Final Report

2012 Performance Audit and Asset Management System Review for Tronox Management Pty Ltd

ELECTRICITY GENERATION LICENCE EGL23

Audit Report	Authorisation	Name	Position	Date
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LIST OF APPENDICES

1. Tronox Performance Audit Review March 2013

2. Tronox Asset Management System Review March 2013

GLOSSARY

AFE	Application for Expenditure
Alstom	Supplier of the gas turbine under the EGT banner, licensee of GE
AMS	Asset Management System
CCTV	Closed circuit TV
CO_2	Carbon dioxide
DAS	Data Acquisition System
DBNGP	Dampier Bunbury Natural Gas Pipeline
DCS	Distributed Control System
Ellipse	Business management software
ERA	Economic Regulation Authority
ETAC	Electricity Transfer Access Contract
FM Global	*(Tronox's Insurance Broker and assists in determining insurance and risk control strategy for their operations and provides expert engineering loss control opinion)*
GES	Geographe Environmental Services
GE	General Electric, Gas Turbine Manufacturer
GT	Gas turbine
HRSG	Heat Recovery Steam Generator
IMO	Independent Market Operator
ISO	International Standards Organisation
IT	Information Technology
JDE	JD Edwards, financial management software
KIC	Kwinana Industries Council
KIMA	Kwinana Industries Mutual Aid, an agreement by Kwinana Industries to assist each other in case of an emergency. Training exercises are held and a committee oversees the procedures to ensure that it is functional if required.
KMK	Western Power's substation connected to the co-gen
KMK	Kerr McGee Kwinana

kV	KiloVolt
LAN	Local Area Net work
LTSA	Long term service agreement
MCC	Motor control centre
MEX	P*roprietary asset management software*
MW	MegaWatt
NOx	Nitrous oxide
OEM	Original equipment manufacturer
O&M	Operate & Maintain
OTI	Oil temperature indicator, on a transformer
PID	Pipe and instrumentation diagram
PLC	Programmable logic controller
RBI	Request for budget inclusion
R O	Reverse Osmosis
SLD	Single line diagram
STEM	Short Term Energy Market
SWIS	South West Interconnected System
TiO2	Titanium Dioxide
Tronox	Tronox Management Pty Ltd
UPS	Uninterruptable power supply
US	United States
WEM	Wholesale Electricity Market
Wilson	Manufacturers of the 132/11kV power transformer
WP	Western Power
WPN	Western Power Networks
WTI	Winding temperature indicator, on a transformer

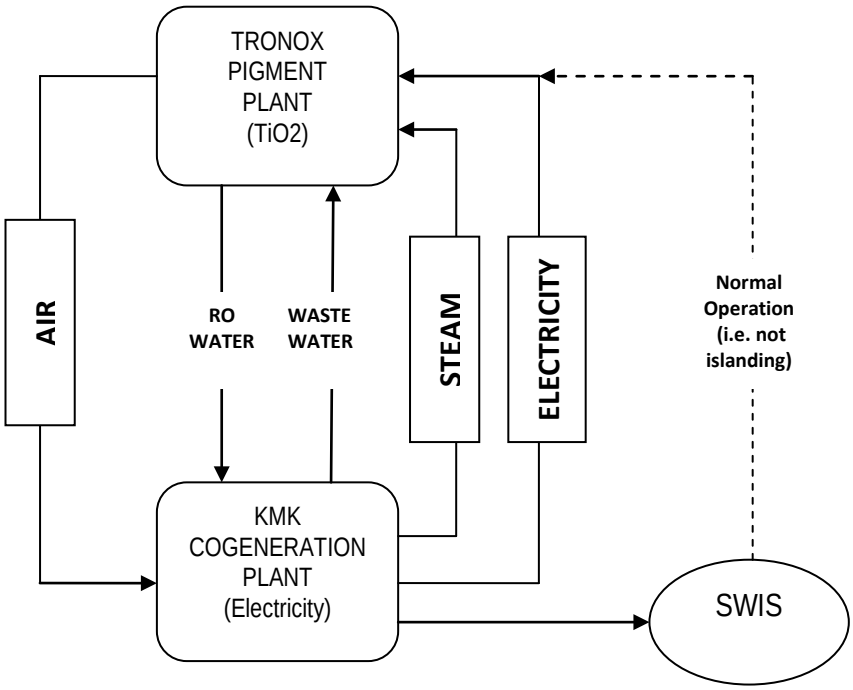
This report is prepared by representatives of GES Pty Ltd in relation to the above named client's conformance to the nominated audit standard(s). Audits are undertaken using a sampling process and the report and its recommendations are reflective only of activities and records sighted during this audit process. GES Pty Ltd shall not be liable for loss or damage caused to or actions taken by third parties as a consequence of reliance on the information contained within this report or its accompanying documentation.

1. EXECUTIVE SUMMARY

Tronox Management Pty Ltd (Tronox) is the part of the world's largest fully integrated producer of titanium ore and titanium dioxide (TiO2), Tronox Ltd. Tronox produces titanium dioxide pigment from its plant in Kwinana. Tronox provides manufacturers with high-quality titanium dioxide to meet international demand for paints, coatings and plastics. As part of the operational process the pigment plant requires super heated steam.

The Pigment Plant operates in a symbiotic relationship with the KMK Cogeneration Plant (illustrated in figure 1). The KMK cogen facility consists of a 36MW Frame 6 gas turbine and heat recovery steam generator, HRSG, that supplies power and steam to the facility (rather than being vented into the atmosphere) and also exports excess power as part of the balancing market through the South West Interconnected System, SWIS.

Figure 1 – Relationship between the Tronox Pigment Plant and the KMK Cogeneration Plant



The KMK Cogeneration (Cogen) Plant is located on the same site as the titanium dioxide pigment plant. It was built in 1999 and was owned and operated by Western Power (later Verve Energy). Tronox Pigment Plant has the ability to island, isolate the site electric power

system from the South West Integrated System, SWIS, and taking electricity directly from the cogeneration plant and thus not relying on WPN for supply of electricity. Ordinarily the Cogen Plant feeds the grid with Tronox drawing and feeding power with the grid. There are specific circumstances for which islanding is required primarily for safety and during storm events. There is a well documented process for this practice between Tronox and WPN.
The Cogen plant is operated and maintained by a third party- Monadelphous Group Limited. Tronox provides the operating framework (electricity and steam output) and approves any maintenance outside of the routine maintenance specified in the Operating and Maintenance Agreement.

As detailed above the generation of electricity is not the core business of the organisation it is a symbiotic process associated with the operations. Therefore the key consideration in the preparation of this audit report centres around the risk of not generating electricity which may result in a need to import from the grid. As such, the asset management risk assessment reflects this approach.

Tronox has engaged Geographe Environmental Services Pty Ltd to undertake its first Performance Audit and Asset Management System Review as required by the Economic Regulation Authority (ERA/Authority). Tronox holds a Generation Licence (Licence Number EGL23) under the *Electricity Industry Act* 2004.

This combined report contains the audit findings for both the Performance Audit and Asset Management System Review.

Sections 13 and 14 of the *Electricity Industry Act* 2004 require as a condition of every licence that the licensee must, not less than once in every period of 24 months (or any longer period that the Authority allows) calculated from the grant of the licence, provide the Authority with a performance audit and a asset management system review report by an independent expert acceptable to the Authority.

Geographe Environmental Services was approved by the Authority on the 15th January 2013 to undertake the works subject to development of an audit plan. Notification of the approval of the audit plan for the 2011 Performance Audit of Licence EGL23 was provided by the ERA on the 28/3/2013. The plan detailed our proposed methodology, , audit report process, materiality and risk assessment and audit program.

This audit report has been developed in accordance with the process flowchart for performance audits and asset management system reviews as detailed in the Audit

Guidelines – Electricity, Gas and Water Licences (August 2010).

As requested by the Authority this audit report includes a breakdown of audit work and amount of time the audit team spent on their allocated tasks.

The period for the audit and review is 24 December 2010 to 31 December 2012, and the report was due to be submitted to the Authority before 31 March 2013. An extension was granted by the ERA until the 15th April 2013 (ref D104538). Submission of the report to the ERA by the 15th April 2013 as required by the notification of extension is evidence of compliance with the Authority's requirements.

The Asset Management System Review and the Performance Audit have been conducted in order to assess the effectiveness of the Tronox's Asset Management Systems and level of compliance with the conditions of its Generation Licence EGL23. Through the execution of the Audit Plan, field work, assessment and testing of the control environment, the information system, control procedures and compliance attitude, the audit team members have gained reasonable assurance that Tronox has an effective asset management system and has complied, with exception of Licence Condition 4.1 (Ref 105) and Licence Condition 16.1 (Ref 124), these issues are in relation to payment of Licence Fees and Annual Compliance Reporting, with its Generating Licence during the audit period 24th December 2010 to 31st December 2012. This audit report is an accurate representation of the audit teams findings and opinions.

1.1 Performance Audit Summary

All, with exception of Licence Condition 4.1 (Ref 105) and Licence Condition 16.1 (Ref 124), these issues are in relation to payment of Licence Fees and Annual Compliance Reporting, licence requirements reviewed were found to be compliant during the audit.

The licensee operates within an effective control environment in relation to compliance processes associated with its Generation Licence. Systems reviewed during the audit process confirm the licensee has sound management philosophy and operating style, organisational structure, use of information technology and the skills and experience of the key staff members. However, the non compliance detailed above relates to assignment of authority and responsibilities and internal audit procedures. Primarily the issue of change in personnel leading to failure to comply with the requirement of annual compliance reporting. It is noted that this occasion as soon as the non compliance was identified it was rectified in a timely manner. Systemic improvements and increased organizational awareness will ensure compliance in the future, refer Appendix A. Incorporation of the Generation Licences requirements in an internal audit programme would further increase likelihood of compliance.

As required in section 11.4.1 of the Audit Guidelines – Electricity, Gas and Water Licences (August 2010) Table 1 summarises the compliance rating for each licence condition using the 7-point rating scale described in Table 3 (Refer Section 2.3 Methodology of this report).

A comprehensive report of the audit findings is included in Appendix 1.

There were Generation Licence compliance elements that were not included in the scope of this audit because they did not eventuate in this audit period or have not been established within licence EGL23. These are defined in Table 1.

Table 1: Electricity Compliance Reporting Manual - Performance Audit Compliance Summary

							COMPLIANCE RATING**						
No.	**Obligation (clause/section)**	**Likelihood**	**Consequence**	**Inherent Risk**	**Adequacy of controls**	**Audit Priority**	**N/R**	**0**	**1**	**2**	**3**	**4**	**5**
12 Electricity Industry Act – Licence Conditions and Obligations													
101	EGL23 - 14.1	Unlikely	Moderate	Medium	Strong	Priority 4						✓	
102	EGL23 - 20.1	Unlikely	Moderate	Medium	Strong	Priority 4							✓
103	EGL23 – 20.2 & 20.3	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
104	EGL23 – 20.4	Unlikely	Minor	Low	Strong	Priority 5						✓	
105	EGL23 – 4.1	Probable	Moderate	Medium	Weak	Priority 3				✓			
106	S 31(3)	Unlikely	Moderate	Medium	Strong	Priority 4							✓
107	S 41(6)	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
13 Electricity Licences – Licence Conditions and Obligations													
119	EGL23 – 12.1	Unlikely	Moderate	Medium	Strong	Priority 4							✓
120	EGL23 – 13.4	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
121	EGL23 - 14.2	Unlikely	Minor	Low	Strong	Priority 4							✓
122	EGL23 – 20.5	Unlikely	Minor	Low	Strong	Priority 4							✓
123	EGL23 – 15.1	Unlikely	Moderate	Medium	Moderate	Priority 4							✓
124	EGL23 – 16.1	Unlikely	Moderate	Medium	Strong	Priority 4				✓			
125	EGL23 – 17.1 & 17.2	Unlikely	Minor	Low	Strong	Priority 4	✓						
126	EGL23 – 18.1	Unlikely	Minor	Low	Strong	Priority 4							✓
15 Electricity Industry Metering Code – Licence Conditions and Obligations													
349	Cl 3.11(3)	Unlikely	Moderate	Medium	Strong	Priority 4							✓
361	Cl 3.16(5)	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
372	Cl 3.27	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
379	Cl 4.4(1)	Unlikely	Minor	Low	Strong	Priority 5	✓						
380	Cl 4.5(1)	Unlikely	Minor	Low	Strong	Priority 5							✓

No.	Obligation (clause/section)	Likelihood	Consequence	Inherent Risk	Adequacy of controls	Audit Priority	N/R	0	1	2	3	4	5
381	Cl 4.5 (2)	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
393	Cl 5.4 (2)	Unlikely	Minor	Low	Strong	Priority 5							✓
395	Cl 5.5(3)	Unlikely	Moderate	Medium	Strong	Priority 4							✓
406	Cl 5.16	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
407	Cl 5.17(1)	Clause 5.17 relates to the User must providing standing data and energy data to user's customers. This is not applicable to Tronox's operation as the organisation does not provide energy to customers											
408	Cl 5.18	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
409	Cl 5.19(1)	Clause 5.19 of the Metering Code relates to the provision of customer information. As Tronox does not directly provide energy to customers, these obligations are not applicable to Tronox's operations.											
410	Cl 5.19(2)												
411	Cl 5.19(3)												
412	Cl 5.19(4)												
414	Cl 5.19(6)												
420	Cl 5.21(5)	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
421	Cl 5.21(6)	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
439	Cl 5.27	Clause 5.27 relates to the Network Operator requesting customer details. As Tronox does not have any customers as defined by the code this obligation is not applicable.											
446	Cl (2)	Unlikely	Moderate	Medium	Strong	Priority 4							✓
448	Cl 7.2(1)	Unlikely	Minor	Low	Strong	Priority 5							✓
450	Cl 7.2(4)	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
451	Cl 7.5(5)	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
452	Cl 7.5	Unlikely	Moderate	Medium	Strong	Priority 4							✓
453	Cl 7.6(1)	Unlikely	Moderate	Medium	Strong	Priority 4							✓
454	Cl 8.1(1)	Unlikely	Minor	Low	Strong	Priority 5	✓						
455	Cl 8.1(2)	Unlikely	Minor	Low	Strong	Priority 5	✓						
456	Cl 8.1(3)	Unlikely	Minor	Low	Strong	Priority 5	✓						
457	Cl 8.1(4)	Unlikely	Moderate	Medium	Strong	Priority 4	✓						
458	Cl 8.3(2)	Unlikely	Minor	Low	Strong	Priority 5	✓						

Note: Only the requirements of the Electricity Compliance Reporting Manual are detailed in table above all other licence requirements and assessments are included in Appendix 1.
** Refer to Methodology for definition of compliance

1.2 Asset Management System Review Summary

The asset management system was found to be satisfactory with a few issues requiring attention. These were Section 1.7 – Asset Planning, Section 7.5 – Asset Management Information System and Section 9.1 Contingency Planning (refer to Table 9 for specific detail).

