ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

SOUTH WAIRARAPA DISTRICT COUNCIL AND MERCURY ENERGY LIMITED

NZBN: 9429037705305

Prepared by: Rebecca Elliot

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Date audit report completed: 24 May 2022

Audit report due date: 1 July 2022

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EXECUTIVE SUMMARY

This audit of the **South Wairarapa District Council (SWDC)** DUML database and processes was conducted at the request of **Mercury Energy Limited (Mercury)** in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

The RAMM database is maintained by Fulton Hogan. PSW complete all fieldwork for the SWDC streetlights, with assistance from Fulton Hogan as required. Additions, removals, and changes to lights are communicated to Fulton Hogan. This information is captured in the field using pocket RAMM.

Mercury reconciles the SWDC DUML load using the HHR profile in accordance with exemption 233. Wattages are derived from a RAMM database extract. On and off times are derived from a data logger.

I compared the submission information for the April 2022 submissions and confirmed that the calculation methodology was correct. I checked the submission calculation provided by Mercury against the data extract and confirm the submission is accurate.

The field audit was undertaken of a statistical sample of 132 items of load on 17 and 18th May 2022. This found the database is not confirmed to be accurate within the allowable ±5% accuracy threshold and over submission is likely to be occurring as a result:

- there is a 95% level of confidence that the installed capacity is between 4kW lower and 3 kW higher than the database,
- in absolute terms, total annual consumption is estimated to be 1,200 kWh lower than the DUML database indicates, and
- there is a 95% level of confidence that the annual consumption is between 15,500 kWh p.a. lower to 11,000 kWh p.a. higher than the database indicates.

This audit identified five non-compliances, and two recommendations were made. The future risk rating of nine indicates that the next audit be completed in 12 months. I have considered this in conjunction with Mercury's comments and recommend that the next audit period be in 12 months.

The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual over submission of 1,200 kWh. One item of load does not have wattage recorded which would result in an estimated under submission of 120 kWh per annum. Changes are not always recorded in the database extract from the date which they became effective.	Moderate	Low	2	Identified
Description and capacity of load	2.4	11(2)(c)(d) of Schedule 15.3	Lamp make and model and wattage is not recorded for one lamp which would result in an estimated under submission of 120 kWh per annum.	Strong	Low	1	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	Eight additional lights found in the field (6% error rate).	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B (b)	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual over submission of 1,200 kWh. One lamp does not have the wattage or model recorded, resulting in an estimated under submission of 120 kWh p.a. based on 4,271 burn hours. Changes are not always recorded in the database extract from the date which they became effective.	Moderate	Low	2	Identified
Volume information accuracy	3.2	15.2 and 15.37B (c)	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual over submission of 1,200 kWh. One lamp does not have the wattage or model recorded resulting in an estimated under	Moderate	Low	2	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			submission of 120 kWh p.a. based on 4,271 burn hours. Changes are not always recorded in the database extract from the date which they became effective.				
Future Risk Rating						9	

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	Correct the 33 items of load that have transposed GPS coordinates, with the northing value recorded in the easting field and vice versa. Correct the street addresses for the six items of load with the correct GPS coordinates. The street name should be updated from Vintners Lane to Dublin Street West for four lamps, and street names should be updated from Esther St to Tuscan Lane and Burgundy Drive for two lamps.

