ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

WAIKATO DISTRICT COUNCIL AND MERIDIAN ENERGY
NZBN: 9429037696863

Prepared by: Rebecca Elliot

Date audit commenced: 5 September 2023

Date audit report completed: 30 October 2023

Audit report due date: 01-Dec-23

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This audit of the **Waikato District Council Unmetered Streetlights (WDC**) 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 database is remotely hosted by thinkproject New Zealand Ltd and the reporting from this is managed by Odyssey Energy Limited. The Waikato District Alliance is a joint venture between Waikato DC and Downer to provide infrastructure management across all of Waikato DC assets. Infrastructure Alliance manages the maintenance contract and updates the database as changes are made in the field. The Waikato District Council Land Development Engineers manage the process for new subdivisions. The new streetlight process does not ensure that new streetlight assets are being added from the correct date. I have repeated the last audit's recommendation that this process is reviewed.

The field audit found the database was within the allowable +/-5% accuracy threshold. However, it did identify a section of a Pokeno subdivision where 172 LED lights have been incorrectly recorded as 37W but are 47W. Some of these have been installed since 2018. I recommend that the asset acceptance check confirms that the correct light description and wattage are provided.

The check of submission values between the kW value in the database to the value provided to EMS identified a difference for one ICP. This is due to 77 items of load that have been passed from the Waka Kotahi RAMM database to WDC. These were advised to Meridian in a spreadsheet in October 2022. The kW value from this spreadsheet is being manually added. Whilst the volume is being submitted the following issues are identified:

- not all items of load are recorded in the WDC database,
- the spreadsheet does not contain sufficient location details to confirm that these are not still being included in the Waka Kotahi RAMM database, and
- any changes made to these lights since October 2022 will not be taken into account as no updates are being tracked for these items of load.

WDC are working to get these added to the RAMM database.

The audit found four non-compliance issues and six recommendations are made. The future risk rating of eight indicates that the next audit be completed in 18 months. I have considered this in conjunction with Meridian's comments and I recommend that the next audit be in 12 months, so any corrections are confirmed as completed with the 14 month revision cycle.

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	WDC database is not up to date. Incorrect lamp description and wattage provided by developer for up to 172 items of load resulting in a potential under submission of 8,106 kWh per annum. Submission is based on a snapshot and does not consider historic changes.	Moderate	Low	2	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	Four items of load of a sample of 272 items checked in the field are missing from the database. Two additional lights identified in the 2022 still missing from the database.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	Incorrect lamp description and wattage provided by developer for up to 172 items of load resulting in a potential under submission of 8,106 kWh per annum. New streetlight assets are added from the date the paperwork is received which can be some months post the assets being vested/ electrically connected resulting in under submission.	Moderate	Low	2	Investigating

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)	Incorrect lamp description and wattage provided by developer for up to 172 items of load resulting in a potential under submission of 8,106 kWh per annum. Submission is based on a snapshot and does not consider historic changes.	Moderate	Low	2	Identified
Future Risk Rating						8	

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	Clause	Description
Deriving submission information	2.1	11(1) of Schedule 15.3	Review monthly wattage report content to include sufficient detail so change can be tracked on a daily basis as required by the code.
Database accuracy	3.1	15.2 and 15.37B(b))	Recommend that light descriptions are reviewed, and details added to confirm the correct wattage has been applied.
			Recommend that the assets passed from Waka Kotahi are audited to confirm data accuracy.
			Recommend that Meridian review the new connection process to ensure there is a process that follows up with WDC post acceptance as the trader for the new streetlight load, and that streetlights are added to RAMM from the date of electrical connection.
			Review asset acceptance process to ensure that light details provided by the developer match what is in the field.
			Meridian work with the WDC Parks and Reserve team and review available data to ensure that all distributed unmetered load is being reconciled.

