ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

TAURANGA NZTA AND TRUSTPOWER LIMITED

Prepared by: Steve Woods

Date audit commenced: 19 November 2018

Date audit report completed: 27 November 2018

Audit report due date: 1 December 2018

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This audit of the Tauranga NZTA DUML database and processes was conducted at the request of Trustpower Limited (Trustpower) 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.

Tauranga City Council manages a RAMM database, including the Tauranga NZTA data.

The field work and asset data capture is conducted by McKay Electrical and they provide updates to Tauranga City Council.

Many improvements have been made to the content of the database during the audit period. Apart from incorrect ICP identifiers, all other fields in the database were complete and accurate.

Now that the database accuracy has been confirmed, Trustpower intends to use this data for submission purposes. Trustpower will need to ensure appropriate revisions are conducted to correct historic submissions.

The future risk rating of 15 indicates that the next audit be completed in 12 months. This seems a reasonable timeframe give the improvements that have been made.

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	Submission totals different to database totals indicating over submission of 116,385 kWh per annum.	Moderate	High	6	Identified
ICP identifier	2.2	11(2)(a) and (aa)	ICP identifiers incorrect in the database.	Moderate	Low	2	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	The field audit identified two lamps which were not recorded in the database.	Strong	Low	1	Cleared
Volume information accuracy	3.2	15.2 and 15.37B(c)	Submission totals different to database totals indicating over submission of 116,385 kWh per annum.	Moderate	High	6	Identified
Future Risk Rating						15	

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

RECOMMENDATIONS

Subject	Section	Clause	Recommendation

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

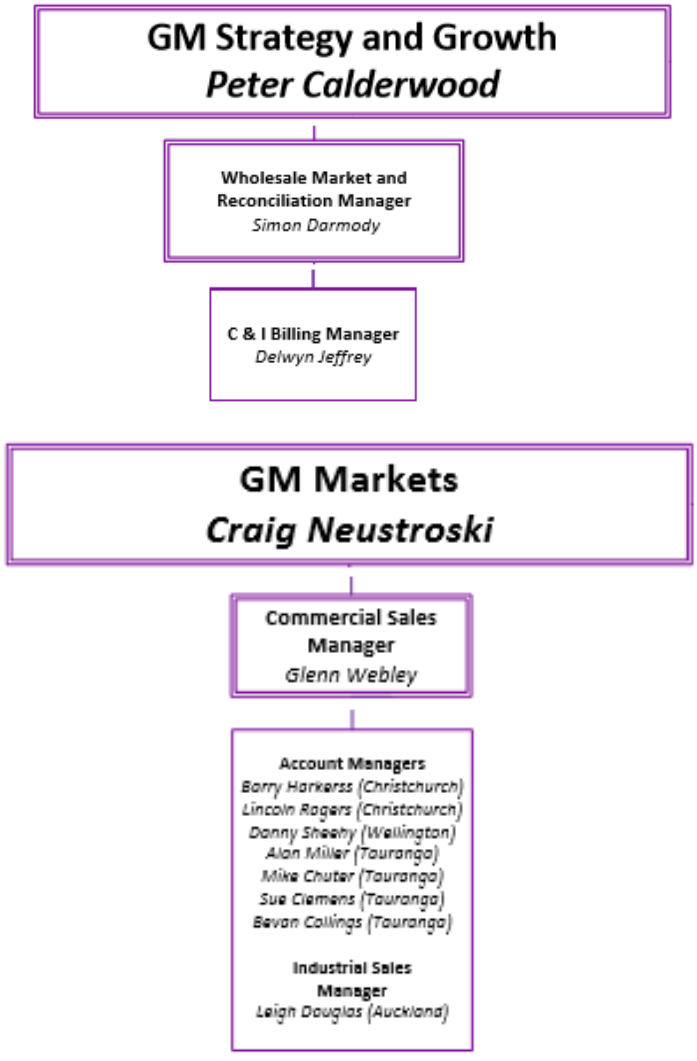
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

There are no exemptions in place relevant to the scope of this audit.

1.2. Structure of Organisation

Trustpower provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Steve Woods

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Robbie Diederen	Reconciliation Analyst	Trustpower
Alan Miller	Commercial Account Manager	Trustpower
Michael Jones	Traffic Systems Engineer	Tauranga City Council

1.4. Hardware and Software

The RAMM database used for the management of DUML is managed by TCC.

