ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

PORIRUA CITY COUNCIL
AND MERIDIAN ENERGY LIMITED

Prepared by: Rebecca Elliot

Date audit commenced: 4 October 2021

Date audit report completed: 24 December 2021

Audit report due date: 31 December 2021

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EXECUTIVE SUMMARY

This audit of the **Porirua City Council (PCC)** 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.

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information.

A RAMM database is managed by PCC in relation to this load. The database is remotely hosted by thinkproject New Zealand Ltd.

Field work and new light installations are carried out by Fulton Hogan, who update the database using Pocket RAMM. Park lights are managed by the parks team.

PCC have worked to improve the database accuracy during the audit period. This audit found the accuracy has improved overall. There is still a way to go to get the database to the required accuracy level.

Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	101.5	Wattage from survey is higher than the database wattage by 1.5%
R_L	98.7	With a 95% level of confidence, it can be concluded that the error could be between -1.3% and +7.5%
R_H	107.5	

In absolute terms, total annual consumption is estimated to be 14,600 kWh higher than the DUML database indicates. This is an improvement from the 141,000 kWh of under submission reported in the last audit.

PCC have now added 206 of the 440 parks and property lights discussed in the last audit. The remaining 234 items of load are still to added. I used the average wattage of the Parks and Property lights that are in RAMM (62 watts) and estimate that there is under submission of 54,549 kWh per annum. This is an improvement from the estimated annual under submission of 141,000 kwh recorded in the last audit.

The future risk rating of 22 indicates that the next audit be completed in three months. This is an improvement from the last audit's risk rating of 38. I recommend that the next audit date is June 2022 and expect this will show further improvement as database management processes are bedded in.

The matters raised are detailed in the table 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	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 14,600 kWh p.a. 257 items of load with the incorrect ballast applied resulting in an estimated over submission of 610.75 kWh. 2,026 LED lights recorded with the incorrect wattage resulting in an estimated over submission of 8,798kWh per annum. Under submission of 54,549 kWh due to inaccurate parks lighting records in RAMM. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates not recorded for new connections.	Moderate	High	6	Identified
Location of each item of load	2.3	11(2)(b) of Schedule 15.3	Eight items of load do not have sufficient location information to enable them to be readily locatable.	Moderate	Low	2	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	Two additional lamps in the field were not recorded in the database that from a sample of 302 items of load.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 14,600 kWh p.a. Eight items of load are not readily locatable. 257 items of load with the incorrect ballast applied resulting in an estimated over submission of 610.75 kWh.	Moderate	High	6	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			2,026 LED lights recorded with the incorrect wattage resulting in an estimated over submission of 8,798kWh per annum. Livening dates not recorded for new connections. Under submission of 54,549 kWh due to inaccurate parks lighting records in RAMM.				
Volume information accuracy	3.2	15.2 and 15.37B(c)	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 14,600 kWh p.a. 257 items of load with the incorrect ballast applied resulting in an estimated over submission of 610.75 kWh. 2,026 LED lights recorded with the incorrect wattage resulting in an estimated over submission of 8,798kWh per annum. Under submission of 54,549 kWh due to inaccurate parks lighting records in RAMM. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates not recorded for new connections.	Moderate	High	6	Identified
						Future Risk Rating	**22**

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	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

