

**ELECTRICITY INDUSTRY PARTICIPATION CODE  
DISTRIBUTED UNMETERED LOAD AUDIT REPORT**

For

**SOUTHLAND DISTRICT COUNCIL AND  
MERIDIAN ENERGY**

Prepared by: Tara Gannon

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Audit report due date: 1 June 2018

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## EXECUTIVE SUMMARY

This audit of the Southland District Council (SDC) DUML database and processes was conducted at the request of Meridian Energy Limited (Meridian), 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, which became effective on 1 June 2017.

The SDC lights are recorded in two databases, and PowerNet is responsible for all field work.

- Lights connected to the Heritage Estate Te Anau embedded network are recorded in Aurora Energy's database.
- All other lights are recorded in the PowerNet network's database.

SDC also maintains their own RAMM database which includes streetlight information. SDC is in the process of validating and updating their own database, including determining accurate locations for each item of load. Once validation is complete, Meridian intends to base its submissions on the RAMM database.

The future risk rating of 17 indicates that the next audit be completed in 12 months. Seven non-compliances were identified, and one recommendations was raised. 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	<p>The databases contain some incorrect and missing information.</p> <ul style="list-style-type: none"> <li>The Aurora Energy Heritage Estate database accuracy is assessed to be 98.3% indicating an estimated over submission of 440 kWh per annum.</li> <li>The PowerNet database accuracy is assessed to be 93.7% indicating an estimated over submission of 7,500 kWh per annum.</li> <li>Some lamps situated in Heritage Estate outside the Aurora Energy embedded network are not recorded in PowerNet's database.</li> <li>Two lamps in the PowerNet database do not have wattage information recorded.</li> <li>Seven lamps in the PowerNet database had incorrect descriptions, but wattage was recorded correctly.</li> <li>Some lamps have incorrect ballast wattages recorded. The total difference for the Aurora Energy Heritage Estate database is 1.5 watts (6 kWh per annum over reported), and the total difference for the PowerNet database is 146.5 watts (625 kWh per annum under reported).</li> </ul>	Weak	Low	3	Identified
Location of each item of load	2.3	11(2)(b) of Schedule 15.3	<p>45 items of load do not have a street address recorded.</p> <p>Eleven items of load had incorrect or insufficient address information and could not be easily located.</p>	Moderate	Low	2	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
Description and capacity of load	2.4	11(2)(b) of Schedule 15.3	Two items of load do not have lamp wattage or total wattage recorded.	Strong	Low	1	Identified
All load recorded in database	2.5	11(2A) of Schedule 15.3	The field audit identified eight lamps missing from Aurora Energy's Heritage Estate database. Some new and extended streets with lights were also excluded from the database.	Moderate	Low	2	Identified
All load recorded in database	2.6	11(3) of schedule 15.3	The tracking of load changes is not being carried out in relation to changing of light type on existing items of load for the PowerNet database.  Changes are not being tracked in Aurora Energy's Heritage Estate database.	Weak	Low	3	Identified
Database accuracy	3.1	15.2 and 15.37B(b)	The databases contain some incorrect and missing information. <ul style="list-style-type: none"> <li>The Aurora Energy Heritage Estate database accuracy is assessed to be 98.3% indicating an estimated over submission of 440 kWh per annum.</li> <li>The PowerNet database accuracy is assessed to be 93.7% indicating an estimated over submission of 7,500 kWh per annum.</li> <li>Some lamps situated in Heritage Estate outside the Aurora Energy embedded network are not recorded in PowerNet's database.</li> <li>Two lamps in the PowerNet database do not have wattage information recorded.</li> <li>Seven lamps in the PowerNet database had incorrect descriptions, but wattage was recorded correctly.</li> <li>Some lamps have incorrect ballast wattages recorded. The total difference for the Aurora Energy Heritage Estate</li> </ul>	Weak	Low	3	Identified

