

ELECTRICITY INDUSTRY PARTICIPATION CODE  
DISTRIBUTED UNMETERED LOAD AUDIT REPORT



For

HAMILTON CITY COUNCIL AND  
GENESIS ENERGY  
NZBN:9429037706609

Prepared by: Rebecca Elliot

Date audit commenced: 7 November 2023

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Audit report due date: 01-Feb-24

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## EXECUTIVE SUMMARY

This audit of the **Hamilton City Council Unmetered Streetlights (HCC)** 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.

The database is remotely hosted by thinkproject Ltd and is managed by Connect Hamilton (this has replaced Infrastructure Alliance), on behalf of HCC, HCC being Genesis's customer. Connect Hamilton operates under a new contract and is still a joint venture between HCC and Downer which provides infrastructure management across all of HCC assets. They provide reporting to Genesis monthly.

The field audit conducted of 534 items of load found that the database did not fall within the accuracy threshold of +/-5% resulting in an estimated over submission of 186,700 kWh per annum. This is largely due to new streetlights not being recorded accurately and I recommend that this process is reviewed.

The monthly wattage report is not derived by the ICP. This is resulting in some lights being missed from submission. I have recommended that ICP assignment is corrected, and ICP based reporting is used to derive the monthly wattage report.

I reviewed the private lights excluded from submission against those that have been passed to WEL Networks to create standard or shared unmetered load. This identified some discrepancies between the two data sets, and I have recommended that Genesis liaise with HCC and WEL Networks to get these resolved.

The issue raised in the last few audits with the Christmas lights being included for the whole year rather than just the period they are burning for has been resolved and HCC now add these lights for the period they are burning with the correct wattage.

The audit found five non-compliance issues and makes six recommendations. The future risk rating of 21 indicates that the next audit be completed in three months. I have considered this in conjunction with the response from Genesis and recommend that the next audit is in nine months. This should allow sufficient time to address the issues raised in this audit.

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	<p>Exclusion of 112 items of load with the HCC DUML ICPs allocated is resulting in an estimated under submission of 36,500 kWh per annum.</p> <p>In absolute terms, total annual consumption is estimated to be 186,700 kWh lower than the DUML database indicates.</p> <p>Analysis of the gear wattage applied indicates an estimated under submission of 1,429 kWh per annum.</p> <p>Submission is based on a snapshot of the database at the end of the month and does not consider historic adjustments or the fact that lights can be livened before they are entered into the database.</p>	Moderate	High	6	Investigating
Description and capacity of load	2.4	11(2)(d) of Schedule 15.3	13,391 items of load with no gear wattage recorded.	Strong	Low	1	Identified
All load recorded in the database	2.5	11(2A) of Schedule 15.3	Eight items of load missing from the database.	Moderate	Low	2	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Database accuracy	3.1	15.2 and 15.37B(b)	<p>In absolute terms, total annual consumption is estimated to be 186,700 kWh lower than the DUML database indicates.</p> <p>Analysis of the gear wattage applied indicates an estimated under submission of 1,429 kWh per annum.</p> <p>Exclusion of 112 items of load with the HCC DUML ICPs allocated is resulting in an estimated under submission of 36,500 kWh per annum.</p>	Moderate	High	6	Investigating
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>Exclusion of 112 items of load with the HCC DUML ICPs allocated is resulting in an estimated under submission of 36,500 kWh per annum.</p> <p>In absolute terms, total annual consumption is estimated to be 186,700 kWh lower than the DUML database indicates.</p> <p>Analysis of the gear wattage applied indicates an estimated under submission of 1,429 kWh per annum.</p> <p>Submission is based on a snapshot of the database at the end of the month and does not consider historic adjustments or the fact that lights can be livened before they are entered into the database.</p>	Moderate	High	6	Investigating
Future Risk Rating						21	

<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	Description
ICP assignment	2.1	Recommend that the correct ICPs be assigned to all items of load, and this is used to derive the monthly wattage report.
Gear wattage	2.4	Populate the blank gear wattages with zero.
Lamp descriptions and wattages	3.1	Review the audit findings and add sufficient details to confirm the correct wattage has been applied.
Private lights		Liaise with HCC and WEL Networks to resolve all the private lights that are not being reconciled.
Vesting of streetlights		Review the vesting process to ensure that what is added to the database is as accurate and timely as possible.
Livening of streetlights		Liaise with HCC, the livening agents and WEL Networks to ensure that new streetlights are being reconciled from the time of electrical connection if Genesis have accepted responsibility for them.

