ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

CLUTHA DISTRICT COUNCIL AND MERIDIAN ENERGY LIMITED

Prepared by: Steve Woods

Date audit commenced: 31 August 2019

Date audit report completed: 8 November 2019

Audit report due date: 1 June 2018

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EXECUTIVE SUMMARY

This audit of the **Clutha District Council (CDC)** 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.

A RAMM database is held by CDC, who is Meridian's customer. There is currently no streetlight contractor in place for maintenance. McKay Electrical is the contractor for the LED rollout.

RAMM population was based on a complete field audit of all items of non-NZTA load. The NZTA data is not all held in RAMM but forms part of the submission for ICP 0001982479TGE75. The NZTA data is held in a spreadsheet supplied by NZTA to CDC. This spreadsheet contains 433 items of load, but does not contain locations, so the accuracy of this data cannot be confirmed. The RAMM database contains 75 items of NZTA load, but this is removed before the report is sent to Meridian, because it is replaced with the spreadsheet of 433 items of load. Whilst the NZTA lighting could not be fully audited, the checks I conducted indicate this data appears to have a high level of accuracy.

Some database inaccuracies were identified during the field audit, and improvements are required to the updating process to ensure accuracy.

A monthly report from the database is provided to Meridian and is used to calculate submissions. The NZTA lighting is held in a spreadsheet and is added to the report prior to it being sent. Meridian submits the DUML load as NHH using the DST profile. The 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 figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit and EMS' agent audit.

Seven non-compliances were identified. The future risk rating of 18 indicates that the next audit be completed in three months. I recommend a longer period of nine months to allow the LED rollout to be completed and to enable the NZTA data to be updated in the database with location details. The next audit can then evaluate a complete set of data.

The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Database audit	1.10	16A.26 and 17.295F	Audit conducted late.	Moderate	Low	2	Cleared
Deriving submission information	2.1	11(1) of Schedule 15.3	In absolute terms, total annual consumption is estimated to be 16,800 kWh higher than the DUML database indicates. Submission is based on a snapshot and does not consider historic adjustments.	Moderate	Medium	4	Identified
ICP identifier and items of load	2.3	11(2)(b) of Schedule 15.3	2 items of load with insufficient location details.	Strong	Low	1	Identified
Description and capacity of load.	2.4	11(2)(c) and (d) of Schedule 15.3	22 items of load with blank lamp wattage, gear wattage and description of load.	Weak	Low	3	Identified
All load recorded in database	2.5	Clause 11(2A) of Schedule 15.3	2 lights in the field not recorded in the database.	Moderate	Low	2	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Database accuracy	3.1	15.2 and 15.37B(b)	In absolute terms, total annual consumption is estimated to be 16,800 kWh higher than the DUML database indicates. The database contains incorrect ballast wattage, but these are corrected prior to submission. 22 items of load do not have make, model, lamp wattage or gear wattage recorded. Two items of load do not have GPS coordinates and there is insufficient detail in the address field to locate them.	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 16,800 kWh higher than the DUML database indicates. Submission is based on a snapshot and does not consider historic adjustments.	Moderate	Medium	4	Identified
Future Risk Rating							20

Future risk rating	0	1-4	5-8	9-15	16-18	19+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Description	Recommendation
			Nil

