ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

MANAWATU DISTRICT COUNCIL AND CONTACT ENERGY

Prepared by: Tara Gannon

Date audit commenced: 13 March 2018

Date audit report completed: 30 April 2018

Audit report due date: 1 June 2018

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This audit of the Manawatu District Council (MDC) DUML database and processes was conducted at the request of Contact Energy (Contact) 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, which became effective on 1 June 2017.

The RAMM database used for submission is managed by Alf Downs on behalf of MDC. New connection, fault, maintenance and upgrade work is completed by Alf Downs. All update the database using Pocket RAMM. Alf Downs provides a monthly report to Contact from the database.

An LED upgrade project is currently underway.

The future risk rating of 16 indicates that the next audit be completed in 12 months. Four non-compliances were identified, and no recommendations were raised. 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	The database used to prepare submissions contains some inaccurate information. The submission calculation excluded gear wattages, which resulted in under submission of 4,307 kWh for February 2018.	Weak	Medium	6	Identified
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	Three lamps had missing model information. All were corrected during the audit.	Moderate	Low	2	Cleared
Database accuracy	3.1	15.2 and 15.37B(b)	The database used to prepare submissions contains some inaccurate information.	Moderate	Low	2	Identified
Volume information accuracy	3.2	*15.2 and 15.37B(c)*	The database used to prepare submissions contains some inaccurate information. The submission calculation excluded gear wattages, which resulted in under submission of 4,307 kWh for February 2018. Incorrect profiles are recorded on the registry for both ICPs.	Weak	Medium	6	Identified
Future Risk Rating						16	

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	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.

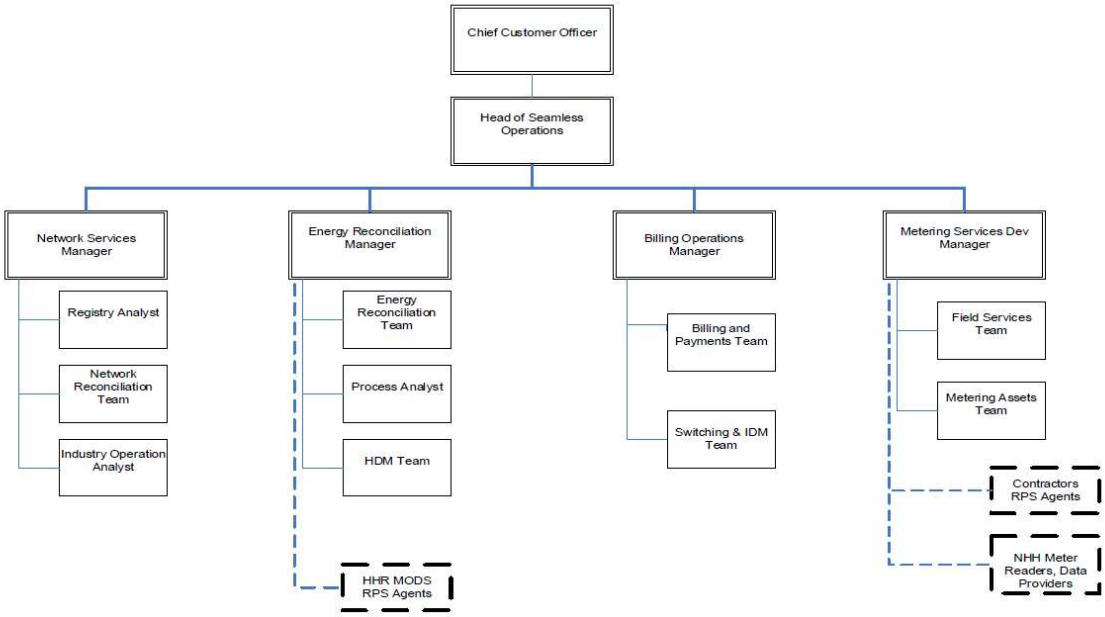
Audit commentary

There is one exemption in place relevant to the scope of this audit:

Exemption No. 177: Exemption to clause 8(g) of schedule 15.3 of the Electricity Industry Participation Code 2010 ("Code") in respect of providing half-hour ("HHR") submission information instead of non half-hour ("NHH") submission information for distributed unmetered load ("DUML"). This exemption expires at the close of 31 October 2023.