## 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

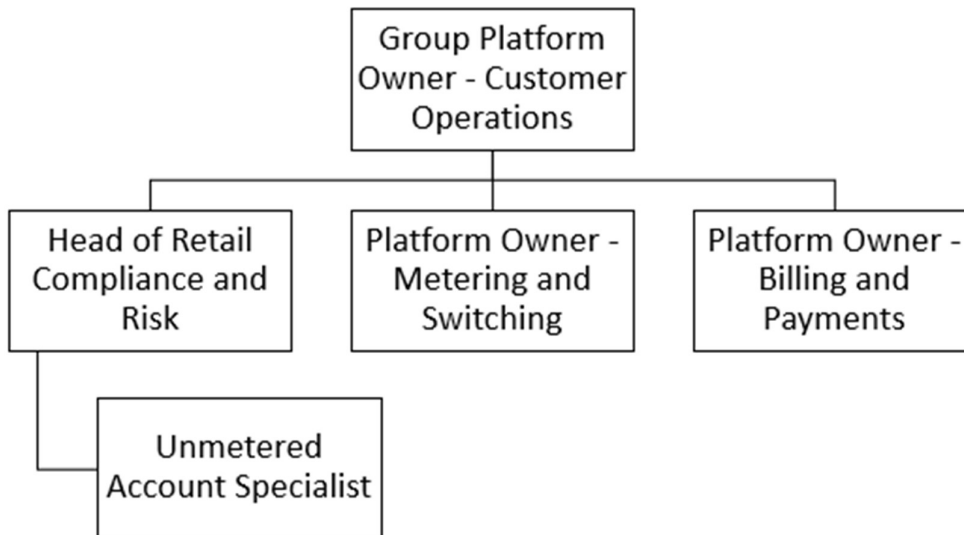
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

#### Audit commentary

Genesis confirms that there are no exemptions in place relevant to the scope of this audit.

### 1.2. Structure of Organisation

Genesis provided the relevant organisational structure:



### 1.3. Persons involved in this audit

Auditor:

**Rebecca Elliot**

**Veritek Limited**

**Electricity Authority Approved Auditor**

Other personnel assisting in this audit were:

Name	Title	Company
Alysha Majury	Unmetered Account Specialist	Genesis Energy
Gerald Wen	Asset Information Manager	Connect Hamilton
Rhys Duncan	Asset Information Technician	Connect Hamilton

### 1.4. Hardware and Software

**Section 1.8** records that the Rooding Asset and Maintenance Management database, commonly known as RAMM continues to be used the management of DUML. This is remotely hosted by thinkproject Ltd. The specific module used for DUML is called "SLIMM" which stands for "Streetlighting Inventory Maintenance Management".

Connect Hamilton confirmed that the database back-up is in accordance with standard industry procedures. Access to the database is secure by way of password protection.

Systems used by the trader and their agent to calculate submissions are assessed as part of their reconciliation participant audits.

### 1.5. Breaches or Breach Allegations

There are no breach allegations relevant to the scope of this audit.

### 1.6. ICP Data

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0000011087WE366	HCC Streetlights, Hamilton	HAM0331	DST	18,924	1,252,902
0000025004WED40	HCC Under Veranda Streetlights, Hamilton	HAM0331	DST	1,280	92,550
TOTAL				20,204	1,345,453



### 1.7. Authorisation Received

All information was provided directly by Genesis or Connect Hamilton.

