ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

WAITOMO DISTRICT COUNCIL AND MERIDIAN ENERGY LIMITED

Prepared by: Steve Woods

Date audit commenced: 26 October 2020

Date audit report completed: 30 October 2020

Audit report due date: 1 November 2020

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EXECUTIVE SUMMARY

This audit of the **Waitomo District Council (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 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 **Alf Downs Streetlighting Limited (Alf Downs)** on behalf of WDC. The database is remotely hosted by RAMM Software Ltd. The field work, asset data capture and database population is conducted by Alf Downs. Alf Downs staff update the database from the field using Pocket RAMM.

NZTA's urban lights in the WDC region are recorded in the database without an ICP number recorded. The previous audit recorded that this NZTA urban load was not submitted for reconciliation or billed to WDC by Meridian. This is now resolved, and the load is added to ICP 0008807413WMA59, although the database still needs to be updated with the ICP identifier. Revisions were conducted for historic months.

Festive lights are now being managed in a compliant manner.

The field audit found that in absolute terms, total annual consumption is estimated to be 11,700 kWh higher than the DUML database indicates.

There are ten private lights without an ICP identifier recorded in the database. These are excluded from submission, leading to under submission of 1,553 kWh per annum.

On 18 June 2019, the Electricity Authority issued a memo clarifying 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 is non-compliant, and Meridian completes revision submissions where corrections are required. Meridian has not yet updated their processes to be consistent with the Authority's memo.

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. New connections are rare, and the last subdivision was created approximately ten years ago.

Alf Downs records the date that the data is loaded for all new connections and changes. This means that where Alf Downs has completed the new connection or change, the date is likely to be accurate. Where another party has completed the work, the date will only be accurate if Alf Downs has recorded the data on the day the change was made.

The future risk rating of 17 indicates that the next audit be completed in six months. This is a small database with accuracy within 5% and Meridian has made sound progress on improvements. I recommend a 12 month audit frequency.

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	In absolute terms, total annual consumption is estimated to be 11,700 kWh higher than the DUML database indicates Under submission of 1,553 kWh p.a. for private lights. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates are not recorded for new connections, and lamp installation dates are replaced where lights change	Moderate	Medium	4	Identified
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	ICP numbers are not recorded in the database for 201 NZTA urban lights and ten private lights.	Weak	Low	3	Investigating
All load recorded in database	2.5	11(2A) of Schedule 15.3	One additional light identified.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	In absolute terms, total annual consumption is estimated to be 11,700 kWh higher than the DUML database indicates Under submission of 1,553 kWh p.a. for private lights. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates are not recorded for new connections, and lamp installation dates are replaced where lights change	Moderate	Medium	4	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	In absolute terms, total annual consumption is estimated to be 11,700 kWh higher than the DUML database indicates Under submission of 1,553 kWh p.a. for private lights.		Medium	4	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates are not recorded for new connections, and lamp installation dates are replaced where lights change.				
Future Risk Rating						17	

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
Database accuracy	3.1	Establish a change management process to ensure that additions, removals, and modifications to NZTA urban lights are correctly recorded in the database.

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.

