ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

SELWYN DISTRICT COUNCIL
AND MERCURY ENERGY LIMITED

Prepared by: Tara Gannon

Date audit commenced: 7 April 2019

Date audit report completed: 9 May 2018

Audit report due date: 31 May 2019

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EXECUTIVE SUMMARY

This audit of the **Selwyn District Council (SDC)** DUML database and processes was conducted at the request of **Mercury Energy Limited (Mercury)**, 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.

A Streetlighting/DUML database is managed by Orion on behalf of SDC, who is Mercury's customer. 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.

A monthly report from the database is provided to Mercury, and used to calculate submissions. Mercury submits the DUML load as HHR using the HHR profile. On hours are derived using data logger information.

Four non-compliances were identified, and no recommendations were raised. The future risk rating of 20 indicates that the next audit be completed in three months.

Orion was provided a list of all discrepancies identified during the audit, which they investigated and resolved where possible. Most were timing differences caused by a delay between LED upgrades being carried out and paperwork received to update the database. Based on this, and the comments received I recommend the next audit be completed in 10 months to allow time to improve processes to record LED upgrades.

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 contains some inaccurate data.	Moderate	High	6	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	14 items of load were missing from the database.	Moderate	Low	2	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The database contains some inaccurate data.	Moderate	High	6	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	The database contains some inaccurate data.	Moderate	High	6	Identified
					Future Risk Rating	**20**	

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	Description	Recommendation
		Nil	

ISSUES

Subject	Section	Description	Issue
		Nil	

1. ADMINISTRATIVE

1.1. Exemptions from Obligations to Comply with Code

Code reference

Section 11 of Electricity Industry Act 2010.

Code related audit information

Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit observation

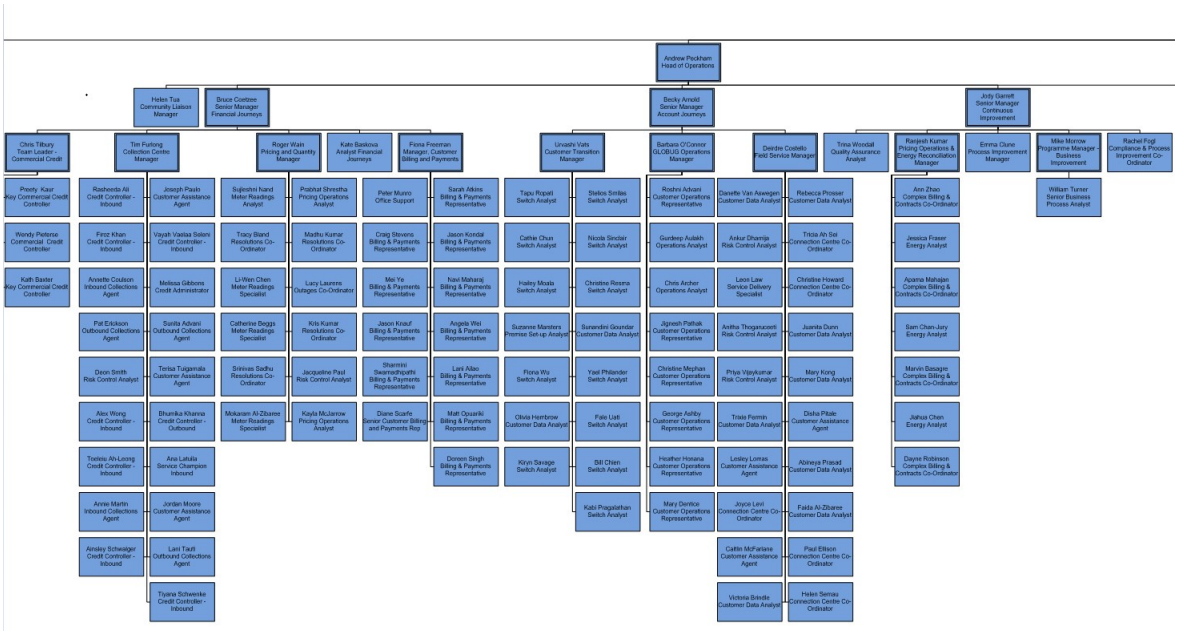
Section 11 of the Electricity Industry Act provides for the Electricity Authority to exempt any participant from compliance with all or any of the clauses.

