ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

For

NZTA CENTRAL OTAGO AURORA DATABASE AND TRUSTPOWER

Prepared by: Rebecca Elliot

Date audit commenced: 15 January 2021

Date audit report completed: 15 March 2021

Audit report due date: 08 April 2021

TABLE OF CONTENTS

Executive summary 3
Audit summary 4

Non-compliances 4
Recommendations 7
Issues 7

1. Administrative 8

1.1. Exemptions from Obligations to Comply with Code 8
1.2. Structure of Organisation 8
1.3. Persons involved in this audit 9
1.4. Hardware and Software 9
1.5. Breaches or Breach Allegations 9
1.6. ICP Data 9
1.7. Authorisation Received 9
1.8. Scope of Audit 10
1.9. Summary of previous audit 10
1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F) 11

2. DUML database requirements 12

2.1. Deriving submission information (Clause 11(1) of Schedule 15.3) 12
2.2. ICP identifier and items of load (Clause 11(2)(a) and (aa) of Schedule 15.3) 14
2.3. Location of each item of load (Clause 11(2)(b) of Schedule 15.3) 14
2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3) 14
2.5. All load recorded in database (Clause 11(2A) of Schedule 15.3) 15
2.6. Tracking of load changes (Clause 11(3) of Schedule 15.3) 17
2.7. Audit trail (Clause 11(4) of Schedule 15.3) 18

3. Accuracy of DUML database 19

3.1. Database accuracy (Clause 15.2 and 15.37B(b)) 19
3.2. Volume information accuracy (Clause 15.2 and 15.37B(c)) 24

Conclusion 27

Participant response 28

EXECUTIVE SUMMARY

This audit of the **NZTA Central Otago (NZTA) Aurora network** 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.

There are three ICPs associated with the NZTA Central Otago streetlights. Trustpower were reconciling all three from the data provided by Aurora but decided after the last audit to separate ICP 0000027638CECB5 to resolve the issue identified where there was a communication problem between two different maintenance contractors maintaining separate databases, so this ICP is now reconciled using the QLDC RAMM database. That audit is expected to be submitted at the same time as this audit. Therefore, this audit is for the remaining two ICPs 0000486694CE943 and 0000486695CE506.

The database is managed by Aurora and the data is held in their GIS system. Delta is the streetlight contractor for the Central Otago NZTA area, but they do not have a relationship with Aurora. Delta advises the Council of any changes as a result of field work; this information is provided to Aurora by way of a monthly file on the first working day of the month. The frequency and timeliness of the update of the file into GIS was not clear.

Examination of both databases found that there are approximately 30 lamps recorded in both databases. The QLDC RAMM database has 30 lamps associated with ICP 0000027638CECB5 (Franklin NSP). The Aurora database has 36 lamps against ICP 0000486695CE506 (Cromwell NSP). It is likely that the light count is correct in the QLDC database, but this needs to be confirmed. These lights are being fed from the Cromwell NSP and not Franklin NSP and therefore these are being submitted against the wrong ICP in the QLDC database. I recommend in both audits that these lights are investigated to confirm which database they should be recorded in. These are being submitted twice and will be resulting in an estimated annual over submission of 19,818 kWh.

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

I recalculated the submissions for December 2020 using the data logger and the database information. I identified a discrepancy of ten additional lamps in the database. This has been passed through to Trustpower to investigate.

In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates.

The audit found four non-compliances and makes three recommendations. The future risk rating of 21 indicates that the next audit be completed within three months. I have considered this in conjunction with Trustpower's comments and recommend that the next audit be in six months time.

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 extract contained ten more lights than the monthly wattage report being supplied to Trustpower. This will be resulting in an estimated under submission of 3,286 kWh per annum. Approximately 30 lamps in Wanaka submitted against the incorrect ICP. Approximately 30 lamps in Wanaka recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 19,818 kWh per annum. Five lamps with no gear wattage recorded resulting in an estimated minor under submission of 769 kWh per annum. In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates, as recorded in section 3.1. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Weak	Medium	6	Investigating
All load recorded in database	2.5	11(2A) of Schedule 15.3	Seven additional items of load were found in the field.	Weak	Low	3	Investigating

