ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

NZTA WAIKATO WEST
AND
GENESIS ENERGY

Prepared by: Rebecca Elliot

Date audit commenced: 15 October 2019

Date audit report completed: 30 November 2019

Audit report due date: 1 June 2018

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This audit of the NZTA Waikato West (NZTA) DUML database and processes was conducted at the request of Genesis Energy Limited (**Genesis**) in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

This audit relates to five ICPs in the Waikato West area:

ICP Number	Description	NSP	Profile
0000036254WE54E	TRANSIT LIGHTS, STATE H/WAY 1, NGARUAWAHIA	HLY0331	NST
0000022579WE623	TRANSIT LIGHTS	HLY0331	NST
0000036247WE323	TRANSIT LIGHTS	TWH0331	NST
0000011095WE94E	UNM Streetlights, Transit N.Z.	HAM0331	UNM
0000026694WE641	AVALON EXT	HAM0331	UNM

Genesis were provided with a database extract from RAMM in 2010 for all five ICPs and there have been no further reports provided by NZTA. These figures have been used for submission for the first three ICPs multiplied by logger hours. The unmetered load details populated on the registry are used to calculate submission for the remaining two ICPs.

NZTA provided a RAMM database extract which contained information for three of the five ICPs. These are highlighted in orange above. A field audit was undertaken of these items of load to assess how accurate the database is likely to be for the three ICPs. This found that the database accuracy is outside of the +/-5% threshold and indicated under submission would occur if used for submission.

NZTA have undertaken a 100% field audit. The results are being assessed and once confirmed to complete the data will be updated. NZTA then expect to be able to provide database reporting for the West Waikato ICPs. No completion date for this was able to be provided as the project to upload the field data is still being scoped.

This load includes the NZTA lights that have been removed from the Hamilton City Council RAMM database.

This audit found nine non-compliances and one recommendation is made. The future risk rating of 97 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' comments and allowing sufficient time for the field audit findings to uploaded to RAMM and recommend that the next audit be in nine 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
Audit	1.10	17.295F	Audit not completed within the required timeframe	Strong	Low	1	Cleared
Deriving submission information	2.1	11(1) of Schedule 15.3	Outdated database or registry UML figures and not a current database used to calculate submission. This will be resulting in an estimated annual over submission of 20,449.58 kWh for the three ICPs where it was compared with the NZTA RAMM database.	None	High	12	Investigating
ICP Identifier	2.2	11(2)(a) and (aa) of Schedule 15.3	No database used to reconcile ICPs.	None	High	12	Investigating
Location of each item of load	2.3	11(2)(b) of Schedule 15.3	No database used to reconcile ICPs.	None	High	12	Investigating
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	No database used to reconcile ICPs.	None	High	12	Investigating
All load recorded in database	2.5	11(2A) of Schedule 15.3	No database used to reconcile ICPs.	None	High	12	Investigating
Audit trail	2.7	11(4) of schedule 15.3	No database used to reconcile ICPs and therefore no audit trail.	None	High	12	Investigating
Database accuracy	3.1	15.2 and 15.37B(b)	No database used to reconcile ICPs.	None	High	12	Investigating

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Volume information accuracy	3.2	15.2 and 15.37B(c)	Outdated database or registry UML figures and not a current database used to calculate submission. This will be resulting in an estimated annual over submission of 20,449.58 kWh for the three ICPs where it was compared with the NZTA RAMM database.	None	High	12	Investigating
Future Risk Rating						97	

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	Next action
Database accuracy	3.1	Responsibility for the database accuracy is included in the NOC contract with a KPI linked to database accuracy findings assessed in the EA DUML audit to ensure that database accuracy is maintained.	Genesis has advised both NZTA and the current TCDC maintain contractor to discuss contractual arrangement for the NZTA assets to be managed.