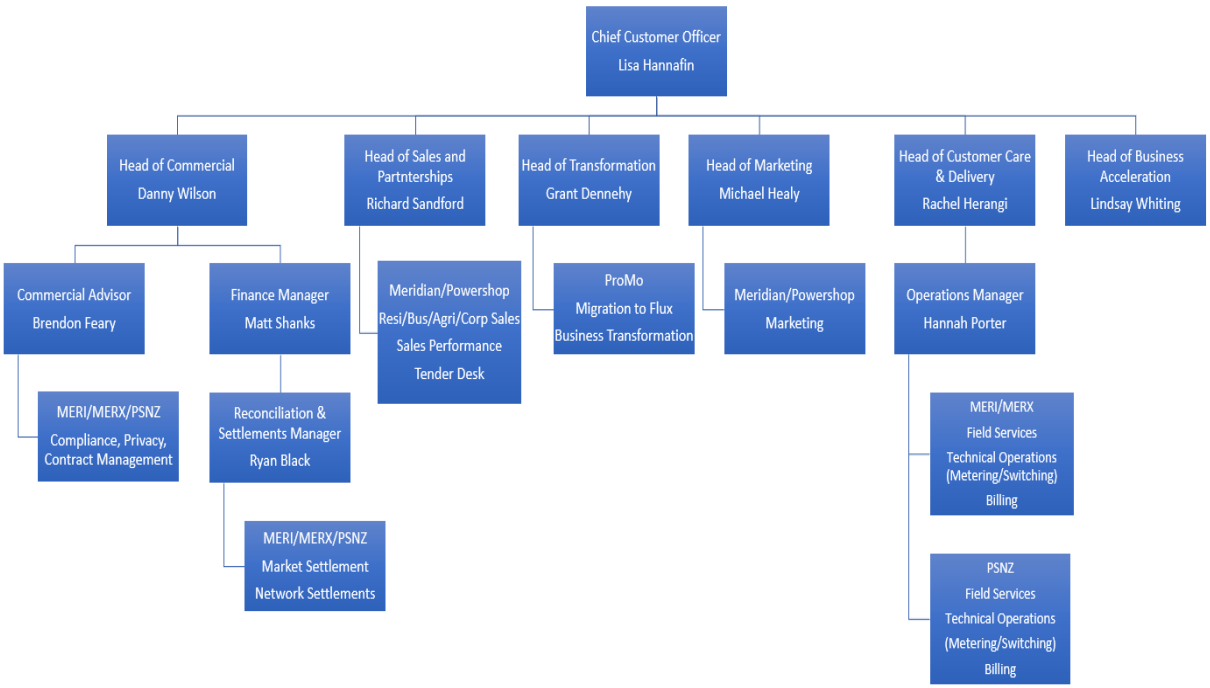
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Meridian provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditors:

Name	Company	Role
Rebecca Elliot	Veritek Limited	Lead Auditor
Brett Piskulic	Veritek Limited	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Amy Cooper	Compliance Officer	Meridian
Jane Pearson	RAMM Technician	Porirua City Council

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Limited. The database is commonly known as "RAMM" which stands for "Road Assessment and Maintenance Management". The specific data used for DUML is held in the Streetlight tables. thinkproject New Zealand Limited backs up the database and assists with disaster recovery as part of their hosting service.

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

Systems used by the trader and their agent to calculate submissions are assessed as part of their reconciliation participant audits.

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	Registry profile	Number of items of load	Database wattage (watts)
0000023024WE5D5	PCC Property – TKR0331	DST	9	1,341
0001255308UN5C4	MASTER ICP PCC Streetlight – TKR0331	DST	3,908	163,131
0001256873UNFA3	MASTER ICP PCC Streetlight – PNI0331	DST	1,387	55,131
0000161078CKA46	MASTER ICP PCC PARKS # PNI0331	DST	140	7,461
0000161079CK603	PCC PARKS #TKR0331 TOTAL ASSETS	DST	59	4,102
Total			**5,503**	**231,166**

1.7. Authorisation Received

All information was provided directly by Meridian or PCC.

1.8. Scope of Audit

This audit of the PCC DUML database and processes was conducted at the request of 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.