Audit commentary

Exemption 233 has been granted to allow Mercury to submit HHR data for DUML to the Reconciliation Manager.

1.2. Structure of Organisation

Mercury provided the relevant organisational structure:



1.3. Persons involved in this audit

Auditor:

Tara Gannon

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Penny Lawrence	Operations Services	Orion
Dayne Robinson	Energy Analyst	Mercury
Ranjesh Kumar	Pricing Operations and Energy Services Manager	Mercury

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 database is restricted using logins and passwords.

1.5. Breaches or Breach Allegations

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

1.6. ICP Data

The following ICPs are relevant to the scope of this audit:

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0007111131RN649	Ref Orion_SDC GXP street light ICP - Aps0111 Gxp Sdc Street Lights	APS0111	HHR	36	5,158
0007111132RNA89	Ref Orion_SDC GXP street light ICP - Gxpclh 0111 Sdc Street Lights	CLH0111	HHR	57	5,895
0007111133RN6CC	Ref Orion_SDC GXP street light ICP - Col0111 Cxp Sdc Street Lights	COL0111	HHR	45	3,208
0007111134RNB06	Ref Orion_SDC GXP street light ICP - Hor0331 Gxp Sdc Street Lights	HOR0331	HHR	542	53,596
0007111135RN743	Ref Orion_SDC GXP street light ICP - Isl0331 Gxp Sdc Street Lights	ISL0331	HHR	705	59,508

ICP Number	Description	NSP	Profile	Number of items of load	Database wattage (watts)
0007131637RN109	Ref Orion_SDC GXP street light ICP - HOR0661 GXP SDC Street Lights	HOR0661	HHR	8	731
0007131640RN99E	Ref Orion_SDC GXP street light ICP - ISL0661 GXP SDC Street Lights	ISL0661	HHR	5,238	426,494
0007152475RN996	Ref Orion_SDC GXP street light ICP Kimberley - West Coast Road	KBY0661	HHR	141	14,861
			Total	**6,772**	**569,451**

1.7. Authorisation Received

All information was provided directly by Mercury or Orion.

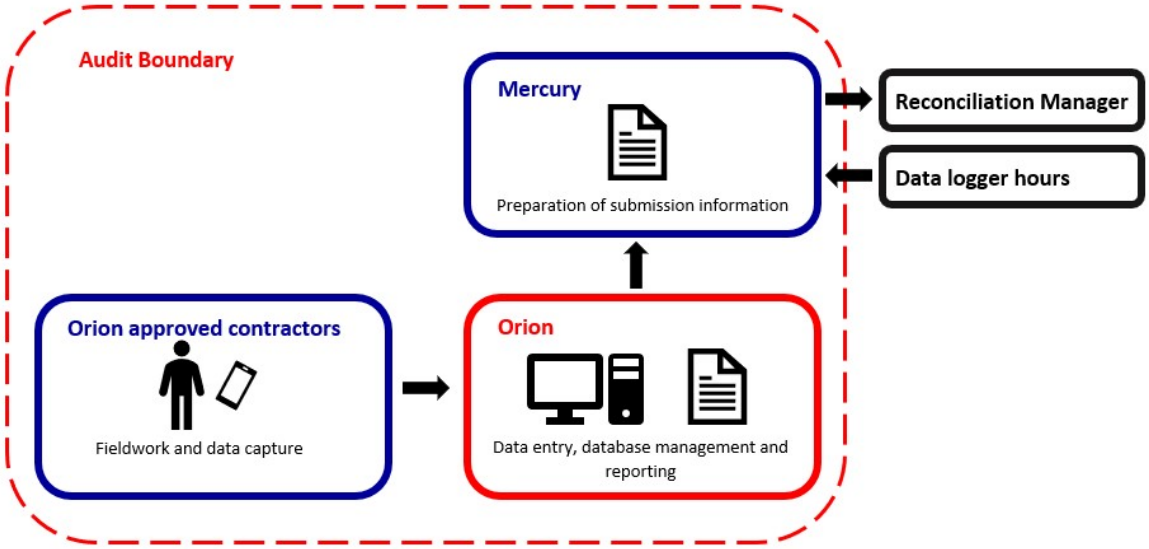
1.8. Scope of Audit

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

A Streetlighting/DUML database is managed by Orion on behalf of SDC, who is Mercury's customer. 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.

