

ELECTRICITY INDUSTRY PARTICIPATION CODE  
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

WAIMAKARIRI DISTRICT COUNCIL AND  
GENESIS ENERGY

Prepared by: Rebecca Elliot

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Audit report due date: 01-Jun-21

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## EXECUTIVE SUMMARY

This audit of the Waimakiriri District Council (**WDC**) Unmetered Streetlights 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.

Genesis have been using the Mainpower database to reconcile this load. Mainpower is no longer engaged as the streetlighting maintenance contractor, therefore they are no longer maintaining the database. Mainpower do not have any visibility of who will be engaged as the new field work contractor. Genesis are working with WDC to determine a new database source but until this time the Mainpower database will be used for submission. This has impacted the audit risk rating for this DUML load as the controls are none as effectively a defunct database is being used for submission.

The audit risk rating indicates that the next audit be in three months, but I recommend that the next audit be in six months to allow sufficient time for Genesis to determine a new data source and establish the updating processes.

## 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>Incorrect submission for two ICPs resulting in an estimated under submission of 105,199 kWh per annum.</p> <p>Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 63,400 kWh per annum.</p> <p>162 items have the incorrect wattage applied indicating an estimated minor under submission of 208 kWh per annum.</p> <p>66 light types with no ICP recorded (including the 32 items of load with no wattage recorded), resulting in an estimated under submission of 16,734 kWh.</p>	None	High	12	Investigating
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	66 items of load with no ICP recorded.	None	Low	5	Investigating
Location of each item of load	2.3	11(2)(b) of Schedule 15.3	Inadequate location information for eight items of load.	None	Low	5	Investigating
Description and capacity of load	2.4	11(2)(c) & (d) of Schedule 15.3	32 lights with no lamp description or total wattage recorded resulting in an estimated under submission of 5,390 kWh annually.	None	Medium	8	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
All load recorded in database	2.5	11(2A) of Schedule 15.3	Two additional lights found in the field.	None	Low	5	Investigating
Database Accuracy	3.1	15.2 and 15.37B(b)	<p>Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 63,400 kWh per annum.</p> <p>162 items have the incorrect wattage applied indicating an estimated minor under submission of 208 kWh per annum.</p> <p>66 items of load with no ICP recorded resulting in an estimated under submission of 16,734 per annum.</p> <p>Inadequate location information for eight items of load.</p>	None	High	12	Investigating
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>Incorrect submission for two ICPs resulting in an estimated under submission of 105,199 kWh per annum.</p> <p>Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 63,400 kWh per annum.</p> <p>162 items have the incorrect wattage applied indicating an estimated minor under submission of 208 kWh per annum.</p> <p>66 items of load with no ICP recorded resulting in an estimated under submission of 16,734 per annum.</p>	None	High	12	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
<b>Future Risk Rating</b>						<b>59</b>	

<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
Location of items of load	2.3	Update road names for some items of load from Petries Road to Fearne Drive, Ranby Place, Catchpole Place, Hamlett Drive, Benjes Place, Keeper Close.
Database accuracy	3.1	Review and change the lamp wattage to the correct value and remove the reference to ballast.

