ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

CHRISTCHURCH CITY COUNCIL AND CONTACT ENERGY LIMITED

NZBN: 9429038549977

Prepared by: Steve Woods

Date audit commenced: 26 October 2022

Date audit report completed: 7 December 2022

Audit report due date: 16 December 2022

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EXECUTIVE SUMMARY

This audit of the **Christchurch City Council (CCC) 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 reconciles this DUML load using the DST profile. Simply Energy on behalf of Contact send the monthly kW values to EMS. EMS prepare the submission file using the data logger hours to determine the burn hours and the file is then sent to Contact who submit the data under the CTCS code.

As noted in the previous audit CCC undertakes dimming of lamps on the network, this leads to over submission by the trader, as they are submitting more than is consumed. If it is assumed that 31,000 lights are dimmed by 20% for a quarter of the night and the average wattage per light is 67 watts (the current average from the database), then the total over submission is estimated to be:

31,000 * 0.067 * 4271 * 0.2 * 0.25 = 443,543 kWh per annum.

It is intended that submission will use the dimming profile that has been approved by the Authority for these lamps. The project to implement this has not yet been completed and it is now estimated to be complete early 2023.

The field audit was undertaken of a statistical sample of sample of 515 items of load on 24th and 25th November. This found the database is not confirmed to be accurate within the allowable ±5% accuracy threshold and over submission is likely to be occurring as a result:

- in absolute terms the installed capacity is estimated to be 163 kW lower than the database indicates,
- there is a 95% level of confidence that the installed capacity is between 358 kW lower and 1 kW lower than the database,
- in absolute terms, total annual consumption is estimated to be 696,100 kWh lower than the DUML database indicates, and
- there is a 95% level of confidence that the annual consumption is between 1,528,800 kWh p.a. lower to 5,900 kWh p.a. lower than the database indicates.

Orion manage the database and field work. The fault, maintenance, new connection, and upgrade work is completed by Orion's approved contractors. The contractors provide paperwork to Orion confirming that work is complete, and Orion uses this information to update the database.

This audit found three non-compliances and makes one recommendation. The future risk rating of 18 indicates that the next audit be completed in six months I have considered this in conjunction with Contact's responses and recommend that the next audit be in 12 months.

The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	In absolute terms, total annual consumption is estimated to be 696,100 kWh lower than the DUML database indicates. 45 lamps have incorrect total wattages, resulting in an estimated under submission of 1,192 kWh p.a. based on 4,271 burn hours. Estimated over submission of 443,543 kWh per annum based on dimming of 31,000 lamps.	Moderate	High	6	Identified
Database accuracy	3.1	15.2 and 15.37B (b)	In absolute terms, total annual consumption is estimated to be 696,100 kWh lower than the DUML database indicates. 45 lamps have incorrect total wattages, resulting in an estimated under submission of 1,192 kWh p.a. based on 4,271 burn hours.	Moderate	High	6	Identified
Volume information accuracy	3.2	15.2 and 15.37B (c)	In absolute terms, total annual consumption is estimated to be 696,100 kWh lower than the DUML database indicates. 45 lamps have incorrect total wattages, resulting in an estimated under submission of 1,192 kWh p.a. based on 4,271 burn hours. Estimated over submission of 443,543 kWh per annum based on dimming of 31,000 lamps.	Moderate	High	6	Identified
Future Risk Rating						18	

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	Confirm the correct wattage has been applied to 28W MH and 750W MV lights, recorded in the database.

