ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

PALMERSTON NORTH CITY COUNCIL AND MERIDIAN ENERGY LIMITED

Prepared by: Rebecca Elliot

Date audit commenced: 6 November 2018

Date audit report completed: 23 November 2018

Audit report due date: 01-Dec-18

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EXECUTIVE SUMMARY

This audit of the Palmerston North City Council (**PNCC**) 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.

A RAMM database is managed by Alf Downs on behalf of PNCC and they provide the monthly reporting to Meridian. The database is remotely hosted by RAMM Software Ltd. The field work, asset data capture and database population is conducted by Alf Downs.

The field audit was undertaken of a statistical sample of 312 items of load on 8th November 2018 and was found to be within the +/-2.5% database accuracy range.

The audit found four non-compliances and makes no recommendations. These relate to use of the use of profiled wattages being applied to LED lights to account for dimming and different drive rates. Meridian reports this load against profile DST, however the profiles used by PNCC to adjust wattages have not been approved by the Electricity Authority. Discussions are progressing with the Electricity Authority, but no new profiles have been approved at the time of this audit.

The future risk rating of 20 indicates that the next audit be completed in three months but I recommend that the next audit not be due at the earliest in six months to allow time for the profiled wattages being used to be resolved. 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	PNCC applies unapproved profiles to adjust specified lamp wattages to account for different drive rates and dimming. 3,564 recorded lamp wattages differ from expected values resulting in a potential under submission of 81,000 kWh per annum. The database wattage and ballast inaccuracies are estimated to be in excess of the 623 kWh per annum.	Moderate	High	6	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	One 20W light not included in the database extract used for submission.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	One item recorded as RGB Sign with a 100W wattage, does not provide sufficient information to be able to confirm the values are correct. PNCC applies unapproved profiles to adjust specified lamp wattages to account for different drive rates and dimming. 3,564 recorded lamp wattages differ from expected values resulting in a potential under submission of 81,000 kWh per annum. The database wattage and ballast inaccuracies are estimated to be in excess of the 623 kWh per annum.	Moderate	High	6	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Volume information accuracy	3.2	15.2 and 15.37B(c)	PNCC applies unapproved profiles to adjust specified lamp wattages to account for different drive rates and dimming. 3,564 recorded lamp wattages differ from expected values resulting in a potential under submission of 81,000 kWh per annum. The database wattage and ballast inaccuracies are estimated to be in excess of the 623 kWh per annum.	Moderate	High	6	Identified
					Future Risk Rating	**20**	

Future risk rating	0	1-4	5-8	9-15	16-18	19+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Description	Issue
		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

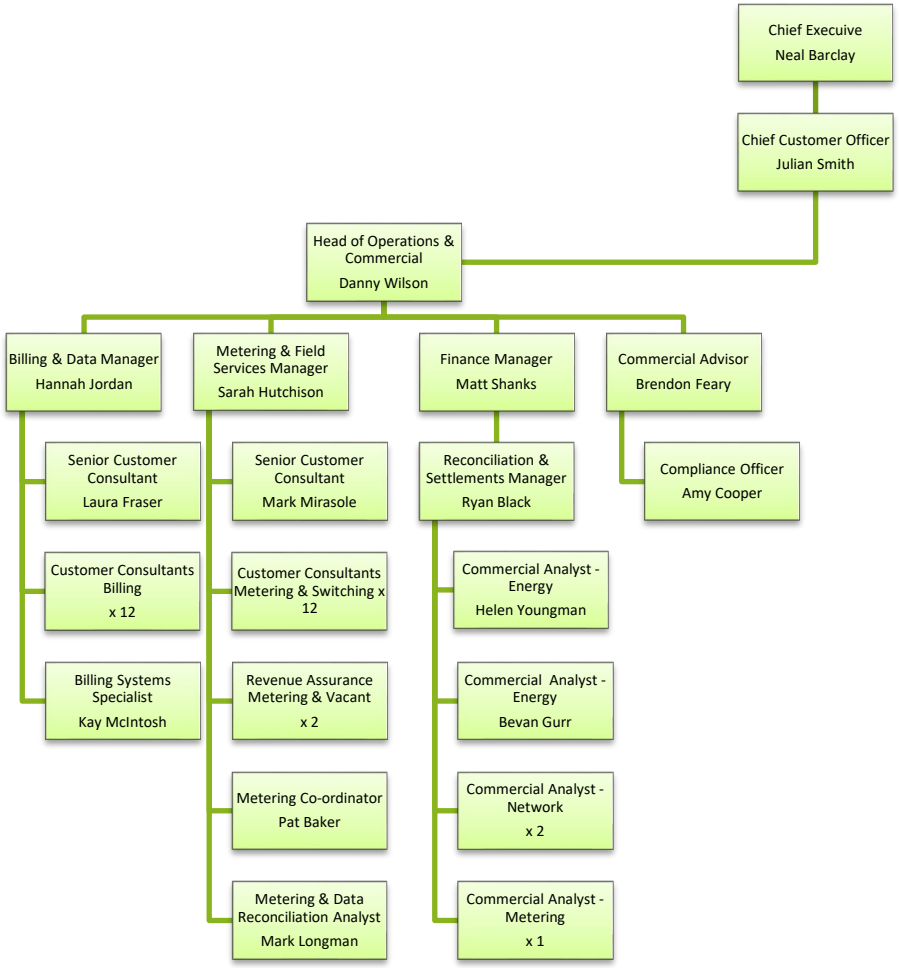
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Meridian provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Name	Title
Rebecca Elliot	Lead Auditor
Debbie Anderson	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Organisation
Neil Warby	Senior Engineering Officer	Palmerston North City Council
Phil Harris	Administration	Alf Downs Streetlighting Limited
Helen Youngman	Energy Data Analyst	Meridian Energy

