ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

HASTINGS DISTRICT COUNCIL AND GENESIS ENERGY

Prepared by: Steve Woods

Date audit commenced: 30 January 2018

Date audit report completed: 30 April 2018

Audit report due date: 01-Jun-18

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EXECUTIVE SUMMARY

This audit of the Hastings District Council **(HDC)** 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, which became effective on 1 June 2017.

The audit found six non-compliances.

The field audit found 34 discrepancies in total. I found five additional lamps in the field than were recorded in the database, three lamps in the database not present in the field and 26 incorrect wattages.

The database accuracy is assessed to be 89.8% indicating an estimated over submission of 269,200 kWh per annum.

24 lamp types have incorrect ballasts recorded, leading to under submission of 13,026 kWh per annum.

29 records have blank or unknown lamp wattages, leading to under submission of approximately 12,320 kWh per annum based on an average wattage of 97 watts

The future risk rating of 29 indicates that the next audit be completed in three months. Genesis has indicated remedial actions are targeted to be complete by October 2018; therefore I recommend the next audit is conducted in six months. 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 accuracy is assessed to be 89.8% indicating an estimated over submission of 269,200 kWh per annum	Moderate	High	6	Investigating
ICP identifier	2.2	11(2)(a) of Schedule 15.3	Two records with blank ICP	Moderate	Low	2	Investigating
Description and capacity	2.4	11(2)(c) of Schedule 15.3	29 records with blank or unknown lamp description	Moderate	Medium	4	Investigating
All load recorded in database	2.5	11(2A) of Schedule 15.3	All load is not recorded in the database (5 lamps missing from 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)	The database accuracy is assessed to be 89.8% indicating an estimated over submission of 269,200 kWh per annum 24 lamp types have incorrect ballasts recorded, leading to under submission of 13,026 kWh per annum. 29 records have blank or unknown lamp wattages, leading to under submission of approximately 12,320 kWh per annum based on an average wattage of 97 watts	Weak	High	9	Investigating
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database accuracy is assessed to be 95.9% indicating an estimated over submission of 106,900 kWh per annum	Moderate	High	6	Investigating
					Future Risk Rating	**29**	

Future risk rating	1-3	4-6	7-8	9-17	18-26	27+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Description	Action
		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

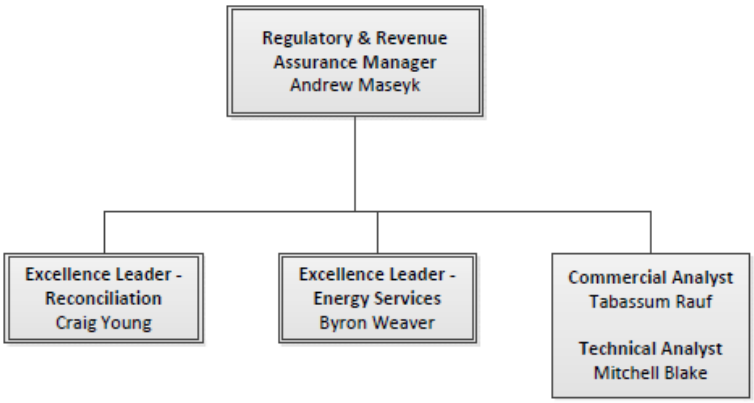
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

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
Craig Young	Excellence Leader- Reconciliation	Genesis Energy
Grace Hawken	Technical Specialist - Reconciliations	Genesis Energy

	Team	
Marius Van Niekerk	Transportation Asset Manager	Hastings DC
Martin Hunter	RAMM Technician	MWH

1.4. Hardware and Software

The SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management".

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

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)
0000939902HBFF4	Streetlight master ICP Urban	FHL0331	7,096	0000939902HBFF4	694,839
0000939904HBE7B	Streetlight master ICP Rural	FHL0331	236	0000939904HBE7B	25,161