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

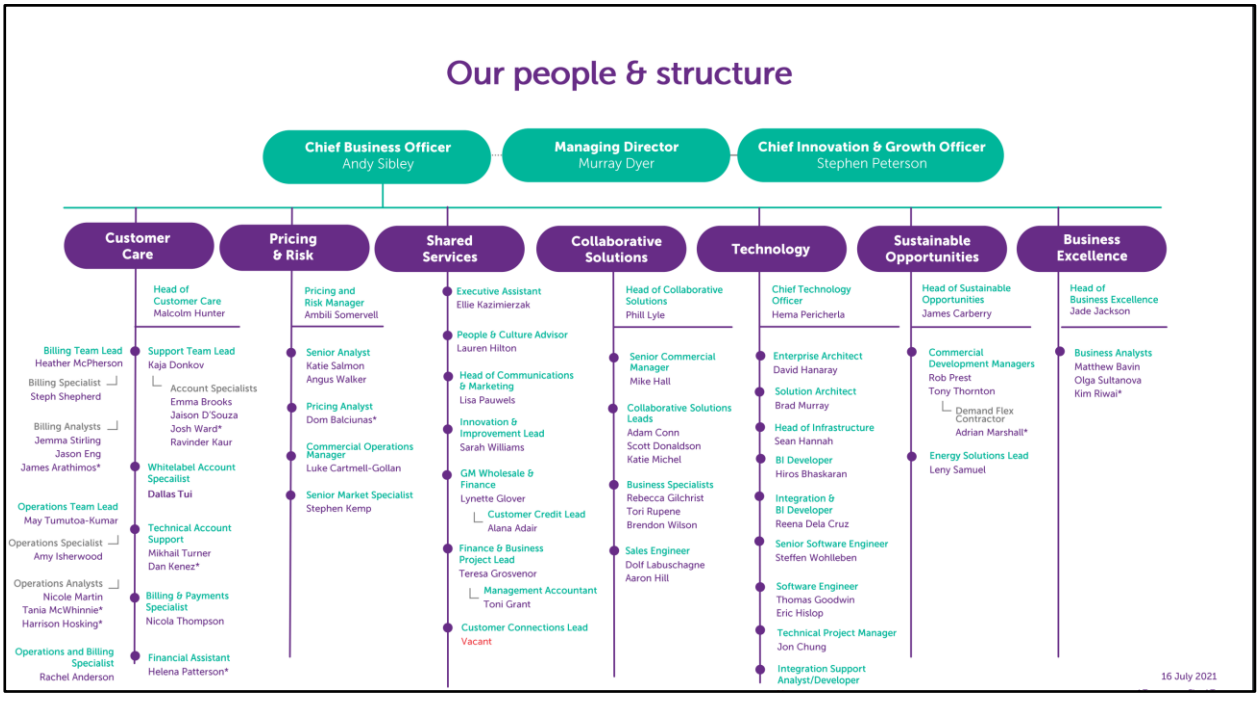
The Electricity Authority's website was reviewed to identify any exemptions relevant to the scope of this audit.

Audit commentary

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

1.2. Structure of Organisation

Contact Energy provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Name	Company	Role
Steve Woods	Veritek Limited	Lead Auditor
Claire Stanley	Veritek Limited	Supporting Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Penny Lawrence	Operations Services	Orion
Luke Cartmell-Gollan	Commercial Operations Manager	Contact Energy

1.4. Hardware and Software

Orion use a purpose-built Oracle Streetlighting/DUML database for the management of the DUML information. Backup and restoration procedures are in place, and access to the Orion network (including the database) is restricted using logins and passwords.

Systems used by the trader and their agent 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)
0007102593RN8D3	Orion_CCC GXP street light ICP	BRY0661	DST	14,534	981,581
0007102594RN519	Orion_CCC GXP street light ICP	ISL0331	DST	3,903	277,732
0007102595RN95C	Orion_CCC GXP street light ICP	ISL0661	DST	26,196	1,829,455
Total				44,633	3,088,768

The smart lights are now recorded in a different database maintained by the CCC for ICPs 0007182097RN3F9, 0007182098RNC27 and 0007182100RN8D0.