## 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

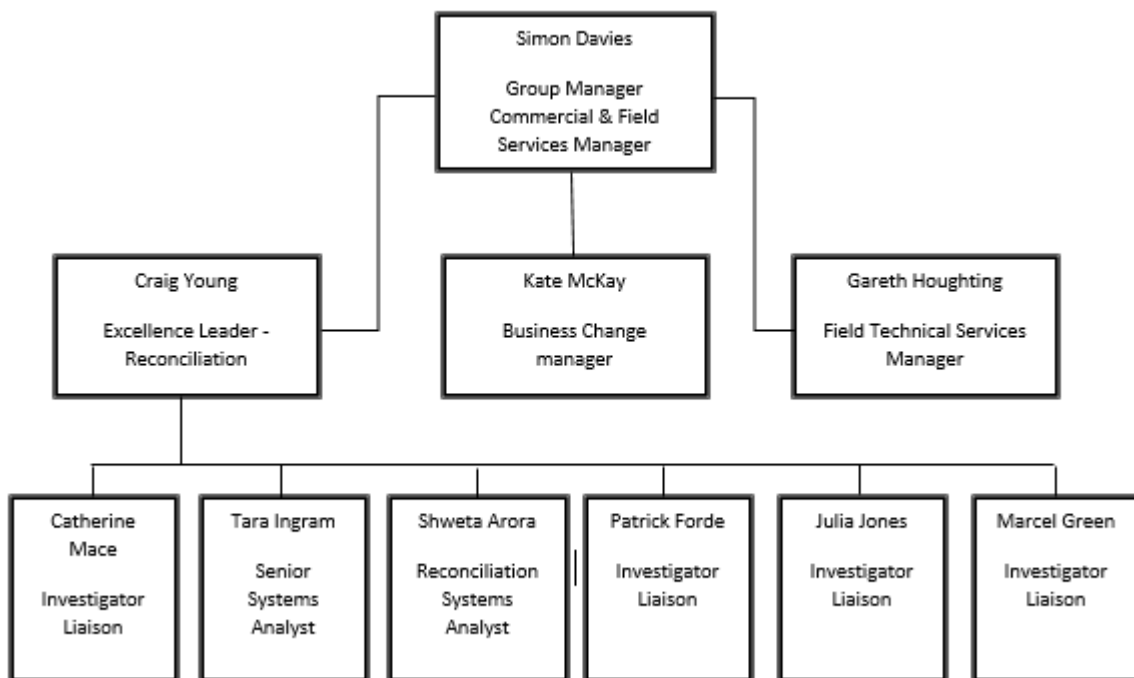
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

#### Audit commentary

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:

Name	Company	Role
Rebecca Elliot	Veritek Limited	Lead Auditor
Claire Stanley	Veritek Limited	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Craig Young	Excellence Leader- Reconciliation	Genesis Energy
Julia Jones	Technical Specialist - Reconciliations Team	Genesis Energy
Sarah Barnes	Regulatory Manager	Mainpower
Neil O'Loughlin	Surveyor/ Pricing Co-ordinator	Mainpower
Joel Hung	Commercial Analyst	Mainpower

### 1.4. Hardware and Software

**Section 1.8** shows that Mainpower maintains an Access database for the management of the DUML information. Backup and restoration procedures are in accordance with normal industry protocols.

### 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)
0000366371MPF7B	STREET LIGHT SBK 0331	SBK0331	ST	2,577	264,306
0000565850KEA7B	DISTRIBUTED STREETLIGHTING OLD KAIAPOI BOROUGH	KAI0111	SST	585	55,351
0000366372MP3BB	STREET LIGHTING KAI0111	KAI0111	SST	2,711	241,265
0000282125MP3EF	STREETLIGHTS SBK0661SWN	SBK0661	SST	51	5,865
0000305303MPA1B	STREETLIGHTS SBK0661BHL	SBK0661	SST	26	4,177
0000328410MP099	STREETLIGHTS SBK0661BHL (Riverlea Estate)	SBK0661BHL	ST	85	8,067
0000366449MP595	Pegasus Town	KAI0111	SST	86	5,002
TOTAL				6,121	584,033

## 1.7. Authorisation Received

All information was provided directly by Genesis or Mainpower.

