# DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

# WAIROA DISTRICT COUNCIL AND GENESIS ENERGY NZBN: 9429037706609

Prepared by: Rebecca Elliot

Date audit commenced: 12 November 2022

Date audit report completed: 22 December 2022

Audit report due date: 28-Feb-23

## TABLE OF CONTENTS

## EXECUTIVE SUMMARY

This audit of the **Wairoa 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.

WDC have undertaken a full field audit since the last audit. The field audit found no errors confirming that the database is accurate. A minor number of incorrect ballasts were identified, and these have been passed to WDC to correct.

The audit found three non-compliances and no recommendation are made. The future risk rating of three indicates that the next audit be completed in 24 months. I have considered this in conjunction with Genesis' comments and agree with this recommendation.

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 | Nine ballast errors resulting in a very minor estimated over submission of 222 kWh per annum.<br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. | Strong | Low | 1 | Identified |
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | Nine ballast errors resulting in a very minor estimated over submission of 222 kWh per annum. | Strong | Low | 1 | Cleared |
| Volume information accuracy | 3.2 | 15.2 and 15.37Bc | Nine ballast errors resulting in a very minor estimated over submission of 222 kWh per annum.<br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. | Strong | Low | 1 | Identified |
| | | | | | **Future Risk Rating** | **3** | |

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

### RECOMMENDATIONS

| Subject | Section | Description |
|---|---|---|
| | | Nil |

### 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

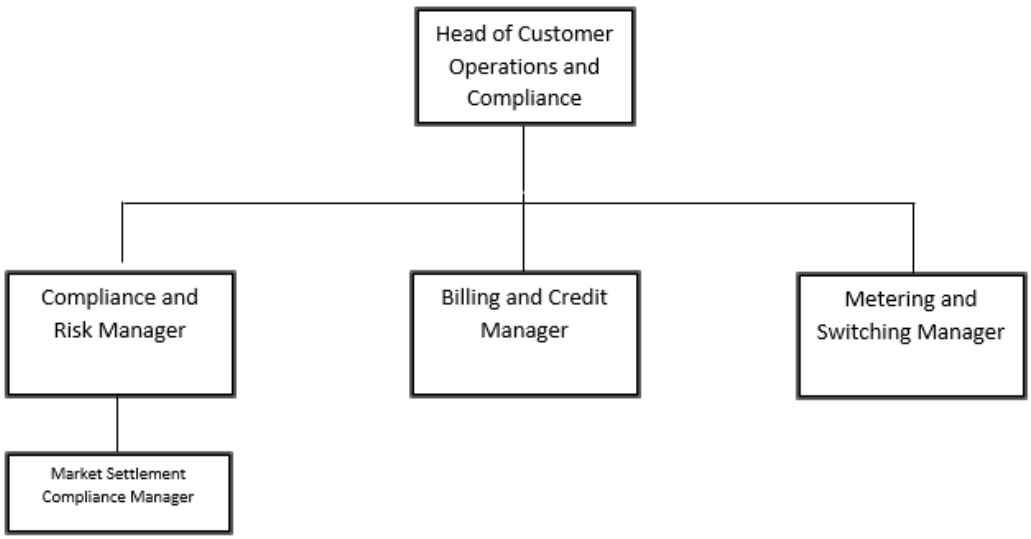
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

### 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 | Title |
|---|---|
| Rebecca Elliot | Auditor |

Other personnel assisting in this audit were:

| Name | Title | Company |
|---|---|---|
| Nirav Teli | DUML Data & Stakeholder Lead | Genesis |
| Stephen Zeilstra | Contracts Engineer - Roads | Wairoa DC |

## 1.4. Hardware and Software

The database used for reporting this DUML load is RAMM from 1 June 2021. This is remotely hosted by thinkproject NZ Ltd. The specific module used for DUML is called "SLIMM" which stands for "Streetlighting Inventory Maintenance Management".

The database is cloud based and 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 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

There is now only one ICP for the Wairoa DC streetlights, which is 0009157081WWB0B and is shown in the table below.

| ICP Number | Description | NSP | Profile | Database wattage (watts) | No of items of load |
|---|---|---|---|---|---|
| 0009157081WWB0B | Wairoa DC | TUI1101 | NST | 27,608 | 777 |

Wairoa DC have undertaken a field audit during the audit period and as a result lights have been reallocated to the correct ICPs reducing the overall lighting load for WDC. As noted in the last audit NZTA lighting is recorded against ICP 0000934950WWBA3, but this is being reconciled by NZTA in a separate RAMM database, so is outside of the scope of this audit.