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

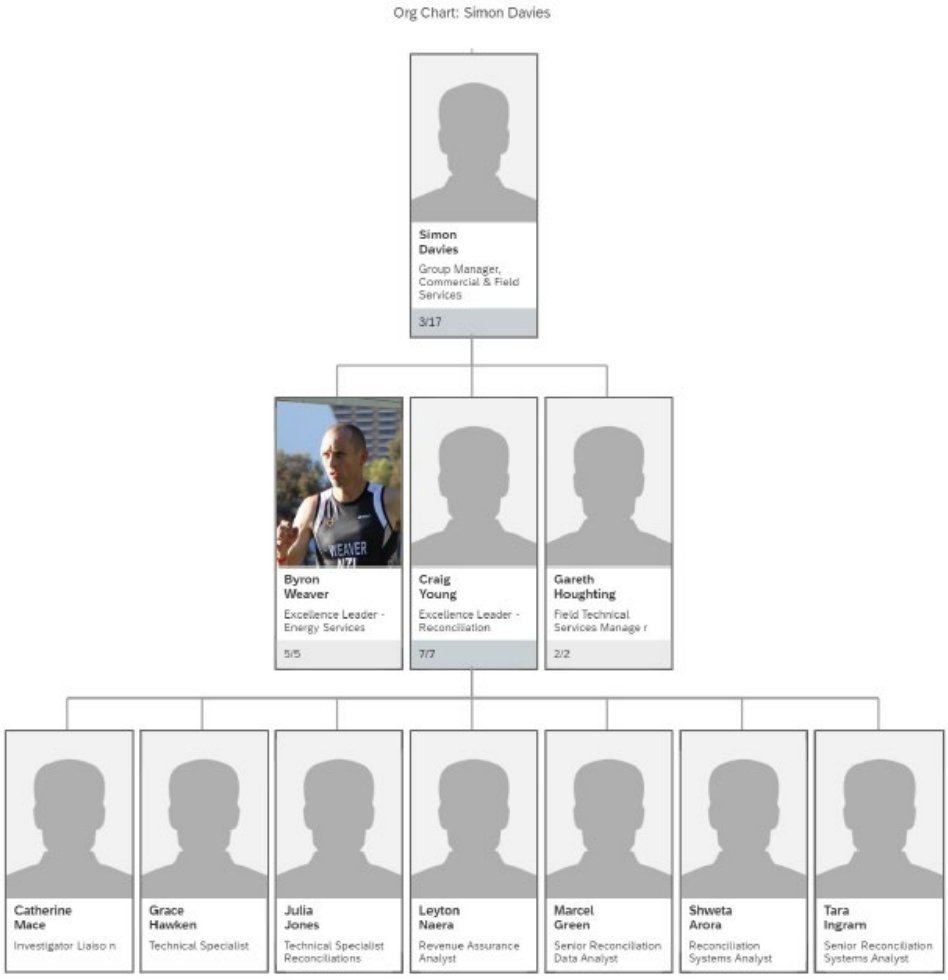
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

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:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Laura Rodriguez Garcia	Network Technician, System Management	NZTA
Craig Young	Excellence Leader - Reconciliation	Genesis Energy
Grace Hawken	Technical Specialist - Reconciliations Team	Genesis Energy

1.4. Hardware and Software

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

The database is backed-up 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)
0000036254WE54E	TRANSIT LIGHTS, STATE H/WAY 1, NGARUAWAHIA	HLY0331	NST	No data in database extract provided	unknown
0000022579WE623	TRANSIT LIGHTS	HLY0331	NST	705	153,663
0000036247WE323	TRANSIT LIGHTS	TWH0331	NST	No data in database extract provided	unknown
0000011095WE94E	UNM Streetlights, Transit N.Z.	HAM0331	UNM	183	33,387
0000026694WE641	AVALON EXT	HAM0331	UNM	36	9,146

1.7. Authorisation Received

All information was provided directly by Genesis and NZTA.