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0007182097RN3F9	Orion CCC GXP smart street light ICP	BRY0661	RPS	73	3.561
0007182098RNC27	Orion CCC GXP smart street light ICP	ISL0331	RPS	16	0.41
0007182100RN8D0	Orion CCC GXP smart street light ICP	ISL0661	RPS	581	41.03
Total				532	44.67

These are recorded with "inactive - reconciled elsewhere" status, and the volumes are expected to be submitted against the corresponding DUML ICP for the NSP as discussed in **sections 2.1** and **3.2**.

1.7. Authorisation Received

All information was provided directly by Contact, Simply Energy and Orion.

1.8. Scope of Audit

This audit of the CCC DUML database and processes was conducted at the request of 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.

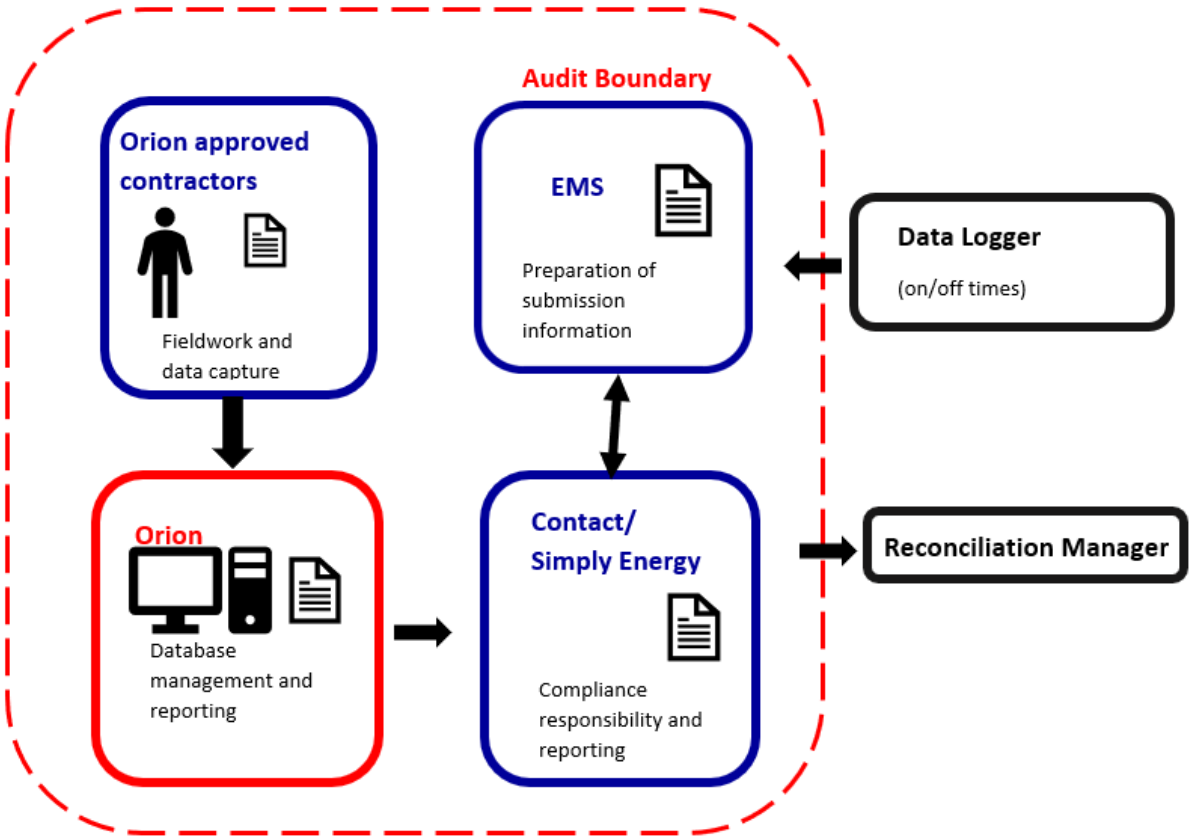
The audit was conducted in accordance with the audit guidelines for DUML audits version 1.1.

