ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

AUCKLAND TRANSPORT AND CONTACT ENERGY

Prepared by: Rebecca Elliot

Date audit commenced: 10 September 2018

Date audit report completed: 15 November 2018

Audit report due date: 01-Dec-18

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EXECUTIVE SUMMARY

This audit of the Auckland Transport Unmetered Streetlights (Auckland Transport) 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 manages the 46 DUML ICPs associated with the RAMM streetlight database. The reduction of eight ICPs is a result of four of them being duplicated in the last audit count. The remaining four ICPS have switched to Trustpower as part of the Auckland City Council switch out. These are the four ICPs that have no database associated with them. Trustpower are investigating these loads. Therefore, these ICPs these are no longer considered to be part of this audit.

Auckland Transport have recorded all the LED lights in the SLV tele-management system. This system is being trialled to record street light energy consumption. The intention is that once the system has been thoroughly tested and the necessary approvals have been granted by the Electricity Authority, this system will be used to calculate submission for the LED lights. Initial results from the 40 check meters installed comparing the volumes recorded in SLV against the check meters are looking promising. In the interim, the LED lights are being recorded in both databases. Discussions are progressing between Auckland Transport and the Electricity Authority to progress the approval of the SLV system to be used for reconciliation. Dimming is being used on the SLV system, but this is not reflected in submission as this system is yet to be approved, therefore over submission will be occurring. The SLV system was not assessed as part of this audit and therefore I was not able to calculate the kWh volume impact.

I checked the submission accuracy for the month of September. Overall there were 537 more lights recorded in the monthly report than in the database extract, but the monthly report has less kW volume than the database extract. The kW difference indicates a potential under submission of 847,622.66 kWh per annum. This is reduction of 321,799.93 kWh (27.5%) from the potential under submission of 1,169,418.59 kWh per annum recorded in the last audit report. The potential reasons for these variances are discussed in **section 3.2**.

Analysis of the database found a smaller number of discrepancies between the database and in the field. These are detailed in the report. Auckland Transport have made good progress to improve database management processes. These are detailed in **section 2.6**.

This audit found five non-compliances and no recommendation were made. This is a reduction from the nine non-compliances found in the last audit. The future risk rating of 30 indicates that the next audit be completed in three months, but I recommend that the next audit be in a minimum of six months to allow time for Auckland Transport and Contact to embed the new processes. 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	Incorrect profile of RPS HHR applied to 44 ICPs. Over submission because of dimming being used. The impact on submission is unknown. Potential under submission of 847,622.56kWh due to the LED wattages being adjusted outside of RAMM and metered load recorded incorrectly against unmetered load ICPs in the RAMM database. 526 items of load with no wattage recorded and 27 items of load with zero wattage recorded indicating potential under submission of 66,132 kWh of under submission. Incorrect ballasts recorded in RAMM indicate over submission of an estimated 8,073 kWh over submission per annum. 187 items of load with an invalid light description.	Moderate	High	6	Investigating
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	526 items of load with no wattage recorded. 27 items of load with zero wattage recorded. 187 items of load with an invalid light description.	Moderate	High	6	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
All load recorded in database	2.5	11(2A) and (d) of Schedule 15.3	Not all load recorded in the database (16 additional lights found or 1.5% of the load sampled).	Moderate	High	6	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	187 items of load with an invalid light description. 526 items of load with no wattage recorded and 27 items of load with zero wattage recorded indicating potential under submission of 66,132 kWh of under submission. Incorrect ballasts recorded in RAMM indicate over submission of an estimated 8,073 kWh over submission per annum.	Moderate	High	6	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Volume information accuracy	3.2	15.2 and 15.37B(c)	Incorrect profile of RPS HHR applied to 44 ICPs. Over submission because of dimming being used. The impact on submission is unknown. Potential under submission of 847,622.56kWh due to the LED wattages being adjusted outside of RAMM and metered load recorded incorrectly against unmetered load ICPs in the RAMM database. 526 items of load with no wattage recorded and 27 items of load with zero wattage recorded indicating potential under submission of 66,132 kWh of under submission. Incorrect ballasts recorded in RAMM indicate over submission of an estimated 8,073 kWh over submission per annum. Unmetered ICPs incorrectly assigned to 1,022 metered items of load in the database 187 items of load with an invalid light description.	Moderate	High	6	Investigating
Future Risk Rating						30	

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

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

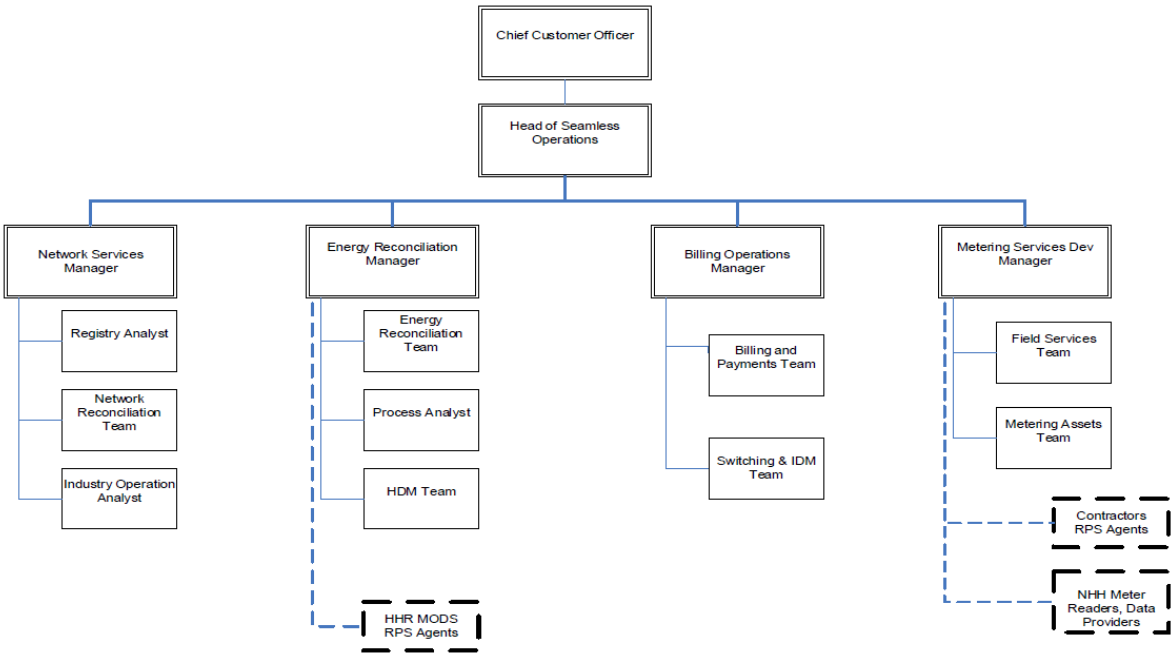
Audit commentary

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

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

1.2. Structure of Organisation

Contact Energy provided a copy of their organisational structure.