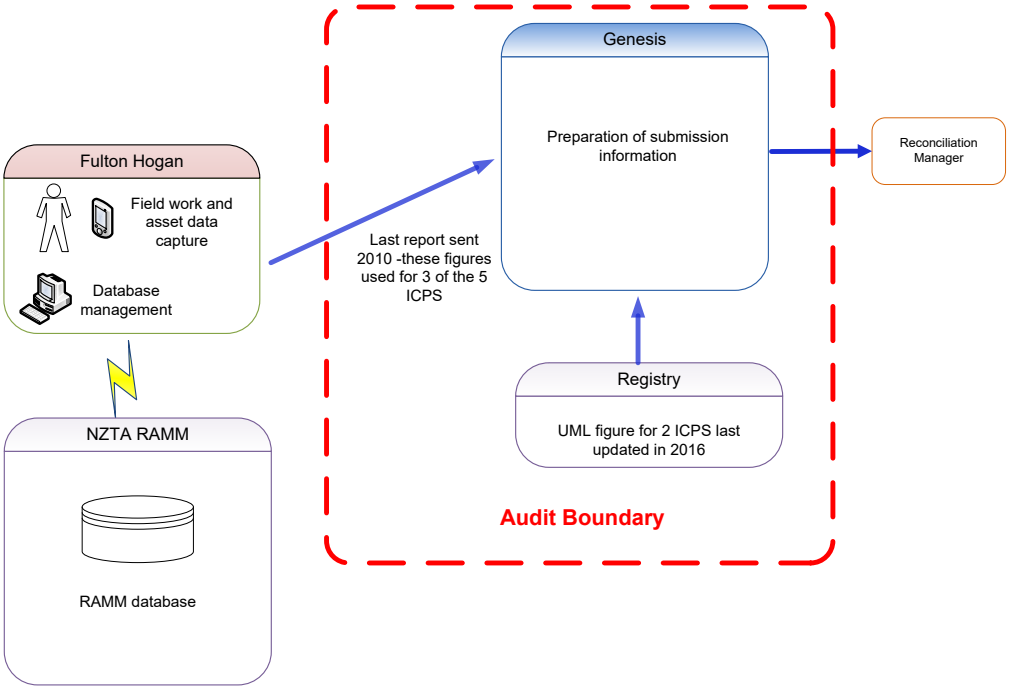
1.8. Scope of Audit

This audit of the NZTA Waikato West (NZTA) 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.

Genesis were provided with a database extract from RAMM in 2010 and there have been no further reports provided by NZTA. These figures have been used for submission for the first three ICPs multiplied by logger hours. The unmetered load details populated on the registry are used to calculate submission for the remaining two ICPs.

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:



A field audit could not be undertaken for two of the five ICPs as there is no known database for these ICPs. A field audit was undertaken of a statistical sample of 150 items of load for the three ICPs recorded in the NZTA RAMM database on 6th November 2019.

1.9. Summary of previous audit

Genesis provided a copy of the last audit report undertaken by Rebecca Elliot of Veritek Limited in May 2017 which was completed for Genesis as part of their 2017 reconciliation participant audit. This audit wasn't submitted due to the audit regime change that occurred on 1st June 2017. For completeness I have included the findings for reference below:

Table of Non-Compliance

Subject	Section	Clause	Non-compliance	Status
Deriving Submission Information	2.1	11(1) of schedule 15.3	Inaccurate submission due to out of date database extract being used to calculate kW figure.	Still existing
ICP Identified	2.2.1	11(2)(a) of schedule 15.3	ICPs not recorded in the database for 729 items of load.	Still existing refer **section 2.2**
Description of Load Type	2.2.3	11(2)(c) of schedule 15.3	Load description missing for 104 items of load.	Still existing refer **section 2.4**
Capacity of items of load	2.2.4	11(2)(d) of schedule 15.3	104 items of load with no lamp wattage recorded. Lamp wattage incorrectly populated in the gear wattage field.	Still existing refer **section 2.4**
Tracking of load changes	2.3	11(3) of schedule 15.3	Discrepancies found in field audit resulting in a potential error rate of 17%.	Still existing refer **section 2.5** and **3.1**

Table of Recommendations

Subject	Section	Clause	Recommendation for Improvement	Status
ICP Identified	2.2.1	11(2)(a) of schedule 15.3	Confirm all lights are mapped to the ICP and therefore NSP.	Still existing

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 of this database. This has been unable to be completed by the due date due to their being no database identified to audit. This is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 1.10 Clause 17.295F From: 01-Jun-18 To: 29-Nov-19	Audit not completed within the required timeframe. Potential impact: Low Actual impact: Low Audit history: None 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 their delay to identify a database caused this audit 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 requested the audit to be conducted with the intent to engage with the NZTA Waikato administration.	2019	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 were provided with a database extract from RAMM in 2010 and there have been no further reports provided by NZTA. These figures have been used for submission for the first three ICPs multiplied by logger hours. The unmetered load details populated on the registry are used to calculate submission for the remaining two ICPs. This is recorded as non-compliance below. As detailed in **section 3.1**, NZTA have undertaken 100% field audit and expect to be able to provide Genesis with database reporting for all the relevant ICPs as soon as the field audit findings have been uploaded. They were unable to give me an expected date for this as the project to upload the field findings is still being scoped.