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

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

Audit observation

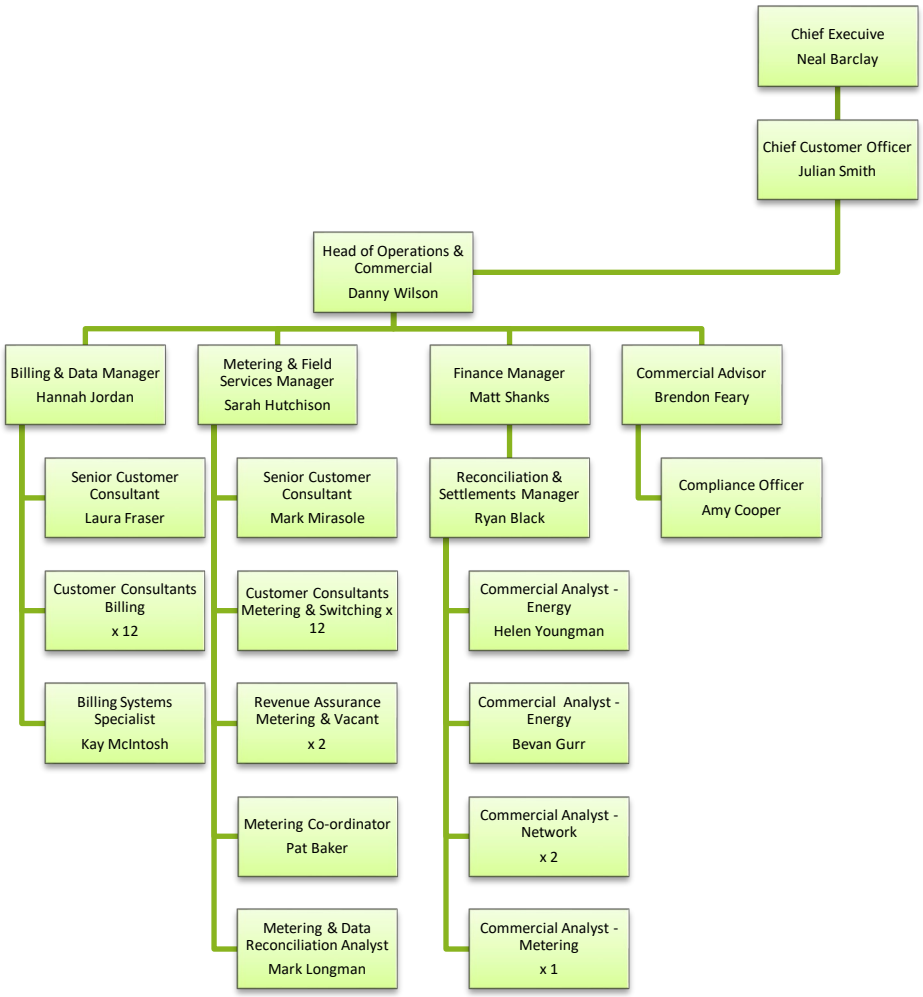
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Meridian provided a copy of their organisational structure:



1.3. Persons involved in this audit

Auditor:

Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Amy Cooper	Compliance Officer	Meridian Energy
Sue Wilkins	Infrastructure Strategy Team	Clutha DC

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".

Database back-up is in accordance with standard industry procedures. 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)
0000207893DE37B	Waipori Falls	WPV0661	DST	10	750
0001982479TGE75	CDC Streetlights	BAL0331	DST	1,328	57,828
0008801005TPE67	CDC Lights Urban	GOR0331	DST	126	4,887
0008801015TP4CA	CDC Lights Rural	GOR0331	DST	0	0

ICP 0008801015TP4CA does not have any load associated with it and it has the same NSP as ICP 0008801005TPE67. Meridian is investigating to determine whether this ICP can be decommissioned.

1.7. Authorisation Received

All information was provided directly by Meridian and CDC.