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	Number of items of load	Database wattage (watts)
1000524102PCBD0	Tauranga City State H/Way TGA 0331	TGA0331	266	67,056
1000524101PC710	SH 2 & SH 29 SH 36 Outgoing TGA0111	TGA0111	130	34,926
1000524103PC795	Tauranga Eastern SH's KMO0331	KMO0331	137	35,328
0001264706UNAD2	Mt Maunganui/Papamoa area MTM0331	MTM0331	211	46,723
Total			**744**	**184,073**

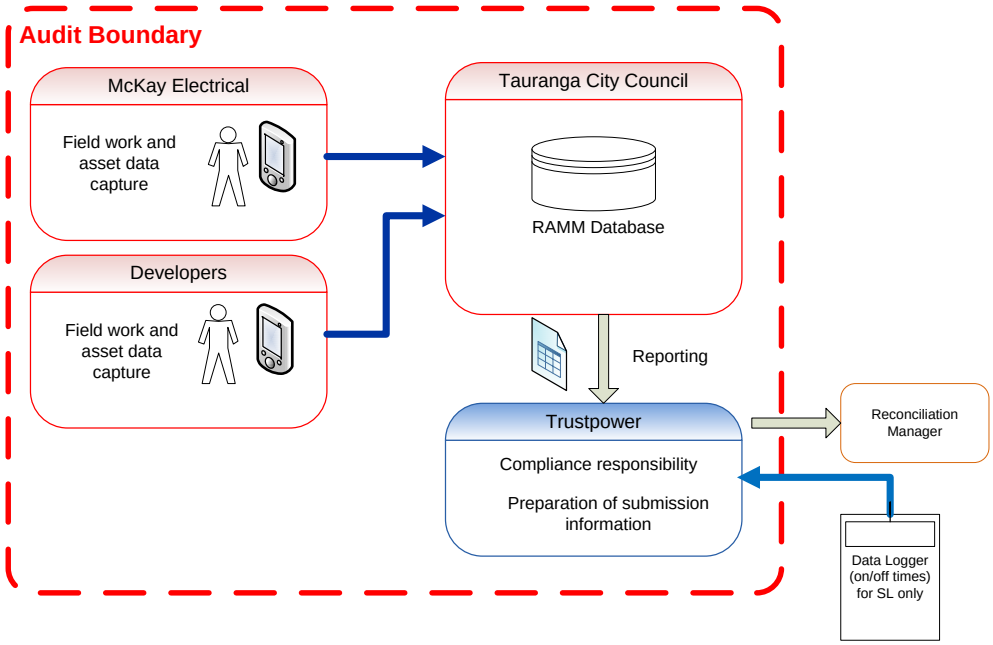
1.7. Authorisation Received

All information was provided directly by Trustpower and TCC.

1.8. Scope of Audit

The database used for submission is managed by TCC. The field work and asset data capture is conducted by McKay Electrical and they update the TCC RAMM database using "Pocket RAMM".

The diagram below shows the current flow of information and the audit boundary for clarity.



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

1.9. Summary of previous audit

The previous audit was completed in April 2018 by Steve Woods of Veritek. Seven non-compliances were identified. The statuses of the non-compliances are described below.

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Submission totals different to database totals indicating under submission of 190,000 kWh per annum.	Cleared
ICP identifier	2.2	11(2)(a) and (aa)	ICP identifier not contained in the database.	Now populated but is incorrect
Location of each item of load	2.3	11(2)(b) of Schedule 15.3	11 records without coordinates.	Cleared
Capacity of load	2.4	11(2)(b) of Schedule 15.3	Gear wattage not recorded in the database.	Cleared
All load recorded in database	2.5	11(2A) of Schedule 15.3	The field audit identified one lamp which was not recorded in the database.	Small number of inaccuracies present
Database accuracy	3.1	15.2 and 15.37B(b)	Database accuracy is 99.3% compared to the field. There are 52 duplicate records (not considered in the 99.3% calculation because they were not part of the statistical sample).	Cleared
Volume information accuracy	3.2	15.2 and 15.37B(c)	Submission totals different to database totals indicating under submission of 190,000 kWh per annum.	Cleared

Subject	Section	Clause	Recommendation	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

Trustpower have requested Veritek to undertake this DUML 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.

