

ELECTRICITY INDUSTRY PARTICIPATION CODE  
DISTRIBUTED UNMETERED LOAD AUDIT REPORT



For

TARARUA DISTRICT COUNCIL  
AND GENESIS ENERGY LIMITED  
NZBN: 9429037706609

Prepared by: Bernie Cross  
Date audit commenced: 19 September 2022  
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Audit report due date: 1 October 2022

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## EXECUTIVE SUMMARY

This audit of the **Tararua 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.

Streetlight load is determined by wattages held within TDC's RAMM database, which is managed by Tararua Alliance and TDC. New connection, fault, maintenance, and upgrade work is completed by Scanpower, CJ Contracting, Centralines and Powerco.

NZTA lights are recorded in the database and are maintained by TDC and included in the monthly trader report. However, the NZTA lights are also recorded in the NZTA Lower North Island database and were expected to be removed from the TDC database on 1 June 2021. The inclusion of the NZTA lighting in this database has led to over submission of 206,653 kWh per annum from June 1<sup>st</sup>, 2021.

Genesis reconciles the DUML using the CST profile. The on and off times are derived from data logger information. Wattages are derived from a database extract provided by TDC each month.

I recalculated the submissions for August 2022 for the four ICPs associated with the database using the data logger and database information and found the calculation for August 2022 to be different to the information provided by Tararua DC for ICP 1000554957PC423 by 46 kWh.

The field audit was undertaken of a statistical sample of 259 items of load on 19<sup>th</sup> September 2022 and confirmed that the database accuracy is not within the allowable +/-5% threshold. Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	102.9	Wattage from survey is higher than the database wattage by 2.9%
R <sub>L</sub>	96.7	With a 95% level of confidence, it can be concluded that the error could be between -3.3% and +14.2%
R <sub>H</sub>	114.2	

In absolute terms, total annual consumption is estimated to be 11,300 kWh higher than the DUML database indicates.

The audit found five non-compliances and makes two recommendations. The future risk rating of 30 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' comments, and that this database has now changed traders and recommend that the next audit be in three months.

The matters raised are detailed in the table 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	<p>Under submission of 46 kWh for August 2022 due to the incorrect calculation of volume for submission.</p> <p>Database assessed as having poor precision therefore the potential error is greater than 5.0% resulting in an estimated under submission of 11,300 kWh per annum.</p> <p>NZTA lighting is recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 206,653 kWh per annum.</p> <p>Three items of load that have either missing or blank lamp model, lamp wattage or, gear wattage resulting in an estimated under submission of 1,806 kWh per annum.</p> <p>29 items of load had gear wattages that did not match the expected values resulting an estimated under submission of 2,674 kWh per annum.</p> <p>Festive lighting in Woodville, Eketahuna and Dannevirke not recorded in the database.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p>	Weak	High	9	

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	Three items of load have either unknown or blank lamp model, lamp wattage or, gear wattage.	Moderate	Low	2	
All load recorded in database	2.5	11(2A) of Schedule 15.3	Three additional lights in the field of the 259 items of load sampled.	Strong	Low	1	
Database accuracy	3.1	15.2 and 15.37B(b)	<p>Database assessed as having poor precision therefore the potential error is greater than 5.0% resulting in an estimated under submission of 11,300 kWh per annum.</p> <p>NZTA lighting is recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 206,653 kWh per annum.</p> <p>Three items of load that have either missing or blank lamp model, lamp wattage or, gear wattage resulting in an estimated under submission of 1,806 kWh per annum.</p> <p>29 items of load had gear wattages that did not match the expected values resulting an estimated under submission of 2,674 kWh per annum.</p> <p>Festive lighting in Woodville, Eketahuna and Dannevirke not recorded in the database.</p>	Weak	High	9	
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>Under submission of 46 kWh for August 2022 due to the incorrect calculation of volume for submission.</p> <p>Database assessed as having poor precision therefore the potential</p>	Weak	High	9	

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			<p>error is greater than 5.0% resulting in an estimated under submission of 11,300 kWh per annum.</p> <p>NZTA lighting is recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 206,653 kWh per annum.</p> <p>Three items of load that have either missing or blank lamp model, lamp wattage or, gear wattage resulting in an estimated under submission of 1,806 kWh per annum.</p> <p>29 items of load had gear wattages that did not match the expected values resulting an estimated under submission of 2,674 kWh per annum.</p> <p>Festive lighting in Woodville, Eketahuna and Dannevirke not recorded in the database. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p>				
Future Risk Rating						30	

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

## RECOMMENDATIONS

Subject	Section	Recommendation
Database Accuracy	1.6	ICP 7012020000CH14D is invalidly treated as standard unmetered load. Either: <ol style="list-style-type: none"> <li>1. create a separate ICP for each point of connection, and then settle each ICP as standard unmetered load, or</li> <li>2. switch the ICP to GENE and settle the load as DUML.</li> </ol> Genesis to work with Meridian to resolve.
Database Accuracy	3.1	Investigate and determine if the festive lights in Eketahuna that are attached to the NZTA poles are in use, and if so when are they used.