1.8. Scope of Audit

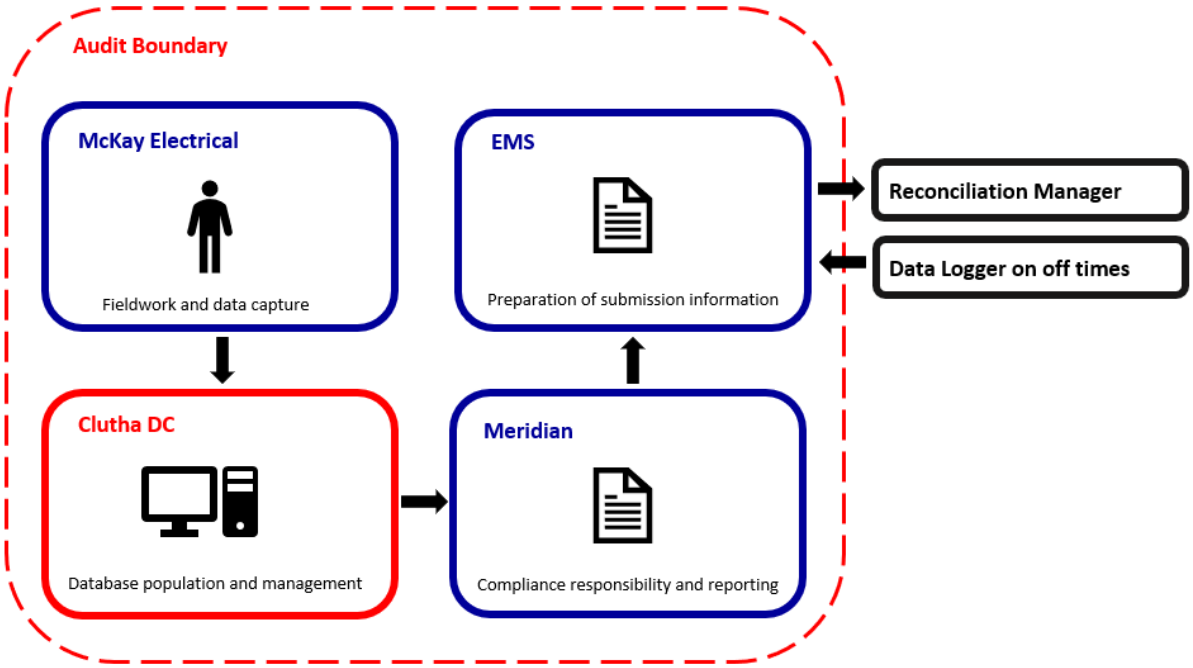
This audit of the CDC DUML database and processes was conducted at the request of Meridian in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied. The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

A RAMM database is held by CDC, who is Meridian's customer. There is currently no streetlight contractor in place for maintenance. McKay Electrical is the contractor for the LED rollout.

RAMM population was based on a complete field audit of all items of non-NZTAload. The NZTA data is not all held in RAMM but forms part of the submission for ICP 0001982479TGE75. The NZTA data is held in a spreadsheet supplied by NZTA to CDC. This spreadsheet contains 433 items of load, but does not contain locations, so the accuracy of this data cannot be confirmed. The RAMM database contains 75 items of NZTA load, but this is removed before the report is sent to Meridian, because it is replaced with the spreadsheet of 433 items of load.

A monthly report from the database is provided to Meridian and is used to calculate submissions. The NZTA lighting is held in a spreadsheet and is added to the report prior to it being sent. Meridian submits the DUML load as NHH using the DST profile. The 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 figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit and EMS' agent audit.

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



The field audit was undertaken of a statistical sample of 147 items of load.

1.9. Summary of previous audit

This is the first audit under the current regime. Previously there was no database to audit, there were only street and town totals held by the Distributor.

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 was due to be completed by 01/06/18 but was only conducted in August 2019, because a database was not available until this time.

Audit outcome

Non-compliant

<table>
<tr><th>Non-compliance</th><th colspan="3">Description</th></tr>
<tr><td>Audit Ref: 1.10
With: Clause 16A.26 and 17.295F

From: 01-Jun-18
To: 08-Sep-19</td><td colspan="3">Audit conducted late.
Potential impact: Medium
Actual impact: Low
Audit history: None
Controls: Moderate
Breach risk rating: 2</td></tr>
<tr><th>Audit risk rating</th><th colspan="3">Rationale for audit risk rating</th></tr>
<tr><td>Low</td><td colspan="3">The controls are recorded as moderate because Meridian was actively working with CDC to obtain a database.
The impact on settlement and participants is minor; therefore, the audit risk rating is low.</td></tr>
<tr><th colspan="2">Actions taken to resolve the issue</th><th>Completion date</th><th>Remedial action status</th></tr>
<tr><td colspan="2">Meridian began trading this DUML in April 19 and had the audit conducted as soon as the database was available.</td><td>Aug 2019</td><td rowspan="3">Cleared</td></tr>
<tr><th colspan="2">Preventative actions taken to ensure no further issues will occur</th><th>Completion date</th></tr>
<tr><td colspan="2"></td><td></td></tr>
</table>

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.