## 1.7. Authorisation Received

All information was provided directly by Genesis or WDC.

## 1.8. Scope of Audit

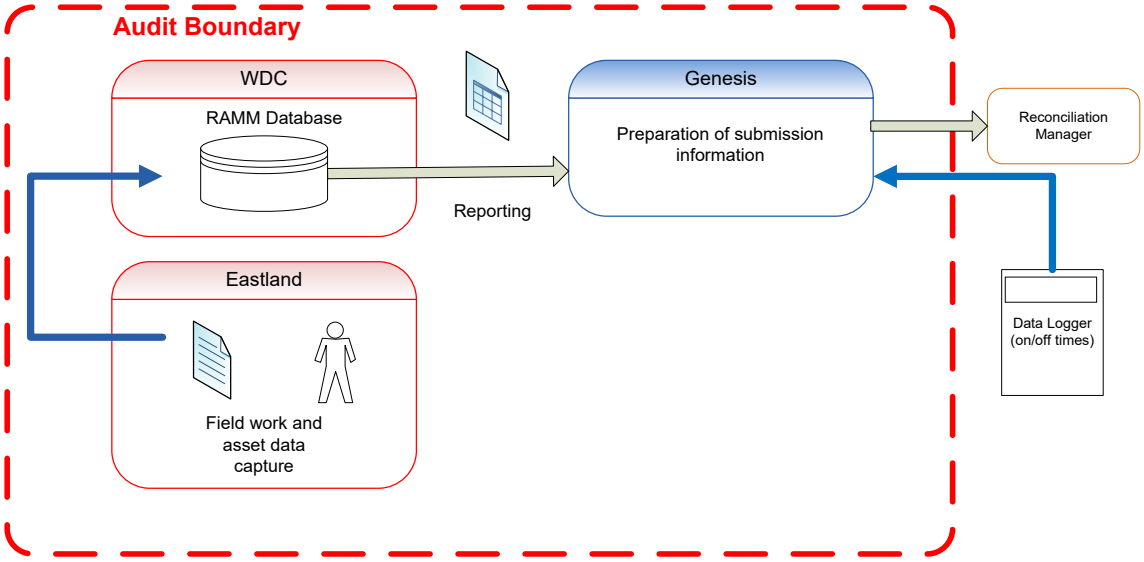
This audit of the WDC DUML database and processes was conducted at the request of Genesis, in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied

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

A RAMM database is used for reporting. This is remotely hosted by thinkproject NZ Ltd. The specific module used for DUML is called "SLIMM" which stands for "Streetlighting Inventory Maintenance Management".

The NZTA lights previously associated with these lights are now reconciled by NZTA and will be subject to a separate audit with a different trader.

The diagram below shows the audit boundary for clarity.




The field audit of 110 items of load was carried out in Wairoa on 14 December 2022.

### 1.9. Summary of previous audit

The last audit report undertaken by Steve Woods of Veritek Limited in May 2022 was reviewed. The table below indicates the current status of that audit's findings.

## Table of Non-Compliance

| Subject | Section | Clause | Non-compliance | Status |
|---|---|---|---|---|
| Deriving submission information | 2.1 | 11(1) of Schedule 15.3 | The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 46,000 kWh lower than the DUML database indicates.<br>5x 125W MV lights with the incorrect ballast applied resulting in a very minor estimated over submission of 299kWh per annum.<br>There are 41 LED items of load with the ballast wattage still recorded in the database. This has resulted in over submission of 2,387 kWh per annum. | Cleared |
| Database accuracy | 3.1 | 15.2 and 15.37B(b) | The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 46,000 kWh lower than the DUML database indicates.<br>5x 125W MV lights with the incorrect ballast applied resulting in a very minor estimated over submission of 299kWh per annum.<br>There are 41 LED items of load with the ballast wattage still recorded in the database. This has resulted in over submission of 2,387 kWh per annum. | Cleared |
| Volume information accuracy | 3.2 | 15.2 and 15.37Bc | The database is outside of the allowable +/-5% threshold. In absolute terms, total annual consumption is estimated to be 46,000 kWh lower than the DUML database indicates.<br>5x 125W MV lights with the incorrect ballast applied resulting in a very minor estimated over submission of 299kWh per annum.<br>There are 41 LED items of load with the ballast wattage still recorded in the database. This has resulted in over submission of 2,387 kWh per annum. | Cleared |

## Table of Recommendations

| Subject | Section | Recommendation for Improvement | Status |
|---|---|---|---|
| Database Accuracy | 3.1 | 100% field audit is undertaken to correct historic errors. | Adopted |

### 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 NST profile. The total volume submitted to the Reconciliation Manager is based on a monthly database report. The "burn time" is sourced from data loggers installed on the Eastland network.

