ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

NZTA NAPIER AND CONTACT ENERGY

Prepared by: Rebecca Elliot

Date audit commenced: 31 January 2018

Date audit report completed: 22 May 2018

Audit report due date: 1 June 2018

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EXECUTIVE SUMMARY

This audit of the NZTA Napier (NZTA) DUML database and processes was conducted at the request of Contact Energy (Contact) 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.

This RAMM database is managed by Power Solutions. New connection, fault and maintenance work is completed by Pope Electrical. Monthly reports are received by Contact.

The future risk rating of 16 indicates that the next audit be completed in 12 months and I agree with this recommendation. Four non-compliances were identified, and no recommendations were 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 used to prepare submissions contains some inaccurate information. The database accuracy is assessed to be 102.6% indicating an estimated under submission of 11,500 kWh per annum. Incorrect profile is recorded on the registry.	Moderate	Medium	4	Identified
All load recorded in the database	2.5	11(2A) of Schedule 15.3	All load is not recorded in the database.	Moderate	Medium	4	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The database used to prepare submissions contains some inaccurate information. The database accuracy is assessed to be 102.6% indicating an estimated under submission of 11,500 kWh per annum. The database is not complete as ballasts are not recorded in the RAMM database.	Moderate	Medium	4	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database used to prepare submissions contains some inaccurate information. The database accuracy is assessed to be 102.6% indicating an estimated under submission of 11,500 kWh per annum. Incorrect profile is recorded on the registry.	Moderate	Medium	4	Identified
Future Risk Rating						16	

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	Description	Recommendation
		Nil	

ISSUES

Subject	Section	Description	Issue
		Nil	

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.

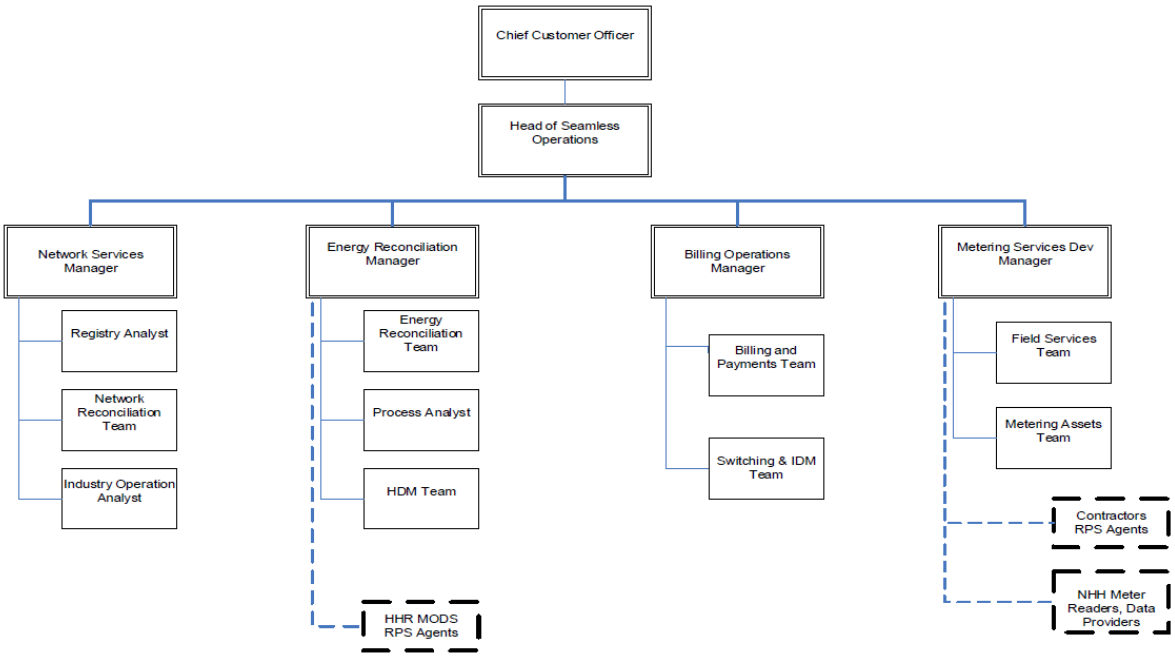
Audit commentary

There is one exemption in place relevant to the scope of this audit:

Exemption No. 177: Exemption to clause 8(g) of schedule 15.3 of the Electricity Industry Participation Code 2010 ("Code") in respect of providing half-hour ("HHR") submission information instead of non-half-hour ("NHH") submission information for distributed unmetered load ("DUML"). This exemption expires at the close of 31 October 2023.