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

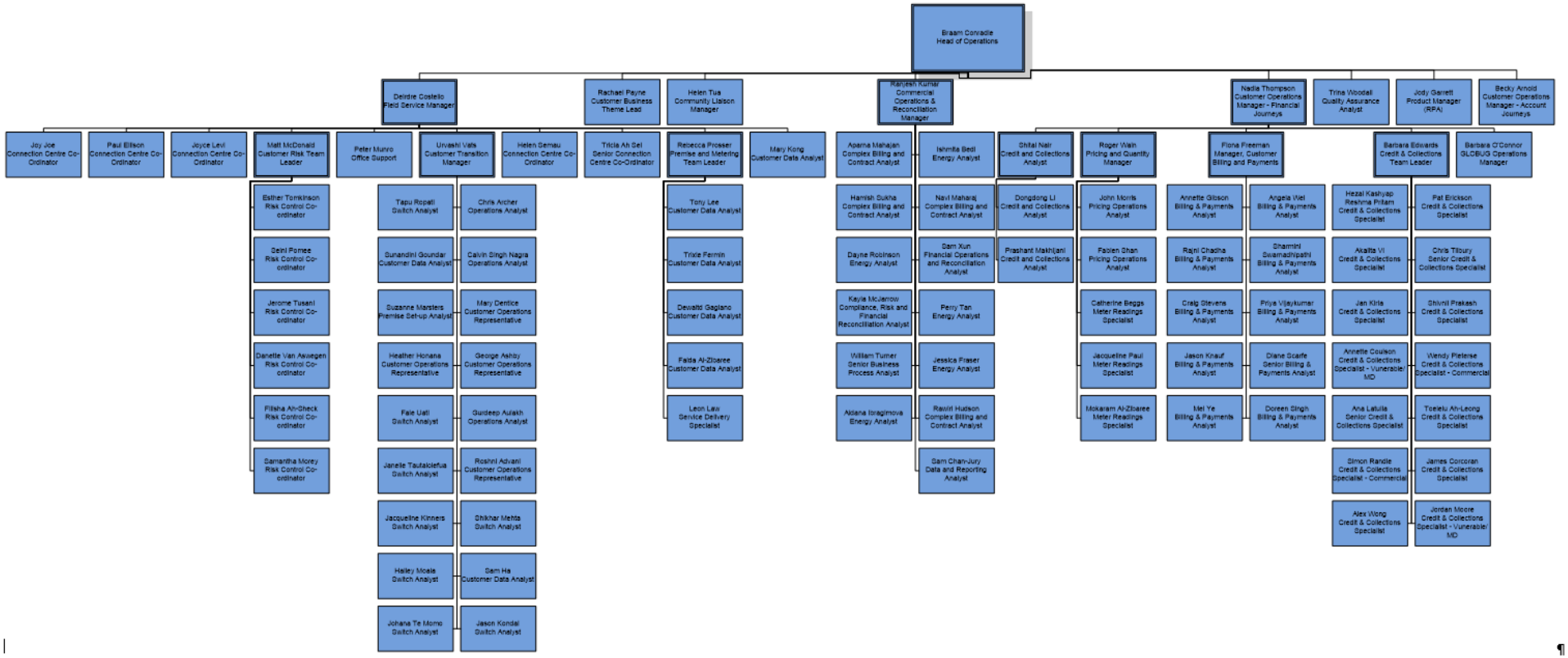
Current code exemptions were reviewed on the Electricity Authority website.

Audit commentary

Mercury has been granted exemption No. 233. This allows them to provide half-hour ("HHR") submission information instead of non-half-hour ("NHH") submission information for distributed unmetered load ("DUML"). This exemption expires on 31 October 2023.

1.2. Structure of Organisation

Mercury provided their current organisational structure:



1.3. Persons involved in this audit

Auditor:

Name	Title	
Rebecca Elliot	Auditor	Veritek Ltd
Claire Stanley	Supporting Auditor	Veritek Ltd

Other personnel assisting in this audit were:

Name	Title	Company
Tim Langley	Roading Manager	South Wairarapa District Council
Chris Posa	Compliance Reconciliation Analyst	Mercury Energy

1.4. Hardware and Software

RAMM

The SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Limited. The database is commonly known as "RAMM" which stands for "Road Assessment and Maintenance Management". The specific data used for DUML is held in the Streetlight tables. thinkproject New Zealand Limited backs up the database and assists with disaster recovery as part of their hosting service.

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

Systems used by Mercury to calculate submissions are assessed as part of their reconciliation participant audit.

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)
0020906000WRDFA	STREET LIGHTING	GYT0331	HHR	845	30,422
Total				845	30,422

1.7. Authorisation Received

All information was provided directly by Mercury and SWDC.

