ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

TASMAN DISTRICT COUNCIL
AND GENESIS ENERGY LIMITED
NZBN: 9429037706609

Prepared by: Tara Gannon

Date audit commenced: 14 July 2023

Date audit report completed: 1 August 2023

Audit report due date: 12 August 2023

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This audit of the **Tasman District Council (TDC)** DUML database and processes was conducted at the request of **Genesis Energy Limited (Genesis)** 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.

Network Tasman maintains an Access database containing the Tasman DC unmetered streetlights. An extract from this database is provided to Genesis monthly, and used to determine the wattage for their submission calculations. Genesis settles the DUML load as NHH using the CST profile, and on hours are determined from data logger information.

TDC maintains a RAMM database of roading assets. Streetlight information was added to RAMM at the beginning of 2023. TDC intends to investigate using RAMM for submission.

Fault, maintenance, and upgrade work is conducted by Powertech. Powertech updates RAMM and provides a "streetlight advice form" to Network Tasman, who update their access database.

New connections are completed by Delta, Powertech and electricians approved to make connections to Network Tasman. Streetlight information is updated on connection in the Network Tasman Access database. Unless the new connection is completed by Powertech, there are sometimes delays in updating RAMM.

The audit considered the accuracy of the Network Tasman Access database because it is currently used for submission.

A field audit was conducted of a statistical sample of 202 items of load. The "database auditing tool" was used to analyse the results, which found that the database was not accurate within ±5.0%. The true wattage (installed in the field) could be between 0.2% and 16.3% lower than the wattage recorded in the DUML database.

- In absolute terms the installed capacity is estimated to be 8 kW lower than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 0 kW and 26 kW lower than the database.
- In absolute terms, total annual consumption is estimated to be 35,700 kWh lower than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 1,700 kWh to 112,700 kWh p.a. lower than the database indicates.

The audit found five non-compliances relating to database completeness and accuracy, and makes two recommendations for improvement. The future risk rating is 21, a decrease from 26 last audit because the submission accuracy issues have been cleared.

The audit risk rating indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' comments and the previous audit's recommended audit period, and recommend that the next audit is completed 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 field audit found that the database accuracy was not accurate within ±5.0%, which could result in estimated over submission of 35,700 kWh per annum. There is one missing gear wattage which could result in estimated under submission of 47 kWh per annum. Six lamp models had inaccurate total wattages recorded which could result in estimated over submission of 111 kWh per annum. This total also includes the 50W SON light described above. The previous audit found four lamps in a new subdivision at Summerfield Boulevard that had 13W LED recorded in the database but were labelled as 28W LEDs (GIS access codes 15096, 15106, 15117 and 15121). These remain incorrect and could result in estimated under submission of 64 kWh per annum. The database extract is provided as a snapshot, and daily changes are not reflected in the submission data.	Weak	Medium	6	Identified
Location of load	2.3	11(2)(b) of Schedule 15.3	180 items of load with insufficient location details.	Moderate	Low	2	Identified
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	One 50W SON light (GIS access code 14656) was recorded with 50W total, but should have had 61W including gear wattage.	Strong	Low	1	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The field audit found that the database accuracy was not accurate within ±5.0%, which could result in estimated over submission of 35,700 kWh per annum. There is one missing gear wattage which could result in estimated under submission of 47 kWh per annum. Six lamp models had inaccurate total wattages recorded which could result in estimated over submission of 111 kWh per annum. This total also includes the 50W SON light described above. The previous audit found four lamps in a new subdivision at Summerfield Boulevard that had 13W LED recorded in the database but were labelled as 28W LEDs (GIS access codes 15096, 15106,	Weak	Medium	6	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			15117 and 15121). These remain incorrect and could result in estimated under submission of 64 kWh per annum.				
Volume information accuracy	3.2	15.2 and 15.37B(c)	The field audit found that the database accuracy was not accurate within ±5.0%, which could result in estimated over submission of 35,700 kWh per annum. There is one missing gear wattage which could result in estimated under submission of 47 kWh per annum. Six lamp models had inaccurate total wattages recorded which could result in estimated over submission of 111 kWh per annum. This total also includes the 50W SON light described above. The previous audit found four lamps in a new subdivision at Summerfield Boulevard that had 13W LED recorded in the database but were labelled as 28W LEDs (GIS access codes 15096, 15106, 15117 and 15121). These remain incorrect and could result in estimated under submission of 64 kWh per annum. The database extract is provided as a snapshot, and daily changes are not reflected in the submission data.	Weak	Medium	6	Identified
Future Risk Rating						21	