1.4. Hardware and Software

The RAMM database used for the management of DUML is remotely hosted by RAMM Software Ltd.

Alf Downs confirmed that the 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	Description	Profile	NSP	No. of items of load	Wattage - watts
0000031152CPB70	Streetlights The Square	DST	LTN0331	9001	672,885

There are a small number of items in the database that are on metered ICPs, these have been excluded from the audit.

1.7. Authorisation Received

All information was provided directly by Meridian, PNCC or Alf Downs Streetlighting Group.

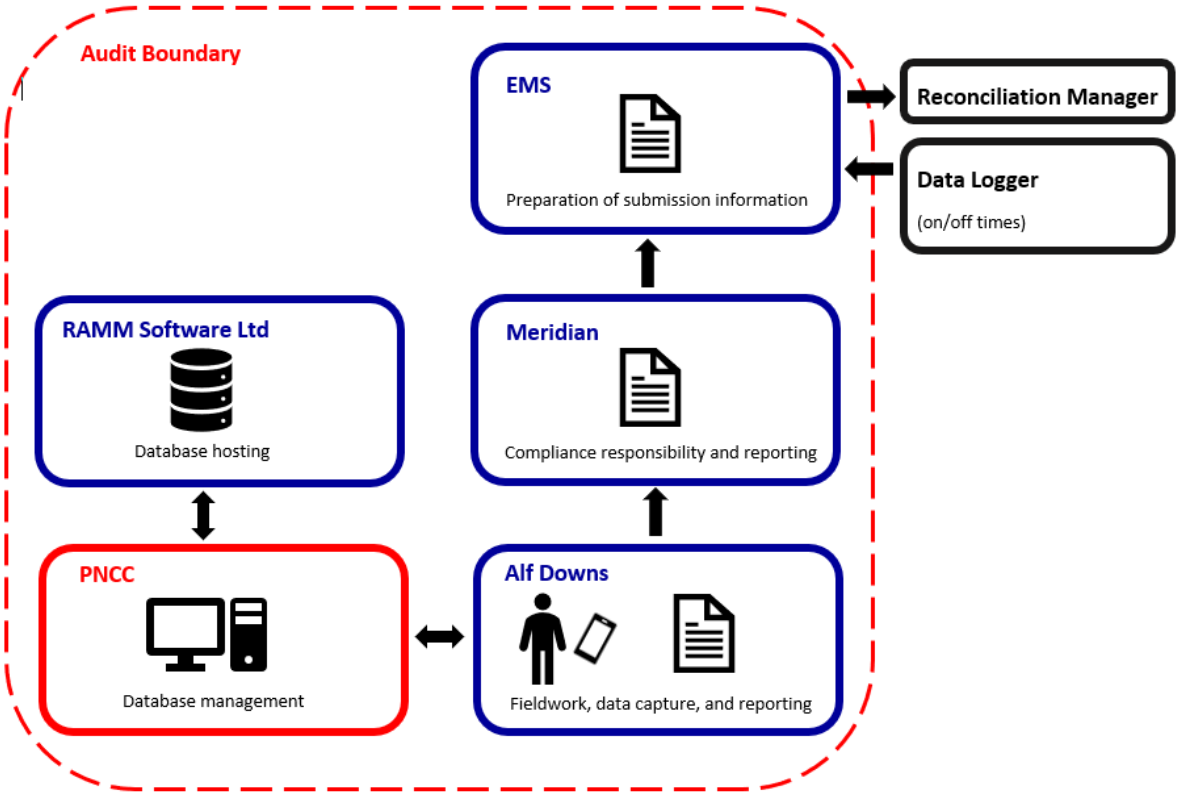
1.8. Scope of Audit

This audit of the Palmerston North City Council (**PNCC**) 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.

A RAMM database is held by PNCC, who is Meridian' customer. This database is hosted by RAMM Software Limited and is managed by PNCC. Alf Downs complete the field work and manages the database on PNCC's behalf. They provide the monthly wattage report to Meridian.

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



The field audit was undertaken of a statistical sample of 312 items of load on 8th November 2018.

1.9. Summary of previous audit

The previous audit of this database was undertaken by Tara Gannon of Veritek in March 2018.

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	The database used to prepare submissions contains some inaccurate information.	Still Existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	For the sample of 405 lamps checked: • two lamps were not found • three extra lamps were recorded.	Still Existing

Subject	Section	Clause	Non-compliance	Status
Tracking of load changes	2.6	11(3) of Schedule 15.3	Database updates may be late for lights in new subdivisions.	Cleared
Database accuracy	3.1	15.2	• PNCC applies unapproved profiles to adjust specified lamp wattages to account for different drive rates and dimming. 3602 recorded lamp wattages differ from expected values. • 27 recorded gear wattages differ from expected values. • 13 recorded lamp and gear models are inconsistent. • Eleven differences were found for the sample of 405 lamps checked during the field audit.	Still Existing
Volume information accuracy	3.2	15.2	The database used to prepare submissions contains some inaccurate information.	Still Existing

Table of Recommendations

Subject	Section	Recommendation	Status
ICP identifier	2.2	Ensure the correct NSP is recorded for the ICP identifier - Review the data to confirm which NSP the lamps are connected to. Set up a new NSP for Bunnythorpe and assign lamps to it as necessary.	Cleared
Description of load type	3.1	Review of recorded wattages - Discuss PNCC's wattage profiling processes with the Electricity Authority, to determine the best way to resolve this non-compliance, including whether the lamps with wattage discrepancies could be split to a separate ICP with a new approved profile.	Still Existing- in progress

