ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

HAURAKI DISTRICT COUNCIL AND GENESIS ENERGY

Prepared by: Rebecca Elliot

Date audit commenced: 28 July 2023

Date audit report completed: 21 September 2023

Audit report due date: 01-Oct-23

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EXECUTIVE SUMMARY

This audit of the **Hauraki District Council Unmetered Streetlights** (**HDC**) 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.

This database switched to Genesis Energy from 8 July 2022.

The field work and asset data capture continue to be conducted by McKay Electrical using Pocket RAMM. HDC manage the database and Power Solutions produce the monthly wattage report, on behalf of the HDC, and provide this to Genesis monthly. Overall, the processes are robust. The field audit found that the database just fell outside of the allowable +/-5% allowable threshold due to a small number of incorrect wattages. There were no extra or missing lights found in the field.

This audit found three non-compliances and no recommendations are made. The future risk rating score of three indicates that the next audit be completed in 24 months. I have considered this in conjunction with Genesis's comments and the minor impact of the non-compliances found 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	The database is just outside of the allowable +/-5% threshold resulting in an estimated under submission of 3,900 kWh per annum.	Strong	Low	1	Investigating
Database accuracy	3.1	15.2 and 15.37B(b)	The database is just outside of the allowable +/-5% threshold resulting in an estimated under submission of 3,900 kWh per annum.	Strong	Low	1	Investigating
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database is just outside of the allowable +/-5% threshold resulting in an estimated under submission of 3,900 kWh per annum.	Strong	Low	1	Investigating
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	Clause	Recommendation
			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

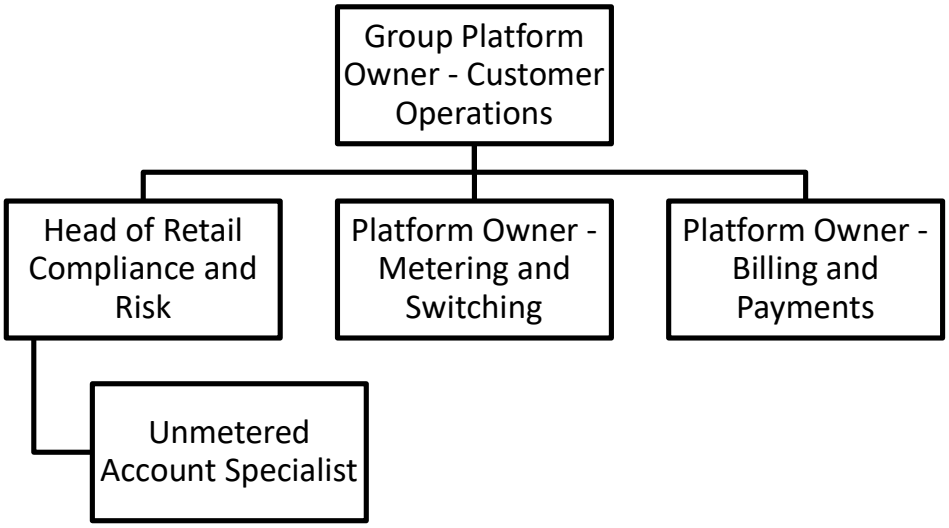
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit commentary

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
Johan van Staden	Risk and Compliance Specialist	Genesis Energy
Lukas De Haast	Transportation Manager	Hauraki DC
Jon Stevens	Projects Engineer	Power Solutions Ltd

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by thinkproject New Zealand Limited. The database is commonly known as "RAMM" which stands for "Road Assessment and Maintenance Management". The specific data used for DUML is held in the Streetlight tables. thinkproject New Zealand Limited backs up the database and assists with disaster recovery as part of their hosting service.

Access to the database is secure by way of password protection.