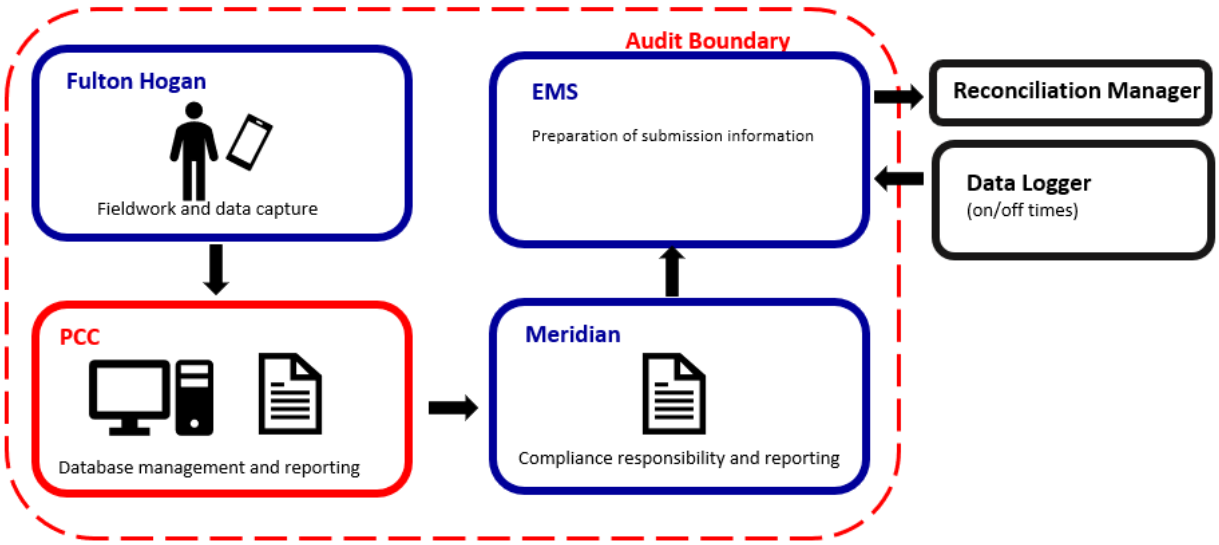
The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information.

A RAMM database is managed by PCC in relation to this load. The database is remotely hosted by thinkproject New Zealand Limited.

Field work and new light installations are carried out by Fulton Hogan. Pocket RAMM is used to update the database.

Park lights are managed by the parks team.

The diagram below shows the audit boundary for clarity.



The field audit was undertaken of a statistical sample of 302 items of load.

1.9. Summary of previous audit

The previous audit was completed in August 2021 by Steve Woods of Veritek Limited. Seven non-compliances were identified, and no recommendations were made. The current statuses of the findings are detailed below.

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Under submission of 141,000 kWh due to inaccurate parks lighting records in RAMM. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates not recorded for new connections. Database is not confirmed as accurate with a 95% level of confidence as recorded in section 3.1.	Still existing
ICP identifier	2.2	11(2)(a) and (aa) of Schedule 15.3	ICP not recorded for three items of load.	Cleared
Location of each item of load	2.3	11(2)(b) of Schedule 15.3	One item of load does not have sufficient location information to enable it to be readily locatable.	Still existing
Description and capacity of load	2.4	11(2)(b) of Schedule 15.3	35 lights have insufficient information to determine the light type. One lamp wattage recorded as zero. 29 lamp wattages and descriptions are blank	Cleared
All load recorded in database	2.5	11(2A) of Schedule 15.3	Five additional lamps in the field that were not recorded in the database.	Still existing

Subject	Section	Clause	Non-compliance	Status
Database accuracy	3.1	15.2 and 15.37B(b)	3 items of load do not have the ICP recorded. One item of load does not have complete location information. 2,028 examples of incorrect or incomplete description or capacity information. Database is not confirmed as accurate with a 95% level of confidence. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates not recorded for new connections. Under submission of 141,000 kWh due to inaccurate parks lighting records in RAMM.	Cleared Still existing for all other items
Volume information accuracy	3.2	15.2 and 15.37B(c)	Under submission of 141,000 kWh due to inaccurate parks lighting records in RAMM. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates not recorded for new connections. Database is not confirmed as accurate with a 95% level of confidence as recorded in section 3.1.	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 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

The audit was completed 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 total volume submitted to the Reconciliation Manager is based on a monthly database report derived from RAMM and the "burn time" which is sourced from data loggers. 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 EMS' agent audit.

