ELECTRICITY INDUSTRY PARTICIPATION CODE
DISTRIBUTED UNMETERED LOAD AUDIT REPORT

VERITEK

For

NEW PLYMOUTH DISTRICT COUNCIL AND CONTACT ENERGY LIMITED

Prepared by: Tara Gannon

Date audit commenced: 7 November 2019

Date audit report completed: 29 November 2019

Audit report due date: 1 December 2019

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EXECUTIVE SUMMARY

This audit of the **New Plymouth District Council (NPDC)** 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. The scope of the audit encompasses the collection, security and accuracy of the data, including the preparation of submission information.

Streetlight load is determined by wattages held within NPDC's RAMM database. Fault, maintenance and upgrade work is managed by NPE Tech. The database is updated in the field using PDAs, or from the office by the NPE Tech administration team. Power Solutions Limited provides monthly reports from RAMM to Contact, including private and NZTA lighting.

Festive lighting is recorded in a separate Excel spreadsheet, and connection and disconnection dates are recorded and provided to Contact.

Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	97.0	Wattage from survey is lower than the database wattage by 3.0%
R_L	89.7	With a 95% level of confidence it can be concluded that the error could be between -0.5% and -10.3%
R_H	99.5	

The variability of the sample results was impacted by large percentage differences for two streets in one stratum (Marsden Place where five LED lights had been recorded as high pressure sodium, and Tyne Place where one high pressure sodium light was missing). The wattage differences for the six affected lights were small, but the percentage difference between the survey and database significantly affected the precision findings in relation to R_L.

The variability of the sample results across the strata means that the true wattage (installed in the field) could be between 0.5% and 10.3% lower than the wattage recorded in the DUML database, and the best available estimate is not precise enough to conclude that the database is accurate within ± 5.0%.

- In absolute terms the installed capacity is estimated to be 14 kW lower than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 3 kW to 49 kW lower than the database.
- In absolute terms, total annual consumption is estimated to be 61,100 kWh lower than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 10,800 and 209,400 kWh p.a. lower than the database indicates.

Contact reconciles this DUML load as HHR using the HHR profile, in accordance with exemption number 177. On and off times are derived from data logger information. ICP numbers were consolidated for submission from 01/09/19, so that there is one ICP per NSP to reduce administration costs.

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed; and

- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current monthly report is provided as a snapshot and is non-compliant, and Contact completes revision submissions where corrections are required. Contact has not yet updated their processes to be consistent with the Authority's memo.

The future risk rating of 21 indicates that the next audit be completed in three months. Given that database accuracy fell within the threshold, and a very small number of discrepancies were found, I recommend that the next audit is completed in 9 months.

The matters raised are detailed below:

AUDIT SUMMARY

NON-COMPLIANCES

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Deriving submission information	2.1	11(1) of Schedule 15.3	The database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.1**. Livening dates are recorded as the installation date for new connections, and change dates may not reflect the date of the change if they are not processed in RAMM at the time that the change occurs. The Excel spreadsheet of festival lights does not record light install, livening, or change dates. There are normally no changes during the period of connection each year, and connection and disconnection dates are provided. One 70W Metal Halide (G12 base) was recorded with a gear wattage of 0 instead of 13. Private lights are not recorded with valid ICP numbers, and are excluded from submission information. For 1,324 items of load, the ICP numbers recorded in the database are decommissioned and differ from the ICP that load is submitted against.	Moderate	Medium	4	Identified
ICP identifier and items of load	2.2	11(2)(a) and (aa) of Schedule 15.3	Private lights do not have a valid ICP number recorded in the database. For 1,324 items of load, the ICP numbers recorded in the database are decommissioned and differ from the ICP that load is submitted against.	Moderate	Low	2	Identified
Description and capacity of load	2.4	11(2)(c) and (d) of Schedule 15.3	One 70W Metal Halide light had an invalid zero gear wattage recorded.	Moderate	Low	2	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	For the sample of lights checked, there was one less light in the database than was present in the street.	Moderate	Low	2	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Audit trail	2.7	11(4) of Schedule 15.3	The festival lights Excel spreadsheet does not record an audit trail.	Weak	Low	3	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The database is not confirmed as accurate with a 95% level of confidence. Livening dates are recorded as the installation date for new connections, and change dates may not reflect the date of the change if they are not processed in RAMM at the time that the change occurs. The Excel spreadsheet of festival lights does not record light install, livening, or change dates. There are normally no changes during the period of connection each year, and connection and disconnection dates are provided. One 70W Metal Halide (G12 base) was recorded with a gear wattage of 0 instead of 13. Private lights are not recorded with valid ICP numbers, and are excluded from submission information.	Moderate	Medium	4	Identified
Volume information accuracy	3.2	15.2 and 15.37B(c)	An incorrect profile is recorded on the registry for 0008807417WMB53. The database is not confirmed as accurate with a 95% level of confidence. Livening dates are recorded as the installation date for new connections, and change dates may not reflect the date of the change if they are not processed in RAMM at the time that the change occurs. The Excel spreadsheet of festival lights does not record light install, livening, or change dates. There are normally no changes during the period of connection each year, and connection and disconnection dates are provided. One 70W Metal Halide (G12 base) was recorded with a gear wattage of 0 instead of 13. Private lights are not recorded with valid ICP numbers, and are	Moderate	Medium	4	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			excluded from submission information. For 1,324 items of load, the ICP numbers recorded in the database are decommissioned and differ from the ICP that load is submitted against.				
Future Risk Rating						21	

Future risk rating	0	1-4	5-8	9-15	16-18	19+
Indicative audit frequency	36 months	24 months	18 months	12 months	6 months	3 months

RECOMMENDATIONS

Subject	Section	Recommendation
Database accuracy	3.1	Confirm the correct lamp and gear wattages for the potential discrepancies described in **section 3.1**.
Database accuracy	3.1	Check ICP number assignment for streets which unexpectedly have lights connected to more than one NSP.