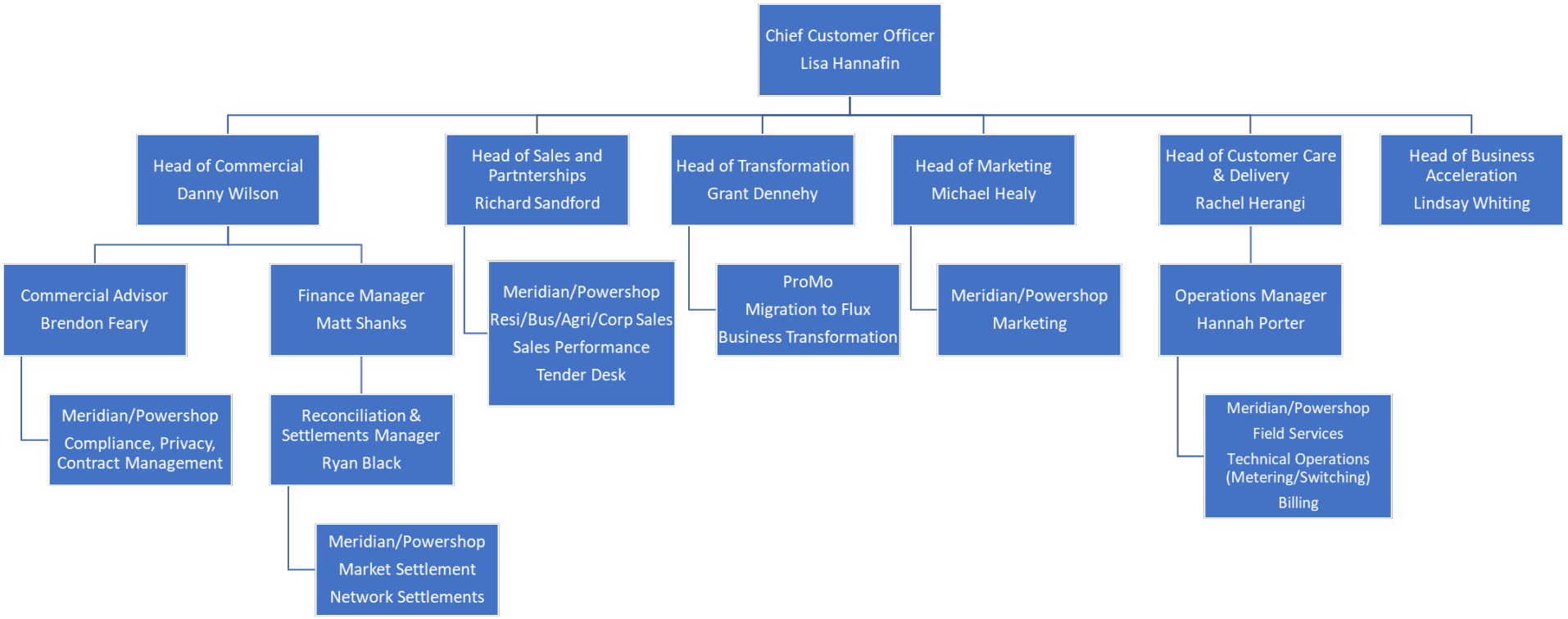
Audit observation

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



1.3. Persons involved in this audit

Auditor:

Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Joanna Towler	Manager - Local Roads	Waitomo District Council
Philip Harris	Street Lighting Contract Administration	The Downs Group
Amy Cooper	Compliance Officer	Meridian Energy Limited

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management". The specific module used for DUML is called RAMM Contractor.

RAMM Software Limited backs up the database and assists with disaster recovery as part of their hosting service. Nightly backups are performed. As a minimum, daily backups are retained for the previous five working days, weekly backups are retained for the previous four weeks, and monthly backups are retained for the previous six months.

Access to the database is secure by way of password protection.

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 (watts)
0001060300WMD10	SKATE PARK STREETLIGHT	HTI0331	DST	13	3,216
0008807413WMA59	Waitomo District Council	HTI0331	DST	814	32,678
NZTA Urban				201	30,209.5
Private				10	363.5
Total				1,038	66,467

NZTA lights

The previous audit report recorded that the ICP identifier for NZTA urban lights was unknown and that they were excluded from submission. These are now allocated to ICP 0008807413WMA59.

Private lights

The issue of private lights is not resolved. The summary below is the same as the last audit.

The Lines Company (TLC) has been working with Waitomo District Council to determine the ownership of all known private streetlights. TLC contacted each of the affected owners, to arrange for standard unmetered load to be created. Most of the owners have responded that they believe the Waitomo District Council should be responsible for the street lighting. WDC accepts responsibility for one light on Ruaparaha St and is investigating taking responsibility for the lights at Kaka St, but believes the other light is genuinely privately owned. TLC is awaiting further information from the Waitomo District Council, before resolving the issues.

1.7. Authorisation Received

All information was provided directly by Meridian, WDC, TLC or Alf Downs.