As required by section 11.4.2 of the Audit Guidelines (August 2010) Table 2 summarises the auditor's assessment of both the process and policy definition rating and the performance rating for each key process in the licensees asset management system, using the scales described in Table 5 and Table 6 (refer Section 3.3 Asset Management Review Methodology). The rating was determined by the auditor's judgement based on the execution of the Audit Plan.

The process and policy and asset management system adequacy ratings are summarised below:

Table 2: Asset Management System - Effectiveness Summary

Asset Management System	Asset Management Process And Policy Definition Adequacy Rating	Asset Management Performance Rating
1. Asset planning	A	2
2. Asset creation/ acquisition	A	1
3. Asset disposal	A	1
4. Environmental analysis	A	1
5. Asset operations	A	1
6. Asset maintenance	A	1
7. Asset Management Information System	A	1
8. Risk management	A	1
9. Contingency planning	A	2
10. Financial planning	A	1
11. Capital expenditure planning	A	1
12. Review of AMS	A	1

The Audit Guidelines (August 2010) require that auditors who have rated the adequacy of the process and policy definition process as C or D or the asset management performance as 3 or 4 also make recommendations to address the issue(s).

2. PERFORMANCE AUDIT

2.1 Performance Audit Scope

This is the first audit of TRONOX's compliance with obligations relating to Generation Licence EGL23. As such, the scope of the audit for the period 24th December 2010 to 31st December 2012 is to:

- assess the license holders internal compliance systems (i.e. process, outcome and output compliance)
- assess the license holders compliance with its license (including integrity of reporting)
- measure performance over time

This Performance Audit was conducted over the following period February to March 2012 and an overview methodology is outlined below;

- Initial approval to conduct audit obtained by ERA
- Preliminary Audit undertaken to assist with preparation of the Audit Plan
- Audit Plan preparation
- Submission of the Audit Plan to the ERA
- Audit Plan Approval
- Performance Audit conducted on site to execute Audit Plan
- Preparation of Audit Report

The following key personnel were interviewed during the Performance Audit;

Rez Khan	Risk Engineer	Tronox
Karen Boyce	Manager Corporate Sustainability and Energy	Tronox
Michael Slee	Finance Group Leader	Tronox
Tim Harrison	Project Manager	Monadelphous
Mark Kempshall	Technical Officer	Monadelphous
Peter Craddon	Senior Operator/ Maintainer	Monadelphous
Ross Sinclair	Operator/Maintainer	Monadelphous

A list of key documents and other information sources examined by the auditor during the Performance Audit is provided below;

- InControl
- Monthly Reports
- Management Meeting Minutes
- ERA Correspondence
- Compliance Reports

- Asset Management Plan
- Legal & Other Obligations register
- Crisis Management Plan
- Business Plans
- Legal Agreements
- Annual Reports
- ETAC
- Financial Reports

Further detail is included in Appendix 1 of the report. In preparation the Performance Audit required 70 hours of Nicole Davies time.

2.2 Performance Audit Objective

The objective of the performance audit, as defined by the Audit Guidelines, is to assess the effectiveness of measures taken by the licensee to meet obligations of the performance and quality standards referred to in the licence.

2.3 Performance Audit Methodology

A risk assessment, assessment of control environment and allocation of audit priority was undertaken in accordance with the Audit Guidelines – Electricity, Gas and Water Licences (August 2010) on each element of the Electricity Compliance Reporting Manual (May 2011) issued by the Authority in relation to Generation licence EGL23.

The Performance Audit Methodology as prescribed in the Guidelines was detailed in the Audit Plan. Detailed review of the methodology is defined within the Audit Guidelines – Electricity, Gas and Water Licences (August 2010) (refer ERA www.erawa.com.au).

Table 3 defines the compliance ratings shown in section 1.1.

Table 3: Operational/Performance Compliance Rating Scale

Compliance Status	Rating	Description of Compliance
Compliant	5	Compliant with no further action required to maintain compliance
Compliant	4	Compliant apart from minor or immaterial recommendations to improve the strength of internal controls to maintain compliance
Compliant	3	Compliant with major or material recommendations to improve the strength of internal controls top maintain compliance
Non-Compliant	2	Does not meet minimum requirements
Significantly Non-Compliant	1	Significant weaknesses and/or serious action required
Not Applicable	N/A	Determined that the compliance obligation does not apply to the licensee's business operations
Not Rated	N/R	No relevant activity took place during the audit period, therefore it is not possible to assess compliance

In order to focus the audit effort and identify areas for testing and analysis a preliminary assessment of the risk and materiality of non-compliance with the Generation Licence was undertaken in accordance with the requirements of AS/NZS 31000 Risk Management and Appendix 2 of the Audit Guidelines. This assessment rating was reviewed during the audit process subject to the verification of control environment.

2.5 2011 Post Audit Implementation Plan

In relation to the Performance Audit Report, there were two non compliant findings arising from the audit, (i.e. Ref 105 & 124). The post audit implementation plan below details opportunities to improve existing systems of control. As stipulated in section 11.9 of the Audit Guidelines (August 2010), the Audit Team notes that the Performance Audit Post Implementation Plan does not form part of the Audit Opinion. It is the responsibility of the licensee to ensure actions are undertaken.

Ref	Licence Condition	Requirement	Opportunity for Improvement (OFI)	Post-Audit Action Plan
101 [N/R]	**Generation Licence Condition 14.1**	A licensee must, not less than once every 24 months, provide the Authority with a performance audit conducted by an independent expert acceptable to the Authority.	OFI 1: To ensure ongoing compliance, consideration could be given to formalising the scheduling of the audit through including the requirement in the legal and other obligations register or scheduling as event in the Incontrol System. It is noted that InControl is used to track the preparation and submission of the Annual Compliance Report.	**ACTION**: Create a scheduled event in InControl to carry out a performance audit at least every 24 months. Add the requirement to the Legal & Other Obligations database, noting the relevant legislation. RESPONSIBILITY: Karen Boyce DATE: 31 May 2013

Ref	Licence Condition	Requirement	Opportunity for Improvement (OFI)	Post-Audit Action Plan
105 [N/R]	**Generation Licence Condition 4.1**	The licensee must pay the applicable fees in accordance with the Regulations. A licensee must pay to the Authority the prescribed licence fee within one month after the day of grant or renewal of the licence and within one month after each anniversary of that day during the term of the licence. i.e. 24th January	OFI 2: As there was a near late payment. Required reminder from the ERA and one missed payment due to the licensee being unaware of requirement. Consideration could be given to including the requirement in the InControl system and including in the legal & Other Obligations Register. It is understood that as this is an Account function it may also be required to include trigger mechanism in their processes.	**ACTION:** Create a scheduled event in InControl to check that the invoice has been received for the annual licence fee and if it has not been received by the end of December to contact ERA to send a copy to allow the amount to be paid. (Accounting standards require an invoice to be received to allow a payment to be made). Include the obligation to pay the annual fee in the Legal & Other Obligations database, noting the relevant legislation. RESPONSIBILITY: Karen Boyce DATE: 31 May 2013
124 [TYPE 2]	**Generation Licence condition 16.1**	A licensee must provide the Authority any information that the Authority may require in connection with its functions	OFI 3: As this requirement has been late and addressed with an internal action plan (i.e. inclusion as scheduled event in InControl) future compliance should be expected.	**ACTION**: Add the obligation to the Legal & Other Obligations database, noting the relevant legislation. RESPONSIBILITY: Karen Boyce

Ref	Licence Condition	Requirement	Opportunity for Improvement (OFI)	Post-Audit Action Plan
		under the Act in the time, manner and form specified by the Authority.	However, consideration could also be given to including in the Legal and Other Obligations Register.	DATE: 31 May 2013
-	***Generation Licence condition 1.2***	A reference in this licence to any applicable legislation includes, unless the context otherwise requires, any statutory modification, amendment or re-enactment of that applicable legislation.	OFI 4: Consideration could be given to aligning the Legal & Other Obligations Register with the Generation Licence Spreadsheet and where possible creating InControl scheduled events to ensure compliance and stream line systems.	**ACTION**: Review all requirements of the Generation licence and ensure that all applicable requirements are entered into the Legal & Other Obligations database, noting the relevant legislation. Ensure that for all periodic requirements, that a scheduled event is created in InControl. RESPONSIBILITY: Karen Boyce DATE: 31 May 2013
1.7	***Asset Planning***	**Likelihood and consequences of asset failure are predicted**	OFI 5: Contingency plans be documented and details investigated	**ACTION**: Document a contingency plan for failure of Cogen assets in conjunction with Monadelphous and FM Global which considers the risk of

Ref	Licence Condition	Requirement	Opportunity for Improvement (OFI)	Post-Audit Action Plan
				such failures. RESPONSIBILITY: Karen Boyce DATE: 31 October 2013
7.5	***Asset Management Information System***	**Data backup procedures appear adequate**	OFI 6: Manual back up to CD's is vulnerable to error and an automated system is recommended	**ACTION**: Tronox to review with Monadelphous their proposed automated system for data back up and determine if this will benefit data security. RESPONSIBILITY: Karen Boyce DATE: 31 May 2013
7.6	***Asset Management Information System***	**Key computations related to licensee performance reporting are materially accurate**	OFI 7: As there is no kWh check metering calibration should be reviewed or some means of checking implemented.	**ACTION**: Tronox to review with Western Power, their ability to carry out calibration of their electrical meters. RESPONSIBILITY: Karen Boyce

Ref	Licence Condition	Requirement	Opportunity for Improvement (OFI)	Post-Audit Action Plan
				DATE: 31 July 2013
9.1	***Contingency Planning***	**Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks**	As for 1.7	As for 1.7

3. ASSET MANAGEMENT SYSTEM EFFECTIVENESS REVIEW

3.1 AMS Review Scope

The scope of the AMS review includes an assessment of adequacy and effectiveness of Tronox's asset management system by evaluating during the audit period 24th December 2010 to 31st December 2012 the following;

1. Asset Planning
2. Asset creation/acquisition
3. Asset disposal
4. Environmental analysis
5. Asset operations
6. Asset maintenance
7. Asset management information system
8. Risk management
9. Contingency planning
10. Financial planning
11. Capital expenditure planning
12. Review of asset management system

The review has been established as a requirement of the current Generating Licence issued by the Economic Regulation Authority to Tronox.

The asset management review follows the approved audit plan and uses;

- a risk based approach to auditing using the risk evaluation model set out in ISO31000:2009
- an overall effectiveness rating for an asset management process, based on a combination of the process and policy adequacy rating and the performance rating
- the format and content of the reviewer's report; and post- implementation plan as described in the Guidelines.

The following people were interviewed during the review;

Rez Khan	Risk Engineer	Tronox
Karen Boyce	Manager Corporate Sustainability and Energy	Tronox
Michael Slee	Finance Group Leader	Tronox
Kynan Johnston	Site Accountant	Tronox
Ciara Murphy	Graduate Accountant.	Tronox
Tim Harrison	Project Manager	Monadelphous
Mark Kempshall	Technical Officer	Monadelphous
Peter Craddon	Senior Operator/ Maintainer	Monadelphous
Ross Sinclair	Operator/Maintainer	Monadelphous

Chris Waterman	Operator/Maintainer	Monadelphous

The key documents and other information sources are detailed below and further in Appendix 2.

1. KMK Asset Management Plan 2012
2. KMK Co-gen Asset Management Plan 2011
3. Monthly reports
4. Trip Report N1101 CO2 release
5. Trip Report N1108 GT low gas pressure trip
6. Trip Report N1115 High steam flow to GT
7. Trip Report N1116 High gas pressure to GT
8. Trip Report High NOx steam flow to GT
9. Forced outage Damper PLC failure
10. MEX User Guide
11. Technical Operations Control Guidelines
12. KMK Co-gen Contract
13. Co-gen Operations Agreement
14. Tronox EGL 23 Licence
15. Tronox EGL 23 Licence letter
16. Transfer of ownership (Pearl St responsibility)
17. ERA compliance report June 2012
18. Training Matrix
19. KMK Suppliers
20. Monadelphous QA certificate
21. Business Management System Document Control
22. JDE Foundation
23. Use of Compaby IT
24. MEX Asset List
25. External lighting upgrade
26. Control room air-conditioning
27. Welfare facilities
28. Defective MOD
29. Ph sensor failure
30. PVC 10206
31. Site security camera
32. NOx humidity Instrument
33. Transformer OTI and WTI
34. MCC air conditioner
35. Flash sump drain pump
36. UPS replacement
37. HRSG BDS access platform
38. Moog valve replacement
39. DCS upgrade
40. DCS upgrade supplementary
41. Asset effective life for depreciation
42. Sub contractor management
43. Supply chain principals and rules
44. Supply agreements
45. Purchasing

46 Major Events
47 Emergency Response Plan KMK Co-gen facility
48 Hazard Report pro forma
49 Safety Interaction pro forma
50 Take 5 pro forma
51 Toolbox Health, Safety & Environment Meeting Report
52 High Voltage Permit Form, switching programme
53 Maintenance Access Permit KMK Co-generation Facility
54 Emergent work request example
55 Work instruction example
56 Request for Budget Inclusion, RBI, example
57 Monadelphous Energy Services Organisation Chart
58 Work plan example, MS project
59 Tronox organisation chart
60 Black Start Work Instruction
61 Islanding Process
62 Liaison with WP
63 DCS printout SLD, PID
64 Manual Islanding Work Instruction
65 Operations shift guide
66 Day to day work management guideline
67 KMK Co-generation facility operations control guideline
68 Capacity credit test on Wed 6th March.
69 Callesta 2 oil monitor
70 IDD bushing monitor
71 Dispatch Instruction Acknowledgement Work Instruction.
72 Legal register, reporting etc
73 EGL23 ver 3.1 revised for Tronox
74 ERA letter confirming licence change
75 Verve WP ETAC transfer correspondence
76 ERA acknowledge receipt of Compliance Report.

The review was conducted in conjunction with the Performance Audit during February-March 2013 and included desktop review, two days audit to execute audit plan and interview sessions and report writing. In total the audit required 80 hours of Simon Ashby's time.

3.2 Objective of the Asset Management System Review

The objective of the review is to examine the effectiveness of the processes used by Tronox to deliver asset management, the information systems supporting asset management activities and the data and knowledge used to make decisions about asset management. These elements were examined from a life cycle perspective i.e. planning, construction, operation, maintenance, renewal, replacement and disposal using the guidelines developed by the Economic Regulation Authority.

3.3 Methodology for Asset Management System Review

The audit methodology detailed in the Audit Guidelines – Electricity, Gas and Water Licences (August 2010) was used in the execution of the Asset Management System Review and is detailed in the Audit Plan.

Asset Management System Effectiveness Rating

The Audit Guidelines (section 11.4.2) states that the asset management review report must provide a table that summarises the auditor's assessment of both the process and policy definition rating and the performance rating for each key process in the licensee's asset management system using the scales described in Table 5 and Table 6. It is left to the judgement of the auditor to determine the most appropriate rating for each asset management process.