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 one exemption in place relevant to the scope of this audit:

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

1.2. Persons involved in this audit

Auditor:

Tara Gannon

Veritek Limited

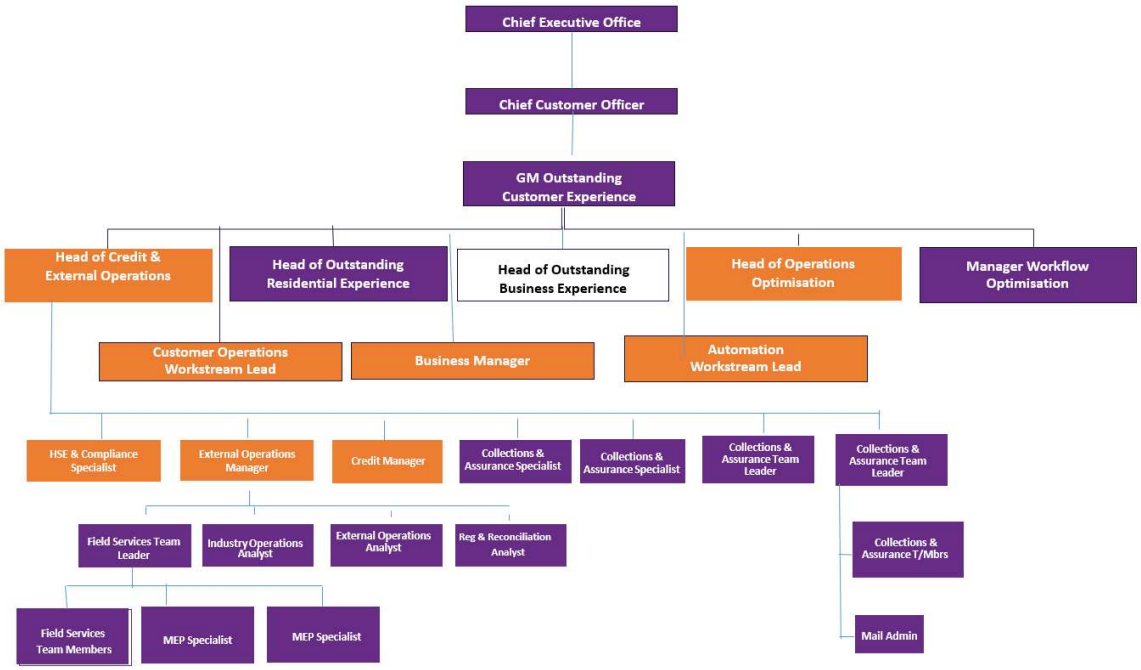
Electricity Authority Approved Auditor

Other personnel assisting in this audit were:

Name	Title	Company
Bill Shera	ITS Contracts Manager – Transportation Team	New Plymouth District Council
John Eagles	Roading Systems Engineer	New Plymouth District Council
Allie Jones	External Operations	Contact Energy

1.3. Structure of Organisation

Contact provided a copy of their organisational structure.



1.4. Hardware and Software

RAMM

The SQL database used for the management of DUML is remotely hosted by RAMM Software Ltd. The database is commonly known as "RAMM" which stands for "Roading Asset and Maintenance Management". The specific module used for DUML is called RAMM Contractor.

RAMM Software Limited backs up the database and assists with disaster recovery as part of their hosting service. Nightly backups are performed. As a minimum daily backups are retained for the previous five working days, weekly backups are retained for the previous four weeks, and monthly backups are retained for the previous six months.

Access to the database is secure by way of password protection.

Festival lights

A database of festival lights is maintained in the form of an Excel spreadsheet. The database is maintained by NPDC and Power Solutions Limited. The spreadsheet is saved on the network, which requires a login and password. Files on the network are backed up.

1.5. Breaches or Breach Allegations

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

1.6. ICP Data

The ICP numbers below are recorded in RAMM, but some ICPs have been decommissioned from 01/09/19 on the registry so that settlement occurs on only one ICP for each NSP. Contact Energy aggregates the ICP information provided by NPDC by NSP and submits it against the active ICP for each NSP. The festival lights ICP information is recorded separately in an Excel spreadsheet.

1000542576PC41E has been decommissioned since March 2018, and has no load recorded against it. Genesis Energy is recorded as the trader.

ICP Number	Description	ICP status	NSP	Profile	Number of items of load	Database wattage (watts)
0001570020PC006	FESTIVAL LIGHTS NPDC TARANAKI	1,6	CST0331	RPS HHR	95	11190
0008807417WMB53	STREETLIGHTS NEW PLYMOUTH DISTRICT COUNCIL TONGAPORUTU	2,0	HTI0331	RPS HHR	9	1217
1000542566PCEB3	NPDC Roading SL - Station Road East	2,0	NPL0331	HHR	1882	55777
1000542567PC2F6	NPDC Parks & Reserves SL – STATION ROAD EAST	3,2	NPL0331	HHR	34	1467.5
1000542568PCD28	NPDC Transit NZ SL - Station Road East	3,2	NPL0331	HHR	271	34915
1000542569PC16D	NPDC Roading SL - TARAHUA ROAD	2,0	CST0331	HHR	4892	184005.4
1000542570PC591	NPDC Parks & Reserves SL - TARAHUA ROAD	3,2	CST0331	HHR	101	3749
1000542571PC9D4	NPDC Transit NZ SL - TARAHUA ROAD	3,2	CST0331	HHR	685	112892.5
1000542572PC514	NPDC Roading SL - Waitara Road	2,0	HUI0331	HHR	1896	56457
1000542573PC951	NPDC Parks & Reserves SL - WAITARA ROAD	3,2	HUI0331	HHR	87	2803
1000542574PC49B	NPDC Transit NZ SL - Waitara Road	3,2	HUI0331	HHR	140	20526.5
1000542575PC8DE	NPDC Roading SL - EAST ROAD	2,0	SFD0331	HHR	3	63

ICP Number	Description	ICP status	NSP	Profile	Number of items of load	Database wattage (watts)
1000542576PC41E	NPDC PARKS & RESERVES SL – STATION ROAD EAST	3,2	SFD0331	HHR	-	-
1000542577PC85B	NPDC Transit NZ SL – EAST ROAD	3,2	SFD0331	HHR	6	1448
Total					**10,101**	**486,510.9**

1.7. Authorisation Received

All information was provided directly by Contact or NPDC.