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

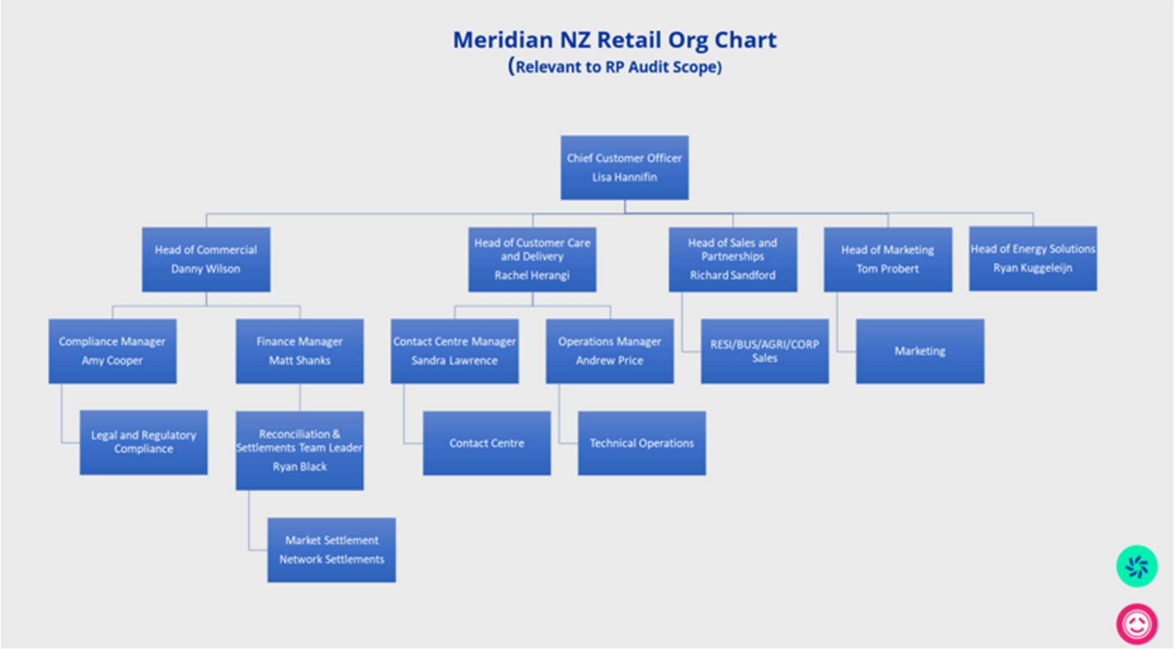
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit commentary

Meridian confirms that there are no exemptions in place relevant to the scope of this audit.

1.2. Structure of Organisation

Meridian provided the relevant organisational structure:



1.3. Persons involved in this audit

Auditor:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Amy Cooper	Compliance Officer	Meridian Energy
David Taylor	Asset Information Manager	Waikato District Alliance
Zoran Draca	Director	Odyssey Energy Ltd

1.4. Hardware and Software

Section 1.8 shows that the SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management". The specific module used for DUML is called RAMM Contractor.

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	NSP	Profile	Number of items of load	Database wattage
0000011102WE267	Waikato DC Streetlights (WEL Network)	HLY0331	DST	4,103	235,645
0007659000WAD19	Waikato DC Streetlights (Waipa Network)	CBG0111	DST	88	7,154
1099570058CN633	Waikato DC Streetlights (Counties Network)	BOB3301	DST	1,191	63,687
1099572699CN8DF	Waikato Streetlights GLN0332 (Counties Network)	GLN0332	DST	21	1,049
1099572700CN06D	Waikato Streetlights BOB1101 (Counties Network)	BOB1101	DST	13	828
			Total	**5,404**	**307,627**

1.7. Authorisation Received

All information was provided directly by Meridian, Odyssey and the Waikato District Alliance.

