ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

JACKS POINT AN MERIDIAN ENERGY

Prepared by: Rebecca Elliot

Date audit commenced: 19 March 2018

Date audit report completed: 22 May 2018

Audit report due date: 31-May-18

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EXECUTIVE SUMMARY

This audit of the Jacks Point streetlight DUML database and processes was conducted at the request of Meridian Energy Limited (**Meridian**), in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1, which became effective on 1 June 2017.

Jacks Point is a private subdivision and the streetlights are owned and managed separately to the surrounding Queenstown Lakes District Council streetlights. The database is managed by Aurora and the data is held in their GIS system.

This audit found a small number of inaccuracies. This appears to be variances between what is actually installed versus what is recorded on the "as-builts" provided. The database inaccuracies showed that the new connection process is not being followed by all contractors when lights are installed. I note some of these lights have been in place for some time.

The future risk rating of 11 indicates that the next audit be completed in 12 months and I agree with this recommendation. Five non-compliances were identified, and one recommendation was raised. The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	The database accuracy is assessed to be 94.8% indicating an estimated over submission of 1,600 kWh per annum. Incorrect ballasts recorded for 305 items of load resulting in an estimated under submission of 3,568.42 kWh.	Moderate	Low	2	Identified
Description and capacity of each item of load	2.4	11(2)(c) of Schedule 15.3	One item of load with no lamp description.	Strong	Low	1	Identified
Tracking of load change	2.6	11(2A) of Schedule 15.3	Load changes not tracked in all instances.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The database accuracy is assessed to be 94.8% indicating an estimated over submission of 1,600 kWh per annum. Incorrect ballasts recorded for 305 items of load resulting in an estimated under submission of 3,568.42 kWh.	Moderate	Low	2	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database accuracy is assessed to be 94.8% indicating an estimated over submission of 1,600 kWh per annum. Incorrect ballasts recorded for 305 items of load resulting in an estimated under submission of 3,568.42 kWh.	Moderate	Low	2	Identified
Future Risk Rating						11	

Future risk rating	1-3	4-6	7-8	9-17	18-26	27+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Recommendation	Remedial outcome
Location of each item of load	2.3	Correct incorrect street names.	

ISSUES

Subject	Section	Description	Issue

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit observation

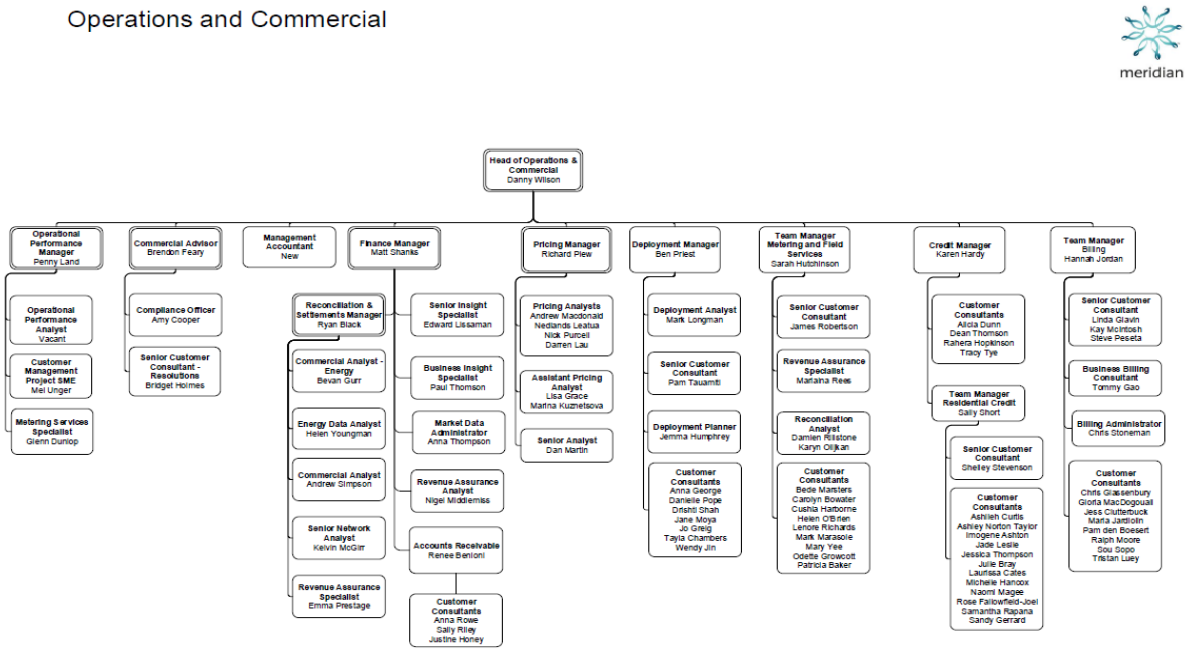
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

There are no exemptions in place relevant to the scope of this audit.