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 is inaccurate. In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates. 36 items of load with incomplete lamp descriptions. Five lamps with no gear wattage recorded resulting in an estimated minor under submission of 769 kWh per annum. LED lights recorded with insufficient descriptions to confirm lamp wattage. Approximately 30 lamps in Wanaka submitted against the incorrect ICP. Approximately 30 lamps in Wanaka recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 19,818 kWh per annum.	Weak	Medium	6	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)	The database extract contained ten more lights than the monthly wattage report being supplied to Trustpower. This will be resulting in an estimated under submission of 3,286 kWh per annum. Approximately 30 lamps in Wanaka submitted against the incorrect ICP. Approximately 30 lamps in Wanaka recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 19,818 kWh per annum. Five lamps with no gear wattage recorded resulting in an estimated minor under submission of 769 kWh per annum. In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates, as recorded in section 3.1. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Weak	Medium	6	Investigating
Future Risk Rating						21	

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
Database accuracy	3.1	Work with CODC to provide LED light details to Aurora.
		Determine the correct database and ICP for the NZTA lights in Wanaka and surrounds.
		Review database updating process with the parties concerned to ensure that the database is updated in a timely manner.

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

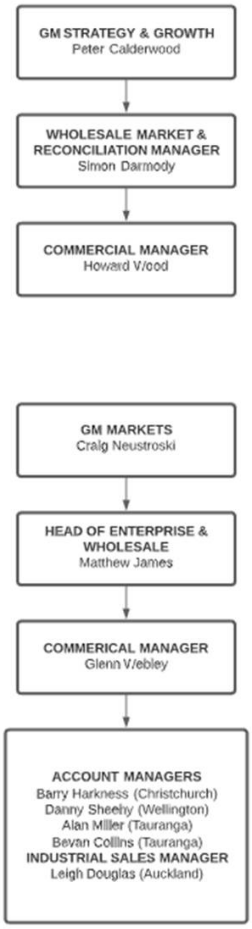
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

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:

Name	Company	Role
Rebecca Elliot	Veritek Limited	Lead Auditor
Claire Stanley	Veritek Limited	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Barry Harkerss	Account Manager	Trustpower
Robbie Diederen	Reconciliation Analyst	Trustpower
Rochelle Spearman	Data and Information Manager	Aurora Energy
Simeon Dwyer	Network Billing Analyst	Aurora Energy

1.4. Hardware and Software

The GIS database used for the management of DUML is managed by Aurora.

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

Systems used by the trader to calculate submissions are assessed as part of their reconciliation participant audits.

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)
0000486694CE943	Central Otago State Highways CYD0331	CYD0331	STL	225	35,300
0000486695CE506	Central Otago State Highways CML0331	CML0331	STL	97	16,071
TOTAL				322	51,371

1.7. Authorisation Received

All information was provided directly by Trustpower and Aurora.

