ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

NZTA NORTHLAND DISTRIBUTED UNMETERED LOAD

GENESIS ENERGY

Prepared by: Steve Woods

Date audit commenced: 17 June 2021

Date audit report completed: 11 October 2021

Audit report due date: 15 June 2021

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EXECUTIVE SUMMARY

This audit of the NZTA Northland Streetlight 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.

The Northland NZTA DUML ICPs are managed in excel spreadsheets by Top Energy. The audit was conducted using the extract provided by Top Energy on 21st June 2021. The data in the excel spreadsheets is incomplete and therefore Genesis use data received historically to calculate submission. NZTA have a RAMM database but this is not being used for submission purposes as the data needs to be updated. As recorded in the previous two audits NZTA had committed to undertaking a 100% field audit of the RAMM database so that Genesis can use this for submission going forward. The NZTA field audit has yet to be completed.

The field audit was undertaken of a statistical sample of 93 items of load from the database on 21st July 2021. The field audit found that the database is not confirmed as accurate with a 95% level of confidence. Contributing to this will be the 164 lights with no input wattage being recorded indicating a potential under submission of 117,675 kWh per annum if the current database were used for submission.

The future risk rating of 43 indicates that the next audit be completed in three months, but I recommend that the next audit be in six months to allow time for Genesis to work with NZTA to improve the accuracy of the data used for submission.

This audit found six non-compliances and makes no recommendations. The matters raised are detailed in the table below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
DUML Audit	1.10	17.295F of part 17	Audit not completed within the required timeframe.	Strong	Low	1	Cleared
Deriving submission information	2.1	11(1) of Schedule 15.3	Database not used for submission resulting in a potential over submission of 20,929.15 kWh per annum. 164 items of load have no recorded wattage recorded in the DUML database which would result in under submission of 117,675 kWh per annum if used for submission. 410 items of load have the incorrect ballast recorded in the DUML database which would result in under submission of 7,142 kWh per annum if used for submission. Database is not confirmed as accurate with a 95% level of confidence as recorded in section 3.1. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Weak	High	9	Identified
Description and capacity of load	2.4	11(2A) and (d) of Schedule 15.3	164 lights with no input wattage being recorded resulting in under submission of an estimated 117,675 kWh if the database were used for submission.	Weak	High	9	Identified
All load recorded in database	2.5	11(2)(b) of Schedule 15.3	16 additional lights were found in the field.	Weak	Medium	6	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)	Database is not confirmed as accurate with a 95% level of confidence. 410 items of permanent load have the incorrect ballast applied indicating over submission of 7,142 kWh per annum if it were used for submission. 164 lights with no input wattage being recorded resulting in under submission of an estimated 117,675 kWh if the database were used for submission.	Weak	High	9	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	Database not used for submission resulting in a potential over submission of 20,929.15 kWh per annum. 164 items of load have no recorded wattage recorded in the DUML database which would result in under submission of 117,675 kWh per annum if used for submission. 410 items of permanent load have the incorrect ballast applied indicating over submission of 7,142 kWh per annum if it were used for submission. Database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.1**. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Weak	High	9	Identified
Future Risk Rating						43	

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	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

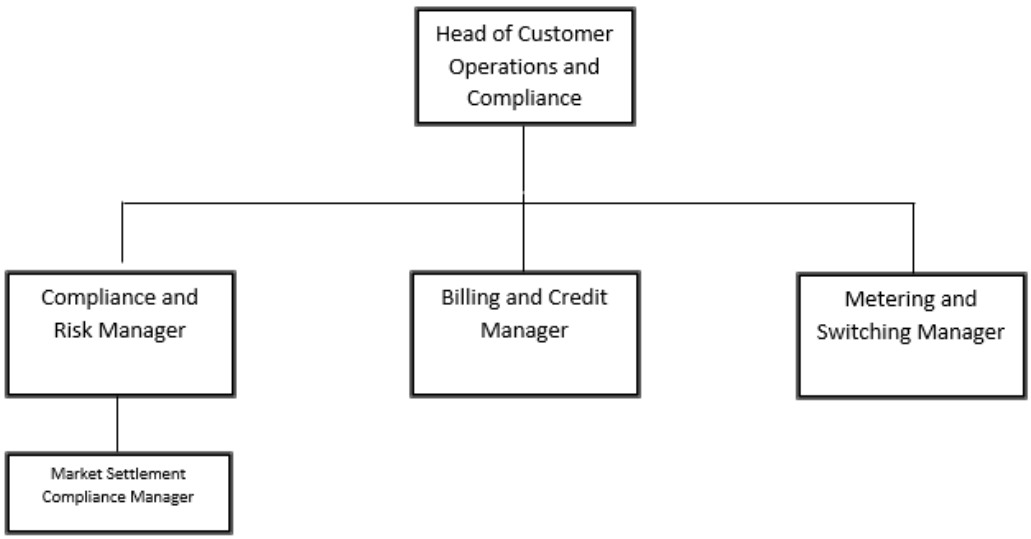
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