1.2. Structure of Organisation

Contact Energy provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Tara Gannon

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Darryn Black	Asset Management Officer	Manawatu District Council
Bernie Cross	Energy Reconciliation Manager	Contact 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.

MDC confirmed that the database back-up is in accordance with standard industry procedures. Access to the database is secure by way of password protection.

1.5. Breaches or Breach Allegations

There are no breach allegations relevant to the scope of this audit.

1.6. ICP Data

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0900087357PCBB6	KAWAKAWA ROAD STREETLIGHTING	BPE0331	RPS HHR	1,846	128,353
1000560474PC712	MASTER ICP – MANAWATU DC URBAN STLIGHTS	BPE0331	RPS HHR	197	32,279
Total				2,043	160,632

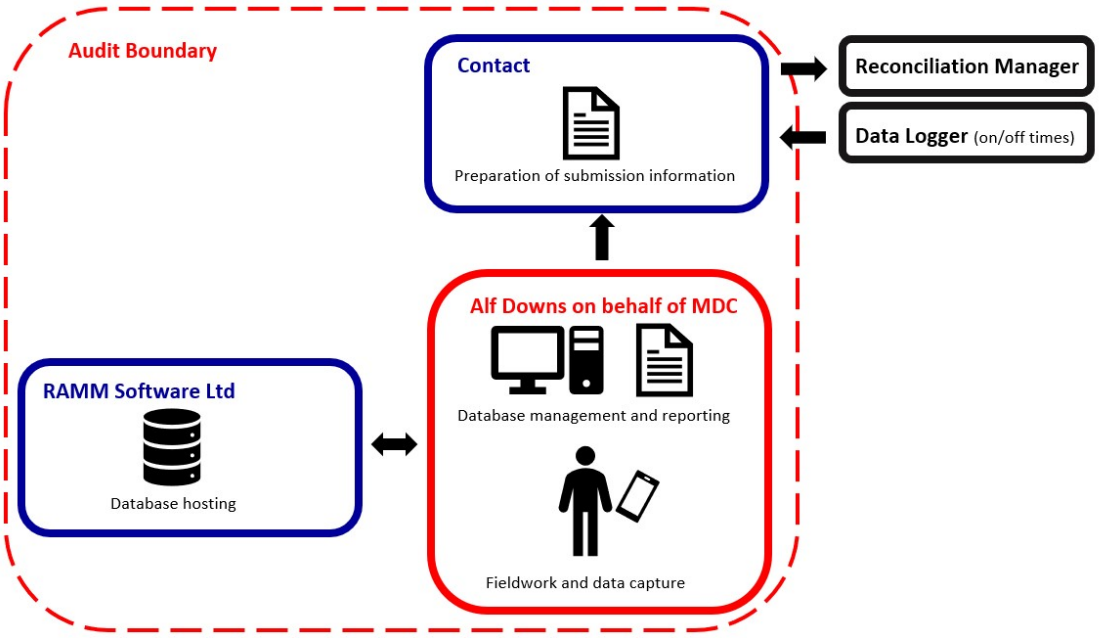
1.7. Authorisation Received

All information was provided directly by Contact and MDC.

1.8. Scope of Audit

The RAMM database used for submission is managed by Alf Downs on behalf of MDC. New connection, fault, maintenance and upgrade work is completed by Alf Downs. All update the database using Pocket RAMM. Alf Downs provides a monthly report to Contact from the database.

The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information based on the database reporting. The diagram below shows the audit boundary for clarity.



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

The field audit was undertaken of a statistical sample of 150 items of load on 13 April 2018. The sample was selected from two strata:

- 0900087357PCBB6 (MDC lights); and
- 1000560474PC712 (NZTA and festive lights).

1.9. Summary of previous audit

This is the first audit of the Manawatu District Council DUML database completed for Contact.

