IXOM

Department of Planning and Environment

2016 Annual Report

Prepared by: Steven Barclay

Date: 21 November 2017

Revision: 1.0

Table of Contents

1 Title Block

Table 1: Annual Review title block

Name of operation	Ixom Botany ChlorAlkali Plant
Name of operator	Ixom Operations Pty Ltd
Development consent / project approval #	DA35/98
Name of holder of development consent / project approval	Ixom Operations Pty Ltd
Annual Review Start Date	1 December 2015
Annual Review End Date	30 November 2016
I, Steven Barclay, certify that this audit report is a true and accurate record of the compliance status of Ixom Botany ChlorAlkali Plant for the period 1 December 2015 – 30 November 2016 and that I am authorised to make this statement on behalf of Ixom Operations Pty Ltd. *Note.* *a) The Annual Review is an 'environmental audit' for the purposes of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000.* *b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement—maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents—maximum penalty 2 years imprisonment or $22,000, or both).*	
Name of Authorising reporting officer	Steven Barclay
Title of Authorised Reporting Officer	Botany Site Manager
Signature of Authorised Reporting Officer	
Date	29/11/18

2 Statement of Compliance

The following tables detail the compliance status of the Ixom Botany ChlorAlkali plant against relevant approvals and licences.

Table 2: Statement of Compliance

Were all conditions of the approvals complied with	
DA 35/98	Yes
EPL 20547	Yes
DG 35/035000 (held by BIP)	Yes

Table 3: Non-compliances

Relevant Approval	Condition Number	Condition Description (summary)	Compliance status	Comment	Where addressed in Annual Review
DA 35/98	-	-	Fully Compliant	-	-
EPL 20547	-	-	Fully Compliant	-	-
DG 35/035000	-	-	Fully Compliant	-	-

Note: Non-compliances identified as part of the Independent Compliance Audit undertaken in December 2016 will be reported and addressed in the December 2016 – November 2017 Annual Review.

Compliance status key for Table 3

Risk level	Colour code	Description
High	Non-compliant	Non-compliance with potential for significant environmental consequences, regardless of the likelihood of occurrence
Medium	Non-compliant	Non-compliance with: • potential for serious environmental consequences, but is unlikely to occur; or • potential for moderate environmental consequences, but is likely to occur
Low	Non-compliant	Non-compliance with: • potential for moderate environmental consequences, but is unlikely to occur; or • potential for low environmental consequences, but is likely to occur
Administrative non-compliance	Non-compliant	Only to be applied where the non-compliance does not result in any risk of environmental harm (e.g. submitting a report to government later than required under approval conditions)

3 Introduction

3.1 Site Overview

The site is located on Beauchamp Road, Matraville, within the Botany Industrial Park (BIP). Site details are summarised in Table 4.

Table 4: Site Details

Address	16-20 Beauchamp Road, Matraville, NSW
Industrial Complex	Botany Industrial Park (BIP)
Local Government Authority	City of Sydney
Site Area	BIP – 70 hectares Site – 23 hectares
Locality Map	Attachment A
Site Plan	Attachment A
Current Use	Botany ChlorAlkali Plant
Lot No	Part of Lot 104 DP 1192400
Site Owner	Orica Limited owns approximately 40% of land at the BIP, including the area specific to this EMP

The facility manufactures chlorine and caustic soda from the electrolysis of salt. Hydrogen is produced as a by-product. The four main products produced are sodium hypochlorite (referred to as 'Hypo'), hydrochloric acid, caustic soda and ferric chloride.

The chlorine produced on site is used in the manufacture of hydrochloric acid, hypo and ferric chloride, with these downstream processes being collectively referred to as product plants. All chlorine produced at Ixom Botany ChlorAlkali facility is consumed in the product plants.

The plant can produce 31,200 tonnes per annum (TPA) following the 19.6 kiloamp(KA) per annum uprate, assuming 95% uptime. All chlorine is reacted to produce the following product range:

- HCl (~35,000 TPA)
- Hypo (~55,000 kLA)
- Ferric chloride (~21,200 TPA)
- Sodium hydroxide (Caustic ~36,000 TPA as 50%) (co product of chlorine manufacturing process).

