ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

HASTINGS DISTRICT COUNCIL AND GENESIS ENERGY

Prepared by: Rebecca Elliot

Date audit commenced: 1 October 2018

Date audit report completed: 7 November 2018

Audit report due date: 01-Dec-18

TABLE OF CONTENTS

Executive summary 3
Audit summary 3

Non-compliances 3
Recommendations 5
Issues 5

1. Administrative 6

1.1. Exemptions from Obligations to Comply with Code 6
1.2. Structure of Organisation 6
1.3. Persons involved in this audit 6
1.4. Hardware and Software 7
1.5. Breaches or Breach Allegations 7
1.6. ICP Data 7
1.7. Authorisation Received 7
1.8. Scope of Audit 8
1.9. Summary of previous audit 9
1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F) 10

2. DUML database requirements 11

2.1. Deriving submission information (Clause 11(1) of Schedule 15.3) 11
2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3) 12
2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3) 13
2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3) 13
2.5. All load recorded in database (Clause 11(2A) of Schedule 15.3) 14
2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3) 17
2.7. Audit trail (Clause 11(4) of Schedule 15.3) 17

3. Accuracy of DUML database 19

3.1. Database accuracy (Clause 15.2 and 15.37B(b)) 19
3.2. Volume information accuracy (Clause 15.2 and 15.37B(c)) 22

Conclusion 25

Participant response 26

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 318 items of load on 8th October 2018.

The audit found four non-compliances. These relate to incorrect ballasts and wattages recorded in the database. A small variance was found in relation to the submission calculation for the month of September. These issues should be relatively easy to correct.

The field audit findings found a high level of accuracy and the database accuracy fell within the accepted variance range.

The future risk rating of 16 indicates that the next audit be completed 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	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.	Moderate	Medium	4	Identified
Description and capacity	2.4	11(2)(c) of Schedule 15.3	14 records with blank or unknown lamp description.	Moderate	Medium	4	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
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.	Moderate	Medium	4	Identified
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.	Moderate	Medium	4	Investigating
					Future Risk Rating	**16**	

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

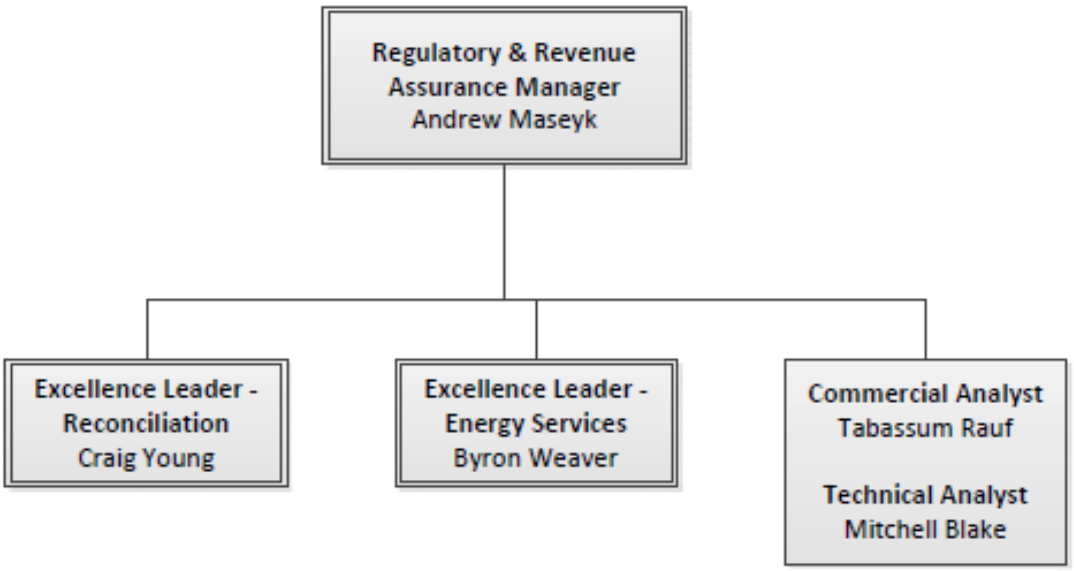
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

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
Rebecca Elliot	Lead Auditor
Debbie Anderson	Supporting 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
Hassan Salarpour	Senior Asset Manager	Beca Limited

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	7,055	618,309
0000939904HBE7B	Street Lights – Rural – Master ICP	FHL0331	NST	236	24,967

Excluding items of load in the database that are described as metered.