Audit commentary

This clause requires that the distributed unmetered load database must satisfy the requirements of schedule 15.5 regarding the methodology for deriving submission information.

A monthly report from the database is provided to Meridian and is used to calculate submissions. The NZTA lighting is held in a spreadsheet and is added to the report prior to it being sent. Meridian submits the DUML load as NHH using the DST profile. The 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 figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit and EMS' agent audit.

The capacities supplied to EMS for July 2019 were checked and confirmed to be accurate.

The field audit found that the total annual consumption is estimated to be 16,800 kWh higher than the DUML database indicates.

The lamp install date is used as the date lights are installed or changed, but submission is based on a snapshot and does not consider historic adjustments.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Jun-18 To: 09-Sep-19	In absolute terms, total annual consumption is estimated to be 16,800 kWh higher than the DUML database indicates. Submission is based on a snapshot and does not consider historic adjustments. Potential impact: Medium Actual impact: Medium Audit history: None Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**

Medium	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 moderate; therefore, the audit risk rating is medium.

Actions taken to resolve the issue	Completion date	Remedial action status
Once the updated RAMM data has been received by CDC from McKay Ltd who is carrying out the LED retrofit, most of the anomalies identified relating to SoN's vs LED's should be rectified. CDC also plans to conduct a full field inspection on completion of the roll out to ensure database accuracy.	March 2020	Identified
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 whether an ICP is recorded for each item of load.

Audit commentary

The analysis found that all items of load had an ICP number recorded.

Audit outcome

Compliant

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

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The database contains street addresses, pole numbers and GPS coordinates.

Two items of load do not have GPS coordinates and there is insufficient detail in the address field to locate them.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.3 With: Clause 11(2)(b) of Schedule 15.3 From: 01-Jun-18 To: 08-Sep-19	2 items of load with insufficient location details. Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as strong because a complete field audit was conducted recently to populate the database, and this is a minor error. 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
CDC are following up with their contractor regarding correction of the missing location information	31 Dec 2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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.

Audit commentary

22 items of load do not have make, model, lamp wattage or gear wattage recorded.

The accuracy of the recorded wattages is discussed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: 01-Jun-18 To: 08-Sep-19	22 items of load with blank lamp wattage, gear wattage and description of load. Potential impact: Medium Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are recorded as weak because monitoring is not in place for database discrepancies. The impact on settlement and participants is minor; therefore, the audit risk rating is low. If the lights are assumed to be 24W LED, the under submission will be 2,255 kWh p.a.

Actions taken to resolve the issue	Completion date	Remedial action status
CDC are following up with their contractor regarding correction of the missing information for these items of load.	31 Dec 2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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 147 items of load.

Audit commentary

The following differences were identified during the field audit.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
AYR STREET	3	3	-	1	1 x 150W HPS recorded as 24W LED
CLUTHA VALLEY ROAD	2	2	-	2	1 x 24W LED recorded as 70W HPS 1 x 150W HPS recorded as 24W LED
CONNOR PLACE	1	1	-	1	1 x 24W LED recorded as 70W HPS
ESSEX STREET	5	5	-	5	3 x 150W HPS with incorrect ballast of 5W 2 x Ped-X lights with no wattage
FINLAYSON ROAD	4	4	-	3	3 x 24W LED recorded as 70W HPS
GORDON STREET	5	4	-1	2	1 light not found 2 x 150W HPS recorded as 70W HPS
LANARK STREET	9	9	-	1	1 x 150W HPS recorded as 70W HPS
MANSE STREET (KELSO)	1	1	-	1	1 x 24W LED recorded as 70W HPS
MATHESONS CORNER ROAD	1	1	-	1	1 x 24W LED recorded as 70W HPS
MAY STREET	3	3	-	3	3 x 70W HPS with incorrect ballast of 5W
POOLE STREET	5	6	+1	-	additional 24W LED corner of Salcombe
RATA LANE	3	4	+1	1	1 x additional 24W LED 1 x 70W HPS with incorrect ballast of 5W
SALCOMBE STREET	11	11	-	2	2 x 24W LED recorded as 70W HPS
SCHOOL ROAD (WAIPAHI)	1	1	-	1	1 x 24W LED recorded as 70W HPS
TAIERI PLAINS HIGHWAY (SH1)	1	1	-	1	1 x 150W HPS with incorrect ballast of 5W