1.2. Structure of Organisation

Contact Energy provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Jon Stevens	Projects Engineer	Power Solutions
Bernie Cross	Energy Reconciliation Manager	Contact Energy

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management". The specific module used for DUML is called RAMM Contractor.

Power Solutions confirmed that 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	Profile	Number of items of load	Database wattage (watts)
0000939905HB23E	TRANSIT STREET LIGHTS	FHL0331	HHR	553	102,689

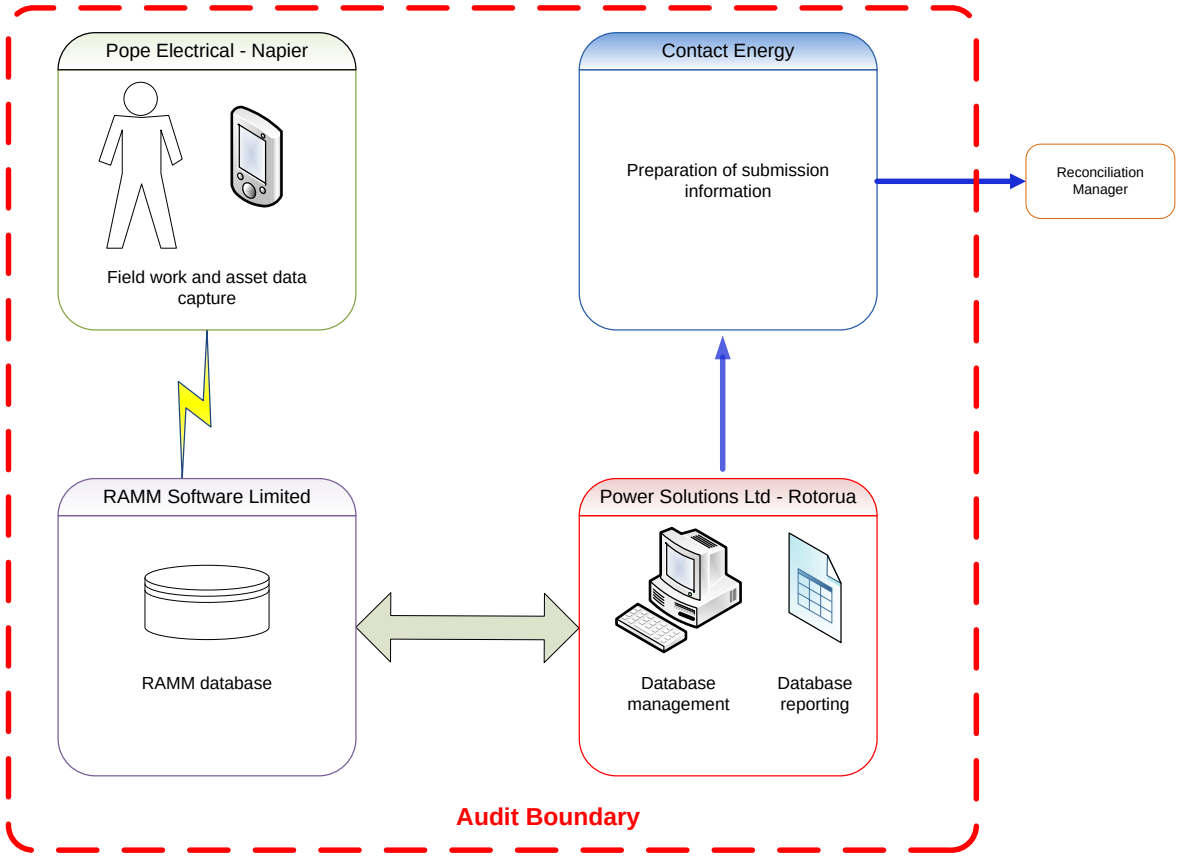
1.7. Authorisation Received

All information was provided directly by Contact and Power Solutions.

1.8. Scope of Audit

The RAMM database used for submission is managed by Power Solutions. New connection, fault and maintenance work is completed by Fulton Hogan. LED upgrades in residential areas are completed by Fulton Hogan, and LED upgrades on arterial routes are completed by PCL. Fulton Hogan and PCL update the database using Pocket RAMM. Power Solutions provide a monthly report to Contact from the database.

