocean outfall pipeline measuring discharge from the clean effluent pond.	The licence holder must immediately commence manual monitoring of the parameters in Table 7 at intervals of 4 hours or less. If the continuous monitor cannot be repaired or replaced within 48 hours of the start of any event, the licence holder must cease discharge from the Kemerton ocean outfall.

8. Following the cessation of emissions/operation under condition 7 above, the licence holder shall not restart operation of the process until:
- (a) the problem that caused the exemption event has been rectified; or
 - (b) the licence holder records the actions taken to maintain compliance with the licence until the problem causing the exemption event has been rectified.

Monitoring

General

- 9. The licence holder must record production or throughput data and any other process parameters relevant to any non-continuous or CEMS monitoring undertaken.
- 10. The licence holder must ensure that all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in the relevant table.
- 11. The licence holder must ensure that all monitoring equipment used on the premises to comply with the conditions of this licence is calibrated in accordance with the manufacturer's specifications.
- 12. The licence holder must, where the requirements for calibration cannot be practicably met, or a discrepancy exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods.
- 13. The licence holder must ensure the limit of detection of analysis for all samples is:
 - (a) one order of magnitude below the relevant ANZECC guideline; or
 - (b) the lowest limit of detection (where the laboratory cannot routinely achieve a limit of detection one order of magnitude below the relevant ANZECC guideline).

Monitoring of point source emissions

- 14. The licence holder must monitor emissions:
 - (a) from each discharge point;
 - (b) at the corresponding monitoring location;
 - (c) for the corresponding parameter;

- (d) at the corresponding frequency;
 - (e) for the corresponding averaging period;
 - (f) in the corresponding unit; and
 - (g) using the corresponding method,
- as set out in Table 6 and Table 7.

Monitoring of point source emissions to air

Table 6: Monitoring of point source emissions to air

Discharge point	Monitoring point	Parameter	Units ¹	Frequency ²	Method
A1	At sampling locations in accordance with the AS 4323.1 or relevant part of the CEMS Code.	Volumetric flow rate	m ³ /hour	Continuous	CEMS
		Stack temperature	°C		
		Chlorine	mg/m ³ g/s		Annually (at least 9 months apart)
		Carbon monoxide, carbonyl sulfide, sulfur dioxide			
		Sulfur dioxide		USEPA Method 6 or 8	
		Carbonyl sulfide		USEPA Method 15 or equivalent ³	
		Carbon monoxide	USEPA Method 10 or 10B		
Chlorine, hydrochloric acid	USEPA Method 26 or 26A				

Note 1: All units are referenced to STP dry.

Note 2: Monitoring shall be undertaken to reflect normal operating conditions and any limits or conditions on inputs or production.

Note 3: DWER approved equivalent method.

15. For any parameter in Table 6 requiring continuous monitoring, the licence holder must ensure that the CEMS is regularly operated, maintained and calibrated in accordance with the CEMS Code.

Monitoring of point source emissions to surface water

16. The licence holder must undertake the monitoring in Table 7 according to the specifications in that table.

Table 7: Monitoring of point source emissions to surface water

Discharge point	Monitoring point reference	Parameter	Units	Frequency	Method
T1	W1	Volumetric flow rate	m ³ /hour	Continuous	AS/NZS 5667.10; AS/NZS 5667.1
		pH	pH unit		
		Total dissolved solids ¹	mg/L		
		Temperature	°C		
		Turbidity	NTU		
		Total suspended solids ²	mg/L	Daily	
		Manganese ²	mg/L	Weekly (at least 5 days apart)	
Aluminium, bicarbonate, cadmium,	mg/L	Quarterly (at			

Discharge point	Monitoring point reference	Parameter	Units	Frequency	Method
		calcium, chromium, copper, iron, lead, magnesium, mercury, molybdenum, nickel, nitrate, selenium, sodium, sulfate, titanium, total suspended solids, vanadium, zinc		least 45 days apart)	

Note 1: Calculated from electrical conductivity @ 25°C.

Note 2: In-house non-NATA accredited analysis permitted.

Ambient environmental quality monitoring

17. The licence holder must undertake the monitoring in Table 8, Table 9, Table 10 and Table 11 according to the specifications in those tables.