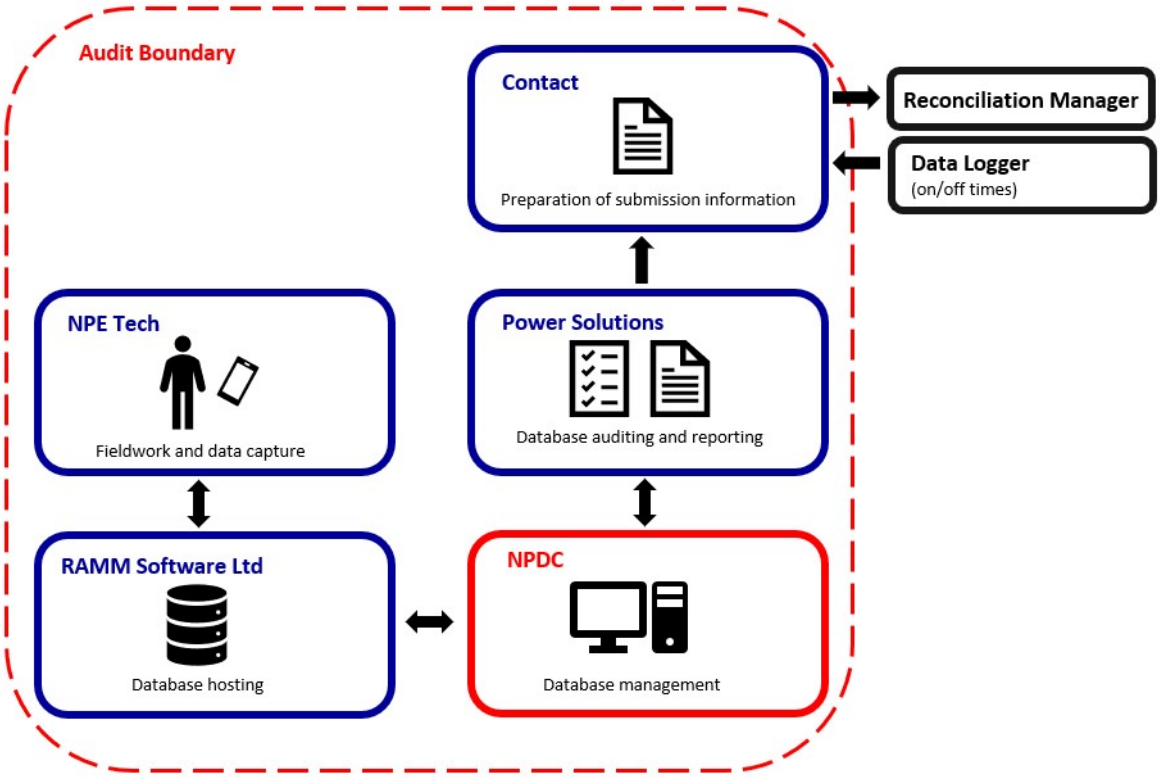
1.8. Scope of Audit

This audit of the NPDC DUML database and processes was conducted at the request of Contact in accordance with clause 15.37B. The purpose of this audit is to verify that the volume information is being calculated accurately, and that profiles have been correctly applied.

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

Streetlight load is determined by wattages held within NPDC's RAMM database. Fault, maintenance and upgrade work is managed by NPE Tech. The database is updated in the field using PDAs, or from the office by the NPE Tech administration team. Power Solutions Limited provides monthly reports from RAMM to Contact, including private and NZTA lighting. Festive lighting is recorded in a separate spreadsheet with the connection dates.

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 307 items of load on 7 November 2019.

1.9. Summary of previous audit

The previous audit of this database was undertaken by Tara Gannon of Veritek Limited in March 2018. The summary table below shows the statuses of the non-compliances and recommendation raised in the previous audit. Further comment is made in the relevant sections of this report.

Subject	Section	Clause	Non-compliance	Status
Deriving Submission Information	2.1	11(1) of Schedule 15.3	The database used to prepare submissions contains some inaccurate information.	Still existing
Description of load type	2.4	11(2)(c) & (d) of Schedule 15.3	11 lamps do not have lamp wattage, gear wattage, or lamp make and model information recorded.	Still existing
Tracking of Load Changes	2.6	11(3) of Schedule 15.3	Database updates may be late for lights in new subdivisions.	Cleared, no late updates were identified
Database Accuracy	3.1	15.2	The database contains some inaccurate information. For the sample of 401 lamps checked in the field audit, five lamps had wattage differences. Four appeared to relate to	Still existing

Subject	Section	Clause	Non-compliance	Status
			timing differences between the database and field audit. 11 lamps did not have lamp or gear wattages populated. Eight lamps did not have correct gear wattages recorded. One lamp was recorded with inconsistent lamp and gear wattages.	
Volume information accuracy	3.2	15.2	The database used to prepare submissions contains some inaccurate information.	Still existing

Subject	Section	Recommendation	Description	Status
ICP information	1.4	Check the load connected to ICP 1000542576PC41E	ICP 1000542576PC41E should be investigated to confirm whether a status update to inactive is required. It appears no lights are connected to this ICP.	Cleared, no lights are connected to this ICP

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

Code reference

Clause 16A.26 and 17.295F

Code related audit information

Retailers must ensure that DUML database audits are completed:

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

Audit observation

Contact have requested Veritek to undertake this streetlight audit.

Audit commentary

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

Audit outcome

Compliant

2. DUML DATABASE REQUIREMENTS

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

Code reference

Clause 11(1) of Schedule 15.3

Code related audit information

The retailer must ensure the:

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

Audit observation

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

Audit commentary

Contact reconciles this DUML load as HHR using the HHR profile, in accordance with exemption number 177. This exemption is discussed further in **section 1.1**.

