ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

WAITOMO DISTRICT COUNCIL AND MERIDIAN ENERGY LIMITED

NZBN: 9429037696863

Prepared by: Rebecca Elliot

Date audit commenced: 5 September 2022

Date audit report completed: 28 October 2022

Audit report due date: 1 November 2022

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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 Horizon Networks on behalf of WDC and they provide the monthly reporting to Meridian. This includes the field work, asset data capture and database population. The contract with Horizon is managed by Pinnacle Civil on behalf of WDC. The database is remotely hosted by thinkproject New Zealand Ltd.

The previous audit found 72 wattage discrepancies. I sampled ten of these and found that not all have not been updated. This audit also found discrepancies in the field including some additional lights in the field. Horizon have advised that the light wattage is believed to have been set to lower wattage than that stated on the light label. I have requested the light specifications to confirm this, but this was unable to be supplied by the time the audit was due. For this reason, I have run two sets of analysis against the field audit findings. The first includes the lamp wattage discrepancies based on the field findings. The second analysis excludes the lights with the lowered wattages. Both sets of analysis found that the database accuracy fell outside of the allowable accuracy threshold. I have recorded the findings from the field audit as I could not confirm if the light wattages have been reduced at the time this audit was completed. That analysis found that there is a 95% level of confidence that the annual consumption is between 14,300 kWh p.a. lower and 4,100 kWh p.a. higher than the database indicates.

The field audit included lights for the skate park in Te Kuiti where the existing lights have been changed from HPS to LEDs. As this project was not carried out by Horizon the lighting changes have not been passed through to be updated in the database. There is not a large amount of this sort of project work in the WDC area, but this discrepancy will have impacted the database accuracy findings. I have recommended that the new connection process be reviewed to ensure that any future projects are captured in the database in a timely manner.

The audit found five non-compliances and makes three recommendations. The future risk rating of ten indicates that the next audit be completed in 12 months. I have considered this in conjunction with Meridian's comments and agree with this recommendation.

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 festive light consumption was not submitted for December 2021 and January 2022 season resulting in a very minor under submission of 4.21 kWh. One item of load incorrectly recorded as private resulting in in a very minor estimated under submission of 83 kWh per annum. The database accuracy is outside the allowable +/-5% threshold. There is a 95% level of confidence that the annual consumption is between 14,300 kWh p.a. lower and 4,100 kWh p.a. higher than the database indicates. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Moderate	Low	2	Identified
ICP Identifier	2.2	11(2)(a) and (aa) of Schedule 15.3	One item of load incorrectly recorded as private resulting in in a very minor estimated under submission of 83 kWh per annum.	Moderate	Low	2	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	14 additional lights identified.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The database accuracy is outside the allowable +/-5% threshold. There is a 95% level of confidence that the annual consumption is between 14,300 kWh p.a. lower and 4,100 kWh p.a. higher than the database indicates. One item of load incorrectly recorded as private resulting in in a very minor estimated under submission of 83 kWh per annum. The festive light consumption was not submitted for December 2021 and January	Moderate	Low	2	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			2022 season resulting in a very minor under submission of 4.21 kWh.				
Volume information accuracy	3.2	15.2 and 15.37B(c)	The festive light consumption was not submitted for December 2021 and January 2022 season resulting in a very minor under submission of 4.21 kWh. One item of load incorrectly recorded as private resulting in in a very minor estimated under submission of 83 kWh per annum. The database accuracy is outside the allowable +/-5% threshold. There is a 95% level of confidence that the annual consumption is between 14,300 kWh p.a. lower and 4,100 kWh p.a. higher than the database indicates. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Moderate	Low	2	Identified
Future Risk Rating						10	

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
ICP Identifier	2.2	Add ICP to RAMM database for private lights on Kakakaka St, Piopio.
Light descriptions	3.1	Add further details of the light type for 34 items of load.
New connections	3.1	Engage with WDC to review the new connection process to ensure new lights are captured in a timely manner.