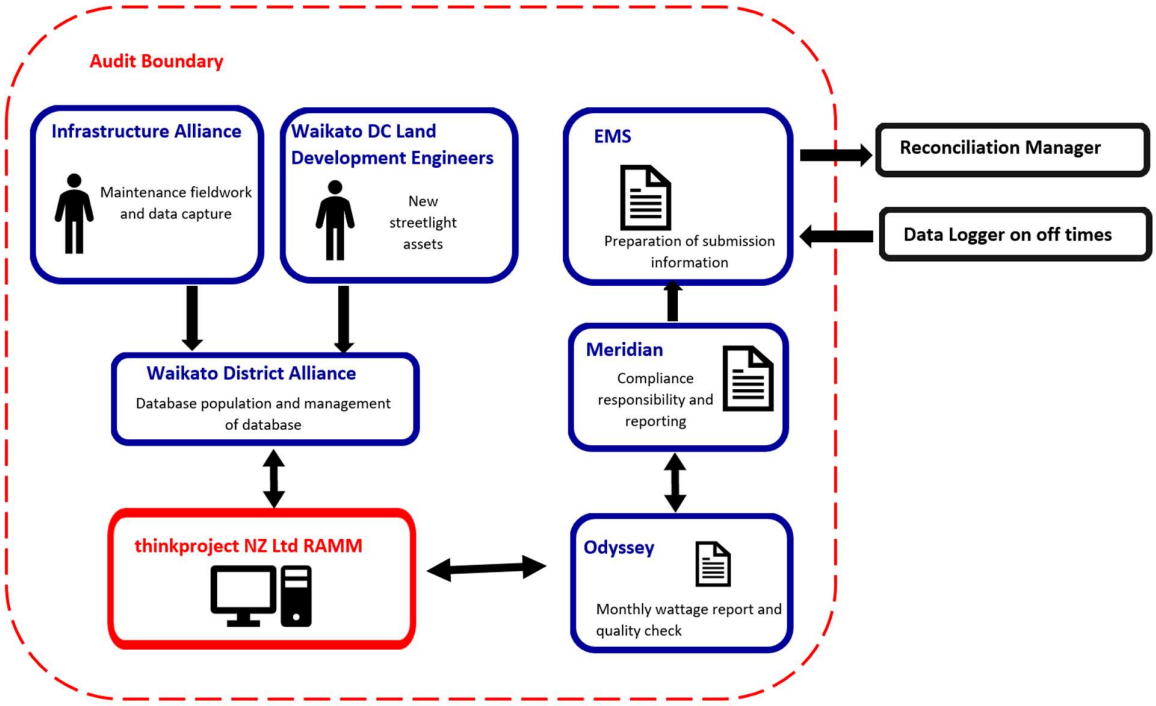
1.8. Scope of Audit

This audit of the **Waikato District Council Unmetered Streetlights** (**WDC**) 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 database is remotely hosted by thinkproject New Zealand Ltd. Infrastructure Alliance is the maintenance contractor and updates RAMM with any changes. Waikato District Alliance manages the database. The Waikato District Council Land Development Engineers manage new streetlight connections and pass through this information to the Waikato District Alliance to add these to RAMM. Odyssey Energy Ltd (Odyssey) reviews the database for data completeness and produce the monthly wattage report that is used to calculate submission.

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



The field audit was undertaken of a statistical sample of 272 items of load on 24th October 2023.

1.9. Summary of previous audit

Meridian provided a copy of the last audit report undertaken by Rebecca Elliot of Veritek Limited in October 2022. The current status of those audit findings is detailed below:

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	In absolute terms, total annual consumption is estimated to be 13,000 kWh higher than the DUML database indicates. Submission is based on a snapshot and does not consider historic changes.	Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	Nine items of load of a sample of 254 items checked in the field are missing from the database.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	In absolute terms, total annual consumption is estimated to be 24,900 kWh higher than the DUML database indicates.	Still existing
Volume information accuracy	3.2	15.2 and 15.37B(c)	In absolute terms, total annual consumption is estimated to be 24,900 kWh higher than the DUML database indicates. Submission is based on a snapshot and does not consider historic changes.	Still existing

Table of Recommendations

Subject	Section	Clause	Recommendation for Improvement	Status
Database accuracy	3.1	15.2 and 15.37B(b))	Recommend that Meridian discuss the capture of GPS location for new items of load with the Waikato District Alliance at the time these are added to RAMM.	Cleared
			Recommend that Meridian review the new connection process with the Waikato District Alliance and the three distributors to put in a place a process to add new lights to RAMM at the point of electrical connection.	Repeated
			Recommend that Meridian liaise with the Waikato District Alliance to confirm if any festive lights are being used in the WDC area.	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

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.

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. This information is used to create a shape file. 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 examined during the 2023 EMS audit and compliance was confirmed. There is a data logger per network to ensure the correct on/off times are used.