Subject	Section	Clause	Non-Compliance	Controls	Audit Risk Rating	Breach Risk Rating	Remedial Action
			database is 1.5 watts (6 kWh per annum over reported), and the total difference for the PowerNet database is 146.5 watts (625 kWh per annum under reported).				
Volume information accuracy	3.2	15.2 and 15.37B(c)	<p>The databases contain some incorrect and missing information.</p> <ul style="list-style-type: none"> <li>The Aurora Energy Heritage Estate database accuracy is assessed to be 98.3% indicating an estimated over submission of 440 kWh per annum.</li> <li>The PowerNet database accuracy is assessed to be 93.7% indicating an estimated over submission of 7,500 kWh per annum.</li> <li>Some lamps situated in Heritage Estate outside the Aurora Energy embedded network are not recorded in PowerNet's database.</li> <li>Two lamps in the PowerNet database do not have wattage information recorded.</li> <li>Seven lamps in the PowerNet database had incorrect descriptions, but wattage was recorded correctly.</li> <li>Some lamps have incorrect ballast wattages recorded. The total difference for the Aurora Energy Heritage Estate database is 1.5 watts (6 kWh per annum over reported), and the total difference for the PowerNet database is 146.5 watts (625 kWh per annum under reported).</li> </ul>				Identified
Future Risk Rating						17	

<b>Future risk rating</b>	1-3	4-6	7-8	9-17	18-26	27+
<b>Indicative audit frequency</b>	36 months	24 months	18 months	12 months	6 months	3 months

## RECOMMENDATIONS

Subject	Section	Description	Recommendation
ICP identifier	2.1	ICP identifier and items of load	Confirm the correct ICP identifier for light number T6663 3/5 Gunn St, Te Anau.

## ISSUES

Subject	Section	Description	Issue
		Nil	

# 1. ADMINISTRATIVE

## 1.1. Exemptions from Obligations to Comply with Code

### Code reference

Section 11 of Electricity Industry Act 2010.

### Code related audit information

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

### Audit observation

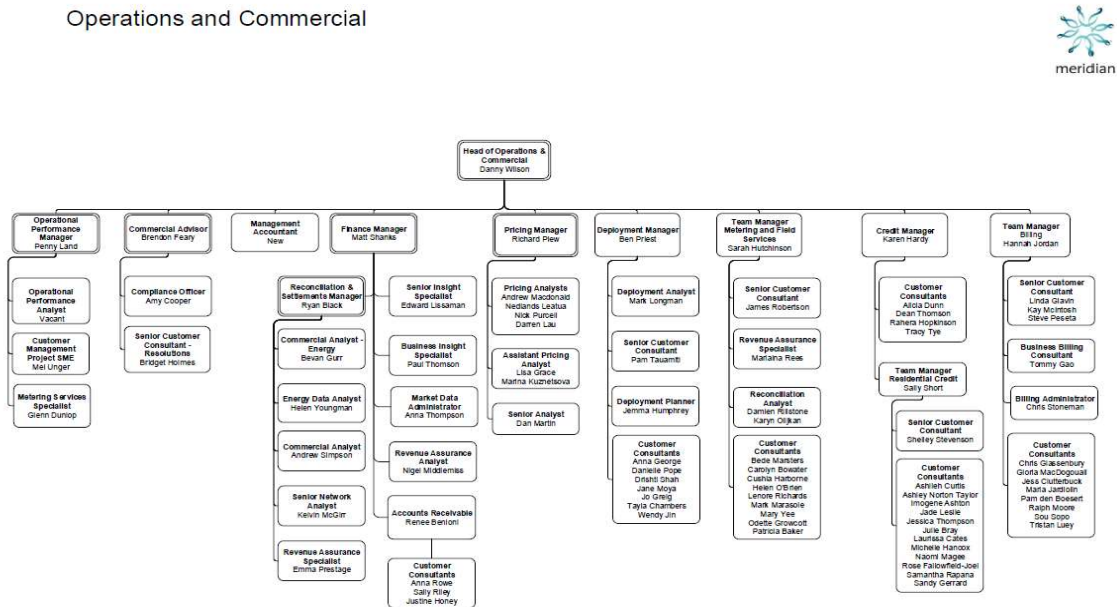
The Electricity Authority’s website was reviewed to identify any exemptions relevant to the scope of this audit.