Table 5: Asset management process and policy definition adequacy ratings

Rating	Description	Criteria
A	Adequately defined	• Processes and policies are documented. • Processes and policies adequately document the required performance of the assets. • Processes and policies are subject to regular reviews, and updated where necessary • The asset management information system(s) are adequate in relation to the assets that are being managed.
B	Requires some improvement	• Process and policy documentation requires improvement. • Processes and policies do not adequately document the required performance of the assets. • Reviews of processes and policies are not conducted regularly enough. • The asset management information system(s) require minor improvements (taking into consideration the assets that are being managed).
C	Requires significant improvement	• Process and policy documentation is incomplete or requires significant improvement. • Processes and policies do not document the required performance of the assets. • Processes and policies are significantly out of date. • The asset management information system(s) require significant improvements (taking into consideration the assets that are being managed).
D	Inadequate	• Processes and policies are not documented. • The asset management information system(s) is not fit for purpose (taking into consideration the assets that are being managed).

Table 6: Asset management performance ratings

Rating	Description	Criteria
1	Performing effectively	• The performance of the process meets or exceeds the required levels of performance. • Process effectiveness is regularly assessed and corrective action taken where necessary.
2	Opportunity for improvement	• The performance of the process requires some improvement to meet the required level. • Process effectiveness reviews are not performed regularly enough. • Process improvement opportunities are not actioned.
3	Corrective action required	• The performance of the process requires significant improvement to meet the required level. • Process effectiveness reviews are performed irregularly, or not at all. • Process improvement opportunities are not actioned.
4	Serious action required	• Process is not performed, or the performance is so poor that the process is considered to be ineffective.

Deviation from the Audit Plan

There were several changes made to the risk assessment ratings conducted for the Audit Plan for the Performance Audit and the Asset Management System Review. The revisions only involve the adequacy of existing controls. All deviations from the Audit Plan are detailed within Appendix 1 and 2 respectively.

3.4 2012 Post Audit Implementation Plan

As stipulated in section 11.9 of the Audit Guidelines (August 2010), the Audit Team notes that the Asset Management Review Post Implementation Plan does not form part of the Audit Opinion. It is the responsibility of the licensee to ensure actions are undertaken as determined by Tronox.

4. FOLLOW UP AUDIT PROCESS

This is the first Performance Audit and Asset Management Review conducted since the issue of the licence. Review of actions taken in response to recommendations will form part of subsequent audit plans.

APPENDIX 1

TRONOX MANAGEMENT PTY LTD
PERFORMANCE AUDIT
MARCH 2013

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
SECTION 12: Electricity Industry Act 2004 – Licence Conditions and Obligations						
101 [N/R]	**Generation Licence Condition 14.1**	**Electricity Industry Act section 13(1)**	A licensee must, not less than once every 24 months, provide the Authority with a performance audit conducted by an independent expert acceptable to the Authority.	4	This is the first audit undertaken by the organisation since the grant of licence. The requirement for the audit is monitored by the Manager, Corp Sustainability & Energy. Reminders are set up in a calendar and communication received from the ERA. The requirement is also tracked informally through Management Meetings. ▪ Discussion with Manager, Corp Sustainability & Energy ▪ Incontrol System – Scheduled Event function ▪ Review of Legal & Other Obligations Register **OFI 1: Consideration could be given to formalising the scheduling of the audit through including the requirement in the legal and other obligations register or scheduling as event in the Incontrol System. It is noted that InControl is used to**	Compliant [4]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
					track the preparation and submission of the Annual Compliance Report.	
102 [N/R]	**Generation Licence Condition 20.1**	**Electricity Industry Act section 14 (1)(a)**	A licensee must provide for an asset management system in respect of the licensee's assets.	4	The organisation has established an asset management system which includes annual asset review and update of the Asset Management Plan (AMP). The licensee's AMP describes the main aspects of operation of the system. Evidence available of compliance, refer to the Asset Management component of this report. ▪ Asset Management Plan	Compliant [5]
103 [TYPE 2]	**Generation Licence Condition 20.2 & 20.3**	**Electricity Industry Act section 14 (1)(b)**	A licensee must notify the Authority of the details of the asset management system within 5 business days from the later of; (a) the commencement date; and (b) the completion of construction of the generating works & The licensee must notify the Authority of any substantial change to the asset management	4	During the audit period, Tronox has not had to notify the Authority of details of its asset management system. The Manager, Corp Sustainability & Energy confirmed that for the period 24th December 2010 to 31st December 2012 there have been no substantial changes to the asset management system. As such, compliance with this requirement has not been rated.	Not Rated [N/R]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			system within 10 business days of such change.			
104 [N/R]	**Generation Licence Condition 20.4**	**Electricity Industry Act section 14 (1)(c)**	A licensee must provide the Authority with a report by an independent expert, acceptable to the Authority, as to the effectiveness of the asset management system not less than once in every period of 24 months calculated from the commencement date (or any longer period that the Authority allows by notice in writing).	5	GES has been appointed in accordance with the Audit Guidelines. Preparation of this report indicates compliance with this requirement. ▪ Management Meeting Minutes tracked the requirement for the ERA audit ▪ Purchase order for the audit was issued to GES Consideration could be given to tracking audit requirement in the InControl system **REFER TO OFI1 – REF 101**	Compliant [4]
105 [N/R]	**Generation Licence Condition 4.1**	**Electricity Industry Act section 17 (1)**	The licensee must pay the applicable fees in accordance with the Regulations. A licensee must pay to the Authority the prescribed licence fee within one month after the day of grant or renewal of the licence and within one month after each anniversary of that day during the term of the licence. i.e. 24th January	3	Licence fees were paid during the audit period 24 December 2010 to 31 December 2012 as follows; - The initial licence fee was not paid and was an oversight by the licensee, however it is noted that an invoice was not raised for payment by the Authority and this has been rectified during this audit by the Accounts Department of the ERA. An invoice was raised by the Finance Officer of the ERA on	Non Compliant [2]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
					the 10/4/12. - ERA Invoice ERA264. Payment ref #23014497 – Paid 7/12/11 - ERA Invoice ERA328 issued 12/12/12 and was paid on the 24/1/13. The payment due date (i.e. 24/1/13) is outside the audit scope and will be assessed in the next audit. However, it is noted an email notifying the Manager, Corp Sustainability & Energy was sent by the Finance Officer of the ERA on the 24/1/13 and an EFT payment was immediately raised. Confirmation has been provided by the ERA accounts receivable that payment was received on the 24/1/13 as such compliance with this requirement is confirmed. Due to this issue and the failure to pay initial fee a pre-emptive mechanism could be established see OFI below. **OFI 2: Consideration could be given to including the requirement in the InControl system.**	

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
106 [N/R]	**Generation Licence Condition 5.1**	***Electricity* Industry *Act Section 31 (3)***	A licensee must take reasonable steps to minimise the extent or duration of any interruption, suspension or restriction of the supply of electricity due to an accident, emergency, potential danger or other unavoidable cause.	4	Effectively managed and reviewed, the nature of the site and its production processes dictates the need for a mature and tested emergency response system. ▪ Crisis Management Plan ▪ Emergency Response Plan ▪ Kwinana Industries Council (KIC) - Kwinana Industries Mutual Aid (KIMA)	Compliant [5]
107 [TYPE 2]	**Generation Licence Condition 5.1**	**Electricity Industry Act section 41 (6)**	A licensee must pay the costs of taking an interest in land or an easement over land.	4	The land is owned by Tronox. No interests or easements taken over the land during the audit period. ▪ Record of certificate of title (Volume 2151/Folio 260)	Not Rated [N/R]
SECTION 13: ELECTRICITY LIECENCES – LICENCE CONDITIONS AND OBLIGATIONS						
119 [TYPE 2]	**Generation Licence condition 12.1**	**Electricity Industry Act section 11**	The licensee and any related body corporate must maintain accounting records that comply with the Australian Accounting Standards Board Standards or equivalent International Accounting Standards.	4	Tronox is compliant with Australian – International Financial Reporting Standards (A-IFRS) and also compliant with US Generally Accepted Accounting Principles Deloittes audits Tronox's Annual Statutory	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
					Accounts for the financial years ending 31 December, assessing compliance with Australian financial reporting standards There are no significant accounting transactions or items that would currently jeopardise Tronox's compliance with accounting standard. • Discussion with Group Leader Finance Tiwest Joint Venture Closing Report year ended 31 December 2011	
120 [TYPE 2]	**Generation Licence condition 13.4**	**Electricity Industry Act section 11**	Once approved by the Authority, the performance standards are included as additional terms and conditions to this licence	4	Not rated as there are no specific performance standards established for EGL23.	Not Rated [N/R]
121 [TYPE 2]	**Generation Licence condition 14.2**	**Electricity Industry Act section 11**	A licensee must comply, and require its auditor to comply, with the Authority's standard audit guidelines dealing with the performance audit.	4	The audit and review plans approved by the Authority on 28 March 2013, require GES and Tronox to comply with the prescribed audit guidelines and reporting manual issued by the Authority. The Auditor has undertaken the audit and	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
					review utilising the Audit Guidelines: Electricity, Gas and Water Licences, dated August 2010.	
122 [TYPE 2]	**Generation Licence condition 20.5**	**Electricity Industry Act section 11**	The licensee must comply, and must require the licensee's expert to comply, with the Authority's standard audit guidelines.	4	Direct instructions from Licensee to Auditor to comply with the ERA guidelines. Copies of communications received from ERA relating to audit requirements sent by Tronox through to Auditor to convey requirements specifically the undertaking of audits in compliance with the Audit Guidelines: Electricity, Gas and Water Licences August 2010.	Compliant [5]
123 [TYPE 2]	**Generation Licence condition 15.1**	**Electricity Industry Act section 11**	The licensee must report to the Authority: (a) if the licensee is under external administration as defined by the Corporations Act 2001 (Cwlth), within 2 business days of such external administration occurring; or (b) if the licensee: (i) experiences a change in the licensee's corporate, financial or technical circumstances upon which this licence was	4	During the Audit Period 24th December 2010 to 31st December 2012, the licensee name was changed from Tiwest Pty Ltd to Tronox Management Pty Ltd on 18 June 2012. This was advised to the Authority within 3 days of the name change (on 15 June 2012) and subsequently a licence amendment application was made and a new licence issued in the new name.	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			granted; and (ii) the change may materially affect the licensee's ability to perform its obligations under this licence, within 10 business days of the change occurring; or (c) if the: (i) licensee's name; (ii) licensee's ABN; (iii) licensee's address; (iv) description of the generating works; or (v) nameplate capacity of the generating works, change within 10 business days of the change occurring.		▪ Decision on amendment of Electricity Generation Licence 23 (EGL23) – Aug 1 02 ▪ Email communication ▪ Letter to ERA requesting change of name on generation licence.	
124 [TYPE 2]	**Generation Licence condition 16.1**	**Electricity Industry Act section 11** **Compliance and Reporting Manual March 2008 section**	A licensee must provide the Authority any information that the Authority may require in connection with its functions under the Act in the time, manner and form specified by the Authority.	4	Every licensee is required to submit a compliance report to the Authority covering all of its type 1 and type 2 licence obligations for each financial year (1 July to 30 June inclusive) by 31 August immediately following the financial year that is the subject of the report.	Non Compliant [2]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
		5.3 and section 5.4			▪ Discussion with Manager, Corp Sustainability & Energy ▪ Review of InControl System – Scheduled Events (Noted Scheduled as recurrent event from 1st Aug assigned to Manager, Corp Sustainability & Energy) ▪ Compliance with ERA process ▪ EGL23 - Compliance Report 24 December 2010– 30 June 2011 (Dated 24/8/11) ▪ EGL23 - Compliance Report 1 July 2011 – 30 June 2012 (Dated 13/11/12) The 1 July 2011 – 30 June 2012 Report was submitted late, as such, it will need to be recorded as a non compliance with clause 16 of the Licence for 2013 reporting year. Preventative measures were undertaken which include incorporating the requirement into the InControl system which should avoid future non compliances of this nature. **OFI 3: It is noted that this event is entered in the InControl System as a scheduled**	