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

Contact 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 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

Contact reconciles this DUML load using the HHR profile, in accordance with exemption number 177. This exemption is discussed further in **section 1.1**.

Submissions are based on the database information, with on and off times derived from data logger information. I recalculated the submissions for February 2018 for both ICPs using the corresponding data logger and database information.

The monthly wattage information records lamp and ballast wattages in separate fields.

ICP	Feb 2018 lamp wattage	Feb 2018 gear wattage	Feb 2018 festive wattage (to be removed from submission when not connected)	Feb 2018 total wattage (lamp + gear – festive)
0900087357PCBB6	120,026	11,651	4,682	126,995
1000560474PC712	28,962	3,378	670	31,670
Total	**148,988**	**15,029**	**5,352**	**158,665**

Contact Energy's submission calculations excluded the gear wattage. Total wattage was calculated as lamp wattage – festive wattage, instead of lamp wattage + gear wattage – festive wattage.

		Contact Energy	Recalculation		
ICP	Burn hours	Feb 2018 submission kWh	Feb 2018 wattage (incl gear, excl festive)	Feb 2018 calculated kWh (wattage x burn hours / 1000)	Difference kWh
0900087357PCBB6	286.58015	33,055.30	126,995	36394.25	3,338.95
1000560474PC712	286.58015	8,107.93	31,670	9075.99	968.07
Total		**41,163.23**	**158,665**	**45,470.24**	**4,307.01**

Festive lights were correctly excluded from the calculation because they were not connected.

There is some inaccurate data within the database used to calculate submissions. This is recorded as non-compliance and discussed in **sections 2.4, 2.5** and **3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: unknown To: 13-Apr-18	The database used to prepare submissions contains some inaccurate information. • The database accuracy is assessed to be 99.1% indicating an estimated over submission of 414 kWh per annum. • 56 lamps had incorrect lamp or gear wattages recorded. The errors amount to 190 watts, resulting in under submission of 784 kWh per annum. The submission calculation excluded gear wattages, which resulted in under submission of 4,307 kWh for February 2018. Potential impact: Medium Actual impact: Medium Audit history: None Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls over database accuracy are rated as weak overall, as they are not sufficient to ensure that submission is accurate. The impact is assessed to be medium, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will work with Manawatu DC to get the DUML database updated with these correct values and attributes The missing gear wattage values from submission volumes relates to a training issue within Contact Energy's processes and this issue has been addressed. Wash up corrections will flow through via the settlement process.	Dec 2018 May 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above	As above	

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 an ICP is recorded for each item of load.

Audit commentary

An ICP is recorded for each item of load.

Audit outcome

Compliant

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

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The database contains the nearest street address and Global Positioning System (GPS) coordinates for each item of load and users in the office and field can view these locations on a mapping system.

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

Lamp make and model, lamp wattage and gear wattage are included in the database.

One NZTA light had a missing lamp model, and two MDC lights were recorded with an unknown lamp model. All three were updated during the audit.

27 festive shapes and three festive strings had blank gear wattages. All are LED lights and the gear wattages were updated to zero during the audit.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clauses 11(2)(c) and (d) of Schedule 15.3 From: unknown To: 13-Apr-18	Three lamps had missing model information. All were corrected during the audit. Potential impact: Low Actual impact: None Audit history: Once previously Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as moderate, as they are sufficient to ensure that most information is complete. There is no impact, because lamp and gear wattage information was correctly recorded for the lamps with missing models. There was no change to the total wattages where the gear wattage had been blank.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will work with Manawatu DC to get the DUML database updated with these correct values and attributes	Dec 2018	Cleared
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above	As above	

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 a statistical sample of 150 items of load was undertaken. The sample was selected from two strata:

- 0900087357PCBB6 (MDC lights); and
- 1000560474PC712 (NZTA and festive lights).