The database is remotely hosted by RAMM Software Ltd and is managed by Power Solutions Limited (PSL), on behalf of Napier NZTA, who is Contact's customer. Reporting is provided by PSL to Contact on a monthly basis. The fieldwork and asset data capture are conducted by Pope Electrical. The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information based on the database reporting. The diagram below shows the audit boundary for clarity.



The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

The field audit was undertaken of a statistical sample of 46 items of load on 31st January 2018.

1.9. Summary of previous audit

The previous audit was completed in February 2017 by Rebecca Elliot of Veritek Limited. This audit report was undertaken for Contact as part of their 2017 reconciliation participant audit. This audit wasn't submitted due to the audit regime change that occurred on 1st June 2017. For completeness I have included the findings for reference below:

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving Submission Information	2.1	11(1) of Schedule 15.3	Incorrect submission due to incorrect wattage report being provided.	Cleared
Capacity of Each Item of Load	2.2.4 refer **section 3.1**	11(2)(d) of schedule 15.3	Incorrect ballast for some lights.	Cleared
Tracking of Load Change	2.3 refer **section 2.5**	11(3) of schedule 15.3	19 additional lights found in the field compared to the database extract.	Still existing

Table of Recommendations

Subject	Section	Clause	Recommendation for Improvement	Status
Capacity of Each Item of Load	2.2.4	11(2)(d) of schedule 15.3	Update RAMM with the correct ballast figures.	

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 three 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

Contact have 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. Compliance is confirmed.

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.

Audit commentary

Contact reconciles this DUML load using the HHR profile, in accordance with exemption number 177. This exemption is discussed further in **section 1.1**. The registry shows HHR RPS profile but should show HHR. Contact usually manually corrects the profiles on business day four each month, but the corrections in recent months were missed due to a staff member being on leave. This is recorded as non-compliance below. Submissions are based on the database information, with on and off times derived from data logger information.

I recalculated the submissions for December 2017 for using the data logger and database information. I confirmed that the calculation method was correct.

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: Clause 11(1) of Schedule 15.3 From: 01-Mar-17 To: 30-Apr-18	The database used to prepare submissions contains some inaccurate information. The database accuracy is assessed to be 102.6% indicating an estimated under submission of 11,500 kWh per annum. Incorrect profile is recorded on the registry. Potential impact: Medium Actual impact: Medium Audit history: Twice previously Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time. The impact is assessed to be medium, based on the kWh differences described above. Profiles were recorded correctly on the registry for most of the audit period.

Actions taken to resolve the issue	Completion date	Remedial action status
Database inaccuracies Contact will work with NZTA in getting these streetlight values and attributes updated within their database. ***Incorrect profiles on registry*** The incorrect profile on the registry issue is a result of a system defect – currently a fix is underway to prevent this issue from occurring. A manual work around is currently in place to update the registry where required	Dec 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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

An ICP is recorded for each item of load.

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 nearest street address, pole numbers and Global Positioning System (GPS) coordinates for each item of load, and users in the office and field can view these locations on a mapping system.

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

Lamp make, model, lamp wattage and ballast wattage are included in the database and all were populated which meets the requirements of this clause.

The gear wattage is recorded in the database which meets the requirements of this clause. As discussed in **section 3.1**, the ballast in RAMM is not correct and is not used for submission. The correct wattages are added in the monthly report. The correct ballasts are applied but this needs to be in the database. This is recorded as non-compliance in **section 3.1**.

Audit outcome

Compliant

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 252 items of load on 3 April 2018.

Audit commentary

The field audit findings are detailed in the table below.

I found four more lamps in the field than were recorded in the database, and six lamp wattage differences.

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
City					
CORUNNA BAY	1	1			
CUSTOMS QUAY	1	1			
CUSTOMS QUAY - NORTH	3	3			
LATHAM STREET	1	1			
NORTHE STREET EAST	1	1			
PANDORA ROAD SH2 EAST	31	31			
STATE HIGHWAY 2B	15	15			
STATE HIGHWAY 50 EXPRESSWAY	9	9			
TARADALE ROAD SH 50 EAST	44	44			
TARADALE ROAD SH 50 WEST	20	20			
TARADALE ROAD WEST	5	5			
North					
CHARLES STREET	1	1			
LADYWOOD ROAD	1	1			