3.2 Key Contacts for Environmental Management

Table 5: Environmental Contacts for Ixom Botany ChlorAlkali Plant

Name	Position	Contact Details
Steven Barclay	Ixom Site Manager	02 3952 2118 0447 216 265 steven.barclay@ixom.com
David Oram	Ixom Botany Compliance Specialist	02 9352 2123 0409 339 905 david.oram@ixom.com
Ben Lim	BIP Environmental Engineer	02 9381 8143 ben.lim@orica.com

4 Approvals

The following approvals are currently held or operated under by the Ixom Botany ChlorAlkali Plant:

Table 6: Current Approvals and Licences

Approval No.	Date last varied	Details of any changes made during reporting period
DA 35/98	10-09-2012	No change
EPL 20547	28-09-2015	No change
DG 35/03500 (held by Botany Industrial Park)	15-05-2014	No changes relevant to Ixom Botany ChlorAlkali Plant
MHF 10358-01	11-02-2014	No change

5 Operations Summary

5.1 Current Reporting Period

The period covered by this report saw continuation of steady operation with a slight increase in output compared to the previous year. The plant achieved an uptime rate of approximately 93% which indicates consistent operation throughout the year.

Truck movements (figures reported below include both inwards and outwards movements – ie one truck entering the facility to load then exiting is counted as two truck movements) fell from 2015 after a new carrier contract was implemented whereby more volume was moved per load due to the increased use of B-doubles. This contract remains in place until 2020, so similar movements would be predicted for the coming year. Table 7 and Figure 1 show a summary of key metrics for the facility over this reporting period compared to previous years.

Table 7: Production Metrics Summary

Reporting Requirement	Limit	Previous reporting period (actual)	This reporting period (actual)	Next reporting period (forecast)
Traffic movements into and out of site	N/A	26,214	22,500	23,000
Hours spent by loaded chlorine road tankers on site	N/A	0	0	0
Production (Tonnes of Cl2)	N/A	27,850	27,288	28,000

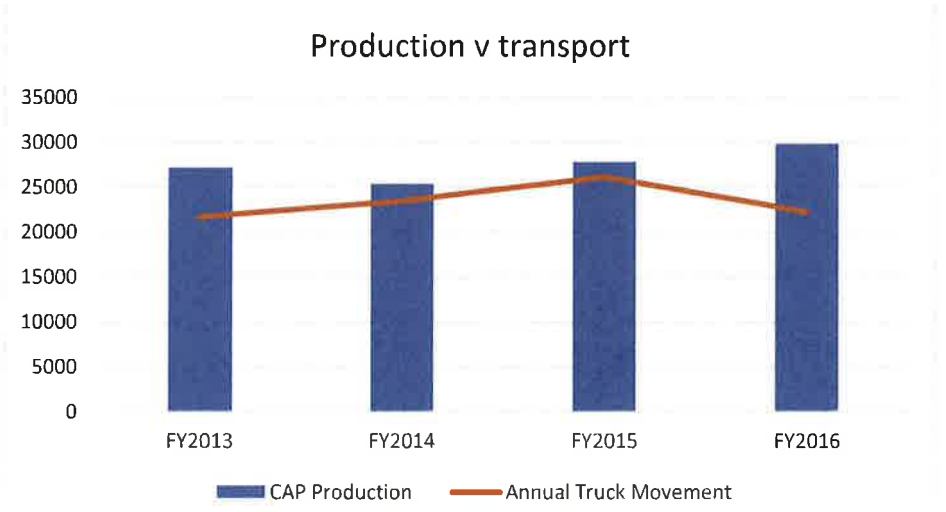


Figure 1: Truck Movements vs Production

Note: Financial year (FY) data provided in Figure 1 is for the October to September period each year (ie – FY2016 shows data from October 2015 to September 2016)

5.2 Next Reporting Period

Continued steady operation is forecast for the next reporting period. There are no upgrades or expansions planned for the Ixom Botany ChlorAlkali Plant in the 2016-17 reporting period.

6 Actions Required from Previous Annual Review

Table 8 details actions which have been undertaken during the reporting period, in response to feedback on the previous Annual Review.

Table 8: Actions required from previous Annual Review

Action required from previous Annual Review	Requested by	Action taken by the Operator	Where discussed in Annual Review
Undertake Independent Compliance Audit, including reference to the EIS	DP&E	Compliance audit scheduled for December 2016	Section 10 – Independent Audit and Appendix B
Include more comprehensive analysis of activity in Annual Review. Particularly in regards to: - Traffic Movements - Air Quality - Noise - Complaints - Status of recommendation of the 2013 IEA - Measures to be undertaken to continually improve environmental performance	DP&E	Annual Review format updated to include required information and to align with the *Annual Review Guideline* published by Dept. Planning in October 2015	Section 5 – Operations Summary Section 7 – Environmental Performance Section 1.1.1 – Summary of Findings (from ICA) Section 7.1 – Continuous Improvement

7 Environmental Performance

7.1 Environmental Performance Dec 2015 to Nov 2016

Table 9 details the key environmental performance parameters for the Ixom Botany ChlorAlkali Plant.