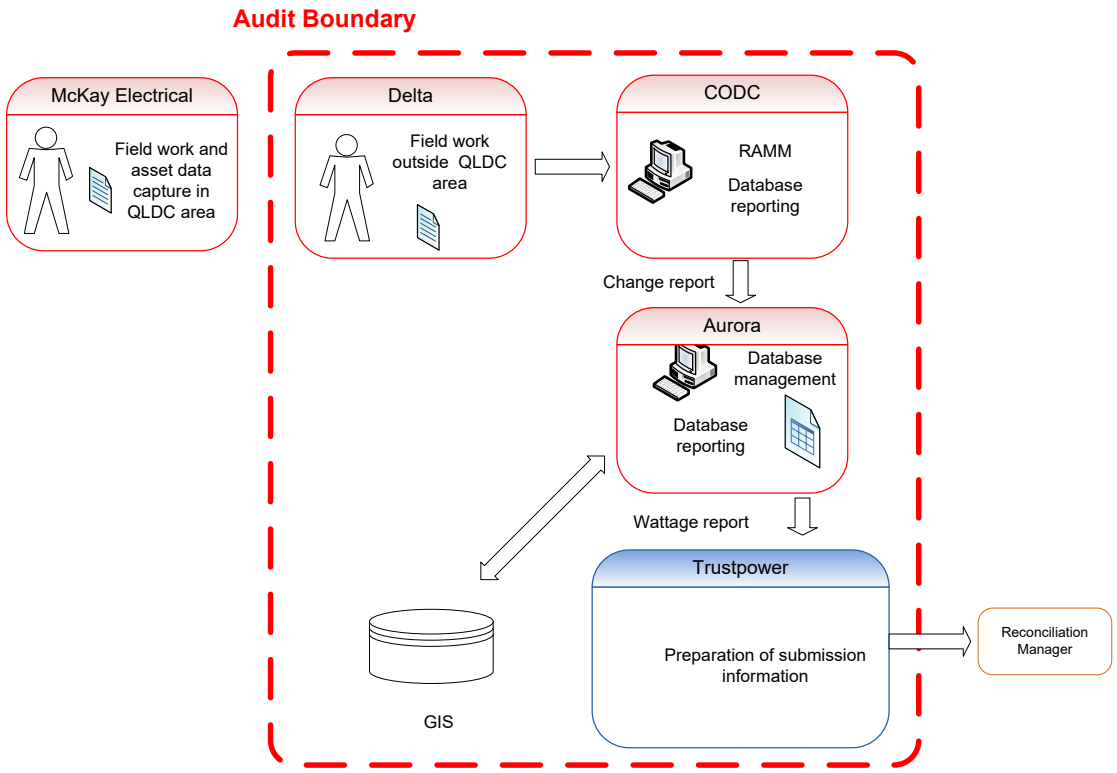
1.8. Scope of Audit

This audit of the **NZTA Central Otago (NZTA)** Aurora network 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.

The database is managed by Aurora and the data is held in their GIS system. Delta is the field contractor for Central Otago NZTA outside of the QLDC area, on the Aurora Network. Delta advises the Council of any changes as a result of field work; this information is provided to Aurora by way of a monthly file on the first working day of the month.

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 on 28th – 29th January 2021. The field audit was undertaken of 170 lights using the statistical sampling methodology.

1.9. Summary of previous audit

The previous audit was completed in August 2019 by Steve Woods of Veritek Limited. Three non-compliances were identified, and no recommendations were made. The statuses of the non-compliances and recommendations are described below.

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	In absolute terms, total annual consumption is estimated to be 23,400 kWh lower than the DUML database indicates, as recorded in section 3.1. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Still existing
Database accuracy	3.1	15.2 and 15.37B(b)	The database is inaccurate. In absolute terms, total annual consumption is estimated to be 23,400 kWh lower than the DUML database indicates. 29 items of load with incomplete lamp descriptions. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	Still existing
Volume information accuracy	3.2	15.2 and 15.37B(c)	In absolute terms, total annual consumption is estimated to be 23,400 kWh lower than the DUML database indicates, as recorded in section 3.1. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot.	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

Trustpower 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.

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.

Audit commentary

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

I recalculated the submissions for December 2020 using the data logger and the database information. I identified a discrepancy of 10 additional lamps in the database. This will be resulting in an estimated under submission of 3,286 kWh per annum. These has been passed through to Trustpower to investigate.

Examination of both databases found that there are approximately 30 lamps recorded in both databases. The QLDC RAMM database has approximately 30 lamps associated with ICP 0000027638CECB5 (Franklin NSP). The Aurora database has 36 lamps against ICP 0000486695CE506 (Cromwell NSP). It is likely that the light count is correct in the QLDC database, but this needs to be confirmed. These lights are being fed from the Cromwell NSP and not the Franklin NSP and therefore these are being submitted against the wrong ICP in the QLDC database. I recommend in both audits that these lights are investigated to confirm which database they should be recorded in. These are being submitted twice and will be resulting in an estimated annual over submission of 19,818 kWh.

Examination of the database found five lamps with no gear wattage recorded resulting in an estimated minor under submission of 769 kWh per annum.

The field audit against the database quantities found that the database is not confirmed as accurate with a 95% level of confidence resulting in an estimated over submission of 3,100 kWh per annum. This is detailed in **section 3.1.**

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

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

The current monthly report is provided as a snapshot and this practice is non-compliant. The database contains an “install date”, but if data entry occurs after the monthly report has been run, the items of load will only appear in the report for the next month and revisions do not occur. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 15-Sep-20 To: 15-Jan-21	The database extract contained ten more lights than the monthly wattage report being supplied to Trustpower. This will be resulting in an estimated under submission of 3,286 kWh per annum. Approximately 30 lamps in Wanaka recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 19,818 kWh per annum. Five lamps with no gear wattage recorded resulting in an estimated minor under submission of 769 kWh per annum. In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates, as recorded in section 3.1. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	Aurora do not have visibility of the fieldwork that takes place, they receive notification by way of a monthly file provided by Central Otago DC containing the complete council database, but it is unclear as to when these get loaded to the GIS. 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
We will be working with NZTA to see if their contractor Aurora is the best placed organisation to maintain this database going forward.	01/06/2021	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Depends on discussions with NZTA	To be advised	

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

All items of load had an ICP recorded as required by this clause.