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:

Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

Supporting Auditor:

Brett Piskulic

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Craig Young	Market Settlement Compliance Manager	Genesis Energy
Julia Jones	Technical Specialist – Market Settlement Compliance	Genesis Energy

1.4. Hardware and Software

The streetlight data is held in excel spreadsheets by Top Energy. These are backed up in accordance with standard industry procedures. Access to the spreadsheets is restricted by way of user log-in to the computer drive.

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)
0000912700TEF16	TRANSIT UNMETERED STREETLIGHTS	KOE1101	NST	1	172
0000004228TE76E	STREETLIGHT	KOE1101	NST	12	1,246
0000911600TE4F2	TRANSIT UNMETERED STREETLIGHTS	KOE1101	NST	2	344
0000913800TE1B9	UNMETERED STREETLIGHTS	KOE1101	NST	431	51,642
0000913600TE7B2	STREETLIGHTS ON TE POLES	KOE1101	NST	143	18,284

The ballast values are included in the wattage totals.

1.7. Authorisation Received

All information was provided directly by Genesis and Top Energy.

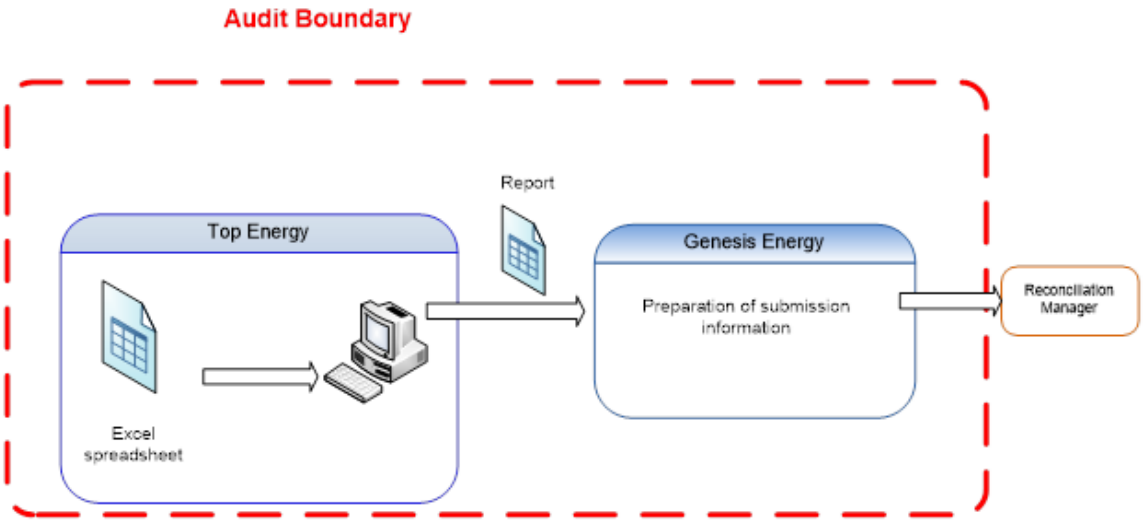
1.8. Scope of Audit

This audit of the NZTA Northland area DUML database and processes was conducted at the request of Genesis Energy (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 ICPs are each managed in an excel spreadsheet held by Top Energy.

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 field audit was undertaken of a statistical sample of 93 items of load on 21st July 2021.