I checked the submission calculations for October 2022 and confirmed they were correct.

The field audit confirmed the database to be accurate.

Analysis of the RAMM database identified only nine ballast errors:

- four 100W HPS lights with a ballast of 13W but this should be 14W, and
- five 125W Mercury Vapor lights were found to have a ballast of 25W applied instead of 11W.

This will be resulting in a very minor estimated over submission of 222 kWh per annum. These have been passed to WDC to correct.

The monthly reporting is provided as a snapshot and does not track load at a daily level. Genesis is working with WDC to get this in place. Non-compliance is recorded below.

**Audit outcome**

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 2.1<br>With: Clause 11(1) of Schedule 15.3<br><br>From: 27-May-22<br>To: 06-Dec-22 | Nine ballast errors resulting in a very minor estimated over submission of 222 kWh per annum.<br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: Multiple times<br>Controls: Strong<br>Breach risk rating: 1 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | The controls are rated as strong as the processes to manage the database have been strengthened during the audit period and will mitigate risk to an acceptable level.<br>The impact is assessed to be very minor and therefore low, based on the kWh differences described above. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis notified Wairoa DC of the discrepancy and has received the updated RAMM extract for January where the ballast has been updated (attached for your reference)<br><br>Genesis has discussed the importance of tracking of change with WDC and have sent them a template to show the details required so tracking of change can be done at a daily level | 01/05/2023 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis continues to work with the council to increase accuracy levels in their database. | 01/05/2023 | |

## 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 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**

Each item of load has the correct ICP recorded.

**Audit outcome**

Compliant

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

**Code reference**

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

**Code related audit information**

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

**Audit observation**

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

**Audit commentary**

The database contains the nearest street address, displacement value and pole numbers and Global Positioning System (GPS) coordinates for majority of items of load and users in the office and field can view these locations on a mapping system.

**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. Analysis of the database found no blank records. The accuracy of lamp description, wattage and gear wattage is discussed in **section 3.1**.

**Audit outcome**

Compliant

## 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 110 items of load using the statistical sampling methodology.

**Audit commentary**

WDC have carried out 100% field audit since May 2022 and no errors were found in the field. This is an excellent improvement.

**Audit outcome**

Compliant

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

**Code reference**

*Clause 11(3) of Schedule 15.3*

**Code related audit information**

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

**Audit observation**

The ability of the database to track changes was assessed and the process for tracking of changes in the database was examined.

**Audit commentary**

The RAMM database functionality achieves compliance with the code.

**Audit outcome**

Compliant

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

### Code reference

*Clause 11(4) of Schedule 15.3*

### Code related audit information

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

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

### Audit observation

The database was checked for audit trails.

### Audit commentary

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 | Wairoa District Council |
| Strata | The database contains 801 items of load in the Wairoa District Council area and excludes NZTA lighting and any metered lights.<br>The processes for the management of items of load are the same, but I decided to place the items of load into four strata, as follows:<br>1. Road name A-C,<br>2. Road name D-L,<br>3. Road name M-O, and<br>4. Road name P-Z |
| Area units | I created a pivot table of the ICP in each area and I used a random number generator in a spreadsheet to select a total of 24 sub-units. |
| Total items of load | 110 items of load were checked. |

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority or the LED specifications.

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 110 items of load and found it to be 100% accurate. WDC have undertaken a 100% field audit since the last audit and the benefits of this is evident. Compliance is confirmed.

| Scenario | Description |
|---|---|
| A - **Good accuracy, good precision** | This scenario applies if:<br>(a) $R_H$ is less than 1.05; and<br>(b) $R_L$ is greater than 0.95<br>The conclusion from this scenario is that:<br>(a) the best available estimate indicates that the database is accurate within +/- 5 %; and<br>(b) this is the best outcome. |
| B - **Poor accuracy, demonstrated with statistical significance** | This scenario applies if:<br>(a) the point estimate of R is less than 0.95 or greater than 1.05<br>(b) as a result, either $R_L$ is less than 0.95 or $R_H$ is greater than 1.05.<br>There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level |
| C - **Poor precision** | This scenario applies if:<br>(a) the point estimate of R is between 0.95 and 1.05<br>(b) $R_L$ is less than 0.95 and/or $R_H$ is greater than 1.05<br>The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 % |

**Wattage and ballast accuracy findings**

The database contains two records for wattage, firstly the lamp wattage and secondly the gear wattage, which represents ballast losses.