## 1.8. Scope of Audit

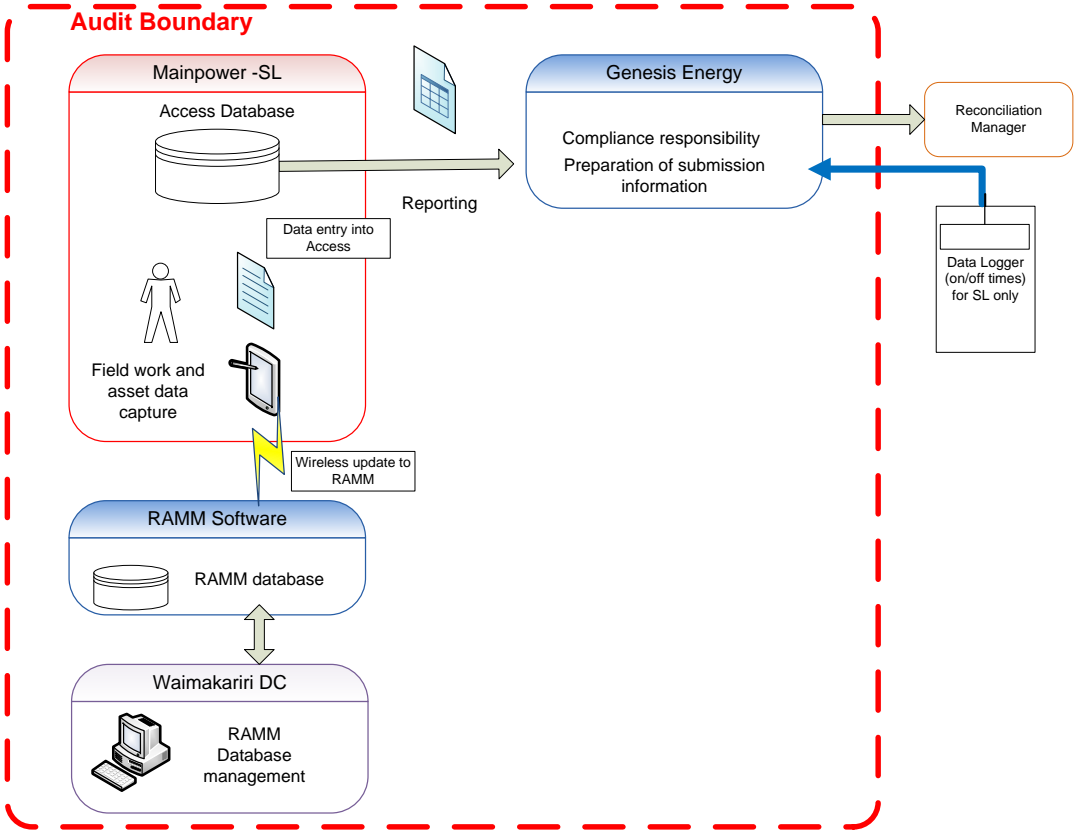
This audit of the WDC DUML database and processes was conducted at the request of Genesis, in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1, which became effective on 1 June 2017.

WDC is located on the Mainpower network. Mainpower is no longer engaged as the streetlighting maintenance contractor, therefore they are no longer being advised of any changes to maintain the database. Mainpower do not have any visibility of who will be engaged as the new field work contractor. They have continued to provide reporting, which is used by Genesis to populate the daily kWh in the registry. Mainpower have advised they are providing a deadline date when they will stop providing reporting. The Mainpower database was audited as they continue to provide monthly reporting to the trader.

A RAMM database is held by WDC, who is Genesis’s customer. This database is hosted by RAMM Software Limited and was populated by Mainpower, but it is not used by Genesis for the calculation of submission information. Genesis are working with WDC to determine the new database source.

The diagram below shows the flow of information and the audit boundary for clarity.



The field audit was undertaken of a statistical sample of 368 items of load on 20 April 2021.

**1.9. Summary of previous audit**

Genesis provided a copy of the last audit report undertaken by Steve Woods of Veritek Limited in May 2019. The table below records the findings.

**Table of Non-Compliance**

Subject	Section	Clause	Non-compliance	Status
Location of each item of load	2.3	11(2)(b) of Schedule 15.3	Some inadequate location information.	Still existing
All load recorded in database	2.5	11(2A) of Schedule 15.3	All load is not recorded in the database, 21 additional items of load were identified.	Still existing

## 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 has 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 SST profile. The methodology for deriving submission information is compliant.

I checked the March 2021 extract provided by Mainpower against the submission totals supplied by Genesis and found that submission matched the database for five of the seven ICPs. The light volumes differ between the March submission and the database extract provided. The volume of light differences does not indicate this is due to a report timing difference:

ICP	Light Count March 2021	Database extract light count	Light count difference	Submitted kWh Value	Expected kWh Value	kWh difference
0000366372MP3BB	2,546	2,710	164	80,453	84,616	4,163
0007102594RN519	2,421	2,577	156	88,126	92,729	4,603
<b>TOTAL</b>						<b>8,766</b>

This will be resulting in an estimated under submission of an estimated 105,199 kWh per annum.

The field audit found that the database accuracy was not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 63,400 kWh.