- Wattages are derived from reports provided by Power Solutions Limited. The field survey found that the best available estimate of field wattage is not precise enough to conclude that the database is accurate within ±5.0% as recorded in **section 3.1**. The variability of the sample results was impacted by large percentage differences for two streets in one stratum. The wattage differences for the six affected lights were small, but the percentage difference between the survey and database significantly affected the precision findings in relation to R_L.
- On and off times are derived from data logger information.

Festive light information is provided with connection and disconnection dates, and they are included in submission data when connected.

Seven DUML ICPs have been decommissioned from 01/09/19 on the registry so that settlement occurs on only one ICP for each NSP. Contact Energy aggregates the ICP information provided by NPDC by NSP, and submits it against the active ICP for each NSP.

I reviewed the submission information for September 2019, and confirmed that it was calculated accurately based on the database and data logger information.

Sources of inaccuracy are as follows:

Issue	Estimated volume information impact (annual kWh)
One 70W Metal Halide (G12 base) was recorded with a gear wattage of 0 instead of 13	Under submission of 56 kWh per annum
Private lights are not recorded with valid ICP numbers	Under submission of up to 21,188 kWh per annum
Some ICPs have been decommissioned from 01/09/19 on the registry so that settlement occurs on only one ICP for each NSP. The original ICP numbers are recorded in the database, and Contact Energy aggregates the ICP information provided by NPDC by NSP, and submits it against the active ICP for each NSP.	None

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

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

The current monthly report is provided as a snapshot and this practice is non-compliant. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes. Contact completes revision submissions where corrections are required, and have not yet updated their processes to be consistent with the Authority's memo.

The RAMM database records an installation date, which typically records the livening date for the light. There is no separate livening date.

Change dates are automatically generated by RAMM when records change, but cannot be selected by the user. Where a change is entered using Pocket RAMM at the time of the change, this date will reflect the date on which the change occurred. If a change or correction is processed by NPE Tech administration staff at a later date, the change date may be incorrect.

The festival lights are recorded in an Excel spreadsheet. The database does not record light install, livening, or change dates for each light, and the monthly report is provided as a snapshot at the end of each month. There are normally no changes during the period of connection each year, and connection and disconnection dates are provided.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.1 With: Clause 11(1) of Schedule 15.3 From: 01-Sep-19 To: 30-Sep-19	The database is not confirmed as accurate with a 95% level of confidence as recorded in **section 3.1**. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates are recorded as the installation date for new connections, and change dates may not reflect the date of the change if they are not processed in RAMM at the time that the change occurs. The Excel spreadsheet of festival lights does not record light install, livening, or change dates. There are normally no changes during the period of connection each year, and connection and disconnection dates are provided. One 70W Metal Halide (G12 base) was recorded with a gear wattage of 0 instead of 13. Private lights are not recorded with valid ICP numbers, and are excluded from submission information. For 1,324 items of load, the ICP numbers recorded in the database are decommissioned and differ from the ICP that load is submitted against. Potential impact: Medium Actual impact: Unknown Audit history: Twice Controls: Moderate Breach risk rating: 4
Audit risk rating	**Rationale for audit risk rating**
Medium	The controls over the database are rated as moderate, because: • The accuracy assessment was skewed by a very small number of exceptions where a large wattage percentage difference was present, and very few data accuracy issues were identified overall. • Processes are in place to arrange for private lights to be connected to the customer's installation or to have a new unmetered ICP created. • The database update processes will ensure that in most cases the change date reflects the date that the change is made. • Light details are selected based on information available at the time of installation. The exception relates to an old metal halide light, installed prior to the audit period. Monitoring controls are also in place to validate light information, and only one exception was identified. • Processes are in place to ensure that volumes are reported against the correct NSP. The impact is medium based on the kWh variances identified; however it is expected that some of the private lights will be metered or have their own unmetered ICPs. The differences resulting from using a monthly snapshot instead of daily data are not expected to be significant based on the volume of changes and new connections occurring.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will work with NPDC to ensure the accuracy of their database – this will encompass installation/change dates and accuracy for submission, Light records and correct ICP numbers displayed in the database. Contact will work with NPDC to find a more efficient way to monitor the festive lighting Contact will work with NPDC to ensure that Private lights have their own ICP's	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact will complete a quarterly database check to help NPDC understand what adjustments need to be made and to ensure its accuracy is as good as possible	Ongoing	

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 analysis found that all items of load had ICP numbers recorded against them, unless they were private lights, metered under verandah lights, or are not connected.

Where private lights connected to streetlight circuits are identified, they are recorded in RAMM and assigned to one of the "private" ICP groups. These groups are included in the report to Contact, but excluded from submission information. Owners are asked to connect the lights to their own metered circuit, or to request a separate ICP through their retailer. NPDC is often not aware of the outcome of this process and the lights remain in the private group in the database, unless the ICP number is known.

As described in **section 1.6**, some ICPs have been decommissioned from 01/09/19 on the registry so that settlement occurs on only one ICP for each NSP. The original ICP numbers are recorded in the database, and Contact Energy aggregates the ICP information provided by NPDC by NSP, and submits it against the active ICP for each NSP.

ICP number accuracy is discussed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.2 With: Clause 11(2)(a) and (aa) of Schedule 15.3 From: 01-Sep-19 To: 30-Sep-19	Private lights do not have a valid ICP number recorded in the database. For 1,324 items of load, the ICP numbers recorded in the database are decommissioned and differ from the ICP that load is submitted against. Potential impact: Medium Actual impact: Unknown Audit history: None Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as moderate. Processes are in place to arrange for private lights to be moved to the customer's metered circuit or have standard unmetered load created. The impact is low: • There were 76 private lights (4,961 W) recorded in the database as at 01/10/19, but it is expected that many of these will now either be metered through the customer's installation or have standard unmetered load created. • The ICP number differences have no impact, because volumes are submitted against the correct NSP.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will work with NPDC to ensure that the accurate ICP is recorded in RAMM and that all Private lights have a valid ICP number	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact will complete a quarterly database check to help NPDC understand what adjustments need to be made and to ensure its accuracy is as good as possible	Ongoing	

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

Code reference

Clause 11(2)(b) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The database contains fields for road names, house numbers, pole numbers and GPS coordinates. 9734 (97.3%) of lamps have GPS coordinates recorded. The lamps without GPS coordinates all have sufficient road name, pole number and/or house number information recorded to enable them to be located.