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.

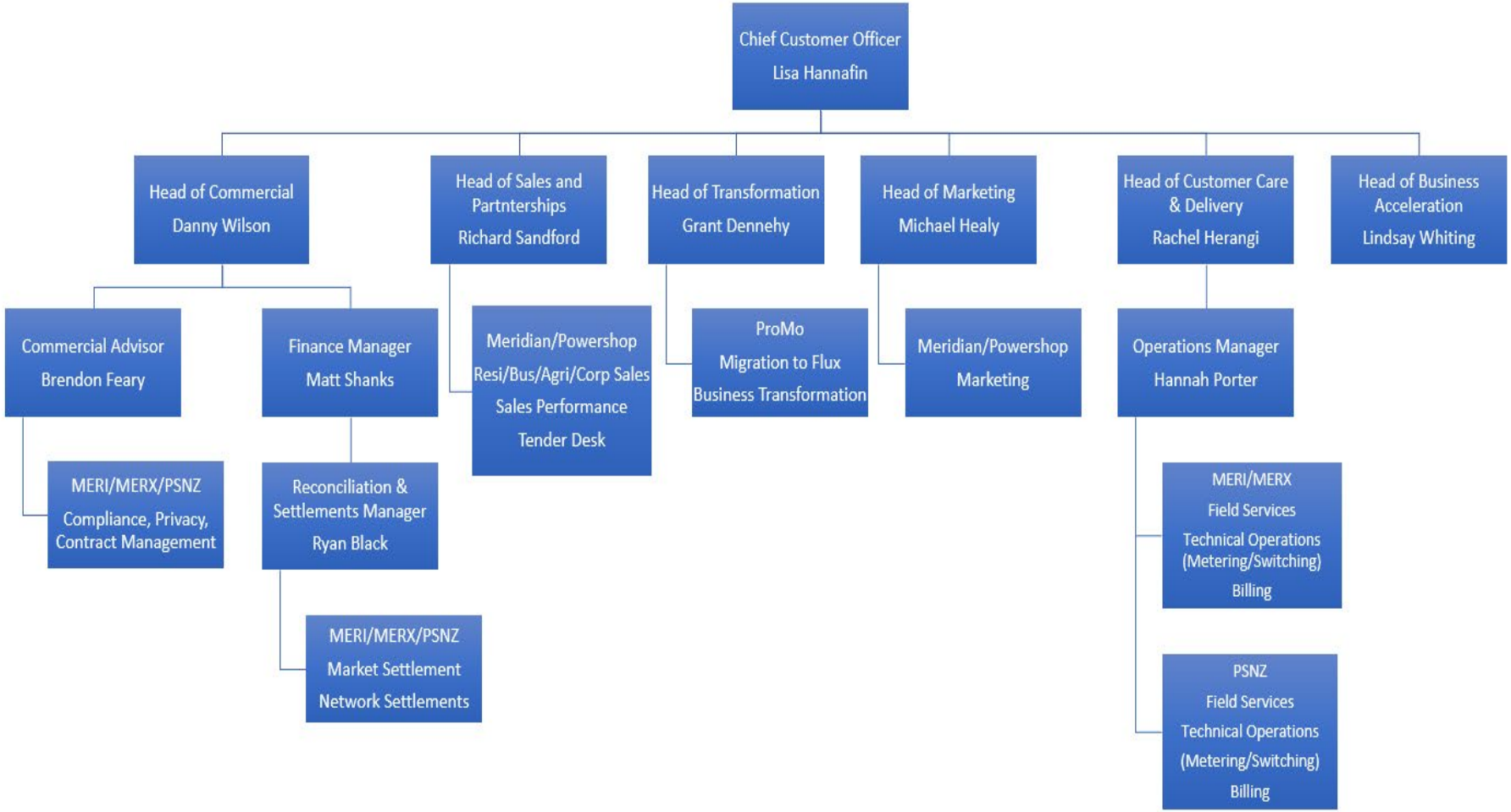
Audit observation

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:

Name	Title
Rebecca Elliot	Lead auditor
Steve Woods	Supporting auditor

Other personnel assisting in this audit were:

Name	Title	Company
Melanie Matthews	Quality and Compliance Advisor	Meridian Energy Limited
Stacey Flintoff	Streetlight Project and Vegetation Administrator	Horizon Networks
Campbell Young	Roading Professional Services	Pinnacles Civil
Chelsea Rangi		Pinnacles Civil

1.4. Hardware and Software

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.

thinkproject New Zealand Ltd 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.