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

1.5. Breaches or Breach Allegations

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

1.6. ICP Data

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
1000508887PC891	ST_LIGHTS- Powerco	WKO0331	NST	1,236	51,483
1000588656PC0B8	Hauraki District Council Streetlights - Kopu GXP	KPU0661	NST	352	14,461
1000588657PCCFD	Hauraki District Council Streetlights - Waihou GXP	WHU0331	NST	2	99
1099570384CNB6C	Hauraki Streetlights Counties	BOB0331	NST	34	1,452
TOTAL				1,945	115,255

Waka Kotahi lights are recorded in the database for the purposes of being able to direct faults that relate to these lights to Waka Kotahi. These items of load are reconciled in the Waikato Waka Kotahi RAMM database and are outside of the scope of this audit.

1.7. Authorisation Received

All information was provided directly by Genesis, HDC and Power Solutions.

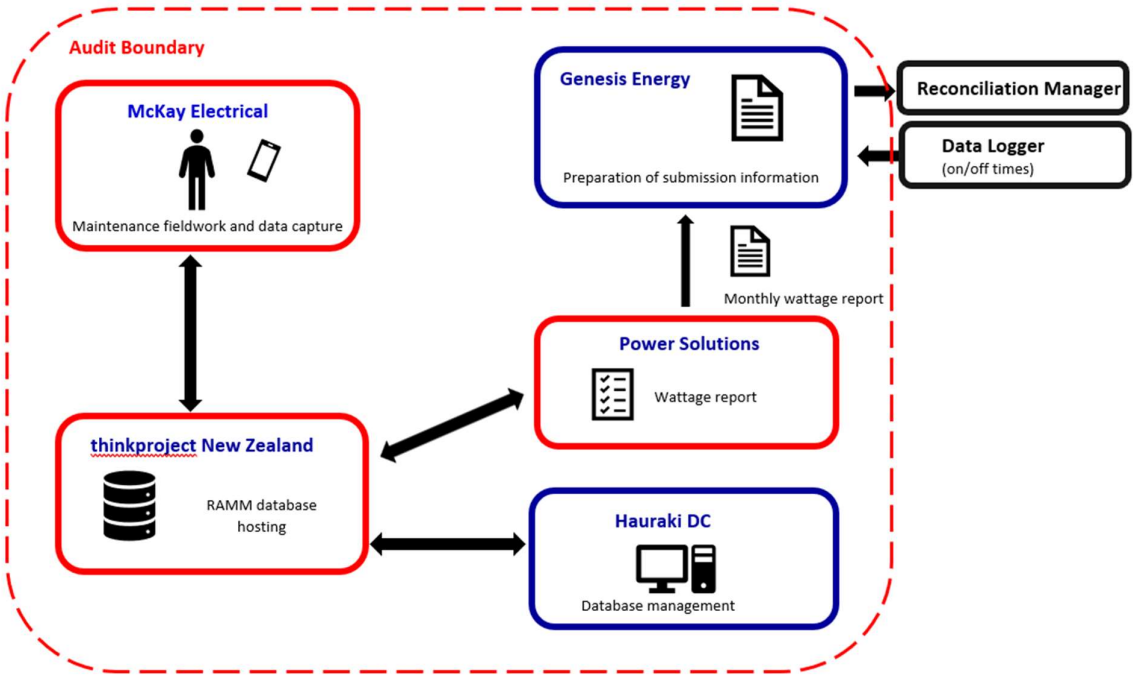
1.8. Scope of Audit

This audit of the Hauraki District Council Unmetered Streetlights (HDC) 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, which became effective on 1 June 2017.

The database is remotely hosted by thinkproject New Zealand Limited. The field work and asset data capture are conducted by McKay Electrical using Pocket RAMM for maintenance. HDC manage the database and Power Solutions produce the monthly wattage report, on behalf of the HDC, and provide this to Genesis on a monthly basis.

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



The field audit was undertaken of a statistical sample of 207 items of load on 6th September and the audit meeting was conducted via zoom on 21 September 2023.

1.9. Summary of previous audit

The previous audit was conducted for Meridian Energy in December 2021 by Rebecca Elliot of Veritek Limited. The current status of the non-compliance against the relevant clauses in that audit are shown in the table below.