Festive lights have location numbers, pole numbers, street addresses and GPS coordinates recorded. There is sufficient description and location information to allow the lights to be located.

Audit outcome

Compliant

2.4. Description and capacity of load (Clause 11(2)(c) and (d) of Schedule 15.3)

Code reference

Clause 11(2)(c) and (d) of Schedule 15.3

Code related audit information

The DUML database must contain:

- *a description of load type for each item of load and any assumptions regarding the capacity*
- *the capacity of each item in watts.*

Audit observation

The database was checked to confirm that:

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

Audit commentary

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

No lamp wattages were invalidly recorded as zero, but two lamps which were disconnected validly had a lamp wattage of zero.

One gear wattage was invalidly recorded as zero, and resulted in under submission of 13 W or 56 kWh per annum (based on 4,271 burn hours):

Lamp make model	Qty	Database gear wattage	Expected gear wattage
70W Metal Halide (G12 base)	1	0	13

The accuracy of the recorded wattages is discussed in **section 3.1**.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(c) and (d) of Schedule 15.3 From: 01-Sep-19 To: 30-Sep-19	One 70W Metal Halide light had an invalid zero gear wattage recorded. Potential impact: Low Actual impact: Low Audit history: Twice Controls: Moderate Breach risk rating: 2
Audit risk rating	**Rationale for audit risk rating**
Low	Controls are rated as moderate. Light details are selected based on information available at the time of installation. The exception relates to an old metal halide light, installed prior to the audit period. Monitoring controls are also in place to validate light information. The impact is low, based on the difference of 13 W or 56 kWh per annum (based on 4,271 burn hours).

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will work with NPDC to ensure that their database is accurate	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact will complete a quarterly database check to help NPDC understand what adjustments need to be made and to ensure its accuracy is as good as possible	Ongoing	

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 307 items of load on 7 November 2019. The sample was selected from three strata, as follows:

1. Parks and NZTA
2. Roading (road names A-K); and
3. Roading (road names L-Z).

Audit commentary

The field audit discrepancies are detailed in the table below:

Street	Database count	Field count	Light count difference	Wattage recorded incorrectly	Comments
Roading (road names A-K)					
CLAWTON STREET	34	35	1	3	Three lights recorded in the database were not present in the street, and four lights were present in the street but not recorded in the database. . Three poles had two lamps attached to them in the database, but only one light was present in each location: • No. 28 (redundant 70W HPS) • No. 30 (redundant 70W HPS) • No. 62 (redundant 52W LED) The two Italo lights and two belisha beacons for the pedestrian crossing on Clawton Street near the corner of Sanders Ave were not listed in the database against Clawton St. This gives a net difference of 1 extra light recorded on the street and three wattage differences.
Roading (road names L-Z)					
MARSDEN PLACE	5	5	-	5	5 x LEDs were recorded in the database as 70W HPS
TYNE PLACE	2	1	-	-	1 x 70 W HPS was not located on the street
Grand Total	**307**	**308**	**1**	**11**	

A net difference of one light was found in the field which was not recorded in the database, and is recorded as non-compliance below. Wattage 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: 01-Sep-19 To: 30-Sep-19	For the sample of lights checked, there was one less light in the database than was present in the street. Potential impact: Medium 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, the small number of exceptions indicated that controls are sufficient to ensure that all lamps are recorded in the database most of the time. The impact is low, because only one missing lamp was identified.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will work with NPDC to ensure that their database is accurate	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact will complete a quarterly database check to help NPDC understand what adjustments need to be made and to ensure its accuracy is as good as possible	Ongoing	

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

Code reference

Clause 11(3) of Schedule 15.3

Code related audit information

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

Audit observation

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

Audit commentary

The change management process and the compliance of the database reporting provided to Contact is detailed in **sections 3.1** and **3.2**.

RAMM

The RAMM database functionality achieves compliance with the code.

Festival lights

The festival lights are recorded in an Excel spreadsheet. The database does not record light install, livening, or change dates for each light. Compliance is recorded because there are normally no changes during the period of connection each year, and connection and disconnection dates are provided.

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

RAMM

The database has a complete audit trail.

Festival lights

The database is an Excel spreadsheet, and does not have an automatically generated audit trail that meets the requirements of Clause 11(4) of Schedule 15.3.

A new version of the spreadsheet is created each year, and old versions are archived. This enables before and after values to be identified, as well as an approximate date of the change.

The user who made changes is not recorded, but access to change the database is restricted through network access permissions.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.7 With: Clause 11(4) of Schedule 15.3 From: 01-Sep-19 To: 31-Oct-19	The festival lights Excel spreadsheet does not record an audit trail. Potential impact: Low Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3

Audit risk rating	Rationale for audit risk rating
Low	The controls are weak, because an audit trail is not generated when changes to the database are made. The audit risk rating is low because historic information is retained enabling before and after values to be confirmed, and the approximate date of the change.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will work with NPDC to have these lights added to RAMM, in a format that will only include them for submission when they are in use	March 2020	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact will complete a quarterly database check to help NPDC understand what adjustments need to be made and to ensure its accuracy is as good as possible	Ongoing	

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

Contact's submissions are based on a monthly extract from the RAMM database. A RAMM database extract was provided in September 2019 and I assessed the accuracy of this by using the DUML Statistical Sampling Guideline. The table below shows the survey plan.

Plan Item	Comments
Area of interest	New Plymouth District Council street lights
Strata	The database contains the NPDC items of load for the DUML ICPs in the New Plymouth Region. The processes for the management of all NPDC items of load are the same, but I decided to place the items of load into three strata: 1. Parks and NZTA 2. Roading (road names A-K); and 3. Roading (road names L-Z).
Area units	I created a pivot table of the roads and I used a random number generator in a spreadsheet to select a total of 35 sub-units.
Total items of load	307 items of load were checked, making up 3% of the total database wattage.

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

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

Audit commentary

Field audit findings

A field audit was conducted of a statistical sample of 307 items of load. The "database auditing tool" was used to analyse the results, which are shown in the table below.

