ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

GISBORNE DISTRICT COUNCIL AND MERCURY ENERGY

NZBN 9429037706609

Prepared by: Steve Woods

Date audit commenced: 16 July 2024

Date audit report completed: 19 August 2024

Audit report due date: 01-Sep-24

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EXECUTIVE SUMMARY

This audit of the **Gisborne District Council (GDC)** Unmetered Streetlights DUML database and processes was conducted at the request of **Mercury NZ Limited (Mercury),** 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.

Mercury reconciles this DUML load using the HHR profile. Mercury used exemption 233 allowing them to provide non-half-hour ("NHH") submission information instead of half-hour ("HHR") submission information for distributed unmetered load ("DUML"). This exemption expired on 31st October 2023. Mercury is in the process for applying for a new exemption. The use of the HHR profile is recorded as non-compliance.

The field audit of 269 items of load (6% of the database) confirmed the database was not accurate and under submission has occurred of 106,400 kWh per annum. The LED roll out is about 76% complete according to the database records. There were 88 incorrect wattages identified by the field audit, which represents one third of the sample. The incorrect wattages are summarised in the table below.

Discrepancy	Quantity
High pressure sodium recorded as LED	47
LED installed but still recorded as high-pressure sodium	36
Incorrect LED wattage	5

The audit found four non-compliances and one recommendation is made. The future risk rating of 29 indicates that the next audit be completed in three months. I have considered this in conjunction with Mercury' comments and I recommend the next audit is conducted in six months, in order to check the database updates and to ensure revisions are conducted to submission information.

The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	The field audit identified annual under submission of 106,400 kWh. HHR profile used without an exemption.	Weak	High	9	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	Two additional lights identified in the field.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	Inaccurate database leading to under submission of approx. 106,400 kWh per annum.	Weak	High	9	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The field audit identified annual under submission of 106,400 kWh. HHR profile used without an exemption.	Weak	High	9	Identified
					Future Risk Rating	**29**	

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	Recommendation
GPS coordinates	2.3	Add GPS coordinates for six items of load.

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

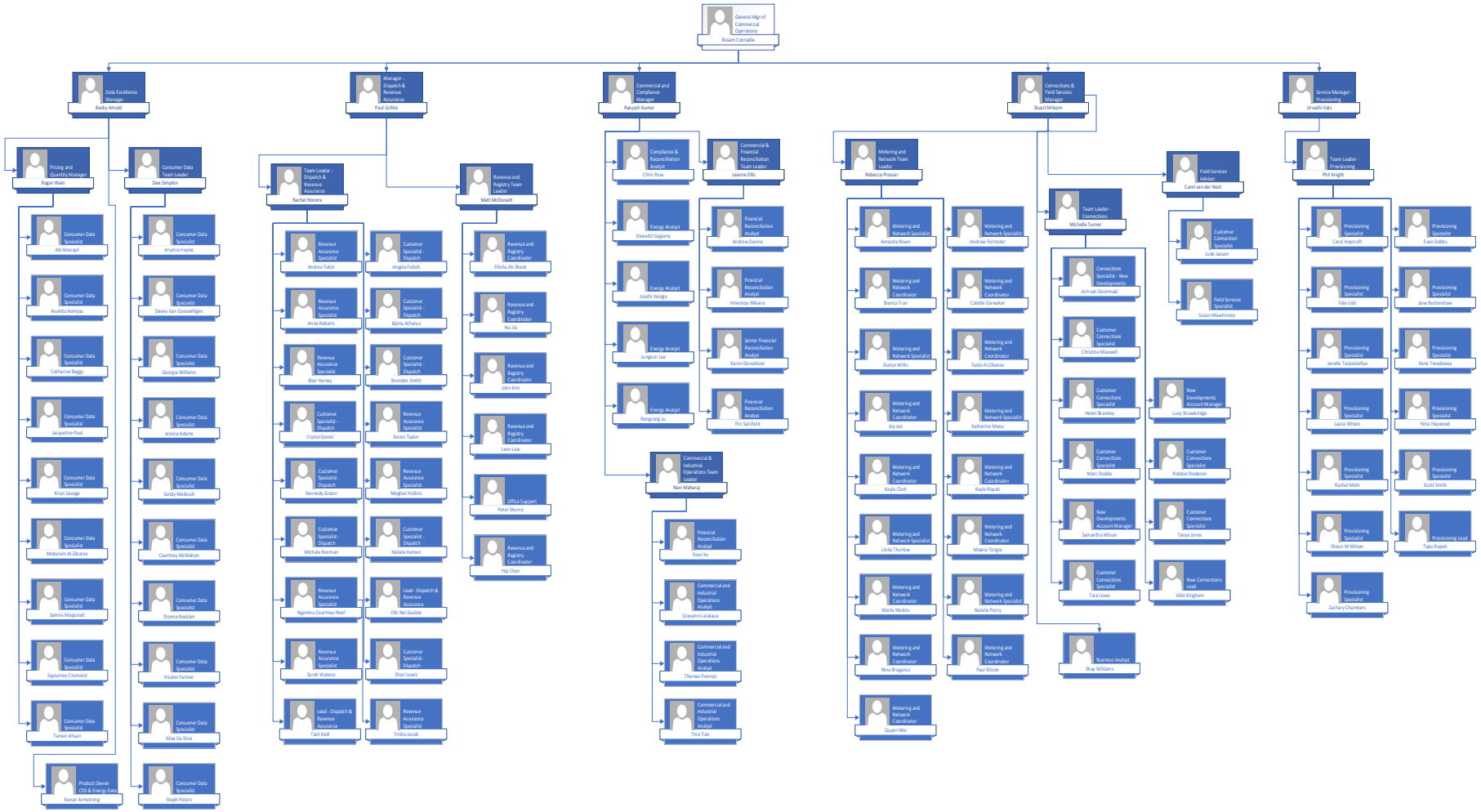
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit commentary