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
MAIN NORTH ROAD	46	44	-2	6	2x 250W HPS missing & 6 LEDs found not 250W HPS
ONEHUNGA ROAD	1	1			
ROGERS ROAD	1	1			
South					
BURNESS UNDERPASS	3	3			
GEORGES DRIVE SH2	55	55			
LATHAM STREET	4	4			
WINIFRED STREET	1	1			
West					
PREBENSEN DRIVE WEST	4	4			
TARADALE ROAD - SERVICE LANE NTH	3	7	4		4x 150W HPS extra lights found in the field
TARADALE ROAD - SERVICE LANE STH	3	3			
TOTAL	252	254	4	6	

I found four more lamps in the field than were recorded in the database. The database accuracy is discussed in **section 3.1**. The items missing from the RAMM database are recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-Mar-17 To: 30-Apr-18	All load is not recorded in the database. Potential impact: Medium Actual impact: Medium Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as moderate, because they are sufficient to ensure that database information is correctly recorded most of the time. The impact is assessed to be medium, based on the kWh differences described in **section 3.1**.

Actions taken to resolve the issue	Completion date	Remedial action status
Database inaccuracies Contact will work with NZTA in getting these streetlight values and attributes updated within their database.	Dec 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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 provision of a copy of the report to Contact each month is sufficient to achieve compliance.

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance. All fault and maintenance work is controlled by PSL and conducted by Pope Electrical through "RAMM Contractor". Once each job is completed the database is updated via field PDA's. Paperwork is also provided to note materials used, and this is compared with the data in the database for each job. The monthly outage patrols also involve a check of database accuracy.

Audit outcome

Compliant

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

PSL demonstrated 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	NZTA Napier region
Strata	The database contains items of load in Napier urban area. The processes for the management of all NZTA items of load are the same, and I decided to place the items of load into four strata, as follows: 1. City 2. North 3. South 4. West.
Area units	I created a pivot table of the roads and I used a random number generator in a spreadsheet to select a total of 23 sub-units.
Total items of load	252 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.

The field audit found:

- A total of four additional lamps in the field than were recorded in the database.
- Six lamp type and wattage differences.

The field data was 102.6% of the database data for the sample checked. The total wattage recorded in the database for the sample was 46,555 watts. The estimated total wattage found in the field for the sample checked was 47,011 watts, a difference of 456 watts. This will result in estimated under submission of 11,500 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. The ballast in RAMM is not correct and is not used for submission. The correct wattages are added in the monthly report. The correct ballasts are applied, but this needs to be in the database hence this is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Mar-17 To: 30-Apr-18	The database used to prepare submissions contains some inaccurate information. The database accuracy is assessed to be 102.6% indicating an estimated under submission of 11,500 kWh per annum. The database is not complete as ballasts are not recorded in the RAMM database. Potential impact: Medium Actual impact: Medium Audit history: None Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as moderate, because they are sufficient to ensure that database information is correctly recorded most of the time. The impact is assessed to be medium, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Database inaccuracies Contact will work with NZTA in getting these streetlight values and attributes updated within their database.	Dec 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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

Contact reconciles this DUML load using the HHR profile, in accordance with exemption number 177. This exemption is discussed further in **section 1.1**.

The registry shows HHR RPS profile but should show HHR. Contact usually manually corrects the profiles on business day four each month, but the corrections in recent months were missed due to a staff member being on leave. This is recorded as non-compliance below. Submissions are based on the database information, with on and off times derived from data logger information.

I recalculated the submissions for December 2017 for using the data logger and database information. I confirmed that the calculation method was correct.

There is some inaccurate data within the database used to calculate submissions. This is recorded as non-compliance and discussed in **sections 2.5** and **3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Mar-17 To: 30-Apr-18	The database used to prepare submissions contains some inaccurate information. The database accuracy is assessed to be 102.6% indicating an estimated under submission of 11,500 kWh per annum. Incorrect profile is recorded on the registry. Potential impact: Medium Actual impact: Medium Audit history: Twice previously Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time. The impact is assessed to be medium, based on the kWh differences described above. Profiles were recorded correctly on the registry for most of the audit period.

Actions taken to resolve the issue	Completion date	Remedial action status
Database inaccuracies Contact will work with NZTA in getting these streetlight values and attributes updated within their database.	Dec 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

CONCLUSION

This RAMM database is managed by Power Solutions. New connection, fault and maintenance work is completed by Pope Electrical. Monthly reports are received by Contact.

The future risk rating of 16 indicates that the next audit be completed in 12 months and I agree with this recommendation. Four non-compliances were identified, and no recommendations were raised.

PARTICIPANT RESPONSE

Contact have reviewed this report and their comments are recorded in the report. No further comments were provided.