A monthly report from the database is provided to Mercury, and used to calculate submissions. Mercury submits the DUML load as HHR using the HHR profile. On hours are derived using data logger information.

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



The field audit was undertaken of a statistical sample of 327 items of load on 7, 8 and 10 April 2019.

1.9. Summary of previous audit

The last audit report completed by Steve Woods of Veritek Limited in May 2018. Four non-compliances were identified, and two 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	Over submission by approximately 14,871 kWh per annum	Still existing
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	Four lamp types have incorrect lamp wattage recorded. The wattage expected under reporting is 1,768 kWh per annum.	Some lamps still have incorrect wattages recorded, and appear as non-compliance in **section 3.1**.
Database accuracy	3.1	15.2 and 15.37B(b)	The database accuracy is assessed to be 99.3% indicating an estimated over submission of 16,639 kWh per annum	Still existing
Volume information accuracy	3.2	15.2 and 15.37B(c)	Over submission by approximately 14,871 kWh per annum	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

Mercury 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 the SDC 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

This clause requires that the distributed unmetered load database must satisfy the requirements of schedule 15.5 regarding the methodology for deriving submission information. Mercury reconciles this DUML load as HHR using the HHR profile, and on and off times are derived from data logger data.

I checked the March 2019 submission data for all eight ICPs, and compliance is confirmed.

Volume inaccuracy is present as follows:

Issue	Estimated volume information impact (annual kWh)
Potential over submission due to database inaccuracy identified during the field audit	Estimated over submission of 385,000 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).
95 lights had a recorded wattage which differed from the expected wattage. Orion corrected the values to match the expected wattages during the audit.	Estimated over submission of 272.5W or 1164 kWh per annum (based on annual burn hours of 4,271).

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: unknown To: 12-Apr-19	The database contains some inaccurate data. The database accuracy is assessed to be 84.2% indicating an estimated over submission of 385,000 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). 95 lights had a recorded wattage which differed from the expected wattage, resulting in estimated over submission of 272.5W or 1164 kWh per annum (based on annual burn hours of 4,271). Orion corrected the values to match the expected wattages during the audit. Potential impact: High Actual impact: Unknown Audit history: Twice Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	Controls are rated as moderate. Almost all the field audit differences relate to LED upgrades, where there is sometimes a delay between the light being installed and paperwork being received to update the database. A relatively small number of lights are affected by the wattage differences. The impact is assessed to be high, based on the kWh differences described above. Orion intends to investigate and correct the differences identified.

Actions taken to resolve the issue	Completion date	Remedial action status
Response: Non compliance accepted and remedial action on-going **Action:** SDC has confirmed with Connetics that some of the sites identified as inaccurate have already been resolved and are awaiting paperwork before the database can be updated. There are a number of zones/groups that were identified that have been actioned, and are in the process of being completed. SDC is aware of the inaccuracies, and are working to get these resolved. Mercury will correct the volume in the subsequent washup files.	On going	Identified

Preventative actions taken to ensure no further issues will occur	Completion date	
SDC have contracted Connetics to conduct a bulk LED upgrade and head replacement which has been approved by Orion. This will be completed over the next few years. Over time this will improve the accuracy of the database as a whole, however the biggest restriction is the reliance on the return of paperwork before the database can be corrected. Once the paperwork for each job is received, the database will be updated with the corrected information.	On going	

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 whether an ICP is recorded for each item of load.

Audit commentary

All items of load have an ICP number recorded.

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

Street addresses and GPS coordinates are recorded for all 6,772 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 lamp type and wattage capacity and included any ballast or gear wattage.

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

The field audit was undertaken of a statistical sample of 327 items of load on 7, 8 and 10 April 2019.