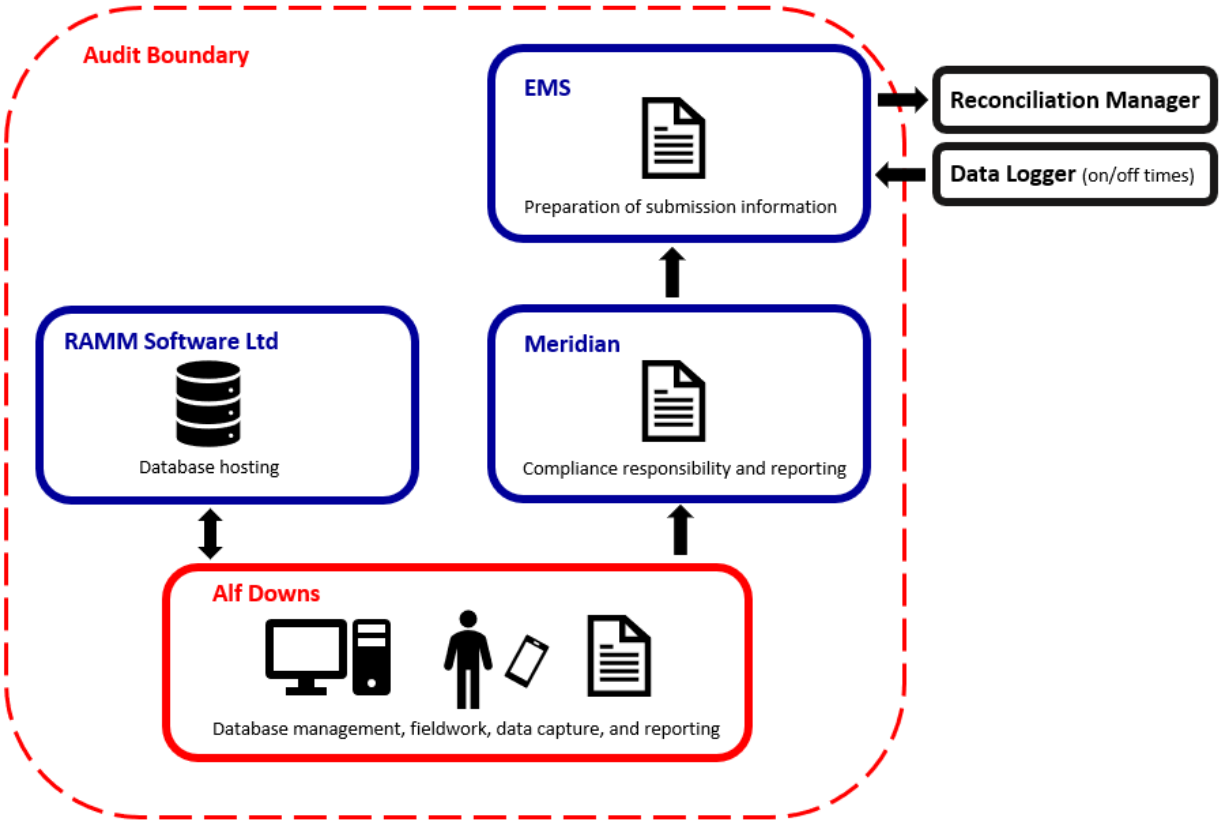
1.8. Scope of Audit

This audit of the WDC 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.

A RAMM database is managed by Alf Downs on behalf of WDC and they provide the monthly reporting to Meridian. The database is remotely hosted by RAMM Software Ltd. The field work, asset data capture and database population is conducted by Alf Downs. Broadspectrum have recently taken responsibility for maintaining the NZTA urban lights, and changes are not communicated to Alf Downs so they can be updated in the database.

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



The field audit was undertaken of a statistical sample of 167 items of load.

1.9. Summary of previous audit

The previous audit of this database was undertaken by Tara Gannon of Veritek Limited in January 2020. The summary table below shows the statuses of the non-compliances raised in the previous audit. Further comment is made in the relevant sections of this report.

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	The database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.1**.	Still existing
			Potential under submission of 0 to 129,024.8 kWh per annum (including festive lights) for NZTA urban lights depending on whether WDC and Meridian are responsible for this load.	Cleared
			Under submission of 1,553 kWh p.a. for private lights.	Still existing
			Over submission of 2,398W (estimated 6,827 kWh) for festive lights during the eight months Meridian has supplied 0008807413WMA59 and the lights were disconnected.	Cleared
			The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Still existing
			Livening dates are not recorded for new connections, and lamp installation dates are replaced where lights change.	Still existing
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	ICP numbers are not recorded in the database for 201 NZTA urban lights and ten private lights.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	The database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.1**.	Still existing
			Potential under submission of 0 to 129,024.8 kWh per annum (including festive lights) for NZTA urban lights depending on whether WDC and Meridian are responsible for this load.	Cleared
			Broadspectrum have recently taken responsibility for maintaining the NZTA urban	Still existing