The capacities supplied to EMS for October 2021 were checked and confirmed to be the same as the database.

The field audit found that the database accuracy was not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 14,600kWh. This is detailed in **section 3.1**.

Some database inaccuracies were found as detailed in **section 3.1** and summarised below:

Description	Items of load	Estimated annual kWh impact
Incorrect ballasts applied	257	-610.75
Incorrect LED lamp wattage	2,060	-8,798
Inaccurate parks lighting information in RAMM	234	+54,549

On 18 June 2019, the Electricity Authority issued a memo confirming that the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current monthly report is provided as a snapshot and this practice is non-compliant. The database contains a "light install date" and a "lamp install date" but there is not a field for "livening date" for newly connected lights. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 02-Jun-21 To: 01-Dec-21	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 14,600 kWh p.a. 257 items of load with the incorrect ballast applied resulting in an estimated over submission of 610.75 kWh. 2,026 LED lights recorded with the incorrect wattage resulting in an estimated over submission of 8,798kWh per annum. Under submission of 54,549 kWh due to inaccurate parks lighting records in RAMM. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates not recorded for new connections. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls over the database are rated as moderate as PCC are working to improve the database accuracy but there is still room for improvement. The audit risk rating is high based on kWh variances detailed above.

Actions taken to resolve the issue	Completion date	Remedial action status
We are continuing to engage with PCC regarding the resolution of inaccuracies within their database. As reported this work is continuing and is likely to take a further 3 – 6 months to complete.	30 June 2022	Identified
We are revising historic submissions as the data received becomes more accurate.	Ongoing	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Database management processes are being reviewed as part of the work being conducted and expected to reduce issues going forward.	30 June 2022	

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 was recorded against each item of load.

Audit commentary

The database contains 212 private lights which are not recorded against an ICP, it has been confirmed that these are not the responsibility of Porirua CC. These lights have been passed to Wellington Electricity to check that these are being reconciled as either standard unmetered load or shared unmetered load against the relevant ICPs. All lights which are the responsibility of the Porirua CC have an ICP recorded.

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 street address and also GPS coordinates.

28 items of load do not have GPS coordinates. Of these, eight items of load do not have sufficient other information to enable them to be located. The house number, road, suburb and pole number fields are not populated for these eight items of load. These eight items of load were recently added to the database, with pole and lamp install dates of 3 December 2021.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.3 With: Clause 11(2)(b) of Schedule 15.3 From: 03-Dec-21 To: 21-Dec-21	Eight items of load do not have sufficient location information to enable them to be readily locatable. Potential impact: Low Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because there is room for improvement. The impact is rated as low as there are only eight items of load that are not readily locatable.

Actions taken to resolve the issue	Completion date	Remedial action status
Audit findings have been provided to the council for resolution.	28 Feb 2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Database management processes are being reviewed as part of the work being conducted and expected to reduce issues going forward.	30 June 2022	

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 database contains fields for lamp make and model. There are three fields which record lamp wattage, gear wattage and total wattage. The fields were populated for all items of load.

The accuracy of lamp descriptions, wattages and ballasts is recorded 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 302 items of load. The sample was selected from five strata, as follows:

- roads A-D,
- roads E-K,
- roads L-O,
- roads P-S, and
- roads T-Z.