1.3. Persons involved in this audit

Auditor:

Rebecca Elliot

Veritek Limited

Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Ahmed Osman	Project Manager Streetlights	Auckland Transport
Allie Jones	External Operations Analyst	Contact Energy
Bernie Cross	Reconciliation Manager	Contact Energy
Charmaine Okros	Asset Systems Manager	Auckland Transport
David Dick	Team Leader Street Lights	Auckland Transport
Derek McGoldrick	Data & Reporting Analyst / Asset Management - Systems	Auckland Transport
Scott Donaldson	Account Executive	Contact Energy
Simon Makrogianni	HDM Team Member	Contact Energy

1.4. Hardware and Software

The streetlight data is held in a RAMM database. Auckland Transport also record the LED lights in a CMS system called the SLV tele-management system (street light vision). This system is not used for submission purposes as yet, but Auckland Transport has met with Ron Beattie of the Electricity Authority to progress this. For this reason, data from SLV has not been reviewed as part of this audit.

Both systems are backed up in accordance with standard industry procedures. Access to RAMM and the SLV tele-management is secure by way of password protection.

1.5. Breaches or Breach Allegations

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

1.6. ICP Data

There are 46 ICPs associated with the Auckland Transport DUML load. The reduction of eight ICPs is a result of these switching to Trustpower. This includes the four unmetered ICPs that have no load recorded in the RAMM database that were with Contact for some time have switched to Trustpower during the audit period. Trustpower are investigating these loads. Therefore, these ICPs these are no longer considered to be part of this audit. All are recorded in the RAMM database:

ICP Number	Network	Profile	NSP	Number of items of load	Database wattage (watts)
0000018370WE118	WAIK	RPS HHR	PAK0331	21	2,603
0000019359WE3BC	WAIK	RPS HHR	TAK0331	114	13,595
0000019934WE91D	WAIK	HHR	WIR0331	15	2,441
0000041244WE13A	WAIK	RPS HHR	WEL0331	52	5,152
0000041245WED7F	WAIK	HHR	HEP0331(N)	8	743
0000041246WE1BF	WAIK	RPS HHR	TAK0331	252	30,060
0000041247WEDFA	WAIK	RPS HHR	OTA0221	199	8,596
0003281740CNA88	COUP	RPS HHR	BOB1101	3,857	274,443
0900343060LC471	VECT	RPS HHR	TAK0331	6,011	696,388
0905321057LCB09	VECT	RPS HHR	HEP0331	419	57,994
0914050273LCECE	VECT	RPS HHR	ROS0221	3,191	604,971
0915197278LC21F	VECT	RPS HHR	PEN0221	1,329	255,188
0918033403LCA10	VECT	RPS HHR	PEN0331	5,889	1,160,776
0929040953LCE6D	VECT	RPS HHR	PEN1101	3,848	632,704
0954776933LCC4F	VECT	RPS HHR	PAK0331	5,776	739,375
0977883655LCF24	VECT	RPS HHR	MNG0331	3,099	462,555
0984112723LC1A6	VECT	RPS HHR	WIR0331	2,982	480,575
0987075446LC985	VECT	RPS HHR	OTA0221	4,388	572,005
1001138654LC940	VECT	RPS HHR	ROS1101	2,353	422,588
1001282117UNECE	VECT	RPS HHR	ALB1101	5,691	856,461
1001282119UND55	VECT	RPS HHR	ALB0331	7,807	1,041,653
1001282121UN8B9	VECT	RPS HHR	HEN0331	4,767	591,268
1001282123UN83C	VECT	RPS HHR	HEP0331(N)	5,300	714,650
1001282124UN5F6	VECT	RPS HHR	SLV0331	4,381	570,784
1001282125UN9B3	VECT	RPS HHR	WRD0331	484	57,569
1001282126UN573	VECT	RPS HHR	WEL0331	1,464	163,143

ICP Number	Network	Profile	NSP	Number of items of load	Database wattage (watts)
1001282153UND61	VECT	RPS HHR	ALB1101	1,456	37,653
1001282154UN0AB	VECT	RPS HHR	ALB0331	2,535	67,685
1001282155UNCEE	VECT	RPS HHR	HEN0331	2,838	72,247
1001282156UN02E	VECT	RPS HHR	HEP0331(N)	2,730	68,663
1001282163UNA99	VECT	RPS HHR	WRD0331	823	22,298
1001282164UN753	UNET	RPS HHR	WEL0331	99	2,769
1001282166LCDC2	VECT	RPS HHR	HEP0331	483	11,716
1001282171LCAA5	VECT	RPS HHR	MNG0331	2,496	70,111
1001282172LC665	VECT	RPS HHR	OTA0221	1,390	42,855
1001282174LC7EA	VECT	RPS HHR	PEN0221	975	25,169
1001282175LCBAF	VECT	RPS HHR	PEN0331	7,232	182,004
1001282176LC76F	VECT	RPS HHR	PEN1101	1,198	37,819
1001282177LCB2A	VECT	RPS HHR	ROS0221	5,204	146,380
1001282178LC4F4	VECT	RPS HHR	ROS1101	2,740	77,221
1001282179LC8B1	VECT	RPS HHR	TAK0331	2,444	63,552
1001282180LC6F7	VECT	RPS HHR	WIR0331	1,323	35,105
1001287978LC3D9	VECT	RPS HHR	PAK0331	2,068	50,677
1001287979UN588	UNET	RPS HHR	SLV0331	1,453	43,992
1099572697CNB44	COUP	RPS HHR	BOB0331	54	3,717
1099572698CN49A	COUP	RPS HHR	GLN0332	1,256	76,361
TOTAL				**114,567**	**11,556,271**

1.7. Authorisation Received

All information was provided directly by Contact or Auckland Transport.

1.8. Scope of Audit

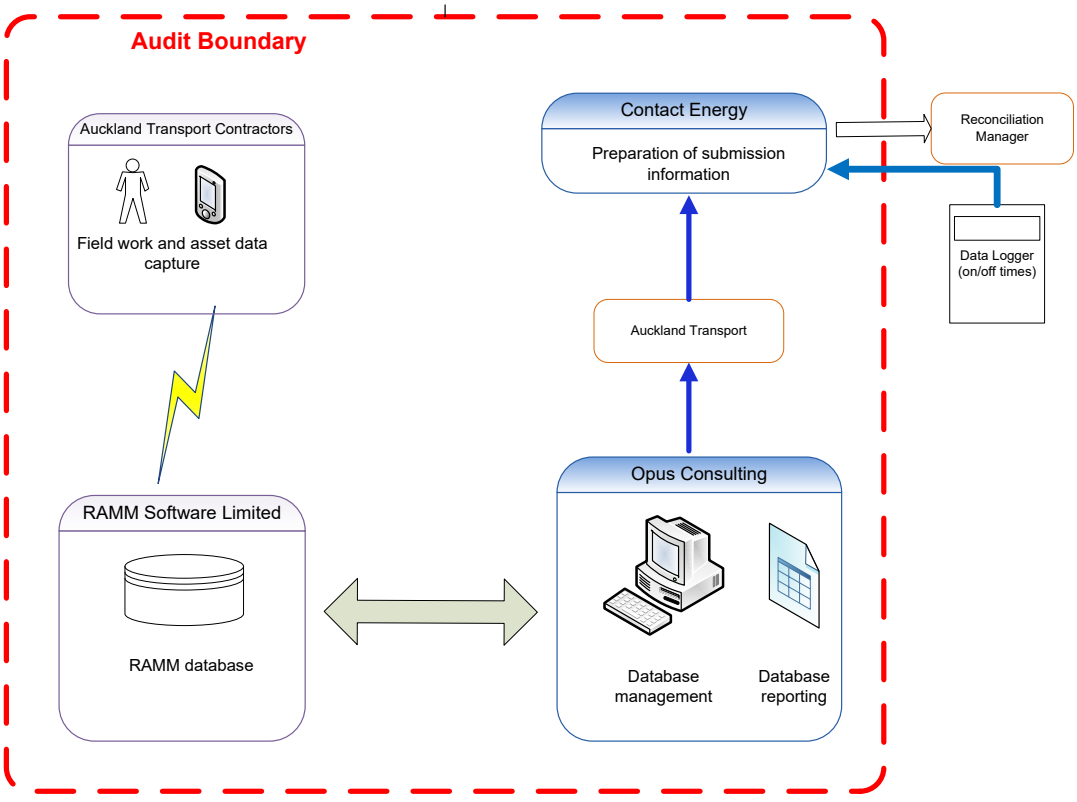
This audit of the Auckland Transport Unmetered Streetlights (AT) DUML database and processes was conducted at the request of Contact Energy Limited (Contact), in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