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	Comment
Database accuracy	3.1	Confirm wattages for 13W LEDs.	Confirm the correct wattages for GIS access codes 15220 and 13011 on Eton St Richmond and Hart St Richmond.	Powertech will investigate these in field as soon as possible to ensure these are confirmed.
Database accuracy	3.1	Entry of new connection data into RAMM	Establish a process to ensure that new connection information is promptly updated in RAMM, before using RAMM for submission.	Tasman District Council will work with Network Tasman to identify ways in which information can be shared more promptly and accurately.

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

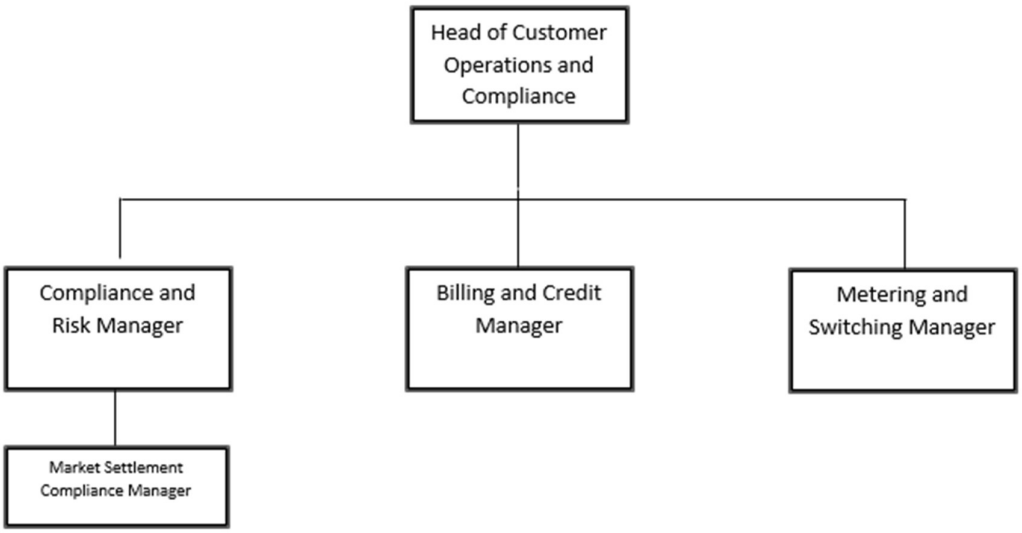
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Genesis Energy provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Name	Company	Role
Tara Gannon	Provera	Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Kerryn Little	Easement Officer	Network Tasman
David Currie	Asset Systems Officer - RAMM	Tasman District Council
Graham Fox	Project Engineer - Waters	Tasman District Council
Steve Elkington	Transportation Network Engineer	Tasman District Council
Shantelle Comer	Customer Operations Data and Systems Specialist	Genesis Energy
Johan van Staden	Risk & Compliance Specialist	Genesis Energy

1.4. Hardware and Software

Network Tasman Access Database

The Access database used by Network Tasman is backed-up, and access to the database is secure by way of password protection.

RAMM

The SQL database used for the management of DUML is remotely hosted by Thinkproject NZ 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 NZ 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.

Genesis systems

Systems used by the trader 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)
0000090005NTAE5	TDC STREETLIGHTING KIKIWA	KIK0111	CST	70	2,638
0000090003NTB6A	TDC STREETLIGHTING MOTUEKA	STK0661	CST	858	35,114
0000090004NT6A0	TDC STREETLIGHTING MOTUPIPI	STK0661	CST	258	9,004
0000090006NT625	TDC STREETLIGHTING MURCHISON	MCH0111	CST	46	1,791
0000090002NT72F	TDC STREETLIGHTING STOKE	STK0331	CST	2,450	113,318
TOTAL				**3,682**	**161,865**

1.7. Authorisation Received

All information was provided directly by Genesis, TDC, and Network Tasman.