Table 9: Environmental Performance

Aspect	Approval criteria / EIS prediction	Performance during the reporting period	Trend / key management implications	Implemented/proposed management actions
Noise	Day – 65 LAeq Evening – 55 LAeq Night - 50 LAeq (Limits from EPL 20547, Section L4.2)	Compliant. Noise monitoring was undertaken by Stephenson Environmental Management Australia during the reporting period. There were no exceedances of the amenity boundary limit related to activities at the ChlorAlkali plant or BIP partners.	The results are consistent with results over the last 7 years.	No action taken
Air quality	There are 3 licenced discharge points at the Ixom Botany ChlorAlkali plant: **Point 1** Hypochlorite Backing Tower. Discharge limit = 200mg/m³ Chlorine, Monitored Continuously **Point 2** Absorption Tail Tower. Discharge limit = 30mg/m³ Hydrogen Chloride. Measured quarterly **Point 3** Emergency Chlorine Vent. No discharge limit in EPL, statutory limit from Schedule 4 of the POEO act of 200mg/m³ used for reference. Monitored Continuously	Compliant. Air quality data is reported on the Ixom website each month and is included in Appendix B of this report.	Results are consistent with that of previous years. See graphs below. Monitoring results for Point 2 have been consistently below monitoring thresholds, and therefore have not been graphed.	No action taken
Water	See Section 1 of this report			
Biodiversity	The EIS identified that there was no expected impact on Biodiversity from the operation of the Ixom Botany ChlorAlkali Plant	No impact	None identified	No action taken

Heritage	The EIS identified that there was no expected impact on Aboriginal, Natural or Urban Heritage items, relics or places from the operation of the Ixom Botany ChlorAlkali Plant	No impact	None identified	No action taken
Flora and Fauna	The EIS indicated that no flora or fauna were expected to be directly affected by the operation of the Ixom Botany ChlorAlkali Plant	No impact	None identified	No action taken
Amenity	The premises and operations shall be conducted in such a manner as not to interfere with, or materially affect, the amenity of the neighbourhood by reason of noise, vibration, smell, fumes, vapour, steam, soot, ash, dust, waste water, waste products, grit, oil, or otherwise. The occupier of the premises shall not cause, permit, or allow the emission of any odorous air impurity from the development such that it can be detected outside the property boundaries by its odour. (DA 35/98 conditions 37 and 38)	Compliant. There were no instances of material harm affecting the amenity of the neighbourhood by reason of noise, vibration, smell, fumes, vapour, steam, soot, ash, dust or waste products. There were no reports of odorous material from the development detected outside the property boundaries. There were no community complaints received in the reporting period related to the Ixom Botany ChlorAlkali Plant or its operation.	None identified	No action taken