The unmetered load is managed by Orion and the data is held in their DUML database, on behalf of CCC, who is Contact's customer.

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 diagrams below show the audit boundaries for clarity.

Orion's fault, maintenance, new connection and upgrade work is completed by Orion's approved contractors. The contractors provide paperwork to Orion confirming that work is complete, and Orion uses this information to update the database.

The smart light ICPs 0007182097RN3F9, 0007182098RNC27 and 0007182100RN8D0 are recorded with "inactive - reconciled elsewhere" status, and the volumes are expected to be submitted against the corresponding DUML ICP for the NSP. This is discussed in **sections 2.1** and **3.2**.



A field audit was undertaken of a statistical sample of 515 items of load on 24th and 25th November 2022.

1.9. Summary of previous audit

The previous audit of this database was undertaken by Steve Woods of Veritek Limited in April 2022. The summary table below shows the statuses of the non-compliances raised in the previous audit. Further comment is made in the relevant sections of this report.

Table of Non-compliances

Subject	Section	Clause	Non-compliance	Status
Deriving submission information	2.1	11(1) of Schedule 15.3	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 792,200 kWh.	Still existing
			45 lamps have incorrect total wattages, resulting in an estimated under submission of 279W or 1,192 kWh p.a. based on 4,271 burn hours.	Still existing
			Estimated over submission of 443,543 kWh per annum based on dimming of 31,000 lamps.	Still existing

Subject	Section	Clause	Non-compliance	Status
All load recorded in database	2.5	11(2A) of Schedule 15.3	One additional light not recorded in the database was located in the field.	Cleared
Database accuracy	3.1	15.2 and 15.37B (b)	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 792,200 kWh. 45 lamps have incorrect total wattages, resulting in an estimated under submission of 279W or 1,192 kWh p.a. based on 4,271 burn hours.	Still existing Still existing
Volume information accuracy	3.2	15.2 and 15.37B (c)	The database is not confirmed as accurate with a 95% level of confidence resulting in an estimated annual under submission of 792,200 kWh. 45 lamps have incorrect total wattages, resulting in an estimated under submission of 279W or 1,192 kWh p.a. based on 4,271 burn hours. Estimated over submission of 443,543 kWh per annum based on dimming of 31,000 lamps.	Still existing Still existing 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

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.

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 application of profiles was checked. The database was checked for accuracy.

Audit commentary

Contact reconciles this DUML load using the DST profile. Simply Energy on behalf of Contact send the monthly kW values to EMS. EMS prepare the submission file using the data logger hours to determine the burn hours and the file is then sent to Contact who submit the data under the CTCS code.

I checked the data submission for October 2022 and confirmed it was accurate.

CCC undertakes dimming of lamps on the network, this leads to over submission by the trader, as they are submitting more than is consumed. If it is assumed that 31,000 lights are dimmed by 20% for a quarter of the night and the average wattage per light is 67 watts (the current average from the database), then the total over submission is estimated to be:

31,000 * 0.067 * 4271 * 0.2 * 0.25 = 443,543 kWh per annum.

It is intended that submission will use the dimming profile that has been approved by the Authority for these lamps. The project to implement this has not yet been completed and it is now estimated to be complete early 2023.

The field audit found that the database accuracy was not confirmed as accurate with a 95% level of confidence resulting in an estimated annual over submission of 696,100 kWh .

A small number of lights were found to have the incorrect ballast applied resulting in an estimated under submission of 1,192 kWh per annum. This is detailed in **section 3.1**.