I checked the kW figures for September 2023 and found the values matched the database extract except for ICP 0000011102WE267:

September 2023 dB extract kW value provided for audit	Meridian kW value provided to Meridian	kW Difference
235.64	242.65	7.01

This is due to 77 items of load that have been passed from the Waka Kotahi RAMM database to WDC. These were advised to Meridian in October 2022. Meridian was provided a spreadsheet detailing the items of load and the kW value is being manually added. Whilst the volume is being submitted the following issues are identified:

- not all items of load are recorded in the WDC database,
- the spreadsheet does not contain sufficient location details to confirm that these are not still being included in the Waka Kotahi RAMM database, and
- any changes made to these lights since October 2022 will not be taken into account as no updates are being tracked for these items of load.

This is recorded as non-compliance below as the database is not up to date.

The field audit confirmed that the database accuracy is within the +/-5% accuracy threshold. However, I did find some light descriptions and associated wattage were incorrect in Pokeno. These details were provided incorrectly by the developer and the asset check process did not identify this. This affects 172 LED lights incorrectly recorded as 37W but are 47W. Some of these have been installed since 2018. This could be resulting in an estimated under submission of 8,106 kWh per annum. I recommend in **section 3.1**, that the asset acceptance check confirms that the correct light description and wattage have been provided.

Submission is based on a snapshot of the database at the end of the month as the monthly wattage report includes only the light type and calculated kW value. I recommend that the report is reviewed to include sufficient detail of changes made so these can be tracked on a daily basis as required by the code.

Recommendation	Description	Audited party comment	Remedial action
Monthly wattage report	Review monthly wattage report content to include sufficient detail so change can be tracked on a daily basis as required by the code.	We have assessed our processes and tools to account for historic lamp installations and changes to the database at a daily level. There are checks in place comparing month to month data to identify any material changes and confirm details for these. These are accounted for in monthly submission. Odyssey have agreed to include light ID in the reports so brand-new lights can be more easily identified.	Identified

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 13-Oct-22 To: 06-Sep-23	WDC database is not up to date. Incorrect lamp description and wattage provided by developer for up to 172 items of load resulting in a potential under submission of 8,106 kWh per annum. Submission is based on a snapshot and does not consider historic changes. 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 overall, but there is room for improvement. The impact is assessed to be low, based on the field audit findings.

Actions taken to resolve the issue	Completion date	Remedial action status
Database not up to date - ICP 0000011102WE267 - This is due to 77 items of load that have been passed from the Waka Kotahi RAMM database to WDC. Currently awaiting confirmation from Council to advise when they will be added to the database.	01/03/2024	Identified
172 items of load – WDC will conduct a field visit to confirm lamp description and wattage.	01/03/2024	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We have assessed our processes and tools to account for historic lamp installations and changes to the database at a daily level. There are checks in place comparing month to month data to identify any material changes and confirm details for these. These are accounted for in monthly submission.	Ongoing	
Odyssey have agreed to include light ID in the reports so brand-new lights can be more easily identified.	01/03/2024	
Meridian will continue to liaise and follow up with WDC and Odyssey to have the database correct for reconciliation and submission.	01/03/2024	

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 RAMM database contains the relevant ICP identifiers for all items of load.

Audit outcome

Compliant

2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3)

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

The DUML database must contain the location of each DUML item.

Audit observation

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

Audit commentary

The database contains the nearest street address, pole numbers and Global Positioning System (GPS) coordinates for each item of load, and users in the office and field can view these locations on a mapping system. Only ten items of load do not have GPS coordinates, but the road name and location allow the lights to be located.

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 each item of load had a value recorded in these fields.

Audit commentary

The database contains two records for wattage, firstly the lamp wattage and secondly the gear wattage, which represents ballast losses. The gear wattage is recorded in the database which meets the requirements of this clause. The accuracy of the description and wattages 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 272 items of load on 24th October 2023.

Audit commentary

The field audit findings are detailed in the table below.

Discrepancy	Quantity
Lights in the field not in the database	4
Lights in the database not in the field	4
Incorrect wattage	33

I checked the discrepancies from the last audit and found all but the two additional lights identified on Liverpool Street were corrected.

This audit found four additional lights in the field than recorded in the database. The accuracy of the database is recorded in **section 3.1**. The items missing from the RAMM database are recorded as non-compliance in this section.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 13-Oct-22 To: 06-Sep-23	Four items of load of a sample of 272 items checked in the field are missing from the database. Two additional lights identified in the 2022 still missing from the database. Potential impact: Low Actual impact: Low Audit history: Multiple times previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate overall, but the new connection process requires improvement to move this to strong. The impact is assessed to be low, based on the quantity of additional lights.

