

**ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT**

For

**NZTA WAIPUKURAU AND MERIDIAN
ENERGY**

Prepared by: Tara Gannon

Date audit commenced: 23 February 2018

Date audit report completed: 29 March 2018

Audit report due date: 1 June 2018

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EXECUTIVE SUMMARY

This audit of the NZTA Waipukurau 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.

A RAMM database is held by NZTA. The field work, asset data capture and database population is conducted by NZTA's contractor Higgins Contractors Limited, and their contractor Pope Electrical. Information from the RAMM database is not regularly reported to Meridian.

Meridian reconciles the unmetered load for ICP 7012031000CH80C as NHH based on historic data from Centralines, which is recorded in the trader unmetered load fields on the registry.

The RAMM database has some missing information, but lamp model and wattage information that is present was found to be correct during the field audit. The correct total wattage is at least 25,936 watts, after accounting for the missing lamp information and gear wattages.

I estimate that Meridian has under reported by approximately 2,347 watts, or 10,280 kWh per annum.

The future risk rating of 16 indicates that the next audit be completed in 12 months. Five 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	Submissions are not based upon the RAMM database.	Weak	Low	3	Identified
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	ICP is not recorded in the database.	Weak	Low	3	Identified
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	Six lamps do not have make, model or wattage information recorded. No lamps have gear or ballast wattage information recorded.	Weak	Low	3	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	One floodlight was not recorded in the database.	Strong	Low	1	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The database has some missing information.	Weak	Low	3	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	Submissions are not based upon the RAMM database.	Weak	Low	3	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 are no exemptions in place relevant to the scope of the audit.

1.2. Structure of Organisation

Not applicable.

1.3. Persons involved in this audit

Auditor:

Tara Gannon

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Amy Cooper	Compliance Officer	Meridian Energy
Helen Youngman	Energy Data Analyst	Meridian Energy
Mike Janus	Key Account Manager	Meridian Energy
Frank Nieuwland	Maintenance Contract Manager Highway Network Operations	NZTA
Ronan Galvin	Streetlight Manager	Pope Electrical
Sid Christy	Roading Engineer	Beca Ltd
Trish Millar	Administration Manager	Higgins Contractors Limited

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”.

Database back-up is in accordance with standard industry procedures. The database is password protected. Compliance is confirmed.

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)
7012031000CH80C	STREET LIGHTING TRANSIT NZ WAIPUKURAU	WPW0331	148	22,050

1.7. Authorisation Received

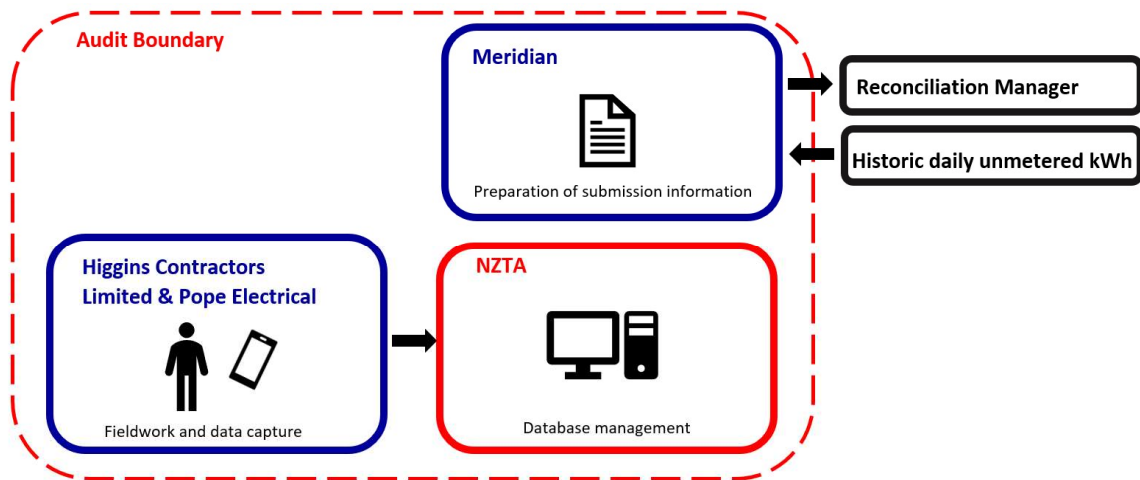
All information was provided directly by Meridian, Beca Ltd, NZTA, Higgins, and Pope Electrical.

1.8. Scope of Audit

A RAMM database is held by NZTA. The field work, asset data capture and database population is conducted by NZTA’s contractor Higgins Contractors Limited, and their contractor Pope Electrical. Information from the RAMM database is not regularly reported to Meridian.

Meridian reconciles the unmetered load for ICP 7012031000CH80C as NHH based on historic data from Centralines, which is recorded in the trader unmetered load fields on the registry.

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 all 148 items of load on 23 February 2018.

1.9. Summary of previous audit

The previous audit was completed in December 2016 by Tara Gannon of Veritek Limited. Four non-compliances were identified, and no recommendations were raised. The statuses of the non-compliances are described below.