1.8. Scope of Audit

This audit of the TDC DUML database and processes was conducted at the request of Genesis 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.

Network Tasman maintains an Access database containing the Tasman DC unmetered streetlights. An extract from this database is provided to Genesis monthly, and used to determine the wattage for their submission calculations. Genesis settles the DUML load as NHH using the CST profile, and on hours are determined from data logger information.

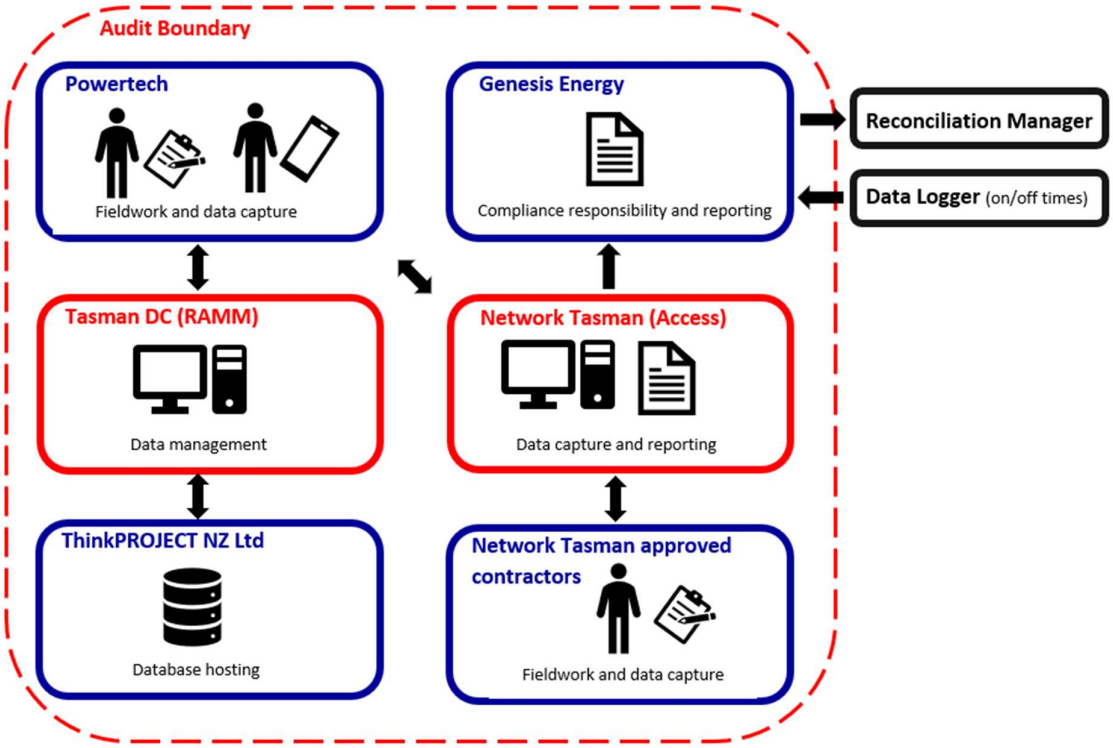
Tasman DC maintains a RAMM database of roading assets. Streetlight information was added to RAMM at the beginning of 2023.

Fault, maintenance, and upgrade work is conducted by Powertech. Powertech updates RAMM and provides a "streetlight advice form" to Network Tasman, who update their access database.

New connections are completed by Delta, Powertech and electricians approved to make connections to Network Tasman. Streetlight information is updated on connection in the Network Tasman Access database. Unless the new connection is completed by Powertech, there are sometimes delays in updating RAMM.

The audit considered the accuracy of the Network Tasman Access database because it is currently used for submission.

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



The field audit was undertaken of a statistical sample of 202 items of load on 14 July 2023.

1.9. Summary of previous audit

The previous audit of this database was undertaken by Rebecca Elliot of Veritek Limited in October 2022. The summary table below shows the statuses of the non-compliances raised in the previous audit.