Audit commentary

The field audit findings are detailed in the table below.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
NZTA					
DUNDAS ROAD (1233)	41	41	-	-	
MDC					
BURT STREET (552)	4	4	-	-	
CAROLINE DRIVE (351)	5	5	-	-	
CHAMBERLAIN STREET (438)	5	5	-	-	
DEWE AVENUE (346)	8	8	-	-	
EAST STREET (390)	33	33	-	-	
ELIZABETH STREET (375)	7	7	-	-	
FERNDALE PLACE (307)	3	3	-	-	
FLORENCE PLACE (377)	1	1	-	-	

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
HOMELANDS AVENUE (332)	4	4	-	-	
KENNEDY AVENUE (357)	5	5	-	-	
MANFEILD PARK DRIVE (1266)	12	8	-4	-	Four security up lights were removed when the Manfield sign was replaced, but are still recorded in the database.
MONTGOMERY STREET (453)	3	3	-	-	
PARKVIEW AVENUE (329)	5	5	-	-	
RATA STREET (302)	8	8	-	1	One 70W SON light is recorded as 24W LED in the database. The light is due to be replaced and has been updated early.
WESTWIND PLACE (315)	4	4	-	-	
Total	**148**	**144**	**-4**	**1**	

I found four less lamps in the field than were recorded in the database and one lamp wattage difference. These differences are recorded as non-compliance in **section 3.1**.

Audit outcome

Compliant

2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3)

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

The DUML database must track additions and removals in a manner that allows the total load (in kW) to be retrospectively derived for any given day.

Audit observation

The process for tracking of changes in the database was examined.

Audit commentary

Any changes that are made during any given month take effect from the beginning of that month. The information is available that 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 provision of a copy of the report to Contact each month is sufficient to achieve compliance.

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance. All fault and maintenance work is issued to Alf Downs field staff through "RAMM Contractor" and once each job is completed the database is updated in the field using Pocket RAMM.

The new connections process differs depending on who the developer is. The developer or MDC conducts livening. An "as built" plan is provided to MDC as part of the consent process. In those instances, when MDC liven the updates are captured into the database efficiently. Alf Downs checks the field to confirm the "as built" details and then enters these into the database including the GPS co-ordinates. When the developer arranges for livening of the street lights there can be some delay in getting these into the database. The volume of new development in the MDC area is low, so the risk is low. MDC is aware of this issue and they monitor any new connections to ensure they are entered into the database at the earliest opportunity.

There are 71 private lights recorded in the database, and Powerco has been advised of these so that ICPs can be created.

Some Christmas and festive lights are used and are included in the database. These lights are excluded from submissions when they are not connected.

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

MDC demonstrated a complete audit trail of all additions and changes to the database 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	MDC region
Strata	The database contains items of load in the Manawatu area. The processes for the management of all MDC items of load are the same, and I decided to create two strata • 0900087357PCBB6 (MDC lights); and • 1000560474PC712 (NZTA and festive lights).
Area units	I created a pivot table of the roads in each stratum, and I used a random number generator in a spreadsheet to select a total of 17 subunits.
Total items of load	150 items of load were checked.

Wattages for all items of load were checked against the published standardised wattage tables produced by the Electricity Authority and Veritek, or the manufacturer's specifications.

Audit commentary

The database was found to contain some inaccuracies. The field audit found:

- four less lamps in the field than were recorded in the database
- one lamp type and wattage difference.

The field data was 99.1% of the database data for the sample checked. The total wattage recorded in the database for the sample was 15,699 watts. The total wattage found in the field for the sample checked was 15,602 watts, a difference of 97 watts. This will result in estimated over submission of 414 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

Wattages for all items of load were checked against the published standardised wattage tables produced by the Electricity Authority and Veritek, or the manufacturer's specifications. The following discrepancies were identified:

Lights affected	Issue	Difference (W)	Action
Light ID 37254	0 lamp wattage recorded	150W	Database corrected during the audit