Audit commentary

The field audit discrepancies are detailed below:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
APPLE TERRACE	8	8	-	1	1 x 50W HPS recorded as 26W LED
BOWMAN PLACE	4	4	-	3	3 x 36W LEDs recorded as 20W LED
CLIPPER STREET	3	3	-	1	1 x 28W LED recorded as 36W LED
DERBY PLACE	4	4	-	1	1 x 28W LED recorded as 26W LED
HALLADALE ROAD	12	12	-	1	1 x 28W LED recorded as 36W LED
KILKERRAN PLACE LEFT FORK	1	1	-	1	1 x 98W LED recorded as 99W LED
KIVELL STREET	4	4	-	1	1 x 26W LED recorded as 70W HPS
LIVET PLACE	4	5	+1	1	1x additional spotlight halogen found in the field. 1x 70W HPS with the incorrect ballast of 12W instead of 13W recorded

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
MAHER PLACE	4	4	-	1	1 x 26W LED recorded as 36W LED
POHUTUKAWA GROVE	3	3	-	2	2 x 28W LEDs recorded as 36W LED
PRINCESS STREET	3	3	-	1	1 x 28W LED recorded as 36W LED
ROYS ROAD	7	6	-1	-	1x 36W LED not found in the field
TAUPO CRESCENT	16	16	-	1	1 x 50W HPS recorded as 36W LED
TONGARIRO DRIVE	14	14	-	2	2 x 28W LEDs recorded as 36W LED
WAIUTA STREET	16	15	-1	2	1x 26W LED not found in the field- new pole 1x 36W LED recorded as 26W 1x 28W LED recorded as 36W
WALL PLACE	5	6	+1		1 additional 73W LED found in the field.
Grand Total	**302**	**302**	**4 (+2/-2)**	**19**	

The field audit found two additional lights. This is recorded as non-compliance below.

The database accuracy has improved during the audit period across a similar sample size as detailed in the table below:

Street	May 2021	December 2021
Incorrect wattages	51	19
Additional lights	5	2
Missing lights	11	2

This is discussed further in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 02-Jun-21 To: 01-Dec-21	Two additional lamps in the field were not recorded in the database that from a sample of 302 items of load. Potential impact: Low Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate as PCC have strengthened their database accuracy by undertaking a field audit and data capture is expected to be more accurate going forward. The audit risk rating is low based on the small volume of lights affected in relation to the sample examined.

Actions taken to resolve the issue	Completion date	Remedial action status
Field audit findings have been provided to the council for resolution.	28 Feb 2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Database management processes are being reviewed as part of the work being conducted and expected to reduce issues going forward.	30 June 2022	

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

The RAMM database functionality achieves compliance with the code.

The change management process and the compliance of the database reporting provided to Meridian is detailed in **sections 3.1** and **3.2**.

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	PCC streetlights in the Porirua area
Strata	The database contains 5,303 items of load in the PCC area. The processes for the management of all PCC items of load is the same. I selected the following strata: • A-D, • E-K, • L-O, • P-S, and • T-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 60 sub-units.
Total items of load	302 items of load were checked.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority against the database or in the case of LED lights against the LED light specification.

The change management process to track changes and timeliness of database updates was evaluated.

Audit commentary

A field audit was conducted of a statistical sample of 302 items of load. The "database auditing tool" was used to analyse the results, which are shown in the table below.

Result	Percentage	Comments
The point estimate of R	101.5	Wattage from survey is higher than the database wattage by 1.5%
R_L	98.7	With a 95% level of confidence, it can be concluded that the error could be between -1.3% and +7.5%
R_H	107.5	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 1 February 2019 and the table below shows that Scenario C (detailed below) applies.

The conclusion from Scenario C is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 1.3% lower and 7.5% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 3 kW higher than the database indicates.

There is a 95% level of confidence that the installed capacity is between 3.0 kW lower to 17 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 14,600 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 12,100kWh p.a. lower to 71,600 kWh p.a. higher than the database indicates.