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 (watts)
0001060300WMD10	SKATE PARK STREETLIGHT	HTI0331	DST	13	3,216
0008807413WMA59	Waitomo District Council	HTI0331	DST	796	30,526.5
NZTA Urban				101	16,400.5
Private				10	363.5
Total				1,038	66,467

NZTA lights

The NZTA lights in the database do not have an ICP. These are being reconciled in the NZTA RAMM database and are therefore outside the scope of this audit.

Private lights

Nine of the ten private lights have been confirmed by the distributor as either removed or are being reconciled against another ICP. WDC accepted responsibility for the light on Ruaparaha St, but the ICP has not been updated. This is discussed in **section 3.1**.

1.7. Authorisation Received

All information was provided directly by Meridian, Horizon or Pinnacles Civil.

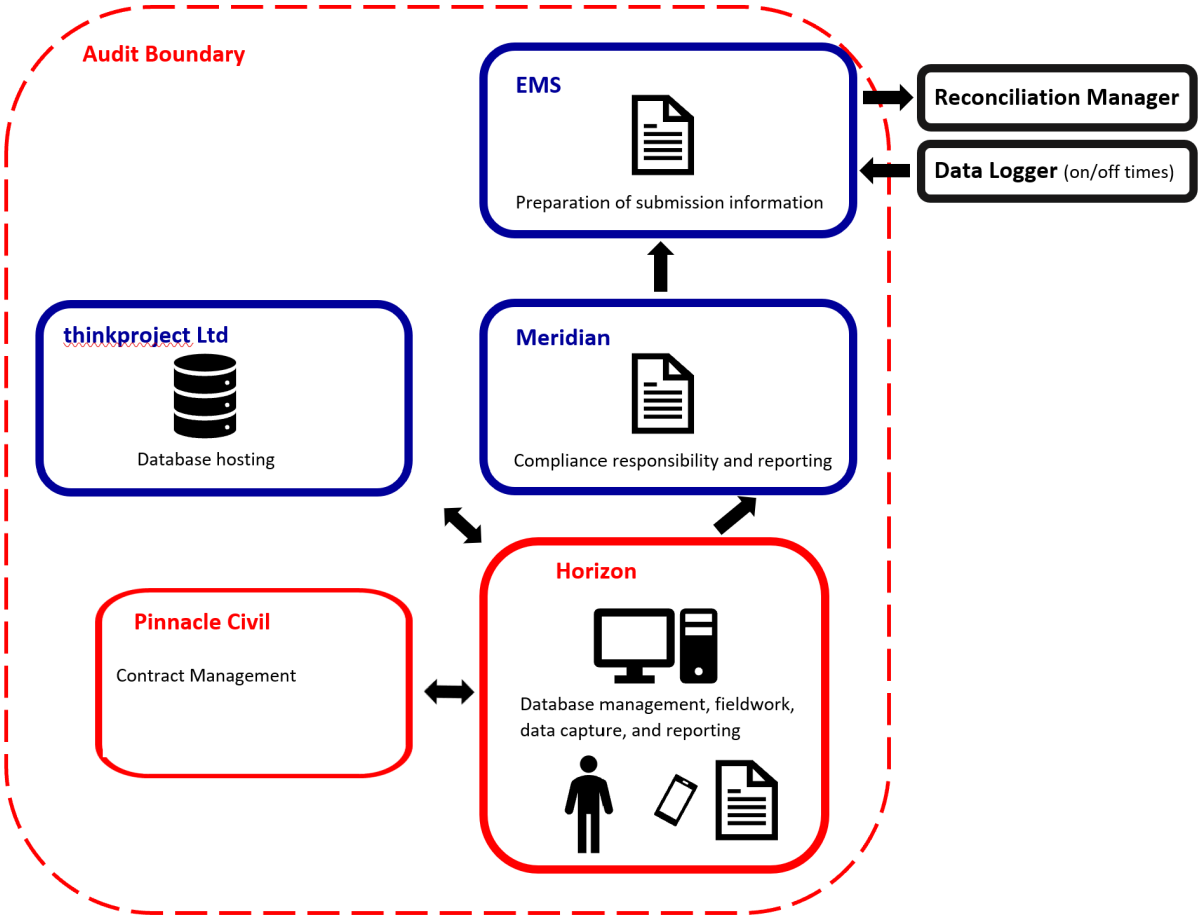
1.8. Scope of Audit

This audit of the Waitomo DC 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 Pinnacles Civil on behalf of WDC and they provide the monthly reporting to Meridian. The database is remotely hosted by thinkproject New Zealand Ltd. The field work, asset data capture and database population is conducted by the field contractor Horizon.

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 154 items of load.

1.9. Summary of previous audit

The previous audit of this database was undertaken by Steve Woods of Veritek Limited in October 2021. 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. No recommendations were made.

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 12,100 kWh lower than the DUML database indicates. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	One additional light identified.	Still existing

Subject	Section	Clause	Non-compliance	Status
Database accuracy	3.1	15.2 and 15.37B(b)	In absolute terms, total annual consumption is estimated to be 12,100 kWh lower than the DUML database indicates. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Still existing
Volume information accuracy	3.2	15.2 and 15.37B(c)	In absolute terms, total annual consumption is estimated to be 12,100 kWh lower than the DUML database indicates. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	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.

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, 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 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 to the capacities provided to EMS for September 2022 and found that they matched exactly.