Subject	Section	Clause	Non-compliance	Status
			lights, and changes are not communicated to Alf Downs so they can be updated in the database.	
			Under submission of 1,553 kWh p.a. for private lights.	Still existing
			Over submission of 2,398W (estimated 6,827 kWh) for festive lights during the eight months Meridian has supplied 0008807413WMA59 and the lights were disconnected.	Cleared
			The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Still existing
			Livening dates are not recorded for new connections, and lamp installation dates are replaced where lights change.	Still existing
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.1**.	Still existing
			Potential under submission of 0 to 129,024.8 kWh per annum (including festive lights) for NZTA urban lights depending on whether WDC and Meridian are responsible for this load.	Cleared
			Under submission of 1,553 kWh p.a. for private lights.	Still existing
			Over submission of 2,398W (estimated 6,827 kWh) for festive lights during the eight months Meridian has supplied 0008807413WMA59 and the lights were disconnected.	Cleared
			The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Still existing
			Livening dates are not recorded for new connections, and lamp installation dates are replaced where lights change.	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

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

In absolute terms, total annual consumption is estimated to be 11,700 kWh higher than the DUML database indicates.

Meridian reconciles this DUML load using the DST profile, and on and off times are derived from a data logger read by EMS and are used to create a shape file. Meridian supplies EMS with the capacity information from Alf Downs, and EMS calculates the kWh figures for the ICPs and includes them in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit and EMS' agent audit.

I compared the RAMM extract provided by Alf Downs for 0001060300WMD10 and 0008807413WMA59 (including NZTA lights) to the capacities provided to EMS for September 2019 and found that they matched exactly.

Festive lights are recorded against the ICP for the pole that they are attached to, either 0008807413WMA59 or NZTA urban. The festive light wattage is correctly deducted from the total wattage for the ICP when they are not connected. Alf Downs has provided a disconnection date for these lights after Xmas 2019.

There are ten private lights without an ICP identifier recorded in the database. These are excluded from submission, leading to under submission of 1,553 kWh per annum.

On 18 June 2019, the Electricity Authority issued a memo clarifying 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 is non-compliant, and Meridian completes revision submissions where corrections are required. Meridian has not yet updated their processes to be consistent with the Authority's memo.

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. New connections are rare, and the last subdivision was created approximately ten years ago.

Alf Downs records the date that the data is loaded for all new connections and changes. This means that where Alf Downs has completed the new connection or change, the date is likely to be accurate. Where

another party has completed the work, the date will only be accurate if Alf Downs has recorded the data on the day the change was made.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Apr-19 To: 30-Oct-20	In absolute terms, total annual consumption is estimated to be 11,700 kWh higher than the DUML database indicates Under submission of 1,553 kWh p.a. for private lights. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates are not recorded for new connections, and lamp installation dates are replaced where lights change. Potential impact: High Actual impact: Medium Audit history: Once Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	Improvements have been made during the audit period. NZTA and festive lights are now being submitted correctly. I have recorded the controls as moderate; however, there are still some improvements required. There is a medium impact on settlement because there is potential under submission of 13,253 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status
Audit results will be provided to the council to correct the errors identified.	30 Nov 2020	Identified
Ownership of unresolved private lights will be clarified with TLC and Waitomo DC.	31 Dec 2020	
We will clarify with Waitomo DC whether NZTA lights are to remain in the database or whether there are plans for these to be recorded and managed in an NZTA database. If these are to remain we will follow up on assignment of an ICP and confirm the change management process for these lights.	March 2021	
Preventative actions taken to ensure no further issues will occur	**Completion date**	

2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3)

Code reference

Clause 11(2)(a) and (aa) of Schedule 15.3

Code related audit information

The DUML database must contain:

- *each ICP identifier for which the retailer is responsible for the DUML*
- *the items of load associated with the ICP identifier.*

Audit observation

The database was checked to confirm the correct ICP was recorded against each item of load.