Mercury had an exemption to use the HHR profile for submission. This has now expired and non-compliance is recorded in Sections 2.1 and 3.2 for the use of the HHR profile without an exemption.

1.2. Structure of Organisation

Mercury provided the relevant organisational structure:



1.3. Persons involved in this audit

Auditor:

Name	Title	Company
Steve Woods	Electricity Authority Approved Auditor	Veritek Limited

Other personnel assisting in this audit were:

Name	Title	Company
Andrew Haughey	Senior Procurement Advisor	Gisborne DC
Chris Posa	Compliance and Reconciliation Analyst	Mercury

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Limited. The specific module used for DUML is called "SLIMM" which stands for "Streetlighting Inventory Maintenance Management".

The database is cloud based and is 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 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

The table below shows the relevant ICPs.

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0000740069EN998	Unmetered Decorative lights	TUI1101	HHR	17	1,504
0000740501EN179	Unmetered Cameras	TUI1101	HHR	3	60
0000740503EN1FC	Unmetered Streetlight Connections	TUI1101	HHR	3,677	230,433
TOTAL				3702	244,711

The previous audit report contained a recommendation that the unmetered cameras be investigated to confirm they were connected to the streetlight circuit. It was confirmed that only three were on the streetlight circuit and the others have been removed from this ICP.

1.7. Authorisation Received

All information was provided directly by GDC and Mercury.