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 either 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 and that each item of load had a value recorded in these fields.

Audit commentary

The database contains two records for wattage, firstly the lamp wattage and secondly the gear wattage, which represents ballast losses. All were populated.

The accuracy of these details is discussed in s**ection 3.1**.

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

The field audit was undertaken of a statistical sample of 170 items of load.

Audit commentary

The field audit was accurate for all, but the following items detailed in the table below:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Ashworth St, Alexandra	1	0	-1		1 x 70W HPS not located in the field
Wilson St, Omakau	4	6	+2		2 x additional 125 MV found in the field
MANUHERIKIA ROAD, Alexandra	8	11	+3		3 x additional 70W HPS located in the field
Tarras Cromwell Rd, Cromwell	9	11	+2	6	2 x additional 150W LED found in the field 6 x incorrect wattage recorded as 150W HPS in the database but 150W LED found in the field
Barry Ave, Cromwell	3	3		3	3 x incorrect wattage recorded as 150W HPS in the database but 250 HPS found in the field
Lode Lane, Cromwell	1	1		1	1 x incorrect wattage recorded as 150W HPS in the database but 250 HPS found in the field
Iles St, Cromwell	5	5		2	2 x incorrect wattage recorded as 150W HPS in the

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
					database but 250 HPS found in the field
Templeton St, Albertown	1	1		1	1 x incorrect wattage recorded as 250W HPS in the database but 163W LED found in the field
Alison Avenue, Albertown	2	2		1	1 x incorrect wattage recorded as 250W HPS in the database but 163W LED found in the field
Murray Terrace	1	1		1	1 x incorrect wattage recorded as 150W HPS in the database but 250 HPS found in the field
Grand Sample Total	**170**	**177**	**8**	**15**	

The field audit found seven additional items of load. The overall database accuracy is detailed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) and (d) of Schedule 15.3 From: 15-Sep-20 To: 15-Jan-21	Seven additional items of load were found in the field. Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3		
Audit risk rating	**Rationale for audit risk rating**		
Low	The controls are recorded as weak as Aurora are not the field contractor and are reliant on CODC providing this information. The impact is assessed to be low. The overall database accuracy is detailed in **section 3.**1.		
Actions taken to resolve the issue		**Completion date**	**Remedial action status**
We will be working with NZTA to see if their contractor Aurora is the best placed organization to maintain this database going forward.		01/06/2021	Investigating
Preventative actions taken to ensure no further issues will occur		**Completion date**	
Depends on discussions with NZTA		To be advised	

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 GIS database functionality achieves compliance with the code. There is an "installation date" used for the date of changes and the date of livening for new installations.

The change management process is detailed in **sections 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 database was checked for audit trails.

Audit commentary

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	NZTA Central Otago lights on the Aurora network
Strata	The database contains items of load Central Otago Aurora network area. The area has two distinct sub-groups of urban and rural. The processes for the management of NZTA Aurora Central Otago items of load are the same, but I decided to place the items of load into two geographical strata, as follows: 1. Alexandra 2. Small towns
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 50 sub-units.
Total items of load	170 items of load were checked.

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

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

Audit commentary

Field audit findings

A field audit was conducted of a statistical sample of 170 items of load. The "database auditing tool" was used to analyse the results, which are shown in the table below.

Result	Percentage	Comments
The point estimate of R	101.4	Wattage from survey is higher than the database wattage by 1.4%
R_L	90.7	With a 95% level of confidence, it can be concluded that the error could be between -9.3% and 7.35%
R_H	107.3	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 1 February 2019 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 9.3% lower and 7.35% higher than the wattage recorded in the DUML database. Non-compliance is recorded because the potential error is greater than 5.0%.