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

There are 46 ICPs associated with Auckland Transport. This is eight less than recorded in the last audit. Four of these were thought to have been excluded from the May 2018 database extract but were duplicated. The remaining four ICPS have switched to Trustpower as part of the Auckland City Council switch out. These are the four ICPs that have no database associated with them.

The streetlight data is held in a RAMM database and this continues to be managed by Opus Consulting; on behalf of Auckland Transport. In addition to the RAMM database Auckland Transport are recording all the LED lights in the SLV tele-management system. The intention is that once the system has been thoroughly tested and the necessary approvals have been granted by the Electricity Authority, this system will be used to calculate submission for the LED lights. Discussions with the Electricity Authority are progressing. The SLV system was not examined as part of this audit.

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



The field audit was undertaken of a statistical sample of 1,011 items of load in October 2018.

1.9. Summary of previous audit

Contact provided a copy of the last audit report undertaken by Rebecca Elliot of Veritek Limited in April 2018 the current status of the non-compliances is recorded below:

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Status
Deriving Submission Information	2.1	11(1) of schedule 15.3	4 ICPs with DUML reconciled without a database. Over submission because of dimming being used. The impact on submission is unknown. The wattage report is adjusted outside of RAMM specifically in relation to the LED light values this is resulting in an estimated under submission of 1,169,418.59 kWh if the wattages in RAMM are correct. The database accuracy is assessed to be 99.6% indicating an estimated over submission of 213,200 kWh per annum if the database was used for submission without the current LED light adjustments being made. Incorrect ballasts recorded in RAMM indicate an over submission of an estimated 546,518.44 kWh per annum (excluding LED lights which are being adjusted outside of RAMM as discussed in **sections 2.1** & **3.1**). 50 items of load with no light or wattage recorded. 206 items of load with an invalid light description.	Switched out Still existing Still existing Cleared Still existing
ICP Identifier	2.2	11(2)(a) and (aa) of Schedule 15.3	4 ICPs with no database associated to record the ICP against each item of load.	Cleared - will be audited with new Trader
Location of each items of load	2.3	11(2)(b) of Schedule 15.3	4 ICPs with no database associated. 54 items of load with insufficient details recorded to locate these.	Cleared - will be audited with new Trader Still existing
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	4 ICPs with no database associated. 50 items of load with no light or wattage recorded. 206 items of load with an invalid light description.	Cleared - will be audited with new Trader Still existing
All load recorded in database	2.5	11(2A) and (d) of Schedule 15.3	4 ICPs with no database. Not all load recorded in the database (46 additional lights found or 4.7% of the total load recorded in RAMM).	Cleared - will be audited with new Trader Still existing

Subject	Section	Clause	Non-Compliance	Status
Tracking of load change	2.6	11(3) of Schedule 11.3	4 ICPs with no database associated.	Cleared - will be audited with new Trader
			New streetlights not captured in RAMM when they are electrically connected.	Cleared from this section- will be recorded in section 3.1 going forward
			Festive lighting not recorded in RAMM but is being reconciled.	
Audit trail	2.7	11(4) of Schedule 15.3	4 ICPs with no database and therefore no audit trail.	Cleared- will be audited with new Trader
Database accuracy	3.1	15.2 and 15.37B(b)	4 ICPs with no DUML database.	Cleared- will be audited with new Trader
			The database accuracy is assessed to be 99.6% indicating an estimated over submission of 213,200 kWh per annum.	Cleared
			Incorrect ballasts recorded in RAMM indicate over submission of an estimated 546,518.44 kWh per annum (excluding LED lights which are being adjusted outside of RAMM as discussed in **sections 2.1** & **3.2**).	Still existing
			50 items of load with no light or wattage recorded.	Still existing
			206 items of load with an invalid light description.	
Volume information accuracy	3.2	15.2 and 15.37B(c)	4 ICPs with DUML reconciled without a database.	Cleared- will be audited with new Trader
			Incorrect profile of RPS HHR applied to 46 ICPs	Still existing
			Over submission because of dimming being used. The impact on submission is unknown.	Still existing
			The wattage report is adjusted outside of RAMM specifically in relation to the LED light values this is resulting in an estimated under submission of 1,169,418.59 kWh if the wattages in RAMM are correct.	Still existing
			The database accuracy is assessed to be 99.6% indicating an estimated over submission of 213,200 kWh per annum if the database was used for submission without the current LED light adjustments being made.	Cleared
			Incorrect ballasts recorded in RAMM indicate an over submission of an estimated 546,518.44 kWh per annum (excluding LED lights which are being adjusted outside of RAMM as discussed in **sections 2.1** & **3.1**).	Still existing

Subject	Section	Clause	Non-Compliance	Status
			50 items of load with no light or wattage recorded. 206 items of load with an invalid light description.	Still existing Still existing

RECOMMENDATIONS

Subject	Section	Clause	Description	Status
			Nil	

1.10. Distributed unmetered load audits (Clause 16A.26 and 17.295F)

Code reference

Clause 16A.26 and 17.295F

Code related audit information

Retailers must ensure that DUML database audits are completed:

1. *by 1 June 2018 (for DUML that existed prior to 1 June 2017)*
2. *within three months of submission to the reconciliation manager (for new DUML)*
3. *within the timeframe specified by the Authority for DUML that has been audited since 1 June 2017.*

Audit observation

Contact have requested Veritek to undertake this streetlight audit.

Audit commentary

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

2. DUML DATABASE REQUIREMENTS

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

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

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

Audit observation

The process for calculation of consumption was examined and the application of profiles was checked. The database was checked for accuracy.

Audit commentary

The registry was checked for all 46 ICPs. All are reconciled half hourly. 44 of the ICPs have the incorrect profile of RPS HHR recorded on the registry. This is recorded as non-compliance in **section 3.2**.

Auckland Transport provide Contact with a monthly report from RAMM. The total "on time" is derived from a data logger and is "actual" on time not estimated. I confirmed the methodology is correct.