The monthly report is provided with a daily kW value. The daily value is used for submission. Revisions are carried out if the data changes. This meets the requirements of the code.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 25-Feb-22 To: 27-Oct-22	In absolute terms, total annual consumption is estimated to be 696,100 kWh lower than the DUML database indicates. 45 lamps have incorrect total wattages, resulting in an estimated under submission of 1,192 kWh p.a. based on 4,271 burn hours. Estimated over submission of 443,543 kWh per annum based on dimming of 31,000 lamps. Potential impact: High Actual impact: High Audit history: Multiple times previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate the risk is mitigated to an acceptable level. The impact is assessed to be high, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Findings from the field audit are being investigated and will be corrected where required. The 45 lights with incorrect ballasts will be corrected	28/2/2023 31/1/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
There has been a substantial investment by CCC and Simply Energy to develop operational processes that will allow us to utilise the (relatively) new approval of a profile by the Authority that will allow us to reconcile volumes in line with the dimming that is already operational within the CCC portfolio. We are working as quick as we can to meet the requirements of the authority before transitioning to the HHS profile.	31/3/2023	

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

An ICP is recorded for each item of load. CCC's database contains a GXP code that is linked to the relevant ICP in the customer table in Access.

Audit commentary

All items of load have a GXP recorded against them and this maps to the ICP.

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 databases were checked to confirm the location is recorded for all items of load.

Audit commentary

The database contains fields for the street name, number, and GPS coordinates. GPS coordinates are recorded for all items of load.

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 light type and wattage capacity,
- wattage capacities include any ballast or gear wattage, and
- each item of load has a light type, light wattage, and gear wattage recorded.

Audit commentary

The database contains a lamp type, which corresponds to a lamp total wattage including ballast wattage. All items of load have a lamp type and total wattage recorded.

The accuracy of the recorded wattages is discussed in **section 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

A field audit was undertaken of a statistical sample of 515 items of load on 24th and 25th November 2022. The sample was selected from four strata, as follows:

- street names A – K,
- street names L – Z,
- BRY, and
- ISL.

Audit commentary

The field audit discrepancies are detailed in the table below:

Address	Database count	Field count	Count difference	Wattage difference	Comments
Aldershot St	21	21		3	1 x 65W LED recorded in the database but 1 x 20W LED located in the field 2 x 70HPS recorded in the database but 2 x 20W LED located in the field
Bradnor Rd	4	3	-1		1 x 2*30W FF recorded in the database but not located in the field
Brookside Tr	21	21		2	1 x 70W HPS recorded in the database but 1 x 20W LED located in the field 1 x 20W LED recorded in the database but 1 x 80W LED located in the field
Caudron Rd	12	12		12	5 x 26W LED recorded in the database but 5 x 33W LED located in the field 7 x 17W LED recorded in the database but 7 x 26W LED located in the field
Chilcombe St	4	4		1	1 x 67W LED recorded in the database but 1 x 68W LED located in the field
Deepdale St	11	11		1	1 x 29W LED recorded in the database but 1 x 25W LED located in the field
Dover St	13	13		2	2 x 125W MV recorded in the database but 2 x 30W LED located in the field
Malvern St	16	15	-1		1 x 150W LED recorded in the database but not located in the field
Matai St	26	26		1	1 x 41W LED recorded in the database but 1 x 54W LED located in the field
Nancy Ave	11	11		1	1 X 2*30W FF recorded in the database but 1 x 20W LED located in the field
Penhelig Pl	4	4		1	1 x 18W LED recorded in the database but 1 x 24W LED located in the field

Address	Database count	Field count	Count difference	Wattage difference	Comments
Powell Cr	7	7		6	6 x 18W LED recorded in the database but 6 x 24W LED located in the field
Raxworthy St	12	11	-1	5	5 x 18W LED recorded in the database but 5 x 24W LED located in the field 1 x 100W LED recorded in the database but not located in the field
Clematis Pl	7	7		7	6 x 38.7W LED recorded in the database but 6 x 39W LED located in the field 1 x 17W LED recorded in the database but 1 x26W LED located in the field
Hammersley St	7	7		1	1 x 49W LED recorded in the database but 1 x 30W LED located in the field
Joy St	19	18		1	1 x 25W LED recorded in the database but 1 x 17W LED located in the field
Marama Cr	12	12		1	1 x 22.1W LED recorded in the database but 1 x 22W LED located in the field
Mauger Dr	9	9		6	6 x 18 LED recorded in the database but 6 x 24W LED located in the field
Slater St	19	19		1	1 x 25W LED recorded in the database but 1 x 18W LED located in the field
Soleares Av	25	25		22	1 x 2*30W FF recorded in the database but 1 x 22W LED located in the field 1 x 2*30W FF recorded in the database but 1 x 22W LED located in the field 1 x 19.9W LED recorded in the database but 1 x 22W LED located in the field 19 x 22.1W LED recorded in the database but 19 x 22W LED located in the field
Grand Total	**44633**	**44630**	**-3**	**74**	