Actions taken to resolve the issue	Completion date	Remedial action status
Four items of load – one has been updated in RAMM. The other three are awaiting a site visit before RAMM is updated. 2 additional lights – Investigation confirms that both lights have been removed and RAMM database has been updated.	01/03/2024 Completed	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Meridian will continue to liaise and follow up with WDC and Odyssey to have the database correct for reconciliation and submission.	01/03/2024	

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 RAMM database has a complete audit trail of all additions and changes to the database information.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

3.1. Database accuracy (Clause 15.2 and 15.37B(b))

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

Audit must verify that the information recorded in the retailer's DUML database is complete and accurate.

Audit observation

The DUML Statistical Sampling Guideline was used to determine the database accuracy. The table below shows the survey plan.

Plan Item	Comments
Area of interest	The rural Waikato District from north of Hamilton to Pokeno
Strata	The database contains items of load in Waikato District Council area. The council area covers three different networks of Counties Network, Waipa and WEL network. The population was divided into four evenly sized strata: 1. A-George, 2. Great South Rd- Lo, 3. Lu-, Ro and 4. Ru- V.
Area units	I created a pivot table of the roads in each area, and I used a random number generator in a spreadsheet to select a total of 54 sub-units.
Total items of load	272 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.

Audit commentary

Database accuracy based on the field audit

A field audit was conducted of a statistical sample of 272 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	100.1	Wattage from the survey is higher than the database wattage by 0.1%
R_L	97.6	With a 95% level of confidence, it can be concluded that the error could be between -2.3% and +2.9%
R_H	102.9	

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 A is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 2.3% lower and 2.9% higher than the wattage recorded in the DUML database. Compliance is recorded because the potential error within the allowable +/- 5.0%.

In absolute terms the installed capacity is estimated to be the same as the database indicates.

There is a 95% level of confidence that the installed capacity is between 7.0 kW lower and 9 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 1,800 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 31,000 kWh p.a. lower to 37,700 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 database was checked, and I found the majority of light descriptions and wattage were recorded correctly. I found a small number of light descriptions that would benefit from having the lamp wattage recorded in the light description. I recommend below that these are reviewed, and more detail is added. I found 15 items of load where the light make and model details were insufficient to determine if the correct wattage has been applied. These have been passed to the Waikato District Alliance to investigate and add details.

Recommendation	Description	Audited party comment	Remedial action
Lamp description and capacity accuracy	Recommend that light descriptions are reviewed, and details added to confirm the correct wattage has been applied.	WDC will conduct a site check on descriptions and wattages. Once confirmed, RAMM database will be updated.	Identified

Waka Kotahi lighting

Waka Kotahi lighting is excluded from the database and is managed in a separate database.

Due to the new Waikato Expressway, lights on the old highways have been moved to the WDC RAMM database. As detailed in **section 2.1**, 77 of these items of load are yet to be added to the WDC database. The field audit found some discrepancies with these lights and due to the lighting load associated with these, I recommend that these assets are audited to confirm data accuracy.

Recommendation	Description	Audited party comment	Remedial action
Former Waka Kotahi lighting	Recommend that the assets passed from Waka Kotahi are audited to confirm data accuracy.	WDC are currently working on having the 77 lights added to the RAMM database and will advise Meridian when they have done so. In the meantime, they will continue to be manually added by Meridian for monthly reconciliation and submission.	Investigating

ICP accuracy

All items of load have an ICP identifier recorded.

Location accuracy

The database contains fields for the street address, and also contains GPS coordinates. The previous audit identified 130 items of load that did not have GPS coordinates and recommended that the process to capture GPS co-ordinates was reviewed. This has been adopted during the audit period and this audit found only ten items of load without GPS co-ordinates. All were readily locatable and GPS co-ordinates are expected to be added in time.

Change management process findings

Field maintenance is carried out by Infrastructure Alliance and updated directly into RAMM via pocket RAMM.