I checked the submission accuracy for the month of September against the data extract provided. Overall there were 537 more lights recorded in the monthly report than in the database extract, but the monthly report has less kW volume than the database extract. The kW difference indicates a potential under submission of 847,622.66 kWh per annum. This is reduction of 321,799.93 kWh (27.5%) from the potential under submission of 1,169,418.59 kWh per annum recorded in the last audit report. The differences found are likely to be due to three factors:

- The increased volume of lights is likely to be due to the timing difference between the database extract being provided part way through September and the monthly report being provided to Contact at the end of the month.
- Auckland Transport believe some of the lower kW value in the monthly report will be due to the LED wattages being adjusted outside of RAMM for the monthly report rather than using the higher LED wattages that are recorded in RAMM. This is because when many of the LED lights were fitted, they were set to a lower wattage than their standard fitting. This is discussed in **section 2.6**.
- Unmetered ICP numbers are recorded against 1,022 metered items of load which equates to 116.26 kW. These lights are excluded from submission but will be included in the database kW calculation. This is detailed in **section 3.2**.

There is some inaccurate data within the database used to calculate submissions. This is recorded as non-compliance and discussed in **sections 2.4, 3.1** and **3.2**.

Issue	Volume information impact (annual kWh)
Items of load with zero or no wattage recorded	66,132 kWh under submission
Incorrect wattage and ballasts applied	8,073.9 kWh over submission
Variance between RAMM database extract and September wattage report indicating potential under submission	847,622.56 kWh under submission

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: From: 01-May-18 To: 01-Oct-18	Incorrect profile of RPS HHR applied to 44 ICPs. Over submission because of dimming being used. The impact on submission is unknown. Potential under submission of 847,622.56kWh due to the LED wattages being adjusted outside of RAMM and metered load recorded incorrectly against unmetered load ICPs in the RAMM database. 526 items of load with no wattage recorded and 27 items of load with zero wattage recorded indicating potential under submission of 66,132 kWh of under submission. Incorrect ballasts recorded in RAMM indicate over submission of an estimated 8,073 kWh over submission per annum. 187 items of load with an invalid light description. Potential impact: High Actual impact: Unknown Audit history: Twice Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, as processes to improve the database accuracy have been implemented during the audit period. The audit risk rating is high due to the indicative kWh variances found for those that can be quantified.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact Energy have requested a fix to their systems for the incorrect profile on the registry, this is unlikely to be addressed prior to June 2019. We are manually updating the registry to ensure that settlement is correct. There can be timing issues with this. Contact Energy have been working with AT to report accurate submission data and all submissions back to when they began with Contact Energy 1 January 2018	ETA June 2019 March 2019	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact Energy and Veritek have explained the importance of a customer reporting accurate data and not adjusting the data. Contact will work with AT to ensure their data continues to improve. Contact are also working with AT to use Static Dimming	TBA	

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

Code reference

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

Code related audit information

The DUML database must contain:

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

Audit observation

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

Audit commentary

The RAMM database extract was analysed and found all items of load had an ICP allocated. I have discussed the accuracy of these ICPs in **section 3.1**.

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

Pocket RAMM is used by all contractors to capture the GPS co-ordinates of each item of load in the RAMM database.

Analysis of the RAMM database extract identified all but 56 items of load have GPS co-ordinates recorded. These 56 items of load were examined and found all had sufficient details to locate them.

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 RAMM database contains fields for the lamp make, lamp model, lamp wattage and the gear wattage.

Analysis of the database found:

- 526 items of load with no wattage recorded
- 27 items of load with zero wattage recorded.

I have estimated 66,132 kWh of under submission per annum based on an average wattage of 28W LED. This is recorded as non-compliance below and in **sections 2.1, 3.1** and **3.2**.

These have been sent to Auckland Transport to correct. This is recorded as non-compliance below.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: 11(2)(c) and (d) of Schedule 15.3 From: 30-Apr-18 To: 01-Oct-18	526 items of load with no wattage recorded. 27 items of load with zero wattage recorded. 187 items of load with an invalid light description. Potential impact: High Actual impact: High Audit history: Three times Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate as the majority of the load is recorded in the RAMM database. The audit risk rating is high if the wattage is assumed to be 28W for the lights with no wattage which results in an estimated annualised under submission of 66,132 kWh.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact Energy have requested a fix to their systems for the incorrect profile on the registry, this is unlikely to be addressed prior to June 2019. We are manually updating the registry to ensure that settlement is correct. There can be timing issues with this. Contact Energy have been working with AT to report accurate submission data and all submissions back to when they began with Contact Energy 1 January 2018 There has been a large improvement in this space, from almost 8000 issues down to about 1000	March 2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact Energy and Veritek have explained the importance of a customer reporting accurate data and not adjusting the data. Contact will work with AT to ensure their data continues to improve. Contact are also working with AT to use Static Dimming	TBA	

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 977 lights using the statistical sampling methodology.

Audit commentary

The field audit findings of those ICPs recorded in the RAMM database are detailed in the table below:

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
Central					
ARUNDEL ST	10	10			
BEACHCROFT AVE	37	37			
BEACHCROFT/CHURCH RAB	1	1			
BOURNEMOUTH AVE	4	4			
BRIGHAM ST	32	32		13	13x incorrect wattages
CLINKER ST	5	5			
DENBIGH AVE	17	17			
ELIZABETHAN GARDENS	6	6			
GOVERNOR FITZROY PL	5	5			
GWILLIAM PL	6	6			
HAWEA RD	3	3			
HENDERSON PL	7	7			
HILLSIDE CRES NORTH	3	3		1	1x incorrect wattage
HOLLAND AVE	12	12		1	1x incorrect wattage
KINDER PL	3	3			
KOTARE AVE	2	2			
MAPIU ST	2	2			
NAMATA RD	23	23		1	1x incorrect wattage
NGAHURA ST	3	3		1	1x incorrect wattage
OAK ST (ROYAL OAK)	5	5			
OMARU LANE	7	7			
PARFITT ST	3	3			
POLYGON RD	17	17			

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
QUEENSTOWN/BEACHCROFT RAB	1	1			
RAYMOND ST	4	4			
SEACOMBE RD	4	4			
TAWA RD (ONEHUNGA)	27	27		2	2x incorrect wattage
WENDELL PL	2	2			
WEST END RD	51	51			
WINDSOR ST	6	6		1	1x incorrect wattage
North					
BALMAIN RD	21	22	1	4	1x extra lamp & 4 incorrect wattages
BERRIDGE RD	3	3			
CHARTWELL AVE	27	27			
CURLEY AVE	5	5			
EMERY GR	3	3			
GLENGARRY AVE	6	6			
GOATLEY RD	2	2			
HAGUE PL	2	2			
IAN MARWICK PL	5	5			
JUMENTO PL	4	4		4	all had the incorrect LED wattage recorded in the database
LAKESIDE DR (OREWA)	37	37		30	30x incorrect LED wattages recorded
LAVENDER CLOSE (PVT)	2	2			
MACKWELL RD	5	5			
MCLEOD ST	1	1			
NAUMAI RD	1	1			
NORTH AVE	5	5			