Audit commentary

The following differences were identified during the field audit.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Other lights					
Christchurch Akaroa Rd	9	14	5	-	Five 100W HPS lights in and near the Taitapu township on the state highway were missing from the database.
Streetlights					
Blakes Rd	18	18	-	1	One 93W LED was recorded as 70W HPS in the database.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Browns Rd	5	5	-	3	Three L29 LEDs were recorded as 70W HPS in the database. The lights have recently been upgraded and Orion is awaiting documentation to update the database.
Cairnbrae Dr	20	23	3	-	Three 70W HPS were missing from the database. A works order was located following the audit and the database has been updated.
Cardale St	7	7	-	4	Four L29 LEDs were recorded in the database as three 2*30W FF and one 70W HPS. The lights have recently been upgraded and Orion is awaiting documentation to update the database.
Chapman St	10	9	-1	8	Three L18, one L29, and five 70W HPS were recorded in the database as four 125 MV and six 70W HPS. The lights have recently been upgraded and Orion is awaiting documentation to update the database.
Chervier St	9	9	-	3	Three L20 were recorded in the database as 125W MV. The lights have recently been upgraded and Orion is awaiting documentation to update the database.
D'arcy St	3	3	-	3	Three L20 were recorded as 125W MV in the database. The lights have recently been upgraded and Orion is awaiting documentation to update the database.
D'arcy St opp	2	2	-	2	One L20 and one L29 were recorded as 125W MV and 70W HPS in the database. The lights have recently been upgraded and Orion is awaiting documentation to update the database.
Dorothys Way	4	4	-	4	Four L18 were recorded as 70W HPS in the database. The lights have recently been upgraded and Orion is awaiting documentation to update the database.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Fairhurst Pl	7	6	-1	-	One 14W LED recorded in the database was not located on the street. Orion believes this lamp is present in the field.
Gordon St	4	4	-	3	Three L20 were recorded as 125W MV in the database. The lights have recently been upgraded and Orion is awaiting documentation to update the database.
Halkett St	6	6	-	6	Six L29 were recorded as 70W HPS in the database. The lights have recently been upgraded and Orion is awaiting documentation to update the database.
Jacqueline Dr	6	6	-	6	Six L18 were recorded as 70W HPS in the database. The lights have recently been upgraded and Orion is awaiting documentation to update the database.
McIlraith St	4	4	-	4	One L18 and three L29 were recorded as four 70W HPS in the database. The lights have recently been upgraded and Orion is awaiting documentation to update the database.
Ritso St	2	2	-	2	Two L20 were recorded as 2*30W FF in the database. The lights have recently been upgraded and Orion is awaiting documentation to update the database.
Rossington Dr	28	30	2	28	28 L18 were recorded as 70W HPS in the database. An additional two L18 near Rossington Common were missing from the database. The lights have recently been upgraded and Orion is awaiting documentation to update the database.
St James St	4	8	4	4	Four L20 were recorded as 2*30W FF in the database. An additional four L20 lights were missing from the database. The lights have recently been upgraded and Orion is awaiting documentation to update the database.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Total	**327**	**340**	**12**	**81**	

The field audit found 14 items of load were missing from the database, which are recorded as non-compliance below.

A further two items of load were recorded in the database but not present in the field, and 81 wattage differences were identified. These differences are recorded as non-compliance in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3 From: unknown To: 10-Apr-19	14 items of load were missing from the database. Potential impact: Low Actual impact: Low Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as moderate. Almost all the differences relate to LED upgrades, where there is sometimes a delay between the light being installed and paperwork being received to update the database. The impact is assessed to be low. The combined missing load is 935W, or 3,993 kWh per annum based on 4271 annual burn hours.

Actions taken to resolve the issue	Completion date	Remedial action status
Response: Non compliance accepted and remedial action on-going **Action:** SDC has confirmed with Connetics that some of the sites identified as inaccurate have already been resolved and are awaiting paperwork before the database can be updated. There are a number of zones/groups that were identified that have been actioned, and are in the process of being completed. SDC is aware of the inaccuracies, and are working to get these resolved. Mercury will correct the volume in the subsequent washup files.	On going	Identified

Preventative actions taken to ensure no further issues will occur	Completion date	
SDC have contracted Connetics to conduct a bulk LED upgrade and head replacement which has been approved by Orion. This will be completed over the next few years. Over time this will improve the accuracy of the database as a whole, however the biggest restriction is the reliance on the return of paperwork before the database can be corrected. Once the paperwork for each job is received, the database will be updated with the corrected information.	On going	

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

On 20th September 2012 the Authority sent a memo to Retailers and auditors advising that tracking of load changes at a daily level was not required as long as the database contained an audit trail. I have interpreted this to mean that the production of a "snapshot" report is sufficient to achieve compliance. The database tracks additions and removals as required by this clause.