No additional items of load were identified in the field audit of 515 items of load sampled.

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

The database functionality achieves compliance with the code.

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 databases were checked for audit trails.

Audit commentary

The database has 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	CCC streetlights connected to the Orion network within the CCC geographical boundary.
Strata	The database contains 44,633 items of load. The processes for the management of all CCC items of load is the same. The database was divided into four strata: • street names A to K, • street names L to Z, • BRY, and • ISL.
Area units	I created a pivot table of the roads in each database and used a random number generator to select a total of 36 sub-units across the four strata.
Total items of load	515 items of load were checked.

Wattages were checked for alignment with the published standardised wattage table produced by the Electricity Authority against the database or in the case of LED lights against the LED light specification.

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

Audit commentary

A field audit was conducted of a statistical sample of 515 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	94.7	Wattage from survey is lower than the database wattage by 5.3%.
R_L	88.4	With a 95% level of confidence, it can be concluded that the error could be -11.6%.
R_H	100.0	

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 1 February 2019. The table below shows that Scenario B (detailed below) applies.

The conclusion from Scenario B is that the variability of the sample results across the strata means that the true wattage (installed in the field) could be 11.6% lower 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 163 kW lower than the database indicates.

There is a 95% level of confidence that the installed capacity is between 358 kW lower and 1 kW lower than the database.

In absolute terms, total annual consumption is estimated to be 696,100 kWh lower than the DUML database indicates.

There is a 95% level of confidence that the annual consumption is between 1,528,800 kWh p.a. lower to 5,900 kWh p.a. lower 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 %

Light description and capacity accuracy

As discussed in **section 2.4**, all lights have a lamp and gear wattage recorded.

Lamp and gear wattages for all other lamps were compared to the expected values, and the following exceptions were identified in the previous audit and are still existing:

Model	Database wattage	Correct wattage	Quantity	Total difference
36W FF	42	46	12	48
58W FF	65	72	33	231
		Total	45	279 W

This could result in an estimated annual under submission of 1,192 kWh per annum (based on annual burn hours of 4,271 as is detailed in the DUML database auditing tool).

Eight 28W MH lights and two 750W MV lights are recorded in the database, and no ballast is recorded for these lights. I recommend specifications are obtained for these lights to confirm the correct information is recorded.

Recommendation	Description	Audited party comment	Remedial action
Database accuracy	Confirm the correct wattage has been applied to 28W MH and 750W MV lights recorded in the database.	These are being investigated and will be updated where required.	Identified

Address location accuracy

As discussed in **section 2.3**, all lights have an address recorded.

As previously reported where Orion is aware that lights are installed but CCC has not provided roading information, Orion records the GPS locations of the lights and a placeholder for road name such as "Road 1", "Unknown" or "Unnamed". Once the street details are provided the road names are updated.

Change management process findings

There has not been any change to the fault, maintenance, new connection, and upgrade work processes. It is completed by Orion's approved contractors. The contractors provide paperwork to Orion confirming that work is complete, and Orion uses this information to update the Streetlighting/DUML database and GIS. For new subdivisions, this paperwork includes "as built" plans.