I checked the calculations for the ICPs for the month of September for the three ICPs I could check against the NZTA RAMM database extract and found:

ICP Number	Sept kWh submitted	Calculated kWh for Sept from RAMM	Variance
0000022579WE623	25,269.20	23,216.39	-2,152.61
0000011095WE94E	12,008	11,889.11	-118.89
0000026694WE641	2,588	3,155.37	567.37
		TOTAL	-1,704.13

There is an estimated over submission of 1,704.13 kWh for the month of September. Annualised this equates to an estimated over submission of 20,449.58 kWh. This is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: unknown To: 30-Nov-19	Outdated database or registry UML figures and not a current database used to calculate submission. This will be resulting in an estimated annual over submission of 20,449.58 kWh for the three ICPs where it was compared with the NZTA RAMM database extract. Potential impact: High Actual impact: Unknown Audit history: Once Controls: None Breach risk rating: 12
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as none as there is no current database available to accurately calculate submission from. This is expected to improve once the NZTA RAMM database is brought up to date and maintained going forward. The impact is assessed to be high as no current database is used for the reconciliation of these ICPs.

Actions taken to resolve the issue	Completion date	Remedial action status
NZTA are working on the RAMM data set to improve its detail. The Councils duplicated data as they had the NZTA lights listed against the council streetlight ICP not the NZTA ICP associated with those assets. The correct ICP has been established and historical revision information corrected, by Genesis.	unknown	Investigating
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Genesis are still working with NZTA to get complete and consistent information.	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

Genesis were provided with a database extract from RAMM in 2010 and there have been no further reports provided by NZTA.

A RAMM database extract was provided by NZTA. This was checked in anticipation of it being used as the database for these ICPs.

Audit commentary

The NZTA RAMM database extract is not being used for reconciliation and the five ICPs associated with this load are being reconciled using historic database information or the unmetered load details from the registry. This is recorded as non-compliance.

The database extract provided for NZTA West Waikato was assessed in anticipation of this being used for submission and found it contained 14 ICPS. 11 of these related to metered supplies so these are outside of the scope of this audit. There were 286 items of load with no ICP recorded against them. NZTA have undertaken a 100% field audit of their assets in the field and this is expected to be uploaded to their RAMM database. The ICP is expected to be populated as part of this process.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.2 With: Clause 11(2)(a) and (aa) of Schedule 15.3 From: unknown To: 30-Nov-19	No database used to reconcile ICPs. Potential impact: High Actual impact: Unknown Audit history: Once previously Controls: None Breach risk rating: 12
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as none as the ICPs are being reconciled either using historic database information or the unmetered load details from the registry. This is expected to improve once the NZTA RAMM database is brought up to date and maintained going forward. The impact is assessed to be high as no current database is used for the reconciliation of these ICPs.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis are working with NZTA to get a complete and consistent data source.	unknown	Investigating
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Levels of accuracy in NZTA database are still unknown but Genesis are currently reviewing whether is now possible to switch data sources.	unknown	

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

Genesis were provided with a database extract from RAMM in 2010 and there have been no further reports provided by NZTA.

A RAMM database extract was provided by NZTA. This was checked in anticipation of it being used as the database for these ICPs.

Audit commentary

The NZTA RAMM database extract is not being used for reconciliation and the five ICPs associated with this load are being reconciled using historic database information or the unmetered load details from the registry. This is recorded as non-compliance.

The database extract provided for NZTA West Waikato was assessed in anticipation of this being used for submission. All have sufficient details to locate them. This includes street name, GPS co-ordinates and metres from the end of the carriageway.

Audit outcome

Non-compliant

<table>
<tr><th>Non-compliance</th><th colspan="3">Description</th></tr>
<tr><td>Audit Ref: 2.3
With: Clause 11(2)(b) of Schedule 15.3