1.7. Authorisation Received

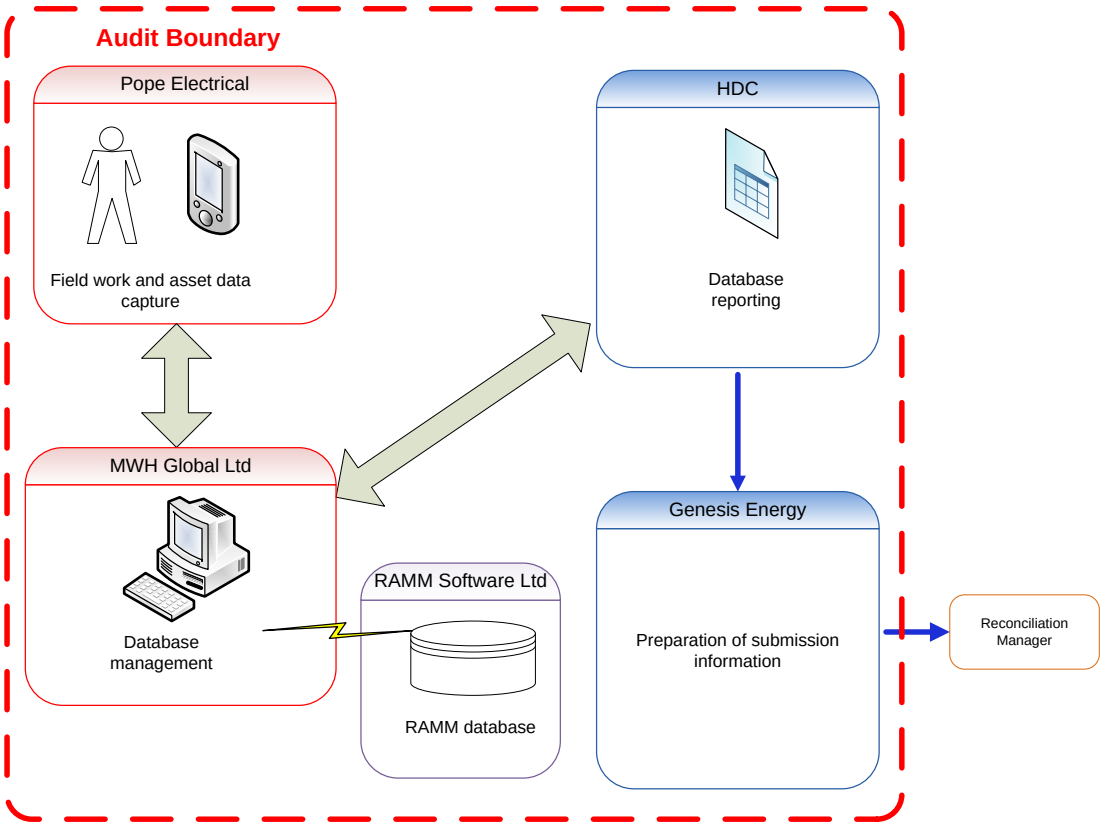
All information was provided directly by Genesis or HDC.

1.8. Scope of Audit

This audit of the HDC 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.

The database is remotely hosted by RAMM Software Ltd. The field work, asset data capture and database population is conducted by Pope Electrical. The database is managed by MWH Global on behalf of Hastings District Council. 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.



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

The audit was carried out at HDC's premises in Hastings on January 30th 2018. A field audit was conducted of 297 items of load.

1.9. Summary of previous audit

Genesis provided a copy of the last audit report undertaken by Rebecca Elliot of Veritek Limited in March 2017. The table below records the findings.

Table of Non-Compliance

Subject	Section	Clause	Non compliance	Status
Deriving Submission	2.1	11(1) of schedule 15.3	Estimated under submission of 17,499 kWh per annum due to incorrect ballast being applied.	Still existing
ICP Identifier	2.2	11(2)(a) of schedule 15.3	103 metered items of load have the UML ICP assigned to them in RAMM.	Still existing
Description of load type	2.4	11(2)(c) of schedule 15.3	Incorrect lamp descriptions. LED wattages recorded as ballast wattages.	Still existing
Capacity of load	2.4	11(2)(d) of schedule 15.3	Incorrect ballast being applied resulting in an estimated under submission of 17,499 kWh per annum	Still existing
Tracking of load changes	2.6	11(3) of schedule 15.3	Incorrect light wattages recorded for 19 items of load and one less light found in the field.	Still existing

Table of Recommendations

Subject	Section	Clause	Recommendation for Improvement	Status
			Nil	

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 3 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. Compliance is confirmed

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.

I checked the December 2017 extract provided by HDC against the submission totals supplied by Genesis and found that submission matched the database.

The methodology for deriving submission information is compliant but there is some inaccurate data within the database used to calculate submissions. This is recorded as non-compliance and discussed in **section 3.1** and **3.2**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Apr-17 To: 31-Jan-18	The database accuracy is assessed to be 89.8% indicating an estimated over submission of 269,200 kWh per annum Potential impact: High Actual impact: High Audit history: Once Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time but there are still some errors. The impact is assessed to be high, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis have contacted the database administrator. The information pertaining to the audit will be investigated and updated as required.	10/2018	Investigating

Preventative actions taken to ensure no further issues will occur	Completion date	
Genesis make all efforts to revise information supplied from 3rd parties, however also rely on 3rd party processes to ensure accuracies are upheld	10/2018	

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 the correct ICP was recorded against each item of load.