1.7. Authorisation Received

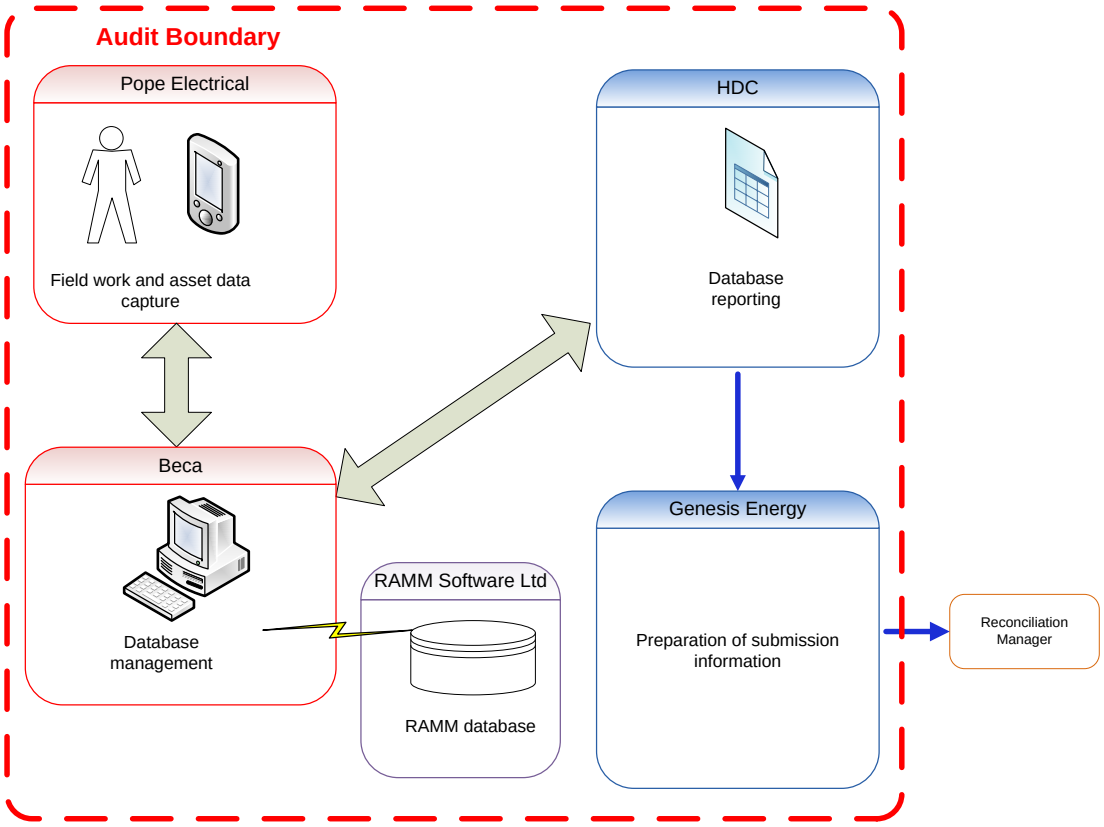
All information was provided directly by Genesis or HDC.

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 8th October 2018. A field audit was conducted of 318 items of load.

1.9. Summary of previous audit

Genesis provided a copy of the last audit report undertaken by Steve Woods of Veritek Limited in April 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	The database accuracy is assessed to be 89.8% indicating an estimated over submission of 269,200 kWh per annum.	Still Existing
ICP identifier	2.2	11(2)(a) of Schedule 15.3	Two records with blank ICP.	Cleared
Description and capacity	2.4	11(2)(c) of Schedule 15.3	29 records with blank or unknown lamp description.	Still Existing
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).	Cleared
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.	Still Existing
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.	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 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 a minor difference of less than 3kWh over submission which appears to be due to a slightly different data logger value being used. This is recorded as non-compliance in **section 3.2**.