Audit commentary

The database records an ICP group. All items of load have a valid ICP number recorded except:

ICP Group	Total wattage	Count	Findings
NZTA Urban	30,209.5	201	I have been unable to confirm the correct ICP number for the NZTA urban lights. These are included in the database extracts provided to Meridian and are submitted against ICP 0008807413WMA59.
Private	363.5	10	No ICP number is recorded because private lights are excluded from submission information. Private lights are discussed further in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.2 With: Clause 11(2)(a) and (aa) of Schedule 15.3 From: 01-Apr-19 To: 30-Oct-20	ICP numbers are not recorded in the database for 201 NZTA urban lights and ten private lights. Potential impact: Medium Actual impact: Low Audit history: Twice Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as weak because the NZTA and private lights still don't have ICPs recorded. The impact is low because submission is occurring for NZTA lights, but not private lights.

Actions taken to resolve the issue	Completion date	Remedial action status
Ownership of unresolved private lights will be clarified with TLC and Waitomo DC. We will clarify with Waitomo DC whether NZTA lights are to remain in the database or whether there are plans for these to be recorded and managed in an NZTA database. If these are to remain we will follow up on assignment of an ICP.	31 Dec 2020 March 2021	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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 RAMM database contains road names, displacements, GPS coordinates and pole numbers.

All except two Items of load have GPS coordinates, and for the other two items of load there is sufficient location information to enable them 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 light type and wattage capacity
- wattage capacities include any ballast or gear wattage; and
- each item of load has a light type, light wattage, and gear wattage recorded.

Audit commentary

A description of each light is recorded in the lamp model field, and wattages are recorded in the lamp wattage and gear wattage fields.

All items of load have a lamp model, lamp wattage, and gear wattage populated. No lamp or gear wattages were invalidly recorded as zero.

The accuracy of the recorded wattages 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 167 items of load. The sample was selected from four strata, as follows:

1. Council A-K
2. Council L-R
3. Council S-Z
4. NZTA lighting

Audit commentary

The field audit discrepancies are detailed in the table below:

Street	Database count	Field count	Light count difference	Wattage recorded incorrectly	Comments
NORTH ST (SH 3)	21	21	-	2	Two 150W HPS were recorded as 70W HPS in the database.
NETTIE ST	6	7	1	0	One additional L19.5
Grand Total	167	167	1	2	

This clause relates to lights in the field that are not recorded in the database. One additional light was identified.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-Jan-20 To: 30-Oct-20	One additional light identified. Potential impact: Medium Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is minor; therefore the audit risk rating is low.

Actions taken to resolve the issue	Completion date	Remedial action status
Details of the additional light will be provided to the council to update in the database.	31 Nov 2020	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

The DUML database must track additions and removals in a manner that allows the total load (in kW) to be retrospectively derived for any given day.

Audit observation

The process for tracking of changes in the database was examined.

Audit commentary

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

Meridian's submissions are based on a monthly extract from the RAMM database. A RAMM database extract was provided in September 2020 and I assessed the accuracy of this by using the DUML Statistical Sampling Guideline. The table below shows the survey plan.

Plan Item	Comments
Area of interest	Waitomo District Council Street Lights
Strata	The database contains the WDC items of load for the DUML ICPs in the Waitomo region. The processes for the management of all WDC items of load are the same. I split them into three strata based on street name. The NZTA lights have a different process, therefore I placed them in their own stratum: 1. Council A-K 2. Council L-R 3. Council S-Z 4. NZTA lighting
Area units	I created a pivot table of the roads and I used a random number generator in a spreadsheet to select a total of 27 sub-units.
Total items of load	106 items of load were checked.

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

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

Audit commentary

Field audit findings

A field audit was conducted of a statistical sample of 167 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	104.1	Wattage from survey is higher than the database wattage by 4.1%
R_L	101.2	With a 95% level of confidence it can be concluded that the error could be between 1.2% and 6.6%
R_H	106.6	

The variability of the sample results across the strata means that the true wattage (installed in the field) could be between 1.2% higher and 6.6% higher than the wattage recorded in the DUML database.

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 01/02/19. The table below shows that Scenario C (detailed below) applies, and the best available estimate is not precise enough to conclude that the database is accurate within ±5.0%. The largest variability was with NZTA lights.

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 1 kW higher and 4 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 11,700 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 3,400 kWh p.a. higher and 18,800 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 %

Light description and capacity accuracy

As discussed in **section 2.4**, all lights have a lamp and gear wattage recorded. Lamp and gear wattages were compared to the expected values for the lamp description and found to match.