Audit commentary

The database has the ICP identifier recorded against all but 2 items of load.

There are 103 items of load with the unmetered ICP load allocated in RAMM when in fact they are indicated as metered. I checked the monthly wattage report and confirmed that they are correctly excluded from the monthly wattage report but do have the incorrect ICP assigned to them in RAMM. This is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.2 With: Clause 11(2)(a) of Schedule 15.3 From: 01-Apr-17 To: 31-Jan-18	Two records with blank ICP 103 metered records with an unmetered ICP Potential impact: Medium Actual impact: Low Audit history: Once Controls: Moderate Breach risk rating: 2		
Audit risk rating	**Rationale for audit risk rating**		
Low	The controls are recorded as moderate because there is room for improvement. The impact on settlement and participants is minor; therefore the audit risk rating is low.		
Actions taken to resolve the issue		**Completion date**	**Remedial action status**

Genesis have contacted the database administrator. The information pertaining to the audit will be investigated and updated as required.	10/2018	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis make all efforts to revise information supplied from 3rd parties, however also rely on 3rd party processes to ensure accuracies are upheld	10/2018	

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 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. This system is viewed as very robust.

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

Audit commentary

Fields exist in RAMM for lamp make and model. I analysed the database and found 29 records with blank or unknown lamp types. They all had a blank wattage as well. This is quantified in Section 2.5.

The analysis has been provided to MWH Global to progress. The inaccuracies are recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) of Schedule 15.3 From: 01-Mar-17 To: 31-Jan-18	29 records with blank or unknown lamp description Potential impact: Medium Actual impact: Medium Audit history: Once Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are recorded as moderate because there is room for improvement. The impact on settlement is medium because under submission has occurred by approximately 12,320 kWh per annum based on an average wattage of 97 watts; the audit risk rating is medium.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis have contacted the database administrator. The information pertaining to the audit will be investigated and updated as required.	10/2018	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis make all efforts to revise information supplied from 3rd parties, however also rely on 3rd party processes to ensure accuracies are upheld	10/2018	

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 297 lights using the statistical sampling methodology. The population was divided into the following strata:

1. Amenity
2. Hastings urban
3. Havelock urban

4. New
5. NZTA
6. Rural

Audit commentary

The field audit findings are detailed in the table below and show some discrepancies.

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments
Amenity					
KEIRUNGA GARDENS_1	1	1	-	-	
LYNDON ROAD EAST	3	3	-	-	
ORCHARD ROAD	2	2	-	-	
SWANSEA ROAD	19	19	-	-	
TUI PLACE EXTN	2	2	-	-	
Hastings Urban					
CAROLINE PLACE	3	3	--	-	
CONWAY STREET	4	4	-	-	
DALCROSS STREET	2	2	-	-	
EDWARDS STREET	4	4	-	1	70SON replaced with 28LED
FRIMLEY OAKS	3	3	-	-	
GARNETT STREET	6	6	-	6	Five 70 SON actually 80MV, one 70SON replaced with 28LED
GARRY STREET	4	4	-	1	35MH replaced with 28LED
KINGSLEY DRIVE	18	18	-	-	
KIWI LANE	1	1	-	-	
LOCHHEAD STREET	5	5	-	-	
MAIRANGI STREET	5	5	-	4	Four 80MV replaced with 21LED
MAXVILLE DRIVE	9	9	-	5	Five 35MV replaced with 28LED
NGAIO STREET	11	11		-	
NIKAU STREET	13	13	-	5	Five 35MV replaced with 28LED
WHITEHEAD ROAD	19	20	+1	-	Additional found in field

Street/Area	Database Count	Field Count	Lamp no. difference	No of incorrect lamp wattage	Comments
Havelock Urban					
ARCADIA LANE	1	1	-	-	
CHAMBERS STREET	14	14	-	-	
KEITH SANDS GROVE	2	2	-	-	
MARGARET AVENUE	16	16	-	4	Four 70SON actually 80MV
PLASSEY STREET	8	8	-	-	
WASHINGTON PLACE	4	4	-	-	
New					
INGLIS PLACE	3	3	-	-	
LOCHHEAD STREET	5	5	-	-	
NORTHWOOD AVENUE	22	22	-	-	
Smidt	0	4	+4	-	
SUE PLACE	4	4	-	-	
NZTA					
Main Rd SH2	36	36	-	-	
Rural					
PAKOWHAI ROAD	25	22	-3	-	Three missing from field where roadwork is occurring
TE HEIPORA PLACE	4	4	-	-	
TOTAL	278	280	+2	26	