1.9. Summary of previous audit

The previous audit was completed in September 2020 by Steve Woods of Veritek Limited. The current status of that audit's findings is detailed below:

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
DUML Audit	1.10	17.295F of part 17	Audit not completed within the required timeframe.	Cleared
Deriving submission information	2.1	11(1) of Schedule 15.3	Database not used for submission resulting in a potential under submission of 89,592.11 kWh per annum. 164 items of load have no recorded wattage recorded in the DUML database which would result in under submission of 117,675 kWh per annum if used for submission. 422 items of load have the incorrect ballast recorded in the DUML database which would result in under submission of 7,218 kWh per annum if used for submission. Database is not confirmed as accurate with a 95% level of confidence as recorded in section 3.1. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Still existing
Description and capacity of load	2.4	11(2A) and (d) of Schedule 15.3	164 lights with no input wattage being recorded resulting in under submission of an estimated 117,675 kWh if the database were used for submission.	Still existing
All load recorded in database	2.5	11(2)(b) of Schedule 15.3	13 additional lights were found in the field.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	Database is not confirmed as accurate with a 95% level of confidence. 422 items of permanent load have the incorrect ballast applied indicating over submission of 7,218 kWh per annum if it were used for submission. 164 lights with no input wattage being recorded resulting in under submission of an estimated 117,675 kWh if the database were used for submission.	Still existing

Subject	Section	Clause	Non-compliance	Status
Volume information accuracy	3.2	15.2 and 15.37(c)	Database not used for submission resulting in a potential under submission of 89,592.11 kWh per annum. 164 items of load have no recorded wattage recorded in the DUML database which would result in under submission of 117,675 kWh per annum if used for submission. 422 items of load have the incorrect ballast recorded in the DUML database which would result in under submission of 7,218 kWh per annum if used for submission. Database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.1**. The data used for submission does not track changes at a daily basis and is provided as a snapshot.	Still existing

Table of Recommendations

Subject	Section	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 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. Genesis were unable to complete this audit by the required timeframe as a database extract was not able to be obtained within time to complete the audit by the due date.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 1.10 Clause 17.295F of part 17 From: 15-Jun-21 To: 23-Jul-21	Audit not completed within the required timeframe. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Strong Breach risk rating: 1
Audit risk rating	**Rationale for audit risk rating**
Low	The controls are rated as strong, as Genesis are reliant on the database provider to supply the data and in this case the delay caused this report to be late. The impact is assessed to be low, as this has no direct impact on reconciliation.

Actions taken to resolve the issue	Completion date	Remedial action status

Genesis has been working with NZTA Northland to be able to utilise their database information, the NZTA had advised they were to do a complete field audit, but this to date has not been done. Since then there has now been managerial staff changes which has further delayed any asset audit. Genesis in late 2020 did their own desk top audit. This data has been reviewed by Top Energy who has advised that the record of assets is also more accurate than the dataset they have. Any future DUML audits will be against this dataset, until NZTA Northland are able to provide a complete data set.		Cleared
Preventative actions taken to ensure no further issues will occur	**Completion date**	

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.

Audit commentary

Genesis reconciles this DUML load using the NST profile. The total volume submitted to the Reconciliation Manager is based on historic data recorded received some years ago. NZTA have a RAMM database but this is not being used for submission purposes as the data needs to be updated. As recorded in the previous two audits NZTA had committed to undertaking a 100% field audit of the RAMM database so that Genesis can use this for submission going forward. The field audit has yet to be completed.

I checked an extract provided by Top Energy on 21st June 2021 against the submission totals supplied by Genesis for May 2021 and found the following variances:

ICP	Fittings number from GENE registry details for May 2021 submission	Fittings number from database extract	Differences	kWh value submitted	Calculated kWh value from database	Differences
0000912700TEF16	6	1	5	369.93	50.93	319.00
0000004228TE76E	3	12	-9	337.9	368.97	-31.07
0000911600TE4F2	3	2	1	201.5	101.87	99.63
0000913800TE1B9	220	431	-211	14,554.5	15,292.23	-737.73
0000913600TE7B2	113	143	30	7171.33	5,414.26	1,757.07
					Total kWh variance	1,406.91

The incorrect submission calculations will be resulting in an estimated annual over submission of 20,929.15 kWh per annum.

The database extract is provided by Top Energy and is not used for submission. Specific issues are:

- 164 lights in the database with no input wattage recorded which would equate to an estimated under submission at 117,675 kWh per annum if the database were being used for submission, and
- 410 lamps had a lamp ballast discrepancy when compared to the standardised wattage table which would equate to an estimated over submission of 7,142 kWh per annum (based on an estimated annual burn hours of 4,271 as is detailed in the DUML database auditing tool) if the database were being used for submission.

The database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.1**.