### Audit commentary

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

## 1.2. Structure of Organisation

Meridian provided a copy of their organisational structure:





### 1.3. Persons involved in this audit

Auditor:

**Tara Gannon**

**Veritek Limited**

**Electricity Authority Approved Auditor**

Other personnel assisting in this audit were:

Name	Title	Company
James McCallum	Roothing Engineer	Southland District Council
Michael Duggan	Roothing Asset Analyst	Southland District Council
Alaister Marshall	Customer and Metering Services Manager	PowerNet
Richard Starkey	Commercial Development Manager	Aurora Energy
Amy Cooper	Compliance Officer	Meridian Energy
Helen Youngman	Energy Data Analyst	Meridian Energy
David Syme	Key Account Manager	Meridian Energy
Matthew Herbert	National Sales Manager - Corporate	Meridian Energy
Rebecca Elliot	Director	Veritek Limited

### 1.4. Hardware and Software

The SDC lights are recorded in two databases:

- An SQL database managed by PowerNet; and
- A GIS with associated database managed by Aurora Energy.

The databases are backed up in accordance with standard industry procedures. Access to the databases is secure by way of password protection.

The RAMM database which is expected to be used in the future is backed up in accordance with industry standards and 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

ICP Number	Description	NSP	Number of items of load	Database wattage (watts)
0000302001HEF6B	HERITAGE ESTATE	HER0111	82	6408
0008801031TP895	SDC LIGHTS - RURAL EDENDALE	EDN0331	17	1594
0008801021TP238	SDC LIGHTS - URBAN EDENDALE	EDN0331	256	25236
0008801033TP810	SDC LIGHTS - RURAL GORE	GOR0331	63	6217
0008801023TP2BD	SDC LIGHTS - URBAN GORE	GOR0331	62	7197
0008801032TP455	SDC LIGHTS - RURAL INVERCARGILL	INV0331	106	11841
0008801022TPEF8	SDC LIGHTS - URBAN INVERCARGILL	INV0331	84	5487
0008801034TP5DA	SDC LIGHTS - RURAL NORTH MAKAREWA	NMA0331	271	31203
0008801024TPF77	SDC LIGHTS - URBAN NORTH MAKAREWA	NMA0331	1893	175606
<b>Total</b>			<b>2834</b>	<b>270789</b>

## 1.7. Authorisation Received

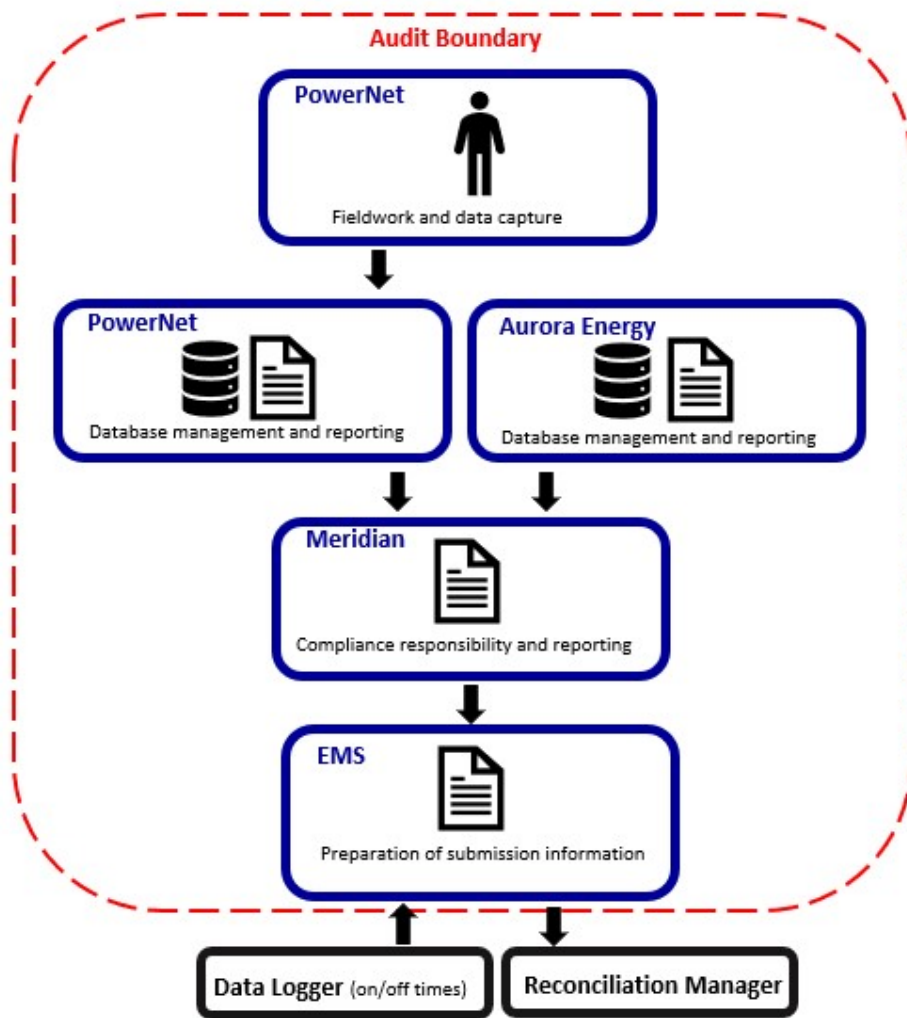
All information was provided directly by Meridian, SDC, Aurora Energy, and PowerNet.