1.2. Structure of Organisation

Meridian provided a copy of their organisational structure:



1.3. Persons involved in this audit

Auditor:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Name	Title	Company
Amy Cooper	Compliance Officer	Meridian
Helen Youngman	Energy Data Analyst	Meridian
Richard Starkey	Commercial Development Manager	Aurora
Neville Hopkins	Assets System Team	Aurora
Suzanne Fraser	Contracts co-ordinator	Delta
Simeon Dwyer	Network Billing Analyst	Aurora

1.4. Hardware and Software

The GIS database used for the management of DUML is managed by Aurora.

The database back up is in accordance with standard industry procedures. Access to the database is secure by way of password protection

1.5. Breaches or Breach Allegations

There are no breach allegations relevant to the scope of this audit.

1.6. ICP Data

ICP Number	Description	NSP	Number of items of load	Database wattage (watts)
0000486616CEC8C	JACKS POINT STREET LIGHTING	FKN0331	345	7,346

1.7. Authorisation Received

All information was provided directly by Meridian and Aurora.

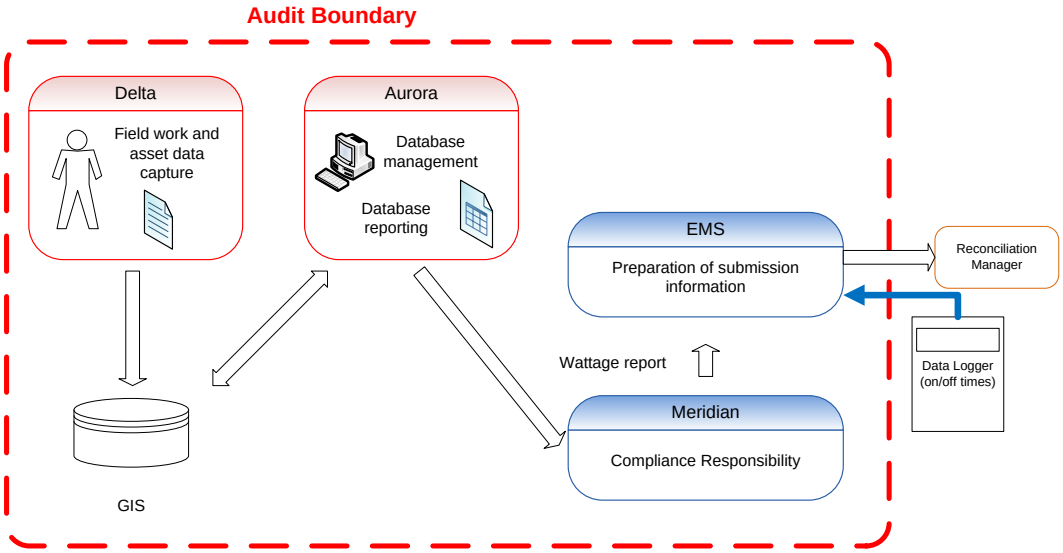
1.8. Scope of Audit

This audit of the Jacks Point streetlight DUML database and processes was conducted at the request of Meridian Energy Limited (**Meridian**), in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1, which became effective on 1 June 2017.

Jacks Point is a private subdivision and the streetlights are owned and managed separately to the surrounding Queenstown Lakes District Council streetlights. The database is managed by Aurora and the data is held in their GIS system. Delta are the field contractors.

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information based on the monthly reporting. The diagram below shows the flow of information and the audit boundary for clarity.



The audit was carried out at Aurora's premises in Cromwell on March 21st 201. The field audit was undertaken of 167 lights using the statistical sampling methodology.