Table 8: Monitoring of ambient surface water quality

Monitoring point reference	Parameter	Units	Frequency	Water column depth	Method
D1 – D4 T2 – T4 ¹	Temperature ³	°C	Annually (at least 9 months apart)	0.5 m below water surface and 0.5 m above sediment surface	AS/NZS 5667.9; AS/NZS 5667.1
	pH ³	pH unit			
	Salinity ³	mg/L		0 – 0.5 m above sediment surface	
	Dissolved oxygen ³				
K20N, K20E, K20S, K20W, K1000N & K1000S ²	Radium-226	Bq/L		Depth integrated	

Note 1: 4 initial dilution points in the mixing zone and 4 plume tracking sites which follow the direction of the water movement established through monitoring of the position of a surface drogoue.

Note 2: Immediate vicinity of diffuser, 20 m North, South, East and West of diffuser, and reference points 1 000 m North and South of diffuser.

Note 3: In-field non-NATA accredited analysis permitted.

Table 9: Monitoring of ambient sediment quality

Monitoring point reference	Parameter	Units	Frequency	Method
K20N, K20E, K20S, K20W, K1000N & K1000S ¹	Grain size distribution	µm	Triennially (at least 2 years and 9 months apart, commencing 2006)	AS/NZS 5667.12
	Carbonate content, organic matter content	% loss on ignition		
	Aluminium, cadmium, chromium, copper, lead, manganese, magnesium, mercury, selenium, titanium, vanadium, zinc	mg/kg		
	Radionuclides (226 _{RA})	Bq/kg		

Note 1: Immediate vicinity of diffuser, 20 m North, South, East and West of diffuser, and reference points 1 000 m North and South of diffuser.

Table 10: Monitoring of ambient groundwater quality

Monitoring point reference	Parameter	Units	Frequency	Method
GQ1 – GQ2 GQ4-GQ9 GQ13-GQ15 GQ17 GQ19-21 ¹	Standing water level ²	mAHD	Quarterly (at least 45 days apart)	AS/NZS 5667.11; AS/NZS 5667.1
	pH ²	pH unit		
	Electrical conductivity ²	µS/cm		
	Bicarbonate, cadmium, calcium, chloride, chromium, copper, iron, lead, magnesium,	mg/L	Annually (at least 9 months apart)	

Monitoring point reference	Parameter	Units	Frequency	Method
	manganese, mercury, nickel, nitrate, selenium, sodium, sulfate, vanadium, zinc			

Note 1: Recovery bores KM4 & KM8, monitoring bores KM1, KM2s, KM2i, KM2d, KM5-KM7, KM9, KM13-KM15, KM17, KM19-KM21.

Note 2: In-field non-NATA accredited analysis permitted.

Table 11: Monitoring of ambient biomonitor health (whole effluent toxicity (WET) testing)

WET test	Dilution series ¹	Dilution water	Analytes for wastewater	Frequency
72 hour microalgae (<i>Nitzschia closterium</i>) growth inhibition test	100%	Marine water from Kemerton marine monitoring program's reference site	Aluminium, ammonium, bicarbonate, cadmium, calcium, carbonate, chloride, chromium, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, nitrate, radionuclides (Radium-226 and Radium-228), selenium, sodium, sulfate, titanium, total phosphorus, total suspended solids, vanadium, zinc	Triennially (at least 2 years and 9 months apart, commencing 2015)
72 hour sea urchin (<i>Helicodaris tuberculata</i>) development test	40%			
48 hour bivalve (<i>Mytilus edulis</i>) larval abnormality test	13.5%			
72 hour macroalgae (<i>Ecklonia radiata</i>) cell germination assay	4.5%			
96 hour fish imbalance test (Yellowtail Kingfish, <i>Seriola lalandi</i> or suitable alternative)	1.5%			
	0.5% wastewater			

Note 1: Dilutions salt-adjusted to achieve marine salinity.

Waste acceptance

18. The licence holder must only accept waste onto the premises of a type that:
- does not exceed the limit; and
 - meets the relevant specification, as set out in Table 12.