Subject	Section	Clause	Non-compliance	Status
Deriving Submission	2.1	11(1) of Schedule 15.3	Under submission due to ballast not being included of an estimated 10,602 kWh.	Still existing. Refer to section 3.1.
ICP identifier	2.2.1	11(2)(a) of Schedule 15.3	ICP is not recorded in the DUML database.	Still existing. Refer to section 2.2.
Capacity of Each Item of Load in kW	2.2.4	Clauses 11(2)(d) of Schedule 15.3	Ballast is not recorded in the DUML database. The lights attached to pole IDs 41535, 41536 and 41537 do not have lamp wattage, and all make and model fields populated.	Still existing. Refer to section 3.1. Still existing. Refer to sections 2.4 and 3.1.
Tracking of load changes	2.3	Clauses 11(3) of Schedule 15.3	The field audit identified four lights where wattage recorded on the lamp did not match the database.	Still existing. Refer to section 3.1.

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 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

Meridian reconciles the load for ICP 7012031000CH80C as NHH using the RPS profile.

Submissions are based upon historic information provided by Centralines; daily unmetered load of 279.91 kWh is reported. This is based on 23,589 watts, on for 11.85 hours per day and 133 fixtures.

The correct total wattage is at least 25,936 watts, after accounting for the missing lamp information and gear wattages in the database. Database accuracy is discussed further in **section 3.1**.

I estimate that under reporting of at least 2,347 watts (approximately 10,280 kWh per annum) has occurred.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: unknown To: 23-Feb-18	Submissions are not based upon the RAMM database. Potential impact: Low Actual impact: Low Audit history: Once previously Controls: Weak Breach risk rating: 3
Audit risk rating	Rationale for audit risk rating
Low	Controls are rated as weak, because submissions are based on historic data, not the RAMM database. The impact is low, as the difference between the data reported and the correct total wattage is approximately 2,347 watts, or 10,280 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status
We have revised the wattage used to calculate submission volumes to reflect the correct total wattage assessed by the auditor (25,936kW). Historic market submissions will be corrected.	07 May 2018	Identified
Preventative actions taken to ensure no further issues will occur	Completion date	
We have requested that NZTA provide regular reporting from their database so changes to wattages can be identified and are awaiting their confirmation that this will occur.	30 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 DUMML database must contain:

- each ICP identifier for which the retailer is responsible for the DUMML
- 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

ICP is not populated in the database. I note that all items of load relate to ICP 7012031000CH80C.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.2 With: Clause 11(2)(a) and (aa) of Schedule 15.3 From: unknown To: 23-Feb-18	ICP is not recorded in the database. Potential impact: Low Actual impact: Low Audit history: Once previously Controls: Weak Breach risk rating: 3

Audit risk rating	Rationale for audit risk rating		
Low	<p>Controls are rated as weak, as ICP number is not recorded for any item of load.</p> <p>The impact is low, because all items of load relate to the same ICP.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
We have asked NZTA to add ICP to the RAMM Database and await their confirmation that this will be completed.		30 June 2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
As above			

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 DUMML database must contain the location of each DUMML item.

Audit observation

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

Audit commentary

All items of load had highway number and displacement distances recorded. The information was sufficient to locate each item of load.

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 DUMML 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

Six lamps did not have any make, model, or wattage information recorded.

The other 142 lamps had make, model, and lamp wattage information recorded, but no ballast or gear wattages.

The missing data is recorded as non-compliance below.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: unknown To: 13-Mar-18	Six lamps do not have make, model or wattage information recorded. No lamps have gear or ballast wattage information recorded. Potential impact: None Actual impact: None Audit history: Once previously Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are rated as weak, because all lamps have some missing wattage information. There is no impact because the database information is not used for submission.		
Actions taken to resolve the issue		Completion date	Remedial action status
The issues identified during the field audit and gear wattage information has been provided to NZTA to update the database and we await their confirmation that this has been completed.		30 June 2018 2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
We have revised the wattage used to calculate submission volumes to reflect the correct total wattage assessed by the auditor (25,936kW) which includes the missing lamp and gear wattage information. Historic market submissions will be corrected.		07 May 2018	

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

A field audit of all items of load was undertaken.

Audit commentary

The field audit findings are detailed in the table below.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
State Highway 2	137	138	1	6	Three lamps with no model or wattage information recorded on the northern side of the Otane intersection appear to be 250W. Three lamps with no model or wattage information recorded at the southern corner of Tapairu Road are labelled S100. There is also a floodlight connected to the centre pole, the wattage of this light is unknown.
State Highway 50	11	11	-	-	
Total	148	149	-	-	

The missing floodlight is recorded as non-compliance below. The wattage difference could not be determined because the floodlight wattage is unknown.