## 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

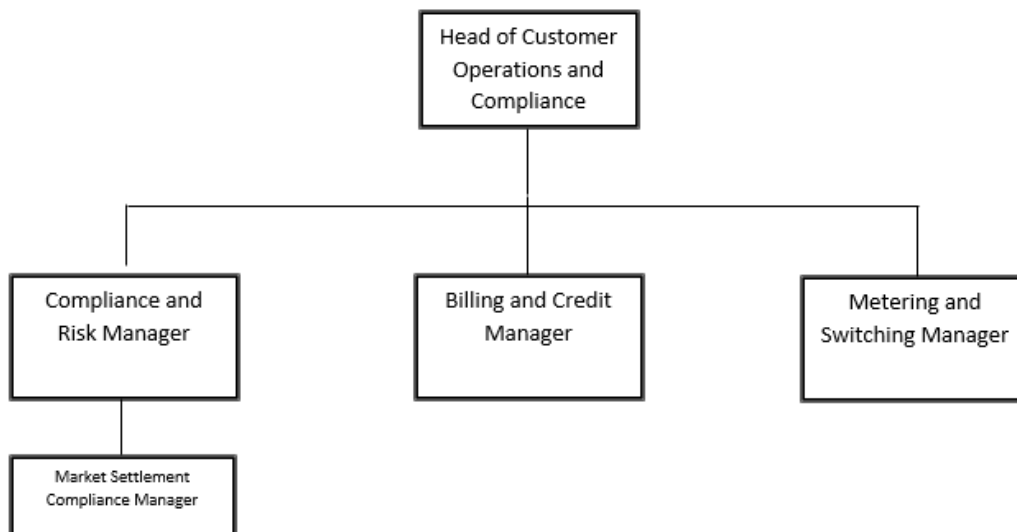
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

#### Audit commentary

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

### 1.2. Structure of Organisation

Genesis provided a copy of their organisational structure:





### 1.3. Persons involved in this audit

Auditor:

**Bernie Cross**

**Veritek Limited**

**Electricity Authority Approved Auditor**

Other personnel assisting in this audit were:

Name	Title	Company
Nirav Teli	DUML Data & Stakeholder Lead	Genesis Energy
Nicky Campbell	Asset Information Technician	Tararua Alliance

### 1.4. Hardware and Software

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 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)
0009100000CADDC	Dannevirke Street Lighting - Dannevirke Borough	DVK0111	CST	821	39,063
0009101000CAC7C	Street Lighting - Rural Streetlighting	DVK0111	CST	85	3,111
0009102000CAE9C	Street Lighting - Woodville Borough	WDV0111	CST	279	18,699
1000554957PC423	TDC Master stlight - cnr Mangamaire & Tutaekara Road	MGM0331	CST	472	29,385
<b>Total</b>				<b>1,657</b>	<b>90,258</b>

As reported in the previous audits, ICP 7012020000CH14D is also included in the database, but is outside the scope of the audit. The ICP is supplied by Meridian and is settled as standard unmetered load. Tararua Alliance confirmed that the six lights connected do not all have the same point of connection.

Light ID	Road	ICP Group	
1523	052-0063	7012020000CH14D	Betacom 27w led
2564	SEAVIEW RD	7012020000CH14D	40W LED
2565	SEAVIEW RD	7012020000CH14D	40W LED
2540	SEAVIEW RD	7012020000CH14D	40W LED
2541	SEAVIEW RD	7012020000CH14D	40W LED
2542	SEAVIEW RD	7012020000CH14D	40W LED

Only loads below the unmetered load threshold with a single point of connection may be settled as standard unmetered load. The recommendation from the last three audits is repeated. Separate ICPs should be created for each point of connection so it can continue to be treated as standard unmetered load, or the ICPs should be treated as DUMML. This was also raised in the Meridian Reconciliation Participant audit. Meridian is working with Genesis to get this resolved.

I repeat the previous recommendation.