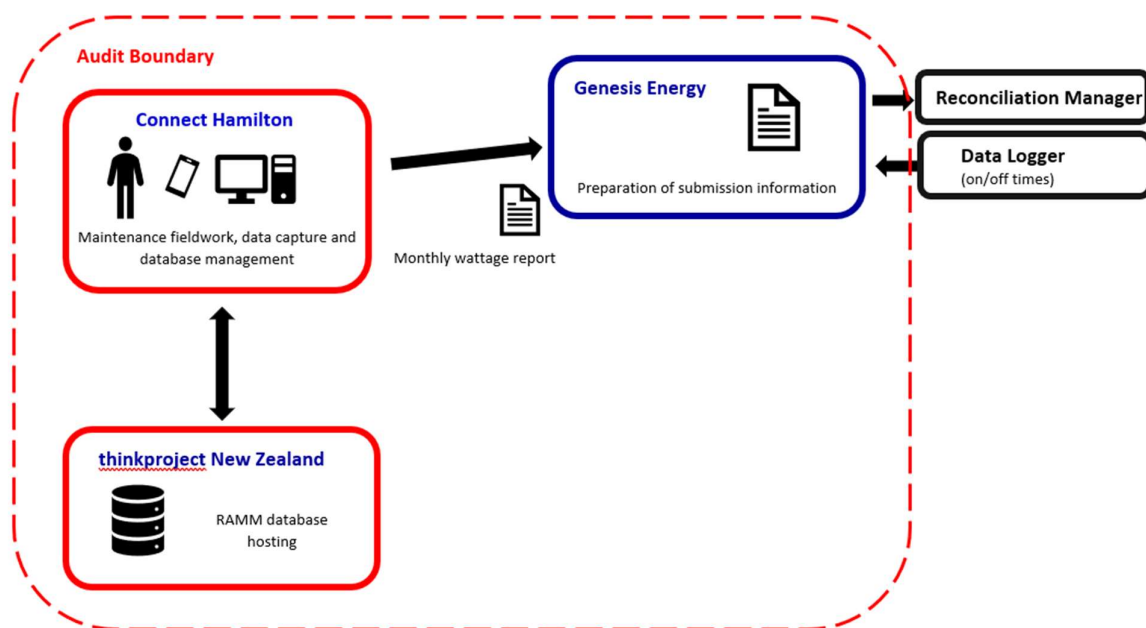
### 1.8. Scope of Audit

This audit of the **Hamilton City Council Unmetered Streetlights (HCC)** 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.

The database is remotely hosted by thinkproject Ltd and is managed by Connect Hamilton (this has replaced Infrastructure Alliance), on behalf of HCC, HCC being Genesis’s customer. Connect Hamilton operates under a new contract and is still a joint venture between HCC and Downer which provides infrastructure management across all of HCC assets. They provide reporting to Genesis monthly.

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 the current arrangements for clarity.



The field audit was undertaken of a statistical sample of 534 items of load on 7 and 8 December 2023.

## 1.9. Summary of previous audit

The previous audit was undertaken by Steve Woods of Veritek Limited in July 2022. The findings from the previous audit are detailed below with the current status of the items raised:

### Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	<p>Christmas light volumes included for the whole year and not the electrically connected period.</p> <p>Analysis of the ballasts applied indicates a minor under submission of 3,846 kWh per annum.</p> <p>Analysis of the database found 72 lights with a light description that could not be verified, or the incorrect wattage applied according to the light specifications. This will be resulting in an estimated over submission of an estimated 700 kWh per annum.</p> <p>Submission is based on a snapshot of the database at the end of the month and does not consider historic adjustments or the fact that lights can be lived before they are entered into the database.</p>	<p>Cleared</p> <p>Still existing for a smaller number of lights</p> <p>Cleared</p> <p>Still existing</p>
All load recorded in the database	2.5	11(2A) of Schedule 15.3	One item of load missing from the database.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	<p>Analysis of the ballasts applied indicates an estimated under submission of 3,846 kWh per annum.</p> <p>Analysis of the database found 72 lights with a light description that could not be verified, or the incorrect wattage applied according to the light specifications. This will be resulting in an estimated under submission of an estimated 700 kWh per annum.</p> <p>Christmas light volumes included for the whole year and not the electrically connected period.</p>	<p>Still existing for a smaller number of lights</p> <p>Cleared</p> <p>Cleared</p>

Subject	Section	Clause	Non-compliance	Status
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>Christmas light volumes included for the whole year and not the electrically connected period.</p> <p>Analysis of the ballasts applied indicates a minor under submission of 3,846 kWh per annum.</p> <p>Analysis of the database found 72 lights with a light description that could not be verified, or the incorrect wattage applied according to the light specifications. This will be resulting in an estimated over submission of an estimated 700 kWh per annum.</p> <p>Submission is based on a snapshot of the database at the end of the month and does not consider historic adjustments or the fact that lights can be livened before they are entered into the database.</p>	<p>Cleared</p> <p>Still existing for a smaller number of lights</p> <p>Cleared</p> <p>Still existing</p>

## Table of Recommendations

Subject	Section	Description	Status
Tracking of load change	2.6	Review electrical connection process with WEL Networks end to end to ensure that new streetlights are being reconciled from the time of electrical connection if they have already been vested to HCC at this point.	Repeated with some modification to the recommendation

### 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 within the required timeframe.

#### Audit outcome

Compliant

## 2. DUML DATABASE REQUIREMENTS

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

#### Code reference

Clause 11(1) of Schedule 15.3

#### Code related audit information

The retailer must ensure the:

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

#### Audit observation

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

#### Audit commentary

Genesis reconciles this DUML load using the NST profile. The total volume submitted to the Reconciliation Manager is based on a monthly database report derived from RAMM and the “burn time” which will be sourced from data loggers.