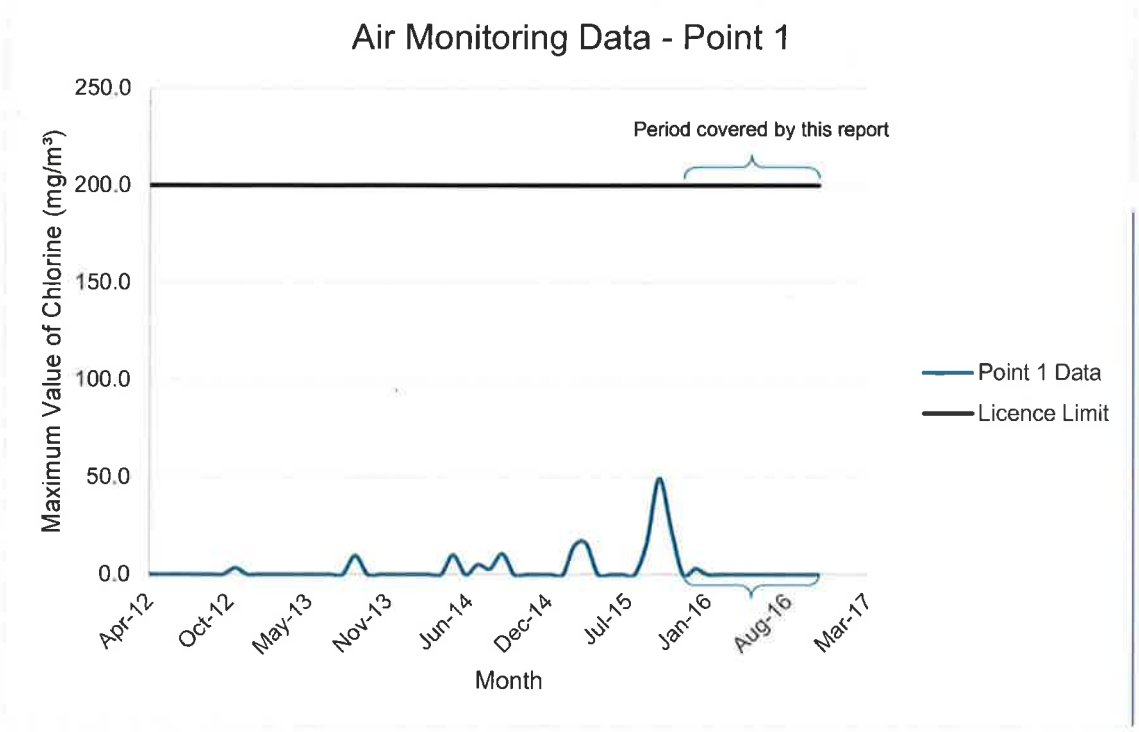


Figure 2: Point 1 Air Monitoring Data April 2012 - November 2016

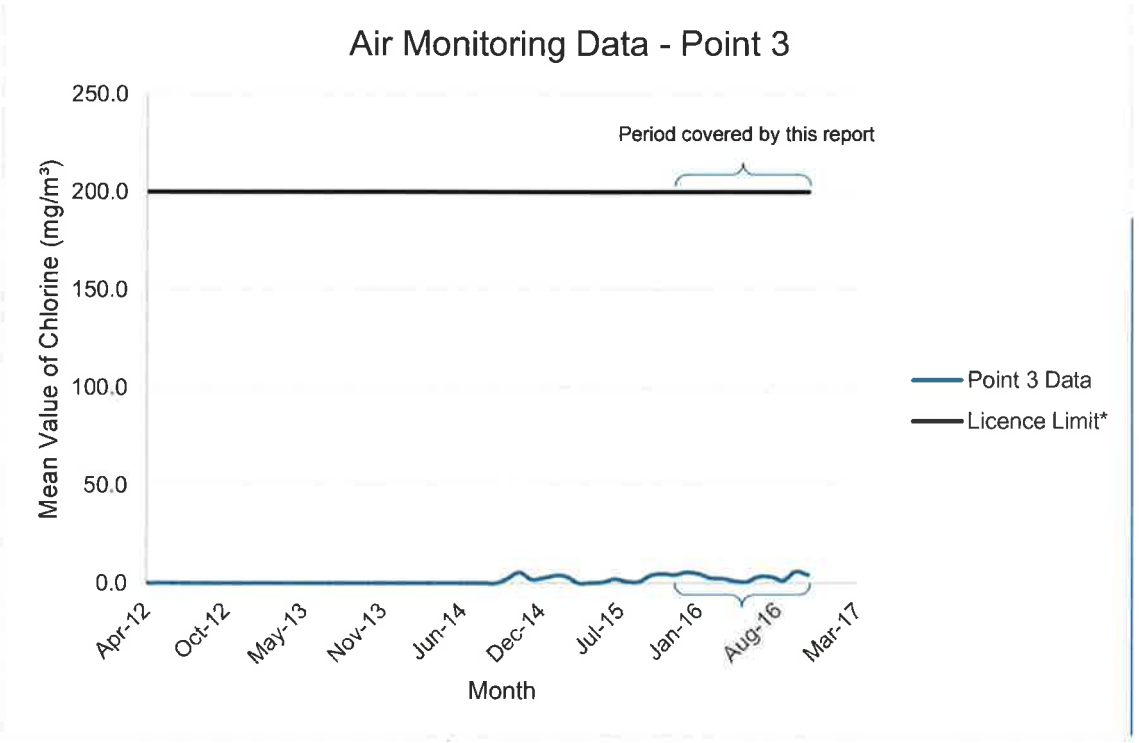


Figure 3: Point 3 Air Monitoring Data April 2012 - November 2016
*** Statute limit as per Schedule 4 of POEO (Clean Air) Regulation**

7.2 Continuous Improvement

The Ixom Botany site has implemented a continuous improvement program. Each financial year a Safety, Health, Environment and Quality (SHEQ) improvement plan is developed, listing the improvement initiatives for the year.

Table 10 lists the continuous improvement projects which were implemented during the 2015-16 reporting period.