Recommendation	Description	Audited party comment	Remedial action
Database Accuracy	<p>ICP 7012020000CH14D is invalidly treated as standard unmetered load. Either:</p> <ol style="list-style-type: none"> <li>create a separate ICP for each point of connection, and then settle each ICP as standard unmetered load, or</li> <li>switch the ICP to GENE and settle the load as DUMML.</li> </ol> <p>Genesis to work with Meridian to resolve.</p>	<p>Tararua DC have conducted a site visit and identified 1523, 2564 &amp; 2565 have Unknown connection point could be on daylight switch.</p> <p>2540, 2541 &amp; 2542 are Connected by relay</p> <p>As Tararua DC have switched away from Genesis we will have to leave it with the gaining retailer to action further</p>	Identified

**1.7. Authorisation Received**

All information was provided directly by Genesis or TDC.

## 1.8. Scope of Audit

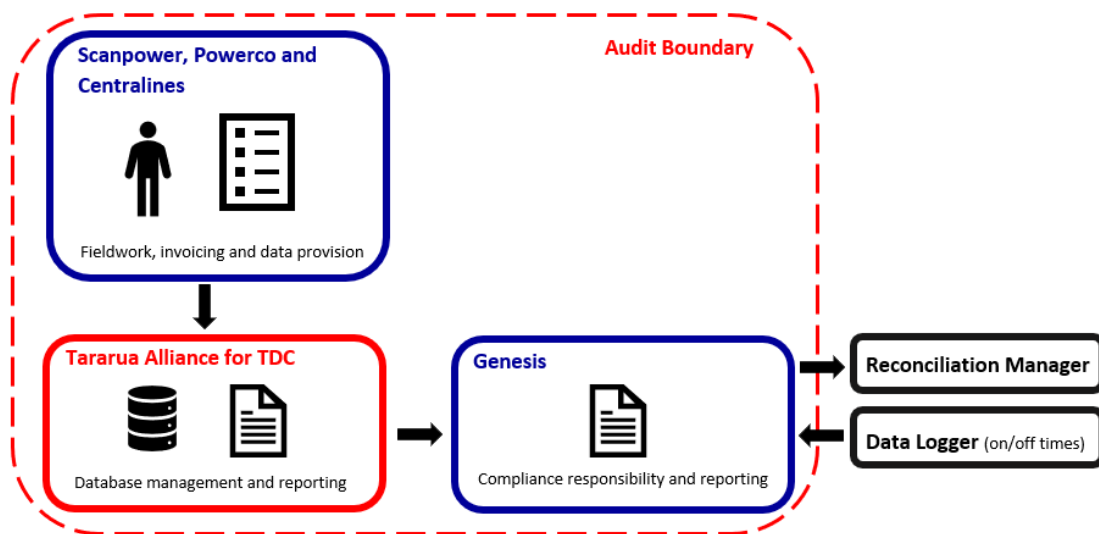
This audit of the TDC DUML database and processes was conducted at the request of Genesis in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

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

Streetlight load is determined by wattages held within TDC's RAMM database. New connection, fault, maintenance, and upgrade work is completed by Scanpower, Centralines and Powerco.

NZTA lights are recorded in the database and are maintained by TDC and included in the monthly trader report. However, the NZTA lights are also recorded in the NZTA Lower North Island database and were expected to be removed from the TDC database on 1 June 2021. During the NZTA Lower North Island audit, it was advised that all Councils had been notified that NZTA lighting needed to be removed on this date. The inclusion of the NZTA lighting in this database has led to over submission of 206,653 kWh per annum since June 1<sup>st</sup>, 2021.

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 259 items of load on 19<sup>th</sup> September 2022.

## 1.9. Summary of previous audit

The previous audit of this database was undertaken by Steve Woods of Veritek Limited in May 2022. The summary table below shows the statuses of the non-compliances and recommendations 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	<p>Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 300 kWh per annum.</p> <p>NZTA lighting is recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 176,367 kWh per annum.</p> <p>Four items of load that have either missing or blank lamp model, lamp wattage or, gear wattage resulting in an estimated under submission of 149 kWh per annum.</p> <p>44 items of load had gear wattages that did not match the expected values resulting an estimated under submission of 2,844 kWh per annum.</p> <p>Festive lighting in Woodville, Eketahuna and Dannevirke not recorded in the database.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p>	<p>Still existing</p> <p>Still existing</p> <p>Still existing for a smaller number of lights</p> <p>Still existing</p> <p>Still existing</p> <p>Still existing</p>
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	Four items of load have either unknown or blank lamp model, lamp wattage or, gear wattage.	Still existing for a smaller number of lights
All load recorded in database	2.5	11(2A) of Schedule 15.3	One additional light in the field of the 222 items of load sampled.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	<p>Database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 300 kWh per annum.</p> <p>NZTA lighting is recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 176,367 kWh per annum.</p> <p>Four items of load have either unknown or blank lamp model, lamp wattage or, gear wattage, resulting in an estimated under submission of 149 kWh p.a.</p>	<p>Still existing</p> <p>Still existing</p> <p>Still existing for a smaller number of lights</p>