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	13,796.7 kWh under submission
Ballast applied to lamps with no lamp description or wattage	16,828 kWh over submission

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Feb-17 To: 24-Sep-18	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. 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 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 medium, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis analysed the detailed data being provided to Genesis. Genesis has found the only blank/zero listed lamp items are in fact for driver feedback signs and pay and display chargers listed in the database. Genesis have sent HDC the dataset error and have requested these to be amended. Genesis has analysed the process of deriving the total kWh's and has found that it rounds up the value as its rounded to 2 decimal places. Genesis are investigating whether Gentrack can accept decimal places greater than 2 in the TOU billing module.	01/03/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis analyses the data each month feedback any erroneous data and make the necessary changes for settlements/billing processes.	01/03/2019	

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.

There are 92 items of load with the unmetered ICP load allocated in RAMM when in fact they are indicated as metered. This has improved from the 103 noted last audit. I checked the monthly wattage report and confirmed that they are correctly excluded from the monthly wattage report but have the incorrect ICPs assigned to them in RAMM. This is recorded as non-compliance in **section 3.1**.

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 14 records with lamp types that were blank or have the word 'unknown' populated and zero wattage recorded. Of these 12 have a wattage value of between 200-460W recorded in the ballast field and the remaining two have no lamp or ballast wattage recorded. I have assumed these to be 35W metal halide (the most popular lamp type recorded in the database and a check of a sample on google Earth confirmed this to be likely correct). This will be resulting in an estimated 16,828 kWh of over submission.

The analysis has been provided to HDC to progress. The missing values are recorded as non-compliance. The accuracy of this data is detailed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) of Schedule 15.3 From: 01-Feb-17 To: 24-Sep-18	14 records with blank or 'unknown' lamp description and missing wattage values. 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 audit risk rating is medium due to the estimated over submission by approximately 16,828 kWh per annum.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis analyzed the detailed data being provided to Genesis. Genesis has found the only blank/zero listed lamp items are in fact for driver feedback signs and pay and display chargers listed in the database. Genesis have sent HDC the dataset error and have requested these to be amended.	01/03/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis analyses the data each month feedback any erroneous data and make the necessary changes for settlements/billing processes.	01/03/2019	

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

- Amenity
- Roading
- NZTA

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	18	18	-		
HASTINGS URBAN	14	14	-		
CAMBRIDGE COURT	2	2	-		
CORNWALL PARK	7	7	-		
HENDERSON ROAD	2	2	-		
KERERU HEIGHTS	3	3	-		
HAV. NTH URBAN	3	3	-		
LIPSCOMBE CRESCENT	3	3	-		
OTHER	2	2	-		
RUAHAPIA ROAD	2	2	-		
Roading	292	291	-1	3	
HASTINGS RURAL	6	6	-	1	
LYNDHURST ROAD	6	6	-	1	70W HPS is a 28W LED
HASTINGS URBAN	178	177	-1		
BLEDISLOE PLACE	2	2	-		
BLEDISLOE STREET	10	10	-		
CANNING ROAD	7	7	-		
FRANCIS HICKS AVENUE	16	16	-		
HART DRIVE	4	4	-		
LOUIE STREET	12	12	-		
LYNDHURST ROAD	10	10	-		
MARTIN DALE	3	3	-		
ORCHARD ROAD	32	32	-		
PATTISON ROAD	6	6	-		
POPLAR PLACE	3	3	-		
RIVERSLEA ROAD SOUTH	33	32	-1		Duplicate in the database 1 x 100W HPS less
RURU PLACE	2	2	-		
SYMONS STREET	5	5	-		
TENBY TERRACE	8	8	-		
WARREN STREET NORTH	20	20	-		
WILKES PLACE	5	5	-		
HAV. NTH RURAL	4	4	-		
TE HEIPORA PLACE	4	4	-		
HAV. NTH URBAN	59	59	-	2	
AOTEA CRESCENT	3	3	-	1	70W MV is a 28W LED