Table 12: Waste acceptance criteria

Waste	Quantity limit	Specification
Leachate from the Cristal TSR Cell at the Banksia Road Landfill Site	500 000 m ³ per annual period	Transferred from the Cristal TSR Cell Leachate Holding Tanks at the Banksia Road Landfill Site via road tankers and discharged into the Dirty Effluent Pond or waste water tank D561.
Treated wastewater from the Kemerton Silicon Smelter	100 000 m ³ per annual period	Transferred from the Kemerton Silicon Smelter reverse osmosis plant and settling pond to the Clean Effluent Pond via an enclosed pipeline.
Treated solid residue slurry from the Australind Finishing Plant	5 000 m ³ per annual period	Transferred from the Australind Finishing Plant via road tankers and discharged into filter feed tank D562.

Information

Records and reporting

Records

19. The licence holder must maintain accurate and auditable books including the following records, information, reports, and data required by this licence:

- (a) the calculation of fees payable in respect of this licence;
 - (b) the works conducted in accordance with condition 29 of this licence;
 - (c) any maintenance of infrastructure that is performed in the course of complying with condition 2 of this licence;
 - (d) monitoring programmes undertaken in accordance with conditions 14, 15, 16 and 17 of this licence; and
 - (e) complaints received under condition 21 of this licence.
20. The books specified under condition 19 must:
- (a) be legible;
 - (b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;
 - (c) be retained by the licence holder for the duration of the licence; and
 - (d) be available to be produced to an inspector or the CEO as required.

Complaints management

21. The licence holder must record the following information in relation to complaints received by the licence holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:
- (a) the name and contact details of the complainant, (if provided);
 - (b) the time and date of the complaint;
 - (c) the complete details of the complaint and any other concerns or other issues raised; and
 - (d) the complete details and dates of any action taken by the licence holder to investigate or respond to any complaint.

Annual Audit Compliance Report

22. The licence holder must:
- (a) undertake an audit of their compliance with the conditions of this licence during the preceding annual period; and
 - (b) prepare and submit to the CEO by 31 March in each year an Annual Audit Compliance Report in the approved form.

Annual Environmental Report

23. The licence holder must submit to the CEO by 31 March in each year, an Annual Environmental Report for the previous annual period for the conditions listed in Table 13, and which provides information in accordance with the corresponding requirement set out Table 13.

Table 13: Annual Environmental Report requirements

Condition or table	Requirement	Format or form
-	Summary of any failure or malfunction of any pollution control equipment or any incidents that have occurred during the annual period and any action taken	None specified
Condition 5, Table 5	Summary of any exemption claimed where specified	

	management action is taken following corresponding event	
Condition 15	CEMS performance	RATA1 (as in Schedule 2: Reporting and notification forms)
Condition 21	Complaints summary	None specified
Condition 22	Compliance	Annual Audit Compliance Report (AACR)
Table 6	Monitoring of point source emissions to air	AR1 (as in Schedule 2: Reporting and notification forms and as condition 26)
Table 7	Monitoring of point source emissions to surface water	As condition 26
Table 8	Monitoring of ambient surface water quality	None specified
Table 9	Monitoring of ambient sediment quality	
Table 10	Monitoring of ambient groundwater quality	
Table 11	Monitoring of ambient biomonitor health' Provide a report every three years outlining the details of recently collected biomonitor health data with comparisons to biomonitoring health data taken from previous years, outlining and discussing any trends.	

24. The licence holder must ensure that the Annual Environmental Report also contains:
- (a) any relevant process, production or operational data recorded under condition 16; and
 - (b) an assessment of the information contained within the report against previous monitoring results and licence limits.
25. The licence holder must submit the information in Table 14 to the CEO according to the specifications in that table.

Table 14: Non-annual reporting requirements

Condition or table	Requirement	Reporting period	Reporting date (after end of the reporting period)	Format or form
-	Copies of original monitoring reports submitted to the licence holder by third parties.	Not applicable.	Within 14 days of the CEOs request.	As received by the licence holder from third parties.

26. The licence holder must ensure that results from CEMS are made available on request as tabulated data and time series graphs including:
- (a) times and dates;
 - (b) unavailability of abatement;
 - (c) target or limit exceedances; and
 - (d) an assessment of the information contained within the report against previous submissions and Licence limits and/or targets.

Notification

27. The licence holder must ensure that the parameters listed in Table 15 are notified to the CEO in accordance with the notification requirements of the table.