Table 10: Continuous Improvement Projects Implemented in 2015-16

Project	Impact	Completion Date
Reduction in brine purge	Reduced plant effluent volume	On-going
Rainwater capture for reuse	Reduced plant effluent flow	Identified and scope progressed

Projects which have been included in the FY2016 SHEQ plan are detailed in Section 13 of this report.

8 Water Management

Potable water is supplied to the Ixom Botany site through the BIP Site Utilities. Water usage for the reporting period is shown in Table 11.

Table 11: Water Usage

	Previous Reporting Period (Dec 2014 – Nov 2015)	Current Reporting Period (Dec 2015 – Nov 2016)
Potable Water Consumed (kL)	68,360	58,850
Recycled Water Consumed (kL)	149,340	181,670
Water Incorporated in Product (kL)	110,420	133,930
Effluent Discharged to BIP Trade-Waste System (kL)	71,330	70,770

The Site Stormwater and Effluent System are managed by BIP Site Utilities.

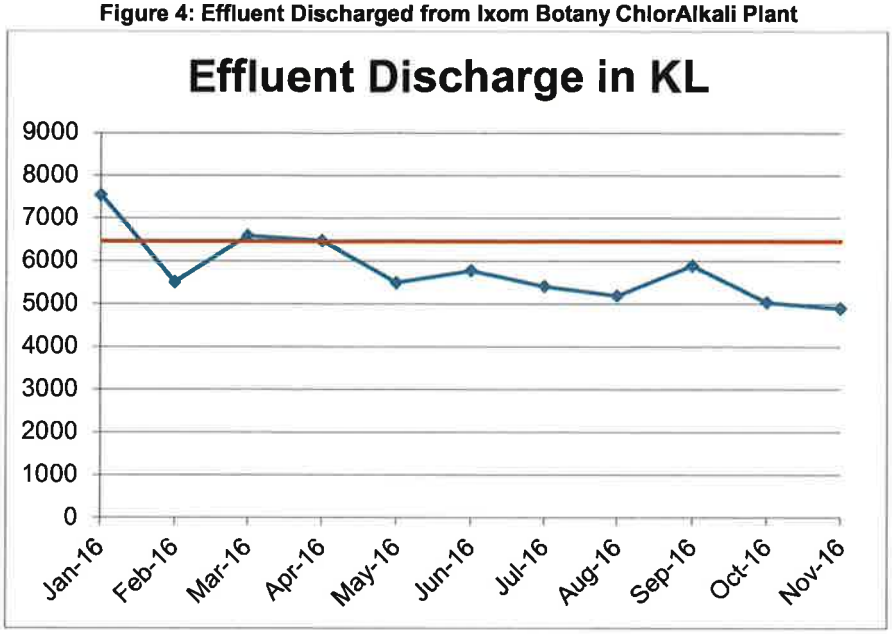
Effluent from the Ixom ChlorAlkali Plant is collected and processed in one of two automated effluent treatment tanks. These tanks each accumulate the plant effluent the dose acid or base into the tanks to control the pH to a consistent and acceptable level. When the target pH is achieved, the tanks are discharged to the EP6 effluent collection pit where flow and pH are continuously measured and recorded. The effluent then joins the other effluent streams from the other facilities at the Botany Industrial Park and flows to the Site Utilities effluent system. In this facility, the effluent is monitored and the pH adjusted where required to achieve permissible effluent standards before discharge from site.

The stormwater from the facility is collected through clearly labelled stormwater drains and flows to the Site Utilities stormwater system. The stormwater is continuously monitored for flow and pH. If the pH of the stormwater exceeds the permissible limits, the stormwater is automatically diverted to the Site Utilities effluent system where is it further treated through a pH adjustment in order to meet the required specifications prior to discharge.

Over the 2015-16 reporting period the Ixom Botany ChlorAlkali plant has implemented two key environmental improvement initiatives: reducing the Brine Purge; and rainwater capture for re-use.

Figure 4 shows the impact that these projects have had on the overall effluent volume discharged from the site.

Figure 4: Effluent Discharged from Ixom Botany ChlorAlkali Plant



9 Rehabilitation

There have been no rehabilitation activities undertaken at the Ixom Botany ChlorAlkali Plant during the reporting period.