BUSBY PLACE	3	3	-		
EVEREST AVENUE	6	6	-		
GRANT STREET	5	5	-		
HODGE TERRACE	5	5	-		
KAWEKA PLACE	5	5	-		
LIPSCOMBE CRESCENT	16	16	-		
LOVAT STREET	2	2	-		
PANCKHURST STREET	4	4	-	1	35W MH is a 28W LED
SEFTON STREET	7	7	-		
VON DADELSZEN PLACE WEST FORK	3	3	-		
NEW	7	7			
HART DRIVE	2	2	-		
IRONGATE ROAD EAST	5	5			
OTHER	38	38	-		
RIVERSLEA ROAD SOUTH	4	4	-		
RUAHAPIA ROAD	4	4	-		
BRECKENRIDGE ROAD	2	2	-		
DARTMOOR ROAD	9	9	-		
LONGLANDS ROAD EAST	6	6	-		
LONGLANDS ROAD WEST	2	2	-		
MANGAROA ROAD	2	2	-		
PUKETAPU ROAD	8	8	-		
STROME ROAD	1	1	-		
Transit New Zealand	7	7	-		
OTHER	7	7	-		
STATE HIGHWAY 2 SOUTH	7	7	-		
Grand Total	**317**	**316**	**-1**	**3**	

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

This clause relates to lights in the field not recorded in the database. The one road discovered with a lamp count discrepancy, Riverslea Road South, has one fewer lamp in the field. This is recorded as non-compliance in **section 3.1.**

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 street lights
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 three strata, as follows: • Amenity • Roading • 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	318 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 99% of the database data for the sample checked. The statistical sampling tool reported with 95% confidence the precision of the sample was 2.5% and the true load in the field will be between 97.5% to 100% of the load recorded in the database.

There will be approximately 26,400 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 67,600 kWh per annum over submission and zero kWh per annum under submission. This falls within the acceptable database accuracy variance as advised by the Electricity Authority's memo issued 22 August 2018.

As detailed in **section 2.4**, 14 lamps have no lamp description and no wattage recorded but 12 have an incorrect wattage value recorded in the ballast field. I have assumed these to be 35W metal halide (the most popular lamp type recorded in the database and a check of a sample of these lights on google Earth confirmed this to be likely correct). This will be resulting in an estimated 16,828 kWh of over submission.

The database was found to contain inaccuracies when matched to the published standardised wattage table:

Incorrect ballasts	Volume information impact (annual kWh)
1,334 x 100W High Pressure Sodium lamps have a ballast recorded of 12W instead of 14W.	11,395kWh under submission
6 x 100W Incandescent lights have ballast wattage recorded and incandescent lights don't have a ballast.	308kWh over submission
75 x 100W Metal Halide lamps have a ballast recorded of 12W instead of 14W.	641kWh under submission
2 x 110W High Pressure Sodium lamps have a ballast recorded of 122W instead of 121W.	8.5kWh over submission
1 x 140W Metal Halide lamp has no ballast recorded.	55.5kWh under submission
1 x 140W Metal Halide lamp has a ballast recorded of 18W instead of 13W.	21kWh over submission
1 x 150W High Pressure Sodium lamp has a ballast recorded of 12W instead of 18W.	25.6kWh under submission
2 x 160W Mercury Vapour lamps have no ballast recorded.	128kWh under submission
8 23W Fluro Compact lamps have a ballast recorded of 9W	307.5W over submission
3 x 250W Mercury Vapour lamps have no ballast recorded.	256kWh under submission
5 x 250W Metal Halide lamps has a ballast recorded of 27W instead of 28W.	21kWh under submission
119 x 35W Metal Halide lamps have a ballast recorded of 8W instead of 10W.	1,016kWh under submission
53 x 35W Metal Halide lamps have a ballast recorded of 9W instead of 10W.	226kWh under submission
1 x 35W Metal Halide lamps has a ballast recorded of 11W instead of 10W.	4kWh over submission
5 x 400W Metal Halide lamps has a ballast recorded of 25W instead of 38W.	277.6kWh under submission