I reviewed the submission information for November 2023 and found the calculation didn’t match the wattage report provided. This is because the monthly wattage report is derived by light owner not ICP. As detailed in **section 3.1**, only lights where the light owner is recorded as “Local Authority or Local Authority – Metered light” are included for submission. The Waka Kotahi, parks and garden lights, private, still to be capitalised (CTU) and unknown owned lights are excluded even though these are recorded against the HCC DUML ICPs. These were examined and found:

Light Owner	Items of load	kW value	Comments
Waka Kotahi	530	90.08	These are being reconciled as part of the Waka Kotahi database so there is no impact on submission accuracy but the HCC DUML ICPs should be removed and recorded as NZTA as this is for reference only.
Private	35	3.12	These have been reviewed and found 18 have been created as standard or shared unmetered load by WEL Networks. The remaining 13 lights have been passed back to HCC as WEL Networks do not believe these to be private. I have reviewed all the lights and provided all parties my findings and I recommend in <b>section 3.1</b> , that Genesis, HCC and WEL Networks work together to resolve these.
Parks and Gardens	24	1.56	These are expected to be reconciled to ICP 0076363539WE02F but have the incorrect ICP assigned and are not being reconciled. These items of load have been passed to that trader to investigate.
Still to be capitalised (CTU)	104	8.35	These are being added from December 2023.
Unknown light owner	8	0.20	These are being investigated by HCC to determine which ICP they should be allocated to.

I recommend that the correct ICPs or other identifier if not being reconciled in this database be assigned to all items of load, and this is used to derive the monthly wattage report.

Recommendation	Description	Audited party comment	Remedial action
ICP assignment	Recommend that the correct ICPs be assigned to all items of load, and this is used to derive the monthly wattage report.	We will continue to work with HCC to ensure accuracy of data	Investigating

As detailed in **section 3.1**, the issue raised in the last few audits with the Christmas lights being included for the whole year rather than just the period they are burning for has been resolved and HCC now add these lights for the period they are burning with the correct wattage.

The field audit found that the database accuracy did not fall within the +/-5% threshold resulting in an estimated over submission of 186,700 kWh per annum.

The analysis of gear wattage found a small number of lights with the incorrect gear wattage applied, resulting in a minor under submission of 1,429 kWh per annum.

Submission continues to be based on a snapshot of the database at the end of the month and does not consider historic adjustments. Genesis is working with HCC to provide reporting detailing changes made at a daily level so this should be resolved by the next audit.

**Audit outcome**

Non-compliant

Non-compliance	Description	
<p>Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3</p> <p>From: 29-Jul-22 To: 30-Nov-23</p>	<p>Exclusion of 112 items of load with the HCC DUML ICPs allocated is resulting in an estimated under submission of 36,500 kWh per annum.</p> <p>In absolute terms, total annual consumption is estimated to be 186,700 kWh lower than the DUML database indicates.</p> <p>Analysis of the gear wattage applied indicates an estimated under submission of 1,429 kWh per annum.</p> <p>Submission is based on a snapshot of the database at the end of the month and does not consider historic adjustments or the fact that lights can be lived before they are entered into the database.</p> <p>Potential impact: High Actual impact: High Audit history: Multiple times Controls: Moderate Breach risk rating: 6</p>	
Audit risk rating	Rationale for audit risk rating	
<p><b>High</b></p>	<p>The controls are rated as moderate, as the maintenance process is robust but there is room for improvement for the adding of new streetlights and the production of the monthly wattage report.</p> <p>The impact is assessed to be high due to the potential over submission indicated from the field audit findings.</p>	
Actions taken to resolve the issue	Completion date	Remedial action status
<p>Genesis will continue to work with HCC to ensure accuracy of data. Genesis will endeavour to set up a tracking of change process with HCC. Genesis will work with the Network company and HCC to ensure a robust new connection process is in place</p>	<p>01/08/2024</p>	<p>Investigating</p>
Preventative actions taken to ensure no further issues will occur	Completion date	
<p>Genesis will continue to work with HCC to ensure accuracy of data. Genesis will endeavour to set up a tracking of change process with HCC. Genesis will work with the Network company and HCC to ensure a robust new connection process is in place</p>	<p>01/08/2024</p>	

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

### Code reference

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

### Code related audit information

*The DUML database must contain:*

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

### Audit observation

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

### Audit commentary

Analysis of the database found 42 items with no ICP recorded. 41 of these are solar powered lights and one is owned by Waka Kotahi. These are not part of the distributed unmetered load. All remaining items of load have an ICP recorded. The accuracy of the ICP assignment is discussed in **section 3.1**.