On 18 June 2019, the Electricity Authority issued a memo confirming that the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current data used is a snapshot and this practice is non-compliant.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 15-Dec-18 To: 21-Jun-21	Database not used for submission resulting in a potential over submission of 20,929.15 kWh per annum. 164 items of load have no recorded wattage recorded in the DUML database which would result in under submission of 117,675 kWh per annum if used for submission. 410 items of load have the incorrect ballast recorded in the DUML database which would result in under submission of 7,142 kWh per annum if used for submission. Database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.1**. The data used for submission does not track changes at a daily basis and is provided as a snapshot. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	Controls are rated as weak as the database has a high level of inaccuracy indicating controls are weak, and it is not used for submission purposes. The impact is assessed to be high due to the kWh volumes.

Actions taken to resolve the issue	Completion date	Remedial action status
Top Energy data is inaccurate and is now not being used, with energy volumes being corrected historically. Genesis has had a discussion with NZTA Northland Early Sept 2021, where Genesis will be assisting NZTA with being able to allocate the ICP number to its assets within their database which will enable Genesis to start utilising their database.	01/09/2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Use the customers dataset when its complete.	unknown	

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 had an ICP recorded but the database is not used for submission purposes.

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 has the nearest street address for all items of load.

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.

Audit commentary

The database contains the manufacturers rated wattage and the ballast wattage. There are 164 lights in the database with no input wattage recorded, this would result in under submission at 117,675 kWh, assuming these were all 150W HPS lights, if the database were used for submission.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: 15-Dec-18 To: 21-Jun-21	164 lights with no input wattage being recorded resulting in under submission of an estimated 117,675 kWh if the database were used for submission. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	Controls are rated as weak as the database has not been updated to reflect the field information. The risk is high due to the impact on submission.

Actions taken to resolve the issue	Completion date	Remedial action status
Top Energy data is inaccurate and is now not being used, with energy volumes being corrected historically. Genesis has had a discussion with NZTA Northland Early Sept 2021, where Genesis will be assisting NZTA with being able to allocate the ICP number to its assets within their database which will enable Genesis to start utilising their database.	01/09/2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Use the customers dataset when its complete.	unknown	

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 93 items of load on 21st July 2021.

Audit commentary

The field audit discrepancies found are detailed in the table below.

There were three lamps not found in the field that were recorded in the database.

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Far North					
Far North Rd Pukenui	7	14	7	1	Database = 1x 70W HPS, & 6x 150W HPS. Field = 1x 70W HPS & 7x 150W HPS & 6x 80W LED. 1x 150W HPS with no wattage recorded.
SH1 Kaitaia	6	6	0	4	Database = 1x 150W TAS, 1x 250W HPS & 4x 150W HPS. Field = 1x 150W TAS, 1x 250W HPS, 3x 150W HPS & 1x 80W LED. 3x 150W HPS with no wattage recorded.
Whangatane Dr Kaitaia	1	1	0	1	1x 150W HPS with no wattage recorded.
SH10 Kaeo	9	9	0	5	3x 150W TAS with no wattage recorded.

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
					2x 150W HPS with no wattage recorded.
East					
SH11 Taumarere	1	1	0	1	1x 150W HPS with no wattage recorded.
Gillies St Kawakawa	7	8	1	1	1x additional 90W HPS found in field. 1x 150W TAS with no wattage recorded.
Haruru Falls Rd Haruru Falls	2	2	0	1	1x150W MH with no wattage recorded.
SH10 Waipapa	13	20	7	1	Database = 1x 150W TAS, & 12x 150W HPS. Field = 6x 150W HPS & 14x 80W LED. 1x 150W TAS with no wattage recorded.
SH10 Kerikeri	3	3	0	1	1x 150W TAS with no wattage recorded.
SH10 Matauri Bay	1	1	0	1	1x 150W TAS with no wattage recorded.
West					
Guy Rd Kaikohe	7	7	0	3	Database = 2x 150W TAS, & 4x 150W HPS. Field = 2x 150W TAS, 3x 150W HPS & 1x 80W LED. 2x 150W TAS with no wattage recorded.

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Park Rd Kaikohe	1	1	0	1	1x 150W HPS with no wattage recorded.
SH1 Mangamuka	2	2	0	1	Database = 2x 150W HPS. Field = 1x 150W HPS & 1x 80W LED.
Taheke Rd Kaikohe	8	9	1	3	Database = 8x 150W HPS. Field = 7x 150W HPS & 2x 80W LED. 1x 150W HPS with no wattage recorded.
Grand Total	**93**	**109**	**16**	**25**	

This clause relates to lights in the field that are not recorded in the database. As recorded in the table above there were 16 lights found in the field that were not recorded in the database.