Subject	Section	Clause	Non-compliance	Status
			44 items of load had gear wattages that did not match the expected values resulting in under an estimated under submission of 2,844 kWh p.a.	Still existing
			Festive lighting in Woodville, Dannevirke and Eketahuna are not recorded in the database.	Still existing

### **Table of Recommendations**

Subject	Section	Recommendation	Status
ICP data	1.6	Work with TDC to either create a separate ICP for each point of connection, or switch ICP to Gene and settle the load as DUML.	Still existing
All load recorded in the database	2.5	Check under the verandah lights in Pahiatua and add them to the database if they are unmetered.	Still existing, work in progress to clear.

### 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 Veritek to undertake this streetlight audit.

#### **Audit commentary**

This audit report confirms that the requirement to conduct an audit has been met for this database.

#### **Audit outcome**

Compliant

## 2. DUML DATABASE REQUIREMENTS

### 2.1. Deriving submission information (Clause 11(1) of Schedule 15.3)

#### Code reference

*Clause 11(1) of Schedule 15.3*

#### Code related audit information

*The retailer must ensure the:*

- *DUML database is up to date*
- *methodology for deriving submission information complies with Schedule 15.5.*

#### Audit observation

The process for calculation of consumption was examined and the application of profiles was checked. The database was checked for accuracy.

#### Audit commentary

Genesis reconciles the DUML using the CST profile. The on and off times are derived from data logger information. Wattages are derived from a database extract provided by TDC each month.

I recalculated the submissions for August 2022 for the four ICPs associated with the database using the data logger and database information and found the calculation for August 2022 to be different to the information provided by Tararua DC for ICP 1000554957PC423 by 46 kWh. Non-compliance is recorded below and in **section 3.2**.

The field audit against the database quantities found that the database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 11,300 kWh per annum. This is detailed in **section 3.1**.

There are three items of load that have either missing or blank lamp model, lamp wattage or, gear wattage resulting in an estimated under submission of 1,806 kWh per annum.

Lamp and gear wattages were compared to the expected values, and I found a further 29 items of load had gear wattages that did not match the expected values. The differences are expected to result in an estimated under submission of 2,674 kWh per annum.

As reported in the previous audit and detailed in **section 3.1**, there is festive lighting used in Woodville and Dannevirke. This is put up by the Community boards around Christmas, and TDC are not advised when the lights are put up, or for how long. Festive lighting was also identified in Eketahuna. The lighting is not recorded in the database. The failure to record these festive lights within the database is recorded as non-compliance.

NZTA lights are recorded in the database and are maintained by TDC and included in the monthly trader report. However, the NZTA lights are also recorded in the NZTA Lower North Island database and were expected to be removed from the TDC database on 1 June 2021. The inclusion of the NZTA lighting in this database has led to over submission of 206,653 kWh per annum from June 1<sup>st</sup>, 2021.

On 18 June 2019, the Electricity Authority issued a memo confirming that the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current monthly report is provided as a snapshot and this practice is non-compliant. When a wattage is changed in the database due to a physical change or a correction, only the record present at

the time the report is run is recorded, not the historical information showing dates of changes. Genesis is working to develop event-based calculations, which will enable accurate volume calculations where lamps change part way through a month.

**Audit outcome**

Non-compliant

Non-compliance	Description
<p>Audit Ref: 2.1            With: Clause 11(1) of Schedule 15.3</p> <p>From: 01-May-22            To: 31-Aug-22</p>	<p>Under submission of 46 kWh for August 2022 due to the incorrect calculation of volume for submission.</p> <p>Database assessed as having poor precision therefore the potential error is greater than 5.0% resulting in an estimated under submission of 11,300 kWh per annum.</p> <p>NZTA lighting is recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 206,653 kWh per annum.</p> <p>Three items of load that have either missing or blank lamp model, lamp wattage or, gear wattage resulting in an estimated under submission of 1,806 kWh per annum.</p> <p>29 items of load had gear wattages that did not match the expected values resulting an estimated under submission of 2,674 kWh per annum.</p> <p>Festive lighting in Woodville, Eketahuna and Dannevirke not recorded in the database.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p> <p>Potential impact: High            Actual impact: High</p> <p>Audit history: Multiple times</p> <p>Controls: Weak</p> <p>Breach risk rating: 9</p>
Audit risk rating	Rationale for audit risk rating
<p><b>High</b></p>	<p>The controls are rated as weak and are unlikely to mitigate risk and remove errors.</p> <p>The impact is assessed to be high based on the effect on submission due to NZTA lights, and over submission kWh volume.</p>