The following database inaccuracies were found:

Issue	kWh Impact
162 items have the incorrect wattage applied	+208
66 light types with no ICP recorded (including the 32 items of load with no wattage recorded)	+16,734

Mainpower is no longer engaged as the streetlighting maintenance contractor, therefore they are no longer being advised of any changes to maintain the database. Genesis are working with WDC to determine a new database source therefore until this is resolved the database used for submission will be becoming less accurate.

## Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3</p> <p>From: 30-May-19 To: 16-Apr-21</p>	<p>Incorrect submission for two ICPs resulting in an estimated under submission of 105,199 kWh per annum.</p> <p>Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 63,400 kWh per annum.</p> <p>162 items have the incorrect wattage applied indicating an estimated minor under submission of 208 kWh per annum.</p> <p>66 light types with no ICP recorded (including the 32 items of load with no wattage recorded), resulting in an estimated under submission of 16,734 kWh.</p> <p>Potential impact: High Actual impact: High Audit history: None Controls: None Breach risk rating: 12</p>		
Audit risk rating	Rationale for audit risk rating		
High	<p>The controls are recorded as none as the database used for submission is no longer being maintained.</p> <p>The audit risk rating is high due to the estimated kWh volume under submission.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis has been engaging with the council to establish what the council can provide the trader, as of August Genesis has been supplied RAMM data for the council assets. Genesis are working with the council to maintain the database information to establish completeness & raise accuracy levels.		01/11/2021	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Continue to provide exception reporting back to the council to assist with raising database accuracy levels		Continuous improvement	

## 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 the correct ICP was recorded against each item of load.

### Audit commentary

Mainpower's database contains a GXP and customer number that is linked to the relevant ICP in the customer table in Access. There are 66 items of load do not have a GXP recorded against them but have the Waimakariri District Council recorded as the light owner. This equates to 3.91 kW of load or an estimated 16,734 kWh per annum. Therefore, these items of load cannot be linked to an ICP and are not being reconciled.

### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.2 With: Clause 11(2)(a) and (aa) of Schedule 15.3  From: 30-May-19 To: 16-Apr-21	66 items of load with no ICP recorded resulting in an estimated 16,374 kWh under submission per annum.  Potential impact: Low  Actual impact: Low  Audit history: None  Controls: None  Breach risk rating: 5		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	The controls are recorded as none as the database used for submission is no longer being maintained.  The impact on settlement and participants is medium; therefore, the audit risk rating is medium.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis has been supplied RAMM data for the council assets. Genesis are working with the council to maintain the database information to establish completeness & raise accuracy levels.		01/11/2021	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Continue to provide exception reporting back to the council to assist with raising database accuracy levels		Continuous improvement	

### 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 Mainpower database contains a field for the nearest street address and there are GPS coordinates. There are eight records with no street address and only a field name which is insufficient to locate them. This is recorded as non-compliance below.

There is a total of 552 items of load with no GPS coordinates recorded. Of these, 115 lamps have been included incorrectly in this database. Mainpower are correcting the customer group so that they will be included for the correct customer group going forward. There is no impact as they are not expected in this database and no wattage is recorded for them.

Some roads are recorded with an incorrect street address, the GPS co-ordinates are accurate for these lights. I recommend that the road names are updated in the database to ensure the lights can be easily located. The lights are recorded as Petries Rd Woodend, some require updating to Fearn Drive, Ranby Place, Catchpole Place, Hamlett Drive, Benjes Place, Keeper Close.

Recommendation	Description	Audited party comment	Remedial action
Regarding Clause 11(2)(b) of Schedule 15.3	Update road names for some items of load from Petries Road to Fearn Drive, Ranby Place, Catchpole Place, Hamlett Drive, Benjes Place, Keeper Close.	Genesis has yet to fully be able to assess the data provided in order to provide direction on the solution for this recommendation.	Investigating

### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.3 With: Clause 11(2)(b) of Schedule 15.3 From: 30-May-19 To: 16-Apr-21	Inadequate location information for eight items of load. Potential impact: Low Actual impact: Low Audit history: Twice Controls: None Breach risk rating: 5		
Audit risk rating	Rationale for audit risk rating		
Low	The controls are recorded as none as the database used for submission is no longer being maintained. The audit risk rating is low as the volume of lights effected is small.		
Actions taken to resolve the issue		Completion date	Remedial action status
Genesis has been supplied RAMM data for the council assets. Genesis are working with the council to maintain the database information to establish completeness & raise accuracy levels.		01/11/2021	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Continue to provide exception reporting back to the council to assist with raising database accuracy levels		Continuous improvement	

#### 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 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

Mainpower's access database contains the manufacturers rated wattage and the ballast wattage.