The State Highway 2 wattage differences are recorded as non-compliance in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: unknown To: 23-Feb-18	One floodlight was not recorded in the database. Potential impact: None Actual impact: None Audit history: Once previously Controls: Strong Breach risk rating: 1

Audit risk rating	Rationale for audit risk rating		
Low	<p>The controls are rated as strong, because only one missing lamp was identified across the entire database.</p> <p>There is no impact because the database information is not used for submission.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
Details of the location of the missing light has been provided to NZTA to verify and add to the database. We are awaiting their confirmation that this has been completed.		30 June 2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Overall controls that are in place to ensure all load is recorded in the database are considered sufficient.		Ongoing	

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. The RAMM database contains an audit trail.

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance.

The field work, asset data capture and database population is conducted by NZTA's contractor Higgins Contractors Limited, and their contractor Pope Electrical.

Night and day inspections are performed by Pope Electrical in accordance with their contractual terms.

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 DUMML 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

The RAMM database contains an audit trail for all changes, in addition this clause requires that an audit trail exists for all processing functions.

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 audit findings were used to determine if the information contained in the database is complete and accurate.

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

Audit commentary

Where populated, lamp wattages were consistent with the published standardised wattage table produced by the Electricity Authority.

Some wattage data is missing from the database:

- Six lamps did not have any make, model, or wattage information recorded. The field audit found three of these lamps appear to be 250W sodium, and three appear to be 100W sodium. A floodlight with unknown wattage was also connected to one of the poles.
- The other 142 lamps had make, model, and lamp wattage information recorded, but no ballast or gear wattages.

The total wattage recorded in the database is 22,050 watts, based on:

Lamp Wattage	Count	Total lamp wattage
100	79	7,900
150	16	2,400
250	47	11,750
Blank	6	0
Total	148	22,050

The correct total wattage is at least 25,936 watts, after accounting for the missing lamp information and gear wattages. The wattage of the floodlight at the southern corner of Tapairu Road could not be determined.

Lamp Wattage	Count	Total lamp wattage	Gear wattage	Total gear wattage	Total wattage
100	82	8,200	14	11,48	9,348
150	16	2,400	18	288	2,688
250	50	12,500	28	1,400	13,900
Blank	0	0	0	0	0
Floodlight	1	unknown	unknown	unknown	unknown
Total	148	23,100		2,836	25,936

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: unknown To: 23-Feb-18	The database has some missing information. Potential impact: None Actual impact: None Audit history: None Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are rated as weak, because all lamps have some missing wattage information. There is no impact because the database information is not used for submission.		
Actions taken to resolve the issue		Completion date	Remedial action status
The issues identified during the field audit and gear wattage information has been provided to NZTA to update the database and we await their confirmation that this has been completed.		30 June 2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
We have revised the wattage used to calculate submission volumes to reflect the correct total wattage assessed by the auditor (25,936kW) which includes the missing lamp and gear wattage information. Historic market submissions will be corrected. We have requested that NZTA provide regular reporting from their database so changes to wattages can be identified and are awaiting their confirmation that this will occur.		07 May 2018 30 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 the load for ICP 7012031000CH80C as NHH using the RPS profile.

Submissions are based upon historic information provided by Centralines; daily unmetered load of 279.91 kWh is reported. This is based on 23,589 watts, on for 11.85 hours per day and 133 fixtures.

The correct total wattage is at least 25,936 watts, after accounting for the missing lamp information and gear wattages in the database. Database accuracy is discussed further in **section 3.1**.

I estimate that under reporting of at least 2,347 watts (approximately 10,280 kWh per annum) has occurred.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: unknown To: 23-Feb-18	Submissions are not based upon the RAMM database. Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3		
Audit risk rating	Rationale for audit risk rating		
Low	Controls are rated as weak, because submissions are based on historic data, not the RAMM database. The impact is low, as the difference between the data reported and the correct total wattage is approximately 2,347 watts, or 10,280 kWh per annum.		
Actions taken to resolve the issue		Completion date	Remedial action status
We have revised the wattage used to calculate submission volumes to reflect the correct total wattage assessed by the auditor (25,936kW). Historic market submissions will be corrected.		07 May 2018	Identified

Preventative actions taken to ensure no further issues will occur	Completion date	
We have requested that NZTA provide regular reporting from their database so changes to wattages can be identified and are awaiting their confirmation that this will occur.	30 June 2018	

CONCLUSION

A RAMM database is held by NZTA. The field work, asset data capture and database population is conducted by NZTA's contractor Higgins Contractors Limited, and their contractor Pope Electrical. Information from the RAMM database is not regularly reported to Meridian.

Meridian reconciles the unmetered load for ICP 7012031000CH80C as NHH based on historic data from Centralines, which is recorded in the trader unmetered load fields on the registry.

The RAMM database has some missing information, but lamp model and wattage information that is present was found to be correct during the field audit. The correct total wattage is at least 25,936 watts, after accounting for the missing lamp information and gear wattages.

I estimate that Meridian has under reported by approximately 2,347 watts, or 10,280 kWh per annum.

The future risk rating of 16 indicates that the next audit be completed in 12 months. Five non-compliances were identified, and no recommendations were raised.

PARTICIPANT RESPONSE

Meridian have reviewed this report, and their comments are contained within its body.