ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

HASTINGS DISTRICT COUNCIL AND GENESIS ENERGY

Prepared by: Steve Woods

Date audit commenced: 15 April 2019

Date audit report completed: 13 May 2019

Audit report due date: 01-Jun-19

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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.

A RAMM database is managed by HDC and monthly reporting is provided to Genesis. The database is remotely hosted by RAMM Software Ltd. The field work, asset data capture and database population is conducted by Pope Electrical.

The field audit was undertaken of a statistical sample of 347 items of load on 15/04/19.

The audit identified one issue, which is recorded in three sections. Some ballast figures were incorrect and need to be updated.

The field data was 98.2% of the database data for the sample checked. The statistical sampling tool reported with 95% confidence the precision of the sample was 6.7% and the true load in the field will be between 94.6% to 101.3% of the load recorded in the database.

There will be approximately 44,900 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool) of over submission. The statistical sampling tool reported with 95% confidence the estimated impact will be between 137,800 kWh per annum over submission and 33,100 kWh per annum under submission. This falls within the acceptable database accuracy variance of +/- 5% as advised by the Electricity Authority, therefore compliance is recorded for database accuracy.

The future risk rating of six indicates that the next audit be completed in 18 months.

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	Incorrect ballasts applied resulting in an estimated 5,727 kWh over submission.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	Incorrect ballasts applied resulting in an estimated 5,727 kWh over submission.	Moderate	Low	2	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	Incorrect ballasts applied resulting in an estimated 5,727 kWh over submission.	Moderate	Low	2	Identified
					Future Risk Rating	**6**	

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	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

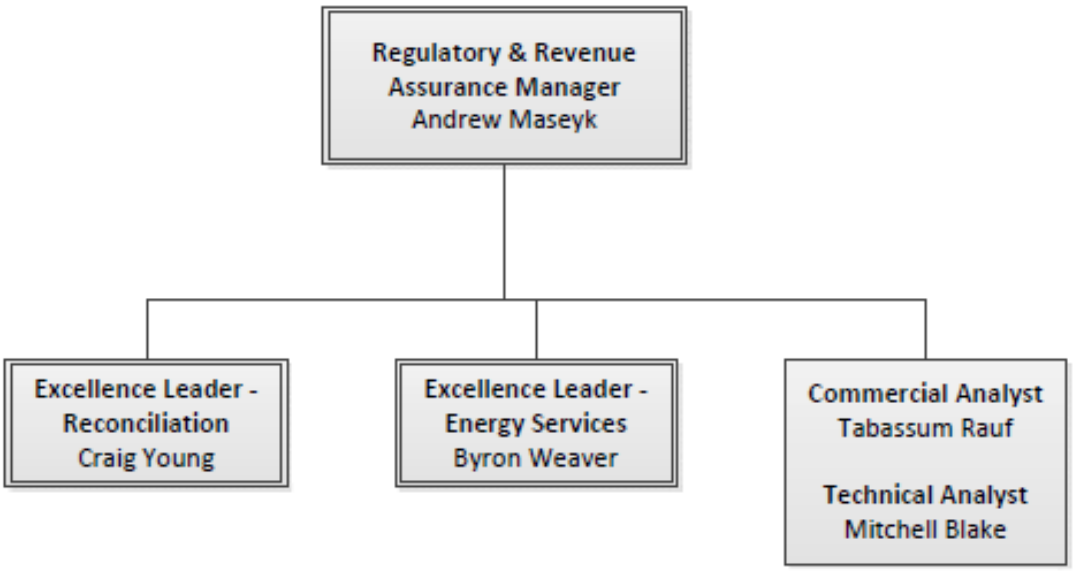
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit commentary

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
Steve Woods	Lead Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Craig Young	Excellence Leader - Reconciliation	Genesis Energy
Grace Hawken	Technical Specialist - Reconciliations Team	Genesis Energy
Marius Van Niekerk	Transportation Asset Manager	Hastings DC

1.4. Hardware and Software

The RAMM database used for the management of DUML is remotely hosted by RAMM Software Ltd.