Table of Non-compliances

Subject	Section	Clause	Non-Compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Seven 20W fluorescent lamps with no ballast recorded resulting in a very minor estimated under submission of 269 kWh per annum. Submission is based on a snapshot and does not consider historic adjustments.	Still existing for a different reason.
Description and capacity of load	2.4	11(2)(d) of Schedule 15.3	Seven 20W fluorescent lamps with no ballast recorded resulting in a very minor estimated under submission of 269 kWh per annum.	Cleared
Database accuracy	3.1	15.2 and 15.37B(b)	Seven 20W fluorescent lamps with no ballast recorded resulting in a very minor estimated under submission of 269 kWh per annum.	Cleared
Volume information accuracy	3.2	15.2 and 15.37B(c)	Seven 20W fluorescent lamps with no ballast recorded resulting in a very minor estimated under submission of 269 kWh per annum. Submission is based on a snapshot and does not consider historic adjustments.	Still existing for a different reason.

1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F)

Code reference

Clause 16A.26 and 17.295F

Code related audit information

Retailers must ensure that DUML database audits are completed:

1. *by 1 June 2018 (for DUML that existed prior to 1 June 2017),*
2. *within three months of submission to the reconciliation manager (for new DUML),*
3. *within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.*

Audit observation

Genesis have requested Veritek to undertake this streetlight audit.

Audit commentary

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

Audit outcome

Compliant

2. DUML DATABASE REQUIREMENTS

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

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

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

Audit observation

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

Audit commentary

Genesis reconciles 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 is sourced from data loggers installed on the Counties and Powerco networks.

I checked the submission calculation provided by Genesis for August 2023 and found that the values matched.

The field audit found that the database is not within the +/-5% allowable threshold resulting in an estimated under submission of 3,900 kWh per annum.

The database was examined and there were no additional or missing lights, but there were six incorrect wattages found.

Power Solutions provide a monthly wattage report with a separate report of changes made during the month to Genesis. The changes made are used to calculate the kW value at a daily level as required by the code.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Oct-21 To: 31-Aug-23	The database is just outside of the allowable +/-5% threshold resulting in an estimated under submission of 3,900 kWh per annum. Potential impact: Low Actual impact: Low Audit history: Three times previously Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as strong as they will mitigate risk to an acceptable level. The impact is assessed to be low as the database is relatively static so the volume of changes will have a minimal effect on submission.

Actions taken to resolve the issue	Completion date	Remedial action status
Field audit findings have been used to update the database and ensure accuracy.	1/10/2023	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Internal investigation to take place to determine how this took place and identify controls to put in place.	1/11/2023	

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

All electrically connected items of load had an ICP recorded in the database. Waka Kotahi lights are recorded in the database but are not reconciled from this database so are denoted by "NZTA-ICP".

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, pole numbers and Global Positioning System (GPS) coordinates for each item 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. All were populated correctly.

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 a statistical sample of 207 items of load.

Audit commentary

The field audit found no additional lights but did find six incorrect wattages recorded. These have been passed to HDC to investigate. The database accuracy is discussed in **section 3.1**.

Audit outcome

Compliant

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

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

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

Audit observation

The process for tracking of changes in the database was examined.

Audit commentary

The RAMM database functionality achieves compliance with the code.

The change management process and the compliance of the database reporting provided to Genesis is detailed in **sections 3.1** and **3.2**.

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	Hauraki plains area
Strata	The database contains items of load in Hauraki District Council area excluding the Waka Kotahi streetlights which are reconciled by Waka Kotahi. The area is across two networks. The processes for the management of HDC items of load are the same, but I decided to place the items of load into four strata, as follows: • Rural, • Paeroa, • Waihi A-L, and • Waihi M-Z.
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 56 sub-units.
Total items of load	207 items of load were checked.

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

The change management process and timeliness of database updates was evaluated.

Audit commentary

Database accuracy based on the field audit

A field audit was conducted of a statistical sample of 207 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	101.4	Wattage from survey is higher than the database wattage by 1.4%
R_L	100.1	With a 95% level of confidence, it can be concluded that the error could be between +0.1% and +6.6%
R_H	106.6	

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 0.1% and 6.6% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 1 kW higher than the database indicates.

There is a 95% level of confidence that the installed capacity is between 4 kW higher to the same as the database.