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
WAIPORI VILLAGE LOOP ROAD	5	5	-	5	5 x 70W HPS with incorrect ballast of 5W
Total			**+1**	**29**	

The field audit identified two lights which were present in the field but not recorded in the database.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-Jun-18 To: 08-Sep-19	2 lights in the field not recorded in the database. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2		
Audit risk rating	**Rationale for audit risk rating**		
Low	Controls are rated as moderate. A complete field audit was conducted and there were only two discrepancies found. The impact is low because only two examples were found.		
Actions taken to resolve the issue		**Completion date**	**Remedial action status**
CDC are following up with their contractor regarding the missing lamps.		31 Dec 2019	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

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	Streetlights in the Clutha region
Strata	The database contains items of load located in the Clutha region owned by CDC. The management process is the same for all lights. The total population was divided into three strata: Roads starting with A-H Roads starting with I–R Roads starting with S-Z
Area units	I created a pivot table of the roads in the stratum, and I used a random number generator in a spreadsheet to select a total of 42 sub-units making up 10% of the total database wattage.
Total items of load	147 items of load were checked.

Wattages for all items of load were checked against the published standardised wattage tables produced by the Electricity Authority, and the manufacturer's specifications.

Audit commentary

Database accuracy based on the field audit

A field audit was conducted of a statistical sample of 147 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	107.4	Wattage from survey is higher than the database wattage by 7.4%
R_L	94.1	With a 95% level of confidence it can be concluded that the error could be between -5.9% and 19.6%
R_H	119.6	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 01/02/19 and the table below shows that Scenario C (detailed below) applies.

The conclusion from Scenario C is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 5.9% lower and 19.6% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 4.0 kW higher than the database indicates.

There is a 95% level of confidence that the installed capacity is between 3 kW lower to 10 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 16,800 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 13,300 kWh p.a. lower to 44,500 kWh p.a. higher than the database indicates.

Included in this error are 15 items of load where the ballast is recorded incorrectly in the database. CDC adds the correct ballast as part of the reporting to Meridian, so whilst the database is inaccurate there is no impact on submission from incorrect ballast details in the database.

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 against the published standardised wattage table, and manufacturer's specifications where available.

22 items of load do not have make, model, lamp wattage or gear wattage recorded.

357 items of load have incorrect gear wattage recorded in the database.

NZTA lighting

NZTA lighting is not all in the database, a spreadsheet is relied upon for this data. The spreadsheet does not have sufficient location details to enable it to be audited. The spreadsheet was provided by NZTA to CDC, but there is no process in place to update this information on an ongoing basis. There are also pdf maps showing every NZTA light. The maps have creation dates in 2017 and 2018. I checked 45 lights in the database against the maps where it was possible to identify groups of lights for small towns, and the spreadsheet matched the maps. I also checked 23 lights in the field against the maps and found 100% accuracy. When better location information is available, an audit needs to be conducted of NZTA lighting, but the checks I conducted confirm the data can be relied on for submission in the meantime.

ICP accuracy

No ICP discrepancies were identified.

Location accuracy

Two items of load do not have GPS coordinates and there is insufficient detail in the address field to locate them.

Change management process findings

Processes to track changes to the database were reviewed.

The database was populated from a complete field audit. The lamp count appears to be reasonably accurate, but some wattages are incorrect. For the LED upgrade process, CDC provides the "work orders" as hard copy, which are then returned, and the database is populated. The discrepancies found during the field audit are believed to be due to the contractor not returning all of the paperwork as required. McKay Electrical is the LED upgrade contractor but there is currently no maintenance contractor.

The lamp install date is used as the date lights are installed or changed.