In absolute terms the installed capacity is estimated to be 1 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 5 kW lower to 4 kW higher than the database.

In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between -20,300 kWh p.a. lower to 16,100 kWh p.a. higher than the database indicates.

Scenario	**Description**
A - **Good accuracy, good precision**	This scenario applies if: (a) R_H is less than 1.05; and (b) R_L is greater than 0.95 The conclusion from this scenario is that: (a) the best available estimate indicates that the database is accurate within +/- 5 %; and (b) this is the best outcome.
B - **Poor accuracy, demonstrated with statistical significance**	This scenario applies if: (a) the point estimate of R is less than 0.95 or greater than 1.05 (b) as a result, either R_L is less than 0.95 or R_H is greater than 1.05. There is evidence to support this finding. In statistical terms, the inaccuracy is statistically significant at the 95% level
C - **Poor precision**	This scenario applies if: (a) the point estimate of R is between 0.95 and 1.05 (b) R_L is less than 0.95 and/or R_H is greater than 1.05 The conclusion from this scenario is that the best available estimate is not precise enough to conclude that the database is accurate within +/- 5 %

Lamp description and capacity accuracy

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority in the database and found a small number of errors. 36 items of load had an incomplete lamp description as detailed in the table below:

Lamp descriptions	Lamp Quantity
LED	26
Monument light, or ped cross, no beacons	2
Pedestrian crossing beacon with floodlights	6
Pedestrian crossing beacon without flood lights	2

I found five lights with no gear wattage applied resulting in an estimated annual under submission of 769 kWh.

The lamp description is in the 'Description" field and contains sufficient information for non-LED lights. For example, "150W HP Sodium streetlight" is sufficient to denote this is a High-Pressure Sodium streetlight with a capacity of 150 watts. LED lights are recorded as "LED" or as "Light Emitting Diode" with the wattage. This is not sufficient to confirm that the correct wattage is being applied. The recommended format for the field is: *Cree;Ledway;60LED;525mA;100W:*

Field	Description
Manufacturer	For example, "Cree"
Model	For example, "Ledway"
Number of LEDS	One make and model of light may have many different variants with different LED quantities. Ledway, for example, have between 20 and 120 LEDs.
Driver	This is the LED power supply and different drivers result in different power outputs.
Wattage	The rated wattage

Aurora is not the contractor for streetlights, and they do not have any further information provided to them. I recommend that Trustpower approach CODC to get this information to be provided to Aurora.

Description	Recommendation	Audited party comment	Remedial action
Database Accuracy	Work with CODC to provide LED light details to Aurora.	Will follow Auditors recommendation	Identified

This is recorded as non-compliance below.

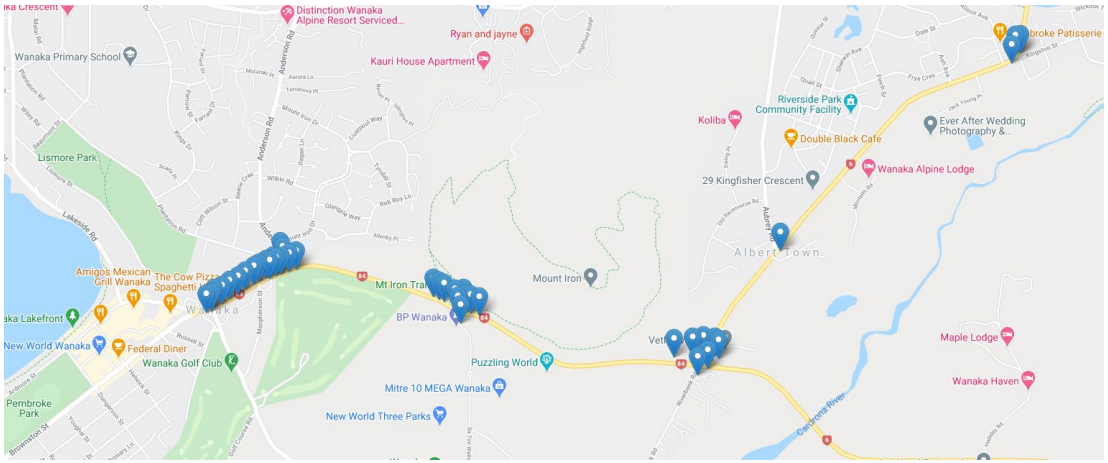
Address accuracy

There were no issues found with location information.