The management of festive lights was discussed and found this was not submitted for the 2021 festive season resulting in a very minor under submission of 4.21 kWh across the December 2021 and January 2022 submission months. This will be corrected through the revision process and will be checked in the next audit.

In the last audit, WDC accepted responsibility for the light at 27 Rauparaha Street, Marakopa. The ICP is still recorded as private resulting in a very minor estimated under submission of 83 kWh per annum.

The previous audit found no missing or additional lights but did find 72 wattage discrepancies. I sampled ten of these and found that not all have not been updated during the audit period. This audit also found discrepancies in the field including some additional lights in the field. Horizon have advised that the light wattage is believed to have been set to lower wattage than that stated on the label. I have requested the light specifications to confirm this, but this was unable to be supplied by the time the audit was due. For this reason, I have run two sets of analysis against the field audit findings. The first includes the lamp wattage discrepancies based on the field findings. The second analysis excludes the lights with the lowered wattages. Both sets of analysis fell outside of the allowable database accuracy threshold, and I have recorded the lower amount as I could not confirm if the field wattages have been reduced at the time this audit was completed. This found that there is a 95% level of confidence that the annual consumption is between 14,300 kWh p.a. lower and 4,100 kWh p.a. higher than the database indicates.

The current monthly report is provided as a snapshot and is non-compliant as it does not track change on a daily basis as required by the code.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 16-Dec-21 To: 05-Sep-22	The festive light consumption was not submitted for December 2021 and January 2022 season resulting in a very minor under submission of 4.21 kWh. One item of load incorrectly recorded as private resulting in in a very minor estimated under submission of 83 kWh per annum. The database accuracy is outside the allowable +/-5% threshold. There is a 95% level of confidence that the annual consumption is between 14,300 kWh p.a. lower and 4,100 kWh p.a. higher than the database indicates. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Potential impact: Medium 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 recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is assessed to be low based on the kWh difference.