32 items of load do not have a lamp type and total wattage recorded. This could result in an estimated under submission of 5,390 kWh annually. The calculation is based on the most common light type of 70W HPS. These are part of the 66 items of load with no ICP associated recorded in **section 2.2**. The accuracy of the recorded wattages is discussed in **section 3.1**.

##### Audit outcome

Non-compliant



Non-compliance	Description		
Audit Ref: 2.4 With: Clause 11(2)(c) & (d) of Schedule 15.3 From: 30-May-19 To: 16-Apr-21	32 lights with no lamp description or total wattage recorded. Potential impact: Low Actual impact: Medium Audit history: None Controls: None Breach risk rating: 8		
Audit risk rating	Rationale for audit risk rating		
<b>Medium</b>	The controls are rated as moderate as the processes in place will ensure that the data is recorded correctly most of the time. The audit risk rating is assessed to be medium based on the kWh volume impact i		
Actions taken to resolve the issue		Completion date	Remedial action status
Due to the issues being identified in the Main Powers database genesis needs to establish the accuracy levels of the data that is now being supplied by the council via RAMM.		01/11/2021	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis are working with the council to maintain the database information to establish completeness & raise accuracy levels and will continue to provide exception reporting back to assist the council.		Continuous improvement	

## 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 368 items of load.

### Audit commentary

The field audit discrepancies are detailed in the table below:

Street	Databas e count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Lacy Gate Place	3	3		1	1 incorrect wattage recorded as 60W Fluro, but 1 x 70W HPS found in the field

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Rex Place	2	2		1	1 incorrect wattage recorded as 60W Fluro, but 1 x 70W HPS found in the field
Ivory Street	14	14		3	3 incorrect wattages recorded as 250W HPS, but 3 x 150W HPS found in the field
Parkhouse Drive	10	10		2	2 incorrect wattages recorded as 70W HPS, but 2 x 19W LED found in the field
Ascot Place	2	4	2		Additional 2 x 70W HPS located in field
Greenfield Mews	4	4		1	1 incorrect wattage recorded as 65W GPLS, but 1 x 47W LED found in the field
Gressons Road	3	3		1	1 incorrect wattage recorded as 250W HPS, but 1 x 100W HPS found in the field
Taiwhenua Street	3	3		3	3 incorrect wattages recorded as 70W HPS, but 3 x 19W LED found in the field
<b>Grand Total</b>	<b>41</b>	<b>43</b>	<b>2</b>	<b>12</b>	

I found two additional lamps in the field than were recorded in the database and 12 lamps with incorrect wattages. The items missing from the database are recorded as non-compliance.

#### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3  From: 30-May-19 To: 16-Apr-21	Two additional lights found in the field.  Potential impact: Low  Actual impact: Low  Audit history: Twice  Controls: None  Breach risk rating: 5		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	The controls are recorded as none as the database used for submission is no longer being maintained.  The impact is assessed to be low due to the small number of additional lights found in the field in relation to the overall count of the items of load.		
Actions taken to resolve the issue		Completion date	Remedial action status
Due to the issues being identified in the Main Powers database genesis needs to establish the accuracy levels of the data that is now being supplied by the council via RAMM.		01/11/2021	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis are working with the council to maintain the database information to establish completeness & raise accuracy levels and will continue to provide exception reporting back to assist the council.		Continuous improvement	

## 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 functionality achieves compliance with the code. As discussed in **section 3.1** it is no longer being updated.

### Audit outcome

Compliant

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

### **Code reference**

*Clause 11(4) of Schedule 15.3*

### **Code related audit information**

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

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

### **Audit observation**

The database was checked for audit trails.

### **Audit commentary**

The database has a complete and compliant audit trail.