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

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.

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 application of profiles was checked. 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 and are used to create a shape file. Meridian supplies EMS with the capacity information and EMS calculates the kWh figure for ICP 0000031152CPB70 and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit and EMS' agent audit. Compliance was confirmed for both parties.

I compared the submission volumes with the load recorded in the database extract against the volumes submitted by Meridian for the month of August 2018 and found that they matched exactly.

While Meridian are using up to date database information, examination of the database accuracy found:

Issue	Estimated volume information impact (annual kWh)
LED wattages variance between expected and dimmed values	81,0000 kWh under submission
Incorrect ballast values in the database	623 kWh under submission
TOTAL	81,623 kWh under submission

This is recorded as non-compliance below and is discussed further in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Apr-18 To: 31-Aug-18	PNCC applies unapproved profiles to adjust specified lamp wattages to account for different drive rates and dimming. 3,564 recorded lamp wattages differ from expected values resulting in a potential under submission of 81,000 kWh per annum. The database wattage and ballast inaccuracies are estimated to be in excess of the 623 kWh per annum. Potential impact: High Actual impact: High Audit history: Once Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	Controls are rated as moderate as the LED light values are being managed well but are recorded at the lower dimmed value. The impact is assessed to be high, based on the kWh differences described in **section 3.1**.

Actions taken to resolve the issue	Completion date	Remedial action status
We will manually adjust wattages for the incorrectly recorded LED lights so these reflect the manufacturers maximum wattage.	31 Dec 2018	Identified
We will recalculate and revise historic submission information using the adjusted wattages as far back as the wash up cycle allows.	Ongoing	
We will ask PNCC to correct the other minor inaccuracies identified during this audit	31 Jan 2019	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We will continue working with PNCC to develop a Code compliant solution for their dimmable LED lighting.	Ongoing	

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 the correct ICP was recorded against each item of load.