Actions taken to resolve the issue	Completion date	Remedial action status
<p>Tararua DC will discuss with NZTA and remove NZTA assets from their dataset and advise Genesis once completed, Genesis will then revise submissions based on the new dataset and confirmation of effective date by Tararua DC.</p> <p>Genesis has reviewed the auditors finding and have advised Tararua DC of the discrepancy with the intent that Tararua DC makes every effort to ensure the exceptions are rectified.</p>	01/01/2023	Investigating
Preventative actions taken to ensure no further issues will occur	Completion date	
<p>Tararua DC has been notified of the asset discrepancies. Genesis relies on Tararua DC to accurately maintain its database.</p>	01/01/2023	

## 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 DUMML database must contain:*

- *each ICP identifier for which the retailer is responsible for the DUMML*
- *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

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 DUMML database must contain the location of each DUMML item.*

### Audit observation

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

### Audit commentary

The database contains fields for the road name, location number, side, and GPS coordinates.



All items of load are locatable. 1,613 (97.34%) of the 1,657 items of load have GPS coordinates.

#### 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 DUMML 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

The database contains fields to record the lamp and gear model, lamp and gear wattage and total wattage. Analysis of the database found a small number of errors.

The following three items of load had either missing or blank lamp models, lamp wattage or gear wattage; the issue was also reported in the previous audit, however the population of this list has changed:

Light ID	Road	Lamp Model	Lamp Wattage	Gear wattage	Expected gear/lamp wattage
2715	EDWARD ST	Blank	Blank	0	27 (L27 LED)
2765	STANLEY ST (SH2) (D)	Unknown	0	0	168 (150W HPS)
2776	TOWN HALL CARPARK	Unknown	0	0	168 (150W MH) + 60 (60W LED)

The accuracy of lamp descriptions, wattage and ballast 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-May-22 To: 31-Aug-22	Three items of load that have either missing or blank lamp model, lamp wattage or, gear wattage resulting in an estimated under submission of 1,806 kWh per annum.  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		
<b>Low</b>	The controls are rated as moderate as controls will mitigate risk most of the time, but there is room for improvement.  The impact on settlement and participants is minor; therefore, the audit risk rating is low.		
Actions taken to resolve the issue		Completion date	Remedial action status
Tararua DC have advised that the above lights identified at Stanley Street might be for NZTA. Tararua DC is going to organize a site visit to confirm the same.  Genesis has reviewed the auditors finding and have advised Tararua DC of the discrepancy with the intent that Tararua DC makes every effort to ensure the exceptions are rectified.		01/01/2023	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Tararua DC has been notified of the asset discrepancies. Genesis relies on Tararua DC to accurately maintain its database.		01/01/2023	

## 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 259 items of load on 19<sup>th</sup> September 2022. The sample was selected from three strata, as follows:

- Dannevirke,
- Woodville, and
- Pahiatua.

### Audit commentary

The field audit discrepancies are detailed in the table below:

Street	Database count	Field count	Light count difference	Wattage recorded incorrectly	Comments
ALLARDICE ST	19	19		1	1 x 150W HPS recorded in the database but 1 x 23W LED located in the field.
BRIDGE ST	11	10	-1		1 x 27W LED recorded in the database but not located in the field.
CADMAN	8	8	0	2	2 X GL600 250W recorded in database but 100W incandescent belusha beacons on same poles not in database.
CHRISTIAN ST	14	14	0	2	1 x 23W LED recorded in the database but L27 located from GPS. 1 x 27W LED recorded in the database but L23 located from GPS.
HERBERT STREET	5	5	0	1	1 x 27W LED recorded in the database but 1 x 23W LED located in the field.
KING STREET (D)	9	10	+1	1	1 x 27W LED located in the field but not recorded in the database. 1 x 23W LED recorded in the database but 1 x 27W LED located in the field.
MATHEW STREET	4	4	0	1	1 x 23W LED recorded in the database but L27 located from GPS.
SEPTIMUS STREET	4	4		4	4 x 27W LED recorded in the database but 4 x 22W LED located in the field.
STATION ST (D)	3	5	+2		2 X GL500 PED located in the field but no recorded in the database.
WOODLANDS ROAD	1	1		1	1 x 27W LED recorded in the database but GL600 150 HPS (S150C) located in the field.
<b>Grand Total</b>			<b>4 (+3, -1)</b>	<b>12</b>	

The audit found three additional lights in the field of the 259 items of load sampled. This is recorded a non-compliance.