The field audit found some lamp wattage discrepancies and three roads had a different count. This is recorded as non-compliance. 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: 01-Apr-17 To: 31-Jan-18	All load is not recorded in the database (5 lamps missing from database) Potential impact: Low Actual impact: Low Audit history: Once Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time. The impact is assessed to be low, based on the number of differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis have contacted the database administrator. The information pertaining to the audit will be investigated and updated as required.	10/2018	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis make all efforts to revise information supplied from 3rd parties, however also rely on 3rd party processes to ensure accuracies are upheld	10/2018	

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

Any changes that are made during any given month take effect from the beginning of that month. The information is available which would allow for the total load in kW to be retrospectively derived for any day. On September 20th 2012, the Authority sent a memo to Retailers and auditors advising that tracking of load changes at a daily level was not required as long as the database contained an audit

trail. I have interpreted this to mean that the production of a monthly "snapshot" report is sufficient to achieve compliance.

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance. All fault and maintenance work conducted by Pope Electrical through "RAMM Contractor" and once each job is completed the database is updated via field PDA's. There is an invoice checking process conducted by HDC which helps to ensure database accuracy. The quarterly outage patrols also involve a check of database accuracy.

When lighting in new subdivisions is connected, "as built" plans are supplied to HDC and then Pope Electrical checks the lights in the field prior to populating the database.

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

HDC demonstrated 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	Hastings District Council
Strata	The database contains items of load in the Hastings District Council area. The processes for the management of items of load are the same, but I decided to place the items of load into six strata, as follows: 1. Amenity 2. Hastings urban 3. Havelock urban 4. New 5. NZTA 6. Rural
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 34 subunits.
Total items of load	219 items of load were checked.

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

Audit commentary

The DUML database auditing tool provided a result indicating the field data was 89.8% of the database data. This will result in an estimated over submission by 269,200 kWh per annum.

The field audit found 26 incorrect wattages, five lamps in the field not in the database and three lamps in the database not in the field.

24 lamp types have incorrect ballasts recorded, leading to under submission of 13,026 kWh per annum.

29 records have blank or unknown lamp wattages, leading to under submission of approximately 12,320 kWh per annum based on an average wattage of 97 watts.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Apr-17 To: 30-Apr-18	The database accuracy is assessed to be 89.8% indicating an estimated over submission of 269,200 kWh per annum 24 lamp types have incorrect ballasts recorded, leading to under submission of 13,026 kWh per annum. 29 records have blank or unknown lamp wattages, leading to under submission of approximately 12,320 kWh per annum based on an average wattage of 97 watts Potential impact: High Actual impact: High Audit history: Once Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as weak, because there are several different sources of inaccuracy, some of which have been present since the last audit. The impact is assessed to be high, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis have contacted the database administrator. The information pertaining to the audit will be investigated and updated as required.	10/2018	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis make all efforts to revise information supplied from 3rd parties, however also rely on 3rd party processes to ensure accuracies are upheld	10/2018	

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
- 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.

I checked the December 2017 extract provided by HDC against the submission totals supplied by Genesis and found that submission matched the database.

The methodology for deriving submission information is compliant but there is some inaccurate data within the database used to calculate submissions. This is recorded as non-compliance and discussed in **section 3.1** and **3.2**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Apr-17 To: 31-Jan-18	The database accuracy is assessed to be 89.8% indicating an estimated over submission of 269,200 kWh per annum Potential impact: High Actual impact: High Audit history: Once Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time but there are still some errors. The impact is assessed to be high, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis have contacted the database administrator. The information pertaining to the audit will be investigated and updated as required.	10/2018	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis make all efforts to revise information supplied from 3rd parties, however also rely on 3rd party processes to ensure accuracies are upheld	10/2018	

CONCLUSION

The audit found six non-compliances.

The field audit found 34 discrepancies in total. I found five additional lamps in the field than were recorded in the database, three lamps in the database not present in the field and 26 incorrect wattages.

The database accuracy is assessed to be 89.8% indicating an estimated over submission of 269,200 kWh per annum.

24 lamp types have incorrect ballasts recorded, leading to under submission of 13,026 kWh per annum.

29 records have blank or unknown lamp wattages, leading to under submission of approximately 12,320 kWh per annum based on an average wattage of 97 watts

PARTICIPANT RESPONSE

Genesis has populated an indicative completion date, however 3rd party field audit completion will determine actual amendment date.