Result	Percentage	Comments
The point estimate of R	97.0	Wattage from survey is lower than the database wattage by 3.0%
R_L	89.7	With a 95% level of confidence it can be concluded that the error could be between -0.5% and -10.3%
R_H	99.5	

The variability of the sample results across the strata means that the true wattage (installed in the field) could be between 0.5% and 10.3% lower than the wattage recorded in the DUML database.

These results were categorised in accordance with the "Distributed Unmetered Load Statistical Sampling Audit Guideline", effective from 01/02/19. The table below shows that Scenario C (detailed below) applies, and the best available estimate is not precise enough to conclude that the database is accurate within ±5.0%. The variability of the sample results was impacted by large percentage differences for two streets in one stratum (Marsden Place where five LED lights had been recorded as high pressure sodium, and Tyne Place where one high pressure sodium light was missing). The wattage differences for the six affected lights were small, but the percentage difference between the survey and database significantly affected the precision findings in relation to R_L. The point of estimate of R is within the accuracy threshold.

- In absolute terms the installed capacity is estimated to be 14 kW lower than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 3 kW to 49 kW lower than the database.
- In absolute terms, total annual consumption is estimated to be 61,100 kWh lower than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 10,800 and 209,400 kWh p.a. lower than the database indicates.

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

Light description and capacity accuracy

As discussed in **section 2.4**, all lights have a lamp and gear wattage recorded. Lamp and gear wattages were compared to the expected values.

One definite discrepancy was identified, and resulted in under submission of 13 W or 56 kWh per annum (based on 4,271 burn hours):

Lamp make model	Qty	Database lamp wattage	Expected lamp wattage	Database gear wattage	Expected gear wattage
70W Metal Halide (G12 base)	1			0	13

519 potential wattage discrepancies were identified, and specifications were requested to confirm that the correct wattage values had been recorded in the database. This information was not provided in time to be reviewed as part of this audit and therefore I cannot confirm compliance. I recommend the potential discrepancies are checked, and the database is updated as necessary.

Lamp make model	Qty	Database lamp wattage	Expected lamp wattage	Database gear wattage	Expected gear wattage
3202 Lucerna LED	8	30	33 or 43		
ITALO 1 STAN1 4.7-4M	259	69.5	Unknown		
ITALO 2 STAN1 4.5-7M	136	94	Unknown		
LED Ropelight	1	10	Unknown		
LED Stela Long 14NRN	59	21	Unknown		
SPWP-24-50 RGBW 30 Degree Spot	16	50	Unknown		
11W Compact Fluorescent	25			0	Unknown
2x58Wx5ft Fluorescent UV	1			0	28
18W Compact Fluorescent	6			0	2
2x36Wx4ft Fluorescent UV	6			0	20
20W PL Fluorescent	2			0	9

Recommendation	Description	Audited party comment	Remedial action
Database Accuracy	Confirm the correct lamp and gear wattages for the potential discrepancies described in **section 3.1**.	Contact will work with NPDC to ensure they update the gear wattage information	Identified

ICP number accuracy

As discussed in **section 2.2**, all items of load had ICP numbers recorded against them, unless they were private lights, metered under verandah lights, or are not connected. As at 01/10/19 up to 76 private streetlights (4,961 W) did not have a valid ICP number recorded, but some of these are expected to be metered through the customer's installation or have standard unmetered load created.

Some ICPs have been decommissioned from 01/09/19 on the registry so that settlement occurs on only one ICP for each NSP. The original ICP numbers are recorded in the database, and Contact Energy aggregates the ICP information provided by NPDC by NSP, and submits it against the active ICP for each NSP. Use of different ICPs in the database and for submission is recorded as non-compliance in s**ection 2.2**.

ICP numbers were originally assigned with assistance from Powerco, the local distributor. I reviewed the database information and identified 33 streets with lights connected to more than one NSP. Of those, 14 were highways or main thoroughfares which were genuinely expected to be connected to more than one NSP. I recommend these are checked to confirm that the ICPs are recorded correctly, and note that they may be correct as some of the New Plymouth NSPs are situated close together.

Street	CST0331	HTI0331	HUI0331	NPL0331	SFD0331	Total
HENWOOD ROAD	26		1			27
TARATA ROAD			2		2	4
WHAKAPAKI STREET			13	1		14
NELSON STREET	2		21			23
WEST QUAY	2		50			52
BARRETT STREET	5			5		10
BELT ROAD	17			6		23
BROIS STREET	27			1		28
CUTFIELD ROAD	15			17		32
FERNLEIGH STREET	4			13		17
GAINE STREET	7			7		14
HUATOKI STREET	72			1		73
MORLEY STREET	2			22		24
MT EDGCUMBE STREET	2			7		9
PEMBROKE STREET	27			11		38
WALLACE PLACE	21			4		25
WEYMOUTH ST (SOUTH)	3			2		5
WEYMOUTH STREET (NORTH)	2			5		7
YOUNG STREET	20			7		27

Recommendation	Description	Audited party comment	Remedial action
Database Accuracy	Check ICP number assignment for streets which unexpectedly have lights connected to more than one NSP.	Contact will pass this on to NPDC and discuss their options with for this recommendation	Investigating

Change management process findings

Fault, maintenance and upgrade work is completed by NPE Tech. The RAMM database is either updated in the field using PDAs, or paper records are provided to the NPE Tech administration staff who update the database directly.

The ITS Contracts Manager – Transportation Team exports data from RAMM and validates changes to the database in the previous 90 days. This check includes identifying missing fields, and incorrect or inconsistent data including wattages, gear wattages, makes, and models. Power Solutions Limited also complete a monthly review of the data prior to reporting to Contact, and follow up any discrepancies with NPDC.

The process for new connections remains unchanged. NPDC is only responsible once the subdivision is "vested" in council. As soon as the electrical certificate is provided and the subdivision is complete, NPDC's development engineers check the lights and then advise NPE Tech to update the database. Development engineers regularly check new developments to monitor compliance and progress, which can help them to identify when streetlights are connected. In some cases, there may be a small delay between lights being connected and added to the database. NPDC notes that most subdivisions have less than 12 lights, and larger subdivisions are completed in stages, so the impact of any delays is minimal.