Audit commentary

Trustpower reconciles this DUML load using the STL profile. The on and off times are derived from data logger information. Trustpower has been using their own database for submission purposes and not the database subject to this audit.

I recalculated the submissions for October 2018 using the data logger and database information. I confirmed that the calculation method was correct, but the total kWh figure I calculated was 71,423 kWh and the submitted figure was 81,996. A difference of 10,572 kWh for the month or approx. 116,385 kWh per annum over submission.

The field audit found an accuracy of 98.1%, therefore compliance is achieved with regard to database accuracy, but non-compliance exists because the database figures are not reflected in submissions.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: 11(1) of Schedule 15.3 From: 01-Jun-18 To: 27-Nov-18	Submission totals different to database totals indicating over submission of 116,385 kWh per annum. Potential impact: High Actual impact: High Audit history: Twice Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	TCC has recently updated the database and the updated data will be used for November 2018 submissions, therefore I have recorded the controls as moderate at the time of the audit. Although controls have been improved, the submissions have been incorrect, and the impact is high until revisions have been conducted.
Actions taken to resolve the issue	**Completion date** / **Remedial action status**

Submission data will be calculated on audit figures, commencing with the next submission	December 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Maintain regular inspections of database against monthly updates, commencing with the next submission	December 2018	

2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3)

Code reference

Clause 11(2)(a) and (aa) of Schedule 15.3

Code related audit information

The DUML database must contain:

- *each ICP identifier for which the retailer is responsible for the DUML*
- *the items of load associated with the ICP identifier.*

Audit observation

The RAMM database was checked to confirm an ICP is recorded for each item of load.

Audit commentary

ICPs have been added to the database but they are the TCC ICPs not the NZTA ICPs. These will need to be updated.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.2 With: 11(2)(a) and (aa) From: 01-Jun-18 To: 27-Nov-18	ICP identifiers incorrect in the database. Potential impact: Medium Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	There is now a process to ensure ICPs are populated, except that the incorrect ICPs were used. The controls are rated as moderate. The impact is rated as low because there is a minor impact of not being able to confirm if the database contains the correct information.
Actions taken to resolve the issue	**Completion date** / **Remedial action status**

Trustpower will advise NZTA of correct ICP's to be added into database.	December 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Inspect Database periodically, commencing early 2019	January 2019	

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

Audit commentary

The database contains coordinates for the location of items of load, along with road names. No blanks or errors were identified.

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 a field for lamp wattage and these were confirmed as correct in relation to the description. All records now include gear wattage and the gear wattages are correct.

Audit outcome

Compliant

2.5. All load recorded in database (Clause 11(2A) of Schedule 15.3)

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

The retailer must ensure that each item of DUML for which it is responsible is recorded in this database.

Audit observation

A field audit of 166 items of load was undertaken.

Audit commentary

The field audit findings are detailed in the table below.

Wattages for lamps found in the field but not the database were based on lamp label information where available and estimated based on physical characteristics and other surrounding lamps where unlabelled.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
1000524101PC710					
002-0146/02.13-D	17	17			
002-0150-R2	5	5			
029-0014-D	7	7			
29A-0008/00.28	4	4			
1000524103PC795					
29A-0000/06.91-D	6	6			
29A-0008-D (HAIRINI RD NORTHBOUND)	12	12			
29A-0008-I (HAIRINI RD SOUTHBOUND)	2	2			
29A-0011-W	3	3			
29A-008-R? (TURRET BR TO MAUNGATAPU R/BOUT)	12	12			
1000524102PCBD0					
002-0146 (WAIHI ROAD BETHLEHEM)	57	57			
002-0151-R2	11	11			
0001264706UNAD2					

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
002-0158-W	1	1			
002-0159-R1 (AERODROME TO MAUNGANUI)	4	4			
002-0159-R3 (FLYOVER TO GOLF ROAD OFFRAMP)	10	10			
002-0159-R4 (MANUGANUI TO AERODROME)	10	11	+1		Additional 150SON
002-0164-I	3	2	-1		One 150SON missing
002-0171-R5	1	1			
29A-0000/00.16-D	4	4			Additional Halogen One 150SON missing
29A-0000/00.19-I	3	2	-1		One 250SON missing
29A-0000-D	3	3			
29A-0000-I (MAUNGANUI TO BAYPARK)	3	3			
29A-0001-W	6	3	-3		3 x 250SON missing
TAURANGA EAST ROAD	1	1			
Total	**185**	**181**	**-4**		

I found four less lamps in the field than were recorded in the database (net difference). This clause relates to items of load in the field not recorded in the database, so the only non-compliance for this clause is that there were two additional lamps in the field not recorded in the database.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: 01-Jun-18 To: 27-Nov-18	The field audit identified two lamps which were not recorded in the database. Potential impact: Medium 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 they are sufficient to ensure that most database information is recorded correctly. The impact is rated as low because the impact on settlement is minor for two lights.