From: unknown
To: 30-Nov-19</td><td colspan="3">No database used to reconcile ICPs.
Potential impact: High
Actual impact: Unknown
Audit history: None
Controls: None
Breach risk rating: 12</td></tr>
<tr><th>Audit risk rating</th><th colspan="3">Rationale for audit risk rating</th></tr>
<tr><td>High</td><td colspan="3">The controls are rated as none as the ICPs are being reconciled either using historic database information or the unmetered load details from the registry. This is expected to improve once the NZTA RAMM database is brought up to date and maintained going forward.
The impact is assessed to be high as no current database is used for the reconciliation of these ICPs.</td></tr>
<tr><th colspan="2">Actions taken to resolve the issue</th><th>Completion date</th><th>Remedial action status</th></tr>
<tr><td colspan="2">Genesis are working with NZTA to get a complete and consistent data source.</td><td>unknown</td><td rowspan="3">Investigating</td></tr>
<tr><th colspan="2">Preventative actions taken to ensure no further issue will occur</th><th>Completion date</th></tr>
<tr><td colspan="2">Levels of accuracy in NZTA database are still unknown but Genesis are currently reviewing whether is now possible to switch data sources.</td><td>unknown</td></tr>
</table>

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

Genesis were provided with a database extract from RAMM in 2010 and there have been no further reports provided by NZTA.

A RAMM database extract was provided by NZTA. This was checked in anticipation of it being used as the database for these ICPs.

Audit commentary

The NZTA RAMM database extract is not being used for reconciliation and the five ICPs associated with this load are being reconciled using historic database information or the unmetered load details from the registry. This is recorded as non-compliance.

The database extract provided for NZTA West Waikato was assessed in anticipation of this being used for submission. This found:

- 109 items of load with no make and model recorded;
- 110 items of load with no or zero wattage recorded; and
- 293 items load with no ballast recorded.

This is expected to be corrected as part of the database update post the 100% field audit that has been undertaken.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c)&(d) of Schedule 15.3 From: unknown To: 30-Nov-19	No database used to reconcile ICPs. Potential impact: High Actual impact: Unknown Audit history: None Controls: None Breach risk rating: 12
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as none as the ICPs are being reconciled either using historic database information or the unmetered load details from the registry. This is expected to improve once the NZTA RAMM database is brought up to date and maintained going forward. The impact is assessed to be high as no current database is used for the reconciliation of these ICPs.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis are working with NZTA to get a complete and consistent data source.	unknown	Investigating
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Levels of accuracy in NZTA database are still unknown but Genesis are currently reviewing whether is now possible to switch data sources.	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

A field audit could not be undertaken for two of five ICPs as the RAMM database extract provided had no items associated with these ICPs. A field audit was undertaken of a statistical sample of 150 items of load of the items of load recorded in the NZTA Waikato West RAMM database on 6th November 2019.

Audit commentary

The NZTA RAMM database extract is not being used for reconciliation and the five ICPs associated with this load are being reconciled using historic database information or the unmetered load details from the registry. This is recorded as non-compliance.

NZTA have undertaken a 100% field audit and expect to be able to provide Genesis with database reporting as soon as the field audit findings have been uploaded. They were unable to give me an expected date for this as the project to upload the field findings is still being scoped.

The field audit was undertaken against the three ICPs detailed in **section 1.6**. This found the following discrepancies:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
NORMANDY AVE RAB - COLLINS RD (449 - 1121m)	8	8	-	3	3x LEDs found in the field but recorded as 250W HPS in the database.
SH 26 RAB - MCCRACKEN AVE (48 - 144m)	5	7	+2		2x additional 60W LED found in the field – both were double heads recorded as single in the database.
MULLANE ST - BERKLEY AVE (211 - 409m)	10	10	-	4	4x LEDs found in the field but recorded as 250W HPS in the database.
RAYNES RD - MYSTERY CREEK RD (1244 - 3477m)	5	5	-	1	1x LED found in the field but recorded as 150W HPS in the database.
SH 1 - TAKAHE ST (0 - 112m)	5	4	-1		1x 250W HPS not found in the field.
SH 1 RAB - MULLANE ST (0 - 211m)	5	6	+1		1x additional 60W LED found in the field – double head recorded as single in the database.
Grand Total	150	152	4	8	

The field audit found three more lamps in the field than were recorded in the database. This is expected to be corrected as part of the database update post the 100% field audit that has been undertaken. 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: unknown To: 30-Nov-19	No database used to reconcile ICPs. Potential impact: High Actual impact: Unknown Audit history: None Controls: None Breach risk rating: 12
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as none as the ICPs are being reconciled either using historic database information or the unmetered load details from the registry. This is expected to improve once the NZTA RAMM database is brought up to date and maintained going forward. The impact is assessed to be high as no current database is used for the reconciliation of these ICPs.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis are working with NZTA to get a complete and consistent data source.	unknown	Investigating
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Levels of accuracy in NZTA database are still unknown but Genesis are currently reviewing whether is now possible to switch data sources.	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 RAMM database functionality achieves compliance with the code. The change management process and the compliance of the database reporting provided to Genesis is detailed in **sections 2.1, 3.1** and **3.2**.