Table 15: Notification requirements

Condition or table	Parameter	Notification requirement ¹	Format or form
Condition 3	Breach of any limit specified in the licence	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable	None specified
Condition 6	Limit exceedance where management action taken	As soon as practicable but no later than 5pm of the next usual working day.	
Condition 11	Calibration report	As soon as practicable.	

Note 1: Notification requirements in the licence shall not negate the requirement to comply with s72 of the Act.

Works

29. The licence holder must:

- (a) construct and install the equipment;
- (b) in accordance with the corresponding design and installation requirements; and
- (c) at the corresponding infrastructure location,

as set out in Table 16.

Table 16: Design and installation requirements

Item	Infrastructure	Design and construction/installation requirements	Infrastructure location
1.	Diffuser with three ports	<ol style="list-style-type: none"> a) Three diffuser ports must be spaced 4 meters apart. b) Each diffuser port must be oriented due-west with an inclination of 60° above the horizontal plane. c) Diffuser internal port diameter must be no greater than 0.9 m. 	As outlined in Schedule 1, Figure 3 and labelled as 'Diffuser'
2.	Filter press plant, comprising: Filter press shed 2 x filter press units Concrete filter cake bunker Wash water tank, filtrate return tank, pipes and pumps Front-end loader pad Front-end loader pad sump Concrete culvert Culvert sump	<ol style="list-style-type: none"> a) Filter press shed floor must be constructed of concrete. b) Filter presses must be located such that the filter cake drops straight into the concrete bunker after each operating cycle. c) Front-end loader pad must be constructed of concrete and bunded for secondary containment and sloped to a perimeter collection sump to collect run-off. d) The filter press plant supporting infrastructure (wash water tank, filtrate tank, pipes and pumps) must be installed within an area surrounded by a concrete bund for secondary containment. Sumps must be: <ol style="list-style-type: none"> e) lined to maintain a permeability of less than 1×10^{-9} m/s or equivalent; f) fitted with pumps to pump back to feed tank; and g) fitted with level indicators and alarms in event of overtopping. h) Pipelines transferring waste must be within a secondary containment culvert which directs any spills to the culvert sump. 	As outlined in Schedule 1, Figure 5 and labelled as 'Proposed filter press plant'

Compliance reporting

30. The licence holder must within 30 calendar days of each item of equipment required

by condition 29 being installed:

- (a) undertake an audit of their compliance with the requirements of condition 29 ; and
- (b) prepare and submit to the CEO an Environmental Compliance Report on that compliance.

31. The Environmental Compliance Report required by condition 30, must include:

- (a) photographic evidence as a minimum that items of infrastructure or component(s) thereof, as specified as item 1 in condition 29, have been constructed by the relevant requirements specified as item 1 in condition 29, and
- (b) certification by a suitably qualified professional engineer that the items of infrastructure or component(s) thereof, as specified as item 2 in condition 29, have been constructed in accordance with the relevant requirements specified as item 2 in condition 29;
- (c) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified as item 2 in condition 29; and
- (d) be signed by a person authorised to represent the licence holder and contains the printed name and position of that person.

Compliance monitoring

32. The licence holder must monitor the ambient water in accordance with Table 17 when operating the infrastructure/equipment outlined as item 1 in condition 29 within:

- (a) 6 months of starting phase 1 operations, where phase 1 is described as existing operating conditions with discharge volumes under 130m³/hour and salinity less than 25 g/L, and
- (b) 6 to 18 months of starting phase 2 operations, where phase 2 is described as modified operating conditions with discharge volumes greater than 150 m³/hour and salinity greater than 50 g/L.

Table 17: Monitoring to ambient water

Monitoring location	Parameter	Unit	Frequency	Duration
Onshore W1 As outlined in Figure 2	Velocity	m ³ /hour	Continuous	3 weeks
	pH	pH unit		
	Salinity (TDS)	mg/L		
	Temperature	°C		
Offshore (K20N, K20S, K20E, K20W) – Surface Offshore (K20N, K20S, K20E, K20W) – Bottom Offshore (K1000N, K1000S) – Surface Offshore (K1000N, K1000S) - Bottom As outlined in Figure 3	pH	pH units	Weekly	3 weeks
	Salinity (TDS)	mg/L		
	Temperature	°C		
	Dissolved oxygen	mg/L		

Note: in field non NATA accredited analysis is permitted.