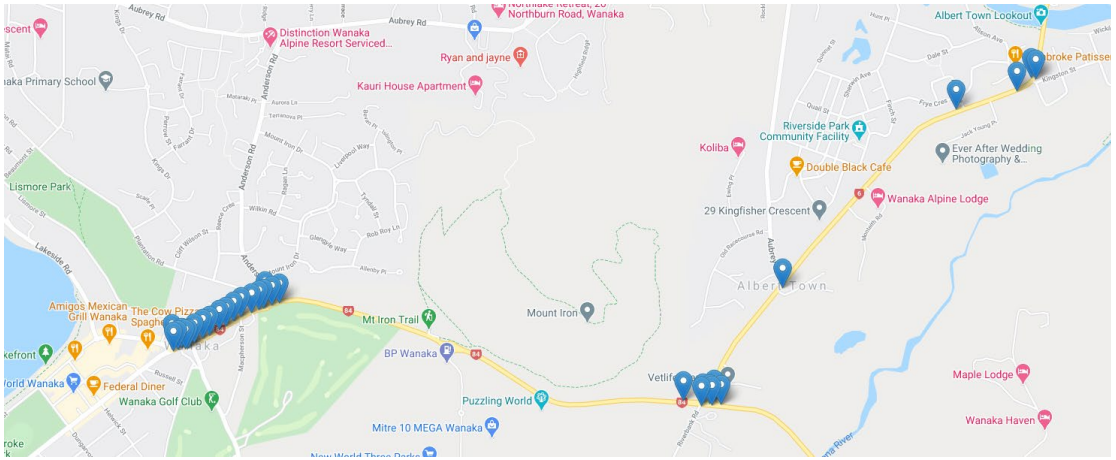
ICP number and owner accuracy

Examination of both databases found that there are approximately 30 lamps recorded in both databases. The QLDC RAMM database has 30 lamps associated with ICP 0000027638CECB5 (Franklin NSP). The Aurora database has 36 lamps against ICP 0000486695CE506 (Cromwell NSP). It is likely that the light count is correct in the QLDC database, but this needs to be confirmed. These lights are being fed from the Cromwell NSP and not Franklin NSP and therefore these are being submitted against the wrong ICP in the QLDC database. I recommend in both audits that these lights are investigated to confirm which database they should be recorded in. These are being submitted twice and will be resulting in an estimated annual over submission of 19,818 kWh.
I have included a GPS plot of the lights in each database for reference:

NZTA Aurora database



QLDC RAMM database



Description	Recommendation	Audited party comment	Remedial action
Database accuracy	Determine the correct database and ICP for the NZTA lights in Wanaka and surrounds.	We are investigating to see if the issue is valid or not	Investigating

Change management process findings

The database is managed by Aurora and the data is held in their GIS system.

Central Otago DC is responsible for initiating faults and maintenance work for NZTA. The fieldwork is managed by Delta, they advise the Central Otago DC of any changes as a result of fieldwork. The Central Otago DC provide a file on the first working day of the month to Aurora Energy, the information is updated in the Aurora GIS system. The frequency and timeliness of when these updates are entered into GIS was not clear and I recommend that the process is reviewed.

Description	Recommendation	Audited party comment	Remedial action
Database accuracy	Review database updating process with the parties concerned to ensure that the database is updated in a timely manner.	We will be working with NZTA to see if their contractor Aurora is the best placed organization to maintain this database going forward.	Investigating

No festive lighting is connected to the Aurora NZTA unmetered streetlight network.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 15- Sept-20 To: 15-Jan-21	The database is inaccurate. In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates. 36 items of load with incomplete lamp descriptions. Five lamps with no gear wattage recorded resulting in an estimated minor under submission of 769 kWh per annum. LED lights recorded with insufficient descriptions to confirm lamp wattage. Approximately 30 lamps in Wanaka recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 19,818 kWh per annum. Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	Aurora do not have visibility of the fieldwork that takes place, they receive notification by way of a monthly file provided by Central Otago DC containing the complete council database, but it is unclear as to when these get loaded to the GIS. 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
We will be working with NZTA to see if their contractor Aurora is the best placed organisation to maintain this database going forward.	01/06/2021	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Depends on discussions with NZTA	To be advised	

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

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

I recalculated the submissions for December 2020 using the data logger and the database information. I identified a discrepancy of 10 additional lamps in the database. This will be resulting in an estimated under submission of 3,286 kWh per annum. These has been passed through to Trustpower to investigate.