Audit commentary

All items of load have an ICP recorded against them.

In the previous audit advised it was noted that there are two NSPs in the PNCC region; Linton and Bunnythorpe and that it was unclear if the load was recorded against the correct NSP. All streetlights in the PNCC database are recorded against the Linton NSP and I have been able to confirm that the load is recorded against the correct NSP. NZTA urban lights remain in the PNCC database, with the ICP number recorded as NZTA. PNCC is not responsible for these lights and does not maintain this information but keeps the records to help them to identify who is responsible if a fault is reported. NZTA rural lights are not recorded at all and are not part of the PNCC's responsibility.

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 databases were checked to confirm the location is recorded for all items of load.

Audit commentary

The database contains fields for the road name, displacement and also GPS coordinates. All fields were populated so that each item of load can be located as required by this clause.

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 it contained a field for lamp type and wattage capacity and included any ballast or gear wattage and that each item of load had a value recorded in these fields.

Audit commentary

The extract provided has fields for lamp model and gear model as well as gear wattage and lamp wattage. All items of load have the lamp wattage populated and where appropriate gear wattage also. The accuracy of the lamp description, capacity and ballasts recorded is discussed 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 312 items of load on 8th November 2018.

Audit commentary

The field audit findings for the sample of lamps are detailed in the table below:

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments
Parks, Reserves & Property combined					
ACHILLES CT	6	6	-		
BOTANICAL RD	1	1	-		
FITZHERBERT AVE	5	5	-		
GREY ST	1	1	-		
MANAWAROA ST	9	9	-		
MARRINER ST	2	2	-		
WALDEGRAVE ST	6	6	-		
Roading A-C					
ALAN ST	6	6			
ALEXANDER ST	8	8			
BENBOW PL	2	2			
BUICK CRES	22	22	-		
BULLER PL	3	3	-		
BURNS AVE	10	10	-		
CARROLL ST	10	10	-		
CASCADE CRES	11	11	-		
COLEMAN PL	6	6	-		
CP_CHALET	3	3	-		
Roading D-L					
DANIEL PL 29 / PEPPERTREE GR 55	1	1			
DAVID ST	5	5			
DOBSONS LANE	1	1			

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments
DOUGLAS ST	4	4			
FAIRS RD	32	32			
GLADYS PL	3	3			
KARAMEA CRES	8	8			
LANGLEY AVE	9	9			
LESLIE AVE	2	2			
LEWIS PL	3	3			
LIVERPOOL ST	11	11			
Roading M-R					
MAIN EAST N	2	2	-		
MAIN EAST S (CBD)	6	6	-		
MANSFORD PL	4	4	-		
MERIDIAN GR	2	2	-		
MERSEY TCE	4	3	-1		1 less 18W LED in the field
MONOWAI PL	11	12	1		1 more 20W LED in the field
OTIRA PL	2	2	-		
PEMBROKE ST	17	17	-		
PIRIE ST	5	5	-		
RONGOPAI ST	19	19	-		
Roading S-Z					
TE AWE AWE ST	42	42	-		
TENNENT OFF LANE 'WEST`	8	8	-		
Grand Total	312	312	2	0	

The field audit found one additional light in Monowai Place and one light in Mersey Terrace that was not able to be located. The accuracy of the database is discussed in **section 3.1.**

This clause relates to lights in the field that are not recorded in the database. The additional light in Monowai Place is 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-Apr-18 To: 31-Aug-18	One 20W LED in Monowai Place is not included in the database extract used for submission. 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 ensure most information is accurate. The impact is assessed to be low, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
We will liaise with PNCC to have this missing light added to the database.	31 Jan 2019	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

On 20th September 2012 the Authority sent a memo to Retailers and auditors advising that tracking of load changes at a daily level was not required as long as 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.

The database tracks additions and removals as required by this clause.

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance, they are largely unchanged from last audit.

Fault, maintenance, and upgrade work is issued to Alf Downs field staff through RAMM Contractor. For routine faults and maintenance, the RAMM database is updated in the field using PDAs.

LED upgrades are updated in RAMM at the end of each week by Alf Downs office staff, based on information provided by field technicians. This enables the technicians to focus on installing as many LED lamps as possible and allows the office staff to check the upgrade data as it is entered. The LED upgrade project is estimated to be 75/80% complete with an anticipated completion date of June 2019.