- 33.** The licence holder must submit to the CEO separate phase 1 and phase 2 reports of the ambient water monitoring outlined in Table 17 within:
- (a) 60 calendar days of the last sample taken within phase 1
 - (b) 60 calendar days of the last sample taken within phase 2.
- 34.** The licence holder must ensure the reports required by condition 33 includes the following:
- (a) results of monitoring undertaken in Table 17, including an appraisal of the results and;
 - (b) a review of the results in comparison to the Tronox Outfall Upgrade – Conceptual Design and Dispersion Modelling Report (BMT 2022),
 - (c) where dispersal of salinity (TDS) has not been met, what measures will the licence holder take to meet them, and
 - (d) results of Table 11 Monitoring of ambient biomonitor health (whole effluent toxicity (WET) testing undertaken in February 2024.

Definitions

In this licence, the terms in Table 18 have the meanings defined.

Table 18: Definitions

Term	Definition
ACN	Australian Company Number
Act	means the <i>Environmental Protection Act 1986</i>
AHD	means the Australian height datum
ANZECC	means the Australian and New Zealand Environment Conservation Council (ANZECC) which was a Ministerial Council operating between 1991 and 2001 and which provided a forum for member governments to develop coordinated policies about national and international environment and conservation issues; ANZECC issued a series of Guidelines such as the ANZECC Guidelines for Fresh and Marine Water Quality 2000
AS 4323.1	means the Australian Standard AS4323.1 <i>Stationary Source Emissions Method 1: Selection of sampling positions</i>
AS/NZS 5667.1	means the Australian Standard AS/NZS 5667.1 <i>Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples</i>
AS/NZS 5667.9	means the Australian Standard AS/NZS 5667.9 <i>Water Quality – Sampling – Guidance on sampling from marine waters</i>
AS/NZS 5667.10	means the Australian Standard AS/NZS 5667.10 <i>Water Quality – Sampling – Guidance on sampling of waste waters</i>
AS/NZS 5667.11	means the Australian Standard AS/NZS 5667.11 <i>Water Quality – Sampling – Guidance on sampling of groundwaters</i>
AS/NZS 5667.12	means the Australian Standard AS/NZS 5667.12 <i>Water Quality – Sampling – Guidance on sampling of bottom sediments</i>
Annual Audit Compliance Report (AACR)	means a report submitted in a format approved by the CEO (relevant guidelines and templates may be available on the Department's website).
annual period	a 12 month period commencing from 1 January until 31 December of the same year.
averaging period	means the time over which a limit is measured or a monitoring result is obtained
biomonitoring	means the measurement of the body burden of toxic chemical compounds, elements, or their metabolites, in biological substances.
books	has the same meaning given to that term under the EP Act.
Bq/kg and Bq/L	means Becquerel per kilogram and Becquerel per litre, respectively.
CEMS	means continuous emissions monitoring system.
CEMS Code	means the current version of the Continuous Emission Monitoring System (CEMS) Code for Stationary Source Air Emissions, Department of Environment & Conservation, Government of Western Australia

Term	Definition
CEO	means Chief Executive Officer of the Department. “submit to / notify the CEO” (or similar), means either: Director General Department administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 Joondalup DC WA 6919 or: info@dwer.wa.gov.au
derived measurement	means the derived measurement of stack gas concentrations based on process measurements upstream of the emission point. The values shall be calculated in accordance with the SCM Chemicals Ltd document entitled <i>Chloride Technical Memo No. 227: Methane Tracer Gas Flow Measurement</i> and dated 24 May 1994
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
discharge	has the same meaning given to that term under the EP Act.
emission	has the same meaning given to that term under the EP Act.
freeboard	means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
EP Regulations	<i>Environmental Protection Regulations 1987</i> (WA)
licence	refers to this document, which evidences the grant of a licence by the CEO under section 57 of the EP Act, subject to the specified conditions contained within.
licence holder	refers to the occupier of the premises, being the person specified on the front of the licence as the person to whom this licence has been granted.
mixing zone	means the area or volume within the receiving water where the initial dilution of the discharge plume occurs as rapid mixing between waste and ambient water and where the water quality fails to meet the relevant ANZECC guideline.
NATA	means the National Association of Testing Authorities, Australia
NATA accredited	means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis.
premises	means the premises to which this licence applies, as specified at the front of this licence and as shown on the premises map Figure 1 in Schedule 1 to this licence.
prescribed premises	has the same meaning given to that term under the EP Act.
quarterly	means the 4 inclusive periods from 1 January to 31 March; 1 April to 30 June, 1 July to 30 September, and 1 October to 31 December in the same year.
shut-down	means the period when plant or equipment is brought from normal operating conditions to inactivity.
spot sample	means a discrete sample representative at the time and place at which the sample is taken.