Upon receipt, paperwork is checked for completeness and accuracy and any issues are followed up with the contractor. The information is sent to the GIS team so that the GIS can be updated, and then returned to the connections team to update the Streetlighting/DUML database from the date the change or new connection was effective. Once data entry is complete, the values loaded are checked against the paperwork provided, and some spot checks in the field are completed. Paperwork is normally promptly provided electronically and processed within two to three business days of receipt.

All jobs are tracked using job numbers by the connections team as part of the works management process. Late paperwork from contractors, and late updates by the GIS team are followed up. A checklist is followed to ensure that all steps in the process are completed.

Orion's approved contractors have access to a web-based version of the Streetlighting/DUML database in the field and advise Orion's connections team if they notice any discrepancies in the data recorded. Orion's operation team acts on these notifications and checks and updates the data where necessary.

The LED upgrade project is in the final stages, changes are still being made in the field and batches of upgraded lights are uploaded to RAMM. The upgrade data including pole, light, and installation date information is provided in spreadsheet form and the IT team run scripts to load the information in the database. The IT and connections teams complete testing on the updates to ensure that the records are correct.

Quarterly outage patrols are completed by Orion's contractors as part of the maintenance programme. Outages are also reported by residents within the CCC region and work orders are raised with contractors as required.

Orion's database records a "start date" and "created date". The "start date" is entered by the user and reflects the date that the light was installed or changed, and system controls prevent future "start

dates" from being entered. The "created date" reflects when the database record was created. Full history of the records that applied from each start date can be viewed in the database.

Festive lights

There has been no change to the festive lights; these are recorded in the database with a class of "miscellaneous" and street address which includes "Christmas lights". These lights are listed as 'Out of Service' in the database when disconnected and made active when they are connected so that they can be included in submission data. The festive lights have not been connected for about five years. They have been correctly excluded from submission information.

Private lights

As previously reported new private lights are not accepted, and where private lights are identified Orion arranges for standard or shared unmetered load to be created. In the meantime, private unmetered lights are recorded in the database against the appropriate ICP number and reported in the monthly extracts.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 25-Feb-22 To: 27-Oct-22	In absolute terms, total annual consumption is estimated to be 696,100 kWh lower than the DUML database indicates. 45 lamps have incorrect total wattages, resulting in an estimated under submission of 1,192 kWh p.a. based on 4,271 burn hours. Potential impact: High Actual impact: High Audit history: Multiple times previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate the risk is mitigated to an acceptable level. The impact is assessed to be high, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Findings from the field audit are being investigated and will be corrected where required. The 45 lights with incorrect ballasts will be corrected	28/02/2023 31/01/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
There has been a substantial investment by CCC and Simply Energy to develop operational processes that will allow us to utilise the (relatively) new approval of a profile by the Authority that will allow us to reconcile volumes in line with the dimming that is already operational within the CCC portfolio. We are working as quick as we can to meet the requirements of the authority before transitioning to the HHS profile.	31/3/2023	

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 the ICP has the correct profile and submission flag, and
- checking the database extract combined with the on hours against the submitted figure to confirm accuracy.

Audit commentary

Contact reconciles this DUML load using the DST profile. Simply Energy on behalf of Contact send the monthly kW values to EMS. EMS prepare the submission file using the data logger hours to determine the burn hours and the file is then sent to Contact who submit the data under the CTCS code.

I checked the data submission for October 2022 and confirmed it was accurate.

CCC undertakes dimming of lamps on the network, this leads to over submission by the trader, as they are submitting more than is consumed. If it is assumed that 31,000 lights are dimmed by 20% for a quarter of the night and the average wattage per light is 67 watts (the current average from the database), then the total over submission is estimated to be:

31,000 * 0.067 * 4271 * 0.2 * 0.25 = 443,543 kWh per annum.

It is intended that submission will use the dimming profile that has been approved by the Authority for these lamps. The project to implement this has not yet been completed and it is now estimated to be complete early 2023.