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
					event. Consideration could also be given to including in the Legal and Other Obligations Register.	
125 [TYPE 2]	**Generation Licence condition 17.1 & 17.2**	**Electricity Industry Act section 11**	17.1 - The Authority may direct the licensee to publish, within a specified timeframe, any information it considers relevant in connection with the licensee or the performance by the licensee of its obligations under this licence. 17.2 - Subject to clause 17.3, the licensee must publish the information referred to in clause 17.1.	4	As above It is noted that Tronox has the ability to comply by publishing on the Tronox Website (www.australia.Tronox.com). ▪ Tronox Website ▪ Discussion with Manager, Corp Sustainability & Energy ▪ Review of ERA Website	Not Rated [N/R]
126 [TYPE 2]	**Generation Licence condition 18.1**	**Electricity Industry Act section 11**	Unless otherwise specified, all notices must be in writing.	4	Use of ERA reporting protocols confirmed in discussion with Manager, Corp Sustainability & Energy. Also verified through completion of the Annual Compliance reports. ▪ Compliance with ERA process	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
					▪ Management meeting minutes ▪ Use of ERA reporting protocols	
SECTION 15: ELECTRICITY METERING CODE – LICENCE CONDITIONS AND OBLIGATIONS						
349 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 3.11(3)***	A Code participant who becomes aware of an outage or malfunction of a metering installation must advise the network operator as soon as practicable.	4	Whilst Tronox does not have its own meters installed to verify data provided by WPN. There are several processes established to ensure metering data is accurately recorded for example; Tronox control room have an alarm on the meter and are able to cross check data sent through a series of performance calculations. This was verified during the audit through interviews with Monadelphous Control Room personal and a review of the alarms on the control system. Also refer 7.6 of asset management review.	Compliant [5]
361 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 3.16(5)***	A network operator or a user may require the other to negotiate and enter into a written service level agreement in respect of the matters in the metrology procedure dealt with	4	Clause 3.16(5) is not applicable to Tronox's operations as this clause refers to Western Power's production of a "notional wholesale meter" value through the conversion of	Not Rated [N/R]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			under clause 3.16(4) of the Code.		non-interval meter consumption to a notional interval meter quantity. As Western Power's tariff meters are all interval meters, such conversion is not required. Accordingly, a related service level agreement is also not required.	
372 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 3.27***	A person must not install a metering installation on a network unless the person is the network operator or a registered metering installation provider for the network operator doing the type of work authorised by its registration.	4	During the audit period 24 December 2010 to 31 December 2012, Tronox has had no involvement with the installation of meters onto the Western Power network. • Discussion with Monadelphous Control Room Operators • Review of operating control system software alarms.	Not Rated [N/R]
379 [N/R]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 4.4(1)***	A network operator and affected Code participants must liaise together to determine the most appropriate way to resolve a discrepancy between energy data held in a metering installation and data held in the	5	During the audit period 24 December 2010 to 31 December 2012, Tronox did not become aware of any discrepancy between energy data held in the tariff meters installed at Tronox's facilities and data held	Not Rated [N/R]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			metering database.		in the metering database. Therefore, neither Tronox nor Western Power was required to liaise with the other to resolve a discrepancy. • Discussion with Monadelphous Control Room Operators • Discussion with Monadelphous Supervisor	
380 [N/R]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 4.5(1)***	A Code participant must not knowingly permit the registry to be materially inaccurate.	5	During the period 24 December 2010 to 31 December 2012 Tronox was not aware of any material inaccuracy in the metering database maintained by Western Power. It is noted that Western Power has the primary responsibility for ensuring the accuracy of energy data held in the registry (metering database), recorded from the tariff meters installed at Tronox's facilities. However Tronox do monitor the meters and are able to determine if not functioning as	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
					required.	
381 *[TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 4.5(2)***	If a Code participant (other than a network operator) becomes aware of a change to or an inaccuracy in an item of standing data in the registry, then it must notify the network operator and provide details of the change or inaccuracy within the timeframes prescribed.	4	During the period 24 December 2010 to 31 December 2012 Tronox did not have access to, nor influence over tariff meter standing data or data held in the metering database. Therefore requirements to notify the network operator and the provision of information were not relevant to Tronox's operations for the period subject to audit.	Not Rated [N/R]
393 [N/R]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 5.4(2)***	A user must, when reasonably requested by a network operator, use reasonable endeavours to assist the network operator to comply with the network operator's obligation	5	Western Power require access to the metering installation on site to obtain an actual meter reading at least once in every 12 month period. During the audit it was confirmed that the Western Power representative had access to the site to undertake this requirement and holds the keys to access the metering equipment. Tronox enable site access through their	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
					security personnel.	
395 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 5.5(3)***	A user must not impose any charge for the provision of the data under this Code unless it is permitted to do so under another enactment.	4	The licensee has not raised a charge for any metering data as such this requirement has not been assessed.	Compliant [5]
406 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 5.16***	A user that collects or receives energy data from a metering installation must provide the network operator with the energy data (in accordance with the communication rules) within the timeframes prescribed.	4	The Manager, Corp Sustainability & Energy confirmed that, for the period 24 December 2010 to 31 December 2012, Tronox did not collect or receive energy data for WPN. As such an assessment of Tronox's compliance with this obligation cannot be made for the period subject to audit. It is noted that, although Monadelphous as operators of the facilty have access to the data, WPN and System Management have direct control of the metering aspects and have not required Tronox to provide data.	Not Rated [N/R]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
407 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 5.17(1)***	A user must provide standing data and validated (and where necessary substituted or estimated) energy data to the user's customer, to which that information relates, where the user is required by an enactment or an agreement to do so for billing purposes or for the purpose of providing metering services to the customer.	N/A	Cl 5.17 relates to the User providing standing data and energy data to user's customers. Tronox does not have any customers as defined by the Code. This obligation is not applicable to Tronox's operations.	Not Applicable [N/A]
408 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 5.18***	A user that collects or receives information regarding a change in the energisation status of a metering point must provide the network operator with the prescribed information, including the stated attributes, within the timeframes prescribed.	4	The Manager, Corp Sustainability & Energy confirmed that, for the period 24 December 2010 to 31 December 2012, Tronox did not collect or receive information regarding the energy status of metering points. Therefore, an assessment of Tronox's compliance with this obligation cannot be made for the period subject to audit.	Not Rated [N/R]
409 [N/R]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 5.19(1)***	A user must, when requested by the network operator acting in accordance with good electricity industry practice, use reasonable endeavours to collect information from customers, if any, that assists the network	N/A	Clause 5.19 of the Metering Code relates to the provision of customer information. As Tronox does not directly provide energy to customers, these obligations are not	Not Applicable [N/A]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			operator in meeting its obligations described in the Code and elsewhere.		applicable to Tronox's operations.	
410 [N/R]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 5.19(2)***	A user must, to the extent that it is able, collect and maintain a record of the address, site and customer attributes, prescribed in relation to the site of each connection point, with which the user is associated.	N/A	As Above	Not Applicable [N/A]
411 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 5.19(3)***	A user must, after becoming aware of any change in a site's prescribed attributes, notify the network operator of the change within the timeframes prescribed.	N/A	As Above	Not Applicable [N/A]
412 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 5.19(4)***	A user that becomes aware that there is a sensitive load at a customer's site must immediately notify the network operator's Network Operations Control Centre of the fact.	N/A	As Above	Not Applicable [N/A]
414	***Generation Licence condition 5.1***	***Electricity Industry Metering Code***	A user must use reasonable endeavours to ensure that it does notify the network operator of a change in an attribute that results from	N/A	As Above	Not Applicable

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
[N/R]		***clause 5.19(6)***	the provision of standing data by the network operator to the user.			[N/A]
420 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 5.21(5)***	A Code participant must not request a test or audit unless the Code participant is a user and the test or audit relates to a time or times at which the user was the current user or the Code participant is the IMO.	4	During the period 24 December 2010 – 31st December 2012, Tronox did not request a test or audit of the items at s.5.21(1) of the Metering Code. Therefore, an assessment of Tronox's compliance with these obligations cannot be made for the period subject to audit. Discussion with Manager, Corp Sustainability & Energy	Not Rated [N/R]
421 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 5.21(6)***	A Code participant must not make a test or audit request that is inconsistent with any access arrangement or agreement.	4	As Above	Not Rated [N/R]
439 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 5.27***	Upon request, a current user must provide the network operator with customer attribute information that it reasonably believes are missing or incorrect within the timeframes	N/A	Clause 5.27 of the Metering Code relates to the provision of customer information. As Tronox does not directly provide energy to customers, this obligation is not applicable	Not Applicable [N/A]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			prescribed.		to Tronox's operations.	
446 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 6.1(2)***	A user must, in relation to a network on which it has an access contract, comply with the rules, procedures, agreements and criteria prescribed.	4	The Licensee has complied with Western Power's requirements and no complaints have been raised.	Compliant [5]
448 [N/R]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 7.2(1)***	Code participants must use reasonable endeavours to ensure that they can send and receive a notice by post, facsimile and electronic communication and must notify the network operator of a telephone number for voice communication in connection with the Code.	5	Western Power has the Licensee's contact details as required. Evidence of communication via post, facsimile, telephone and electronic communication were all verified during the audit.	Compliant [5]
450 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 7.2(4)***	A Code participant must notify its contact details to a network operator with whom it has entered into an access contract within 3 business days after the network operator's request.	4	No request was made during the audit period for contact details by the network operator. Therefore, an assessment of Tronox's compliance with these obligations cannot be made for the period subject to	Not Rated [N/R]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
					audit.	
451 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 7.2(5)***	A Code participant must notify any affected network operator of any change to the contact details it notified to the network operator at least 3 business days before the change takes effect.	4	During the audit period there have been changes to the Tronox contact details maintained within the MPI Web Portal (Metering Portal Interface Portal). As part of Tronox position handover internal requirements, areas of responsibility must be amended as required. The changes to contact personal details was confirmed by the Manager, Corp Sustainability & Energy to have occurred as required, however, the dates of changes are not recorded within the MPI Web Portal. It is noted that the requirement is documented in an excel spreadsheet maintained by the Manager, Corp Sustainability & Energy referred to asthe Generation Licence Reporting Requirements spreadsheet.	Compliant [5]
452	***Generation Licence***	***Electricity Industry Metering Code***	A Code participant must not disclose, or permit the disclosure of, confidential information	4	During the audit period there has been no disclosure of confidential information. The	Compliant

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
[TYPE 2]	***condition 5.1***	***clause 7.5***	provided to it under or in connection with the Code and may only use or reproduce confidential information for the purpose for which it was disclosed or another purpose contemplated by the Code.		Licensee has adequately identified confidential documentation and established the required controls.	[5]
453 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 7.6(1)***	A Code participant must disclose or permit the disclosure of confidential information that is required to be disclosed by the Code.	4	As above	
454 [N/R]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 8.1(1)***	Representatives of disputing parties must meet within 5 business days after a notice given by a disputing party to the other disputing parties and attempt to resolve the dispute under or in connection with the Electricity Industry Metering Code by negotiations in good faith.	5	The Manager, Corp Sustainability & Energy confirmed that no metering disputes have arisen between Western Power and Tronox during the period 24 December 2010 to 31 December 2012. Accordingly, an assessment of compliance with s.8.1 of the Metering Code cannot be made.	Not Rated [N/R]
455	***Generation Licence condition 5.1***	***Electricity Industry Metering Code***	If a dispute is not resolved within 10 business days after the dispute is referred to representative negotiations, the disputing	5	As above	Not Rated

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
[N/R]		***clause 8.1(2)***	parties must refer the dispute to a senior management officer of each disputing party who must meet and attempt to resolve the dispute by negotiations in good faith.			[N/R]
456 [N/R]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 8.1(3)***	If the dispute is not resolved within 10 business days after the dispute is referred to senior management negotiations, the disputing parties must refer the dispute to the senior executive officer of each disputing party who must meet and attempt to resolve the dispute by negotiations in good faith.	5	As above	Not Rated [N/R]
457 [TYPE 2]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 8.1(4)***	If the dispute is resolved by representative negotiations, senior management negotiations or CEO negotiations, the disputing parties must prepare a written and signed record of the resolution and adhere to the resolution.	4	As above	Not Rated [N/R]
458 [N/R]	***Generation Licence condition 5.1***	***Electricity Industry Metering Code clause 8.3(2)***	The disputing parties must at all times conduct themselves in a manner which is directed towards achieving the objective of dispute resolution with as little formality and	5	As above	Not Rated [N/R]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			technicality and with as much expedition as the requirements of Part 8 of the Code and a proper hearing and determination of the dispute, permit.			
GENERATION LICENCE CONDITON 5 – COMPLIANCE						
-	***Generation Licence condition 5.1***	***Electricity Compliance - Reporting Manual*** ***5.2.1 Format and Timing of Annual Compliance Reports***	The licensee is required to submit an annual compliance report to the Authority by 31 August for the year ending 30 June. The template for the annual compliance report is provided in section 6 of this Reporting Manual. The annual compliance report requires a licensee to: • confirm that it has complied with all applicable Type 1 and Type 2 licence obligations during the period, other than those specifically referred to in Schedule A of the annual compliance report; identify in Schedule A any Type 1 or Type 2 licence obligations that have been breached	4	Refer to finding 124	Non Compliant [2]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			during the period and provide details of: - the licence obligation that has been breached; - the nature and extent of the breach; - the impact of the breach including the number of customers and other licensees affected; - the reasons for the breach; - the actions that the licensee has taken to rectify the breach; - the actions that the licensee has taken to prevent recurrence of the breach; and - the date the licensee has, or expects to, comply again fully with the licence obligation that has been breached. The annual compliance report must be approved by the licensee's CEO or senior executive officer and an original, signed copy			

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			must be provided to the Authority by 31 August following the year ending 30 June.			
-		***Electricity Compliance Reporting Manual*** ***5.2.2 Lodgement of Compliance Reports***	A licensee must lodge an original signed copy of the annual compliance report to the following address: Chairman Economic Regulation Authority PO Box 8469 Perth Business Centre Western Australia 6849 Annual compliance reports may also be delivered by hand to the Authority's offices. Please refer to the Authority's website http://www.erawa.com.au to find the Authority's current address.	4	The licensee lodged an original signed copy of both the annual compliance reports submitted during the audit period on 13/11/12 and 24/8/11. It has been confirmed that the Authority has these documents.	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
-		***6 Annual Compliance Report Template***	Licensees must use the format for the annual compliance report included in the Electricity Compliance Reporting Manual.	4	The correct format was used in reporting the both the annual compliance reports submitted during the audit period on 13/11/12 and 24/8/11	Compliant [5]
GENERATION LICENCE CONDITIONS (NOT REFERENCED WITHIN THE ELECTRICITY COMPLIANCE AND REPORTING MANUAL)						
GENERATION LICENCE CONDITION 1 - DEFINITIONS AND INTERPRETATION						
-	***Generation Licence condition 1.1***	***Electricity Industry Act***	Definitions & Interpretations	N/A	The organisation subscribes and receives emails/correspondence from the Economic Regulation Authority in regards to changes to definitions	Not Rated [N/R]
-	***Generation Licence condition 1.2***	***Electricity Industry Act***	A reference in this licence to any applicable legislation includes, unless the context otherwise requires, any statutory modification, amendment or re-enactment of that applicable legislation.	4	The organisation has, as part of its integrated management system, established a system for identification and response to changes to legislation. It is noted that this system is not fully utilised with regards to the Generation Licence. However, the Manager, Corporate Sustainability & Energy has established an excel spreadsheet by which obligations	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
					under the licence are being tracked as being the responsibility of Tronox or Monadelphous the O&M Contractors. ▪ Legal & Other Obligations Register ▪ In Control System ▪ Generation Licence reporting requirements 2011 excel spreadsheet **OFI 4: Consideration could be given to aligning the Legal & Other Obligations Register with the Generation Licence Spreadsheet and where possible creating InControl scheduled events to ensure compliance.**	
GENERATION LICENCE CONDITION 2 - GRANT OF LICENCE						
-	***Generation Licence condition 2.1***	***Electricity Industry Act***	The licensee is granted a licence for the licence area to construct and operate existing generating works in accordance with the terms and conditions of this licence.	5	The licensee has operated the generating works in accordance with the licence EGL23. The installed capacity of the operations, as defined by EGL23, is 36 MW. ▪ Tronox Generation Licence – EGL23 – Schedule 1 ▪ Located within the operating area of the	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
					licence. ▪ Discussion with Manager, Corporate Sustainability & Energy. ▪ Tronox Land Title	
GENERATION LICENCE CONDITION 3 – TERM						
-	***Generation Licence condition 3.1***	***Electricity Industry Act***	This licence commences on the commencement date and continues until the earlier of: (a) the cancellation of the licence pursuant to clause 7 of this licence; (b) the surrender of the licence pursuant to clause 8 of this licence; or (c) the expiry date.	5	No issues with regards to surrender or cancellation of the licence were raised during the audit period. As such assessment of compliance with clause cannot be undertaken.	N/R
GENERATION LICENCE CONDITION 6 – TRANSFER						