The Waikato District Council Land Development Engineers manage the process for new subdivisions. New streetlighting information is eventually passed to Waikato District Alliance to add to the database. This can be months after the lights have been electrically connected and vested to WDC. The lights are loaded to RAMM from the date the paperwork is received and not the date of electrical connection or vesting.

This will be resulting in missing volumes from submission. The networks require a retailer to accept new streetlight connections prior to electrical connection with the relevant ICP being detailed on these requests. I recommend that Meridian review this process and ensure that any new streetlights that are to be associated with a Council ICP that are being accepted are added to the streetlight database from the electrical connection date.

Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Recommend that Meridian review the new connection process to ensure there is a process that follows up with WDC post acceptance as the trader for the new streetlight load, and that streetlights are added to RAMM from the date of electrical connection.	Meridian is currently reviewing the DUML new connection process to ensure that all parties involved are informed throughout the complete process to ensure that databases are updated as soon as possible.	Investigating

The field audit found that some light descriptions and associated wattage have been provided incorrectly by the developer and the asset check process is not always identifying this. For example, 172 LED lights in Pokeno have been incorrectly recorded as 37W but are 47W. Some of these have been installed since 2018. This could be resulting in an estimated under submission of 8,106 kWh per annum. I recommend that the asset acceptance check confirms that the correct light description and wattage are provided.

Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Review asset acceptance process to ensure that light details provided by the developer match what is in the field.	WDC will conduct field visits to confirm supplied details are accurate and update RAMM accordingly.	Investigating

The monthly wattage report is produced by Odyssey Energy Limited. As part of the monthly report production, they check the wattage, gear wattage and ICP allocation for any anomalies and these are resolved before the wattage report is sent to Meridian Energy. I recommend in **section 2.1**, that further detail is added to this report so changes made at a daily level can be taken into account.

There are no outage patrol processes in place as LED lights have a low failure rate. Any streetlight replacements are made on a reactive basis generated from public requests.

Festive and Private Lighting

Meridian have confirmed with WDC that no festive lights are connected into the unmetered streetlight circuits.

No private lights are recorded in the WDC database, and none are known to exist.

Parks and Amenity Lighting

The Waikato Alliance are responsible for the management of roading assets but do not manage Parks and Amenity lighting. The RAMM database contains 230 items of load that are associated with Parks and Amenity Lighting. These are being reconciled under the road lighting ICP 0000011102WE267 on the WEL Network. No amenity lighting is recorded against any other ICPs. It is unclear if there are other distributed unmetered assets or whether these are being reconciled as standard unmetered load against individual ICPs. Odyssey have an old set of data that they will make available to Meridian. I recommend that Meridian investigate Parks and Amenity lighting with the relevant WDC department to ensure that all distributed unmetered load is being reconciled.

Recommendation	Description	Audited party comment	Remedial action
Parks and Amenity lighting	Meridian work with the WDC Parks and Reserve team and review available data to ensure that all distributed unmetered load is being reconciled.	Meridian is currently liaising with WDC to confirm that all DUML lighting is accounted for on the RAMM database.	Investigating

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 13-Oct-22 To: 06-Sep-23	Incorrect lamp description and wattage provided by developer for up to 172 items of load resulting in a potential under submission of 8,106 kWh per annum. New streetlight assets are added from the date the paperwork is received which can be some months post the assets being vested/ electrically connected resulting in under submission. Potential impact: Low Actual impact: Low Audit history: Multiple times previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate as there is room for improvement in the management of new streetlight connections. The impact is assessed to be low as the database was found to be within the accuracy threshold, but the new streetlight process will be resulting in some under submission.

Actions taken to resolve the issue	Completion date	Remedial action status
172 items of load – WDC will conduct a field visit to confirm lamp description and wattage.	01/03/2024	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Meridian will continue to liaise and follow up with WDC and Odyssey to have the database correct for reconciliation and submission.	01/03/2024	
Meridian is currently reviewing the DUML new connection process to ensure that all parties involved are informed throughout the complete process to ensure that databases are updated as soon as possible.	01/03/2024	

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

Meridian reconciles this DUML load using the DST profile. The on and off times are derived from a data logger read by EMS. This information is used to create a shape file. 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 examined during the 2023 EMS audit and compliance was confirmed. There is a data logger per network to ensure the correct on/off times are used.