### Audit outcome

Compliant

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

### Code reference

*Clause 11(2)(b) of Schedule 15.3*

### Code related audit information

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

### Audit observation

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

### Audit commentary

The database contains fields for the nearest street address, distance from the end of the road and GPS co-ordinates. All but 206 items of load have GPS coordinates for each item of load. These are readily locatable as all have the distance from the end of road recorded.

### Audit outcome

Compliant

## 2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3)

### Code reference

Clause 11(2)(c) and (d) of Schedule 15.3

### Code related audit information

The DUML database must contain:

- a description of load type for each item of load and any assumptions regarding the capacity,
- the capacity of each item in watts.

### Audit observation

The database was checked to confirm that it contained a field for lamp type and wattage capacity and included any ballast or gear wattage and that each item of load had a value recorded in these fields.

### Audit commentary

The database contains two records for wattage, firstly the lamp wattage and secondly the gear wattage, which represents ballast losses. I found no blank records for lamp wattage but found 13,391 items of load have no gear wattage recorded. The value is zero, so this has no impact on submission, but I recommend that these are populated.

Recommendation	Description	Audited party comment	Remedial action
Gear wattage	Populate the blank gear wattages with zero.	Genesis will work with HCC to ensure accuracy of data and that the dataset records are updated accurately.	Investigating

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

### Audit outcome

Non-compliant



Non-compliance	Description		
Audit Ref: 2.4 With: Clause 11(2)(d) of Schedule 15.3 From: 29-Jul-22 To: 13-Nov-23	13,391 items of load with no gear wattage recorded. Potential impact: None Actual impact: None 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 overall as the lights with a gear wattage of more than zero are all populated correctly but there is room for improvement as recommended above.  The impact is assessed to be none as this has no impact on submission but low was selected as none is not available.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis will work with HCC to ensure accuracy of data and that the dataset records are updated accurately.		01/03/2024	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis will work with HCC to ensure accuracy of data and that the dataset records are updated accurately.		01/03/2024	

## 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 534 items of load on 7 and 8 December 2023.

### Audit commentary

The field audit discrepancy findings are detailed in the table below:

Discrepancy	Quantity
Lights in the database not in the field	10
Lights in the field, not in the database	8
Incorrect wattage	17

A detailed spreadsheet has been provided to HCC.

The field audit found eight additional items of load in the field. This is recorded as non-compliance below.

The database accuracy is detailed in **section 3.1**.

**Audit outcome**

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3  From: 29-Jul-22 To: 30-Nov-23	Eight items of load missing from the database.  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 the new connection process needs reviewing to ensure that all lights installed are captured correctly.  The impact is rated as low as the number of extra lights found in the field were minor in relation to the volume sampled.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis will work with the Network company and HCC to ensure a robust new connection process is in place		01/08/2024	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis will work with the Network company and HCC to ensure a robust new connection process is in place		01/08/2024	

## 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 database tracks additions and removals as required by this clause.

### Audit outcome

Compliant

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

### Code reference

*Clause 11(4) of Schedule 15.3*

### Code related audit information

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

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

### Audit observation

The database was checked for audit trails.

### Audit commentary

The RAMM database has a complete audit trail of all additions and changes to the database information.

### Audit outcome

Compliant

### 3. ACCURACY OF DUML DATABASE

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

##### Code reference

Clause 15.2 and 15.37B(b)

##### Code related audit information

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

##### Audit observation

The DUML Statistical Sampling Guideline was used to determine the database accuracy. The table below shows the survey plan.

Plan Item	Comments
Area of interest	Hamilton City area
Strata	<p>The database contains items of load in Hamilton City Council area.</p> <p>The area has three distinct sub-groups. Urban, under verandah and central city.</p> <p>The processes for the management of HCC items of load are the same, but I decided to place the items of load into five strata by road name, as follows:</p> <ol style="list-style-type: none"> <li>1. A-C</li> <li>2. D-H</li> <li>3. I-P</li> <li>4. O-S</li> <li>5. T-Z</li> </ol>
Area units	I created a pivot table of the roads in each area, and I used a random number generator in a spreadsheet to select a total of 94 sub-units.
Total items of load	534 items of load were checked.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority or against the LED light specification provided.

The accuracy of the ICP assignment was examined. This is also discussed in **sections 2.1 & 3.2**.

The process to manage changes made in the field being updated in the database was examined.