Processes to track changes to the database were reviewed.

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 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 operations 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. 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 operations 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 operations 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.

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

An LED upgrade project is underway. All new lights installed and replacement lights are LEDs. A general rollout is gradually occurring street by street. At this stage, SDC has no plans to use a centralised management system or dimming capability.

A small number of private lights are recorded in the database and reconciled. SDC does not use festive lights.

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

Orion demonstrated a complete audit trail of all additions and changes to the database information.

Audit outcome

Compliant

3. ACCURACY OF DUML DATABASE

3.1. Database accuracy (Clause 15.2 and 15.37B(b))

Code reference

Clause 15.2 and 15.37B(b)

Code related audit information

Audit must verify that the information recorded in the retailer's DUML database is complete and accurate.

Audit observation

DUML Statistical Sampling Guideline was used to determine the database accuracy. The table below shows the survey plan.

Plan Item	Comments
Area of interest	Streetlights in the Selwyn region
Strata	The database contains 6,772 items of load located in the Selwyn region. The management process is the same for all lights. I created two strata: • Streetlights • Other lights (including car parks, parks and reserves, pedestrian crossings, state highways).
Area units	I created a pivot table of the roads in each stratum, and I used a random number generator in a spreadsheet to select a total of 43 sub-units making up 5% of the total database wattage.
Total items of load	327 items of load were checked.

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

Audit commentary

Database accuracy based on the field audit

The database was found to contain some inaccuracies and missing data as described in **section 2.5**. Almost all the differences relate to LED upgrades, where there is sometimes a delay between the light being installed and paperwork being received to update the database. Orion was provided a list of all discrepancies identified during the audit, which they investigated and resolved where possible. Most were timing differences caused by a delay between LED upgrades being carried out and paperwork received to update the database.

The field data was 84.2% 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 24.6%, and the true load in the field will be between 69.3% to 93.9% of the load recorded in the database. The sample is not sufficiently precise to be able to determine the database accuracy but indicates that the database is likely to be over reporting the kW value.

The tool indicated that there is potentially 385,000 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool) of over submission. The statistical sampling tool reported with 95% confidence that there is a potential estimated over submission variance range of between 148,500 kWh and 746,500 kWh per annum.

Wattage accuracy

Orion's database contains a lamp type, which corresponds to a lamp total wattage including ballast wattage. The database was checked against the published standardised wattage table, and manufacturer's specifications where available. The following discrepancies were identified:

Lamp Type	Count	Recorded wattage	Expected wattage	Total difference (W)	Comment
18.5W LED	7	18.0	18.5	3.5	Orion will update to the expected value
45W NGMH	15	51	50	-15	Orion will update to the expected value
60W LED	23	68	60	-184	Orion will update to the expected value
60W NGMH	47	67	66	-47	Orion will update to the expected value
EM42	3	56	46	-30	Orion will update to the expected value
Total	**95**			**-272.5**	

Specifications could not be located for lamp types M11FF and M26FF to verify the wattages applied. Orion confirmed that to the best of their knowledge, the recorded wattages for these lamps are correct.

Incorrect lamp wattages identified in the previous audit were followed up, and found to be corrected.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: unknown To: 12-Apr-19	The database contains some inaccurate data. The database accuracy is assessed to be 84.2% indicating an estimated over submission of 385,000 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). 95 lights had a recorded wattage which differed from the expected wattage, resulting in estimated over submission of 272.5W or 1164 kWh per annum (based on annual burn hours of 4,271). Orion corrected the values to match the expected wattages during the audit. Potential impact: High Actual impact: Unknown Audit history: Twice Controls: Moderate Breach risk rating: 6

Audit risk rating	Rationale for audit risk rating
High	Controls are rated as moderate. Almost all the field audit differences relate to LED upgrades, where there is sometimes a delay between the light being installed and paperwork being received to update the database. A relatively small number of lights are affected by the wattage differences. The impact is assessed to be high, based on the kWh differences described above. Orion intends to investigate and correct the differences identified.