I checked the kW figures for September 2023 and found the values matched the database extract except for ICP 0000011102WE267:

September 2023 dB extract kW value provided for audit	Meridian kW value provided to Meridian	kW Difference
235.64	242.65	7.01

This is due to 77 items of load that have been passed from the Waka Kotahi RAMM database to WDC. These was advised to Meridian in October 2022. Meridian was provided a spreadsheet detailing the items of load and the kW value is being manually added. Whilst the volume is being submitted the following issues are identified:

- not all items of load are recorded in the WDC database,
- the spreadsheet does not contain sufficient location details to confirm that these are not still being included in the Waka Kotahi RAMM database, and
- any changes made to these lights since October 2022 will not be taken into account as no updates are being tracked for these items of load.

This is recorded as non-compliance in **section 2.1**, as the database is not up to date.

The field audit confirmed that the database accuracy is within the +/-5% accuracy threshold. However, I did find some light descriptions and associated wattage were incorrect in Pokeno. These details were provided incorrectly by the developer and the asset check process did not identify this. This affects 172 LED lights incorrectly recorded as 37W but are 47W. Some of these have been installed since 2018. This could be resulting in an estimated under submission of 8,106 kWh per annum. I recommend in **section 3.1**, that the asset acceptance check confirms that the correct light description and wattage have been provided.

Submission is based on a snapshot of the database at the end of the month as the monthly wattage report includes only the light type and calculated kW value. I recommend in **section 2.1**, that the report is reviewed to include sufficient detail of changes made so these can be tracked on a daily basis as required by the code.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 13-Oct-22 To: 06-Sep-23	Incorrect lamp description and wattage provided by developer for up to 172 items of load resulting in a potential under submission of 8,106 kWh per annum. Submission is based on a snapshot and does not consider historic changes. 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 overall, but there is room for improvement. The impact is assessed to be low, based on the field audit findings.

Actions taken to resolve the issue	Completion date	Remedial action status
172 items of load – WDC will conduct a field visit to confirm lamp description and wattage.	01/03/2024	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Meridian will continue to liaise and follow up with WDC and Odyssey to have the database correct for reconciliation and submission.	01/03/2024	
We have assessed our processes and tools to account for historic lamp installations and changes to the database at a daily level. There are checks in place comparing month to month data to identify any material changes and confirm details for these. These are accounted for in monthly submission.	Ongoing	
Odyssey have agreed to include light ID in the reports so brand-new lights can be more easily identified.	01/03/2024	

CONCLUSION

The database is remotely hosted by thinkproject New Zealand Ltd and the reporting from this is managed by Odyssey Energy Limited. The Waikato District Alliance is a joint venture between Waikato DC and Downer to provide infrastructure management across all of Waikato DC assets. Infrastructure Alliance manages the maintenance contract and updates the database as changes are made in the field. The Waikato District Council Land Development Engineers manage the process for new subdivisions. The new streetlight process does not ensure that new streetlight assets are being added from the correct date. I have repeated the last audit's recommendation that this process is reviewed.

The field audit found the database was within the allowable +/-5% accuracy threshold. However, it did identify a section of a Pokeno subdivision where 172 LED lights have been incorrectly recorded as 37W but are 47W. Some of these have been installed since 2018. I recommend that the asset acceptance check confirms that the correct light description and wattage are provided.

The check of submission values between the kW value in the database to the value provided to EMS identified a difference for one ICP. This is due to 77 items of load that have been passed from the Waka Kotahi RAMM database to WDC. These were advised to Meridian in a spreadsheet in October 2022. The kW value from this spreadsheet is being manually added. Whilst the volume is being submitted the following issues are identified:

- not all items of load are recorded in the WDC database,
- the spreadsheet does not contain sufficient location details to confirm that these are not still being included in the Waka Kotahi RAMM database, and
- any changes made to these lights since October 2022 will not be taken into account as no updates are being tracked for these items of load.

WDC are working to get these added to the RAMM database.

The audit found four non-compliance issues and six recommendations are made. The future risk rating of eight indicates that the next audit be completed in 18 months. I have considered this in conjunction with Meridian's comments and I recommend that the next audit be in 12 months, so any corrections are confirmed as completed with the 14 month revision cycle.

PARTICIPANT RESPONSE

Meridian has provided comments within the body of the report and no further comments were provided.