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Estimated over submission of 214,344 kWh per annum due to discrepancies between data extract and volume submitted. Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 27,300 kWh per annum. Incorrect wattages for 20 items of load resulting in an estimated minor over submission of 87.12 kWh per annum.	Cleared Still existing Still existing
Location of load	2.3	11(2)(b) of Schedule 15.3	137 items of load with insufficient details to locate these.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	Incorrect wattages for 20 items of load resulting in an estimated minor over submission of 87.12 kWh per annum. Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 27,300 kWh per annum.	Still existing Still existing

Subject	Section	Clause	Non-compliance	Status
Volume information accuracy	3.2	15.2 and 15.37B(c)	Estimated over submission of 214,344 kWh per annum due to discrepancies between data extract and volume submitted. Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 27,300 kWh per annum. Incorrect wattages for 20 items of load resulting in an estimated minor over submission of 87.12 kWh per annum.	Cleared Still existing Still existing

Table of recommendations

Subject	Section	Recommendation	Status
Location of each item of load	2.3	Add GPS co-ordinates to items of load with insufficient information.	Not adopted, and not re-raised.
		Review the "Area" field to contain "area" details only and not street level detail.	Not adopted, and not re-raised.
Database Accuracy	3.1	Confirm wattages for new connections with contractor. The wattage for 44 new connections has been advised as 13W, however the field audit identified this was not correct.	Not adopted, re-raised for a subset of lights.
		The database records 3,181 LED lights as "LED" lights only. There are 61 different LED wattages recorded. Update database with lamp descriptions to confirm the correct wattage has been applied.	Not adopted, and not re-raised.

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

Genesis have requested Provera 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 Network Tasman Access database was checked for accuracy.

Audit commentary

Genesis submits the DUML load as NHH using the CST profile. Wattages are derived from an extract provided from the Network Tasman Access database each month by Network Tasman. On and off times are derived from a data logger.

I reviewed the submission information for April 2023 and confirmed that it the calculation was correct, with wattages based on database extract totals and on hours based on data logger information.

The previous audit recorded that incorrect submission volumes were calculated for August 2022, because the database extract for that month included historical lights which were no longer present. Further investigation found that September and October 2022 also had incorrect submission volumes due to this issue. Genesis confirmed that the volumes have now been corrected for August, September, and October 2022, and revised submission data will be provided for the 14 month revisions.

Volume inaccuracy is present in the Network Tasman Access database as follows:

Discrepancy	Estimated potential impact on submission
The field audit found that the database accuracy was not accurate within ±5.0%.	Over submission of 35,700 kWh per annum.
One item of load had a missing gear wattage. A 50W SON light (GIS access code 14656) was recorded with 50W total wattage, but should have had 61W including gear wattage.	Under submission of 47 kWh per annum.
Six lamp models had inaccurate total wattages recorded. This total also includes the 50W SON light described above.	Over submission of 111 kWh per annum.
The previous audit found four lamps in a new subdivision at Summerfield Boulevard that had 13W LED recorded in the database but were labelled as 28W LEDs (GIS access codes 15096, 15106, 15117 and 15121). These remain incorrect.	Under submission of 64 kWh per annum.

The Network Tasman Access database assigns a unique identifier per light. Each item of load has a "UML start date" and "UML end date". The "UML start date" relates to the installation date for the light. The "UML end date" defaults to 2099 and is updated to the date of removal when the light is replaced. This is updated on a daily basis in the Network Tasman ICP database. A snapshot is provided at the end of each month, and is used for submission by Genesis.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 12-Jun-23 To: 31-Jul-23	The field audit found that the database accuracy was not accurate within ±5.0%, which could result in estimated over submission of 35,700 kWh per annum. There is one missing gear wattage which could result in estimated under submission of 47 kWh per annum. Six lamp models had inaccurate total wattages recorded which could result in estimated over submission of 111 kWh per annum. This total also includes the 50W SON light described above. The previous audit found four lamps in a new subdivision at Summerfield Boulevard that had 13W LED recorded in the database but were labelled as 28W LEDs (GIS access codes 15096, 15106, 15117 and 15121). These remain incorrect and could result in estimated under submission of 64 kWh per annum. The database extract is provided as a snapshot, and daily changes are not reflected in the submission data. Potential impact: Medium Actual impact: Medium Audit history: Multiple times previously Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are recorded as weak because database accuracy is not within ±5.0%, indicating that changes may not be being accurately captured. The impact is assessed to be medium based on the potential kWh impact.