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
NORTHWICK PL	3	3			
OAKPARK PL	3	3			
RAMILLIES PL	9	9			
RAYMOND GRACE AVENUE	7	7			
RIVERLEIGH DR	11	11			
SACRED KINGFISHER RD	1	4	3		3x lamps missing from the database
SAWYERS LANE	4	4			
SEQUOIA PL	5	5			
STONE ST	2	2			
SUCCESS CRT	9	9			
SUMMIT DR (TORBAY)	3	3			
TAROKA CLOSE	9	9		1	1x incorrect wattage recorded
TAUMATA ST	2	2			
TILLY LANE	2	3	1		1x lamp missing from the database
TOTARA VIEWS DR	29	32	3	1	3x lamps missing from the database & 1x incorrect wattage recorded
TUI ST (TORBAY)	2	2		1	1x incorrect wattage recorded
WILLIAM BOND ST	6	6			
South					
ASICS DR	6	6			
BERLANE PL	3	3			
DANA PL	2	2			
DERRYVEAGH LANE	3	3			
DILLIMORE AVE	1	1			

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
EAST ST SERVICE LANE (RP324 LHS)	8	9	1		1x lamp missing from the database
FARMDALE CRT HAMMERHEAD	6	6			
FRANSHELL CRES	10	10			
GILBERT RD	21	21			
HARRIER PL	3	3		1	1x incorrect wattage recorded
HURSTBOURN PRIORS	4	4			
JAY CRT	2	2			
KAWAKAWA-ORERE RD	11	11		2	2x incorrect wattages recorded
KELLAWAY DR	12	13	1	1	1x lamp missing from the database and 1x incorrect wattage recorded
LOCKWOOD RD	2	2			
MAKATITI RD	4	4			
MARK CARTER PL	2	2			
MAURICE ST	3	3			
MURCHISON RD	4	4			
NORMANBY RD EAST	2	2			
PALANDO PL	1	2	1		1x incorrect wattage recorded
PEARL BAKER DR	20	20		1	1x incorrect wattage recorded
PUMA DR	5	5			
RANGI RD (TAKANINI)	13	13		1	1x incorrect wattage recorded
RIVIERA DR	6	6		4	4x incorrect wattages recorded
ROHI PL	5	5			

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
ROSELLA RD	22	22		8	8x incorrect wattages recorded
ROUTLY AVE	2	2			
STEWART GIBSON PL	8	8			
WALLACE RD (MANGERE)	70	70		5	5x incorrect wattages recorded
WASTNEY RD	1	1			
WELLINGTON ST (PUKEKOHE)	21	21		1	1x incorrect wattage recorded
WILLIAMS AVE	7	7			
WILLOUGHBY AVE	12	12			
West					
BARRELS CL	2	2			
CANDIA RD	20	20		1	1x incorrect wattage recorded
CONNAUGHT ST	3	3			
GLEN NORMAN AVE	3	3			
HOLMES DR SOUTH	11	12	1		1x lamp missing from the database
HUGH BROWN DR	16	16		7	7x incorrect wattages recorded
HUGH BROWN DR RAB	1	1			
LOFT PL	8	8			
NIKAU WAY (PVT)	1	1			
TIRIMOANA RD	31	31		1	1x incorrect wattage recorded
TOMO ST	5	5			
TUI PL (WAITAKERE) (PVT)	1	1			
WATERVIEW DOWNS (PVT)	2	6	4		4xlamps missing from the database

Street	Database count	Field count	Light count differences	Wattage recorded incorrectly	Comments
WILLOWBROOK PL	2	2			
GERRARD/HAUGHEY WWAY (RP77 RHS)	4	4			
HANNIGAN/MERTON WWAY (RP611 RHS)	3	3			
HART RD/HARLEY CL CYWAY	1	1			
HOLGATE/KOHIMARAMA WWAY (RP260)	1	1			
AIRFIELD RD (PAPAKURA) (SW)	17	17			
CROWS RD	33	33			
TOTAL	**1011**	**1027**	**16**	**94**	

Not all load was recorded in the database. The accuracy of the database load is discussed in **section 3.1.**

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.5 With: 11(2A) of Schedule 15.3 From: 01-May-18 To: 01-Oct-18	Not all load recorded in the database (16 additional lights found or 1.5% of the load sampled). Potential impact: High Actual impact: High Audit history: Three times previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, as processes to improve the database accuracy have been implemented during the audit period. The audit risk rating is high due to the impact of 1.5% variance for this large database potentially has on reconciliation.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact Energy will work with AT to report correct submission data and all submissions back to when they began with Contact Energy 1 January 2018	March 2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact Energy and Veritek have explained the importance of a customer reporting accurate data and not adjusting the data. Contact will work with AT to ensure their data continues to improve With the review to the New Connection process these issues should be cleared	TBA	

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

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

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

All changes to the database are tracked as required by this clause.

Auckland Transport are making good progress to improve the timely tracking of load change. Specifically:

- For new connections, Auckland Transport have put in place with the two networks their lights are connected to, a memorandum of understanding with the networks. This requires that the network not connect any new unmetered streetlights without first confirming with Auckland Transport that these items of load are recorded in the RAMM database. This should greatly assist in ensuring new lights are added to the database in a timely manner.
- For lighting upgrades Auckland Transport contractors use RAMM to directly enter the details in the field. The field contractors are financially incentivised to complete all field work correctly. Auckland Transport staff carry out a random audit of 10% of all fieldwork to confirm that what has been claimed has been completed to the correct standard including the data capture into RAMM. Street light designers have been tasked with completing a field check confirming that what was proposed has been installed.
- The field audit of the existing LED lights being undertaken by Opus has commenced. 7,000 LED lights were audited, and the audit found a similar level of error to that found in this and the last audit. RAMM is being updated with these findings.
- Auckland Transport still intend to use the SLV system to manage the LED wattages. This is currently being trialled with the initial accuracy results looking promising. This system will be accurately able to record the light wattage on each pole and identify if any items of load which have a wattage outside of the light type threshold. These will be flagged as exceptions and investigated. If this information can be used for submission this will resolve the LED wattages that are currently be adjusted outside of RAMM and will also be able to measure accurately any dimming occurring.
- The new light labels which will be specific and identify the light type and wattage are about to be put in place - therefore the correct light type and wattage will be recorded correctly in RAMM.
- Festive lights are being added to the RAMM database for the 2018 festive season and should flow through to submission.

The outage patrols are still being carried out regularly by all field contractors across Auckland Transport's area as part of their contract.

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

The RAMM 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 of the Auckland Transport DUML load for the 46 ICPs supplied in the database extract. The table below shows the survey plan.

Plan Item	Comments
Area of interest	Auckland Council region
Strata	The database contains items of load in Auckland area. The area has four sub geographical regions of Central, North, South and West. This is reflective of the field contractor management areas. The processes for the management of Auckland Transport items of load are the same, but I decided to place the items of load into four strata, as follows: 1. Central 2. North 3. South 4. West
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 117 sub-units.
Total items of load	1,011 items of load were checked.

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

Audit commentary

The database was found to contain some inaccuracies and missing data. As detailed in **sections 2.1** and **3.2**, the monthly wattage report is calculated outside of RAMM, therefore the results below are only applicable if the database was used for submission without the LED lighting volumes being adjusted outside of RAMM.