As reported in the previous audits, Tararua Alliance believed some under verandah lights in Pahiatua were unmetered but not recorded in the database, and a recommendation was raised to check the lights and update the database as necessary. Work is currently underway to confirm if the Under Verandah lights are required by each shop, and if they are not required, they will be disconnected. If lights are required, they will be replaced by new Under Verandah lights to be installed and recorded in the database.

The accuracy of the database is discussed in **section 3.1**.

#### **Audit outcome**

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3  From: 01-May-22 To: 31-Aug-22	Three additional lights in the field of the 259 items of load sampled.  Potential impact: Low  Actual impact: Low  Audit history: None  Controls: Strong  Breach risk rating: 1		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	The controls are rated as strong 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.		
Actions taken to resolve the issue		Completion date	Remedial action status
Tararua DC have advised a site visit will be done for the above lights identified at King Street.  Genesis has reviewed the auditors finding and have advised Tararua DC of the discrepancy with the intent that Tararua DC makes every effort to ensure the exceptions are rectified.		01/01/2023	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Tararua DC has been notified of the asset discrepancies. Genesis relies on Tararua DC to accurately maintain its database.		01/01/2023	

## 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 DUMML 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

A database extract was provided, and I assessed the accuracy of this by using the DUML Statistical Sampling Guideline. The table below shows the survey plan.

Plan Item	Comments
Area of interest	Tararua District Council streetlights
Strata	The database contains the TDC items of load for DUML ICPs in the Tararua region. The processes for the management of all TDC items of load are the same, but I decided to place the items of load into three strata: <ul style="list-style-type: none"> <li>• Dannevirke,</li> <li>• Paihiatua, and</li> <li>• Woodville.</li> </ul>
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 44 sub-units.
Total items of load	259 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 259 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	102.9	Wattage from survey is higher than the database wattage by 2.9%
R <sub>L</sub>	96.7	With a 95% level of confidence, it can be concluded that the error could be between -3.3% and +14.2%
R <sub>H</sub>	114.2	

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 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 3.3% lower and 14.2% 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 3 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 11,300 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 12,600 kWh lower p.a. to 54,700 kWh p.a. higher than the database indicates.

Scenario	Description
<p><b>A - Good accuracy, good precision</b></p>	<p>This scenario applies if:</p> <ul style="list-style-type: none"> <li>(a) <math>R_H</math> is less than 1.05; and</li> <li>(b) <math>R_L</math> is greater than 0.95</li> </ul> <p>The conclusion from this scenario is that:</p> <ul style="list-style-type: none"> <li>(a) the best available estimate indicates that the database is accurate within +/- 5 %; and</li> <li>(b) this is the best outcome.</li> </ul>
<p><b>B - Poor accuracy, demonstrated with statistical significance</b></p>	<p>This scenario applies if:</p> <ul style="list-style-type: none"> <li>(a) the point estimate of R is less than 0.95 or greater than 1.05</li> <li>(b) as a result, either <math>R_L</math> is less than 0.95 or <math>R_H</math> is greater than 1.05.</li> </ul> <p>There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level</p>
<p><b>C - Poor precision</b></p>	<p>This scenario applies if:</p> <ul style="list-style-type: none"> <li>(a) the point estimate of R is between 0.95 and 1.05</li> <li>(b) <math>R_L</math> is less than 0.95 and/or <math>R_H</math> is greater than 1.05</li> </ul> <p>The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 %</p>

**Light description and capacity accuracy**

As discussed in **section 2.4**, three items of load have either unknown or blank lamp model, lamp wattage or, gear wattage resulting in an estimated under submission of 1,806 kWh per annum based on 4,271 burn hours p.a.

Lamp and gear wattages were compared to the expected values, and I found 1 item of load had gear wattages that did not match the expected values, the light description and gear wattage was also incorrect for 28 lamps. The differences are expected to result in under an estimated under submission of 2,674 kWh p.a. based on 4,271 burn hours p.a.