Audit outcome

Compliant

2.7. Audit trail (Clause 11(4) of Schedule 15.3)

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

The DUML database must incorporate an audit trail of all additions and changes that identify:

- *the before and after values for changes*
- *the date and time of the change or addition*
- *the person who made the addition or change to the database*

Audit observation

The NZTA RAMM database extract is not being used for reconciliation and the five ICPs associated with this load are being reconciled using historic database information or the unmetered load details from the registry. This is recorded as non-compliance.

The NZTA RAMM database has a complete audit trail of all additions and changes to the database, therefore this non-compliance will clear once the database is used for reconciliation.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.7 With: 11(4) of Schedule 15.3 From: Unknown To: 30-Nov-19	No database used to reconcile ICPs and therefore no audit trail. Potential impact: High Actual impact: Unknown Audit history: None Controls: None Breach risk rating: 12
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as none as the ICPs are being reconciled either using historic database information or the unmetered load details from the registry. This is expected to improve once the NZTA RAMM database is brought up to date and maintained going forward. The impact is assessed to be high as no current database is used for the reconciliation of these ICPs.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis are working with NZTA to get a complete and consistent data source.	unknown	Investigating
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Levels of accuracy in NZTA database are still unknown but Genesis are currently reviewing whether is now possible to switch data sources.	unknown	

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 NZTA RAMM database extract is not being used for reconciliation and the five ICPs associated with this load are being reconciled using historic database information or the unmetered load details from the registry. This is recorded as non-compliance.

The database extract provided for NZTA West Waikato was assessed in anticipation of this being used for submission. This included data for three of the five ICPs. A field audit of these items of load was undertaken. 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 Waikato West area
Strata	The RAMM database contains the items of load in for three ICPs as indicated in **section 1.6**. The management of the NZTA items of load are the same, but I decided to place the items of load into three similarly sized strata based on road name.
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 33 sub-units.
Total items of load	150 items of load were checked.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority or LED light specifications where available in anticipation of RAMM being used for reconciliation.

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

Audit commentary

The lack of a current database to calculate the kW load associated with the five NZTA Waikato West ICPs is recorded as non-compliance.

NZTA RAMM Field audit findings

A statistical sample of 150 items of load undertaken in anticipation of this database being used for reconciliation found that the field data was 96.0% of the database data for the sample checked.

Result	Percentage	Comments
The point estimate of R	96.0%	Wattage from survey is lower than the database wattage by 4.0%
R_L	90.0%	With a 95% level of confidence it can be concluded that the error could be between -0.6% and -10.0%
R_H	99.4%	

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 C (detailed below) applies.

The conclusion from Scenario C is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be between 0.4% to 10.0% lower than the wattage recorded in the DUML database. This would be non-compliant if the database was being used for submission because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 8.0 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 1 kW to 20 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 33,900 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 4,700 kWh to 83,400 kWh lower p.a. higher than the database indicates.

This is expected to be corrected as part of the database update post the 100% field audit that has been undertaken.

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

A check of the RAMM database was undertaken in anticipation of it being used for reconciliation and found:

- 109 items of load with no make and model recorded;
- 110 items of load with no or zero wattage recorded;
- 293 items load with no ballast recorded;
- 8X 150W HPS lights with 28W ballast applied instead of 18W;
- 20X 250W HPS lights with various ballasts applied instead of 28W;
- 2X 400W HPS lights with 28W ballast applied instead of 38W;
- 10X 70W HPS lights with a ballast of 11W applied instead of 13W; and
- 4X 80W Metal halide lights with a ballast of 9W applied instead of 10W

This is expected to be corrected as part of the database update post the 100% field audit that has been undertaken.

Change management process findings

NZTA expect the NOC to maintain the RAMM database as part of their contract for both new connections and maintenance. Fulton Hogan use pocket RAMM to track changes. The same process is used for new connections of which there are very few.

NZTA are reviewing the database maintenance processes and I recommend that KPI's for database accuracy be included in the NOC contracts with a link to the database accuracy expectations assessed in these audits.