A statistical sample of 1,011 items of load found that the field data was 97.7% of the database data for the sample checked. The database accuracy is within the required +/-2.5%. The statistical sampling tool reported with 95% confidence the precision of the sample was 11.2% and the true load in the field will be between 89.8% to 101.0% of the load recorded in the database. The sample is not sufficiently precise to be able to determine the database accuracy.

The tool indicated that there is potentially 1,151,200 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 submission variance range of between 5,053,200 kWh over submission and 500,300 kWh per annum under submission. The results of the field audit are detailed in **section 2.5**.

187 items of load were identified with an invalid light type description as detailed in the table below:

Light Type	Volume
350W Metal Halide	17
45W Metal Halide	1
500W HPS	1
57W Metal Halide	7
60W Metal Halide	29
70W Mercury Vapour	30
Mercury Vapour 70W	102
GRAND TOTAL	**187**

This is reduction of 19 lamps from the volume recorded in the last report. These are recorded as non-compliance below

There are 526 items of load with no wattage recorded, the 27 items of load with zero wattage recorded. I have estimated 66,132 kWh of under submission per annum based on an average wattage of 28W LED. This is detailed in **section 2.4.**

I checked the wattages and ballasts being applied and found 1,112 items of load with a wattage or ballast discrepancy. This is a significant reduction from the 7,038 found in the last audit.

This is detailed in the table below:

Light Type	Incorrect ballast	Total lights	Percentage of light type	Ballast difference
80				
MV	3	3	100%	-9
100				
HPS lamp	1	1	100%	1
125				
MV	4	4	100%	28

Light Type	Incorrect ballast	Total lights	Percentage of light type	Ballast difference
150				
MV	3	3	100%	-9.6
250				
MV	5	5	100%	-40
1000W Halogen				
	2	2	100%	-76
	11	11	100%	-348
1000W Metal Halide				
	3	3	100%	-300
100W HPS				
	24	6354	0%	12
	1	61	2%	-14
100W Metal Halide				
	6	44	14%	-18
	1	98	1%	1
110w lamp				
	11	11	100%	-23
11W Energy Saver				
	1	26	4%	-13
	3	3	100%	-18
11W Fluorescent PL				
	36	36	100%	-331.2
125w				
	1	1	100%	-7
125W Mercury Vapour				
	42	42	100%	-294
	2	2	100%	-14
13W Incandescent				
	6	7	86%	-78
140W Cosmo				
	70	570	12%	-444
150W Bi Pin Metal Halide				
	3	70	4%	6
150W Halogen				
	9	9	100%	-164
150W HPS				
	13	182	7%	234
	1	382	0%	3
	30	12883	0%	445
150W Metal Halide				
	15	1055	1%	10
	9	3269	0%	110

Light Type	Incorrect ballast	Total lights	Percentage of light type	Ballast difference
	4	436	1%	19
160w lamp				
	2	2	100%	-1
160W Mercury Vapour				
	1	1	100%	-3
18W Energy Saver				
	8	8	100%	-136
18W Fluorescent				
	15	15	100%	-17
18W Fluorescent Energy/ Saver				
	4	4	100%	17
2000W Halogen				
	1	1	100%	-38
210W Cosmo				
	6	97	6%	-56
250 MV lamp				
	1	1	100%	-8
250W HPS				
	1	8	13%	28
	6	313	2%	60
	2	7130	0%	51
250W Mercury Vapour				
	50	51	98%	-245
	3	4	75%	-24
250W Metal Halide				
	29	781	4%	260
	14	3398	0%	186
25W Fluorescent				
	33	34	97%	-50.6
2x20W Fluorescent				
	4	4	100%	-42
	28	56	50%	135
	1	1	100%	-1
35W Metal Halide				
	6	18	33%	42
	11	160	7%	-12
	1	1	100%	-4
36W 26mm Fluorescent Tube				
	3	4	75%	4
40 LED				
	1	114	1%	-5
400W Mercury Vapour				

Light Type	Incorrect ballast	Total lights	Percentage of light type	Ballast difference
	4	4	100%	-52
400W Metal Halide				
	5	55	9%	50
	1	293	0%	10
42 w E/saver				
	63	65	97%	406
45W Cosmo				
	12	27	44%	-86
500W Halogen				
	2	2	100%	-76
	2	2	100%	-76
50W Halogen				
	9	9	100%	-90
50W Metal Halide				
	2	2	100%	4
	8	9	89%	-6
54W Fluorescent				
	10	10	100%	31
60W Cosmo				
	255	414	62%	-1908
60W CPO Lamp PGZ12 Base				
	2	6	33%	-18
60W Metal Halide				
	27	27	100%	-154
	2	2	100%	-14
70W Halogen				
Thorn	1	1	100%	-13
70W HPS				
	2	189	1%	26
	2	131	2%	13
	28	7680	0%	285
70W HPS - E type				
	2	2149	0%	19
70W Metal Halide				
	11	1425	1%	87
	3	91	3%	-15
80W HPS				
	2	2	100%	8
80W MV GL500				
	1	1	100%	-3
90W Cosmo				
	3	35	9%	-12

Light Type	Incorrect ballast	Total lights	Percentage of light type	Ballast difference
90W SOX				
	1	1	100%	16
Ambar-2 HPS 150w				
	3	30	10%	54
Ambar-2 HPS 70w				
	2	9	22%	26
Belisha Beacon 100W				
	4	4	100%	-56
	2	2	100%	-28
Fluorescent to 58w				
	7	7	100%	11
Fluorescent up to 58W				
	13	13	100%	51
NAV 100Whps				
	1	17	6%	-4
S70				
	1	94	1%	13
Sodium Vapour 150w				
	7	915	1%	126
Sodium Vapour 250w				
	25	173	14%	340
Sodium Vapour 50w				
	1	25	4%	-2
Sodium Vapour 70w				
	6	124	5%	78
Sodium Vapour SON 100W				
	2	5	40%	26
Sodium Vapour SON 150W				
	3	56	5%	54
	1	769	0%	18
Sodium Vapour SON 50W				
	9	47	19%	-21
Sodium Vapour SON 70W				
	13	1016	1%	169
	1	1	100%	14
TOTAL	1,112			-1,890.4

The incorrect ballasts indicate an estimated 8,073.9 kWh over submission per annum. These have been sent to Auckland Transport for correction. As detailed in **section 2.1** and **3.2**, the LED wattages are believed to be incorrectly recorded in RAMM and are being adjusted before the monthly report is sent to Contact. The incorrect wattage and ballasts recorded in RAMM are recorded as non-compliance.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b) From: 01-May-18 To: 01-Oct-18	187 items of load with an invalid light description. 526 items of load with no wattage recorded and 27 items of load with zero wattage recorded indicating potential under submission of 66,132 kWh of under submission. Incorrect ballasts recorded in RAMM indicate over submission of an estimated 8,073 kWh over submission per annum. Potential impact: High Actual impact: High Audit history: Three times previously Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, as a large proportion of the incorrect ballasts have been corrected and processes being put in place will assist with recording the correct wattage is recorded. The impact is assessed to be medium, based on the kWh differences described above.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact Energy will work with AT to report correct submission data and all submissions back to when they began with Contact Energy 1 January 2018	March 2019	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact Energy and Veritek have explained the importance of a customer reporting accurate data and not adjusting the data. Contact will work with AT to ensure their data continues to improve	TBA	

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
- checking the database extract combined with the burn hours against the submitted figure to confirm accuracy.