Examination of both databases found that there are approximately 30 lamps recorded in both databases. The QLDC RAMM database has 30 lamps associated with ICP 0000027638CECB5 (Franklin NSP). The Aurora database has 36 lamps against ICP 0000486695CE506 (Cromwell NSP). It is likely that the light count is correct in the QLDC database, but this needs to be confirmed. These lights are being fed from the Cromwell NSP and not Franklin NSP and therefore these are being submitted against the wrong ICP in the QLDC database. I recommend in both audits that these lights are investigated to confirm which database they should be recorded in. These are being submitted twice and will be resulting in an estimated annual over submission of 19,818 kWh.

Examination of the database found five lamps with no gear wattage recorded resulting in an estimated minor under submission of 769 kWh per annum.

In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates, as recorded in **section 3.1.**

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

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

The current monthly report is provided as a snapshot and this practice is non-compliant. The database contains an “install date”, but if data entry occurs after the monthly report has been run, the items of load will only appear in the report for the next month and revisions do not occur. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 15-Sep-20 To: 15-Jan-21	The database extract contained ten more lights than the monthly wattage report being supplied to Trustpower. This will be resulting in an estimated under submission of 3,286 kWh per annum. Approximately 30 lamps in Wanaka recorded in two databases and therefore submitted twice resulting in an estimated over submission of approximately 19,818 kWh per annum. Five lamps with no gear wattage recorded resulting in an estimated minor under submission of 769 kWh per annum. In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates, as recorded in section 3.1. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Potential impact: Medium Actual impact: Medium Audit history: Multiple times Controls: Weak Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
Medium	Aurora do not have visibility of the fieldwork that takes place, they receive notification by way of a monthly file provided by Central Otago DC containing the complete council database. 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
We will be working with NZTA to see if their contractor Aurora is the best placed organisation to maintain this database going forward.	01/06/2021	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Depends on discussions with NZTA	To be advised	

CONCLUSION

The database is managed by Aurora and the data is held in their GIS system. Delta is the streetlight contractor for the Central Otago NZTA area, but they do not have a relationship with Aurora. Delta advises the Council of any changes as a result of field work; this information is provided to Aurora by way of a monthly file on the first working day of the month. The frequency and timeliness of the update of the file into GIS was not clear.

Examination of both databases found that there are approximately 30 lamps recorded in both databases. The QLDC RAMM database has 30 lamps associated with ICP 0000027638CECB5 (Franklin NSP). The Aurora database has 36 lamps against ICP 0000486695CE506 (Cromwell NSP). It is likely that the light count is correct in the QLDC database, but this needs to be confirmed. These lights are being fed from the Cromwell NSP and not Franklin NSP and therefore these are being submitted against the wrong ICP in the QLDC database. I recommend in both audits that these lights are investigated to confirm which database they should be recorded in. These are being submitted twice and will be resulting in an estimated annual over submission of 19,818 kWh.

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

I recalculated the submissions for December 2020 using the data logger and the database information. I identified a discrepancy of 10 additional lamps in the database. This has been passed through to Trustpower to investigate.

In absolute terms, total annual consumption is estimated to be 3,100 kWh higher than the DUML database indicates.

The audit found four non-compliances and makes three recommendations. The future risk rating of 20 indicates that the next audit be completed within three months. I have considered this in conjunction with Trustpower's comments and recommend that the next audit be in six months time.

Participant response

We are investigating with the contractors if the issue of the 30 lights identified by the Auditor is correct.

Until this investigation is completed, we are unable to confirm if this is an issue or not. Unfortunately, the person managing the database is away on sick leave and we have not yet had a response from them.

With regard to the management issues between the Contractor Delta and the Database holder Aurora we will be having discussions with NZTA as to who they want to maintain the database going forward. This issue needs NZTA to resolve and is currently beyond our control.

We have previously raised with the EA our concerns about how NZTA manage the DUML providers and the Field maintenance contractors is extremely frustrating for all retailers.