1.9. Summary of previous audit

Meridian provided a copy of the previous audit report for this DUML load, conducted in March 2017 by Rebecca Elliot of Veritek Limited. Two non-compliances were found. The current status of these are detailed below:

Subject	Section	Clause	Non compliance	Status
Deriving Submission Information	2.1	11(1) of schedule 15.3	Inaccurate submission due to an inaccurate database.	Still existing
Tacking of Load Change	2.3	11(3) of schedule 15.3	Database inaccuracies found.	Still existing

1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F)

Code reference

Clause 16A.26 and 17.295F

Code related audit information

Retailers must ensure that DUML database audits are completed:

1. *by 1 June 2018 (for DUML that existed prior to 1 June 2017)*
2. *within 3 months of submission to the reconciliation manager (for new DUML)*
3. *within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.*

Audit observation

Meridian has requested Veritek to undertake this streetlight audit

Audit commentary

This audit report confirms that the requirement to conduct an audit has been met for this database within the required timeframe

Audit outcome

Compliant

2. DUML DATABASE REQUIREMENTS

2.1. Deriving submission information (Clause 11(1) of Schedule 15.3)

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

- *DUML database is up to date*
- *methodology for deriving submission information complies with Schedule 15.5.*

Audit observation

The process for calculation of consumption was examined and the database was checked for accuracy.

Audit commentary

Meridian reconciles this DUML load using the DST profile. The on and off times are derived from a data logger read by EMS. This information is used to create a shape file. Meridian supplies EMS with the capacity information and EMS calculates the kWh figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit, and compliance was confirmed.

I checked the submission for the month of March and found that the loads matched with the database.

There is some inaccurate data within the database used to calculate submissions. This is recorded as non-compliance and discussed in **3.1** and **3.2**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: 11(1) of Schedule 15.3 From: 01-Apr-17 To: 30-Apr-18	The database accuracy is assessed to be 94.8% indicating an estimated over submission of 1,600 kWh per annum. Incorrect ballasts recorded for 15 items of load resulting in an estimated minor under submission of 256.26 kWh. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate, because they are sufficient to ensure that changes to the database are correctly recorded most of the time. The impact is assessed to be low due to the kWh volumes.

Actions taken to resolve the issue	Completion date	Remedial action status
We will provide the field audit findings to our agent to investigate and resolve. We believe the issues with locating lights may relate to incorrect location information rather than the lights not being installed.	15 June 2018	Identified
We will have our agent correct the ballasts for the items of load where this was found to be incorrect.	30 June 2018	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We will provide the table of standardised wattages to our agent so that the correct ballasts are applied to any new lights added to the database.	15 June 2018	

2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3)

Code reference

Clause 11(2)(a) and (aa) of Schedule 15.3

Code related audit information

The DUML database must contain:

- *each ICP identifier for which the retailer is responsible for the DUML*
- *the items of load associated with the ICP identifier.*

Audit observation

The database was checked to confirm an ICP is recorded for each item of load.

Audit commentary

All items of load had an ICP recorded as required by this clause.

Audit outcome

Compliant

2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3)

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

The DUML database must contain the location of each DUML item.

Audit observation

The database was checked to confirm the location is recorded for all items of load.

Audit commentary

The database contains the Global Positioning System (GPS) for all items of load which meets the requirements of this clause. The street name is not correct in all instances and I recommend that the street names are corrected.

Description	Recommendation	Audited party comment	Remedial action
Location of each item of load	Correct incorrect street names.	We will ask our agent to consider making these changes.	Investigating

Audit outcome

Compliant

2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3)

Code reference

Clause 11(2)(c) and (d) of Schedule 15.3

Code related audit information

The DUML database must contain:

- *a description of load type for each item of load and any assumptions regarding the capacity*
- *the capacity of each item in watts.*

Audit observation

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage.

Audit commentary

The database contains two fields for wattage, firstly the manufacturers rated wattage and secondly the "ballast wattage". The ballast wattage is expected to be a calculated figure which accounts for any variation from the input wattage and includes losses associated with ballasts. Examination of the database found one item of load that had no light type recorded. This is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: 01-Apr-17 To: 30-Apr-18	One item of load with no lamp description. Potential impact: None Actual impact: None Audit history: None Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as strong as the data is correct for all but one item of load. The impact is assessed to be low, as the item has a wattage assigned consistent with other lights in the surrounds.