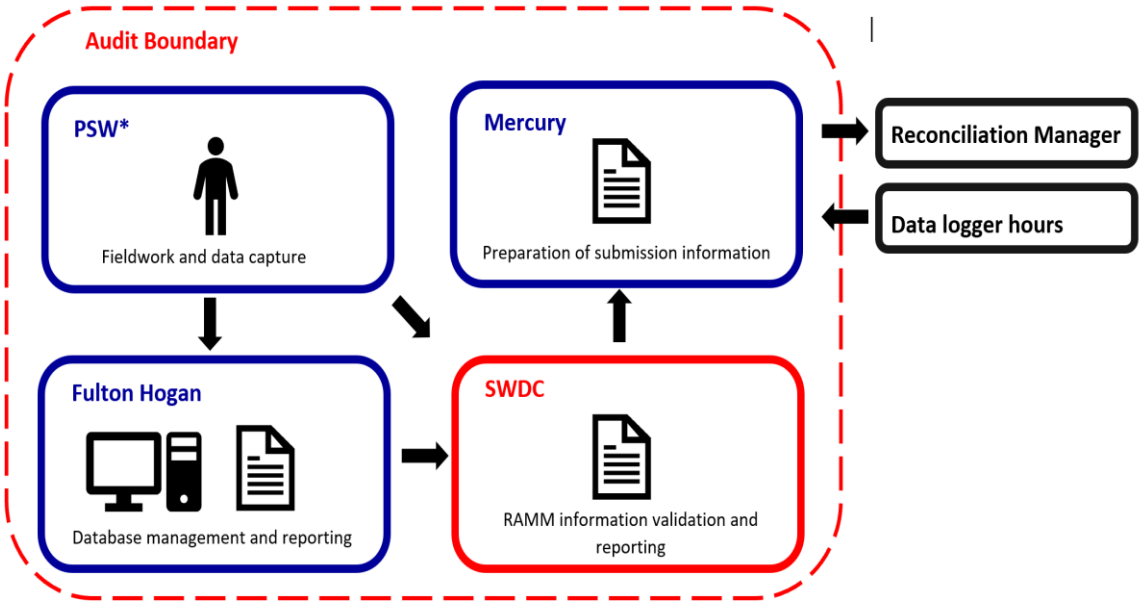
1.8. Scope of Audit

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

The RAMM database is maintained by Fulton Hogan. PSW complete all fieldwork for the SWDC streetlights, with assistance from Fulton Hogan as required. Additions, removals, and changes to lights are communicated to Fulton Hogan. This information is captured in the field using pocket RAMM.

Mercury reconciles the SWDC DUML load using the HHR profile in accordance with exemption 233. Wattages are derived from a RAMM database extract. On and off times are derived from a data logger.

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 boundaries for clarity.



The field audit was undertaken of a statistical sample of 132 items of load on 17 and 18th May 2022.

1.9. Summary of previous audit

The previous audit of this database was undertaken by Rebecca Elliot of Veritek Limited in May 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.

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Variance in light volumes reported to Mercury vs what is recorded in the database is likely to be resulting in an estimated 48,756 kWh per annum of under submission.	Cleared
			The database accuracy is assessed to be 95.4% of the database for the sample checked indicating a potential under submission of approximately 14,400 kWh per annum.	Still existing
			14 items of load have incorrect lamp wattage resulting in an estimated minor over submission of 222 kWh p.a. based on 4,271 burn hours.	Cleared
			12 items of load have incorrect gear wattage resulting in an estimated minor under submission of 406 kWh p.a. based on 4,271 burn hours.	Cleared
			Changes are not always recorded in the database extract from the date which they became effective.	Still existing
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	Blank or incorrect ICP number recorded in the database for 861 items of load.	Cleared
Database accuracy	3.1	15.2 and 15.37B (b)	The database accuracy is assessed to be 95.4% of the database for the sample checked indicating a potential under submission of approximately 14,400 kWh per annum.	Still existing
			14 items of load have incorrect lamp wattage resulting in an estimated minor over submission of 222 kWh p.a. based on 4,271 burn hours.	Cleared
			12 items of load have incorrect gear wattage resulting in an estimated minor under submission of 406 kWh p.a. based on 4,271 burn hours.	Cleared
			Blank or incorrect ICP number recorded in the database for 861 items of load.	Cleared
			Changes are not always recorded in the database extract from the date which they became effective.	Still existing
Volume information accuracy	3.2	15.2 and 15.37B (c)	Variance in light volumes reported to Mercury vs what is recorded in the database is likely to be resulting in an estimated 48,756 kWh per annum of under submission.	Cleared
			The database accuracy is assessed to be 95.4% of the database for the sample checked indicating a potential under submission of approximately 14,400 kWh per annum.	Still existing
				Cleared