Lights affected	Issue	Difference (W)	Action
Light ID 38212	Incorrect model recorded	-	Database corrected during the audit
BetaLEDway T3M 40LED x 8	LED wattage split between lamp and gear	-	Database corrected during the audit to show full wattage in the lamp wattage field
LED ECO WFLED x 2	LED wattage split between lamp and gear	-	Database corrected during the audit to show full wattage in the lamp wattage field
Phillips Pacific Batten x 4	LED wattage split between lamp and gear	-	Database corrected during the audit to show full wattage in the lamp wattage field
Goughlite 500 x 10	Gear wattage was recorded as 10W but should be 14W	40W	Database corrected during the audit
Festive shapes x 27 and festive strings x 3	Gear wattage is blank but expected to be 0.	-	Database corrected during the audit
Total		**190W**	

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: unknown To: 13-Apr-18	The database used to prepare submissions contains some inaccurate information. • The database accuracy is assessed to be 99.1% indicating an estimated over submission of 414 kWh per annum. • 56 lamps had incorrect lamp or gear wattages recorded. The errors amount to 190 watts, resulting in under submission of 784 kWh per annum. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2

Audit risk rating	Rationale for audit risk rating
Low	The controls are rated as moderate, because they are sufficient to ensure that lamp information is correctly recorded most of the time. The impact is assessed to be low, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will work with Manawatu DC to get the DUML database updated with these correct values and attributes	Dec 2018	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above	As above	

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

Contact reconciles this DUML load using the HHR profile, in accordance with exemption number 177. This exemption is discussed further in **section 1.1**.

The registry shows HHR RPS profile but should show HHR. Contact usually manually corrects the profiles on business day four each month, but some corrections in recent months were missed due to a staff member being on leave. This is recorded as non-compliance below.

ICP Number	Registry Profile	Date
0900087357PCBB6	RPS HHR	2/12/2017 – 26/4/2018
1000560474PC712	RPS HHR	2/12/2017 – 26/4/2018

Submissions are based on the database information, with on and off times derived from data logger information.

As discussed in **section 2.1**, I recalculated the submissions for February 2018 for both ICPs using the corresponding data logger and database information. I found that Contact Energy's submission calculations excluded the gear wattage. Total wattage was calculated as lamp wattage – festive wattage, instead of lamp wattage + gear wattage – festive wattage. This resulted in under reporting of approximately 4,307 kWh for February 2018.

There is some inaccurate data within the database used to calculate submissions. This is recorded as non-compliance and discussed in **sections 2.4, 2.5** and **3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: unknown To: 13-Apr-18	The database used to prepare submissions contains some inaccurate information. • The database accuracy is assessed to be 99.1% indicating an estimated over submission of 414 kWh per annum. • 56 lamps had incorrect lamp or gear wattages recorded. The errors amount to 190 watts, resulting in under submission of 784 kWh per annum. The submission calculation excluded gear wattages, which resulted in under submission of 4,307 kWh for February 2018. Incorrect profiles are recorded on the registry for both ICPs. Potential impact: Medium Actual impact: Medium Audit history: None Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls over database accuracy are rated as weak overall, as they are not sufficient to ensure that submission is accurate. The impact is assessed to be medium, based on the kWh differences described above. Profiles were recorded correctly on the registry for most of the audit period.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will work with Manawatu DC to get the DUML database updated with these correct values and attributes	Dec 2018	Identified
The missing gear wattage values from submission volumes relates to a training issue within Contact Energy's processes and this issue has been addressed. Wash up corrections will flow through via the settlement process.	May 2018	
The incorrect profile on the registry issue is a result of a system defect – currently a fix is underway to prevent this issue from occurring. A manual work around is currently in place to update the registry where required	July 2018	
Preventative actions taken to ensure no further issues will occur	**Completion date**	
As above	As above	

CONCLUSION

The RAMM database used for submission is managed by Alf Downs on behalf of MDC. New connection, fault, maintenance and upgrade work is completed by Alf Downs. All update the database using Pocket RAMM. Alf Downs provides a monthly report to Contact from the database.

An LED upgrade project is currently underway.

The future risk rating of 16 indicates that the next audit be completed in 12 months. Four non-compliances were identified, and no recommendations were raised.

PARTICIPANT RESPONSE

Contact have reviewed this report, and their comments are contained within its body.