Actions taken to resolve the issue	Completion date	Remedial action status
Tasman District Council has taken their database management in-house and will work with Powertech to ensure all inconsistencies captured in this report are resolved.	15/10/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Tasman District Council will build a report to run routinely, this report will capture all blank fields and exceptions in the RAMM database. This will also be run against Network Tasman's database.	1/1/2024	

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

The Network Tasman Access database was checked to confirm an ICP was recorded against each item of load.

Audit commentary

All items of load have an ICP recorded against them.

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 Network Tasman Access database was checked to confirm the location is recorded for all items of load.

Audit commentary

The Network Tasman Access database contains fields for light ID, location description, area, and GPS co-ordinates. I checked the address information for the 3,682 items of load, and found 3,110 items had valid, non-zero GPS coordinates recorded. The other 572 items were checked:

- 392 have sufficient street name, street number and/or location description information to enable them to be readily located,
- 167 items of load have street names and lot numbers only, and
- 13 items of load do not have do not have lot numbers or sufficient information to enable them to be readily located.

The previous audit raised two recommendations, relating to:

- adding GPS coordinates for new connections, and
- reviewing and cleansing the content of the "area" field which contains a mix of areas and street names.

Neither recommendation has been adopted. The recommendations are not re-raised because TDC will investigate using RAMM for submission. TDC advised that RAMM contains full location information.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.3 With: Clause 11(2)(b) of Schedule 15.3 From: 04-Feb-22 To: 31-Jul-23	180 items of load with insufficient location details. Potential impact: Low Actual impact: Low Audit history: Multiple times Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as moderate because most items of load have complete addresses. The audit risk rating is recorded as low due to the small number of lights that cannot be readily located.

Actions taken to resolve the issue	Completion date	Remedial action status
Tasman District Council will add GPS coordinates to new connections and review the database to ensure all GPS fields are completed where possible.	1/1/2024	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Tasman District Council will build a report to run routinely, this report will capture all blank fields and exceptions in the RAMM database. This will also be run against Network Tasman's database.	1/1/2024	

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 Network Tasman Access 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

A lamp type, lamp wattage and total wattage including an allowance for ballast is recorded for each item of load in the database.

No items of load had missing lamp types, or missing or invalid zero lamp wattages.

One item of load had a missing gear wattage. A 50W SON light (GIS access code 14656) was recorded with 50W total wattage, but should have had 61W including gear wattage.

The accuracy of 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: 12-Jun-23 To: 12-Jun-23	One 50W SON light (GIS access code 14656) was recorded with 50W total but should have had 61W including gear wattage. 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 rated as strong, because one light has a missing gear wattage. The impact is low, with estimated under submission of 47 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status
Tasman District Council will work with Powertech to ensure this gear wattage is corrected in the database and matching what is in the field.	1/10/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Tasman District Council and Powertech will work together to establish processes to better share and receive information to ensure database integrity.	1/1/2024	

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 202 items of load on 14 July 2023. The sample was selected from four strata, as follows:

- road names A to Fearon,
- road names Feary to Mellifera,

- road names Memorial to Salisbury, and
- road names Saltmarsh to Z.

Lights were allocated to a strata based on the first street name in the address where they were located on a corner. Where a street was randomly selected in the sample, I ensured that all corner properties on the street were also selected for field checks. This means that the street name they were selected for review under may not be the same as the street name which determined their strata, e.g. the light addressed "Herringbone Street Berryfield Drive cnr" has a strata of "Road names Feary to Mellifera" but was sampled with the other lights on Berryfield Drive.

Audit commentary

The field audit findings for the sample of lamps was accurate with the exception of the streets detailed in the table below.

Street	Database count	Field count	Light count difference	Wattage recorded incorrectly	Comments
Road names A to Fearon					
Florence Street	1	1	-	1	One SON 250 (GIS access code 13702) has a road name of Florence St and a GPS location at Pah Road in Motueka. The GPS location is correct.
Road names Feary to Mellifera					
Berryfield Drive	3	2	-1	-	One LED 22.4 was not present on the street.
George Quay	1	1	-	1	One LED 53 was recorded in the database as MH 400.
Road names Saltmarsh to Z					
Park Drive	1	1	-	1	One L24 (GIS access code 13372) is recorded in the database as HPS100.
Grand Total	**202**	**201**	**-1**	**3**	

This clause relates to lights in the field that are not recorded in the database. The field audit did not find any additional lights in the field of the 202 items of load sampled. The database accuracy is discussed in **section 3.1**.