##### Audit commentary

##### Database accuracy based on the field audit

A field audit was conducted of a statistical sample of 534 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	96.3	Wattage from survey is less than the database wattage by 4.2%
R <sub>L</sub>	87.8	With a 95% level of confidence, it can be concluded that the error could be between -12.2% and +0.2%
R <sub>H</sub>	100.2	

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 12.2% lower and 0.2% higher than the wattage recorded in the DUMML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 44 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 145 kW lower to 3 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 186,700 kWh lower than the DUMML database indicates.

There is a 95% level of confidence that the annual consumption is between 619,500 kWh p.a. lower to 12,300 kWh p.a. higher than the database indicates.

The decline in the accuracy of the database is largely due to new streetlights not being recorded accurately and I recommend that this is reviewed further below in this section.

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>

**Lamp description and capacity accuracy**

The issue raised in the last few audits with the Christmas lights being included for the whole year rather than just the period they are burning for has been resolved and HCC now add these lights for the period they are burning with the correct wattage.

The database was examined to confirm that the light descriptions were sufficient to determine the correct lamp wattage has been applied. I confirmed the correct lamp wattage was applied for all but 571 lights.

These lights require more detail to confirm the correct wattage is being applied and I recommend below that Genesis works with HCC to progress this.

Recommendation	Description	Audited party comment	Remedial action
Lamp descriptions and wattages	Review the audit findings and add sufficient details to confirm the correct wattage has been applied.	Genesis will work with HCC to ensure accuracy of data and that the dataset records are updated accurately.	Identified

The last audit identified two light types that had the incorrect wattage applied and three that required further information. The incorrect wattages have been corrected but three light types still require further information, and these are included in the 571 lights detailed above.

I checked the gear wattages being applied and found:

- a small number of lights with the incorrect gear wattage applied resulting in an estimated under submission of 1,429 kWh per annum; these have been passed to HCC to correct and are recorded as non-compliance below and in **sections 2.1 and 3.2**, and
- as detailed in **section 2.4**, 13,391 have no gear wattage recorded; the value is zero and I recommend in **section 2.4**, that these are populated.

As reported in the last audit, HCC have no plans to use a CMS system and therefore will not be dimming the lights so the wattage recorded in the database is what will be burning in the field.

#### ICP accuracy

Analysis of the database found 42 items with no ICP recorded. 41 of these are solar powered lights and one is owned by Waka Kotahi. These are not part of the distributed unmetered load. All remaining items of load have an ICP recorded.

There are 637 items of load with an HCC DUML ICP allocated but these are being excluded from submission. These are made up of

Light Owner	Items of load	kW value	Comments
Waka Kotahi	530	90.08	These are being reconciled as part of the Waka Kotahi database so there is no impact on submission accuracy but the HCC DUML ICPs should be removed and recorded as NZTA as this is for reference only.
Private	35	3.12	These have been reviewed and found 18 have been created as standard or shared unmetered load by WEL Networks. The remaining 13 lights have been passed back to HCC as WEL Networks do not believe these to be private. I have reviewed all the lights and provided all parties my findings and I recommend below that Genesis, HCC and WEL Networks work together to resolve these.
Parks and Gardens	24	1.56	These are expected to be reconciled to ICP 0076363539WE02F but have the incorrect ICP assigned and are not being reconciled. These items of load have been passed to that trader to investigate.

Light Owner	Items of load	kW value	Comments
Still to be capitalised (CTU)	104	8.35	These are being added from December 2023.
Unknown light owner	8	0.20	These are being investigated by HCC to determine which ICP they should be allocated to.

In addition to the 35 items of load recorded as private, WEL Networks have seven lights recorded on the original private street light list provided by HCC, but these are no longer recorded in the HCC database. These details have been passed to HCC and should be investigated with WEL Networks.

Recommendation	Description	Audited party comment	Remedial action
Private lights	Liaise with HCC and WEL Networks to resolve all the private lights that are not being reconciled.	Genesis will work with HCC & WEL Network to ensure accuracy of data and that the dataset records are updated accurately.	Identified

The exclusion of the still to be capitalised and unknown light owner lights will be resulting in an estimated under submission of 36,500 kWh per annum. This is recorded as non-compliance.

I recommend in **section 2.1**, that the correct ICPs be assigned to all items of load, and this is used to derive the monthly wattage report.

#### Change management process findings

The processes were reviewed for ensuring that changes in the field are notified through to Connect Hamilton. All maintenance work in the field is entered directly into "Pocket RAMM". There is an audit process in place which checks both quality of workmanship and accuracy of asset capture. Any errors found are corrected.

HCC has now completed the LED roll out. There are a very few HPS lights remaining. These will be changed out as they fail.