Model	Expected Ballast kW	Database Ballast kW	Database quantity	Variance kW
250 HPS Vapour	28	18	1	10
135W HPS Vapour	36	13	24	552
90W HPS Vapour	30	14	4	64
Total			29	626

### Change management process finding

New connection, fault, maintenance, and upgrade work is completed by Scanpower, Centralines and Powerco. For maintenance work a CRM is received from the council, it is assigned to the supervisor at TA who allocates the work to appropriate contractor, field work is completed, and the 'as built' form is returned to the assets team to update in RAMM manually. There are only a small number of jobs annually. There have not been any new subdivisions in the area in recent years.

The RAMM database records an installation date. The date of installation recorded on the 'as built' form is used as the liven date.

NZTA lights are recorded in the database and are maintained by TDC and included in the monthly trader report. However, the NZTA lights are also recorded in the NZTA Lower North Island database and were expected to be removed from the TDC database on 1 June 2021. The inclusion of the NZTA lighting in this database has led to over submission of 206,653 kWh per annum from June 1<sup>st</sup>, 2021. This is recorded as non-compliance.

Outage patrols are not completed, any issues are identified reactively through the TDC or Scanpower, and there is not a lot of activity in this area. The majority of lights are now LED, with the sodium lights remaining in the database belonging to NZTA.

### Festive lights

Festive lighting is used in Woodville and Dannevirke. This is put up by the Community boards around Christmas, and TDC are not advised when the lights are put up, or for how long. There are festive lights in Eketahuna that are on the NZTA poles, these are to be investigated to determine if they are in use and when they are in use. The lighting is not recorded in the database. The failure to record these festive lights within the database is recorded as non-compliance.

### Private lights

Tararua Alliance is not aware of any private unmetered lights.

Recommendation	Description	Audited party comment	Remedial Action
Database Accuracy	Investigate and determine if the festive lights in Eketahuna that are attached to the NZTA poles are in use, and if so when are they used.	Genesis has reviewed the auditors finding and have advised Tararua DC of the discrepancy with the intent that Tararua DC makes every effort to ensure the exceptions are rectified.	Investigating

### Audit outcome

Non-compliant



Non-compliance	Description	
<p>Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b)</p> <p>From: 01-May-22 To: 31-Aug-22</p>	<p>Database assessed as having poor precision therefore the potential error is greater than 5.0% resulting in an estimated under submission of 11,300 kWh per annum.</p> <p>NZTA lighting is recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 206,653 kWh per annum.</p> <p>Four items of load have either unknown or blank lamp model, lamp wattage or, gear wattage, resulting in an estimated under submission of 1,806 kWh p.a.</p> <p>29 items of load had gear wattages that did not match the expected values resulting in under an estimated under submission of 2,674 kWh p.a.</p> <p>Festive lighting in Woodville, Dannevirke and Eketahuna are not recorded in the database.</p> <p>Potential impact: High Actual impact: High Audit history: Multiple times Controls: Weak Breach risk rating: 9</p>	
Audit risk rating	Rationale for audit risk rating	
<p><b>High</b></p>	<p>The controls are rated as weak and are unlikely to mitigate risk and remove errors.</p> <p>The impact is assessed to be high based on the effect on submission due to NZTA lights, and over submission kWh volume.</p>	
Actions taken to resolve the issue	Completion date	Remedial action status
<p>Tararua DC will discuss with NZTA and remove NZTA assets from their dataset and advise Genesis once completed, Genesis will then revise submissions based on the new dataset and confirmation of effective date by Tararua DC.</p> <p>Genesis has reviewed the auditors finding and have advised Tararua DC of the discrepancy with the intent that Tararua DC makes every effort to ensure the exceptions are rectified.</p>	<p>01/01/2023</p>	<p>Investigating</p>
Preventative actions taken to ensure no further issues will occur	Completion date	
<p>Tararua DC has been notified of the asset discrepancies. Genesis relies on Tararua DC to accurately maintain its database.</p>	<p>01/02/2023</p>	

### 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 reconciles the DUML using the CST profile. The on and off times are derived from data logger information. Wattages are derived from a database extract provided by TDC each month.

I recalculated the submissions for August 2022 for the four ICPs associated with the database using the data logger and database information and found the calculation for August 2022 to be different to the information provided by Tararua DC for ICP 1000554957PC423 by 46 kWh. Non-compliance is recorded below and in **section 2.1**.

The field audit against the database quantities found that the database is not confirmed as accurate with a 95% level of confidence resulting in an estimated under submission of 11,300 kWh per annum. This is detailed in **section 3.1**.

There are three items of load that have either missing or blank lamp model, lamp wattage or, gear wattage resulting in an estimated under submission of 1,806 kWh per annum.