Actions taken to resolve the issue	Completion date	Remedial action status
Nil. Database already updated	Cleared	Cleared
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Nil	NA	

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 PowerNet 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 20 September 2012, the Authority sent a memo to retailers and auditors advising that tracking of load changes at a daily level was not required if 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.

McKay Electrical has the maintenance contract for streetlights and data is entered directly into the RAMM database via pocket RAMM. McKay Electrical submits Service Orders immediately after the work has been completed and this is in turn checked by Tauranga City Council to validate the claims.

I did not identify any problems with the tracking of load changes.

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 contains a complete audit trail of all additions and changes.

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	Tauranga NZTA
Strata	The database contains items of NZTA load in the Tauranga region. The processes for the management of all items of load are the same, but I decided to place the items of load into four strata, based on ICPs, as follows: 0001264706UNAD2 1000524101PC710 1000524102PCBD0 1000524103PC795
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 22 sub-units.
Total items of load	185 items of load were checked.

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

Audit commentary

A statistical sample of 185 items of load found that the field data was 98.1% of the database data for the sample checked. This is within the required database accuracy of ± 2.5%. The statistical sampling tool reported with 95% confidence the precision of the sample was 8.0% and the true load in the field will be between 92.9% to 100.9% of the load recorded in the database. The sample is not considered sufficiently precise to be able to determine the database accuracy, but it indicates that the database accuracy is likely to cause over submission.

The tool indicated that there is potentially 15,000 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 that there is a potential estimated submission variance range of between 55,500 kWh over submission and 7,100 kWh under submission.

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority and found to be correct.

Audit outcome

Compliant

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
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

Audit commentary

Trustpower reconciles this DUML load using the STL profile. The on and off times are derived from data logger information.

I recalculated the submissions for October 2018 using the data logger and database information. I confirmed that the calculation method was correct, but the total kWh figure I calculated was 71,423 kWh and the submitted figure was 81,996. A difference of 10,572 kWh for the month or approx. 116,385 kWh per annum over submission.

The field audit found an accuracy of 98.1%, therefore compliance is achieved with regard to database accuracy, but non-compliance exists because the database figures are not reflected in submissions.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: 11(1) of Schedule 15.3 From: 01-Jun-18 To: 27-Nov-18	Submission totals different to database totals indicating over submission of 116,385 kWh per annum. Potential impact: High Actual impact: High Audit history: Twice Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	TCC has recently updated the database and the updated data will be used for November 2018 submissions, therefore I have recorded the controls as moderate at the time of the audit. Although controls have been improved, the submissions have been incorrect, and the impact is high until revisions have been conducted.

Actions taken to resolve the issue	Completion date	Remedial action status

Nil: Database has been updated . November submission will use database totals .	Completed	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Database will be checked following monthly updates, commencing December 2018	December 2018	

CONCLUSION

Tauranga City Council manages a RAMM database, including the Tauranga NZTA data.

The field work and asset data capture is conducted by McKay Electrical and they provide updates to Tauranga City Council.

Many improvements have been made to the content of the database during the audit period. Apart from incorrect ICP identifiers, all other fields in the database were complete and accurate.

Now that the database accuracy has been confirmed, Trustpower intends to use this data for submission purposes. Trustpower will need to ensure appropriate revisions are conducted to correct historic submissions.

The future risk rating of 15 indicates that the next audit be completed in 12 months. This seems a reasonable timeframe give the improvements that have been made.

PARTICIPANT RESPONSE

Trustpower will ensure that the correct ICP's are showing in the database.

Due to a number of road works currently taking place on these roads, lights will be removed and new lights installed. Now that the database is accurate, monthly checks of the database maybe required following month end submissions. Trustpower will work with TCC to manage this.