Term	Definition
stack test	means a discrete set of samples taken over a representative period at normal operating conditions.
start-up	means the period when plant or equipment is brought from inactivity to normal operating conditions.
STP dry	means standard temperature and pressure (0°Celsius and 101.325 kilopascals respectively), dry
triennial	means recurring every 3 years
USEPA	means United States (of America) Environmental Protection Agency
USEPA Method 6	means the USEPA Method 6 <i>Determination of Sulfur Dioxide Emissions from Stationary Sources</i>
USEPA Method 8	means the USEPA Method 8 <i>Determination of Sulfuric Acid and Sulfur Dioxide Emissions from Stationary Sources</i>
USEPA Method 10	means the USEPA Method 10 <i>Determination of Carbon Monoxide Emissions from Stationary Sources (Instrument Analyser Procedure)</i>
USEPA Method 10B	means the USEPA Method 10B <i>Determination of Carbon Monoxide Emissions from Stationary Sources</i>
USEPA Method 15	means the USEPA Method 15 <i>Determination of Hydrogen Sulfide, Carbonyl Sulfide and Carbon Disulfide Emissions from Stationary Sources</i>
USEPA Method 26	means the USEPA Method 26 <i>Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources (Non-Isokinetic Method)</i>
USEPA Method 26A	means the USEPA Method 26A <i>Determination of Hydrogen Halide and Halogen Emissions from Stationary Sources (Isokinetic Method)</i>
µS/cm	means microsiemens per centimetre
waste	has the same meaning given to that term under the EP Act.

END OF CONDITIONS

Schedule 1: Maps

Premises map

The boundary of the prescribed premises is shown in the map below (Figure 1).



Figure 1: Map of the boundary of the prescribed premises

The location of the containment infrastructure described in Table 1 and emission points defined in Table 2 are shown below.



Figure 2: Emission points, monitoring points and containment infrastructure

The location of the emission point defined in Table 2 and the monitoring points defined in Table 8, Table 9 and Table 11 are shown below.



Figure 3: Emission points and monitoring points

The locations of the monitoring points defined in Table 10 are shown below.