### **Audit outcome**

Compliant

### 3. ACCURACY OF DUML DATABASE

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

##### Code reference

Clause 15.2 and 15.37B(b)

##### Code related audit information

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

##### Audit observation

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

Plan Item	Comments
Area of interest	Waimakariri District Council
Strata	<p>The database contains items of load in the Waimakariri District Council area.</p> <p>The processes for the management of items of load are the same, but I decided to place the items of load into three strata, as follows:</p> <ol style="list-style-type: none"> <li>1. GXP KAI0111</li> <li>2. GXP SBK0331</li> <li>3. Small town</li> </ol> <p>NZTA lighting is a separate audit report and not included in this one.</p>
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 69 sub-units.
Total items of load	368 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.

##### Audit commentary

A field audit was conducted of a statistical sample of 368 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	97.5	Wattage from survey is higher than the database wattage by 2.5%
R <sub>L</sub>	94.8	With a 95% level of confidence, it can be concluded that the error could be between -5.2% and -0.8%
R <sub>H</sub>	99.2	

These results were categorised in accordance with the “Distributed Unmetered Load Statistical Sampling Audit Guideline”, effective from 01/02/19. The table below shows that Scenario B (detailed below) applies, and the best available estimate indicates that the database is not accurate within  $\pm 5.0\%$ .

The conclusion from Scenario B is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 0.8% and 5.2% lower than the wattage recorded in the DUML database.

In absolute terms the installed capacity is estimated to be 15 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 5 kW and 30 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 63,400kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 19,900 and 129,900 kWh p.a. lower 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 <math>\pm 5\%</math>; 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 <math>\pm 5\%</math></p>

### Light description and capacity accuracy

Lamp and gear wattages for all other lamps were compared to the expected values, and the following exceptions were identified:

Model	Database wattage	Correct wattage	Quantity	Total difference
Ibex mini martin 2700	22	22.3	162	+48.6
<b>Total</b>			<b>162</b>	<b>48.6</b>

This could result in an estimated annual under submission of 208 kWh.

As discussed in **section 2.4**, 32 items of load do not have a lamp type and total wattage recorded. This could result in an estimated under submission of under submission of 5,390 kWh annually. The calculation is based on the most common light type of 70W HPS. These make up 32 of the 66 items of load with no ICP recorded detailed in **section 2.2** and below, therefore I have not recorded the missing kWh of submission in the non-compliance table.

I checked the LED lights against the LED light specification sheets and confirmed them to be correct. 22 LED light types in the Streetlight wattage value table contain a value for ballast, I recommend changing the lamp wattage to the correct value in the table and remove the reference to ballast for these lamps.

Recommendation	Description	Audited party comment	Remedial action
<b>Regarding:</b> Clause 11(2)(c) and (d) of Schedule 15.3	Review and change the lamp wattage to the correct value and remove the reference to ballast.	Genesis are currently reviewing the data supplied by the Councils RAMM database, this recommendation albeit for Main Power database, is still relevant for the new database and will work with the council to make corrections as required.	Investigating

### Database accuracy

The field audit found several errors, and two additional lamps. These are detailed in **section 2.5**

### ICP number accuracy

The ICP and corresponding GXP number are assigned based on information provided during the connection process. As discussed in **section 2.2**, 66 lights do not have a GXP and corresponding ICP recorded. This equates to 3.91 kW of load or an estimated 16,734 kWh per annum. Therefore, these items of load cannot be linked to an ICP and are not being reconciled.

### Address location accuracy

As discussed in **section 2.3**, all but eight have sufficient details to locate them. However, I note that the Mainpower database contains 42 lamps for Petries Rd Woodend. When these are mapped using the GPS co-ordinates approx. 23 of the lamps are located on Fearne Drive, Ranby Place, Catchpole Place, Hamlett Drive, Benjes Place, Keeper Close, the addresses need to be updated.

### Change management process findings

Mainpower is no longer engaged as the streetlighting maintenance contractor, therefore they are no longer being advised of any changes to maintain the database.

Outage patrols are no longer conducted by Mainpower. Genesis are working with WDC to confirm a new database source.

### Festive lights

There are some festive lights connected to the Wamakariri DC street light circuits. These were being reported separately to Genesis for inclusion in submission information. This process will need to be re-established once the new database source has been determined.

### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 3.1 With: 15.2 and 15.37B(b)  From: 30-May-19 To: 16-Apr-21	Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 63,400 kWh per annum.  162 items have the incorrect wattage applied indicating an estimated minor under submission of 208 kWh per annum.  66 items of load with no ICP recorded resulting in an estimated under submission of 16,734 per annum.  Inadequate location information for eight items of load.  Potential impact: High Actual impact: High Audit history: Once Controls: None Breach risk rating: 12		
Audit risk rating	Rationale for audit risk rating		
<b>High</b>	The controls are recorded as none as the database used for submission is no longer being maintained.  The impact is assessed to be high due to the impact on submission.		
Actions taken to resolve the issue		Completion date	Remedial action status
Due to the issues being identified in the Main Powers database genesis needs to establish the accuracy levels of the data that is now being supplied by the council via RAMM.		01/11/2021	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis are working with the council to maintain the database information to establish completeness & raise accuracy levels and will continue to provide exception reporting back to assist the council.		Continuous improvement	



### 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 SST profile. The methodology for deriving submission information is compliant.

I checked the March 2021 extract provided by Mainpower against the submission totals supplied by Genesis and found that submission matched the database for five of the seven ICPs. The light volumes differ between the March submission and the database extract provided. The volume of light differences does not indicate this is due to a report timing difference:

ICP	Light Count March 2021	Database extract light count	Light count difference	Submitted kWh Value	Expected kWh Value	kWh difference
0000366372MP3BB	2,546	2,710	164	80,453	84,616	4,163
0007102594RN519	2,421	2,577	156	88,126	92,729	4,603
<b>TOTAL</b>						8,766

This will be resulting in an estimated under submission of an estimated 105,199 kWh per annum.

The field audit found that the database accuracy was not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 63,400 kWh.

The following database inaccuracies were found:

Issue	kWh Impact
162 items have the incorrect wattage applied	+208
66 light types with no ICP recorded (including the 32 items of load with no wattage recorded)	+16,734

Mainpower is no longer engaged as the streetlighting maintenance contractor, therefore they are no longer being advised of any changes to maintain the database. Genesis are working with WDC to determine a new database source therefore until this is resolved the database used for submission will be becoming less accurate.

### Audit outcome

#### Non-compliant

Non-compliance	Description		
Audit Ref: 3.2 With: 15.2 and 15.37B(c) From: 30-May-19 To: 16-Apr-21	Incorrect submission for two ICPs resulting in an estimated under submission of 105,199 kWh per annum. Database accuracy is outside of the allowable threshold resulting in an estimated over submission of 63,400 kWh per annum. 162 items have the incorrect wattage applied indicating an estimated minor under submission of 208 kWh per annum. 66 items of load with no ICP recorded resulting in an estimated under submission of 16,734 per annum. Potential impact: High Actual impact: High Audit history: None Controls: None Breach risk rating: 12		
Audit risk rating	Rationale for audit risk rating		
High	The controls are recorded as none as the database used for submission is no longer being maintained. The impact is assessed to be high due to the impact on submission.		
Actions taken to resolve the issue		Completion date	Remedial action status
Due to the issues being identified in the Main Powers database genesis needs to establish the accuracy levels of the data that is now being supplied by the council via RAMM.		01/11/2021	Investigating
Preventative actions taken to ensure no further issues will occur		Completion date	
Genesis are working with the council to maintain the database information to establish completeness & raise accuracy levels and will continue to provide exception reporting back to assist the council.		Continuous improvement	

## CONCLUSION

Genesis have been using the Mainpower database to reconcile this load. Mainpower is no longer engaged as the streetlighting maintenance contractor, therefore they are no longer maintaining the database. Mainpower do not have any visibility of who will be engaged as the new field work contractor. Genesis are working with WDC to determine a new database source but until this time the Mainpower database will be used for submission. This has impacted the audit risk rating for this DUML load as the controls are none as effectively a defunct database is being used for submission.

The audit risk rating indicates that the next audit be in three months, but I recommend that the next audit be in six months to allow sufficient time for Genesis to determine a new data source and establish the updating processes.

## PARTICIPANT RESPONSE

Due to the audit being conducted under the provision of information from Mainpower, It is difficult to completely set a compliance plan around rectifying the issues outlined in the audit, however the council is now providing data to Genesis as @ 01/08/2021 and Genesis are working with the council to maintain the database information to establish completeness & raise accuracy levels and will continue to provide exception reporting back to assist the council with that process.