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
-	***Generation Licence condition 6.1***	***Electricity Industry Act section 18 - Transfer of a licence***	The licence may be transferred only in accordance with the Act	5	No transfer of licence undertaken during the audit period. As such assessment of compliance with clause cannot be undertaken.	Not Rated [N/R]
GENERATION LICENCE CONDITION 7 – CANCELLATION						
	Generation Licence condition 7.1	***Electricity Industry Act section 35 - Cancellation of licence***	This licence may be cancelled only in accordance with the Act	5	No cancellation of licence undertaken during the audit period. As such assessment of compliance with clause cannot be undertaken.	Not Rated [N/R]
GENERATION LICENCE CONDITION 8 – SURRENDER OF LICENCE						
	Generation Licence condition 8.1	***Electricity Industry Act***	The licensee may only surrender the licence pursuant to this clause 8.	5	No surrender of licence undertaken during the audit period. As such assessment of compliance with clause cannot be undertaken.	Not Rated [N/R]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
	Generation Licence condition 8.2	***Electricity Industry Act***	If the licensee intends to surrender the licence the licensee must, by notice in writing to the Authority: (a) set out the date that the licensee wishes the surrender of the licence to be effective; and (b) set out the reasons why the licensee wishes to surrender the licence, including the reasons why it would not be contrary to the public interest for the surrender of the licence to be effective on the date set out in the notice.	5	As above	Not Rated [N/R]
	Generation Licence condition 8.3	***Electricity Industry Act***	Upon receipt of the notice from the licensee pursuant to clause 8.2, the Authority will publish the notice.	5	As Above	Not Rated [N/R]
	Generation Licence condition 8.4	***Electricity Industry Act***	Notwithstanding clause 8.2, the surrender of the licence will only take effect on the later of the day that: (a) the Authority publishes a notice of the	5	As Above	Not Rated [N/R]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			surrender in the Western Australian Government Gazette, such date to be at the discretion of the Authority; and (b) the licensee hands back the licence to the Authority.			
	Generation Licence condition 8.5	***Electricity Industry Act***	The licensee will not be entitled to a refund of any fees by the Authority.	5	As Above	Not Rated [N/R]
GENERATION LICENCE CONDITION 9 – RENEWAL OF LICENCE						
	Generation Licence condition 9.1	***Electricity Industry Act section 16. Renewal of licence***	This licence may be renewed only in accordance with the Act	5	No renewal of licence undertaken during the audit period. As such assessment of compliance with clause cannot be undertaken.	Not Rated [N/R]
GENERATION LICENCE CONDITION 10 - AMENDMENT OF LICENCE APPLICATION OF LICENSEE						

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
	Generation Licence condition 10.1	***Electricity Industry Act***	The licensee may apply to the Authority to amend the licence in accordance with the Act.	5	The licensee requested an amendment to licence to correct an erroneous ABN number that was detailed within EGL23. ▪ Licence Amendment Application - EGL023 - Tronox Management Pty Ltd - EGL023 - Tronox Management Pty Ltd ▪ Information - Tiwest Pty Ltd - Amendment to Electricity Generation Licence EGL23 ▪ Decision on amendment of Electricity Generation Licence 23 (EGL23) - Tronox Management Pty Ltd (previously Tiwest Pty Ltd) ▪ ERA Website – www.era.com.au ▪ Government Gazette, 10 AUGUST 2012 No. 143	Compliant [5]
GENERATION LICENCE CONDITION 11 - AMENDMENT OF LICENCE BY THE AUTHORITY						
	Generation Licence condition 11.1	***Electricity Industry Act***	Subject to any applicable legislation, the Authority may amend the licence at any time in accordance with this clause.	5	The Authority have undertaken the following amendments during the audit period;	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
					▪ Government Gazette, 7 SEPTEMBER 2012 No. 161 - Minor amendments—correction of issue date. ▪ Government Gazette, 28 JANUARY 2011 No. 12 Electricity Licence Review 2010 amendment by substitution.	
	Generation Licence condition 11.2	***Electricity Industry Act***	Before amending the licence under clause 11.1, the Authority must: (a) provide the licensee with written notice of the proposed amendments under consideration by the Authority; (b) allow 15 business days for the licensee to make submissions on the proposed amendments; and (c) take into consideration those submissions.	5	As Above	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
	Generation Licence condition 11.3	***Electricity Industry Act***	This clause also applies to the substitution of the existing licence.	5	As Above	Compliant [5]
	Generation Licence condition 11.4	***Electricity Industry Act***	For avoidance of doubt, the licensee will not have to pay a fee for amendments under clause 11.	5	As Above	Not Rated [N/R]
GENERATION LICENCE CONDITION 13 - INDIVIDUAL PERFORMANCE STANDARDS						
	Generation Licence condition 13.1	***Electricity Industry Act***	Performance standards are contained in applicable legislation.	5	There are no specific performance standards established for EGL23 accordingly this clause cannot be rated.	Not Rated [N/R]
	Generation Licence condition 13.2	***Electricity Industry Act A20***	The Authority may prescribe individual performance standards applying to the licensee in respect of the licensee's obligations under this licence or the applicable legislation.	5	As above	Not Rated [N/R]
	Generation Licence	***Electricity Industry***	Before approving any individual performance	5	As above	Not Rated

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
	condition 13.3	***Act***	standards under this clause, the Authority will: (a) provide the licensee with a copy of the proposed individual performance standards; (b) allow 15 business days for the licensee to make submissions on the proposed individual performance standards; and (c) take into consideration those submissions.			[N/R]
GENERATION LICENCE CONDITION 14 - PERFORMANCE AUDIT						
	Generation Licence condition 14.3	***Electricity Industry Act***	The licensee may seek a review of any of the requirements of the Authority's standard audit guidelines in accordance with clause 19.1	5	The Licensee did not seek a review of any of the requirements of the Authority's standard audit guidelines during the audit period 24 December 2010 to 31 December 2012	Not Rated [N/R]
	Generation Licence condition 14.4	***Electricity Industry Act***	The performance audit must be conducted by an independent auditor approved by the Authority. If the licensee fails to nominate an auditor within one month of the date that the performance audit was due, or the auditor	5	The Licensee nominated auditors in accordance with the Audit Guidelines 2010 and the Electricity Industry Act • Auditor Approval letter ERA (Ref	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			nominated by the licensee is rejected on two successive occasions by the Authority, the Authority may choose an independent auditor to conduct the performance audit.		D12040) – 15/1/13	
GENERATION LICENCE CONDITION 17 - PUBLISHING INFORMATION						
	Generation Licence condition 17.3	***Electricity Industry Act section 11***	If the licensee considers that the information is confidential it must; (a) immediately notify the Authority; and (b) seek a review of the Authority's decision in accordance with clause 19.1	4	Refer 125	Not Rated [N/R]
	Generation Licence condition 17.4	***Electricity Industry Act section 11***	Once it has been reviewed the decision, the Authority will direct the licensee in accordance with the review to: (a) publish the information (b) publish the information with the confidential information removed or modified;	5	Refer 125	Not Rated [N/R]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			or (c) not publish the information.			
GENERATION LICENCE CONDITION 18 – NOTICES						
	Generation Licence condition 18.2	***Electricity Industry Act section 11***	A notice will be regarded as having been sent and received: (a) when delivered in person to the addressee; or (b) 3 business days after the date of posting if the notice is posted in Western Australia; or (c) 5 business days after the date of posting if the notice is posted outside Western Australia; or (d) if sent by facsimile when, according to the sender's transmission report, the notice has been successfully received by the addressee; or (e) if sent by electronic means when, according to the sender's electronic record, the notice	5	All notices sent during the audit period in accordance with 18.2	Compliant [5]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
			has been successfully sent to the addressee.			
GENERATION LICENCE CONDITION 19 - REVIEW OF THE AUTHORITY'S DECISIONS						
	Generation Licence condition 19.1	***Electricity Industry Act section 11***	The licensee may seek a review of a reviewable decision by the Authority pursuant to this licence in accordance with the following procedure: (a) the licensee shall make a submission on the subject of the reviewable decision within 10 business days (or other period as approved by the Authority) of the decision; and (b) the Authority will consider the submission and provide the licensee with a written response within 20 business days.	5	During the audit period the licensee did not seek a review of a reviewable decision by the Authority.	Not Rated [N/R]
	Generation Licence condition 19.2	***Electricity Industry Act section 11***	For avoidance of doubt, this clause does not apply to a decision of the Authority pursuant to the Act, nor does it restrict the licensee's right to have a decision of the Authority reviewed in accordance with the Act.	5	As Above	Not Rated [N/R]

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
GENERATION LICENCE CONDITION 20 - ASSET MANAGEMENT SYSTEM						
	Generation Licence Condition 20.6	***Electricity Industry Act section 14***	The licensee may seek a review of any of the requirements of the Authority's standard audit guidelines dealing with the asset management system in accordance with clause 19.1.	5	The Licensee did not seek a review of any of the requirements of the Authority's standard audit guidelines during the audit period 24 December 2010 to 31 December 2012	Not Rated [N/R]
	Generation Licence Condition 20.7	***Electricity Industry Act section 14***	The review of the asset management system must be conducted by an independent expert approved by the Authority. If the licensee fails to nominate an independent expert within one month of the date that the review of the asset management system was due, or the independent expert nominated by the licensee is rejected on two successive occasions by the Authority, the Authority may choose an independent expert to conduct the review of the asset management system.	5	The Licensee nominated auditors in accordance with the Audit Guidelines 2010 and the Electricity Industry Act • Auditor Approval letter ERA (Ref D12040) – 15/1/13	Compliant [5]
SCHEDULE 1 - LICENCE DETAILS						

REF*	LICENCE CONDITION	RELATED LEGISLATION	LEGISLATIVE/LICENCE REQUIREMENT	AUDIT PRIORITY	AUDITING FINDING ▪ RELATED DOCUMENTATION &/OR SYSTEMS/AUDIT EVIDENCE → OPPORTUNITY FOR IMPROVEMENT	COMPLIANCE RATING**
	Schedule 1 - 1	***Licence Area***	The licence area is the area as set out in plan ERA-EL-048B	5	Plan ERA-EL-048 accurately reflects the licence area	Compliant [5]
	Schedule 1 - 2	***Commencement Date***	24/12/2010	5	Commencement of Licence as detailed in Schedule 1-2	Compliant [5]
	Schedule 1 - 3	***Expiry Date***	23/12/2040	5	The Licence has not expired during the audit period	Not Rated [N/R]
SCHEDULE 1 - LICENCE DETAILS						
				N/A	There have been no additional licence clauses specified in Schedule 2 of Licence EGL23	Not Rated [N/R]

APPENDIX 2

TRONOX MANAGEMENT PTY LTD
ASSET MANAGEMENT REVIEW
MARCH 2013

Table 1.0 Effectiveness Criteria Descriptors

1	Key Process - Asset Planning *Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).*	Outcome *Integration of asset strategies into operational or business plans will establish a framework for existing and new assets to be effectively utilised and their service potential optimised.*
1.1	Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning	
1.2	Service levels are defined	
1.3	Non-asset options (e.g. demand management) are considered	
1.4	Lifecycle costs of owning and operating assets are assessed	
1.5	Funding options are evaluated	
1.6	Costs are justified and cost drivers identified	
1.7	Likelihood and consequences of asset failure are predicted	
1.8	Plans are regularly reviewed and updated	
2	Key Process - Asset creation/acquisition *Asset creation/acquisition means the provision or improvement of an asset where the outlay can be expected to provide benefits beyond the year of outlay.*	Outcome *A more economic, efficient and cost-effective asset acquisition framework which will reduce demand for new assets, lower service costs and improve service delivery.*
2.1	Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions	
2.2	Evaluations include all life-cycle costs	
2.3	Projects reflect sound engineering and business decisions	
2.4	Commissioning tests are documented and completed	
2.5	Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood	
3	Key process - Asset disposal *Effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets. Alternatives are evaluated in cost-benefit terms*	Outcome *Effective management of the disposal process will minimise holdings of surplus and under-performing assets and will lower service costs.*
3.1	Under-utilised and under-performing assets are identified as part of a regular systematic review process	
3.2	The reasons for under-utilisation or poor performance are critically examined and corrective action or disposal undertaken	
3.3	Disposal alternatives are evaluated	
3.4	There is a replacement strategy for assets	

4	Key Process - Environmental analysis *Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system.*	Outcome *The asset management system regularly assesses external opportunities and threats and takes corrective action to maintain performance requirements.*
4.1	Opportunities and threats in the system environment are assessed	
4.2	Performance standards (availability of service, capacity, continuity, emergency response, etc) are measured and achieved	
4.3	Compliance with statutory and regulatory requirements	
4.4	Achievement of customer service levels	
5	Key Process - Asset operations *Operations functions relate to the day-to-day running of assets and directly affect service levels and costs.*	Outcome *Operations plans adequately document the processes and knowledge of staff in the operation of assets so that service levels can be consistently achieved.*
5.1	Operational policies and procedures are documented and linked to service levels required	
5.2	Risk management is applied to prioritise operations tasks	
5.3	Assets are documented in an Asset Register including asset type, location, material, plans of components, an assessment of assets' physical/structural condition and accounting data	
5.4	Operational costs are measured and monitored	
5.5	Staff receive training commensurate with their responsibilities	
6	Key process - Asset maintenance *Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.*	Outcome *Maintenance plans cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost.*
6.1	Maintenance policies and procedures are documented and linked to service levels required	
6.2	Regular inspections are undertaken of asset performance and condition	
6.3	Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	
6.4	Failures are analysed and operational/maintenance plans adjusted where necessary	
6.5	Risk management is applied to prioritise maintenance tasks	
6.6	Maintenance costs are measured and monitored	
7	Key process - Asset Management Information System (MIS) *An asset management information system is a combination of processes, data and software that support the asset management functions.*	Outcome - *The asset management information system provides authorised, complete and accurate information for the day-to-date running of the asset management system. The focus of the review is the accuracy of performance information used by the licensee to monitor and report on service standards.*
7.1	Adequate system documentation for users and IT operators	
7.2	Input controls include appropriate verification and validation of data entered into the system	
7.3	Logical security access controls appear adequate, such as passwords	
7.4	Physical security access controls appear adequate	
7.5	Data backup procedures appear adequate	
7.6	Key computations related to licensee performance reporting are materially accurate	
7.7	Management reports appear adequate for the licensee to monitor licence obligations	
8	Key Process - Risk Management *Risk management involves the identification of risks and their management within an acceptable level of risk.*	Outcome *An effective risk management framework is applied to manage risks related to the maintenance of service standards*
8.1	Risk management policies and procedures exist and are being applied to minimise internal and external risks associated with the asset management system	
8.2	Risks are documented in a risk register and treatment plans are actioned and monitored	
8.3	The probability and consequences of asset failure are regularly assessed	
9	Key Process - Contingency Planning *Contingency plans document the steps to deal with the unexpected failure of an asset.*	Outcome- *Contingency plans have been developed and tested to minimise any significant disruptions to service standards.*
9.1	Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	
10	Key Process - Financial Planning *The financial planning component of the asset management plan brings together the financial elements of the service delivery to ensure its financial viability over the long term.*	Outcome *A financial plan that is reliable and provides for long-term financial viability of services*
10.1	The financial plan states the financial objectives and strategies and actions to achieve the objectives	
10.2	The financial plan identifies the source of funds for capital expenditure and recurrent costs	
10.3	The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance	

	sheets)
10.4	The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period
10.5	The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services
10.6	Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary

11	Key Process - Capital Expenditure Planning *The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each over the next five or more years.* *Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would usually be based on firm estimates.*	Outcome - *A capital expenditure plan that provides reliable forward estimates of capital expenditure and asset disposal income, supported by documentation of the reasons for the decisions and evaluation of alternatives and options.*
11.1	There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates	
11.2	The plan provide reasons for capital expenditure and timing of expenditure	
11.3	The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	
11.4	There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned	
12	Key Process - Review of AMS *The asset management system is regularly reviewed and updated*	Outcome *Review of the Asset Management System to ensure the effectiveness of the integration of its components and their currency.*
12.1	A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current	
12.2	Independent reviews (e.g. internal audit) are performed of the asset management system	

Table 2.0 Audit Review Ratings & Recommendations

1	Key Process - Asset Planning *Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).* Outcome *Integration of asset strategies into operational or business plans will establish a framework for existing and new assets to be effectively utilised and their service potential optimised.*	Asset management process and policy definition adequacy rating A	Asset management performance rating 2

Interviewees:

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1	KMK Asset Management Plan 2012
2	KMK Co-gen Asset Management Plan 2011
3	Monthly reports
10	MEX User Guide
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13	Co-gen Operations Agreement
24	MEX Asset List
32	NOx humidity Instrument
33	Transformer OTI and WTI
41	Asset effective life for depreciation
42	Sub contractor management
43	Supply chain principals and rules
44	Supply agreements
45	Purchasing
46	Major Events
47	Emergency Response Plan KMK Co-gen facility
67	KMK Co-generation facility operations control guideline
68	Capacity credit test on Wed 6th March.
71	Dispatch Instruction Acknowledgement Work Instruction.