Subject	Section	Clause	Non-compliance	Status
			14 items of load have incorrect lamp wattage resulting in an estimated minor over submission of 222 kWh p.a. based on 4,271 burn hours. 12 items of load have incorrect gear wattage resulting in an estimated minor under submission of 406 kWh p.a. based on 4,271 burn hours. Changes are not always recorded in the database extract from the date which they became effective.	Cleared Still existing

Table of Recommendations

Subject	Section	Recommendation	Status
Deriving submission information	2.1	Mercury to work with the South Wairarapa DC to determine why there is a difference in the data that has been provided for the audit and the data that the customer has received for the same date period.	Cleared
Database Accuracy	3.1	Mercury to liaise with South Wairarapa DC to update the ICP in RAMM for all items of load.	Cleared
		Correct the 147 items of load that have transposed GPS coordinates, with the northing value recorded in the easting field and vice versa. Correct the street addresses for the nine items of load with the correct GPS coordinates. The street names should be updated from Esther St to Tuscan Lane and Burgundy Drive.	Some still remaining Some still remaining

1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F)

Code reference

Clause 16A.26 and 17.295F

Code related audit information

Retailers must ensure that DUML database audits are completed:

1. *by 1 June 2018 (for DUML that existed prior to 1 June 2017)*
2. *within three months of submission to the reconciliation manager (for new DUML)*
3. *within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.*

Audit observation

Mercury 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

Mercury reconciles this DUML load using the HHR profile in accordance with exemption 233. On and off times are derived from a data logger.

I compared the submission information for the April 2022 submissions and confirmed that the calculation methodology was correct. I checked the submission calculation provided by Mercury against the data extract and confirm the submission is accurate.

The field audit found that the database accuracy was not confirmed as accurate with a 95% level of confidence resulting in an estimated annual over submission of 1,200 kWh.

The database contained one minor inaccuracy resulting in an under submission of 120 kWh per annum. This is detailed in **section 3.1.**

The current monthly report is compliant, and Mercury completes revision submissions where corrections are required.

The RAMM database contains a “light install date” and a “lamp install date” but there is not a field for “livening date” for newly connected lights. When changes are processed in the database extract used for submission, if the livening date is not known it is applied from the first day of the month, rather than the date that the change took effect.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 18-May-21 To: 09-May-22	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual over submission of 1,200 kWh. One item of load does not have wattage recorded which would result in an estimated under submission of 120 kWh per annum. Changes are not always recorded in the database extract from the date which they became effective. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate as the processes in place will ensure that the data is recorded correctly most of the time. 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
South Wairarapa DC have advised that they are making the necessary updates to the database in terms of wattage. We have recommended that they add a 'Livening Date' field to the database. We have asked that they keep us updated and we will be following up with them.	June 2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The customer is aware of the need to keep the database updated accurately and we will continue to work with them on this.	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

An ICP is recorded for all items of load.

Audit outcome

Compliant

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

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The database contains the nearest street address, pole numbers and Global Positioning System (GPS) coordinates for most items of load.

11 items of load do not have GPS co-ordinates recorded, however there is sufficient information recorded in the road and location fields to be able to locate these lamps.

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.

As detailed in the previous audits, SWDC confirmed previously that their 26W fluorescent lights are self-ballasted, and the zero gear wattages recorded for the 23 lamps of this type is correct.

The database contains fields to record the lamp make and model. Analysis of the database found one item of load with no lamp model or wattage recorded. If it is assumed that this light is 28W LED, then under submission of 120kWh p.a. is estimated (based on 4271 hours per annum).

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: 18-May-21 To: 09-May-22	Lamp make and model and wattage is not recorded for one lamp which would result in an estimated under submission of 120 kWh per annum. Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as strong, with only one exception indicates that controls are sufficient to ensure that all lamps are recorded in the database most of the time. 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
South Wairarapa DC have advised that they are making the necessary updates to the database for the lamp in question. We have asked that they keep us updated and we will be following up with them.	June 2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The customer is aware of the need to keep the database updated accurately and we will continue to work with them on this.	Ongoing	

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 132 items of load on 17 and 18th May 2022.