New connections may be completed by the distributor, the developer, or Alf Downs with PNCC's approval. Once livening has occurred an "as built" plan is provided to PNCC, who then takes responsibility for the lights. PNCC undertake an on-site check of the lights to confirm the plans received. Alf Downs is responsible for capturing the streetlight data and entering it into RAMM, including the GPS coordinates. This process can result in delays between the lights being electrically connected and included in RAMM. Lights which have been connected but are not vested in council are identified through monthly outage patrols. The accuracy of the database is discussed in **section 3.1**.

Festive lights are recorded in the database and reported separately with on and off dates when they are connected.

Private lights are recorded in the database but excluded from the submission reports and these have been confirmed that they are reconciled either as standard unmetered load or shared unmetered load with the Distributor.

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

The database has a complete audit trail.

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	Palmerston North City Council Street Lights
Strata	The database contains items of load in the Palmerston North City Council area. I selected the following strata: • Parks, Reserves & Property combined • Roading A-C • Roading D-L • Roading M-R • Roading S-Z
Area units	I created a pivot table of the roads in each database and used a random number generator in each spreadsheet to select a total of 40 sub-units.
Total items of load	312 items of load were checked.

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

Audit commentary

The field data was 100% of the database data for the sample checked. The statistical sampling tool reported with 95% confidence the precision of the sample was 1.7% and the true load in the field will be between 99.3% to 101% of the load recorded in the database. The sample is sufficiently precise to be able to determine that the is database is accurate.

The tool indicated that there is potentially 500 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool) of over submission. The statistical sampling tool reported with 95% confidence the estimated impact will be between 19,400 kWh per annum over submission and 28,300 kWh per annum under submission.

The lamp wattages were checked and found all items of load have the lamp model populated but one item has its lamp model recorded as RGB Sign, this does not offer enough information to be able to identify the lamp or wattage and is recorded as non-compliance below.

The code requires any non-standard profiles applied to be approved by the Electricity Authority and recorded on the reconciliation submissions. Meridian reports the load for ICP 0000031152CPB70 against profile DST, however the profiles used by PNCC to adjust wattages have not been approved by the Electricity Authority. Discussions are progressing with the Electricity Authority, but no new profiles have been approved at the time of this audit.

As reported in the last audit, Alf Downs confirmed that PNCC applies profiled wattages for LED lights, to account for dimming and different drive rates. Lamp wattage differences were identified for 3,564 (41.7%) of PNCCs streetlights, as shown below:

Lamp Model	Quantity	Lamp Wattage	Expected Lamp Wattage
20 LED AT 525mA	6	27	35-39 (depending on voltage)
20 LED AT 700mA	4	37	47-51 (depending on voltage)
30 LED AT 525mA	10	36	53-55 (depending on voltage)
30 LED AT 525mA	20	37	53-55 (depending on voltage)
30 LED AT 700mA	7	53	70-73 (depending on voltage)
Piano 1 32 Leds	3	43	36 at 350mA, 52 at 500mA, or 73 at 700mA
Road Grace BRP711 23LED20W	2296	14	20
Road Grace BRP711 30LED26W	67	18	26
Teceo 16 LED	2	27	20
Teceo 32 LED	29	37	36
Teceo 56 LED	4	87	62
Teceo 80 LED	5	122	86
Teceo 90 LED	21	146	96
Tera LED Mini 12W	90	9	12
Tera LED Mini 18W	964	15	18
Tera LED Mini 24W	51	22	51
Tera LED Mini 36W	19	29	36
Total	**3,564**	**57,783**	**Approximately 73,748 (depending on voltage)**

This is resulting in an approximate variance of 18,965 watts between the light description value and that of the value being used for submission. The equates to potential under submission of 81,000 kWh per annum if the expected lamp wattage values were used for submission.