The field audit found that the database accuracy was not confirmed as accurate with a 95% level of confidence resulting in an estimated annual over submission of 696,100 kWh .

A small number of lights were found to have the incorrect ballast applied resulting in an estimated under submission of 1,192 kWh per annum. This is detailed in **section 3.1**.

The monthly report is provided with a daily kW value. The daily value is used for submission. Revisions are carried out if the data changes. This meets the requirements of the code.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 25-Feb-22 To: 27-Oct-22	In absolute terms, total annual consumption is estimated to be 696,100 kWh lower than the DUML database indicates. 45 lamps have incorrect total wattages, resulting in an estimated under submission of 1,192 kWh p.a. based on 4,271 burn hours. Estimated over submission of 443,543 kWh per annum based on dimming of 31,000 lamps. Potential impact: High Actual impact: High Audit history: Multiple times previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate the risk is mitigated to an acceptable level. The impact is assessed to be high, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Findings from the field audit are being investigated and will be corrected where required. The 45 lights with incorrect ballasts will be corrected	28/02/2023 31/1/2023	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
There has been a substantial investment by CCC and Simply Energy to develop operational processes that will allow us to utilise the (relatively) new approval of a profile by the Authority that will allow us to reconcile volumes in line with the dimming that is already operational within the CCC portfolio. We are working as quick as we can to meet the requirements of the authority before transitioning to the HHS profile.	31/1/2023	

CONCLUSION

Contact reconciles this DUML load using the DST profile. Simply Energy on behalf of Contact send the monthly kW values to EMS. EMS prepare the submission file using the data logger hours to determine the burn hours and the file is then sent to Contact who submit the data under the CTCS code.

As noted in the previous audit CCC undertakes dimming of lamps on the network, this leads to over submission by the trader, as they are submitting more than is consumed. If it is assumed that 31,000 lights are dimmed by 20% for a quarter of the night and the average wattage per light is 67 watts (the current average from the database), then the total over submission is estimated to be:

31,000 * 0.067 * 4271 * 0.2 * 0.25 = 443,543 kWh per annum.

It is intended that submission will use the dimming profile that has been approved by the Authority for these lamps. The project to implement this has not yet been completed and it is now estimated to be complete early 2023.

The field audit was undertaken of a statistical sample of sample of 515 items of load on 24th and 25th November. This found the database is not confirmed to be accurate within the allowable ±5% accuracy threshold and over submission is likely to be occurring as a result:

- in absolute terms the installed capacity is estimated to be 163 kW lower than the database indicates,
- there is a 95% level of confidence that the installed capacity is between 358 kW lower and 1 kW lower than the database,
- in absolute terms, total annual consumption is estimated to be 696,100 kWh lower than the DUML database indicates, and
- there is a 95% level of confidence that the annual consumption is between 1,528,800 kWh p.a. lower to 5,900 kWh p.a. lower than the database indicates.

Orion manage the database and field work. The fault, maintenance, new connection, and upgrade work is completed by Orion's approved contractors. The contractors provide paperwork to Orion confirming that work is complete, and Orion uses this information to update the database.

This audit found three non-compliances and makes one recommendation. The future risk rating of 18 indicates that the next audit be completed in six months I have considered this in conjunction with Contact's responses and recommend that the next audit be in 12 months.

PARTICIPANT RESPONSE

There has been a substantial investment by CCC and Simply Energy to develop operational processes that will allow us to utilise the (relatively) new approval of a profile by the Authority. This will allow us to reconcile volumes that are an accurate reflection of consumption of the CCC portfolio. We are working as quick as we can to meet the requirements of the authority before transitioning to the HHS profile.

Once this occurs, we will be effectively creating a new database and therefore a new audit schedule for CCC which will be auditable within 3 months (expecting sometime in Q1 2023). The lights connected to CCC's CMS system (which will encompass all light with dimming technology) will transition to this new database. Lights not connected to the CMS will remain within the boundary of the audit.