The accuracy of the lamp description and the wattage was examined and found:

- four 100W HPS lights with a ballast of 13W but this should be 14W, and
- five 125W Mercury Vapor lights were found to have a ballast of 25W applied instead of 11W.

This will be resulting in a very minor estimated over submission of 222 kWh per annum.

**NZTA lighting**

NZTA lighting is recorded in the database, but this is being reconciled by NZTA in a separate RAMM database, so is outside of the scope of this audit.

**ICP accuracy**

All items of load have the correct ICP recorded.

**Location accuracy**

The database contains fields for the street address and also GPS coordinates. All items of load were locatable.

**Change management process findings**

Eastland Network is the streetlight contractor. A monthly claim is provided which includes the details of lights changed, added or removed, and these are updated manually. Now that the data in the database has been cleansed the monthly claim can be scrutinised and any anomalies can be identified and investigated.

**Audit outcome**

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 3.1<br>With: Clause 15.2 and 15.37B(b)<br><br>From: 27-May-22<br>To: 06-Dec-22 | Nine ballast errors resulting in a very minor estimated over submission of 222 kWh per annum.<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: Multiple times<br>Controls: Strong<br>Breach risk rating: 1 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | The controls are rated as strong as the processes to manage the database have been strengthened during the audit period and will mitigate risk to an acceptable level.<br>The impact is assessed to be very minor and therefore low, based on the kWh differences described above. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis notified Wairoa DC of the discrepancy and has received the updated RAMM extract for January where the ballast has been updated (attached for your reference) | 08/02/2023 | Cleared |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis continues to work with the council to increase accuracy levels in their database. | 08/02/2023 | |

## 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. The "burn time" is sourced from data loggers installed on the Eastland network.

I checked the submission calculations for October 2022 and confirmed they were correct.

The field audit confirmed the database to be accurate.

Analysis of the RAMM database identified only nine ballast errors:

- four 100W HPS lights with a ballast of 13W but this should be 14W, and
- five 125W Mercury Vapor lights were found to have a ballast of 25W applied instead of 11W.

This will be resulting in a very minor estimated over submission of 222 kWh per annum. These have been passed to WDC to correct.

The monthly reporting is provided as a snapshot and does not track load at a daily level. Genesis is working with WDC to get this in place. Non-compliance is recorded below.

### Audit outcome

Non-compliant

| Non-compliance | Description |
|---|---|
| Audit Ref: 3.2<br>With: Clause 15.2 and 15.37B(c)<br><br>From: 27-May-22<br>To: 06-Dec-22 | Nine ballast errors resulting in a very minor estimated over submission of 222 kWh per annum.<br>The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.<br>Potential impact: Low<br>Actual impact: Low<br>Audit history: Multiple times<br>Controls: Strong<br>Breach risk rating: 1 |
| **Audit risk rating** | **Rationale for audit risk rating** |
| **Low** | The controls are rated as strong as the processes to manage the database have been strengthened during the audit period and will mitigate risk to an acceptable level.<br>The impact is assessed to be very minor and therefore low, based on the kWh differences described above. |

| Actions taken to resolve the issue | Completion date | Remedial action status |
|---|---|---|
| Genesis notified Wairoa DC of the discrepancy and has received the updated RAMM extract for January where the ballast has been updated (attached for your reference)<br><br>Genesis has discussed the importance of tracking of change with WDC and have sent them a template to show the details required so tracking of change can be done at a daily level | 01/05/2023 | Identified |
| **Preventative actions taken to ensure no further issues will occur** | **Completion date** | |
| Genesis continues to work with the council to increase accuracy levels in their database. | 01/05/2023 | |

## CONCLUSION

WDC have undertaken a full field audit since the last audit. The field audit found no errors confirming that the database is accurate. A minor number of incorrect ballasts were identified, and these have been passed to WDC to correct.

The audit found three non-compliances and no recommendation are made. The future risk rating of three indicates that the next audit be completed in 24 months. I have considered this in conjunction with Genesis' comments and agree with this recommendation.

PARTICIPANT RESPONSE

Genesis continues to build on their relationship with the council. There has been very good response form WDC and updates have been made in RAMM as required. Genesis has discussed the importance of tracking of change with WDC and have sent them a template to show the details required so tracking of change can be done at a daily level.