Actions taken to resolve the issue	Completion date	Remedial action status
We have obtained information of festive lights and confirmed when these were operating for 21/22. Submissions will be revised for Dec 21 and Jan 22 at the next opportunity. Horizon will add the correct council ICP to the one item of load currently recorded as private. Discrepancies identified during the field audit have been provided to Horizon for resolution.	31 March 2023 30 Nov 2022 30 Nov 2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We have agreed with Horizon that going forward they will include the festive lights in data extracts when these are operating. We will continue to follow up to ensure correct light and wattage information is confirmed and corrected in the database where needed. 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 Ongoing 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 an 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 for ten private lights. Nine of these have been investigated by the distributor and found:

- the light at the beginning of Waitomo Caves Hotel Access Road has been removed by The Lines Company so this can be removed from the database, and
- the Lines Company have accepted that the Kaka Street private lights identified in the last WDC audit do not belong to WDC and have created ICP 0001113548WM792 to account for this unmetered load; I recommend that this ICP is added to the RAMM database for future reference.

Recommendation	Description	Audited party comment	Remedial action
ICP identifier	Add ICP to RAMM database for private lights on Kakakaka St, Piopio.	The relevant ICP has been provided to Horizon to add to the database for clarity	Identified

In the last audit, WDC accepted responsibility for the light at 27 Rauparaha Street, Marakopa. The ICP is still recorded as private resulting in a very minor estimated under submission of 83 kWh per annum. This is recorded as non-compliance below and in **sections 2.1,3.1** and **3.2**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.2 With: Clause 11(2)(a) and (aa) of Schedule 15.3 From: 16-Dec-21 To: 05-Sep-22	One item of load incorrectly recorded as private resulting in in a very minor estimated under submission of 83 kWh per annum. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is estimated to be low based on the kWh difference.

Actions taken to resolve the issue	Completion date	Remedial action status
Horizon will add the correct council ICP to the one item of load currently recorded as private.	30 Nov 2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
No comment provided		

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 these 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 131 items of load. The sample was selected from three strata, as follows:

1. Council A-K,
2. Council L-R, and
3. Council S-Z.

Audit commentary

The field audit discrepancies are detailed in the table below:

Street	Database count	Field count	Light count difference	Wattage recorded incorrectly	Comments
ARIA TCE	7	7	-	2	2 x 36W LED recorded in the database but 2 x 19.5W LED located in the field
CARROLL ST (SH 3)	18	23	+12 -7	1	7 x MV & HPS lights not found in the field as these have been replaced with 12x LED lights as part of the rail overbridge redevelopment 1 x 14W LED recorded in the database but 1 x 20W LED located in the field
GRIBBIN ST	1	1	-	1	1 x 36W LED recorded in the database but 1 x 19.5W LED located in the field
HOSPITAL RD EXTENSION	5	5	-	5	5 x 14W LED recorded in the database but 5 x 20W LED located in the field
KING ST EAST	1	0	-1		1x 70W HPS recorded in the database but not found in the field
MAROKOPA RD	1	1	-	1	1x 36W LED recorded in the database but 1 x 26W LED located in the field
MINE RD	1	1	-	1	1 x 19.5W LED recorded in the database but 1 x 42W LED located in the field
NETTIE ST	6	7	+1		1x additional 19.5W light found on pole 1069170
PARK ST	3	3	-	3	3 x 14W LED recorded in the database but 3 x 20W LED located in the field
PRINCES ST	3	3	-	3	3 x 14W LED recorded in the database but 3 x 20W LED located in the field
RAUPARAHA ST	6	6	-	1	1 x 19.5W LED recorded in the database but 1 x 36W LED located in the field
RIVERSIDE LANE (NORTH)	3	4	+1		1x additional 19.5W light found in the field
SCHOOL RD	5	5	-	5	5 x 14W LED recorded in the database but 4 x 19.5W LED and 1x 20W LED located in the field
SOUTH ST	5	5	-	1	1 x 14W LED recorded in the database but 1 x 36W LED located in the field