Audit outcome

Compliant

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 databases was examined.

Audit commentary

The Network Tasman Access database and RAMM functionality achieve 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 databases were checked for audit trails.

Audit commentary

The Network Tasman Access database and RAMM have 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

Genesis' submissions are based on a monthly extract from the RAMM database. A database extract was provided in June 2023, 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	Tasman District Council street lights
Strata	The database contains the items of load for DUML ICPs in the TDC region. The processes for the management of all items of load are the same, but I decided to place the items of load into four strata based on the street names: • road names A to Fearon, • road names Feary to Mellifera, • road names Memorial to Salisbury, and • road names Saltmarsh to Z. Lights were allocated to a strata based on the first street name in the address where they were located on a corner, e.g. the light addressed "Herringbone Street Berryfield Drive cnr" has a strata of "Road names Feary to Mellifera".
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 96 sub-units. Where a street was randomly selected in the sample, I ensured that all corner properties on the street were also selected for field checks. This means that the street name they were selected for review under may not be the same as the street name which determined their strata, e.g. the light addressed "Herringbone Street Berryfield Drive cnr" has a strata of "Road names Feary to Mellifera" but was sampled with the other lights on Berryfield Drive.
Total items of load	202 items of load were checked, making up 7.3% of the total database wattage.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority against the database or in the case of LED lights against the LED light specification.

Audit commentary

Field audit findings

A field audit was conducted of a statistical sample of 202 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	94.8	Wattage from survey is lower than the database wattage by 4.0%
R_L	83.7	With a 95% level of confidence, it can be concluded that the error could be between -0.2% and -16.3%
R_H	99.8	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 1 February 2019 and the table below shows that Scenario B (detailed below) applies. The conclusion from Scenario B is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 0.2% and 16.3% lower 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 8 kW lower than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 0 kW and 26 kW lower than the database.
- In absolute terms, total annual consumption is estimated to be 35,700 kWh lower than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 1,700 kWh to 112,700 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 %

Light description and capacity accuracy

As recorded in **section 2.4**, no items of load had missing lamp types, or missing or invalid zero lamp wattages. One item of load had a missing gear wattage. A 50W SON light (GIS access code 14656) was recorded with 50W total wattage, but should have had 61W including gear wattage.

Lamp and gear wattages in the Network Tasman Access database were compared to the expected values. No lamp models had inaccurate lamp wattages recorded, but six different lamp models (28 lamps) had inaccurate total wattages recorded including the 50W SON described in the paragraph above. These lamp models were also recorded as exceptions in the previous two audits, and will result in estimated annual over submission of 111 kWh.

Lamp make model	Quantity	Database total wattage	Expected total wattage	Variance
Fluor (26 watts)	6	33	28	+30
Fluor (2x58W)	2	130	144	-28
Fluor (2x60W)	1	132	143	-11
Metal Halide (150W)	2	167	168	-2
Metal Halide (70W)	16	86	83	+48
SON (50W)	1	50	61	-11
			TOTAL	+26

The Network Tasman Access database records 3,517 LED lights as "LED" lights only, and there are 67 different LED wattages recorded. The previous audit raised a recommendation to update the database with lamp descriptions to confirm the correct wattage has been applied. The recommendation has not been adopted, and is not re-raised because TDC will investigate using RAMM for submission. TDC advised that RAMM contains full lamp make and model information.

The previous audit found four lamps in a new subdivision at Summerfield Boulevard that had 13W LED recorded in the database but were labelled as 28W LEDs (GIS access codes 15096, 15106, 15117 and 15121). These remain incorrect and will result in estimated annual under submission of 64 kWh.