The new connection process was discussed. The team structure has changed since becoming Hamilton Connect. There is a Network Inspector who carries out the inspection of assets as they are passed from the development team into Hamilton Connect. The field audit identified that the decline in the accuracy of the database is largely due to new streetlights not being recorded accurately and I recommend that this process is reviewed.

Recommendation	Description	Audited party comment	Remedial action
Vesting of streetlights	Review the vesting process to ensure that what is added to the database is as accurate and timely as possible.	Genesis will work with the Network company and HCC to ensure a robust new connection process is in place	Investigating

The previous audit recorded that WEL Networks livens streetlights. This process was reviewed during the recent WEL Networks Distributor audit. New streetlights can only be approved via the new connection process. The process identifies the relevant ICP and includes approval from the trader. The trader engages the livening agent directly, so notification of electrical connection is expected to be provided by that agent to the trader. HCC will only add lights to the database once they have been vested. Most lights have already been livened prior to this date highlighting a break down in the process. I recommend that Genesis liaise with HCC, the livening agent and WEL Networks to review this process to ensure that lights are not being livened without them being reconciled against an ICP.

Recommendation	Description	Audited party comment	Remedial action
Livening of streetlights	Liaise with HCC, the livening agents and WEL Networks to ensure that new streetlights are being reconciled from the time of electrical connection if Genesis have accepted responsibility for them.	Genesis will work with the Network company and HCC to ensure a robust new connection process is in place	Investigating

### **Festive Lighting**

As detailed above, the issue raised in the last few audits with the Christmas lights being included for the whole year rather than just the period they are burning for has been resolved and HCC now add these lights for the period they are burning with the correct wattage.

### **Audit outcome**

Non-compliant



Non-compliance	Description		
<p>Audit Ref: 3.1</p> <p>With: Clause 15.2 and 15.37B(b)</p> <p>From: 29-Jul-22</p> <p>To: 30-Nov-23</p>	<p>In absolute terms, total annual consumption is estimated to be 186,700 kWh lower than the DUMML database indicates.</p> <p>Analysis of the gear wattage applied indicates an estimated under submission of 1,429 kWh per annum.</p> <p>Exclusion of 112 items of load with the HCC DUMML ICs allocated is resulting in an estimated under submission of 36,500 kWh per annum.</p> <p>Potential impact: High</p> <p>Actual impact: High</p> <p>Audit history: Multiple times</p> <p>Controls: Moderate</p> <p>Breach risk rating: 6</p>		
Audit risk rating	Rationale for audit risk rating		
<p><b>High</b></p>	<p>The controls are rated as moderate, as the maintenance process is robust but there is room for improvement for the adding of new streetlights.</p> <p>The impact is assessed to be high due to the potential over submission indicated from the field audit findings.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
<p>Genesis will continue to work with HCC to ensure accuracy of data. Genesis will endeavour to set up a tracking of change process with HCC.</p> <p>Genesis will work with the Network company and HCC to ensure a robust new connection process is in place</p>		<p>01/08/2024</p>	<p>Investigating</p>
Preventative actions taken to ensure no further issues will occur		Completion date	
<p>Genesis will continue to work with HCC to ensure accuracy of data. Genesis will endeavour to set up a tracking of change process with HCC.</p> <p>Genesis will work with the Network company and HCC to ensure a robust new connection process is in place</p>		<p>01/08/2024</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 burn hours against the submitted figure to confirm accuracy.

#### Audit commentary

Genesis reconciles this DUML load using the NST profile. The total volume submitted to the Reconciliation Manager is based on a monthly database report derived from RAMM and the “burn time” which will be sourced from data loggers.

As detailed in **section 3.1**, only lights where the light owner is recorded as “*Local Authority or Local Authority – Metered light*” are included for submission. The Waka Kotahi, parks and garden lights, private, still to be capitalised (CTU) and unknown owned lights are excluded even though these are recorded against the HCC DUML ICPs. These were examined and found:

Light Owner	Items of load	kW value	Comments
Waka Kotahi	530	90.08	These are being reconciled as part of the Waka Kotahi database so there is no impact on submission accuracy but the HCC DUML ICPs should be removed and recorded as NZTA as this is for reference only.
Private	35	3.12	These have been reviewed and found 18 have been created as standard or shared unmetered load by WEL Networks. The remaining 13 lights have been passed back to HCC as WEL Networks do not believe these to be private. I have reviewed all the lights and provided all parties my findings and I recommend in <b>section 3.1</b> , that Genesis, HCC and WEL Networks work together to resolve these.
Parks and Gardens	24	1.56	These are expected to be reconciled to ICP 0076363539WE02F but have the incorrect ICP assigned and are not being reconciled. These items of load have been passed to that trader to investigate.
Still to be capitalised (CTU)	104	8.35	These are being added from December 2023.
Unknown light owner	8	0.20	These are being investigated by HCC to determine which ICP they should be allocated to.