Street	Database count	Field count	Light count difference	Wattage recorded incorrectly	Comments
TE ANGA RD	3	3	-	3	3 x 36W LED recorded in the database but 3 x 26W LED located in the field
TOKOPAPA ST	2	2	-	1	1 x 70W LED recorded in the database but 1 x 23W LED located in the field
Grand Total	**836**	**842**	**22(+14,-8)**	**28**	

The previous audit found no missing or additional lights but did find 72 wattage discrepancies. I sampled ten of these and found that these have not been corrected during the audit period. This audit also found discrepancies in the field including some additional lights in the field. Horizon have been advised that the light wattage is believed to have been set to lower wattage than that stated on the label. I have requested light specifications to confirm this but was unable to be supplied by the time the audit was due. For this reason, I have run two sets of analysis. The first includes the lamp wattage discrepancies based on the field findings. The second analysis excludes the lights with the lowered wattages. The change management process and overall database accuracy is discussed in **section 3.1**.

The 14 additional lights found in the field are recorded as non-compliance below.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 17-Dec-21 To: 05-Sep-22	14 additional lights identified. Potential impact: Medium Actual impact: Low Audit history: Twice previously 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**
Discrepancies identified during the field audit have been provided to Horizon for resolution.		30 Nov 2022	Identified
Preventative actions taken to ensure no further issues will occur		**Completion date**	
We will continue to follow up to ensure additional lights identified are added to the database.		30 Nov 2022	

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

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The RAMM database functionality achieves compliance with the code.

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

Audit outcome

Compliant

2.7. Audit trail (Clause 11(4) of Schedule 15.3)

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

The DUML database must incorporate an audit trail of all additions and changes that identify:

- *the before and after values for changes*
- *the date and time of the change or addition*
- *the person who made the addition or change to the database.*

Audit observation

The database was checked for audit trails.

Audit commentary

The database has a complete audit trail.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

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

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

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

Audit observation

Meridian's submissions are based on a monthly extract from the RAMM database. A RAMM database extract was provided, 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. 1. Council A-K, 2. Council L-R, and 3. Council S-Z.
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 42 sub-units.
Total items of load	154 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

Field audit findings

A field audit was conducted of a statistical sample of 154 items of load. The previous audit found no missing or additional lights but did find 72 wattage discrepancies. I sampled ten of these and found that not all have not been corrected during the audit period. This audit also found discrepancies in the field including some additional lights in the field. Horizon have advised that the light wattage is believed to have been set to lower wattage than that stated on the label. I have requested the light specifications to confirm this, but this was unable to be supplied by the time the audit was due. For this reason, I have run two sets of analysis against the field audit findings. The first includes the lamp wattage discrepancies based on the field findings. The second analysis excludes the lights with the lowered wattages.

Analysis 1: all field audit discrepancies included:

Result	Percentage	Comments
The point estimate of R	97.7	Wattage from survey is lower than the database wattage by 2.3%
R_L	90.0	With a 95% level of confidence, it can be concluded that the error could be between -10.0% and +2.9%
R_H	102.9	

The variability of the sample results across the strata means that the true wattage (installed in the field) could be between 10% lower and 2.9% 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 1 February 2019. The table below shows that Scenario C (detailed below) applies, confirming the database is outside the allowable accuracy threshold of +/-5%.

In absolute terms the installed capacity is estimated to be 1.0 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 3.0 kW lower and 1.0 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 3,300 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 14,300 kWh p.a. lower and 4,100 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 %

Analysis 2: excluding the lights with the lowered wattages:

Result	Percentage	Comments
The point estimate of R	94.5	Wattage from survey is lower than the database wattage by 2.3%
R_L	79.9	With a 95% level of confidence, it can be concluded that the error could be between -5.1% and -20.1%
R_H	94.9	

The variability of the sample results across the strata means that the true wattage (installed in the field) could be between 5.1% and 20.1% lower 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 1 February 2019. The table below shows that Scenario C (detailed below) applies, confirming the database is outside the allowable accuracy threshold of +/-5%.