10 Community

The Botany Industrial Park (BIP) maintains an up to date website for the public that provides the following information:

- Minutes of the BIP Community Consultative Committee (BIPCC)
- Community Hotline
- Contacts for Regulators
- Items of interest including updates where appropriate. Currently information on PFAs is being shared.
- Commitments to Safety

Ixom maintains an up to date public website that provides the following information:

- Information about the Botany Chloralkali plant
- Details of Licence conditions
- Contact details for more information on the facility
- Map of licensed discharge points
- Results of monthly air quality monitoring
- Safety Management system
- Emergency Response including PIRMP
- Actions for the public to take in the event of an emergency
- Pollution Notification Process

There were three BIPCC meetings held throughout the reporting period, on 23 March 16, 20 July 16 and 23 Nov 16. Ixom representatives attended all meetings.

There were no public complaints recorded against Ixom via the community hotline during the reporting period.

11 Independent Audits

11.1 Independent Compliance Audit

In April 2016, Ixom received a letter from the NSW Department of Planning and Environment (DP&E), requesting an Independent Compliance Audit (ICI) of the CAP at Botany which would be in lieu of the Independent Environmental Audit (IEA) triggered by the Development Consent DA 35/98 Condition 24, as well in lieu of resubmission of the Annual Report ended November 2015.

The period of the ICA was defined to be from 26 January 2013 (the end of the previous IEA period) to 29 November 2016 (the first day of the site visit of this ICA). This work was undertaken by WSP/Parsons Brinckerhoff, after approval by the DP&E on 18 October 2016. Whilst the report was not completed within the reporting period, an overview of results has been included below, for completeness.

The next IEA is due to be completed in December 2019.

11.1.1 Summary of Findings

During the Audit a total of 266 approval and licence conditions and commitments were assessed, resulting in seven non-compliances. Five of these non-compliances were listed as "administrative" (i.e. non-compliance does not impact on performance), with the remaining two non-compliances being assessed and ranked as "low" risk.

There were no "high" or "medium" rated risks identified in the audit.

The Audit also found that all but one action from the 2013 IEA had been closed out. The outstanding action related to correspondence from the City of Botany Bay council regarding the issuing of a Compliance Certificate. The matter is scheduled to be resolved during 2017.

11.2 Hazard Audit

The last Hazard Audit was conducted on 26 June 2015, and was undertaken by an independent approved third party against the requirements of HIPAP No5 – Hazard Audit Department of Planning 2011.

The next Hazard Audit is due to be completed in June 2018.

11.2.1 Summary of Findings

The Audit found that there was demonstration of a '*clear commitment to maintaining plant operations in terms of formal risk management performance*' through the '*use of several programs for risk management and continuous safety improvement initiatives*.'

There were 13 recommendations from the Audit, all prioritised as "Medium". The status of these recommendations is detailed in Table 12.

Table 12: Status of Hazard Audit Recommendations

Recommendation	Status (as at November 2016)
Ensure Electrical work carried out on site, including electrical isolations, is lined up with the required procedures and applicable standard.	Standard and procedure in place
Electrical procedures require updating	Complete - All procedures up to date
Conduct drill for bomb threat	Complete
Update SHE Committee records for CAP to show attendance to meetings	Complete minutes reflect attendees
Authorised clearance issuers listing is not up to date	Complete
Continue investigation on how to reduce the risk of damage to gantry and camlocks	Complete - camlocks angle changed
Provide signs on vessels and pipes within the ferric chloride plant as per legislative requirements	Complete
Check DG signs around plants to ensure signage up to date	DG audit scheduled
Check adequacy of hypo tank bunding at the cells cooling tower and sulphuric acid tanks	Incomplete - project initiated to correct
Replace/rectify missing flange covers in the ferric chloride plant area	Complete
Work instructions used at the CAP plant are of varying quality and standard	Work instructions progressively updated and will be moved to new DMS
Follow up mandatory PTW training	Complete
Initiate Job Cycle checks for critical maintenance procedures	Complete

12 Incidents and Non-Compliances During the Reporting Period

During the reporting period there were no incidents or non-compliances against the conditions of any relevant permit, licence or approval for the Ixom Botany ChlorAlkali Plant.

Note: Non-compliances identified as part of the Independent Compliance Audit undertaken in December 2016 will be reported and addressed in the December 2016 – November 2017 Annual Review.