Audit commentary

The field audit discrepancies are detailed in the table below:

Street	Database count	Field count	Light count difference	Wattage recorded incorrectly	Comments
EAGLE PLACE	6	3	-3		3 x 26W LED recorded in the database but not located in the field
GREY ST	8	10	+2		2 x 28W LED not recorded in the database but located in the field
HAWKINS DRIVE	8	6	-2		2 x 28W LED recorded in the database but not located in the field
ORCHARD RD	3	7	+4		4 x 27W LED not recorded in the database but located in the field
REGENT ST	13	15	+2		2 x 28W LED not recorded in the database but located in the field
VINTERS LN	4	3	-1		1 x 100 SON recorded in the database but not located in the field
Grand Total	**845**	**847**	**14 (+8, - 6)**		

The field audit found eight more lamps in the field of the 132 items of load sampled. This is 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: 18-May-21 To: 09-May-22	Eight additional lights found in the field of the sample of 132 items of load (6% error rate). Potential impact: Low Actual impact: Low Audit history: Multiple times previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate as the processes in place will ensure that the data is recorded correctly most of the time. The impact is assessed to be low due to the small number of additional lights found in the field in relation to the overall count of the items of load.

Actions taken to resolve the issue	Completion date	Remedial action status
South Wairarapa DC have advised that they are making the necessary updates to the database. We have asked that they keep us updated and we will be following up with them.	June 2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The customer is aware of the need to keep the database updated accurately and we will continue to work with them on this.	Ongoing	

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

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The RAMM database functionality achieves compliance with the code.

Audit outcome

Compliant

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

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

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

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

Audit observation

The database was checked for audit trails.

Audit commentary

RAMM records audit trail information of changes made.

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	South Wairarapa DC streetlights
Strata	The database contains 845 items of load in the South Wairarapa DC region. The management process is the same for all lights. I created three strata: 1. Street name A - G, 2. Street names H – O, and 3. Street names P - Y.
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 16 sub-units.
Total items of load	132 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 132 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	99.1	Wattage from the survey is higher than the database wattage by 0.9%
R_L	88.0	With a 95% level of confidence, it can be concluded that the error could be between -12% and +8.5%
R_H	108.5	

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.

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 8.2% lower and 0.2% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

There is a 95% level of confidence that the installed capacity is between 4kW lower and 3 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 1,200 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 15,500 kWh p.a. lower to 11,000 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

The database was checked against the published standardised wattage table, and manufacturer's specifications where available.

I checked the wattages being applied in the database and found the following error:

As detailed in **section 2.4:**

Quantity	Finding
1	Missing lamp wattage and lamp model

If it is assumed that this light is 28W LED, then under submission of 120kWh p.a. is estimated (based on 4271 hours per annum).

Address location accuracy

As discussed in **section 2.3** 11 items of load do not have GPS co-ordinates recorded, however there is sufficient information recorded in the road and location fields to be able to locate these lamps all items of load have a road name and location recorded.

33 items of load had transposed GPS coordinates, with the northing value recorded in the easting field and vice versa. This was also identified in the last audit for a larger number, so the volume of ICP's with this issue has decreased. The GPS co-ordinates should be updated in RAMM.

Six items of load had the correct GPS coordinates, but incorrectly recorded street address. Four are recorded as Vintners Lane in the database but the street name and maps record this as Dublin Street West, the street name should be updated. As reported in the last audit, the street names should be updated from Esther St to Tuscan Lane and Burgundy Drive for two lamps.

Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Correct the 33 items of load that have transposed GPS coordinates, with the northing value recorded in the easting field and vice versa. Correct the street addresses for the six items of load with the correct GPS coordinates. The street name should be updated from Vintners Lane to Dublin Street West for four lamps, and street names should be updated from Esther St to Tuscan Lane and Burgundy Drive for two lamps.	South Wairarapa DC have advised that they are making the necessary updates to the database. We have asked that they keep us updated and we will be following up with them.	Identified

Change management process findings

A RAMM database is maintained by Fulton Hogan. PSW complete all fieldwork for the SWDC streetlights, with assistance from Fulton Hogan as required. Additions, removals, and changes to lights are communicated to Fulton Hogan. This information is captured in the field using pocket RAMM.

For new connections, lights are loaded into RAMM once the lights are vested in council. SWDC has requested developers not connect lights until this process is complete. SWDC monitors new subdivisions and keeps in close contact with Powerco to ensure that they are aware quickly when the lights are connected. SWDC are reviewing this process within Council to ensure all parties receive timely and complete information regarding new connections.