Actions taken to resolve the issue	Completion date	Remedial action status
Response: Non compliance accepted and remedial action on-going **Action:** SDC has confirmed with Connetics that some of the sites identified as inaccurate have already been resolved and are awaiting paperwork before the database can be updated. There are a number of zones/groups that were identified that have been actioned, and are in the process of being completed. SDC is aware of the inaccuracies, and are working to get these resolved. Mercury will correct the volume in the subsequent washup files.	On going	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
SDC have contracted Connetics to conduct a bulk LED upgrade and head replacement which has been approved by Orion. This will be completed over the next few years. Over time this will improve the accuracy of the database as a whole, however the biggest restriction is the reliance on the return of paperwork before the database can be corrected. Once the paperwork for each job is received, the database will be updated with the corrected information.	On going	

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 burn hours against the submitted figure to confirm accuracy.

Audit commentary

This clause requires that the distributed unmetered load database must satisfy the requirements of schedule 15.5 regarding the methodology for deriving submission information. Mercury reconciles this DUML load as HHR using the HHR profile, and on and off times are derived from data logger data. The correct profile and submission type is recorded on the registry for all ICPs.

I checked the March 2019 submission data for all eight ICPs, and compliance is confirmed.

Volume inaccuracy is present as follows:

Issue	Estimated volume information impact (annual kWh)
Potential over submission due to database inaccuracy identified during the field audit	Estimated over submission of 385,000 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).
95 lights had a recorded wattage which differed from the expected wattage. Orion corrected the values to match the expected wattages during the audit.	Estimated over submission of 272.5W or 1164 kWh per annum (based on annual burn hours of 4,271).

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: unknown To: 12-Apr-19	The database contains some inaccurate data. The database accuracy is assessed to be 84.2% indicating an estimated over submission of 385,000 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool). 95 lights had a recorded wattage which differed from the expected wattage, resulting in estimated over submission of 272.5W or 1164 kWh per annum (based on annual burn hours of 4,271). Orion corrected the values to match the expected wattages during the audit. Potential impact: High Actual impact: Unknown Audit history: Twice Controls: Moderate Breach risk rating: 6

Audit risk rating	Rationale for audit risk rating
High	Controls are rated as moderate. Almost all the field audit differences relate to LED upgrades, where there is sometimes a delay between the light being installed and paperwork being received to update the database. A relatively small number of lights are affected by the wattage differences. The impact is assessed to be high, based on the kWh differences described above. Orion intends to investigate and correct the differences identified.

Actions taken to resolve the issue	Completion date	Remedial action status
Response: Non compliance accepted and remedial action on-going **Action:** SDC has confirmed with Connetics that some of the sites identified as inaccurate have already been resolved and are awaiting paperwork before the database can be updated. There are a number of zones/groups that were identified that have been actioned, and are in the process of being completed. SDC is aware of the inaccuracies, and are working to get these resolved. Mercury will correct the volume in the subsequent washup files.	On going	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
SDC have contracted Connetics to conduct a bulk LED upgrade and head replacement which has been approved by Orion. This will be completed over the next few years. Over time this will improve the accuracy of the database as a whole, however the biggest restriction is the reliance on the return of paperwork before the database can be corrected. Once the paperwork for each job is received, the database will be updated with the corrected information.	On going	

CONCLUSION

A Streetlighting/DUML database is managed by Orion on behalf of SDC, who is Mercury's customer. 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.

A monthly report from the database is provided to Mercury, and used to calculate submissions. Mercury submits the DUML load as HHR using the HHR profile. On hours are derived using data logger information.

Four non-compliances were identified, and no recommendations were raised. The future risk rating of 20 indicates that the next audit be completed in three months. Orion was provided a list of all discrepancies identified during the audit, which they investigated and resolved where possible. Most were timing differences caused by a delay between LED upgrades being carried out and paperwork received to update the database. Based on this, and the comments received I recommend the next audit be completed in 10 months to allow time to improve processes to record LED upgrades.

PARTICIPANT RESPONSE

Mercury is working with Selwyn DC to ensure database is updated in timely and efficient manner to ensure energy is reconciled correctly to the market. We believe that the breach risk rating is over stated as on item is causing 3 different areas of non compliance with total of 18 points.