ICP number and owner accuracy

As discussed in **section 2.2**, NZTA urban lights and private lights do not have a valid ICP number recorded.

Private lights

Private lights are recorded in the database with "Private" as the ICP group. They are recorded in the database for completeness only. WDC does not have responsibility for maintaining private lights and does not expect to be billed for them. End users are not billed for electricity consumption for private lights by WDC.

Slim Pole ID	Council Pole No	Road Name	Lamp Model	Lamp Wattage	Gear Wattage	Total Wattage
1839	L0056	KAKA ST	LED22NW	22	0	22
1842	L0063	KAKA ST	LED22NW	22	0	22
1843	L0062	KAKA ST	LED22NW	22	0	22
1844	L0061	KAKA ST	LED22NW	22	0	22
1845	L0060	KAKA ST	LED22NW	22	0	22
1847	L0058	KAKA ST	LED22NW	22	0	22
1849	L0057	KAKA ST	LED22NW	22	0	22
1850	L0059	KAKA ST	LED22NW	22	0	22
2190	L0372	RAUPARAHA ST	Itron Zero 0c6 STA 4.5-2M/D/NZ	19.5	0	19.5
1088	POLE 2	WAITOMO VILLAGE RD	150w HPS	150	18	168
Total				**345.5**	**18**	**363.5**

The Lines Company (TLC) has been working with Waitomo District Council to determine the ownership of all known private streetlights. TLC contacted each of the affected owners, to arrange for standard unmetered load to be created. Most of the owners have responded that they believe WDC should be responsible for the street lighting. WDC accepts responsibility for one light on Ruaparaha St and is investigating taking responsibility for the lights at Kaka St, but believes the other light is genuinely privately owned. TLC is awaiting further information from the Waitomo District Council, before resolving the issues.

Change management process findings

Changes in the field are conducted by Alf Downs and recorded in RAMM using "pocket RAMM" which is a field version of RAMM allowing population of the database through hand-held devices. This process also plots the GPS coordinates. Broadspectrum have recently taken responsibility for maintaining the NZTA urban lights, and changes are not communicated to Alf Downs so they can be updated in the database.

Recommendation	Description	Audited party comment	Remedial action
Change management process for NZTA urban lights	Establish a change management process to ensure that additions, removals, and modifications to NZTA urban lights are correctly recorded in the database.	We will clarify with Waitomo DC whether NZTA lights are to remain in the database or whether there are plans for these to be recorded and managed in an NZTA database. . If these are to remain we will follow up to confirm change management processes.	Investigating

New connections are rare, and the last new subdivision was added approximately ten years ago. Alf Downs has monthly meetings with the council and are advised of any pending new connections. Alf Downs visits the site once connection is complete to capture the asset data.

An LED upgrade is mostly complete, most of the remaining non-LED lights are NZTA or overbridge lights.

Monthly "outage patrols" are conducted by Alf Downs and the process is used to identify any incorrect wattage and location issues that may exist.

The current monthly report is provided as a snapshot and this practice is non-compliant. 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.

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. New connections are rare, and the last subdivision was created approximately ten years ago.

Alf Downs records the date that the data is loaded for all new connections and changes. This means that where Alf Downs has completed the new connection or change, the date is likely to be accurate. Where another party has completed the work, the date will only be accurate if Alf Downs has recorded the data on the day the change was made.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Apr-19 To: 30-Oct-20	In absolute terms, total annual consumption is estimated to be 11,700 kWh higher than the DUML database indicates Under submission of 1,553 kWh p.a. for private lights. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates are not recorded for new connections, and lamp installation dates are replaced where lights change. Potential impact: High Actual impact: Medium Audit history: Twice Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	Improvements have been made during the audit period. NZTA and festive lights are now being submitted correctly. I have recorded the controls as moderate; however, there are still some improvements required. There is a medium impact on settlement because there is potential under submission of 13,253 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status
Audit results will be provided to the council to correct the errors identified.	30 Nov 2020	Identified
Ownership of unresolved private lights will be clarified with TLC and Waitomo DC.	31 Dec 2020	
We will clarify with Waitomo DC whether NZTA lights are to remain in the database or whether there are plans for these to be recorded and managed in an NZTA database. If these are to remain we will follow up on assignment of an ICP and confirm the change management process for these lights.	March 2021	
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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

In absolute terms, total annual consumption is estimated to be 11,700 kWh higher than the DUML database indicates.