There are a further 43 lamps currently recorded as 13W LEDs. TDC confirmed that there are 13W LED bollard lights installed in some semi-rural subdivisions and walkways. I checked the affected lights against google maps information and found:

- 32 were located on semi-rural accessways or subdivisions in Appleby, Takaha, or Mapua and are likely to be 13W LED bollards,
- nine lamps had insufficient information to enable them to be located including five in Wakefield (GIS access codes 12154-12158) and four in Richmond (GIS access numbers 15294, 15295, 15218 and 15219), and
- two are located on Eton St Richmond (GIS access code 15220) and Hart St Richmond (GIS access code 13011) and all other lights on the streets have higher wattages so it is possible that these lamps may be incorrectly recorded.

Recommendation	Description	Audited party comment	Remedial action
Confirm wattages for 13W LEDs.	Confirm the correct wattages for GIS access codes 15220 and 13011 on Eton St Richmond and Hart St Richmond.	Powertech will investigate these in field as soon as possible to ensure these are confirmed.	Investigating

Change management process findings

Fault, maintenance, and upgrade work is conducted by Powertech. Powertech updates RAMM and provides a "streetlight advice form" to Network Tasman, who update their Access database.

New connections are completed by Delta, Powertech and electricians approved to make connections to Network Tasman. Streetlight information is updated on connection in the Network Tasman Access database. Unless the new connection is completed by Powertech, there are sometimes delays in updating RAMM. I recommend TDC establishes a process to ensure that new connection information is promptly updated in RAMM, before using RAMM for submission.

Recommendation	Description	Audited party comment	Remedial action
Entry of new connection data into RAMM	Establish a process to ensure that new connection information is promptly updated in RAMM, before using RAMM for submission.	Tasman District Council will work with Network Tasman to identify ways in which information can be shared more promptly and accurately.	Investigating

Three network inspections are completed per annum. The whole network is checked and any maintenance issues are reported. Apart from this, any outages or maintenance issues are reported by residents.

LED upgrades

95.5% of the lights have been upgraded to LED. The remaining upgrades will be completed as funding becomes available, or where lights require replacement through the maintenance process.

TDC has investigated the use of dimming, and at this stage the costs of managing dimming outweigh the benefits due to the size of the network and density of connections. If dimming is revisited, TDC will work with Genesis to ensure that submission and profile processes are compliant.

Festive lights

No festive lighting is used in the Tasman DC region.

Private lights

Private lights are recorded as either standard unmetered load or shared unmetered load as required by the code. No private lights are recorded in the database.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 12-Jun-23 To: 31-Jul-23	The field audit found that the database accuracy was not accurate within ±5.0%, which could result in estimated over submission of 35,700 kWh per annum. There is one missing gear wattage which could result in estimated under submission of 47 kWh per annum. Six lamp models had inaccurate total wattages recorded which could result in estimated over submission of 111 kWh per annum. This total also includes the 50W SON light described above. The previous audit found four lamps in a new subdivision at Summerfield Boulevard that had 13W LED recorded in the database but were labelled as 28W LEDs (GIS access codes 15096, 15106, 15117 and 15121). These remain incorrect and could result in estimated under submission of 64 kWh per annum. Potential impact: Medium Actual impact: Medium Audit history: Multiple times previously Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are recorded as weak because database accuracy is not within ±5.0%, indicating that changes may not be being accurately captured. The impact is assessed to be medium based on the potential kWh impact.

Actions taken to resolve the issue	Completion date	Remedial action status
Tasman District Council has taken their database management in-house and will work with Powertech to ensure all inconsistencies captured in this report are resolved.	15/10/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Tasman District Council will build a report to run routinely, this report will capture all blank fields and exceptions in the RAMM database. This will also be run against Network Tasman's database.	1/1/2024	

3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

- *volume information for the DUML is being calculated accurately*
- *profiles for DUML have been correctly applied.*

Audit observation

The submission was checked for accuracy for the month the database extract was supplied. This included:

- checking the registry to confirm that the ICP has the correct profile and submission flag, and
- checking the database extract combined with the on hours against the submitted figure to confirm accuracy.

Audit commentary

Genesis submits the DUML load as NHH using the CST profile, and the correct profiles and submission types are recorded on the registry. Wattages are derived from an extract provided from the Network Tasman Access database each month by Network Tasman. On and off times are derived from a data logger.