LED upgrades for NPDC lights have been completed, NZTA lights are still to be upgraded.

The current monthly report is provided as a snapshot and this practice is non-compliant. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes.

The RAMM database records an installation date, which typically records the livening date for the light. There is no separate livening date.

Change dates are automatically generated by RAMM when records change, but cannot be selected by the user. Where a change is entered using Pocket RAMM at the time of the change, this date will reflect the date on which the change occurred. If a change or correction is processed by NPE Tech administration staff at a later date, the change date may be incorrect.

Outage patrols are conducted monthly for the downtown NZTA lights. Reliance is placed on the faults process to identify issues with other lights.

Festival lights

Festival light information is checked and updated each year, when the lights are connected.

The festival lights are recorded in an Excel spreadsheet. The database does not record light install, livening, or change dates for each light, and the monthly report is provided as a snapshot at the end of each month. There are normally no changes during the period of connection each year, and connection and disconnection dates are provided.

Private lights

Where private lights connected to streetlight circuits are identified, they are recorded in RAMM and assigned to one of the "private" ICP groups. These groups are included in the monthly report to Contact Energy, but excluded from submission information.

Owners are asked to connect the lights to their own metered circuit, or to request a separate ICP through their retailer. NPDC is often not aware of the outcome of this process and the lights remain in the private group in the database.

Private lights as at 01/10/19 are:

ICP Group	Qty	Lamp W	Gear W	Total W
Private-Moturoa	42	2,128	340	2,468
Private-Carringt	24	1,735	310	2,045
Private-Huirangi	10	448	0	448
Private-Stratfor	0	0	0	0
Total	**76**	**4,311**	**650**	**4,961**

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.1 With: Clause 15.2 and 15.37B(b)	The database is not confirmed as accurate with a 95% level of confidence. Livening dates are recorded as the installation date for new connections, and change dates may not reflect the date of the change if they are not processed in RAMM at the time that the change occurs. The Excel spreadsheet of festival lights does not record light install, livening, or change dates. There are normally no changes during the period of connection each year, and connection and disconnection dates are provided. One 70W Metal Halide (G12 base) was recorded with a gear wattage of 0 instead of 13. Private lights are not recorded with valid ICP numbers, and are excluded from submission information. For 1,324 items of load, the ICP numbers recorded in the database are decommissioned and differ from the ICP that load is submitted against. Potential impact: Medium Actual impact: Medium Audit history: Twice Controls: Moderate Breach risk rating: 4
From: 01-Sep-19 To: 30-Sep-19	

Audit risk rating	Rationale for audit risk rating
Medium	The controls over the database are rated as moderate, because: • The accuracy assessment was skewed by a very small number of exceptions where a large wattage percentage difference was present, and very few data accuracy issues were identified overall. • Processes are in place to arrange for private lights to be connected to the customer's installation or to have a new unmetered ICP created. • Light details are selected based on information available at the time of installation. The exception relates to an old metal halide light, installed prior to the audit period. Monitoring controls are also in place to validate light information, and only one exception was identified. • The database update processes will ensure that in most cases the change date reflects the date that the change is made. The impact is medium based on the kWh variances identified; however it is expected that some of the private lights will be metered or have their own unmetered ICPs. The differences resulting from using a monthly snapshot instead of daily data are not expected to be significant based on the volume of changes and new connections occurring.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact will work with NPDC to ensure the accuracy of their database – this will encompass installation/change dates and accuracy for submission, Light records and correct ICP numbers displayed in the database. Contact will work with NPDC to find a more efficient way to monitor the festive lighting Contact will work with NPDC to ensure that Private lights have their own ICP's	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact will complete a quarterly database check to help NPDC understand what adjustments need to be made and to ensure its accuracy is as good as possible	Ongoing	

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

Code reference

Clause 15.2 and 15.37B(c)

Code related audit information

The audit must verify that:

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

Audit observation

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

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

Audit commentary

Contact reconciles this DUML load using the HHR profile, and the correct profiles and submission types are recorded on the registry for the ICPs used for submission except for 0008807417WMB53 which has RPS HHR profile recorded instead of HHR. The correct profile is applied for submission.

Contact reconciles this DUML load as HHR using the HHR profile, in accordance with exemption number 177. This exemption is discussed further in **section 1.1**.

- Wattages are derived from reports provided by Power Solutions Limited. The field survey found that the best available estimate of field wattage is not precise enough to conclude that the database is accurate within ±5.0% as recorded in **section 3.1**. The variability of the sample results was impacted by large percentage differences for two streets in one stratum. The wattage differences for the six affected lights were small, but the percentage difference between the survey and database significantly affected the precision findings in relation to R_L.
- On and off times are derived from data logger information.

Festive light information is provided with connection and disconnection dates, and they are included in submission data when connected.

Seven DUML ICPs have been decommissioned from 01/09/19 on the registry so that settlement occurs on only one ICP for each NSP. Contact Energy aggregates the ICP information provided by NPDC by NSP, and submits it against the active ICP for each NSP.

I reviewed the submission information for September 2019, and confirmed that it was calculated accurately based on the database and data logger information.

Sources of inaccuracy are as follows:

Issue	Estimated volume information impact (annual kWh)
One 70W Metal Halide (G12 base) was recorded with a gear wattage of 0 instead of 13	Under submission of 56 kWh per annum
Private lights are not recorded with valid ICP numbers	Under submission of up to 21,188 kWh per annum
Some ICPs have been decommissioned from 01/09/19 on the registry so that settlement occurs on only one ICP for each NSP. The original ICP numbers are recorded in the database, and Contact Energy aggregates the ICP information provided by NPDC by NSP, and submits it against the active ICP for each NSP.	None

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

- take into account when each item of load was physically installed or removed; and

- wash up volumes must take into account where historical corrections have been made to the DUML load and volumes.

The current monthly report is provided as a snapshot and this practice is non-compliant. When a wattage is changed in the database due to a physical change or a correction, only the record present at the time the report is run is recorded, not the historical information showing dates of changes. Contact completes revision submissions where corrections are required, and have not yet updated their processes to be consistent with the Authority's memo.