Meridian reconciles this DUML load using the DST profile, and on and off times are derived from a data logger read by EMS and are used to create a shape file. Meridian supplies EMS with the capacity information from Alf Downs, and EMS calculates the kWh figures for the ICPs and includes them in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit and EMS' agent audit.

I compared the RAMM extract provided by Alf Downs for 0001060300WMD10 and 0008807413WMA59 (including NZTA lights) to the capacities provided to EMS for September 2019 and found that they matched exactly.

Festive lights are recorded against the ICP for the pole that they are attached to, either 0008807413WMA59 or NZTA urban. The festive light wattage is correctly deducted from the total wattage for the ICP when they are not connected. Alf Downs has provided a disconnection date for these lights after Xmas 2019.

There are ten private lights without an ICP identifier recorded in the database. These are excluded from submission, leading to under submission of 1,553 kWh per annum.

On 18 June 2019, the Electricity Authority issued a memo clarifying 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 is non-compliant, and Meridian completes revision submissions where corrections are required. Meridian has not yet updated their processes to be consistent with the Authority's memo.

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. New connections are rare, and the last subdivision was created approximately ten years ago.

Alf Downs records the date that the data is loaded for all new connections and changes. This means that where Alf Downs has completed the new connection or change, the date is likely to be accurate. Where another party has completed the work, the date will only be accurate if Alf Downs has recorded the data on the day the change was made.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Apr-19 To: 30-Oct-20	In absolute terms, total annual consumption is estimated to be 11,700 kWh higher than the DUML database indicates Under submission of 1,553 kWh p.a. for private lights. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates are not recorded for new connections, and lamp installation dates are replaced where lights change. Potential impact: High Actual impact: Medium Audit history: Once Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	Improvements have been made during the audit period. NZTA and festive lights are now being submitted correctly. I have recorded the controls as moderate; however, there are still some improvements required. There is a medium impact on settlement because there is potential under submission of 13,253 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status
Audit results will be provided to the council to correct the errors identified.	30 Nov 2020	Identified
Ownership of unresolved private lights will be clarified with TLC and Waitomo DC.	31 Dec 2020	
We will clarify with Waitomo DC whether NZTA lights are to remain in the database or whether there are plans for these to be recorded and managed in an NZTA database. If these are to remain we will follow up on assignment of an ICP and confirm the change management process for these lights.	March 2021	
Preventative actions taken to ensure no further issues will occur	**Completion date**	

CONCLUSION

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 **Alf Downs Streetlighting Limited (Alf Downs)** on behalf of WDC. The database is remotely hosted by RAMM Software Ltd. The field work, asset data capture and database population is conducted by Alf Downs. Alf Downs staff update the database from the field using Pocket RAMM.

NZTA's urban lights in the WDC region are recorded in the database without an ICP number recorded. The previous audit recorded that this NZTA urban load was not submitted for reconciliation or billed to WDC by Meridian. This is now resolved, and the load is added to ICP 0008807413WMA59, although the database still needs to be updated with the ICP identifier. Revisions were conducted for historic months.

Festive lights are now being managed in a compliant manner.

The field audit found that in absolute terms, total annual consumption is estimated to be 11,700 kWh higher than the DUML database indicates.

There are ten private lights without an ICP identifier recorded in the database. These are excluded from submission, leading to under submission of 1,553 kWh per annum.

On 18 June 2019, the Electricity Authority issued a memo clarifying 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 is non-compliant, and Meridian completes revision submissions where corrections are required. Meridian has not yet updated their processes to be consistent with the Authority's memo.

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. New connections are rare, and the last subdivision was created approximately ten years ago.

Alf Downs records the date that the data is loaded for all new connections and changes. This means that where Alf Downs has completed the new connection or change, the date is likely to be accurate. Where another party has completed the work, the date will only be accurate if Alf Downs has recorded the data on the day the change was made.

The future risk rating of 17 indicates that the next audit be completed in six months. This is a small database with accuracy within 5% and Meridian has made sound progress on improvements. I recommend a 12 month audit frequency.

PARTICIPANT RESPONSE

Meridian have reviewed this report and their comments are contained within the report. No further comments were provided.