In absolute terms the installed capacity is estimated to be 2.0 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 2.0 kW and 7.0 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 7,900 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 7,300 kWh p.a. and 28,800 kWh p.a. lower 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 %

Both sets of analysis fell outside of the allowable database accuracy threshold, and I have recorded the lower amount as I could not confirm if the field wattages have been reduced at the time this audit was completed.

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. There were 34 items of load that I recommend further details be captured to assist with this.

Recommendation	Description	Audited party comment	Remedial action
Light descriptions	Add further details of the light type for 34 items of load.	Horizon will review these lamps	Investigating

ICP number and owner accuracy

As confirmed in the previous audit, NZTA lights are now excluded from the database. There are some private lights without ICPs, and it is not clear who is responsible for these. I've left in the commentary from the last audit report below.

Private lights

Ten private lights "Private" recorded as this ICP. Nine of these have been investigated by the distributor since the last audit and found:

- the light at the beginning of Waitomo Caves Hotel Access Road has been removed by The Lines Company so this can be removed from the database, and
- the Lines Company have accepted that the Kaka Street private lights identified in the last audit do not belong to WDC and have created ICP 0001113548WM792 to account for this unmetered load; I recommend that this ICP is added to the RAMM database for future reference **in section 2.2**.

In the last audit, WDC accepted responsibility for the light at 27 Rauparaha Street, Marakopa. The ICP is still recorded as private resulting in a very minor estimated under submission of 83 kWh per annum. This is recorded as non-compliance below and in **section 2.2**.

Festive lights

As detailed in **sections 2.1** and **3.2**, the management of festive lights was discussed and found this was not submitted for the 2021 festive season resulting in a very minor under submission of 4.21 kWh across the December 2021 and January 2022 submission months. This will be corrected through the revision process and will be checked in the next audit.

Change management process findings

Horizon carries out the field maintenance and changes in the field are 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.

The field audit included lights for the skate park in Te Kuiti and the existing lights have been changed from HPS to LEDs. As this project was not carried out by Horizon the lighting changes have not been passed through to be updated in the database. I recommend that the new connection process be reviewed to ensure that any future projects are captured in the database in a timely manner.

Recommendation	Description	Audited party comment	Remedial action
New connections	Engage with WDC to review the new connection process to ensure new lights are captured in a timely manner.	We'll confirm expected processes for new lighting connections with Horizon and the council's roading contractor.	Identified

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 16-Dec-21 To: 05-Sep-22	The database accuracy is outside the allowable +/-5% threshold. There is a 95% level of confidence that the annual consumption is between 14,300 kWh p.a. lower and 4,100 kWh p.a. higher than the database indicates. One item of load incorrectly recorded as private resulting in in a very minor estimated under submission of 83 kWh per annum. The festive light consumption was not submitted for December 2021 and January 2022 season resulting in a very minor under submission of 4.21 kWh. Potential impact: Medium Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is low based on the kWh difference.

Actions taken to resolve the issue	Completion date	Remedial action status
We have obtained information of festive lights and confirmed when these were operating for 21/22. Submissions will be revised for Dec 21 and Jan 22 at the next opportunity. Horizon will add the correct council ICP to the one item of load currently recorded as private. Discrepancies identified during the field audit have been provided to Horizon for resolution.	31 March 2023 30 Nov 2022 30 Nov 2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We have agreed with Horizon that going forward they will include the festive lights in data extracts when these are operating. We will continue to follow up to ensure correct light and wattage information is confirmed and corrected in the database where needed.	Ongoing 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 on hours against the submitted figure to confirm accuracy.

Audit commentary

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 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 to the capacities provided to EMS for September 2022 and found that they matched exactly.

The management of festive lights was discussed and found this was not submitted for the 2021 festive season resulting in a very minor under submission of 4.21 kWh across the December 2021 and January 2022 submission months. This will be corrected through the revision process and will be checked in the next audit.