Recommendation	Description	Audited party comment	Remedial action
Database Accuracy	Responsibility for the database accuracy is included in the NOC contract with a KPI linked to database accuracy findings assessed in the EA DUML audit to ensure that database accuracy is maintained.	Genesis has advised both NZTA and the current TCDC maintain contractor to discuss contractual arrangement for the NZTA assets to be managed.	Investigating

Outage patrols are undertaken on a 2-monthly basis.

There are no private or festival lights connected to the NZTA load.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: unknown To: 30-Nov-19	No database used to reconcile ICPs. Potential impact: High Actual impact: Unknown Audit history: None Controls: None Breach risk rating: 12
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as none as there is no current database available to accurately calculate submission from. This is expected to improve once the NZTA RAMM database is brought up to date and maintained going forward. The impact is assessed to be high as no current database is used for the reconciliation of these ICPs.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis are working with NZTA to get a complete and consistent data source.	unknown	Investigating
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Levels of accuracy in NZTA database are still unknown but Genesis are currently reviewing whether is now possible to switch data sources.	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 were provided with a database extract from RAMM in 2010 for all five ICPs and there have been no further reports provided by NZTA. These figures have been used for submission for the first three ICPs multiplied by logger hours. The unmetered load details populated on the registry are used to calculate submission for the remaining two ICPs. This is recorded as non-compliance below. As detailed in **section 3.1**, NZTA have undertaken 100% field audit and expect to be able to provide Genesis with database reporting for all the relevant ICPs as soon as the field audit findings have been uploaded. They were unable to give me an expected date for this as the project to upload the field findings is still being scoped.

I checked the calculations for the ICPs for the month of September and found for the three ICPs I could check against the NZTA RAMM database extract:

ICP Number	Sept kWh submitted	Calculated kWh for Sept from RAMM	Variance
0000022579WE623	25,269.20	23,216.39	-2,152.61
0000011095WE94E	12,008	11,889.11	-118.89
0000026694WE641	2,588	3,155.37	567.37
		TOTAL	-1,704.13

There is an estimated over submission of 1,704.13 kWh for the month of September. Annualised this equates to an estimated over submission of 20,449.58 kWh. This is recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: unknown To: 30-Nov-19	Outdated database or registry UML figures and not a current database used to calculate submission. This will be resulting in an estimated annual over submission of 20,449.58 kWh for the three ICPs where it was compared with the NZTA RAMM database. Potential impact: High Actual impact: Unknown Audit history: Once Controls: None Breach risk rating: 12
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as none as there is no current database available to accurately calculate submission from. This is expected to improve once the NZTA RAMM database is brought up to date and maintained going forward. The impact is assessed to be high as no current database is used for the reconciliation of these ICPs.

Actions taken to resolve the issue	Completion date	Remedial action status
Genesis are working with NZTA to get a complete and consistent data source.	unknown	Investigating
Preventative actions taken to ensure no further issue will occur	**Completion date**	
Levels of accuracy in NZTA database are still unknown but Genesis are currently reviewing whether is now possible to switch data sources.	unknown	

CONCLUSION

Genesis were provided with a database extract from RAMM in 2010 for all five ICPs and there have been no further reports provided by NZTA. These figures have been used for submission for the first three ICPs multiplied by logger hours. The unmetered load details populated on the registry are used to calculate submission for the remaining two ICPs.

NZTA provided a RAMM database extract which contained information for three of the five ICPs. These are highlighted in orange above. A field audit was undertaken of these items of load to assess how accurate the database is likely to be for the three ICPs. This found that the database accuracy is outside of the +/-5% threshold and indicated under submission would occur if used for submission.

NZTA have undertaken a 100% field audit. The results are being assessed and once confirmed to complete the data will be updated. NZTA then expect to be able to provide database reporting for the West Waikato ICPs. No completion date for this was able to be provided as the project to upload the field data is still being scoped.

This load includes the NZTA lights that have been removed from the Hamilton City Council RAMM database.

This audit found nine non-compliances and one recommendation is made. The future risk rating of 97 indicates that the next audit be completed in three months. I have considered this in conjunction with Genesis' comments and allowing sufficient time for the field audit findings to uploaded to RAMM and recommend that the next audit be in nine months.

PARTICIPANT RESPONSE

Genesis conducted the audit due to NZTA Waikato West not being able to be audited previously as required under 15.37(b). The data base has yet to be established and NZTA has not been able to advise when the administration of the audit would be completed.