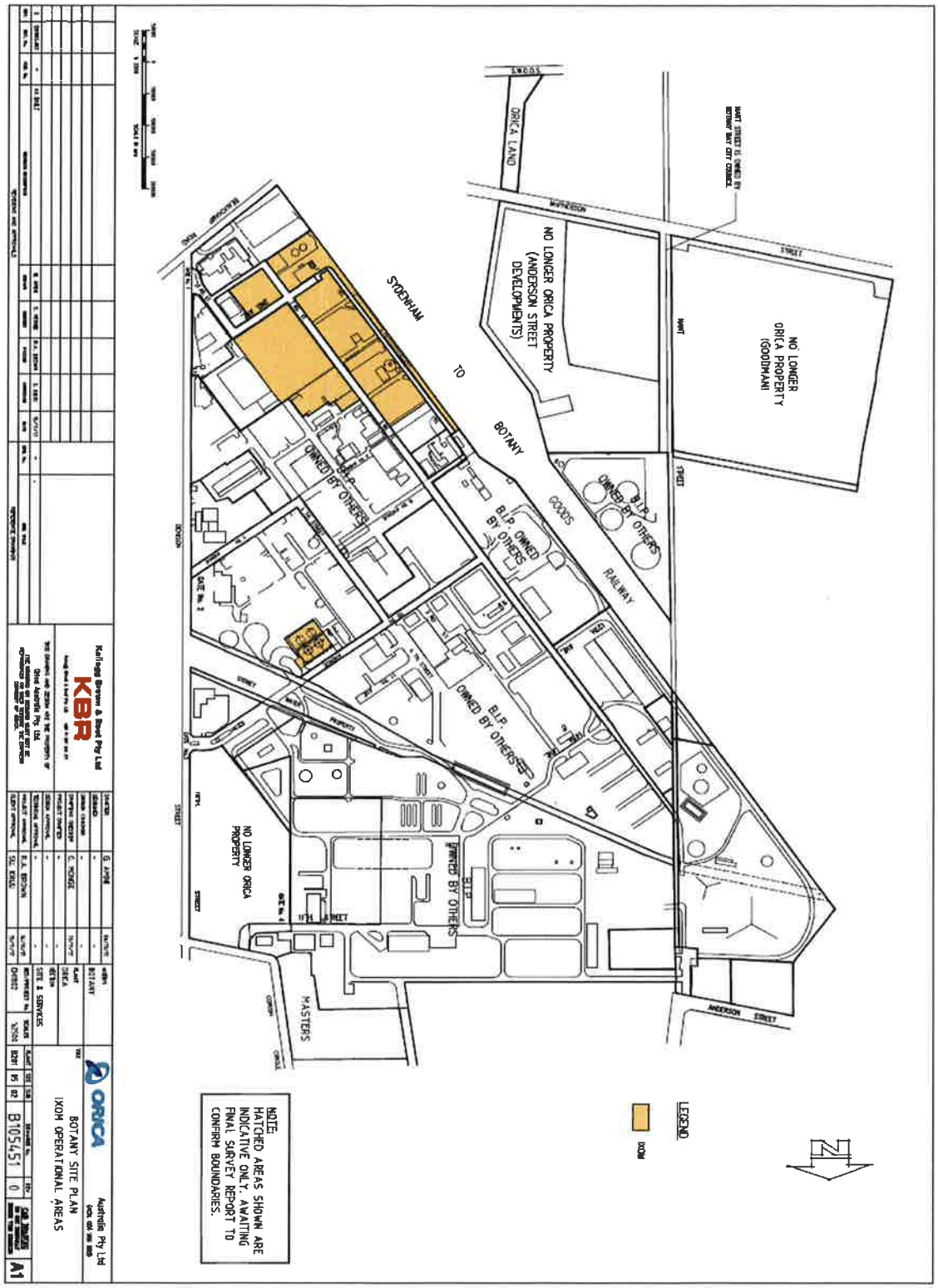
13 Activities to be completed in the next Reporting Period

The following tables detail activities that are scheduled to be completed during the December 2016 - November 2017 reporting period. Further environmental initiatives are also included in **Error! Reference source not found.** in Section 7.2 of this report.

Table 13: Activities (incl. Continuous Improvement identified in 2016 SHEQ plan) Scheduled for 2016/17

Activity Detail	Scheduled Completion Date
Update asbestos management survey	Ongoing
Using the continuous improvement process, look for ways to reduce effluent	Ongoing
Implement a stormwater monitoring program	2017/2018
Replace stormwater lines	TBD
Replace effluent transfer lines to trade-waste pit	TBD
Cooling tower blowdown reduction	Dec 2017
Control valve installed to control effluent from sulphuric acid bund to EP6 - tradewaste discharge	Dec 2017

Appendix A – Site Map



Appendix B - Air Monitoring Data

Historical data is available through the Ixom website: https://www.ixom.com/being-responsible/environmental-monitoring-data/botany