Incorrect ballasts	Volume information impact (annual kWh)
3 x 400W Metal Halide lamps has a ballast recorded of 30W instead of 38W.	102.5kWh under submission
2 x 60W Metal Halide lamps have a ballast recorded of 7W instead of 6W.	8.5kWh over submission
1 x 60W Metal Halide lamps has a ballast recorded of 18W instead of 6W.	51kWh over submission
46 x 70W Metal Halide lamps has a ballast recorded of 11W instead of 13W.	392kWh under submission
2 x 70W Metal Halide lamps has a ballast recorded of 12W instead of 13W.	8.5kWh under submission
507 x 80W Mercury Vapour lamps have a ballast recorded of 11W instead of 10W.	2,165kWh over submission
100 x 80W Mercury Vapour lamps have a ballast recorded of 16W instead of 10W.	2,562.6kWh over submission
1 x 90W LED lamp has ballast wattage of 24W recorded and LED lights don't have ballasts.	102.5kWh over submission
1 x A2 0C STL VP 4.5-50 LED lamp has wattage of 84W recorded and not the expected 77W.	30kWh over submission
6 x Stela Long 30 LED lamp have wattage of 43W recorded and not the expected 30W.	333kWh over submission
Estimated annual kWh submission impact:	**13,769.7 under submission**

This is also recorded as non-compliance in **sections 2.1** and **3.2**.

There are 92 metered lamps in the database excluded from submission data but recorded against the unmetered ICPs. This is recorded as non-compliance below.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Feb-17 To: 24-Sep-18	14 records have blank or unknown lamp wattages, leading to over submission of approximately 16,828 kWh per annum. Incorrect ballasts applied resulting in an estimated 13,796.7 kWh under submission. 92 metered lamps recorded incorrectly against an unmetered ICP. Potential impact: High Actual impact: Medium Audit history: Once Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	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 medium, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis analysed the detailed data being provided to Genesis. Genesis has found the only blank/zero listed lamp items are in fact for driver feedback signs and pay and display chargers listed in the database. Genesis have sent HDC the dataset error and have requested these to be amended.	01/03/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis analyses the data each month feedback any erroneous data and make the necessary changes for settlements/billing processes.	01/03/2019	

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

- 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 submission calculation provided by Genesis and found a minor difference of less than 3kWh over submission which appears to be due to a slightly different data logger value being used. This is recorded as non-compliance.

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	13,796.7 kWh under submission
Ballast applied to lamps with no lamp description or wattage recorded	16,828 kWh over submission

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Feb-17 To: 24-Sep-18	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. Potential impact: High Actual impact: Medium Audit history: Once Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	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 medium, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status

Genesis the findings regarding the logger variation, as the same logger is used with Napier CC and there was no issue recorded against 3.2 in relation to the logger 206562019. Genesis analysed the detailed data being provided to Genesis. Genesis has found the only blank/zero listed lamp items are in fact for driver feedback signs and pay and display chargers listed in the database. Genesis have sent HDC the dataset error and have requested these to be amended.	01/03/2019	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis analyses the data each month feedback any erroneous data and make the necessary changes for settlements/billing processes.	01/03/2019	

CONCLUSION

The audit found four non-compliances. These relate to incorrect ballasts and wattages recorded in the database. A small variance was found in relation to the submission calculation for the month of September. These issues should be relatively easy to correct.

The field audit findings found a high level of accuracy and the database accuracy fell within the accepted variance range.

The future risk rating of 16 indicates that the next audit be completed in six months.

PARTICIPANT RESPONSE

Genesis continue to work with Hastings as they implement LED lighting. We found majority of the asset database was correct bar some, as mentioned in the auditor's findings. Genesis has been in contact with HDC and advised them of the corrections that will need to be completed. Genesis will correct the November data to depict the correct settlement and billing volumes. Genesis are investigating the logger calculation variance, and believe it's due to a rounding error, however further investigation is required as to whether Gentrack's 3.8 TOU billing module can accept more than 2 decimal places.

Genesis accepts the 6-month review recommendation.