Audit commentary

The registry was checked for all 46 ICPs. All are reconciled half hourly. 44 of the ICPs have the incorrect profile of RPS HHR recorded on the registry. This is corrected at the time of submission, but SAP reverts this back to RPS HHR between submissions. The incorrect profile is recorded as non-compliance below.

In addition to the RAMM database Auckland Transport are recording all the LED lights in the SLV tele-management system. This system is being trialled to record street light energy consumption. The intention is that once the system has been thoroughly tested and the necessary approvals have been granted by the Electricity Authority, this system will be used to calculate submission for the LED lights. Initial results from the 40 check meters installed comparing the volumes recorded in SLV against the check meters are looking promising. In the interim, the LED lights are being recorded in both databases. Discussions are progressing between Auckland Transport and the Electricity Authority to progress the approval of the SLV system to be used for reconciliation. Dimming is being used on the SLV system, but this is not reflected in submission as this system is yet to be approved, therefore over submission will be occurring. The SLV system was not assessed as part of this audit and therefore I was not able to calculate the kWh volume impact. This is recorded as non-compliance below.

I checked the submission accuracy for the month of September and found:

- Eight ICPs had the same number of items of load and the volumes matched within 1 kW. These are mostly the lights on the small embedded WEL networks.
- Two ICPs had the same number of items of load but the Contact kW volume was less than that was recorded in the database.
- 17 ICPs had fewer lights and therefore less kW than was recorded in the RAMM extract.
- 19 ICPs had more lights and therefore more kW than was recorded in the RAMM extract.

The findings are detailed in the table below by ICP:

ICP Number	Network	Profile	NSP	Number of items of load	Light count difference	Database wattage (watts)	Database kW value	AT Sept kW value	kW difference
0000018370WE118	WAIK	RPS HHR	PAK0331	21	0	2,603	2.60	2.60	0.00
0000019359WE3BC	WAIK	RPS HHR	TAK0331	114	0	13,595	13.60	13.59	0.00
0000019934WE91D	WAIK	HHR	WIR0331	15	0	2,441	2.44	2.38	0.06
0000041244WE13A	WAIK	RPS HHR	WEL0331	52	0	5,152	5.15	5.14	0.01
0000041245WED7F	WAIK	HHR	HEP0331(N)	8	0	743	0.74	0.74	0.00
0000041246WE1BF	WAIK	RPS HHR	TAK0331	252	0	30,060	30.06	30.10	-0.04
0000041247WEDFA	WAIK	RPS HHR	OTA0221	199	0	8,596	8.60	9.00	-0.40
0003281740CNA88	COUP	RPS HHR	BOB1101	3,857	-4	274,443	274.44	268.07	6.37
0900343060LC471	VECT	RPS HHR	TAK0331	6,011	-149	696,388	696.39	702.76	-6.37
0905321057LCB09	VECT	RPS HHR	HEP0331	419	-1	57,994	57.99	57.84	0.15
0914050273LCECE	VECT	RPS HHR	ROS0221	3,191	-34	604,971	604.97	607.04	-2.06
0915197278LC21F	VECT	RPS HHR	PEN0221	1,329	-15	255,188	255.19	256.00	-0.81
0918033403LCA10	VECT	RPS HHR	PEN0331	5,889	-95	1,160,776	1160.78	1165.29	-4.51
0929040953LCE6D	VECT	RPS HHR	PEN1101	3,848	-59	632,704	632.70	632.10	0.60
0954776933LCC4F	VECT	RPS HHR	PAK0331	5,776	-57	739,375	739.38	742.62	-3.25
0977883655LCF24	VECT	RPS HHR	MNG0331	3,099	-78	462,555	462.56	466.99	-4.44
0984112723LC1A6	VECT	RPS HHR	WIR0331	2,982	-25	480,575	480.58	482.07	-1.49

ICP Number	Network	Profile	NSP	Number of items of load	Light count difference	Database wattage (watts)	Database kW value	AT Sept kW value	kW difference
0987075446LC985	VECT	RPS HHR	OTA0221	4,388	-39	572,005	572.01	574.81	-2.80
1001138654LC940	VECT	RPS HHR	ROS1101	2,353	-37	422,588	422.59	427.16	-4.57
1001282117UNECE	VECT	RPS HHR	ALB1101	5,691	979	856,461	856.46	793.79	62.67
1001282119UND55	VECT	RPS HHR	ALB0331	7,807	109	1,041,653	1041.65	1012.20	29.46
1001282121UN8B9	VECT	RPS HHR	HEN0331	4,767	-14	591,268	591.27	586.97	4.30
1001282123UN83C	VECT	RPS HHR	HEP0331(N)	5,300	-16	714,650	714.65	715.51	-0.86
1001282124UN5F6	VECT	RPS HHR	SLV0331	4,381	135	570,784	570.78	556.88	13.90
1001282125UN9B3	VECT	RPS HHR	WRD0331	484	0	57,569	57.57	56.99	0.58
1001282126UN573	VECT	RPS HHR	WEL0331	1,464	-13	163,143	163.14	163.17	-0.02
1001282153UND61	VECT	RPS HHR	ALB1101	1,456	-493	37,653	37.65	46.78	-9.12
1001282154UN0AB	VECT	RPS HHR	ALB0331	2,535	2	67,685	67.69	60.79	6.89
1001282155UNCEE	VECT	RPS HHR	HEN0331	2,838	30	72,247	72.25	67.39	4.85
1001282156UN02E	VECT	RPS HHR	HEP0331(N)	2,730	16	68,663	68.66	65.14	3.53
1001282163UNA99	VECT	RPS HHR	WRD0331	823	12	22,298	22.30	19.46	2.83
1001282164UN753	UNET	RPS HHR	WEL0331	99	18	2,769	2.77	1.94	0.83
1001282166LCDC2	VECT	RPS HHR	HEP0331	483	0	11,716	11.72	11.59	0.12
1001282171LCAA5	VECT	RPS HHR	MNG0331	2,496	52	70,111	70.11	58.66	11.46
1001282172LC665	VECT	RPS HHR	OTA0221	1,390	-14	42,855	42.86	33.70	9.16
1001282174LC7EA	VECT	RPS HHR	PEN0221	975	18	25,169	25.17	22.97	2.20
1001282175LCBAF	VECT	RPS HHR	PEN0331	7,232	75	182,004	182.00	171.77	10.24
1001282176LC76F	VECT	RPS HHR	PEN1101	1,198	27	37,819	37.82	28.10	9.72
1001282177LCB2A	VECT	RPS HHR	ROS0221	5,204	40	146,380	146.38	123.94	22.44
1001282178LC4F4	VECT	RPS HHR	ROS1101	2,740	33	77,221	77.22	64.97	12.25

ICP Number	Network	Profile	NSP	Number of items of load	Light count difference	Database wattage (watts)	Database kW value	AT Sept kW value	kW difference
1001282179LC8B1	VECT	RPS HHR	TAK0331	2,444	14	63,552	63.55	58.32	5.23
1001282180LC6F7	VECT	RPS HHR	WIR0331	1,323	27	35,105	35.11	31.10	4.00
1001287978LC3D9	VECT	RPS HHR	PAK0331	2,068	41	50,677	50.68	48.65	2.03
1001287979UN588	UNET	RPS HHR	SLV0331	1,453	52	43,992	43.99	33.62	10.37
1099572697CNB44	COUP	RPS HHR	BOB0331	54	0	3,717	3.72	3.71	0.01
1099572698CN49A	COUP	RPS HHR	GLN0332	1,256	0	76,361	76.36	73.41	2.96
TOTAL				**114,567**	537	**11,556,271**	11556.27	11357.81	198.46

The overs and under light count differences found at the ICP level between the monthly report and the database extract are likely to be due to work that has been undertaken during the audit period to correct the NSP in RAMM but the ICP was not adjusted. Auckland Transport are investigating this.