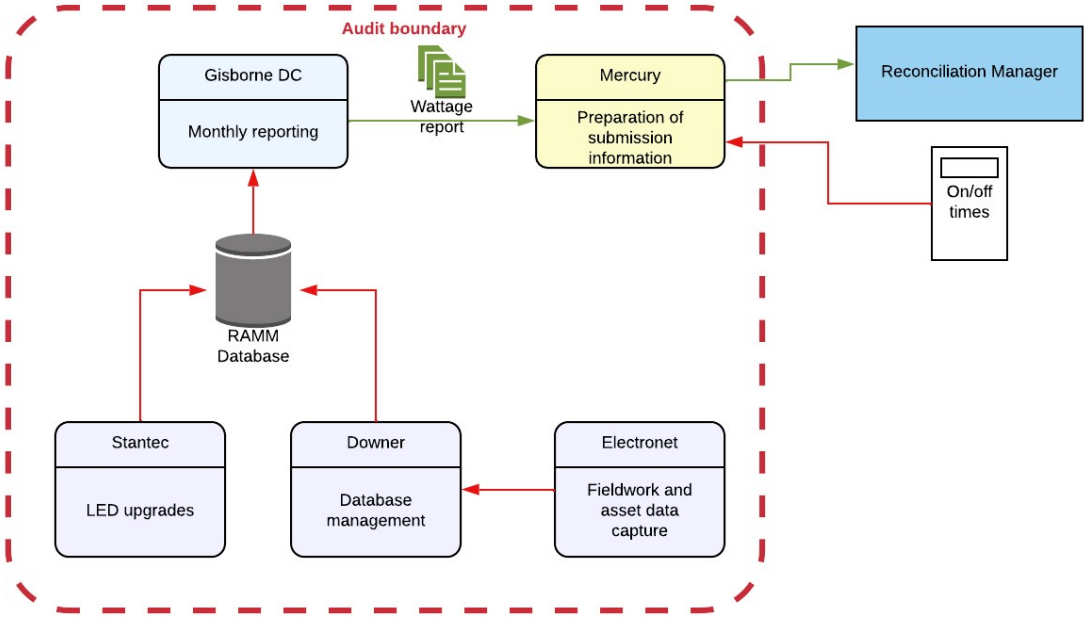
1.8. Scope of Audit

This audit of the GDC RAMM DUML database and processes was conducted at the request of Mercury, 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.

GDC provide a monthly report to Mercury. The on/off times are derived by a data logger interrogated by Bluecurrent.

The diagram below shows the audit boundary for clarity.



The field audit was carried out of 269 items of load on 16 and 17 July 2024.

1.9. Summary of previous audit

The previous audit was conducted by Steve Woods of Veritek Limited in August 2023. That audit found four non-compliances. The table below details the status of those findings.

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	The field audit identified annual over submission of 59,500 kWh.	Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	Two additional lights identified in the field.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	Inaccurate database leading to over submission of approx. 59,500 kWh per annum.	Still existing
Volume information accuracy	3.2	15.2 and 15.37B(c)	The field audit identified annual over submission of 59,500 kWh.	Still existing

Table of Recommendations

Subject	Section	Recommendation	Status
Unmetered cameras	1.6	Check whether the cameras are connected to the streetlight circuits or not and whether they should be in this database and reconciled with the NST profile.	Cleared

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

Mercury has requested Veritek to undertake this streetlight audit.

Audit commentary

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

Audit outcome

Compliant

2. DUML DATABASE REQUIREMENTS

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

Code reference

Clause 11(1) of schedule 15.3

Code related audit information

The retailer must ensure the:

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

Audit observation

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

Audit commentary

Mercury reconciles this DUML load using the HHR profile. Mercury used exemption 233 that allowed them to provide non-half-hour ("NHH") submission information instead of half-hour ("HHR") submission information for distributed unmetered load ("DUML"). This exemption expired on 31st October 2023. Mercury is in the process for applying for a new exemption. The use of the HHR profile is recorded as non-compliance.

The total volume submitted to the Reconciliation Manager is based on a monthly database report provided by GDC from RAMM. The "burn time" is sourced from a data logger. The report allows changes made to the database at a daily level to be identified.

The NZTA lights in the Gisborne area are being reconciled by NZTA using the NZTA RAMM database and are therefore no longer part of the scope of this audit. I checked the submission for June 2024 and confirmed that the calculations were correct.

The field audit identified annual under submission of 106,400 kWh. This is detailed 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-Sep-23 To: 19-Jul-24	The field audit identified annual under submission of 106,400 kWh. HHR profile used without an exemption. Potential impact: High Actual impact: High Audit history: Multiple times previously Controls: Weak Breach risk rating: 9

Audit risk rating	Rationale for audit risk rating
High	The controls are rated as weak because although there are sound processes in place to identify business as usual changes, the LED rollout appears to be causing some database inaccuracy. The impact is assessed to be high because the impact on submission is greater than 50,000 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status
We are in the process of drafting applications for DUML profiles that allow us to submit as HHR, we will submit to the EA as soon as possible. August/September 2024. Gisborne DC advised that they believe the inaccuracies in the database are due to bulk update done that contained inaccurate information, they are planning to do a tidy up with an ETA on completion of end of August 2024.	August/September 2024	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We will continue to work with Gisborne DC on ensuring database accuracy.	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 that an ICP was recorded against each item of load.