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	Street Lighting Master ICP	FHL0331	NST	7,060	570,496
0000939904HBE7B	Street Lights – Rural – Master ICP	FHL0331	NST	236	24,080

1.7. Authorisation Received

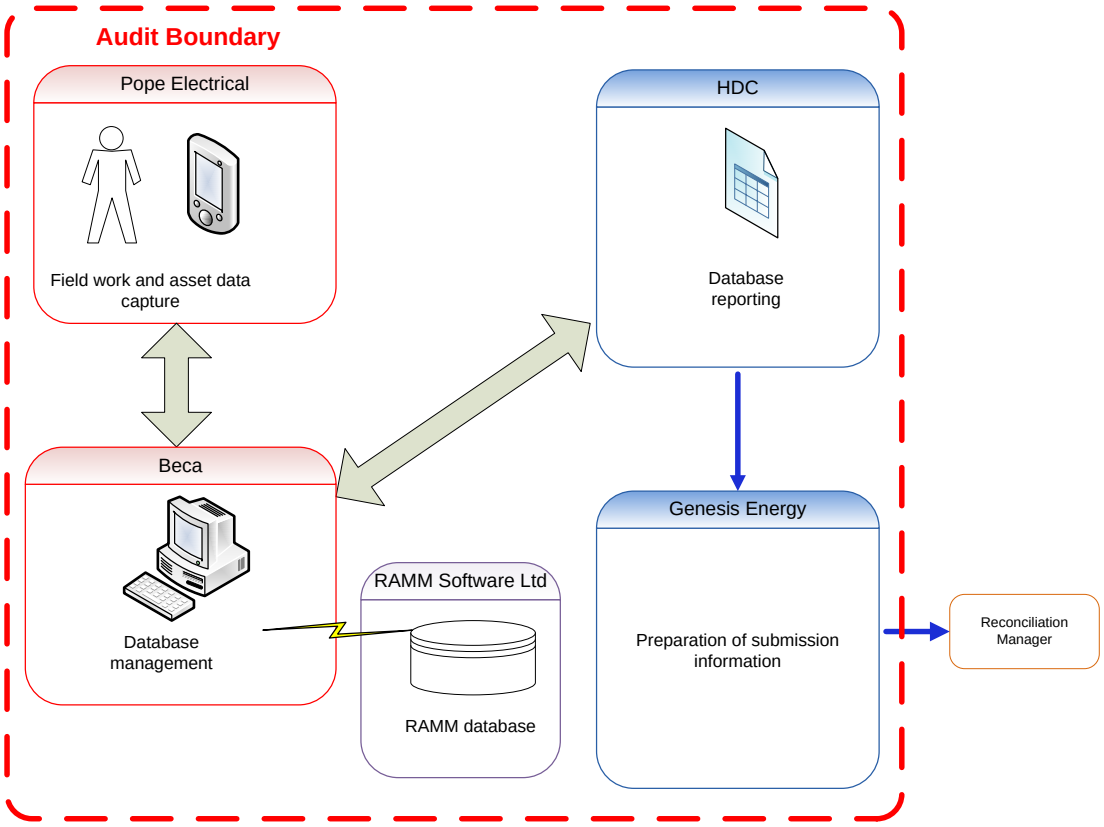
All information was provided directly by Genesis or HDC.

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.

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 Beca Limited on behalf of HDC. 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.

The audit was carried out at HDC's premises in Hastings on 15/04/19. A field audit was conducted of 347 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 October 2018. The table below records the findings.

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Incorrect ballasts applied resulting in an estimated 13,796.7 kWh under submission. 14 records have blank or unknown lamp wattages, leading to over submission of approximately 16,828 kWh per annum.	Mostly resolved
Description and capacity	2.4	11(2)(c) of Schedule 15.3	14 records with blank or unknown lamp description.	Cleared
Database accuracy	3.1	15.2 and 15.37B(b)	14 records have blank or unknown lamp wattages, leading to over submission of approximately 16,828 kWh per annum. Incorrect ballasts applied in the database resulting in an estimated 13,796.7 kWh per annum under submission. 92 metered lamps recorded incorrectly against an unmetered ICP.	Mostly resolved
Volume information accuracy	3.2	15.2 and 15.37B(c)	Submission calculation difference leading to a 3 kWh over submission for the month of September. Incorrect ballasts applied resulting in an estimated 13,796.7 kWh under submission. 14 records have blank or unknown lamp wattages, leading to over submission of approximately 16,828 kWh per annum.	Mostly resolved

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 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. 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 submission calculation provided by Genesis and found the correct kW and hours figures were used.

There is some inaccurate data within the database used to calculate submissions as detailed in the table below. This is recorded as non-compliance and discussed in **sections 2.4, 3.1** and **3.2**.

Issue	Volume information impact (annual kWh)
Incorrect ballasts applied	5,727 kWh over submission

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Nov-17 To: 15-Apr-19	Incorrect ballasts applied resulting in an estimated 5,727 kWh over submission. Potential impact: Medium Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 1		
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, but there are still some errors. 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**

Genesis has raised these with Hastings DC and requested the ballast exceptions to be corrected.	01/07/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis will review and report exceptions back to Hastings DC monthly where exceptions are identified.	01/06/2019	

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

All items of load have an ICP recorded against them.