The database accuracy is discussed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-Aug-19 To: 21-Jul-21	16 additional lights were found in the field. Potential impact: High Actual impact: Medium Audit history: Once Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as weak as the database has not been updated to reflect the field information. The impact is assessed to be medium due to the kWh volumes.

Actions taken to resolve the issue	Completion date	Remedial action status

Genesis has been working with NZTA Northland to be able to utilise their database information, the NZTA had advised they were to do a complete field audit, but this to date has not been done. Since then there has now been managerial staff changes which has further delayed any asset audit. Genesis in late 2020 did their own desk top audit. This data has been reviewed by Top Energy who has advised that the record of assets is also more accurate than the dataset they have. Any future DUML audits will be against this dataset, until NZTA Northland are able to provide a complete data set.	01/09/2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis to use the customers database asset extraction	unknown	

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 database has the ability to track additions and removals as required by this clause.

The accuracy of the database is discussed in **section 3.1.**

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 spreadsheet was checked for audit trails.

Audit commentary

Top Energy has previously demonstrated a complete audit trail of all additions and changes to the spreadsheet 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	NZTA Northland Streetlights
Strata	The database contains items of load on the Northland state highway network. The processes for the management of all NZTA items of load are the same, but I decided to place the items of load into three strata based on location as follows: 1. Far North 2. East 3. West
Area units	I created a pivot table of the roads and I used a random number generator in a spreadsheet to select a total of 17 sub-units.
Total items of load	93 items of load were checked.

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

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

Audit commentary

A statistical sample of 93 items of load found that the field data was 133.8% of the database data for the sample checked.

Result	Percentage	Comments
The point estimate of R	127.1%	Wattage from survey is higher than the database wattage by 1.6%
R_L	110.9%	With a 95% level of confidence it can be concluded that the error could be between +10.9% and +44.1%.
R_H	144.1%	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 01/02/19 and the table below shows that Scenario B (detailed below) applies.

The conclusion from Scenario B is that in statistical terms, the inaccuracy is statistically significant at the 95% level. The sample results across the strata means that the true wattage (installed in the field) could be between 10.9% and 44.1% 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 19.0 kW higher than the database indicates.

There is a 95% level of confidence that the installed capacity is between 8 kW lower to 32 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 83,100 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 33,300 kWh p.a. to 135,000 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

I checked the ballasts being applied and found that 410 lamps had a discrepancy when compared to the standardised wattage table. This is detailed in the table below:

Lamp Type	Database Total Wattage	EA Standardised Wattage	Variance	Database Quantity	Estimated Annual kWh effect on consumption
125w MV Lamp	142	136	+6	6	+154
250w MV Lamp	275	270	+5	1	+21
70w HPSV Lamp	90	83	+7	28	+837
150w HPSV Lamp	172	168	+4	354	+6,048
125w HPSV Lamp	156	150	+6	1	+26
250w HPSV Lamp	279	278	+1	19	+90
400w HPSV Lamp	434	438	-4	2	-34
Total estimated annual effect on submission					+7,142

The incorrect capacities will be resulting in an estimated over submission of 7,142 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool) if the database were being used for submission.

As detailed in **section 2.4**, there are 164 lights in the database with no input wattage recorded, this would result in under submission at 117,675 kWh, assuming these were all 150W HPS lights, if the database were used for submission.

Change management process findings

Updates of any changes made are provided to Top Energy by the contractors who complete the work.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 15-Dec-18 To: 21-Jun-21	Database is not confirmed as accurate with a 95% level of confidence. 410 items of permanent load have the incorrect ballast applied indicating over submission of 7,142 kWh per annum if it were used for submission. 164 lights with no input wattage being recorded resulting in under submission of an estimated 117,675 kWh if the database were used for submission. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as weak as the database has not been updated to reflect the field information. The impact is assessed to be high due to the kWh volumes.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis has been working with NZTA Northland to be able to utilise their database information, the NZTA had advised they were to do a complete field audit, but this to date has not been done. Since then there has now been managerial staff changes which has further delayed any asset audit. Genesis in late 2020 did their own desk top audit. This data has been reviewed by Top Energy who has advised that the record of assets is also more accurate than the dataset they have. Any future DUML audits will be against this dataset, until NZTA Northland are able to provide a complete data set.	01/09/2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis to use the customers database asset extraction	unknown	

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 all ICPs have 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 historic data recorded received some years ago. NZTA have a RAMM database but this is not being used for submission purposes as the data needs to be updated. As recorded in the previous two audits NZTA had committed to undertaking a 100% field audit of the RAMM database so that Genesis can use this for submission going forward. The field audit has yet to be completed.