I reviewed the submission information for April 2023 and confirmed that it the calculation was correct, with wattages based on database extract totals and on hours based on data logger information.

The previous audit recorded that incorrect submission volumes were calculated for August 2022, because the database extract for that month included historical lights which were no longer present. Further investigation found that September and October 2022 also had incorrect submission volumes due to this issue. Genesis confirmed that the volumes have now been corrected for August, September, and October 2022, and revised submission data will be provided for the 14 month revisions.

Volume inaccuracy is present in the Network Tasman Access database as follows:

Discrepancy	Estimated potential impact on submission
The field audit found that the database accuracy was not accurate within ±5.0%.	Over submission of 35,700 kWh per annum.
One item of load had a missing gear wattage. A 50W SON light (GIS access code 14656) was recorded with 50W total wattage, but should have had 61W including gear wattage.	Under submission of 47 kWh per annum.
Six lamp models had inaccurate total wattages recorded. This total also includes the 50W SON light described above.	Over submission of 111 kWh per annum.
The previous audit found four lamps in a new subdivision at Summerfield Boulevard that had 13W LED recorded in the database but were labelled as 28W LEDs (GIS access codes 15096, 15106, 15117 and 15121). These remain incorrect.	Under submission of 64 kWh per annum.

The Network Tasman Access database assigns a unique identifier per light. Each item of load has a "UML start date" and "UML end date". The "UML start date" relates to the installation date for the light. The "UML end date" defaults to 2099 and is updated to the date of removal when the light is replaced. This is updated on a daily basis in the Network Tasman ICP database. A snapshot is provided at the end of each month, and is used for submission by Genesis.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 12-Jun-23 To: 31-Jul-23	The field audit found that the database accuracy was not accurate within ±5.0%, which could result in estimated over submission of 35,700 kWh per annum. There is one missing gear wattage which could result in estimated under submission of 47 kWh per annum. Six lamp models had inaccurate total wattages recorded which could result in estimated over submission of 111 kWh per annum. This total also includes the 50W SON light described above. The previous audit found four lamps in a new subdivision at Summerfield Boulevard that had 13W LED recorded in the database but were labelled as 28W LEDs (GIS access codes 15096, 15106, 15117 and 15121). These remain incorrect and could result in estimated under submission of 64 kWh per annum. The database extract is provided as a snapshot, and daily changes are not reflected in the submission data. Potential impact: Medium Actual impact: Medium Audit history: Multiple times previously Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are recorded as weak because database accuracy is not within ±5.0%, indicating that changes may not be being accurately captured. The impact is assessed to be medium based on the potential kWh impact.

Actions taken to resolve the issue	Completion date	Remedial action status
Tasman District Council has taken their database management in-house and will work with Powertech to ensure all inconsistencies captured in this report are resolved.	15/10/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Tasman District Council will build a report to run routinely, this report will capture all blank fields and exceptions in the RAMM database. This will also be run against Network Tasman's database.	1/1/2024	

CONCLUSION

Network Tasman maintains an Access database containing the Tasman DC unmetered streetlights. An extract from this database is provided to Genesis monthly, and used to determine the wattage for their submission calculations. Genesis settles the DUML load as NHH using the CST profile, and on hours are determined from data logger information.

TDC maintains a RAMM database of roading assets. Streetlight information was added to RAMM at the beginning of 2023. TDC intends to investigate using RAMM for submission.

The audit considered the accuracy of the Network Tasman Access database because it is currently used for submission.

The audit found five non-compliances relating to database completeness and accuracy, and makes two recommendations for improvement. The future risk rating is 21, a decrease from 26 last audit because the submission accuracy issues have been cleared.

The audit risk rating indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' comments and the previous audit's recommended audit period, and recommend that the next audit is completed in 12 months.

Participant response

Tasman District Council has taken the data management in-house in order to better reconcile their assets in the field and therefore provide a more accurate representation for billing and market reconciliation purposes.

Tasman District Council will work with their contracted fieldworkers, Powertech, to remedy the identified inconsistencies in this report. Tasman District Council will also work to strengthen processes with Network Tasman, specifically regarding new connections.

Additional controls will be put in place to identify exceptions in the RAMM database and remedy these, Tasman District