Sampling Frequency: Continuous

EPA Point: Point 1 - Stack Gas — Hypochlorite Backing Tower

Pollutant	Monitoring Period	Units	Licence Limit	Minimum Value	Maximum Value	Requirement Met	Results Obtained	Results Published
Chlorine	01/12/15 - 01/1/16	mg/m3	200	0.0	0.0	Yes	8/01/2016	9/01/2016
Chlorine	01/1/16 - 31/1/16	mg/m3	200	0.0	3.0	Yes	3/02/2016	5/02/2016
Chlorine	01/2/16 - 29/2/16	mg/m3	200	0.0	0.0	Yes	2/03/2016	3/03/2016
Chlorine	01/3/16 - 31/3/16	mg/m3	200	0.0	0.0	Yes	4/04/2016	5/04/2016
Chlorine	01/4/16 - 30/4/16	mg/m3	200	0.0	0.0	Yes	3/05/2016	4/05/2016
Chlorine	01/5/16 - 31/5/16	mg/m3	200	0.0	0.0	Yes	6/05/2016	8/05/2016
Chlorine	01/6/16 - 30/6/16	mg/m3	200	0.0	0.0	Yes	5/07/2016	7/07/2016
Chlorine	01/7/16 - 31/7/16	mg/m3	200	0.0	0.0	Yes	2/08/2016	4/08/2016
Chlorine	01/8/16 - 31/8/16	mg/m3	200	0.0	0.0	Yes	19/09/2016	21/09/2016
Chlorine	01/9/16 - 30/9/16	mg/m3	200	0.0	0.0	Yes	6/10/2016	8/10/2016
Chlorine	01/10/16 - 31/10/16	mg/m3	200	0.0	0.0	Yes	4/11/2016	7/11/2016
Chlorine	01/11/16 - 30/11/16	mg/m3	200	0.0	0.0	Yes	7/12/2016	9/12/2016

Sampling Frequency: Quarterly

EPA Point: Point 2 - Stack Gas — Absorption Tail Tower

Pollutant	Monitoring Date	Units	Licence Limit	Result	Requirement Met	Results Obtained	Results Published	
Hydrogen Chloride	29/01/2016	mg/m3	30	<0.3	Yes	3/02/2016	5/02/2016	
Hydrogen Chloride	25/02/2016	mg/m3	30	<0.3	Yes	5/07/2016	7/07/2016	
Hydrogen Chloride	18/06/2016	mg/m3	30	<0.3	Yes	5/07/2016	7/07/2016	
Hydrogen Chloride	20/09/2016	mg/m3	30	<0.3	Yes	6/10/2016	8/10/2016	

Sampling Frequency: Continuous

EPA Point: Point 3 - Stack Gas — Emergency Chlorine Vent

Pollutant	Monitoring Period	Units	Licence Limit*	Minimum Value	Mean Value	Requirement Met	Maximum Value	Results Obtained	Results Published
Chlorine	01/12/15 - 01/1/16	mg/m3	200	0.0	4.2	Yes	15	8/01/2016	9/01/2016
Chlorine	01/1/16 - 31/1/16	mg/m3	200	0.0	5.8	Yes	16.8	3/02/2016	5/02/2016
Chlorine	01/2/16 - 29/2/16	mg/m3	200	0.0	4.8	Yes	14.1	2/03/2016	3/03/2016
Chlorine	01/3/16 - 31/3/16	mg/m3	200	0.0	2.7	Yes	18.6	4/04/2016	5/04/2016
Chlorine	01/4/16 - 30/4/16	mg/m3	200	0.0	2.4	Yes	12	3/05/2016	4/05/2016
Chlorine	01/5/16 - 31/5/16	mg/m3	200	0.0	1.2	Yes	5.1	6/06/2016	8/06/2016
Chlorine	01/6/16 - 30/6/16	mg/m3	200	0.0	0.9	Yes	6.6	5/07/2016	7/07/2016
Chlorine	01/7/16 - 31/7/16	mg/m3	200	0.0	3.3	Yes	9.3	2/08/2016	4/08/2016
Chlorine	01/8/16 - 31/8/16	mg/m3	200	0.0	3.3	Yes	10.8	19/09/2016	21/09/2016
Chlorine	01/9/16 - 30/9/16	mg/m3	200	0.0	1.6	Yes	123.9	6/10/2016	8/10/2016
Chlorine	01/10/16 - 31/10/16	mg/m3	200	0.0	5.9	Yes	15	4/11/2016	7/11/2016
Chlorine	01/11/16 - 30/11/16	mg/m3	200	0.0	4.2	Yes	11.1	7/12/2016	9/12/2016

* Statute limit as per Schedule 4 of POEO (Clean Air) Regulation