Audit commentary

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

Audit commentary

The database contains a road or park name for all items of load. GPS co-ordinates are recorded for all items of load apart from six. I recommend coordinates are added for these lights.

Description	Recommendation	Audited party comment	Remedial action
GPS coordinates	Add GPS coordinates for six items of load.	We have recommended this to Gisborne DC.	Identified

Audit outcome

Compliant

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage and that all items of load were recorded.

Audit commentary

Lamp make, lamp mode and lamp wattage are included in the database. I examined the database and found all items of load had a wattage value and the correct ballasts have been applied where expected.

The overall 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 269 lights using the statistical sampling methodology.

Audit commentary

The field audit discrepancy findings are summarised in the table below. A detailed list was provided to Gisborne DC and Mercury.

Discrepancy	Quantity	Comments
Lights in the field not in the database	2	
Lights in the database not in the field	1	
Incorrect wattage	88	14 updates have occurred, and the remainder are imminent.
GRAND TOTAL	**91**	

This clause relates to lights in the field not recorded in the database. Two additional lights were identified in the field.

The accuracy of the database is discussed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-Sep-23 To: 19-Jul-24	Two additional lights identified in the field. Potential impact: Low Actual impact: Low Audit history: Three times previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate because they mitigate risk most of the time. The impact is assessed to be low as the number of lights missing from the database is small.

Actions taken to resolve the issue	Completion date	Remedial action status
Gisborne DC are in the process of doing a tidy up of the database with an ETA on completion of end of August 2024. We have highlighted regarding these 2 lights to them.	August/September 2024	Identified

Preventative actions taken to ensure no further issues will occur	Completion date	
We will continue to work with Gisborne DC on ensuring database accuracy.	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 ability of the database to track changes was assessed and the process for tracking of changes in the database was examined.

Audit commentary

The database functionality achieves compliance with the code.

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	Gisborne District Council
Strata	The GDC RAMM database contains the items of unmetered load in the Gisborne District Council area. The processes for the management of items of load are the same, but I decided to place the items of load into four strata, as follows: • street name A - De, • street name Di - Jo, • street name Ju - P, and • street name Q - Y.
Area units	I created a pivot table of the ICP in each area and used a random number generator in a spreadsheet to select a total of 53 sub-units representing 6% of the total database load.
Total items of load	269 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 and timeliness of database updates was evaluated.

Audit commentary

Database accuracy based on the field audit

A field audit was conducted of a statistical sample of 269 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	110.7	Wattage from survey is higher than the database wattage by 10.7%
R_L	93.4	With a 95% level of confidence, it can be concluded that the error could be between -6.6% and + 34.4%
R_H	134.4	

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 B (detailed

below) applies. Scenario B means the database has poor accuracy, demonstrated with statistical significance.

In absolute terms the installed capacity is estimated to be 25 kW higher than the database indicates.

There is a 95% level of confidence that the installed capacity is between 15.0 kW lower and 80.0 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 106,400 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 65,300 kWh p.a. lower to 340,700 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

The RAMM database was examined and found that all wattages and ballasts were correct.

NZTA lighting

NZTA lighting is not included in the GDC RAMM database and is no longer included in the scope of this audit. These are being audited as part of an NZTA RAMM database for another trader.

ICP accuracy

All items of load have an ICP identifier recorded in the extract provided to Mercury for submission.

Location accuracy

The database contains fields for the street address and GPS coordinates for all items of load apart from six. I have made a recommendation in **section 2.3** to add these coordinates.

Private lights

The database contains some private lights. None are excluded from submission.

Festive lights

Festive lights are used but these are connected to metered circuits so do not need to be considered as part of this audit.