I checked an extract provided by Top Energy on 21st June 2021 against the submission totals supplied by Genesis for May 2021 and found, as detailed in **section 2.1**, the database extract did not match the volumes submitted by Genesis resulting in an over submission of 1,406.91kWh for the month of May 2021. Annualised this will result in an estimated annual under submission of 20,929.15 kWh.

The database extract is provided by Top Energy and is not used for submission due to it not being complete and accurate. Specifically:

- 164 lights in the database with no input wattage recorded which would equate to an estimated under submission at 117,675 kWh per annum if the database were being used for submission, and
- 410 lamps had a lamp ballast discrepancy when compared to the standardised wattage table which would equate to an estimated over submission of 7,142 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool) if the database were being used for submission.

The field audit against the database quantities found that the database is not confirmed as accurate with a 95% level of confidence. This is detailed in **section 3.1.**

On 18 June 2019, the Electricity Authority issued a memo confirming that the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed, and
- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current data used is a snapshot and this practice is non-compliant.

Audit outcome

Non-compliant

Non-compliance	Description

Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 15-Dec-18 To: 31-Jul-20	Database not used for submission resulting in a potential over submission of 20,929.15 kWh per annum. 164 items of load have no recorded wattage recorded in the DUML database which would result in under submission of 117,675 kWh per annum if used for submission. 410 items of permanent load have the incorrect ballast applied indicating over submission of 7,142 kWh per annum if it were used for submission. Database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.1**. The data used for submission does not track changes at a daily basis and is provided as a snapshot. Potential impact: High Actual impact: High Audit history: Multiple times Controls: Weak Breach risk rating: 9
Audit risk rating	**Rationale for audit risk rating**
High	Controls are rated as weak as the database has a high level of inaccuracy indicating controls are weak and it is not used for submission purposes. The impact is assessed to be high due to the kWh volumes.

Actions taken to resolve the issue	**Completion date**	**Remedial action status**
Genesis has been working with NZTA Northland to be able to utilise their database information, the NZTA had advised they were to do a complete field audit, but this to date has not been done. Since then there has now been managerial staff changes which has further delayed any asset audit. Genesis in late 2020 did their own desk top audit. This data has been reviewed by Top Energy who has advised that the record of assets is also more accurate than the dataset they have. Any future DUML audits will be against this dataset, until NZTA Northland are able to provide a complete data set.	01/09/2021	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Genesis to use the customers database asset extraction	unknown	

CONCLUSION

The Northland NZTA DUML ICPs are managed in excel spreadsheets by Top Energy. The audit was conducted using the extract provided by Top Energy on 21st June 2021. The data in the excel spreadsheets is incomplete and therefore Genesis use data received historically to calculate submission. NZTA have a RAMM database but this is not being used for submission purposes as the data needs to be updated. As recorded in the previous two audits NZTA had committed to undertaking a 100% field audit of the RAMM database so that Genesis can use this for submission going forward. The NZTA field audit has yet to be completed.

The field audit was undertaken of a statistical sample of 93 items of load from the database on 21st July 2021. The field audit found that the database is not confirmed as accurate with a 95% level of confidence. Contributing to this will be the 164 lights with no input wattage being recorded indicating a potential under submission of 117,675 kWh per annum if the current database were used for submission.

The future risk rating of 43 indicates that the next audit be completed in three months, but I recommend that the next audit be in six months to allow time for Genesis to work with NZTA to improve the accuracy of the data used for submission.

This audit found six non-compliances and makes no recommendations

PARTICIPANT RESPONSE

Genesis Energy has identified that both NZTA data and Top Energy data are both incomplete and inaccurate. Genesis has completed a google field audit which proved Top Energy data was leading Genesis under bill and settle volumes. Genesis has had NZTA RAMM data provided, but the ICP was missing from the dataset, making the dataset unable to be used for settlement. Genesis has engaged with NZTA Northland in late 2020 where NZTA stated that a full field audit was to be completed. This to date has still not been completed. NZTA Northland has had managerial changes in the region and Genesis are beginning this engagement process again. Genesis will be assisting NZTA Northland in updating their dataset where possible with the intent to use asap. Genesis has also consolidated the ICP's to two ICP's from five, and utilising Genesis' google field audit to establish an accuracy level increasement with the intent to revise energy volumes historically, whilst Genesis assists NZTA enabling the switch of data sources to the NZTA data held in RAMM.