In absolute terms, total annual consumption is estimated to be 3,900 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 200 kWh p.a. to 19,000 kWh p.a. higher than the database indicates.

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

Lamp description and capacity accuracy

The database contains two records for wattage, firstly the lamp wattage and secondly the gear wattage, which represents ballast losses. A check of the database found all wattages and ballasts are populated correctly.

Waka Kotahi lighting

Waka Kotahi lights are recorded in the database but are not reconciled from this database so are denoted by "NZTA-ICP. This load is reconciled Waka Kotahi and is excluded from the scope of this audit.

ICP accuracy

All load has the correct ICP allocated.

Location accuracy

The location details were found to be accurate.

Change management process findings

Processes to track changes to the database were reviewed.

The process for new connections in new developments was discussed. Powerco require approval be given by the retailer and HDC before new streetlights are electrically connected. There can be a short gap between lights being livened and when they are reconciled due to the vesting process that requires sign off of the asset to the council and then the 224C is issued. The process is a lot tighter than it was previously but won't match the livening date as it appears that Powerco approved contractors will sometimes liven for testing and then leave them electrically connected or the developer wants them to be connected prior to vesting. Genesis intends to liaise with HDC and Powerco to discuss this process to see if this process can be tightened further.

For new streetlights such as infill lighting, HDC manage the end-to-end process and these changes are provided as part of the appended change report so that Genesis can account for these from the date they were electrically connected.

All fault and maintenance work is controlled by HDC and conducted by McKay Electrical through "RAMM Contractor" and once each job is completed the database is updated via field PDA's.

HDC has completed the main LED rollout and only the decorative lighting remains to be changed. HDC are still investigating options to upgrade these to LED in the future.

There are no festive lights connected to the streetlight circuits.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Oct-21 To: 31-Aug-23	In absolute terms, total annual consumption is estimated to be 3,900 kWh higher than the DUML database indicates. Potential impact: Low Actual impact: Low Audit history: Three times previously Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as strong as they will mitigate risk to an acceptable level. The impact is assessed to be low, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Field audit findings have been used to update the database and ensure accuracy.	1/10/2023	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Internal investigation to take place to determine how this took place and identify controls to put in place.	1/11/2023	

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 derived from RAMM and the "burn time" which is sourced from data loggers installed on the Counties and Powerco networks.

I checked the submission calculation provided by Genesis for August 2023 and found that the values matched.

The field audit found that the database is not within the +/-5% allowable threshold resulting in an estimated under submission of 3,900 kWh per annum.

The database was examined and there were no additional or missing lights, but there were six incorrect wattages found.

Power Solutions provide a monthly wattage report with a separate report of changes made during the month to Genesis. The changes made are used to calculate the kW value at a daily level as required by the code.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Oct-21 To: 31-Aug-23	The database is just outside of the allowable +/-5% threshold resulting in an estimated under submission of 3,900 kWh per annum. Potential impact: Low Actual impact: Low Audit history: Three times previously Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as strong as they will mitigate risk to an acceptable level. The impact is assessed to be low as the database is relatively static so the volume of changes will have a minimal effect on submission.

Actions taken to resolve the issue	Completion date	Remedial action status
Field audit findings have been used to update the database and ensure accuracy.	1/10/2023	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Internal investigation to take place to determine how this took place and identify controls to put in place.	1/11/2023	

CONCLUSION

This database switched to Genesis Energy from 8 July 2022.

The field work and asset data capture continue to be conducted by McKay Electrical using Pocket RAMM. HDC manage the database and Power Solutions produce the monthly wattage report, on behalf of the HDC, and provide this to Genesis monthly. Overall, the processes are robust. The field audit found that the database just fell outside of the allowable +/-5% allowable threshold due to a small number of incorrect wattages. There were no extra or missing lights found in the field.

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

PARTICIPANT RESPONSE

Both Genesis and the customer are comfortable with the level of compliance of this database. Findings from the audit, particularly the field audit have been used to update the database and both parties are thankful for this information.

Investigation will take place to determine the reason for the few inaccuracies found and determine how the risk of these can be mitigated for the future.

In line with the future risk rating, Genesis believe that a 24+ month period be given until the next audit of this database.