The RAMM database records an installation date, which typically records the livening date for the light. There is no separate livening date.

Change dates are automatically generated by RAMM when records change, but cannot be selected by the user. Where a change is entered using Pocket RAMM at the time of the change, this date will reflect the date on which the change occurred. If a change or correction is processed by NPE Tech administration staff at a later date, the change date may be incorrect.

The festival lights are recorded in an Excel spreadsheet. The database does not record light install, livening, or change dates for each light, and the monthly report is provided as a snapshot at the end of each month. There are normally no changes during the period of connection each year, and connection and disconnection dates are provided.

Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 3.2 With: Clause 15.2 and 15.37B(c) From: 01-Sep-19 To: 30-Sep-19	An incorrect profile is recorded on the registry for 0008807417WMB53. The database is not confirmed as accurate with a 95% level of confidence. The monthly database extract provided does not track changes at a daily basis and is provided as a snapshot. Livening dates are recorded as the installation date for new connections, and change dates may not reflect the date of the change if they are not processed in RAMM at the time that the change occurs. The Excel spreadsheet of festival lights does not record light install, livening, or change dates. There are normally no changes during the period of connection each year, and connection and disconnection dates are provided. One 70W Metal Halide (G12 base) was recorded with a gear wattage of 0 instead of 13. Private lights are not recorded with valid ICP numbers, and are excluded from submission information. For 1,324 items of load, the ICP numbers recorded in the database are decommissioned and differ from the ICP that load is submitted against. Potential impact: Medium Actual impact: Medium Audit history: Twice Controls: Moderate Breach risk rating: 4

Audit risk rating	Rationale for audit risk rating
Medium	The controls over the database are rated as moderate, because: • The accuracy assessment was skewed by a very small number of exceptions where a large wattage percentage difference was present, and very few data accuracy issues were identified overall. • Processes are in place to arrange for private lights to be connected to the customer's installation or to have a new unmetered ICP created. • The database update processes will ensure that in most cases the change date reflects the date that the change is made. • Light details are selected based on information available at the time of installation. The exception relates to an old metal halide light, installed prior to the audit period. Monitoring controls are also in place to validate light information, and only one exception was identified. • Processes are in place to ensure that volumes are reported against the correct NSP. The impact is medium based on the kWh variances identified; however it is expected that some of the private lights will be metered or have their own unmetered ICPs. The differences resulting from using a monthly snapshot instead of daily data are not expected to be significant based on the volume of changes and new connections occurring.

Actions taken to resolve the issue	Completion date	Remedial action status
Contact have a process to ensure that accurate profile is on the registry for submission – we have been working with IT to get a permanent solution to show the accurate profile on the registry at any time Contact will work with NPDC to ensure the accuracy of their database – this will encompass installation/change dates and accuracy for submission, Light records and correct ICP numbers displayed in the database. Contact will work with NPDC to find a more efficient way to monitor the festive lighting Contact will work with NPDC to ensure that Private lights have their own ICP's	Ongoing	Identified
Preventative actions taken to ensure no further issues will occur	**Completion date**	
Contact will complete a quarterly database check to help NPDC understand what adjustments need to be made and to ensure its accuracy is as good as possible	Ongoing	

CONCLUSION

Streetlight load is determined by wattages held within NPDC's RAMM database. Fault, maintenance and upgrade work is managed by NPE Tech. The database is updated in the field using PDAs, or from the office by the NPE Tech administration team. Power Solutions Limited provides monthly reports from RAMM to Contact, including private and NZTA lighting.

Festive lighting is recorded in a separate Excel spreadsheet, and connection and disconnection dates are recorded and provided to Contact.

Database accuracy is described as follows:

Result	Percentage	Comments
The point estimate of R	97.0	Wattage from survey is lower than the database wattage by 3.0%
R_L	89.7	With a 95% level of confidence it can be concluded that the error could be between -0.5% and -10.3%
R_H	99.5	

The variability of the sample results was impacted by large percentage differences for two streets in one stratum (Marsden Place where five LED lights had been recorded as high pressure sodium, and Tyne Place where one high pressure sodium light was missing). The wattage differences for the six affected lights were small, but the percentage difference between the survey and database significantly affected the precision findings in relation to R_L.

The variability of the sample results across the strata means that the true wattage (installed in the field) could be between 0.5% and 10.3% lower than the wattage recorded in the DUML database, and the best available estimate is not precise enough to conclude that the database is accurate within ± 5.0%.

- In absolute terms the installed capacity is estimated to be 14 kW lower than the database indicates.
- There is a 95% level of confidence that the installed capacity is between 3 kW to 49 kW lower than the database.
- In absolute terms, total annual consumption is estimated to be 61,100 kWh lower than the DUML database indicates.
- There is a 95% level of confidence that the annual consumption is between 10,800 and 209,400 kWh p.a. lower than the database indicates.

Contact reconciles this DUML load as HHR using the HHR profile, in accordance with exemption number 177. On and off times are derived from data logger information. ICP numbers were consolidated for submission from 01/09/19, so that there is one ICP per NSP to reduce administration costs.

On 18 June 2019, the Electricity Authority issued a memo clarifying the memo of 2012 that stated that a monthly snapshot was sufficient to calculate submission from, and confirmed the code requirement to calculate the correct monthly load must:

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

The current monthly report is provided as a snapshot and is non-compliant, and Contact completes revision submissions where corrections are required. Contact has not yet updated their processes to be consistent with the Authority's memo.

The future risk rating of 21 indicates that the next audit be completed in three months. Given that database accuracy fell within the threshold, and a very small number of discrepancies were found, I recommend that the next audit is completed in 9 months.

PARTICIPANT RESPONSE

Contact Energy will work with NPDC to understand their systems and processes and will then ensure that NPDC is aware of the requirements of the code in the DUML space.

This is the first audit we have had with NPDC.

NPDC have just adjusted their ICP numbers to ensure there is only 1 ICP per GXP per owner, so there is some initial clean up to be completed