Scenario	**Description**
A - **Good accuracy, good precision**	This scenario applies if: (a) R_H is less than 1.05; and (b) R_L is greater than 0.95 The conclusion from this scenario is that: (a) the best available estimate indicates that the database is accurate within +/- 5 %; and (b) this is the best outcome.
B - **Poor accuracy, demonstrated with statistical significance**	This scenario applies if: (a) the point estimate of R is less than 0.95 or greater than 1.05 (b) as a result, either R_L is less than 0.95 or R_H is greater than 1.05. There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level
C - **Poor precision**	This scenario applies if: (a) the point estimate of R is between 0.95 and 1.05 (b) R_L is less than 0.95 and/or R_H is greater than 1.05 The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 %

Lamp description and capacity accuracy

I checked the ballasts being applied and found that 257 lamps had a discrepancy when compared to the standardised wattage table. This is detailed in the table below:

Lamp Type	Database Total Lamp Wattage	EA Standardised Total Wattage	Variance (watts)	Database Quantity	Estimated Annual kWh effect on consumption
250W MV	268	270	-2	1	-8.542
250W MV	278	270	+8	1	+34.168
50W MV	50	59	-9	19	-730.341
50W MV	62	59	+3	16	+196.466
70W SON-E	82	77	+5	33	+704.715
70W SON	80	83	-3	1	-12.813
70W SON	186	83	-1	186	-794.406
Total estimated annual effect on submission				257	-610.753 kWh

I checked LED lamp wattages against available specification sheets and found that 2,060 Italo 35.5W lamps are incorrectly recorded in the database as 36W. This will be resulting in an estimated over submission of 8,798 kWh. I was unable to confirm the wattage of 25 models of LED lamps which amount to 1,202 lamps due to the light specifications being unable to be reviewed before the audit is due. These will be confirmed in the next audit.

Address accuracy

The location information is incomplete for eight items of load. This is recorded as non-compliance below and in **section 2.3**.

ICP number and owner accuracy

All lights which are the responsibility of the Porirua CC have an ICP recorded.

Change management process findings

The RAMM database used for submission is managed by PCC. The streetlight contractors update the database using Pocket RAMM.

The new connection process remains unchanged. The lights are recorded in RAMM when an “as built” plan is provided to Fulton Hogan.

The current monthly report is provided as a snapshot and this practice is non-compliant. The database contains a “light install date” and a “lamp install date” but there is not a field for “livening date” for newly connected lights. Lights can be livened prior to “vesting” and PCC will not take responsibility for the consumption until “vesting” occurs. The new connections process will need to be revised and it’s possible separate ICPs may be required for the developer in situations where lighting is livened but is not the responsibility of PCC. When a wattage is changed in the database due to a physical change or a correction,

only the record present at the time the report is run is recorded, not the historical information showing dates of changes.

Festive lighting is no longer connected.

Outage patrols are conducted at night over a 4-month cycle.

Parks Lighting

During the previous audit, PCC provided the results of a full field survey of Parks and Property lights. This audit found that there were 440 lights. 206 have now been added to the RAMM database. The remaining 234 items of load are still to be added. I used the average wattage of the Parks and Property lights that are in RAMM (62 watts) and estimate that there is under submission of 54,549 kWh per annum. This is an improvement from the estimated annual under submission141,000 kwh recorded in the last audit.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 02-Jun-21 To: 01-Dec-21	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 14,600 kWh p.a. Eight items of load are not readily locatable. 257 items of load with the incorrect ballast applied resulting in an estimated over submission of 610.75 kWh. 2,026 LED lights recorded with the incorrect wattage resulting in an estimated over submission of 8,798kWh per annum. Livening dates not recorded for new connections. Under submission of 54,549 kWh due to inaccurate parks lighting records in RAMM. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls over the database are rated as moderate as PCC are working to improve the database accuracy but there is still room for improvement. The audit risk rating is high based on kWh variances.

Actions taken to resolve the issue	Completion date	Remedial action status
We are continuing to engage with PCC regarding the resolution of inaccuracies within their database. As reported this work is continuing and is likely to take a further 3 – 6 months to complete.	30 June 2022	Identified
We are revising historic submissions as the data received becomes more accurate.	Ongoing	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Database management processes are being reviewed as part of the work being conducted and expected to reduce issues going forward.	30 June 2022	

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, and
- checking the database extract combined with the on hours against the submitted figure to confirm accuracy.

Audit commentary

Meridian reconciles this DUML load using the DST profile. The total volume submitted to the Reconciliation Manager is based on a monthly database report derived from RAMM and the "burn time" which is sourced from data loggers. 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 EMS' agent audit.

The capacities supplied to EMS for October 2021 were checked and confirmed to be the same as the database.

The field audit found that the database accuracy was not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 14,600kWh. This is detailed in **section 3.1**.

Some database inaccuracies were found as detailed in **section 3.1** and summarised below:

Description	Items of load	Estimated annual kWh impact
Incorrect ballasts applied	257	-610.75
Incorrect LED lamp wattage	2,060	-8,798
Inaccurate parks lighting information in RAMM	234	+54,549

On 18 June 2019, the Electricity Authority issued a memo confirming that the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current monthly report is provided as a snapshot and this practice is non-compliant. The database contains a "light install date" and a "lamp install date" but there is not a field for "livening date" for newly connected lights. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 02-Jun-21 To: 01-Dec-21	Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 14,600 kWh p.a. 257 items of load with the incorrect ballast applied resulting in an estimated over submission of 610.75 kWh. 2,026 LED lights recorded with the incorrect wattage resulting in an estimated over submission of 8,798kWh per annum. Under submission of 54,549 kWh due to inaccurate parks lighting records in RAMM. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates not recorded for new connections. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls over the database are rated as moderate as PCC are working to improve the database accuracy but there is still room for improvement. The audit risk rating is high based on kWh variances.

Actions taken to resolve the issue	Completion date	Remedial action status
We are continuing to engage with PCC regarding the resolution of inaccuracies within their database. As reported this work is continuing and is likely to take a further 3 – 6 months to complete.	30 June 2022	Identified
We are revising historic submissions as the data received becomes more accurate.	Ongoing	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Database management processes are being reviewed as part of the work being conducted and expected to reduce issues going forward.	30 June 2022	

CONCLUSION

A RAMM database is managed by PCC in relation to this load. The database is remotely hosted by thinkproject New Zealand Ltd.

Field work and new light installations are carried out by Fulton Hogan, who update the database using Pocket RAMM. Park lights are managed by the parks team.

PCC have worked to improve the database accuracy during the audit period. This audit found the accuracy has improved overall. There is still a way to go to get the database to the required accuracy level.

Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	101.5	Wattage from survey is higher than the database wattage by 1.5%
R_L	98.7	With a 95% level of confidence, it can be concluded that the error could be between -1.3% and +7.5%
R_H	107.5	

In absolute terms, total annual consumption is estimated to be 14,600 kWh higher than the DUML database indicates. This is an improvement from the 141,000 kWh of under submission reported in the last audit.

PCC have now added 206 of the 440 parks and property lights discussed in the last audit. The remaining 234 items of load are still to added. I used the average wattage of the Parks and Property lights that are in RAMM (62 watts) and estimate that there is under submission of 54,549 kWh per annum. This is an improvement from the estimated annual under submission of 141,000 kwh recorded in the last audit.

The future risk rating of 22 indicates that the next audit be completed in three months. This is an improvement from the last audit's risk rating of 38. I recommend that the next audit date is June 2022 and expect this will show further improvement as database management processes are bedded in.

PARTICIPANT RESPONSE

We are continuing to actively engage with PCC to ensure work to improve database compliance continues. We are pleased to see the improvements noted in this audit although acknowledge there is still work to be done.

The findings of this audit have been provided to the council for action and to ensure the issues noted are included in their clean up work.

We also acknowledge the slightly late submission of this report which was due to timing of the report receipt and due date over the holiday period and staff leave.