Change management process findings

The GDC RAMM database is being used for billing and reconciliation. Electronet provide updates to the RAMM database on behalf of GDC. Roading Logistics assists with oversight of database accuracy. The relevant install dates are being used to ensure lights are accounted for correctly. GDC produce a monthly wattage report and provide this to Mercury. The report allows changes made to the database at a daily level to be identified.

Outage patrols are carried out as part of the maintenance contract but as the LED rollout nears completion this requirement is expected to be reduced.

The LED roll out is about 76% complete according to the database records. There were 88 incorrect wattages identified by the field audit, which represents one third of the sample. The incorrect wattages are summarised in the table below.

Discrepancy	Quantity
High pressure sodium recorded as LED	47
LED installed but still recorded as high-pressure sodium	36
Incorrect LED wattage	5

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Sep-21 To: 13-Jul-23	Inaccurate database leading to under submission of approx. 106,400 kWh per annum. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as weak because although there are sound processes in place to identify business as usual changes, the LED rollout appears to be causing some database inaccuracy. The impact is assessed to be high because the impact on submission is greater than 50,000 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status

Gisborne DC advised that they believe the inaccuracies in the database are due to bulk update done that contained inaccurate information, they are planning to do a tidy up with an ETA on completion of end of August 2024.	August/September 2024	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We will continue to work with Gisborne DC on ensuring database accuracy.	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, and
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

Audit commentary

Mercury reconciles this DUML load using the HHR profile. Mercury used exemption 233 that allowed them to provide non-half-hour ("NHH") submission information instead of half-hour ("HHR") submission information for distributed unmetered load ("DUML"). This exemption expired on 31st October 2023. Mercury is in the process for applying for a new exemption. The use of the HHR profile is recorded as non-compliance.

The total volume submitted to the Reconciliation Manager is based on a monthly database report provided by GDC from RAMM. The "burn time" is sourced from a data logger. The report allows changes made to the database at a daily level to be identified.

The NZTA lights in the Gisborne area are being reconciled by NZTA using the NZTA RAMM database and are therefore no longer part of the scope of this audit. I checked the submission for June 2024 and confirmed that the calculations were correct.

The field audit identified annual under submission of 106,400 kWh. This is detailed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Sep-23 To: 19-Jul-24	The field audit identified annual under submission of 106,400 kWh. HHR profile used without an exemption. Potential impact: High Actual impact: High Audit history: Multiple times previously Controls: Weak Breach risk rating: 9

Audit risk rating	Rationale for audit risk rating
High	The controls are rated as weak because although there are sound processes in place to identify business as usual changes, the LED rollout appears to be causing some database inaccuracy. The impact is assessed to be high because the impact on submission is greater than 50,000 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status
We are in the process of drafting applications for DUML profiles that allow us to submit as HHR, we will submit to the EA as soon as possible. August/September 2024. Gisborne DC advised that they believe the inaccuracies in the database are due to bulk update done that contained inaccurate information, they are planning to do a tidy up with an ETA on completion of end of August 2024.	August/September 2024	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We will continue to work with Gisborne DC on ensuring database accuracy.	Ongoing	

CONCLUSION

Mercury reconciles this DUML load using the HHR profile. Mercury used exemption 233 allowing them to provide non-half-hour ("NHH") submission information instead of half-hour ("HHR") submission information for distributed unmetered load ("DUML"). This exemption expired on 31st October 2023. Mercury is in the process for applying for a new exemption. The use of the HHR profile is recorded as non-compliance.

The field audit of 269 items of load (6% of the database) confirmed the database was not accurate and under submission has occurred of 106,400 kWh per annum. The LED roll out is about 76% complete according to the database records. There were 88 incorrect wattages identified by the field audit, which represents one third of the sample. The incorrect wattages are summarised in the table below.

Discrepancy	Quantity
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The audit found four non-compliances and one recommendation is made. The future risk rating of 29 indicates that the next audit be completed in three months. I have considered this in conjunction with Mercury' comments and I recommend the next audit is conducted in six months, in order to check the database updates and to ensure revisions are conducted to submission information.

PARTICIPANT RESPONSE

Thank you to Steve for his work and support on this audit.