Criteria Effectiveness			Post Review Audit Priority						
	Policy	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			

1.1	Ref docs - 1, 2, 3, 10, 12, 13, 41, 42, 43, 44, 45, 67 & 71 ,	Primary purpose of the plant is to supply process steam at defined temperature and pressure. Power generation is a by-product. The Tronox - Monadelphous agreement details maintenance scope and asset review process that identifies asset needs for changes in the assets. Established process forecasts and communicates process steam requirements. IMO process managed by experts (Perth Energy). Maintenance and capital works are planned with these considerations in mind.	C	2	M	M	4	A	1
1.2	Ref docs - 1, 2, 3, 10, 12, 13, 42, 43, 44, 45 & 68	The Tronox - Monadelphous agreement details maintenance scope. Steam parameters and availability defined and achieved. Current debate on the interpretation of reserve capacity when the system is islanded but this only affects capacity payments.	C	2	M	M	4	A	1
1.3	Ref docs – 1, 2, 3, 12 & 13	Co-gen utilises waste heat to improve overall efficiency and financial returns from the steam generator.	C	1	L	M	5	A	1
1.4	Ref docs – 1, 2, 3, 10 &12, 41	Life cycle costs are monitored, evaluated, reported and incorporated into the business and budget planning processes. Contract constructed to reward preventative maintenance.	B	2	M	M	4	A	1
1.5	Ref docs – 1, 2, 3, 10, 12, 42, 43, 44 & 45	All funding is internal to Tronox overseen by the US parent company.	B	2	M	M	4	A	1
1.6	Ref docs – 1, 2, 3, 10, 12, 13, 25, 26, 27, 31, 33, 39, 40, 41, 42, 43, 44 & 45	Request for Budget Inclusion, RBI, and Application for Expenditure, AFE, processes provides long term financial planning and requires cost justification.	C	2	M	M	4	A	1
1.7	Ref docs – 1, 2, 3, 10, 12, 13, 24, 32, 33, 42, 43, 44, 45, 46 & 47 Note: Audit Priority changed from 2 to 4 due to review and assessment of control adequacy. Control mechanisms are sufficient and adequately address requirements.	Co-gen is vulnerable to several single modes of failure, including GT, transformer, gas and steam supply systems. The likelihood and consequences of asset failure are analysed Plant availability and incidents are regularly reported, a procedure exists to ensure that all incidents are reviewed. Insured for loss of production. Contingency plans are in place but not	B	2	H	M	4	A	2

		clearly documented							
1.8	Ref docs – 1, 2, 3, 10, 12 & 13	Annual asset review and update of the AMS. Maintenance history retained in MEX	C	1	L	M	5	A	1

Comments & Recommendations
1.7 Contingency plans appear not to be clearly documented or detail designed. .
Recommendation. Contingency plans be documented and details investigated .

2	Key Process - Asset creation/acquisition *Asset creation/acquisition means the provision or improvement of an asset where the outlay can be expected to provide benefits beyond the year of outlay.* Outcome *A more economic, efficient and cost-effective asset acquisition framework which will reduce demand for new assets, lower service costs and improve service delivery.*	Asset management process and policy definition adequacy rating A	Asset management performance rating 1

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18	Training matrix
19	KMK Suppliers
20	Monadelphous QA certificate
24	MEX Asset List
25	External lighting upgrade
26	Control room air-conditioning
27	Welfare facilities
28	Defective MOD
29	Ph sensor failure
30	PVC 10206
31	Site security camera
32	NOx humidity Instrument
33	Transformer OTI and WTI
34	MCC air conditioner
35	Flash sump drain pump
36	UPS replacement
37	HRSG BDS access platform
38	Moog valve replacement
39	DCS upgrade
40	DCS upgrade supplementary
42	Sub contractor management
43	Supply chain principals and rules
44	Supply agreements
45	Purchasing

			54 Emergent work request example 68 Capacity credit test 72 Legal register, reporting etc 78 ERA acknowledgment receipt of compliance report						
Criteria Effectiveness			Post Review Audit Priority						
	Policy	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
2.1	Ref docs – 1, 2, 3, 10, 12, 13, 19, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45 & 54,	Project are identified early, budgeted for and authorised. OEM suppliers are preferred in many cases limiting alternatives to some extent. Evaluation of new assets is documented, reviewed and controlled.	B	2	M	M	4	A	1
2.2	Ref docs – 1, 2, 3, 10, 12, 13, 19, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45 & 54	Life –cycle costs are evaluated as part of the asset acquisition process and the maintenance management process. Having only one planned outage a year requires upmost reliability and longevity.	C	1	L	M	4	A	1
2.3	Ref docs – 1, 2, 3, 10, 12, 13, 19, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 42, 43, 44, 45 & 54,	Engineering, financial and service performance are reviewed.OEM equipment and suppliers are preferred for specialist engineering e.g. GE, Siemens, Wilson. Participation in the GTusers Group provides up to date engineering information. GE provides technical updates.	C	2	M	M	4	A	1
2.4	Ref docs – 1, 2, 3, 10, 12, 13, 19, 24, 39 & 40	Commissioning test and data are conducted and retained on MEX. Protection regularly tested by Global Testing Services. Same preferred vendors used since commencement.	C	2	M	M	4	A	1
2.5	Ref docs – 1, 2, 3, 10, 12, 13, 18, 20, 32, 68, 72 & 78	Pressure vessel, gas, electrical protection, emission testing programmed in MEX. NOx emissions monitored. Monadelphous are ISO 9001 accredited.	C	2	M	M	4	A	1

		Tronox have certification by an independent 3rd Party to AS4801, Environment Management System ISO 14001 and Quality Management ISO 9001. Effective management control and communication processes established between Tronox and operational contractor Monadelphous.							

Comments & Recommendations
Asset creation has been small scale with the focus maintaining and updating the existing plant which meets Tronox's requirements. One major addition has been GT spares as there is no longer contractual support from Verve. These spares are from the original equipment manufacturer.

3	Key process - Asset disposal *Effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets. Alternatives are evaluated in cost-benefit terms* Outcome *Effective management of the disposal process will minimise holdings of surplus and under-performing assets and will lower service costs.*	Asset management process and policy definition adequacy rating A	Asset management performance rating 1

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6	Trip Report N1115 High steam flow to GT
7	Trip Report N1116 High gas pressure to GT
8	Trip Report High NOx steam flow to GT
9	Forced outage Damper PLC failure
10	MEX User Guide
12	KMK Co-gen Contract
13	Co-gen Operations Agreement
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40	DCS upgrade supplementary
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43	Supply chain principals and rules
44	Supply agreements
45	Purchasing
46	Major Events
54	Emergent work request example
56	Request for Budget Inclusion, RBI, example
68	Capacity credit test
69	Callesta 2 oil monitor
70	IDD bushing monitor

Criteria Effectiveness			Post Review Audit Priority						
	Policy	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy Rating	Performance Rating
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3.1	Ref docs – 1, 2, 3, 10, 12, 13, 24, 32, 33, 39, 40, 68, 69 & 70	Plant performance monitored on the DCS and reported in monthly reports. Primary importance is the steam supply and plant is run with this in mind. Bi annual capacity tests for the System Operator prove GT output.	C	2	L	M	4	A	1
3.2	Ref docs – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 36, 39, 40 & 54	GT is operated well below full load due to steam requirements; this has resulted in low wear and maintenance requirements. HRSG is also part loaded most of the time. Venting steam or hot exhaust gases is required at times when islanded. Failures are analysed.	B	2	M	M	4	A	1
3.3	Ref docs – 1, 2, 3, 12, & 13	Waste products and materials are disposed of through the Tronox Plant's processes. No planned major asset replacements.	C	1	L	M	4	A	1
3.4	Ref docs – 1, 2, 3, 10, 12, 13, 19, 24, 42, 43, 44, 45, 46, 54, 56, Note: Audit Priority changed from 2 to 4 due to review and assessment of control adequacy. Control mechanisms are sufficient and adequately address requirements.	No planned major asset replacements. Major service on GT planned in which blades will be replaced and burners upgraded. Parts removed to be refurbished for stock spares or returned to the supplier. Annual review of assets. Stock of GT spares obtained as Verve no longer is committed to supply these. GTusers Group a source of contingency spares. Strategy for back up transformer in place.	B	2	H	M	4	A	1

Comments & Recommendations
The consequences of a major failure of the GT or boiler would be severe but a full level of redundancy of plant cannot be justified and instead there is collaborative support from the GT User group and Verve

4	Key Process - Environmental analysis *Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system.*	Asset management process and policy definition adequacy rating	Asset management performance rating
	Outcome *The asset management system regularly assesses external opportunities and threats and takes corrective action to maintain performance requirements.*	A	1

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7	Trip Report N1116 High gas pressure to GT
8	Trip Report High NOx steam flow to GT
9	Forced outage Damper PLC failure
10	MEX User Guide
11	Technical Operations Control Guidelines
12	KMK Co-gen Contract
13	Co-gen Operations Agreement
14	Tronox EGL 23 Licence
15	Tronox EGL 23 Licence letter
16	Transfer of ownership (Pearl St responsibility)
17	ERA compliance report June 2012
18	Training Matrix
19	KMK Suppliers
72	Legal register, reporting etc

Criteria Effectiveness			Post Review Audit Priority						
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			C=unlikely	3=major	H=high	W=weak			
4.1	Ref docs - 1, 2, 3, 10, 12, 13	Steam requirements for the pigment plant control generation. High value product can be stockpiled during low price periods. Tronox supply markets worldwide with various grades of product. Take or pay gas supply minimises risk to supply. Cap and floor bids with the IMO minimise influence of external power demands. Mutual support through KIMA available in event of on or near site emergency incidents.	B	2	M	M	4	A	1
4.2	Ref docs - 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 & 18	The Tronox - Monadelphous agreement details steam parameters and availability requirements which have been achieved. The monthly reports document the performance of the plant, fuel supply and customer demand.	C	2	M	M	4	A	1
4.3	Ref docs - 1, 2, 3, 10, 11, 12, 13, 14, 15, 16, 17, 18, 32 & 72	Statutory and regulatory requirements have been met and are documented and regularly reviewed.	B	2	M	M	4	A	1
4.4	Ref docs - 1, 2, 3, 10, 11, 12, 13, 14, 15, 17 & 32	Customer service levels are well documented in the monthly reports and reviewed financially and for performance internally and by the IMO.	C	2	M	M	4	A	1

Comments & Recommendations

5	Key Process - Asset operations *Operations functions relate to the day-to-day running of assets and directly affect service levels and costs.*	Asset management process and policy definition adequacy rating A	Asset management performance rating 1
	Outcome *Operations plans adequately document the processes and knowledge of staff in the operation of assets so that service levels can be consistently achieved.*		

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10	MEX User Guide
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12	KMK Co-gen Contract
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18	Training Matrix
19	KMK Suppliers
20	Monadelphous QA certificate
22	JDE Foundation
24	MEX Asset List
41	Asset effective life for depreciation
42	Sub contractor management
43	Supply chain principals and rules
44	Supply agreements
45	Purchasing
46	Major Events
47	Emergency Response Plan KMK Co-gen facility
48	Hazard Report pro forma
49	Safety Interaction pro forma
50	Take 5 pro forma
51	Toolbox Health, Safety & Environment Meeting Report

	52 High Voltage Permit Form, switching programme 53 Maintenance Access Permit KMK Co-generation Facility 54 Emergent work request example 55 Work instruction example 56 Request for Budget Inclusion, RBI, example 57 Monadelphous Energy Services Organisation Chart 58 Work plan example, MS project 59 Tronox organisation chart 60 Black Start Work Instruction 61 Islanding Process 62 Liaison with WP 63 DCS printout SLD, PID 64 Manual Islanding Work Instruction 65 Operations shift guide 66 Day to day work management guideline 67 KMK Co-generation facility operations control guideline 68 Capacity credit test on Wed 6th March. 70 IDD bushing monitor 71 Dispatch Instruction Acknowledgement Work Instruction.
Criteria Effectiveness	Post Review Audit Priority

	Policy	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy Rating	Performance rating
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5.1	Ref docs – 1, 2, 3, 10, 11, 12, 13, 18, 19, 20, 24, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 53, 54, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 70 & 71	Operating policies and procedures (including emergency procedures) are well documented and regularly reviewed. Availability target has always been met.	C	2	L	M	4	A	1
5.2	Ref docs – 1, 2, 3, 10, 11, 12, 13, 18, 19, 20, 24, 41, 42, 43, 44, 45, 54,55, 56, 57, 58, 59, 65, 66 & 67	Maintenance work is programmed through MEX based on historical performance and manufacturers, GE and GT users Group provide regular updates on similar GT's	B	1	L	M	5	A	1

		performance. Insurers, FM Global, cover includes loss of pigment production, and they audit and require actions to minimise risk and their exposure e.g. condition monitoring on the transformer. Planning for the annual outages starts well in advance.							
5.3	Ref docs – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 20, 21, 22, 24& 45	MEX has records of asset maintenance from when the plant was built in 1998-9. Annual review of asset's condition reported. New assets are added to MEX.	C	2	M	M	4	A	1
5.4	Ref docs – 1, 2, 3, 10, 11, 12, 13, 22, 24, 56, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68 & 71	Steam and power outputs are recorded with gas input and reported monthly. Generation exported and imported are reported to the IMO by System Management. Bi annual GT Reserve Capacity tests for IMO record capacity. Tronox use Ellipse where costs are recorded and Monadelphous use JDE financial management packages.	B	2	M	M	4	A	1
5.5	Ref docs – 1, 2, 3, 10, 11, 12, 13, 18 & 72	All on site co-gen staff have boiler tickets and either electrical, instrument or mechanical qualifications. Training is provided for asset alterations such as the update of the DCS. Licence expiry dates are monitored in MEX	C	2	M	M	4	A	1