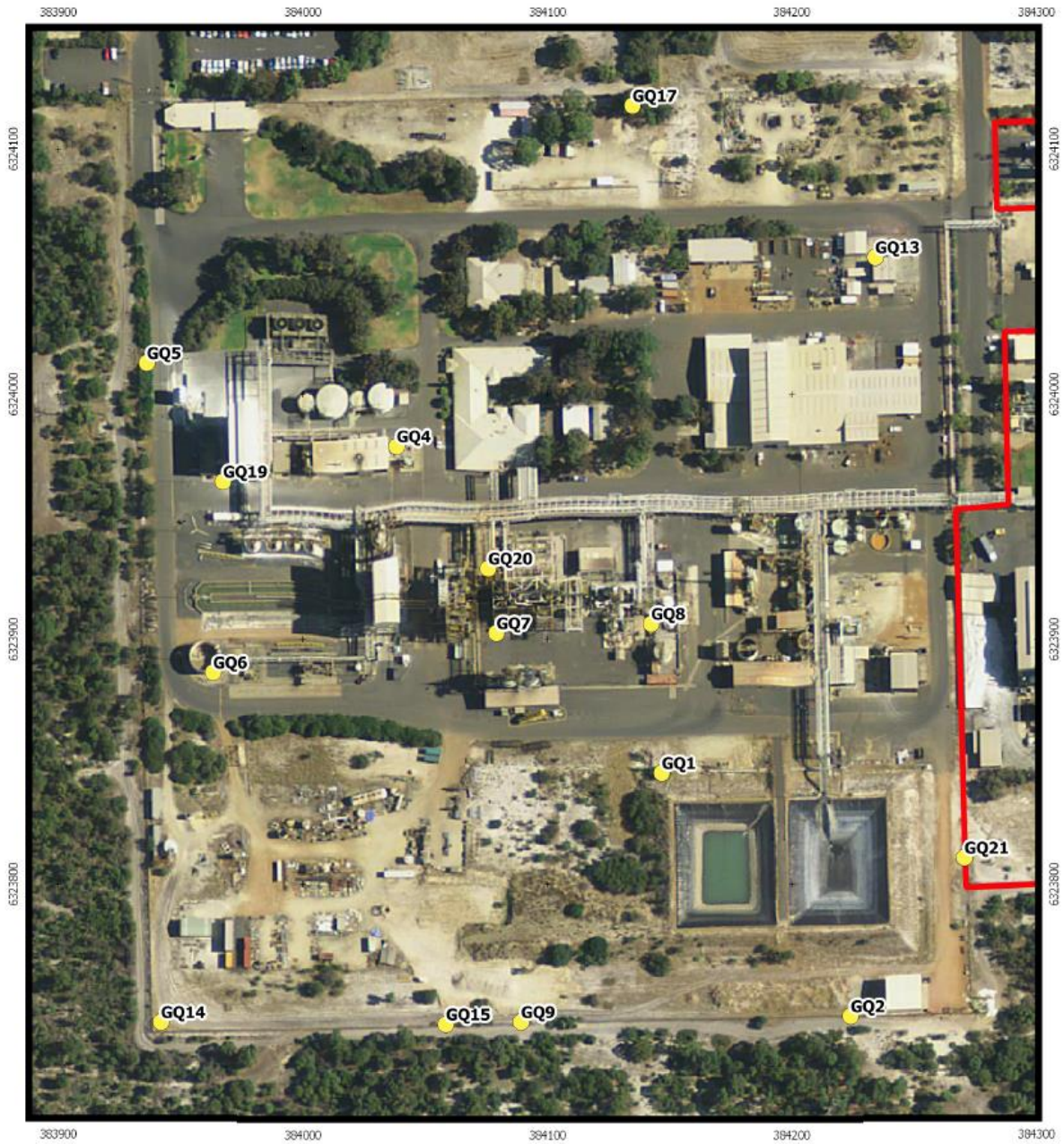


Figure 4: Monitoring point locations

Location of the proposed filter press plant defined in condition 29 is shown below.



Figure 5: Proposed filter press plant location

Schedule 2: Reporting and notification forms

Form AR1: Monitoring of point source emissions to air

Licence: L8870/2014/1 Licence holder: Tronox Pigment Bunbury Ltd
 Form: AR1 Period:
 Name: Monitoring of point source emissions to air

Emission point	Parameter	Limit	Result ¹	Result ¹	Averaging period	Method	Sample date and times
A1	Sulfur dioxide	11 400	mg/m ³	g/s		USEPA Method 6 or 8	
	Carbonyl sulfide	26 400	mg/m ³	g/s		USEPA Method 15 ²	
	Carbon monoxide	229 000	mg/m ³	g/s		USEPA Method 10 or 10B	
	Chlorine	500	mg/m ³	g/s		USEPA Method 26 or 26A	
	Hydrochloric acid	100	mg/m ³	g/s		USEPA Method 26 or 26A	
	Sulfur dioxide	11 400	mg/m ³	g/s		USEPA Method 6 or 8	
	Carbonyl sulfide	26 400	mg/m ³	g/s		USEPA Method 15 ²	

Note 1: All units are referenced to STP dry

Note 2: Or equivalent DWER approved method

Signed on behalf of Tronox Pigment Bunbury Ltd:

Date:

Form AR2: RATA

Licence: L8870/2014/1 Licence holder: Tronox Pigment Bunbury Ltd
 Form: RATA1 Period:
 Name: Monitoring of CEMS Performance

Emission point	Parameter	Reference Method	Run	Sample date & times	Reference Result	CEMS Result	Unit		
A1	Volumetric flow rate Chlorine	USEPA Method 2 (Flow)	1				m ³ /s ppm (v) mg/m ³		
			2						
			3						
			4						
			5						
			6						
		USEPA Method 2 (Temperature)	7						
			USEPA Method 26 or 26A	8					
				9					
				10					
				11					
				12					
Relative Accuracy							%		
Bias							%		

Signed on behalf of Tronox Pigment Bunbury Ltd: Date: