ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

QUEENSTOWN LAKES DISTRICT COUNCIL AND CONTACT ENERGY

Prepared by: Rebecca Elliot

Date audit commenced: 22 March 2019

Date audit report completed: 10 May 2019

Audit report due date: 01-Jun-19

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EXECUTIVE SUMMARY

This audit of the Queenstown Lakes District Council (**QLDC**) streetlight DUML database and processes was conducted at the request of Contact Energy Limited (**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.

Contact began using the QLDC RAMM database to derive submission from November 1st, 2018. This database has been assessed for this audit.

QLDC are undertaking an LED rollout this does not include a central management system but this may be considered in the future. Delta will be the field contractor for QLDC until 1/5/19 when McKay Electrical takes over the contract.

The audit found six non-compliances and makes one recommendation. The database accuracy did not fall within the acceptable +/- 5% range. QLDC are committed to improving the database accuracy. As part of the new field contract McKay Electrical will undertake a 100% field audit to bring the database up to date. This is expected to be completed within the first three months of the contract. This is expected to bring the database accuracy within the acceptable range.

The future risk rating of 32 indicates that the next audit be completed in three months. I have considered this in conjunction with the comments provided by Contact Energy and recommend that the next audit be in nine months to allow sufficient time for the database to be corrected.

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 field data was 93.7% of the database data for the sample checked. This will result in potential over submission of 86,400 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). 151 items of load with incomplete lamp descriptions and zero wattage recorded indicating a potential estimated under submission of 53,528 kWh per annum. Nine items of load with and incorrect lamp and wattage combination. 80 items of load with the incorrect ballast recorded resulting in a minor estimated annual under submission of 2,773 kWh (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Queenstown winter festival lights are not recorded in RAMM.	Moderate	High	6	Identified
Location of each item of load	2.3	11(2)(b) of Schedule 15.3	103 items of load not readily locatable	Moderate	Low	2	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Description and capacity of each item of load	2.4	11(2)(c) of Schedule 15.3	151 items of load with incomplete lamp descriptions and zero wattage recorded indicating a potential estimated under submission of 53,528 kWh per annum.	Moderate	High	6	Identified
All load recorded in database	2.5	11(2A) and (d) of Schedule 15.3	24 additional items of load found. Queenstown winter festival lights are not recorded in RAMM.	Moderate	High	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)	The database contains some inaccurate data. The field data was 93.7% of the database data for the sample checked. This will result in potential over submission of 86,400 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). 151 items of load with incomplete lamp descriptions and zero wattage recorded indicating a potential estimated under submission of 53,528 kWh per annum. Nine items of load with and incorrect lamp and wattage combination. 80 items of load with the incorrect ballast recorded resulting in a minor estimated annual under submission of 2,773 kWh (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Queenstown winter festival lights are not recorded in RAMM.	Moderate	High	6	Identified

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)	The database contains some inaccurate data. The field data was 93.7% of the database data for the sample checked. This will result in potential over submission of 86,400 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). 151 items of load with incomplete lamp descriptions and zero wattage recorded indicating a potential estimated under submission of 53,528 kWh per annum. Nine items of load with and incorrect lamp and wattage combination. 80 items of load with the incorrect ballast recorded resulting in a minor estimated annual under submission of 2,773 kWh (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Queenstown winter festival lights are not recorded in RAMM.	Moderate	High	6	Identified
Future Risk Rating						32	

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	Recommendation
Tracking of load change	2.6	Contact to liaise with QLDC, Aurora and PowerNet to review the electrical connection of streetlights.

ISSUES

Subject	Section	Description	Issue

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.

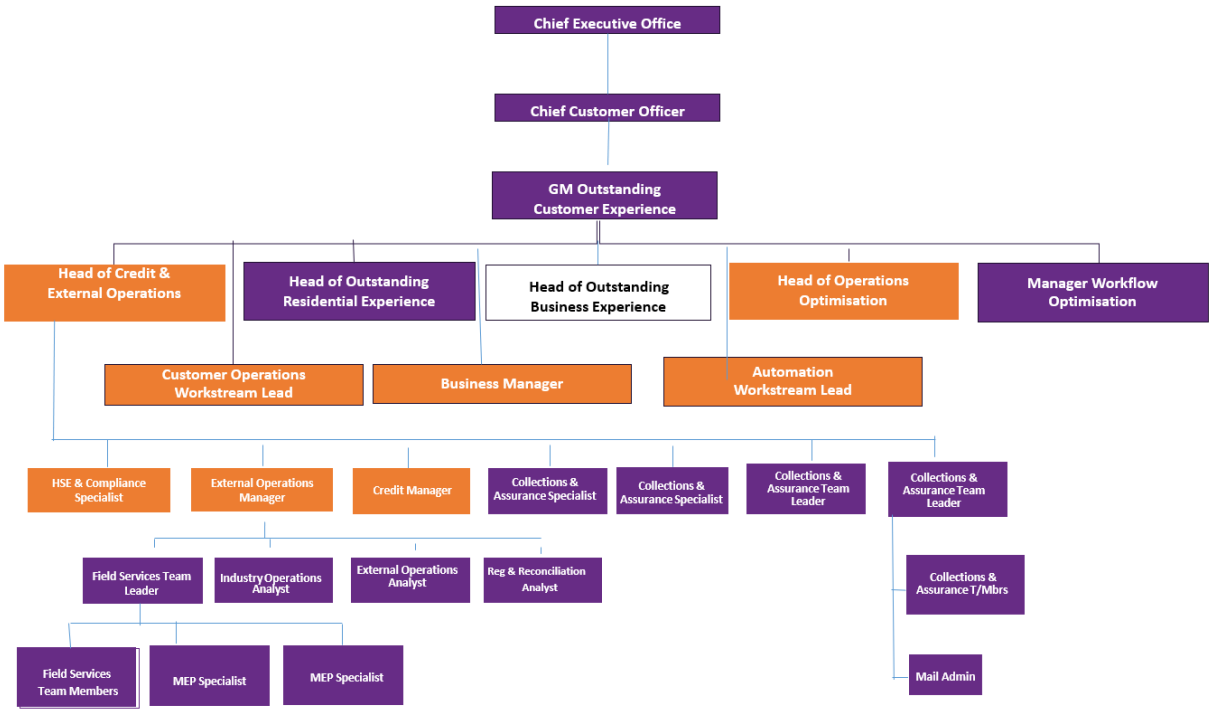
Audit commentary

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:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Name	Title	Organisation
Roger Hughes	Contract Data Engineer	QLDC
Alison Tomlinson	Senior Asset Engineer (Transportation)	QLDC
Allie Jones	External Operations Analyst	Contact
Paul Robson	Field Services Team Member	Contact

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".

QLDC 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	Number of items of load	Database wattage (watts)
0000950000LN0EC	Franklin	FKN0331	187	20,362
0000990001LN819	QLDC lights Lakeview subdivision	NLK0111	27	783
0008801006TP2A7	KINGSTON	NMA0331	41	891
0000480064CEA92	CROMWELL GXP	CML0331	2,014	193,997
0000027637CE36B	FRANKTON GXP	FKN0331	1,808	161,714

1.7. Authorisation Received

All information was provided directly by Contact and QLDC.

1.8. Scope of Audit

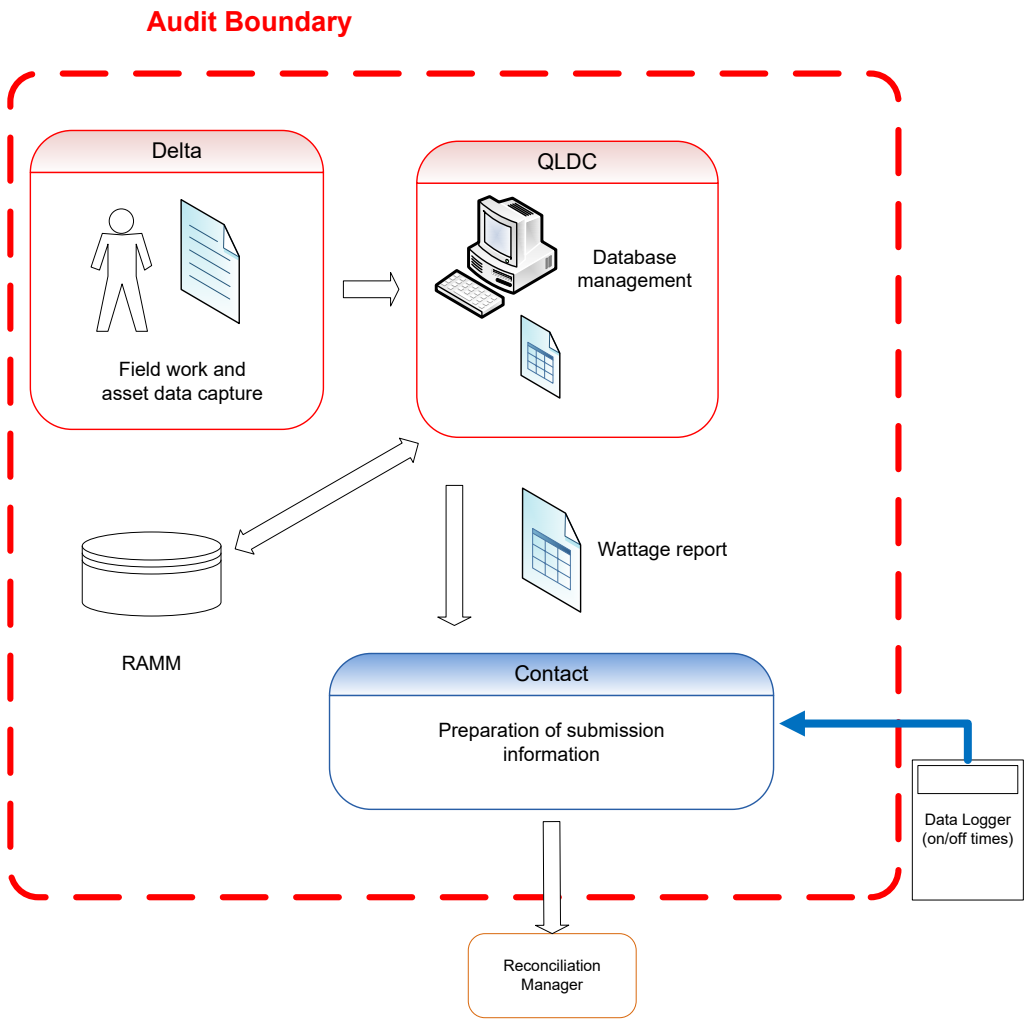
This audit of the Queenstown Lakes District Council (**QLDC**) streetlight DUML database and processes was conducted at the request of Contact Energy Limited (**Contact**), in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

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

Contact moved to using the QLDC RAMM data for reconciliation for the submission month of November 2018. This is the first audit undertaken using this data.

Delta are the field contractor for QLDC. This will change to McKay Electrical from May 1st, 2019.

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



The audit was carried out at QLDC's offices in Wanaka on 3rd & 4th April, 2019. The field audit was undertaken of 366 lights using the statistical sampling methodology.

1.9. Summary of previous audit

Contact provided a copy of the previous audit report, conducted in March 2018 by Rebecca Elliot of Veritek Limited. Five non-compliances were found and one recommendation was made. The current status of these are detailed below:

NON-COMPLIANCES

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	Aurora database accuracy is assessed to be 99.3% indicating an estimated over submission of 11,200 kWh per annum. Incorrect ballasts recorded for 786 items of load in the Aurora database, resulting in an estimated under submission of 12,321.84 kWh. PowerNet database accuracy is assessed to be 100.9% indicating a minor estimated under submission of 900 kWh per annum.	Still existing for RAMM database Still existing but much smaller volume affected
Description and capacity of each item of load	2.4	11(2)(c) of Schedule 15.3	178 items of load with incomplete lamp descriptions. Six items of load recorded with zero wattage. 98 items of load with an invalid light description.	Still existing
All load recorded in database	2.5	11(2A) and (d) of Schedule 15.3	1 additional item of load found on the Aurora managed DUML database. Some additional items of load found on the PowerNet managed DUML database.	Still existing
Tracking of load change	2.6	11(2A) of Schedule 15.3	The tracking of load changes is not being carried out in relation to changing of light type on existing items of load for the PowerNet database. Festive lights not tracked in the Aurora database.	Still existing but recorded against sections 2.1, 31 & 3.2

Subject	Section	Clause	Non-compliance	Status
Database accuracy	3.1	15.2 and 15.37B(b)	Aurora database accuracy is assessed to be 99.3% indicating an estimated over submission of 11,200 kWh per annum. Incorrect ballasts recorded for 786 items of load in the Aurora database, resulting in an estimated under submission of 12,321.84 kWh. PowerNet database accuracy is assessed to be 100.9% indicating a minor estimated under submission of 900 kWh per annum.	Still existing for RAMM database Still existing but much smaller volume affected

RECOMMENDATIONS

Subject	Section	Recommendation	Status
Location of each item of load	2.3	Correct incorrect street names.	N/A as RAMM is now being used.

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 has requested Veritek to undertake this streetlight audit

Audit commentary

This audit report confirms that the requirement to conduct an audit has been met for this database within the required timeframe

Audit outcome

Compliant

2. DUML DATABASE REQUIREMENTS

2.1. Deriving submission information (Clause 11(1) of Schedule 15.3)

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

- *DUML database is up to date*
- *methodology for deriving submission information complies with Schedule 15.5.*

Audit observation

The process for calculation of consumption was examined and the database was checked for 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 for four of the five ICPs. This is recorded as non-compliance below. Submissions are based on the database information, with on and off times derived from data logger information.

Contact began using the QLDC RAMM database to derive submission from November 1st, 2018. This database has been assessed for this audit.

I recalculated the submissions for February using the data logger and database information. I confirmed that the calculation method was correct.

Analysis of the database indicated that there are volume inaccuracies present as follows:

Issue	Estimated volume information impact (annual kWh)
Potential over submission due to database inaccuracy identified during the field audit	Potential over submission of 86,400 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).
151 lamps had zero wattage recorded.	Potential under submission of 12,533W or 53,528 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).
80 items of load with an incorrect ballast applied	Potential under submission of 2,773 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool.
Queenstown winter festival lights not recorded in RAMM	I am unable to estimate the volume associated with these lights but they are LED and only connected temporarily so the anticipated volume will be small.

This is also recorded as non-compliance and discussed in **sections 2.4, 3.1** and **3.2**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: 11(1) of Schedule 15.3 From: 01-Nov-18 To: 28-Feb-19	The field data was 93.7% of the database data for the sample checked. This will result in potential over submission of 86,400 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). 151 items of load with incomplete lamp descriptions and zero wattage recorded indicating a potential estimated under submission of 53,528 kWh per annum. Nine items of load with and incorrect lamp and wattage combination. 80 items of load with the incorrect ballast recorded resulting in a minor estimated annual under submission of 2,773 kWh (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Queenstown winter festival lights are not recorded in RAMM. Potential impact: High Actual impact: High Audit history: Once previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, they have been weak but QLDC have appointed a new contractor and this will move the controls to be moderate with the expectation that controls will move to strong once the full field audit is completed. The impact is assessed to be high due to volume of additional lights found in the field.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will continue to work with QLDC on ensuring the accuracy of their database	23/05/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact is in regular contact with QLDC on their database. We will also continue to complete quarterly checks on the database. The full field check should also highlight some more accurate information	23/05/2019	

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

The database was checked to confirm the correct ICP was recorded against each item of load.

Audit commentary

All items of load have an ICP recorded against them.

Audit outcome

Compliant

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

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The database contains fields for the street address and also GPS coordinates. 103 items of load were not locatable. These relate to lights that have been identified from internal audits. The location of these lights is in the process of being updated.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.3 With: 11(2)(b) of Schedule 15.3 From: 01-Nov-18 To: 28-Feb-19	103 items of load not readily locatable 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, historically this data was not maintained as expected. QLDC are undertaking a full field audit that will address these items hence I have rated controls as moderate. The audit risk rating is low as this represents a small percentage of the database.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will continue to work with QLDC on ensuring the accuracy of their database	23/05/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact is in regular contact with QLDC on their database. We will also continue to complete quarterly checks on the database. The full field check should also highlight some more accurate information	23/05/2019	

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 databases were 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. The extract provided has fields for lamp and gear make and model. Analysis found:

- 146 items had no lamp description, wattage and ballast recorded as either blank or zero
- Five items had zero wattage and zero ballast recorded

Assuming the missing items of load are 70W HPS lights (the most common light type in the database) this equates to a potential estimated under submission of 53,528 kWh per annum.

The accuracy of the ballasts applied is discussed in **section 3.1**. These include the 103 items of load detailed in **section 2.3** and are expected to be corrected with the database cleanse discussed in section 2.6.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: 01-Nov-18 To: 28-Feb-19	151 items of load with incomplete lamp descriptions and zero wattage recorded indicating a potential estimated under submission of 53,528 kWh per annum. Potential impact: High Actual impact: High Audit history: Multiple Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, historically this data was not maintained as expected. QLDC are undertaking a complete data cleanse that will address these items hence I have rated controls as moderate. The impact is assessed to be low, as this represents 2.8% of the total load.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will continue to work with QLDC on ensuring the accuracy of their database	23/05/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact is in regular contact with QLDC on their database. We will also continue to complete quarterly checks on the database. The full field check should also highlight some more accurate information	23/05/2019	

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

Code reference

Clause 11(2A) of Schedule 15.3

Code related audit information

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

Audit observation

The field audit was undertaken of a statistical sample of 366 items of load. The field audit was undertaken on 3-4th April 2019 for all databases.

Audit commentary

The table below details the roads where discrepancies were found:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
ASHENHURST WAY (2597)	8	8		2	2x LED incorrect wattages
ASPEN GROVE (1345)	13	14	1		1x extra 70W HPS found in the field
BANNISTER STREET (2905)	8	10	2	4	2x extra 36W LED found in the field 4x LED incorrect wattages
BROWNSTON STREET (EAST) (1380)	29	29		19	19x incorrect wattages 70W HPS recorded in the database but 13 x 29W LED and 6x halogen lights (pedestrian crossings) found in the field
CARDRONA VALLEY ROAD (1301)	4	3	-1		1x 70W HPS not found in the field
CLIFF WILSON STREET (1732)	6	8	2	2	2x extra 100W HPS found in the field 2x 110W HPS recorded in the database but 100W HPS found in the field
COTTER AVENUE (198)	16	15	-1	1	1x 100W HPS not found in the field 1x 70W HPS recorded in the database but 29W LED found in the field
DANIELS TERRACE (2133)	2	4	2		2x extra 22W LED found in the field

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
DUNMORE STREET (602)	11	11		1	1x 70W HPS recorded in the database but 29W LED found in the field
FRANCIS LANE (2880)	4	4		4	4x incorrect LED wattages recorded as 27W but 20W LED found in the field.
FRANKTON DOMAIN (2806)	2	2		1	1x 70W HPS recorded in the database but 29W LED found in the field
HADDOWS PLACE ACCESSWAY 2 F1 (2459)	1	2	1		1x extra 70W HPS found in the field
JACK HANLEY DRIVE (2904)	11	14	3		3x extra 59W LED found in the field
JACK YOUNG PLACE (2180)	7	7		1	1x 150W HPS light recorded with zero wattage in the database
LINDMORE LANE (1744)	5	1	-4		4x 20W LED not found in the field
LISMORE PARK (2719)	2	2		1	1x 70W HPS recorded in the database but 29W LED found in the field
LONGWOOD PLACE (84)	2	2		1	1x 70W HPS recorded in the database but 22W LED found in the field
MAIZE STREET (2909)	3	4	1		1x extra 36W LED found in the field
OLD STATION AVENUE SOUTH (1880)	8	12	4		4x extra 70W HPS found in the field
ONSLOW ROAD (1843)	18	22	6		6x extra 28W LED lights found in the field
PANORAMA PLACE (88)	2	2		2	2x lights recorded as HPS in the database but LED lights found in the field
PETERLEY ROAD (2772)	8	8		1	1x incorrect LED rcorded as 27W but 30W found in the field

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
QUEENSTOWN CEMETERY (2732)	5	5		1	1x 150W HPS light recorded in the database but 29W LED found in the field
QUEENSTOWN GARDENS (2811)	13	10	-3		3x 70W HPS lights not found in the field
QUEENSTOWN GARDENS 1 F1 (2232)	3	3		2	2x 100W HPS recorded in the database but 29W LED found in the field
REGENT STREET (2603)	8	8		2	2x incorrect LED wattages recorded as 49W in the database but 30W LED found in the field
ROSS STREET (40)	1	1		1	1x 70W HPS recorded in the database but 29W LED found in the field
ST GEORGES AVENUE (1930)	7	8	1		1x extra 70W HPS found in the field
STATE HIGHWAY 6A (1384)	7	7		3	3x incorrect wattages. Recorded as HPS in the database but LED found in the field
STONEBROOK DRIVE (1785)	12	12		1	1x 70W HPS recorded in the database but 29W LED found in the field
STONEY CREEK PARK (2740)	1	1		1	1x 70W HPS recorded in the database but 29W LED found in the field
TAPLEY PADDOCK (617)	3	3	-1		1x 22W LED not found in the field
URQUHART PLACE ACCESSWAY F1 (2479)	2	2	-2		No lights located in the field
WARD STREET (2906)	3	4	1		1x extra 36W LED found in the field
WOODSTOCK ROAD (2584)	10	10		1	2x incorrect LED wattages recorded as 88W in the database but 49W LED found in the field

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Grand Total	366	372	36	52	

I checked the field audit against a more recent data extract to ensure that only those variances found had been present for more than one month. The field audit found a large number of errors. QLDC are aware that the quality of the data in RAMM is not accurate and McKay Electrical will be undertaking a full field audit of the assets to address this. The overall database accuracy is detailed in **section 3.1**.

The field audit found 24 additional lamps in the field. This is recorded as non-compliance below.

As noted in **section 2.6**, festive lights for the Queenstown winter festival are connected to the unmetered street light circuits but are not recorded in the database. This is recorded as non-compliance below.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) and (d) of Schedule 15.3 From: 01-Nov-18 To: 28-Feb-19	24 additional items of load found. Queenstown winter festival lights are not recorded in RAMM. Potential impact: High Actual impact: High Audit history: Once Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, they have been weak but QLDC have appointed a new contractor and this will move the controls to be moderate with the expectation that controls will move to strong once the full field audit is completed. The impact is assessed to be high due to volume of additional lights found in the field.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will continue to work with QLDC on ensuring the accuracy of their database	23/05/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact is in regular contact with QLDC on their database. We will also continue to complete quarterly checks on the database. The full field check should also highlight some more accurate information. QLDC are also completing a full audit of their assets	23/05/2019	

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

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

Any changes that are made during any given month take effect from the beginning of that month. The information is available which would allow for the total load in kW to be retrospectively derived for any day. On 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 when changes occur is sufficient to achieve compliance.

The database tracks additions and removals as required by this clause.

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance. Contact now use the RAMM database for submission rather than the network databases. Therefore the new connection process has changed.

Any new streetlight connections on the PowerNet sections of the network are notified to QLDC. This gives QLDC notification of new assets being connected. These assets are not added to the RAMM database until the 254C notification has been received. This can be sometime after electrical connection has occurred.

No notifications are received for new connections on the Aurora network. I recommend that Contact liaise with QLDC, Aurora and PowerNet to review the electrical connection of streetlight circuits.

Recommendation	Description	Audited party comment	Remedial action
Tracking of load change	Contact to liaise with QLDC, Aurora and PowerNet to review the electrical connection of streetlights	Contact has already discussed this with QLDC and QLDC were to implement a process surrounding this directly with the networks	Investigating

For reference, it is the distributor's responsibility to gain permission from a trader prior to such connections being made as detailed in the code reference below:

Clause 10.33A(4)

No participant may electrically connect a point of connection or authorise the electrical connection of a point of connection, other than a reconciliation participant.

Delta Contracting who have historically carried out all fault and maintenance work are being replaced by McKay Electrical from May 1st, 2019. As part of this contract they will undertake a 100% field audit to bring the database up to date. This is expected to be completed within the first three months of the contract. Outage and condition patrols are included in the contract. The frequency of these is based on the lamp type.

QLDC are undertaking an LED rollout. McKay Electrical have been carrying this work out. The replacement of the residential lights is largely complete. The V category and decorative lights are still to be carried out. The decorative light replacements pose some difficulty to find a suitable LED fixture that can be retrofitted.

Festive lighting is used in Queenstown for the winter festival, but these are not tracked in the RAMM database. QLDC intend to get these added so this volume is included in submission. This is recorded as non-compliance below in **sections 2.1, 3.1** and **3.2**.

There are no known private lights recorded in the QLDC database.

Audit outcome

Compliant

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

Code reference

Clause 11(4) of Schedule 15.3

Code related audit information

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

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

Audit observation

The RAMM database was checked for audit trails.

Audit commentary

The RAMM database contain a complete audit trail of all additions and changes including the identifier of person who makes any 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	Queenstown Lakes District Council Area
Strata	The database contains items of load in Queenstown Lakes District Area. The processes for the management of all QLDC items of load are the same, the population was across four strata: • Arrowtown • Queenstown • Wanaka • Rural
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 72 sub-units.
Total items of load	366 items of load were checked.

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

Audit commentary

The database was found to contain some inaccuracies and missing data as described in **section 2.5**. The field data was 93.7% of the database data for the sample checked. This is not within the required database accuracy of ±5%. The statistical sampling tool reported with 95% confidence the precision of the sample was 18.2%, and the true load in the field will be between 84.4% to 102.6% of the load recorded in the database. There is sufficient evidence to support the finding that the database is likely to be over recording wattages. This is recorded as non-compliance below.

The tool indicated that there is potentially 86,400 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool) of over submission. The statistical sampling tool reported with 95% confidence the possible impact will be between 213,800 of over submission and 35,400 kWh per annum of under submission.

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority and found as detailed in **section 2.4**:

- 146 items had no lamp description, wattage and ballast recorded as either blank or zero
- Five items had zero wattage and zero ballast recorded

Assuming the missing items of load are 70W HPS lights (the most common light type in the database) this equates to a potential estimated under submission of 53,528 kWh per annum.

In addition to this I found:

- Nine lights with an incorrect lamp and wattage combination:
  - 5x 23W high pressure sodium
  - 2x 50W fluorescent
  - 2x 70W fluorescent
- 80 lights with an incorrect ballast applied resulting in an estimated minor under submission of 2,773 kWh per annum

There were an additional 89 items of load with a fluorescent wattage that is not represented on the Electricity Authority's standard wattage table therefore I am unable to confirm the correct ballasts to be applied to these:

Fluorescent	Ballast	
	0	**5**
12		2
13		2
18		6
23		79

The accuracy of the lamp ballasts is an improvement on the network databases that were previously being used for reconciliation. The missing and incorrect lamp description and ballasts applied are recorded as non-compliance below.

As noted in **section 2.6**, festive lights for the Queenstown winter festival are connected to the unmetered street light circuits but are not recorded in the database. This is recorded as non-compliance below.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-Nov-18 To: 28-Feb-19	The database contains some inaccurate data. The field data was 93.7% of the database data for the sample checked. This will result in potential over submission of 86,400 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). 151 items of load with incomplete lamp descriptions and zero wattage recorded indicating a potential estimated under submission of 53,528 kWh per annum. Nine items of load with and incorrect lamp and wattage combination. 80 items of load with the incorrect ballast recorded resulting in a minor estimated annual under submission of 2,773 kWh (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Queenstown winter festival lights are not recorded in RAMM. Potential impact: High Actual impact: High Audit history: Once previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, they have been weak but QLDC have appointed a new contractor and this will move the controls to be moderate with the expectation that controls will move to strong once the full field audit is completed. The impact is assessed to be high due to volume of additional lights found in the field.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will continue to work with QLDC on ensuring the accuracy of their database	23/05/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact is in regular contact with QLDC on their database. We will also continue to complete quarterly checks on the database. The full field check should also highlight some more accurate information	23/05/2019	

3.2. Volume information accuracy (Clause 15.2 and 15.37B(c))

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

- *volume information for the DUML is being calculated accurately*
- *profiles for DUML have been correctly applied.*

Audit observation

The submission was checked for accuracy for the month the database extract was supplied. This included:

- checking the registry to confirm that 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 for four of the five ICPs. This is recorded as non-compliance below. Submissions are based on the database information, with on and off times derived from data logger information.

Contact began using the QLDC RAMM database to derive submission from November 1st, 2018. This database has been assessed for this audit.

I recalculated the submissions for February using the data logger and database information. I confirmed that the calculation method was correct.

There is some inaccurate data within the databases used to calculate submissions. This is recorded as non-compliance and discussed in sections **2.1, 2.5, 2.4** and **3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Nov-18 To: 28-Feb-19	The field data was 93.7% of the database data for the sample checked. This will result in potential over submission of 86,400 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). 151 items of load with incomplete lamp descriptions and zero wattage recorded indicating a potential estimated under submission of 53,528 kWh per annum. Nine items of load with and incorrect lamp and wattage combination. 80 items of load with the incorrect ballast recorded resulting in a minor estimated annual under submission of 2,773 kWh (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). Queenstown winter festival lights are not recorded in RAMM. Potential impact: High Actual impact: High Audit history: Once previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls are rated as moderate, they have been weak but QLDC have appointed a new contractor and this will move the controls to be moderate with the expectation that controls will move to strong once the full field audit is completed. The impact is assessed to be high due to volume of additional lights found in the field.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will continue to work with QLDC on ensuring the accuracy of their database	23/05/2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact is in regular contact with QLDC on their database. We will also continue to complete quarterly checks on the database. The full field check should also highlight some more accurate information	23/05/2019	

CONCLUSION

Contact began using the QLDC RAMM database to derive submission from November 1st, 2018. This database has been assessed for this audit.

QLDC are undertaking an LED rollout this does not include a central management system but this may be considered in the future. Delta will be the field contractor for QLDC until 1/5/19 when McKay Electrical takes over the contract.

The audit found six non-compliances and makes one recommendation. The database accuracy did not fall within the acceptable +/- 5% range. QLDC are committed to improving the database accuracy. As part of the new field contract McKay Electrical will undertake a 100% field audit to bring the database up to date. This is expected to be completed within the first three months of the contract. This is expected to bring the database accuracy within the acceptable range.

The future risk rating of 32 indicates that the next audit be completed in three months. I have considered this in conjunction with the comments provided by Contact Energy and recommend that the next audit be in nine months to allow sufficient time for the database to be corrected.

PARTICIPANT RESPONSE

Contact Energy believes that QLDC are making a concentrated effort to better their database.

Since switching to a QLDC owned RAMM database from 01 November 2018, QLDC has showed willingness and made a great leap in compliance for a database that had so many holes to start.

The authority have been lenient on this customer in the past and we ask that they continue to do so. We ask that the Authority please considers their response based solely on the work this customer has put into this database for this audit. We ask for a longer audit period in light of the work the customer is currently completing to ensure the accuracy of their database.