When the planned NZTA LED rollout occurs, it is not clear whether the CDC RAMM database will be used or the NZTA RAMM database. The timeframe for this rollout is unknown.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Jun-18 To: 09-Sep-19	In absolute terms, total annual consumption is estimated to be 16,800 kWh higher than the DUML database indicates. The database contains incorrect ballast wattage, but these are corrected prior to submission. 22 items of load do not have make, model, lamp wattage or gear wattage recorded Two items of load do not have GPS coordinates and there is insufficient detail in the address field to locate them. Potential impact: High Actual impact: Medium Audit history: None Controls: Moderate Breach risk rating: 4

Audit risk rating	Rationale for audit risk rating
Medium	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 moderate; therefore, the audit risk rating is medium.

Actions taken to resolve the issue	Completion date	Remedial action status
Once the updated RAMM data has been received by CDC from McKay Ltd who is carrying out the LED retrofit, most of the anomalies identified relating to SoN's vs LED's should be rectified.	Mar 2020	Identified
CDC also plans to conduct a full field inspection on completion of the roll out to ensure database accuracy.		
Missing location and capacity information is being followed up for correction.	31 Dec 2019	
CDC are investigating options for adding the NZTA lighting to the RAMM database with their contractor and NZTA.	June 2020	
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

Submission data was checked for accuracy, including:

- checking the registry to confirm that all ICPs have 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

The process for calculation of consumption was examined.

Audit commentary

This clause requires that the distributed unmetered load database must satisfy the requirements of schedule 15.5 regarding the methodology for deriving submission information.

A monthly report from the database is provided to Meridian and is used to calculate submissions. The NZTA lighting is held in a spreadsheet and is added to the report prior to it being sent. Meridian submits

the DUML load as NHH using the DST profile. The 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 figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit and EMS' agent audit.

The capacities supplied to EMS for July 2019 were checked and confirmed to be accurate.

The field audit found that the total annual consumption is estimated to be 16,800 kWh higher than the DUML database indicates.

The lamp install date is used as the date lights are installed or changed, but submission is based on a snapshot and does not consider historic adjustments.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 15.2 and 15.37B(c) From: 01-Jun-18 To: 09-Sep-19	In absolute terms, total annual consumption is estimated to be 16,800 kWh higher than the DUML database indicates. Submission is based on a snapshot and does not consider historic adjustments. Potential impact: Medium Actual impact: Medium Audit history: None Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	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 moderate; therefore, the audit risk rating is medium.

Actions taken to resolve the issue	Completion date	Remedial action status
Once the updated RAMM data has been received by CDC from McKay Ltd who is carrying out the LED retrofit, most of the anomalies identified relating to SoN's vs LED's should be rectified. CDC also plans to conduct a full field inspection on completion of the roll out to ensure database accuracy.	March 2020	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	

CONCLUSION

A RAMM database is held by CDC, who is Meridian's customer. There is currently no streetlight contractor in place for maintenance. McKay Electrical is the contractor for the LED rollout.

RAMM population was based on a complete field audit of all items of load. The NZTA data is not all held in RAMM but forms part of the submission for ICP 0001982479TGE75. The NZTA data is held in a spreadsheet supplied by NZTA to CDC. This spreadsheet contains 433 items of load, but does not contain locations, so the accuracy of this data cannot be confirmed. The RAMM database contains 75 items of NZTA load, but this is removed before the report is sent to Meridian, because it is replaced with the spreadsheet of 433 items of load. Whilst the NZTA lighting could not be fully audited, the checks I conducted indicate this data appears to have a high level of accuracy.

Some database inaccuracies were identified during the field audit, and improvements are required to the updating process to ensure accuracy.

A monthly report from the database is provided to Meridian and is used to calculate submissions. The NZTA lighting is held in a spreadsheet and is added to the report prior to it being sent. Meridian submits the DUML load as NHH using the DST profile. The 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 figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit and EMS' agent audit.

Seven non-compliances were identified. The future risk rating of 18 indicates that the next audit be completed in three months. I recommend a longer period of nine months to allow the LED rollout to be completed and to enable the NZTA data to be updated in the database with location details. The next audit can then evaluate a complete set of data.

PARTICIPANT RESPONSE