Overall there were 537 more lights recorded in the monthly report than in the database extract, but the monthly report has less kW volume than the database extract. The kW difference indicates a potential under submission of 847,622.66 kWh per annum. This is reduction of 321,799.93 kWh (27.5%) from the potential under submission of 1,169,418.59 kWh per annum recorded in the last audit report. The differences found are likely to be due to three main factors:

- The increased volume of lights is likely to be due to the timing difference between the database extract being provided part way through September and the monthly report being provided to Contact at the end of the month.
- Auckland Transport believe some of the lower kW value in the monthly report will be due to the LED wattages being adjusted outside of RAMM for the monthly report rather than using the higher LED wattages that are recorded in RAMM. This is because when many of the LED lights were fitted, they were set to a lower wattage than their standard fitting. This is discussed in **sections 2.1** and **2.6**.

- Unmetered ICP numbers are recorded against 1,022 metered items of load which equates to 116.26 kW. These lights are excluded from submission but will be included in the database kW calculation. Below is an extract from the monthly report indicating the metered load but all are recorded against unmetered ICPs. These need to have the correct ICP allocated to them:

MET ICP	Sum of No. of Street Lights	Sum of Total Load (kW)
1001282119UND55	202	32.811
1001282117UNECE	501	51.052
1001282153UND61	4	0.332
1001282121UN8B9	35	5.756
0905321057LCB09	3	0.614
0987075446LC985	1	0.168
0915197278LC21F	3	0.504
0918033403LCA10	6	0.923
0929040953LCE6D	3	0.724
0914050273LCECE	17	3.019
1001138654LC940	3	0.405
1001282124UN5F6	217	17.453
1001282126UN573	5	0.865
0984112723LC1A6	6	0.375
1001282125UN9B3	16	1.255
TOTAL	1,022	116.2555

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

Issue	Volume information impact (annual kWh)
Items of load with zero or no wattage recorded	66,132 kWh under submission
Incorrect wattage and ballasts applied	8,073.9 kWh over submission

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: 15.37B(c) From: 01-Apr-18 To: 31-May-18	Incorrect profile of RPS HHR applied to 44 ICPs. Over submission because of dimming being used. The impact on submission is unknown. Potential under submission of 847,622.56kWh due to the LED wattages being adjusted outside of RAMM and metered load recorded incorrectly against unmetered load ICPs in the RAMM database. 526 items of load with no wattage recorded and 27 items of load with zero wattage recorded indicating potential under submission of 66,132 kWh of under submission. Incorrect ballasts recorded in RAMM indicate over submission of an estimated 8,073 kWh over submission per annum. Unmetered ICPs incorrectly assigned to 1,022 metered items of load in the database 187 items of load with an invalid light description. Potential impact: High Actual impact: Unknown Audit history: None Controls: Moderate Breach risk rating: 6
Audit risk rating	**Rationale for audit risk rating**
High	The controls are rated as moderate, as processes to improve the database accuracy have been implemented during the audit period. The audit risk rating is high due to the indicative kWh variances found for those that can be quantified.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact Energy have requested a fix to their systems for the incorrect profile on the registry, this is unlikely to be addressed prior to June 2019 Contact Energy will work with AT to report correct submission data and all submissions back to when they began with Contact Energy 1 January 2018	ETA June 2019 March 2019	Investigating
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact Energy and Veritek have explained the importance of a customer reporting accurate data and not adjusting the data. Contact will work with AT to ensure their data continues to improve	TBA	

CONCLUSION

Contact manages the 46 DUML ICPs associated with the streetlight database. The reduction of eight ICPs is a result of four of them being duplicated in the last audit count. The remaining four ICPS have switched to Trustpower as part of the Auckland City Council switch out. These are the four ICPs that have no database associated with them. Trustpower are investigating these loads. Therefore, these ICPs these are no longer considered to be part of this audit.

Auckland Transport have recorded all the LED lights in the SLV tele-management system. This system is being trialled to record street light energy consumption. The intention is that once the system has been thoroughly tested and the necessary approvals have been granted by the Electricity Authority, this system will be used to calculate submission for the LED lights. Initial results from the 40 check meters installed comparing the volumes recorded in SLV against the check meters are looking promising. In the interim, the LED lights are being recorded in both databases. Discussions are progressing between Auckland Transport and the Electricity Authority to progress the approval of the SLV system to be used for reconciliation. Dimming is being used on the SLV system, but this is not reflected in submission as this system is yet to be approved, therefore over submission will be occurring. The SLV system was not assessed as part of this audit and therefore I was not able to calculate the kWh volume impact.

I checked the submission accuracy for the month of September. Overall there were 537 more lights recorded in the monthly report than in the database extract, but the monthly report has less kW volume than the database extract. The kW difference indicates a potential under submission of 847,622.66 kWh per annum. This is reduction of 321,799.93 kWh (27.5%) from the potential under submission of 1,169,418.59 kWh per annum recorded in the last audit report. The potential reasons for these variances are discussed in **section 3.2**.

Analysis of the database found a smaller number of discrepancies between the database and in the field. These are detailed in the report. Auckland Transport have made good progress to improve database management processes. These are detailed in **section 2.6**.

This audit found five non-compliances and no recommendation were made. This is a reduction from the nine non-compliances found in the last audit. The future risk rating of 30 indicates that the next audit be completed in three months, but I recommend that the next audit be in minimum of six months to allow time for Auckland Transport and Contact to embed the new processes.

PARTICIPANT RESPONSE

Auckland Transport are continuing to make steady progress in improving their DUML database accuracy.

Auckland Transport is the largest DUML database in the country. They are continuing to forge ahead with their Smart Streetlighting network.

Auckland Transport are engaged to correct their database, starting with a targeted field audit being completed by an external party.

Contact will continue to work with Auckland Transport to ensure their submission data is accurate. We also intend to complete submission revisions prior to March 2019.

Contact Energy has advised Auckland Transport that they wish to work with Auckland Transport when they visit the Electricity Authority in regards to their CRM system. Contact is committed to work with AT to create an EA approved Static Dimming solution until such time as their CRM system can be certified.

Contact Energy encourages the Electricity Authority to take into consideration the efforts that Auckland Transport is making in regards to their DUML database. The size of this DUML area dictates that corrections in this data will take time.