Actions taken to resolve the issue	Completion date	Remedial action status
We will ask our agent to verify the one item of load identified with no description and update if necessary.	30 June 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Existing controls are considered sufficient to mitigate risk to an acceptable level	Ongoing	

2.5. All load recorded in database (Clause 11(2A) of Schedule 15.3)

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

The retailer must ensure that each item of DUML for which it is responsible is recorded in this database.

Audit observation

The field audit was undertaken of a statistical sample of 165 items of load on 21st March 2018.

Audit commentary

The field audit findings are detailed in the table below:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Existing					
Aberdare Court	4	4			

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Arran Lane	1	1			
Big Valley Drive	2	2			
Branigan Court	1	1			
Bretby Court	7	7			
Buckler Court	2	2			
Chimney Lane	1	1			
Double Cone Road	13	11	-2		2 less 18W fluorescent lights found in the field
Durness Court	3	3			
Ellesmere Avenue	4	4			
Falconer Rise	8	8			
Fife Court	2	2			
Glenfiddich Road	10	8	-2		2 less 18W fluorescent lights found in the field
Glengarry Court	2	2			
Hovingham Court	3	3			
Kerrera Lane	2	2			
McAdam Drive	15	14	-1		1 less 18W fluorescent light found in the field
McKenzies Shute	2	2			
Orford Drive	27	27			
Pendeen Crescent	5	5			
Polperro Court	2	2			
Rabbiters Drive	5	5			
Reading Court	2	2			

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Skye Lane	17	14	-3		3 less 18W fluorescent lights found in the field
Soudley Court	5	4	-1		1 less 18W fluorescent light found in the field
Torridon Court	1	1			
New					
Falconer Rise	19	19			
Kerrera Lane	1	1			
Wanderer Lane	1	1			
Grand Total	165	156	9		

No additional items of load were found in the field. The field audit variances found are recorded as non-compliance in **section 3.1**.

Audit outcome

Compliant

2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

The DUML database must track additions and removals in a manner that allows the total load (in kW) to be retrospectively derived for any given day.

Audit observation

The process for tracking of changes in the database was examined.

Audit commentary

Any changes that are made during any given month take effect from the beginning of that month. The information is available which would allow for the total load in kW to be retrospectively derived for any day. On 20 September 2012, the Authority sent a memo to retailers and auditors advising that tracking of load changes at a daily level was not required if the database contained an audit trail. I have interpreted this to mean that the production of a monthly "snapshot" report is sufficient to achieve compliance.

Aurora expect that all new lamp installations, or changes of wattage are managed via an application for service form being provided to Aurora. As I noted in the last audit, this process does not appear to be followed by all contractors when these lights were first installed, as there were errors found in the field audit.

Condition audits are undertaken in April and October each year by Derby Partners.

No festive lights are connected to the unmetered street light circuits in Jacks Point.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.6 With: Clause 11(3) of Schedule 15.3 From: 01-Apr-17 To: 30-Apr-18	Load changes not tracked in all instances. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate, because they are sufficient to ensure that changes to the database are correctly recorded most of the time. The impact is assessed to be low due to the kWh volumes.

Actions taken to resolve the issue	Completion date	Remedial action status
We will provide the field audit findings to our agent to investigate and resolve. We believe the issues with locating lights may relate to incorrect location information recorded in the database rather than the lights not being installed or having been removed.	15 June 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We will have our agent review the processes for notifying of changes if this is identified as the root cause of the database discrepancies.	30 Sept 2018	

2.7. Audit trail (Clause 11(4) of Schedule 15.3)

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

The DUML database must incorporate an audit trail of all additions and changes that identify:

- *the before and after values for changes*
- *the date and time of the change or addition*
- *the person who made the addition or change to the database.*

Audit observation

The database was checked for audit trails.

Audit commentary

A complete audit trail of all additions and changes to the database information.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

3.1. Database accuracy (Clause 15.2 and 15.37B(b))

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

Audit must verify that the information recorded in the retailer's DUML database is complete and accurate.

Audit observation

The DUML Statistical Sampling Guideline was used to determine the database accuracy. The table below shows the survey plan.