In the last audit, WDC accepted responsibility for the light at 27 Rauparaha Street, Marakopa. The ICP is still recorded as private resulting in a very minor estimated under submission of 83 kWh per annum.

The previous audit found no missing or additional lights but did find 72 wattage discrepancies. I sampled ten of these and found that not all have not been updated during the audit period. This audit also found discrepancies in the field including some additional lights in the field. Horizon have advised that the light wattage is believed to have been set to lower wattage than that stated on the label. I have requested the light specifications to confirm this, but this was unable to be supplied by the time the audit was due. For this reason, I have run two sets of analysis against the field audit findings. The first includes the lamp wattage discrepancies based on the field findings. The second analysis excludes the lights with the lowered wattages. Both sets of analysis fell outside of the allowable database accuracy threshold, and I have recorded the lower amount as I could not confirm if the field wattages have been reduced at the time this audit was completed. This found that there is a 95% level of confidence that the annual consumption is between 14,300 kWh p.a. lower and 4,100 kWh p.a. higher than the database indicates.

The current monthly report is provided as a snapshot and is non-compliant as it does not track change 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: 16-Dec-21 To: 05-Sep-22	The festive light consumption was not submitted for December 2021 and January 2022 season resulting in a very minor under submission of 4.21 kWh. One item of load incorrectly recorded as private resulting in in a very minor estimated under submission of 83 kWh per annum. The database accuracy is outside the allowable +/-5% threshold. There is a 95% level of confidence that the annual consumption is between 14,300 kWh p.a. lower and 4,100 kWh p.a. higher than the database indicates. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Potential impact: Medium 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 recorded as moderate because they mitigate risk most of the time but there is room for improvement. The impact on settlement and participants is low based on the kWh difference.

Actions taken to resolve the issue	Completion date	Remedial action status
We have obtained information of festive lights and confirmed when these were operating for 21/22. Submissions will be revised for Dec 21 and Jan 22 at the next opportunity. Horizon will add the correct council ICP to the one item of load currently recorded as private. Discrepancies identified during the field audit have been provided to Horizon for resolution.	31 March 2023 30 Nov 2022 30 Nov 2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
We have agreed with Horizon that going forward they will include the festive lights in data extracts when these are operating. We will continue to follow up to ensure correct light and wattage information is confirmed and corrected in the database where needed. 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 Ongoing Ongoing	

CONCLUSION

The previous audit found 72 wattage discrepancies. I sampled ten of these and found that not all have not been updated. This audit also found discrepancies in the field including some additional lights in the field. Horizon have advised that the light wattage is believed to have been set to lower wattage than that stated on the light label. I have requested the light specifications to confirm this, but this was unable to be supplied by the time the audit was due. For this reason, I have run two sets of analysis against the field audit findings. The first includes the lamp wattage discrepancies based on the field findings. The second analysis excludes the lights with the lowered wattages. Both sets of analysis found that the database accuracy fell outside of the allowable accuracy threshold. I have recorded the findings from the field audit as I could not confirm if the light wattages have been reduced at the time this audit was completed. That analysis found that there is a 95% level of confidence that the annual consumption is between 14,300 kWh p.a. lower and 4,100 kWh p.a. higher than the database indicates.

The field audit included lights for the skate park in Te Kuiti where the existing lights have been changed from HPS to LEDs. As this project was not carried out by Horizon the lighting changes have not been passed through to be updated in the database. There is not a large amount of this sort of project work in the WDC area, but this discrepancy will have impacted the database accuracy findings. I have recommended that the new connection process be reviewed to ensure that any future projects are captured in the database in a timely manner.

The audit found five non-compliances and makes three recommendations. The future risk rating of ten indicates that the next audit be completed in 12 months. I have considered this in conjunction with Meridian's comments and agree with this recommendation.

PARTICIPANT RESPONSE

Meridian have reviewed this report and their comments are recorded in the body of the report.