Fulton Hogan have a maintenance contract with SWDC and complete outage patrols in one town per month, so each town is patrolled every four months. Any outages identified during patrols are passed to PSW, who complete the repairs, and this information is captured in the field using pocket RAMM.

SWDC's LED upgrade project is mostly complete. There are a few SON lamps remaining, and it is planned to upgrade these to LED as budget allows.

The RAMM database contains a "light install date" and a "lamp install date" but there is not a field for "livening date" for newly connected lights. When changes are processed in the database extract used

for submission, if the livening date is not known it is applied from the first day of the month, rather than the date that the change took effect.

Festive and private lights

There are no festive or private lights in use in the SWDC region.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 18-May-21 To: 09-May-22	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual over submission of 1,200 kWh. One lamp does not have the wattage or model recorded, resulting in an estimated under submission of 120 kWh p.a. based on 4,271 burn hours. Changes are not always recorded in the database extract from the date which they became effective. Potential impact: Low Actual impact: Low Audit history: Multiple times previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate as the processes in place will ensure that the data is recorded correctly most of the time. 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
South Wairarapa DC have advised that they are making the necessary updates to the database in terms of wattage. We have recommended that they add a 'Livening Date' field to the database. We have asked that they keep us updated and we will be following up with them.	June 2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The customer is aware of the need to keep the database updated accurately and we will continue to work with them on this.	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

Mercury reconciles this DUML load using the HHR profile in accordance with exemption 233. On and off times are derived from a data logger.

I compared the submission information for the April 2022 submissions and confirmed that the calculation methodology was correct. I checked the submission calculation provided by Mercury against the data extract and confirm the submission is accurate.

The field audit found that the database accuracy was not confirmed as accurate with a 95% level of confidence resulting in an estimated annual over submission of 1,200 kWh.

The database contained one minor inaccuracy resulting in an under submission of 120 kWh per annum. This is detailed in **section 3.1.**

The current monthly report is compliant, and Mercury completes revision submissions where corrections are required.

The RAMM database contains a “light install date” and a “lamp install date” but there is not a field for “livening date” for newly connected lights. When changes are processed in the database extract used for submission, they are applied from the first day of the month, rather than the date that the change took effect.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 18-May-21 To: 09-May-22	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual over submission of 1,200 kWh. One item of load does not have wattage recorded which would result in an estimated under submission of 120 kWh per annum. Changes are not always recorded in the database extract from the date which they became effective. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate as the processes in place will ensure that the data is recorded correctly most of the time. 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
South Wairarapa DC have advised that they are making the necessary updates to the database in terms of wattage. We have recommended that they add a 'Livening Date' field to the database. We have asked that they keep us updated and we will be following up with them.	June 2022	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
The customer is aware of the need to keep the database updated accurately and we will continue to work with them on this.	Ongoing	

CONCLUSION

The RAMM database is maintained by Fulton Hogan. PSW complete all fieldwork for the SWDC streetlights, with assistance from Fulton Hogan as required. Additions, removals, and changes to lights are communicated to Fulton Hogan. This information is captured in the field using pocket RAMM.

Mercury reconciles the SWDC DUML load using the HHR profile in accordance with exemption 233. Wattages are derived from a RAMM database extract. On and off times are derived from a data logger.

I compared the submission information for the April 2022 submissions and confirmed that the calculation methodology was correct. I checked the submission calculation provided by Mercury against the data extract and confirm the submission is accurate.

The field audit was undertaken of a statistical sample of 132 items of load on 17 and 18th May 2022. This found the database is not confirmed to be accurate within the allowable ±5% accuracy threshold and over submission is likely to be occurring as a result:

- there is a 95% level of confidence that the installed capacity is between 4kW lower and 3 kW higher than the database,
- in absolute terms, total annual consumption is estimated to be 1,200 kWh lower than the DUML database indicates, and
- there is a 95% level of confidence that the annual consumption is between 15,500 kWh p.a. lower to 11,000 kWh p.a. higher than the database indicates.

This audit identified five non-compliances, and two recommendations were made. The future risk rating of nine indicates that the next audit be completed in 12 months. I have considered this in conjunction with Mercury's comments and recommend that the next audit period be in 12 months.

PARTICIPANT RESPONSE

Mercury has reviewed this report and their comments are contained within the report.