Plan Item	Comments
Area of interest	Jacks Point private subdivision
Strata	The database contains items of load in the Jacks Point subdivision just south of Queenstown. The area has two distinct sub groups of existing and new. I decided to place the items of load into the two strata as indicated above: 1. Existing 2. New
Area units	I created a pivot table of the roads in each area and I used a random number generator in a spreadsheet to select a total of 29 sub-units.
Total items of load	165 items of load were checked.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority.

Audit commentary

The database was found to contain some inaccuracies and missing data. I note that these lights may be present in the field but mis-plotted therefore they are recorded as missing. These are likely to have been misplotted when they were first connected.

The field data was 94.8% of the database data for the sample checked. The total wattage recorded in the database for the sample was 2,975 watts. The estimated total wattage found in the field for the sample checked was 2,812 watts, a difference of 163 watts. This will result in an estimated minor amount of over submission of 1,600 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority confirmed to be compliant with the exception of 15x 70W MH lights that have a ballast recorded of 9 watts and this should be 13 watts. This will be resulting in a minor under submission of 256.26 kWh.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Apr-17 To: 30-Apr-18	The database accuracy is assessed to be 94.8% indicating an estimated over submission of 1,600 kWh per annum. Incorrect ballasts recorded for 15 items of load resulting in an estimated minor under submission of 256.26 kWh. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate, because they are sufficient to ensure that changes to the database are correctly recorded most of the time. The impact is assessed to be low due to the kWh volumes.

Actions taken to resolve the issue	Completion date	Remedial action status
We will provide the field audit findings to our agent to investigate and resolve. We believe the issues with locating lights may relate to incorrect location information rather than the lights not being installed.	15 June 2018	Identified
We will have our agent correct the ballasts for the items of load where this was found to be incorrect.	30 June 2018	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We will provide the table of standardised wattages to our agent so that the correct ballasts are applied to any new lights added to the database.	15 June 2018	

3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

- *volume information for the DUML is being calculated accurately*
- *profiles for DUML have been correctly applied.*

Audit observation

The submission was checked for accuracy for the month the database extract was supplied. This included:

- checking the registry to confirm that all ICPs have the correct profile and submission flag
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

Audit commentary

Meridian reconciles this DUML load using the DST profile. The on and off times are derived from a data logger read by EMS. This information is used to create a shape file. Meridian supplies EMS with the capacity information and EMS calculates the kWh figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit, and compliance was confirmed.

I checked the submission for the month of March and found that the loads matched with the database.

There is some inaccurate data within the database used to calculate submissions. This is recorded as non-compliance and discussed in **2.1** and **3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Apr-17 To: 30-Apr-18	The database accuracy is assessed to be 94.8% indicating an estimated over submission of 1,600 kWh per annum. Incorrect ballasts recorded for 15 items of load resulting in an estimated minor under submission of 256.26 kWh. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate, because they are sufficient to ensure that changes to the database are correctly recorded most of the time. The impact is assessed to be low due to the kWh volumes.

Actions taken to resolve the issue	Completion date	Remedial action status
We will provide the field audit findings to our agent to investigate and resolve. We believe the issues with locating lights may relate to incorrect location information rather than the lights not being installed.	15 June 2018	Identified
We will have our agent correct the ballasts for the items of load where this was found to be incorrect.	30 June 2018	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We will provide the table of standardised wattages to our agent so that the correct ballasts are applied to any new lights added to the database.	15 June 2018	

CONCLUSION

This audit found a small number of inaccuracies. This appears to be variances between what is actually installed versus what is recorded on the "as-builts" provided. The database inaccuracies showed that the new connection process is not being followed by all contractors.

The future risk rating of 11 indicates that the next audit be completed in 12 months and I agree with this recommendation. Five non-compliances were identified, and one recommendation was raised.

PARTICIPANT RESPONSE

This audit has identified a number of lights that could not be located in the field and states that this indicates a problem with the new connection process.

In November 2017, Delta undertook a full field audit of all items of load related to the Jacks Point database. This audit identified 1 item of load in the database that was not installed in the field and 6 items of load installed in the field that were not in the database.

The database was updated following this audit.

The field audit undertaken by Veritek indicates 9 items of load that were not able to be located. Given the previous recent field audit and the low probability of items of load being completely removed we believe that there may be an issue with the location information recorded in the database rather than an issue with field changes not being fed through to the database.