I checked the wattages and ballasts applied for lamps other than LEDs and found 20 items of load when matched to the published standardised wattage table:

Incorrect ballasts	**Volume information impact (annual kWh)**
1 x 150watt SON-T (HPS) has a ballast recorded of 28W instead of 18W.	42 kWh over submission
1 x 160watt Mercury Vapour ML has no ballast instead of 15W ballast.	64 kWh under submission
2 x 16W PL Fluorescent have no ballast recorded but it should be 3.8W	33 kWh under submission
13 x (2 X 18W PL LAMP) have no ballast recorded but should be 10W	555 kWh under submission
1 x 36watt TLD Fluorescent has a ballast recorded of 17W and not the expected 10W.	30 kWh over submission
2 x TLD 20watts/33x 2 tubes - lamp wattage recorded as 45W and not the expected 50	43 kWh under submission
TOTAL	623 kWh under submission

The wattage discrepancies are recorded as non-compliance below.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Apr-18 To: 31-Aug-18	One item recorded as RGB Sign with a 100W wattage, does not provide sufficient information to be able to confirm the values are correct. PNCC applies unapproved profiles to adjust specified lamp wattages to account for different drive rates and dimming. 3,564 recorded lamp wattages differ from expected values resulting in a potential under submission of 81,000 kWh per annum. The database wattage and ballast inaccuracies are estimated to be in excess of the 623 kWh per annum. Potential impact: High Actual impact: High Audit history: Once Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, because they are sufficient to ensure that the database is accurate most of the time. The impact is assessed to be high, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
We will manually adjust wattages for the incorrectly recorded LED lights so these reflect the manufacturers maximum wattage.	31 Dec 2018	Identified
We will recalculate and revise historic submission information using the adjusted wattages as far back as the wash up cycle allows.	Ongoing	
We will ask PNCC to correct the other minor inaccuracies identified during this audit	31 Jan 2019	
Preventative actions taken to ensure no further issues will occur	Completion date	
We will continue working with PNCC to develop a Code compliant solution for their dimmable LED lighting.	Ongoing	

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 the ICP has 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 and are used to create a shape file. Meridian supplies EMS with the capacity information and EMS calculates the kWh figure for ICP 0000031152CPB70 and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit and EMS' agent audit. Compliance was confirmed for both parties.

I compared the submission volumes with the load recorded in the database extract against the volumes submitted by Meridian for the month of August 2018 and found that they matched exactly.

Meridian reports the load for ICP 0000031152CPB70 against profile DST, however the profiles used by PNCC to adjust wattages for LED lamp dimming have not been approved by the Electricity Authority. Discussions are progressing with the Electricity Authority, but no new profiles have been approved at the time of this audit. This is causing a variance between the expected lamp wattage and that being used in the database resulting in an apparent under submission of 81,000 kWh per annum if the expected lamp wattage values are correct. This is discussed in **section 3.1**.

21 of incorrect ballasts were found and this is resulting in 623 kWh per annum under submission. This is detailed in **section 3.1** and recorded as non-compliance in **sections 2.1** and **3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 Clause 15.2 and 15.37B(c) From: 01-Apr-18 To: 31-Aug-18	PNCC applies unapproved profiles to adjust specified lamp wattages to account for different drive rates and dimming. 3,564 recorded lamp wattages differ from expected values resulting in a potential under submission of 81,000 kWh per annum. The database wattage and ballast inaccuracies are estimated to be in excess of the 623 kWh per annum. Potential impact: High Actual impact: High Audit history: Once Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, because they are sufficient to ensure that the database is accurate most of the time. The impact is assessed to be high, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
We will manually adjust wattages for the incorrectly recorded LED lights so these reflect the manufacturers maximum wattage.	31 Dec 2018	Identified
We will recalculate and revise historic submission information using the adjusted wattages as far back as the wash up cycle allows.	Ongoing	
We will ask PNCC to correct the other minor inaccuracies identified during this audit	31 Jan 2019	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We will continue working with PNCC to develop a Code compliant solution for their dimmable LED lighting.	Ongoing	

CONCLUSION

The field audit was undertaken of a statistical sample of 312 items of load on 8th November 2018 and was found to be accurate.

The audit found four non-compliances and makes no recommendations. These relate to use of the use of profiled wattages being applied to LED lights to account for dimming and different drive rates. Meridian reports this load against profile DST, however the profiles used by PNCC to adjust wattages have not been approved by the Electricity Authority. Discussions are progressing with the Electricity Authority, but no new profiles have been approved at the time of this audit.

The future risk rating of 20 indicates that the next audit be completed in three months but I recommend that the next audit not be due at the earliest in six months to allow time for the profiled wattages being used to be resolved.

PARTICIPANT RESPONSE

Following the previous audit PNCC committed to adjusting the wattages in the database to reflect the manufacturers maximum wattage.

As this has not been actioned, we will instead implement a workaround to manually adjust wattages for the impacted LED lights before calculating submission volumes for this DUML. We will also apply this workaround to historic data received and revise our submissions as far back as the wash up cycle will allow.