Audit outcome

Compliant

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

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The database contains fields for the street address and also GPS coordinates. There are three records that do not have GPS coordinates, but in all cases the item of load can be located by the address.

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, 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 no blank or inaccurate records.

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

- Amenity
- Roading A-H
- Roading I-M
- Roading N-Z
- NZTA.

Audit commentary

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

Road	SLIM Pole	DB watts	Field watts	Comments
JOLL ROAD	33167	200	0.0	Festive lights, need a process to add these just for December and January
OAKLEIGH DOWNS	39261	21	103	80W MV installed here
BALLANTYNE STREET	41827	28	103	80W MV installed here
NAPIER ROAD	33154	82	0.0	Not there
NAPIER ROAD	33160	82	0.0	Not there
REEVE DRIVE	33863	103	20	LED installed here
ST HILL LANE	34318	115	68	LED installed here
USHERWOOD CRESCENT	34528	103	20	LED installed here

The field audit found six lamp wattage discrepancies and one road that has a different count.

This clause relates to lights in the field not recorded in the database. There were no additional lamps found in the field.

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

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 20th September 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 database tracks additions and removals as required by this clause.

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance. All fault and maintenance work is 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. Lamp outages are predominately notified to HDC by residents from which work requests are made to Pope Electrical.

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

The database has a complete 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	Hastings District Council streetlights
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 five strata, as follows: • Amenity • Roading A-H • Roading I-M • Roading N-Z • NZTA.
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 47 sub-units.
Total items of load	347 items of load were checked.

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

Audit commentary

The field data was 98.2% of the database data for the sample checked. The statistical sampling tool reported with 95% confidence the precision of the sample was 6.7% and the true load in the field will be between 94.6% to 101.3% of the load recorded in the database.

There will be approximately 44,900 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool) of over submission. The statistical sampling tool reported with 95% confidence the estimated impact will be between 137,800 kWh per annum over submission and 33,100 kWh per annum under submission. This falls within the acceptable database accuracy variance of +/- 5% as advised by the Electricity Authority, therefore compliance is recorded for database accuracy.

As detailed in **section 2.1**, incorrect ballasts are applied resulting in an estimated 5,727 kWh over submission.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Nov-17 To: 15-Apr-19	Incorrect ballasts applied resulting in an estimated 5,727 kWh over submission. Potential impact: High Actual impact: Low Audit history: Twice 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 the database is accurate most of the time. 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
Genesis has raised these with Hastings DC and requested the ballast exceptions to be corrected.	01/07/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis will review and report exceptions back to Hastings DC monthly where exceptions are identified.	01/06/2019	

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.

There is some inaccurate data within the database used to calculate submissions as detailed in the table below. This is recorded as non-compliance and discussed in **section 2.4** and **3.1**.

Issue	Volume information impact (annual kWh)
Incorrect ballasts applied	5,727 kWh over submission

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Nov-17 To: 15-Apr-19	Incorrect ballasts applied resulting in an estimated 5,727 kWh over submission. Potential impact: High Actual impact: Low Audit history: Twice 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 but there are still some errors. 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
Genesis has raised these with Hastings DC and requested the ballast exceptions to be corrected.	01/07/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis will review and report exceptions back to Hastings DC monthly where exceptions are identified.	01/06/2019	

CONCLUSION

The audit identified one issue, which is recorded in three sections. Some ballast figures were incorrect and need to be updated.

The field data was 98.2% of the database data for the sample checked. The statistical sampling tool reported with 95% confidence the precision of the sample was 6.7% and the true load in the field will be between 94.6% to 101.3% of the load recorded in the database.

There will be approximately 44,900 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool) of over submission. The statistical sampling tool reported with 95% confidence the estimated impact will be between 137,800 kWh per annum over submission and 33,100 kWh per annum under submission. This falls within the acceptable database accuracy variance of +/- 5% as advised by the Electricity Authority, therefore compliance is recorded for database accuracy.

The future risk rating of six indicates that the next audit be completed in 18 months.

PARTICIPANT RESPONSE

Genesis have worked closely with Hastings DC in which reflects the current state of the dataset. Genesis is requesting a 24 month review due to minor ballast issue that will be cleared by the council. Genesis also would like to highlight that the 6 risk points calculated are all for the same non-compliance over 3 different sections of the audit.