Comments & Recommendations

6	Key process - Asset maintenance *Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.* Outcome *Maintenance plans cover the scheduling and resourcing of the maintenance tasks so that work can be done on time and on cost.*	Asset management process and policy definition adequacy rating A	Asset management performance rating 1

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Criteria Effectiveness			Post Review Audit Priority						
	Policy	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy Rating	Performance Rating
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6.1	Ref docs – 1, 2, 3, 10, 11, 12, 13, 18, 19, 20, 24, 42, 43, 53, 54, 55, 56, 57, 58, 62, 66 & 67	Maintenance plans, policy and procedures are well documented in MEX and are based on records from the whole life of the plant. Records of the GT prior to location on site are poor and critical components that cannot be traced are replaced.	B	2	M	M	4	A	1
6.2	Ref docs – 1, 2, 3, 10, 11,12, 13, 19, 58, 68, 69 & 70	Plant inspections are carried out 2 times per shift with regular, major inspections and an annual asset condition review which is reported to Tronox. Condition monitoring instruments on transformer and GT Performance conditions are monitored on the DCS.	C	2	M	M	4	A	1
6.3	Ref docs – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 18, 19, 20, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 64, 65, 66, 67 & 68	Maintenance outages of the plant are currently a 6 year cycle of yrs1, 2, 4 and 5, combustion parts inspection, yr3 hot gas path inspection and yr6 major maintenance outage. Planning starts well before so parts can be procured. All outage records are reported and collated on MEX and the DCS.	B	2	M	M	4	A	1
6.4	Ref docs – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39 & 40	Asset failures are analysed, reported and reviewed. Failures are reported in the monthly reports and discussed at toolbox meetings. Maintenance and/or operational plans are modified as required. e.g. CO_2 activation.	C	2	M	M	4	A	1
6.5	Ref docs – 1, 2, 3, 10, 11, 12, 13, 24, 26, 38, 39, 40, 41, 55, 56, 58, 66, 67, 69 & 70	Maintenance tasks are prioritised with whole of plant risk assessments, MEX plant history and insurer's advice. Day to day maintenance tasks are programmed via MEX and prioritised at the toolbox meetings.	C	2	M	M	4	A	1

		A combination of MEX data, DCS data, operating procedures and plant knowledge and history are utilised to rate risk and prioritise maintenance tasks.							
6.6	Ref docs – 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 54, 55, 56 & 71	Operational maintenance falls under the Tronox – Monadelphous contract and are monitored by Monadelphous. Unplanned works are on a cost plus basis using either nominated contractors, e.g. GE or Alstom or market prices depending on the complexity and value of the works. Tronox have a long term service agreement, LTSA, with Siemens for the DCS covering maintenance. Deviations from budget are reported and investigated.	C	2	M	M	4	A	1

Comments & Recommendations
Note: Historical records of the GT whilst it was at Pinjar prior to relocation to Tronox are poor and where GE Technical Bulletins are issued concerning vulnerable parts Tronox err on the safe side if they cannot identify the history of the parts concerned and replace them.

7	Key process - Asset Management Information System (MIS) *An asset management information system is a combination of processes, data and software that support the asset management functions.*	Asset management process and policy definition adequacy rating A	Asset management performance rating 2
	Outcome *The asset management information system provides authorised, complete and accurate information for the day-to-date running of the asset management system. The focus of the review is the accuracy of performance information used by the licensee to monitor and report on service standards.*		

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Chris Waterman	Operator/Maintainer	Monadelphous

Relevant documentation:

1	KMK Asset Management Plan 2012
2	KMK Co-gen Asset Management Plan 2011
3	Monthly reports
10	MEX User Guide
11	Technical Operations Control Guidelines
12	KMK Co-gen Contract
13	Co-gen Operations Agreement
14	Tronox EGL 23 Licence
15	Tronox EGL 23 Licence letter
16	Transfer of ownership (Pearl St responsibility)
17	ERA compliance report June 2012
18	Training Matrix
19	KMK Suppliers
20	Monadelphous QA certificate
21	Business Management System Document Control
22	JDE Foundation
23	Use of Compaby IT
24	MEX Asset List
25	External lighting upgrade
26	Control room air-conditioning
27	Welfare facilities
28	Defective MOD
29	Ph sensor failure
30	PVC 10206
31	Site security camera
32	NOx humidity Instrument
33	Transformer OTI and WTI

	34 MCC air conditioner 35 Flash sump drain pump 36 UPS replacement 37 HRSG BDS access platform 38 Moog valve replacement 39 DCS upgrade 40 DCS upgrade supplementary 41 Asset effective life for depreciation 42 Sub contractor management 43 Supply chain principals and rules 44 Supply agreements 45 Purchasing 46 Major Events 47 Emergency Response Plan KMK Co-gen facility 48 Hazard Report pro forma 49 Safety Interaction pro forma 50 Take 5 pro forma 51 Toolbox Health, Safety & Environment Meeting Report 52 High Voltage Permit Form, switching programme 53 Maintenance Access Permit KMK Co-generation Facility 54 Emergent work request example 55 Work instruction example 56 Request for Budget Inclusion, RBI, example 58 Work plan example, MS project 59 Tronox organisation chart 60 Black Start Work Instruction 61 Islanding Process 63 DCS printout SLD, PID 64 Manual Islanding Work Instruction 65 Operations shift guide 66 Day to day work management guideline 67 KMK Co-generation facility operations control guideline 68 Capacity credit test on Wed 6th March. 69 Callesta 2 oil monitor 70 IDD bushing monitor 71 Dispatch Instruction Acknowledgement Work Instruction.

			72 Legal register, reporting etc 73 EGL23 ver 3.1 revised for Tronox 74 ERA letter confirming licence change 75 Verve WP ETAC transfer correspondence 76 ERA acknowledge receipt of Compliance Report.						
Criteria Effectiveness			Post Review Audit Priority						
	Policy	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy Rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
7.1	Ref docs – 1, 2, 3, 10, 11, 12, 13, 18, 19, 20, 21, 23, 24, 39, 40, 41, 42, 43, 44, 45, 61, 63, 64, 72, 73, 74, 75 & 76	Tronox have a long term service agreement, LTSA, with Siemens for the DCS covering its maintenance. MEX is well documented and has been employed since the plant was established. Monadelphous uses an isolated LAN system for documentation with back up off site. This is soon to be integrated with their corporate system. Critical computers are isolated from the internet.	B	2	M	M	4	A	1
7.2	Ref docs – 1, 2, 3, 11, 12, 13, 21, 22, 23, 24, 66, 67 & 68	Interfacing with the IMO is by Perth Energy who are contracted to complete electricity market activities on Tronox's behalfData is collected by the DCS and reported. Steam, power and gas usage is monitored and trended by Tronox. Power metering is conducted by Western Power, no check meters are installed, however, efficiency is monitored and reported in monthly reports. Gas metering by ATCO who are contracted by gas supplier, Synergy.	B	1	L	M	5	A	1

7.3	Ref docs – 1, 2, 3, 10, 11, 12, 13, 21, 23, 31, 66, 67 & 72	Computer access is limited to staff and passwords are in place. Similarly access to the DCS and its data acquisition system is also controlled to ensure validity of data entry. DCS data exchange with Tronox is by fibre and is limited with duplicate firewall protection. Back up data stored off site. Monadelphous IT system to be incorporated into their corporate intranet in the future, currently it is independent.	B	2	M	M	4	A	1
7.4	Ref docs – 1, 2, 3, 10, 11, 12, 13, 61, 65, 66 & 67	The co-gen site surrounded by secure areas, BP, Western Power and Tronox and has its own swipe card operated gate, only Monadelphous staff receive swipe cards, all other visitors must contact the control room to gain access. The site is monitored by CCTV cameras with movement activated zoom. The site is attended by at least two operators 24/7.	B	2	M	M	4	A	1
7.5	Ref docs – 1, 2, 3, 10, 11, 12, 13, 23, 24, 25, 66 & 67	Operational data is backed up onto CDs; DCS has off site back up by Siemens. USB dedicated ports are blocked. DCS has co-server swap out in event of failure.	B	2	M	M	4	A	2
7.6	Ref docs – 1, 2, 3, 11, 12, 13, 17, 21, 22, 23, 68, 71, 72, 73, 74, 75, 76,	Monitoring of electrical energy transfer between Tronox and the SWIS is with Western Power calibrated metering at the KMK substation. Natural gas supply is from the Dampier Bunbury Gas Pipeline with Synergy tariff metering. Perth Energy manages the IMO market involvement.	B	2	M	M	4	A	2
7.7	Ref docs – 1, 2, 3, 11, 12, 13, 14, 15, 16, 17, 21, 22, 23, 46, 48, 49, 50, 51, 52, 53, 54, 56, 58, 59, 66, 67, 68, 71, 72, 73, 74, 75, 76,	Management reports are regular and appear adequate and appropriate. Marginally late with the last ERA Compliance Report due to staff changes.	C	1	L	M	5	A	1

Comments & Recommendations
7.5 Manual back up to CD's is vulnerable to error and an automated system is recommended.
7.6 Since there is no kWh check metering calibration should be reviewed or some means of checking implemented.
Recommendations.

Automate data backup system and store off site. Review accuracy of electrical tariff metering.

8	Key Process - Risk Management *Risk management involves the identification of risks and their management within an acceptable level of risk.*	Asset management process and policy definition adequacy rating A	Asset management performance rating 1
	Outcome *An effective risk management framework is applied to manage risks related to the maintenance of service standards*		

Interviewees:

Rez Khan	Risk Engineer	Tronox
Karen Boyce	Manager Corporate Sustainability and Energy	Tronox
Michael Slee	Finance Group Leader	Tronox
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Peter Craddon	Senior Operator/ Maintainer	Monadelphous
Ross Sinclair	Operator/Maintainer	Monadelphous
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Relevant documentation:

1	KMK Asset Management Plan 2012
2	KMK Co-gen Asset Management Plan 2011
3	Monthly reports
4	Trip Report N1101 CO2 release
5	Trip Report N1108 GT low gas pressure trip
6	Trip Report N1115 High steam flow to GT
7	Trip Report N1116 High gas pressure to GT
8	Trip Report High NOx steam flow to GT
9	Forced outage Damper PLC failure
12	KMK Co-gen Contract
13	Co-gen Operations Agreement
18	Training Matrix
19	KMK Suppliers
20	Monadelphous QA certificate
42	Sub contractor management
43	Supply chain principals and rules
44	Supply agreements
45	Purchasing
46	Major Events
47	Emergency Response Plan KMK Co-gen facility
48	Hazard Report pro forma
49	Safety Interaction pro forma
50	Take 5 pro forma
51	Toolbox Health, Safety & Environment Meeting Report
52	High Voltage Permit Form, switching programme
53	Maintenance Access Permit KMK Co-generation Facility
56	Request for Budget Inclusion, RBI, example
60	Black Start Work Instruction
61	Islanding Process

			63 DCS printout SLD, PID 64 Manual Islanding Work Instruction 67 KMK Co-generation facility operations control guideline 68 Capacity credit test on Wed 6th March. 69 Callesta 2 oil monitor 70 IDD bushing monitor						
Criteria Effectiveness			Post Review Audit Priority						
	Policy	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy Rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
8.1	Ref docs – 1, 2, 3,4, 5, 6, 7, 8, 9, 11, 12, 13, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 56, 60, 61, 63, 64, 67, 68, 69, 70,	Tronox have ISO 9001, AS4801 and ISO14001 accreditation. Risk management integral with their management and safety policies. The process gases are potentially dangerous if released, boiler pressure vessels are certified, loss of production is insured, contingency plans are in place and the market risk is managed through stockpiling. Management ISO 9001. Membership of GT Users Forum, KIMA, KIC and their relationship with Verve Energy also manage risk.	C	2	M	S	4	A	1
8.2	Ref docs – 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 47, 48, 49, 50, 51 & 56	Risk are identified and monitored in the monthly reports and on the risk register. The workplan incorporates rectification works. Safety audits are regularly carried out.	C	1	L	S	5	A	1
8.3	Ref docs – 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 47, 48, 49, 50, 51 & 56 Note: Audit Priority changed from 2 to 4 due to review and assessment of control adequacy. Control mechanisms are sufficient and adequately address requirements.	The probability and consequences of asset failure are reviewed with the risk register regularly updated. Risk assessment is part of the annual AMS review and update	C	2	M	S	4	A	1

Comments & Recommendations

9	Key Process - Contingency Planning *Contingency plans document the steps to deal with the unexpected failure of an asset.* Outcome- *Contingency plans have been developed and tested to minimise any significant disruptions to service standards.*	Asset management process and policy definition adequacy rating A	Asset management performance rating 2

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Relevant documentation:

1	KMK Asset Management Plan 2012
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3	Monthly reports
10	MEX User Guide
11	Technical Operations Control Guidelines
12	KMK Co-gen Contract
13	Co-gen Operations Agreement
18	Training Matrix
24	MEX Asset List
47	Emergency Response Plan KMK Co-gen facility
60	Black Start Work Instruction
61	Islanding Process
63	DCS printout SLD, PID
64	Manual Islanding Work Instruction
71	Dispatch Instruction Acknowledgement Work Instruction.

	Criteria Effectiveness		Post Review Audit Priority						
	Policy	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy Rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
9.1	Ref doc – 1, 2, 3, 10, 11, 12, 13, 24, 47, 60, 61, 62, 63, 64 & 71 Note: Audit Priority changed from 2 to 4 due to review and assessment of control adequacy. Control mechanisms are	Co-gen operations come under the Tronox well developed plans for site emergency, incident and evacuation which are reviewed annually, updated accordingly, monitored and tested. Staff evacuation and plant/operation protections plans are also in	B	2	M	S	4	A	2

	sufficient and adequately address requirements.	place as part of the Kwinana Industrial zone. Co-gen operational contingencies are well documented. e.g. islanding, black start and have been tested. Loss of critical power and steam generation plant has been considered and contingency plans are in place but those for power do not appear to be documented in detail.							