Lamp and gear wattages were compared to the expected values, and I found a further 29 items of load had gear wattages that did not match the expected values. The differences are expected to result in an estimated under submission of 2,674 kWh per annum.

As reported in previous audits and detailed in **section 3.1**, there is festive lighting used in Woodville and Dannevirke. This is put up by the Community boards around Christmas, and TDC are not advised when the lights are put up, or for how long. Festive lighting was also identified in Eketahuna. The lighting is not recorded in the database. The failure to record these festive lights within the database is recorded as non-compliance.

NZTA lights are recorded in the database and are maintained by TDC and included in the monthly trader report. However, the NZTA lights are also recorded in the NZTA Lower North Island database and were expected to be removed from the TDC database on 1 June 2021. During the NZTA Lower North Island audit, it was advised that all Councils had been notified that NZTA lighting needed to be removed on this date. The inclusion of the NZTA lighting in this database has led to over submission of 206,653 kWh per annum from June 1<sup>st</sup>, 2021. This is recorded as non-compliance.

On 18 June 2019, the Electricity Authority issued a memo confirming that the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current monthly report is provided as a snapshot and this practice is non-compliant. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes. Genesis is working to develop event-based calculations, which will enable accurate volume calculations where lamps change part way through a month.

### Audit outcome

Non-compliant

Non-compliance	Description	
<p>Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c)</p> <p>From: 01-May-22 To: 31-Aug-22</p>	<p>Under submission of 46 kWh for August 2022 due to the incorrect calculation of volume for submission.</p> <p>Database assessed as having poor precision therefore the potential error is greater than 5.0% resulting in an estimated under submission of 11,300 kWh per annum.</p> <p>NZTA lighting is recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 206,653 kWh per annum.</p> <p>Three items of load that have either missing or blank lamp model, lamp wattage or, gear wattage resulting in an estimated under submission of 1,806 kWh per annum.</p> <p>29 items of load had gear wattages that did not match the expected values resulting an estimated under submission of 2,674 kWh per annum.</p> <p>Festive lighting in Woodville, Eketahuna and Dannevirke not recorded in the database.</p> <p>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.</p> <p>Potential impact: High Actual impact: High Audit history: Multiple times Controls: Weak Breach risk rating: 9</p>	
Audit risk rating	Rationale for audit risk rating	
High	<p>The controls are rated as weak and are unlikely to mitigate risk and remove errors.</p> <p>The impact is assessed to be high based on the effect on submission due to NZTA lights, and over submission kWh volume.</p>	
Actions taken to resolve the issue	Completion date	Remedial action status
<p>Tararua DC will discuss with NZTA and remove NZTA assets from their dataset and advise Genesis once completed, Genesis will then revise submissions based on the new dataset and confirmation of effective date by Tararua DC.</p> <p>Genesis has reviewed the auditors finding and have advised Tararua DC of the discrepancy with the intent that Tararua DC makes every effort to ensure the exceptions are rectified</p>	01/02/2023	Investigating
Preventative actions taken to ensure no further issues will occur	Completion date	
Tararua DC has been notified of the asset discrepancies. Genesis relies on Tararua DC to accurately maintain its database.	01/02/2023	

## CONCLUSION

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

Streetlight load is determined by wattages held within TDC's RAMM database, which is managed by Tararua Alliance and TDC. New connection, fault, maintenance, and upgrade work is completed by Scanpower, Centralines and Powerco.

Genesis reconciles the DUML using the CST profile. The on and off times are derived from data logger information. Wattages are derived from a database extract provided by TDC each month.

NZTA lights are recorded in the database and are maintained by TDC and included in the monthly trader report. However, the NZTA lights are also recorded in the NZTA Lower North Island database and were expected to be removed from the TDC database on 1 June 2021. The inclusion of the NZTA lighting in this database has led to over submission of 206,653 kWh per annum from June 1<sup>st</sup>, 2021.

The field audit was undertaken of a statistical sample of 259 items of load on 19<sup>th</sup> September 2022 and confirmed that the database accuracy is not within the allowable +/-5% threshold. Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	102.9	Wattage from survey is higher than the database wattage by 2.9%
R <sub>L</sub>	96.7	With a 95% level of confidence, it can be concluded that the error could be between -3.3% and +14.2%
R <sub>H</sub>	114.2	

In absolute terms, total annual consumption is estimated to be 11,300 kWh higher than the DUML database indicates.

The audit found five non-compliances and makes two recommendations. The future risk rating of 30 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' comments, and that this database has now changed traders and recommend that the next audit be in three months.

## PARTICIPANT RESPONSE