I recommend in **section 2.1**, that the correct ICPs or other identifier if not being reconciled in this database be assigned to all items of load, and this is used to derive the monthly wattage report.

As detailed in **section 3.1**, the issue raised in the last few audits with the Christmas lights being included for the whole year rather than just the period they are burning for has been resolved and HCC now add these lights for the period they are burning with the correct wattage.

The field audit found that the database accuracy did not fall within the +/-5% threshold resulting in an estimated over submission of 186,700 kWh per annum.

The analysis of gear wattage found a small number of lights with the incorrect gear wattage applied, resulting in a minor under submission of 1,429 kWh per annum.

Submission continues to be based on a snapshot of the database at the end of the month and does not consider historic adjustments. Genesis is working with HCC to provide reporting detailing changes made at a daily level so this should be resolved by the next audit.

#### **Audit outcome**

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c)</p> <p>From: 29-Jul-22 To: 30-Nov-23</p>	<p>Exclusion of 112 items of load with the HCC DUML ICPs allocated is resulting in an estimated under submission of 36,500 kWh per annum.</p> <p>In absolute terms, total annual consumption is estimated to be 186,700 kWh lower than the DUML database indicates.</p> <p>Analysis of the gear wattage applied indicates an estimated under submission of 1,429 kWh per annum.</p> <p>Submission is based on a snapshot of the database at the end of the month and does not consider historic adjustments or the fact that lights can be lived before they are entered into the database.</p> <p>Potential impact: High Actual impact: High Audit history: Multiple times Controls: Moderate Breach risk rating: 6</p>		
Audit risk rating	Rationale for audit risk rating		
<p><b>High</b></p>	<p>The controls are rated as moderate, as the maintenance process is robust but there is room for improvement for the adding of new streetlights and the production of the monthly wattage report.</p> <p>The impact is assessed to be high due to the potential over submission indicated from the field audit findings.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
<p>Genesis will continue to work with HCC to ensure accuracy of data. Genesis will endeavour to set up a tracking of change process with HCC.</p> <p>Genesis will work with the Network company and HCC to ensure a robust new connection process is in place</p>		<p>01/08/2024</p>	<p>Investigating</p>
Preventative actions taken to ensure no further issues will occur		Completion date	
<p>Genesis will continue to work with HCC to ensure accuracy of data. Genesis will endeavour to set up a tracking of change process with HCC.</p> <p>Genesis will work with the Network company and HCC to ensure a robust new connection process is in place</p>		<p>01/08/2024</p>	

## CONCLUSION

The database is remotely hosted by thinkproject Ltd and is managed by Connect Hamilton (this has replaced Infrastructure Alliance), on behalf of HCC, HCC being Genesis's customer. Connect Hamilton operates under a new contract and is still a joint venture between HCC and Downer which provides infrastructure management across all of HCC assets. They provide reporting to Genesis monthly.

The field audit conducted of 534 items of load found that the database did not fall within the accuracy threshold of +/-5% resulting in an estimated over submission of 186,700 kWh per annum. This is largely due to new streetlights not being recorded accurately and I recommend that this process is reviewed.

The monthly wattage report is not derived by the ICP. This is resulting in some lights being missed from submission. I have recommended that ICP assignment is corrected, and ICP based reporting is used to derive the monthly wattage report.

I reviewed the private lights excluded from submission against those that have been passed to WEL Networks to create standard or shared unmetered load. This identified some discrepancies between the two data sets, and I have recommended that Genesis liaise with HCC and WEL Networks to get these resolved.

The issue raised in the last few audits with the Christmas lights being included for the whole year rather than just the period they are burning for has been resolved and HCC now add these lights for the period they are burning with the correct wattage.

The audit found five non-compliance issues and makes six recommendations. The future risk rating of 21 indicates that the next audit be completed in three months. I have considered this in conjunction with the response from Genesis and recommend that the next audit is in nine months. This should allow sufficient time to address the issues raised in this audit.

## PARTICIPANT RESPONSE

Genesis will continue to work with HCC to ensure the accuracy of their datasets and we endeavour to set up a tracking of change process with HCC also.

Genesis will work with HCC and WEL Network to review the new connection process to ensure a robust new connection process is in place for all parties to mitigate the risks highlighted.

Genesis agrees with the auditors recommendations.