Comments & Recommendations
9.1 Contingency plans seem to be adequate apart from those for a transformer failure which appear not to be clearly documented or detail designed. The likelihood of a transformer failure is low and the financial risk for Tronox is considered acceptable. The consequences on the SWIN are also low considering the small contribution provided by the Co-gen, <1%, to the overall SWIN generation capacity...
Recommendation. Contingency plans be documented and details investigated e.g. there is no defined contingency in event of the step up transformer failing, if such an event were to occur the industry network would be used to help find a solution. A step up transformer failure would prevent exporting of power but the pigment process could continue using power from the SWIN, this is currently an acceptable risk to Tronox

10	Key Process - Financial Planning *The financial planning component of the asset management plan brings together the financial elements of the service delivery to ensure its financial viability over the long term.* Outcome *A financial plan that is reliable and provides for long-term financial viability of services*	Asset management process and policy definition adequacy rating A	Asset management performance rating 1

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Relevant documentation:

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3	Monthly reports
12	KMK Co-gen Contract
13	Co-gen Operations Agreement
21	Business Management System Document Control
22	JDE Foundation
44	Supply agreements
45	Purchasing
56	Request for Budget Inclusion, RBI, example

	Criteria Effectiveness		Post Review Audit Priority						
	Policy	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy Rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
10.1	Ref docs – 1, 2, 3, 12, 13, 21, 22, 44, 45 & 56	Steam supply is vital to the operation of the plant and loss of production costs are high. The main objective is to maintain steam supply and this is achieved by good operation and maintenance of the co-gen facility. Budget and operating costs are reported in monthly reports and monitored through spreadsheets, JDE and Ellipse and any variations investigated. IMO dealings are through Perth Energy	C	1	L	S	5	A	1

10.2	Ref docs – 1, 2, 3, 12, 13, 21, 22, 44, 45 & 56	Routine maintenance costs are included in the Monadelphous contract. These and fuel costs are in the operations budget which is approved by Tronox USA. Other major funding is from the US parent company	C	1	L	S	5	A	1
10.3	Ref docs – Sample computer displays sighted, discussion with Michael Slee	Forward financial plans cover the full 6 year GT maintenance cycle. The co-gen steam generation amounts less than 1% of Tronox's costs and doesn't warrant itemised reporting in the US parent company annual report but it is reported on at Kwinana.	C	1	L	S	5	A	1
10.4	Ref docs – Posters and 'in sites" newsletter,	Steam requirements are process driven and Tronox's declared vision is to double profits by 2017.	C	1	L	S	5	A	1
10.5	Ref docs –1, 2, 3, 12, 13 discussion with Michael Slee	Steam supply and maintenance costs are budgeted for in the annual budget. Tronox operates on calendar year and budgets are prepared mid year for submission with the business plan in November. Strategies are in place for revisions to the Capex budget. Costs are monitored against budget and variances investigated.	C	1	L	S	5	A	1
10.6	Ref docs –1, 2, 3, 12, 13 discussion with Michael Slee	Revenue and costs are monitored on a monthly basis and corrective action implemented accordingly.	C	1	L	S	5	A	1

Comments & Recommendations
Steam generation costs are only a small part of the overall pigment process cost and are directly related to production levels which fluctuate in response to market conditions. Electricity generation is a bonus contributing a very small percentage towards offsetting production costs. The focus is mainly on maintaining availability and planning critical works to be during the planned shutdowns even if this incurs higher costs.

11	Key Process - Capital Expenditure Planning *The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each over the next five or more years.* *Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would usually be based on firm estimates.*	Asset management process and policy definition adequacy rating A	Asset management performance rating 1
	Outcome - *A capital expenditure plan that provides reliable forward estimates of capital expenditure and asset disposal income, supported by documentation of the reasons for the decisions and evaluation of alternatives and options.*		

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Relevant documentation:

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10	MEX User Guide
12	KMK Co-gen Contract
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27	Welfare facilities
28	Defective MOD
29	Ph sensor failure
30	PVC 10206
31	Site security camera
32	NOx humidity Instrument
33	Transformer OTI and WTI
34	MCC air conditioner
35	Flash sump drain pump
36	UPS replacement
37	HRSG BDS access platform
38	Moog valve replacement
39	DCS upgrade
40	DCS upgrade supplementary
41	Asset effective life for depreciation

			45 Purchasing 54 Emergent work request example 56 Request for Budget Inclusion, RBI, example 58 Workplan example, MS Project						
Criteria Effectiveness			Post Review Audit Priority						
	Policy	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy Rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
11.1	Ref docs – 1, 2, 3,12, 21, 39, 40, 56, 45, 54, 56,	Budget prepared mid year for inclusion in the Business Plan submitted in Nov for US board approval. Requests for budget inclusion, RBI, detail needs and options. More detailed application prior to approval for expenditure.	C	2	M	S	4	A	1
11.2	Ref docs – 1, 2, 3, 10, 12, 13, 22, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 54 & 56	MEX, the annual asset review, risk register, condition monitoring, supplier recommendations and specialist reports are utilised as basis for capital justification. Wherever possible capital works are scheduled during the annual outages.	C	2	M	S	4	A	1
11.3	Ref docs – 1, 2, 3, 10, 12, 13, 22, 24, 54, 56 & 58	There is no planned end date for Tronox operations at Kwinana and raw material supply is not a limiting factor. Maintenance of the co-gen is based on ongoing operations.	C	2	M	S	4	A	1
11.4	Ref docs – 1, 2, 3, 10, 12, 13, 22, 24 & 58	A well documented and rigorous process is in place to ensure that capital expenditure occurs timely and on budget.	C	2	M	S	4	A	1

Comments & Recommendations

12	Key Process - Review of AMS *The asset management system is regularly reviewed and updated*	Asset management process and policy definition adequacy rating	Asset management performance rating
	Outcome *Review of the Asset Management System to ensure the effectiveness of the integration of its components and their currency.*	A	1

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Relevant documentation:

1	KMK Asset Management Plan 2012
2	KMK Co-gen Asset Management Plan 2011
3	Monthly reports
12	KMK Co-gen Contract
13	Co-gen Operations Agreement
41	Asset effective life for depreciation

Criteria Effectiveness			Post Review Audit Priority						
	Policy	Performance	Likelihood	Consequence	Inherent Risk rating	Adequacy of existing controls	Review priority	Adequacy rating	Performance Rating
			A=likely B=probable C=unlikely	1=minor 2=moderate 3=major	L=low M=medium H=high	S=strong M=moderate W=weak			
12.1	Ref doc – 1, 2, 3, 12, 13, 41,	AMS revised annually. Tronox operates on calendar year and budgets from the revised AMS are prepared mid year for submission with the business plan in November	C	1	L	S	5	A	1
12.2	Ref doc – 1, 2, 3, 12 & 13	Internal and external review of the assets and management systems are regularly conducted. Monadelphous are ISO9001 accredited. Insurers, FM Global, review risks and make recommendations. ERA requires AMS review as part of the	C	1	L	S	5	A	1

		licensing renewal. Insurance reviews have been conducted regularly and capital works initiated based on insurer's recommendations.							

Comments & Recommendations

Table 3.0 Effectiveness Criteria Pre- Audit Review

Ref	Asset management system component	Details/Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium, high	Adequacy of existing controls S=strong, M=moderate, W=weak	Review Priority					
							1	2	3	4	5	N/A
1	Asset Planning	Asset planning strategies are focused on meeting customer needs in the most effective and efficient manner (delivering the right service at the right price).					0	1	0	5	2	0
1.1		Planning process and objectives reflect the needs of all stakeholders and is integrated with business planning	2	C	MEDIUM	M				4		
1.3		Service levels are defined	2	C	MEDIUM	M				4		
1.3		Non-asset options (e.g. demand management) are considered	1	C	LOW	M					5	
1.4		Lifecycle costs of owning and operating assets are assessed	2	B	MEDIUM	M				4		
1.5		Funding options are evaluated	2	B	MEDIUM	M				4		
1.6		Costs are justified and cost drivers identified	2	C	MEDIUM	M				4		
1.7		Likelihood and consequences of asset failure are predicted	3	B	HIGH	M		2				
1.8		Plans are regularly reviewed and updated	1	C	LOW	M					5	

Ref	Asset management system component	Details/Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium, high	Adequacy of existing controls S=strong, M=moderate, W=weak	Review Priority					
2	Asset creation/acquisition	Asset creation/acquisition means the provision or improvement of an asset where the outlay can be expected to provide benefits beyond the year of outlay.					0	0	0	4	1	0
2.1		Full project evaluations are undertaken for new assets, including comparative assessment of non-asset solutions	2	B	MEDIUM	M				4		
2.2		Evaluations include all life-cycle costs	1	C	LOW	M					5	
2.3		Projects reflect sound engineering and business decisions	2	C	MEDIUM	M				4		
2.4		Commissioning tests are documented and completed	2	C	MEDIUM	M				4		
2.5		Ongoing legal/environmental/safety obligations of the asset owner are assigned and understood	2	B	MEDIUM	M				4		
3	Asset disposal	Effective asset disposal frameworks incorporate consideration of alternatives for the disposal of surplus, obsolete, under-performing or unserviceable assets. Alternatives are evaluated in cost-benefit terms					0	1	0	2	1	0
3.1		Under-utilised and under-performing assets are identified as part of a regular systematic review process	2	C	MEDIUM	M				4		
3.2		The reasons for under-utilisation or poor performance are critically examined and corrective action or	2	B	MEDIUM	M				4		

Ref	Asset management system component	Details/Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium, high	Adequacy of existing controls S=strong, M=moderate, W=weak	Review Priority					
		disposal undertaken										
3.3		Disposal alternatives are evaluated	1	C	LOW	M					5	
3.4		There is a replacement strategy for assets	3	B	HIGH	M		2				
4	Environmental analysis	Environmental analysis examines the asset system environment and assesses all external factors affecting the asset system.					0	0	0	4	0	0
4.1		Opportunities and threats in the system environment are assessed	2	B	MEDIUM	M				4		
4.2		Performance standards (availability of service, capacity, continuity, emergency response, etc) are measured and achieved	2	C	MEDIUM	M				4		
4.3		Compliance with statutory and regulatory requirements	2	B	MEDIUM	M				4		
4.4		Achievement of customer service levels	2	C	MEDIUM	M				4		
5	Asset operations	Operations functions relate to the day-to-day running of assets and directly affect service levels and costs.					0	0	0	4	1	0
5.1		Operational policies and procedures are documented and linked to service levels required	2	C	MEDIUM	M				4		

Ref	Asset management system component	Details/Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium, high	Adequacy of existing controls S=strong, M=moderate, W=weak	Review Priority					
5.2		Risk management is applied to prioritise operations tasks	1	C	LOW	M					5	
5.3		Assets are documented in an Asset Register including asset type, location, material, plans of components, an assessment of assets' physical/structural condition and accounting data	2	C	MEDIUM	M				4		
5.4		Operational costs are measured and monitored	2	B	MEDIUM	M				4		
5.5		Staff receive training commensurate with their responsibilities	2	C	MEDIUM	M				4		
6	Asset maintenance	Maintenance functions relate to the upkeep of assets and directly affect service levels and costs.					0	0	0	6	0	0
6.1		Maintenance policies and procedures are documented and linked to service levels required	2	B	MEDIUM	M				4		
6.2		Regular inspections are undertaken of asset performance and condition	2	C	MEDIUM	M				4		
6.3		Maintenance plans (emergency, corrective and preventative) are documented and completed on schedule	2	B	MEDIUM	M				4		
6.4		Failures are analysed and operational/maintenance plans adjusted where necessary	2	C	MEDIUM	M				4		

Ref	Asset management system component	Details/Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium, high	Adequacy of existing controls S=strong, M=moderate, W=weak	Review Priority					
6.5		Risk management is applied to prioritise maintenance tasks	2	C	MEDIUM	M				4		
6.6		Maintenance costs are measured and monitored	2	C	MEDIUM	M				4		
7	Asset Management Information System	An asset management information system is a combination of processes, data and software that support the asset management functions.					0	0	0	5	2	0
7.1		Adequate system documentation for users and IT operators	2	B	MEDIUM	M				4		
7.2		Input controls include appropriate verification and validation of data entered into the system	1	B	LOW	M					5	
7.3		Logical security access controls appear adequate, such as passwords	2	C	MEDIUM	M				4		
7.4		Physical security access controls appear adequate	2	B	MEDIUM	M				4		
7.5		Data backup procedures appear adequate	2	B	MEDIUM	M				4		
7.6		Key computations related to licensee performance reporting are materially accurate	2	B	MEDIUM	M				4		
7.7		Management reports appear adequate for the licensee to monitor licence obligations	1	C	LOW	M					5	
8	Risk Management	Risk management involves the identification of risks and their management within an acceptable level of risk.					0	1	0	2	0	0
8.1		Risk management policies and procedures exist and are being applied to minimise internal and	2	B	MEDIUM	M				4		

Ref	Asset management system component	Details/Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium, high	Adequacy of existing controls S=strong, M=moderate, W=weak	Review Priority					
		external risks associated with the asset management system										
8.2		Risks are documented in a risk register and treatment plans are actioned and monitored	2	C	MEDIUM	M				4		
8.3		The probability and consequences of asset failure are regularly assessed	3	B	HIGH	M		2				
9	Contingency Planning	Contingency plans document the steps to deal with the unexpected failure of an asset.					0	1	0	0	0	0
9.1		Contingency plans are documented, understood and tested to confirm their operability and to cover higher risks	3	B	HIGH	M		2				
10	Financial Planning	The financial planning component of the asset management plan brings together the financial elements of the service delivery to ensure its financial viability over the long term.					0	0	0	5	1	0
10.1		The financial plan states the financial objectives and strategies and actions to achieve the objectives	1	C	LOW	M					5	
10.2		The financial plan identifies the source of funds for capital expenditure and recurrent costs	2	C	MEDIUM	M				4		
10.3		The financial plan provides projections of operating statements (profit and loss) and statement of financial position (balance sheets)	2	C	MEDIUM	M				4		

Ref	Asset management system component	Details/Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium, high	Adequacy of existing controls S=strong, M=moderate, W=weak	Review Priority					
10.4		The financial plan provide firm predictions on income for the next five years and reasonable indicative predictions beyond this period	2	B	MEDIUM	M				4		
10.5		The financial plan provides for the operations and maintenance, administration and capital expenditure requirements of the services	2	C	MEDIUM	M				4		
10.6		Significant variances in actual/budget income and expenses are identified and corrective action taken where necessary	2	C	MEDIUM	M				4		
11	Capital Expenditure Planning	The capital expenditure plan provides a schedule of new works, rehabilitation and replacement works, together with estimated annual expenditure on each over the next five or more years. Since capital investments tend to be large and lumpy, projections would normally be expected to cover at least 10 years, preferably longer. Projections over the next five years would usually be based on firm estimates					0	0	0	1	3	0
11.1		There is a capital expenditure plan that covers issues to be addressed, actions proposed, responsibilities and dates	1	B	LOW	M					5	

Ref	Asset management system component	Details/Requirements	Consequence 1=minor, 2=moderate, 3=major	Risk Likelihood A=likely, B=probable, C=unlikely	Inherent Risk low, medium, high	Adequacy of existing controls S=strong, M=moderate, W=weak	Review Priority					
11.2		The plan provide reasons for capital expenditure and timing of expenditure	1	C	LOW	M					5	
11.3		The capital expenditure plan is consistent with the asset life and condition identified in the asset management plan	2	C	MEDIUM	M				4		
11.4		There is an adequate process to ensure that the capital expenditure plan is regularly updated and actioned	1	C	LOW	M					5	
12	Review of AMS	The asset management system is regularly reviewed and updated.					0	0	0	1	1	0
12.1		A review process is in place to ensure that the asset management plan and the asset management system described therein are kept current	2	B	MEDIUM	M				4		
12.2		Independent reviews (e.g. internal audit) are performed of the asset management system	1	B	LOW	M					5	