## 1.8. Scope of Audit

The SDC lights are recorded in two databases, and PowerNet is responsible for all field work.

- Lights connected to the Heritage Estate Te Anau embedded network are recorded in Aurora Energy's database.
- All other lights are recorded in the PowerNet network's database. SDC also maintains their own RAMM database which includes streetlight information. SDC is in the process of validating and updating their own database, including determining accurate locations for each item of load. Once validation is complete, Meridian intends to base its submissions on the RAMM database.

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 audit focusses on the PowerNet and Aurora databases, because they are used for submission. The diagram below shows the audit boundary for clarity.



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

The field audit was undertaken of 381 items of load on 19 to 22 March 2018. The total population was divided into three strata:

- Aurora Energy’s Heritage Estate Te Anau
- PowerNet’s Southland DC urban; and
- PowerNet’s Southland DC rural.

### 1.9. Summary of previous audit

The previous audit was completed in March 2017 by Rebecca Elliot of Veritek Limited. Three non-compliances were identified, and two recommendations were made. The statuses of the non-compliances and recommendations are described below.

Subject	Section	Clause	Non-compliance	Status
Deriving Submission Information	2.1	11(1) of schedule 15.3	Incorrect kW figure submitted for the months of November 16- February 17 due to incorrect reporting being provided by PowerNet.  Inaccurate submission due to inaccurate databases.	Still existing. Refer to <b>section 2.1</b> .
Location of each item of load	2.2.2	11(2)(b) of schedule 15.3	Insufficient address details for 46 items of load in the PowerNet database.	Still existing. Refer to <b>section 2.3</b> .
Tracking of load changes	2.3	11(3) of schedule 15.3	Database inaccuracies found in both the Delta and PowerNet databases.	Still existing. Refer to <b>section 3.1</b> .

Subject	Section	Clause	Recommendations	Status
Tracking of Load Change	2.3	11(3) of schedule 15.3	Check accuracy of RAMM database for accuracy before being used for submission.	Underway.
Tracking of Load Change	2.3	11(3) of schedule 15.3	Review management of street light information between Southland DC and Delta.	There still appear to be some issues with the Aurora data completeness and accuracy. This is discussed in <b>section 3.1</b> .

## 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

Meridian 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.

#### Audit commentary

Meridian reconciles this DUML load using the DST profile. The on and off times are derived from a data logger read by EMS and are used to create a shape file. Meridian supplies EMS with the capacity information and EMS calculates the kWh figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant audit, and its accuracy and compliance was confirmed.

I compared the Aurora Energy database for Heritage Estate provided during February 2018 to the capacity information Meridian supplied to EMS in February 2018 and found it matched exactly.

I compared the PowerNet database provided during February 2018 to the capacity information Meridian supplied to EMS in February 2018 and found it matched exactly for seven ICPs. For ICP 0008801034TP5DA, there was a small timing difference due to the changes made to the database between the time the extract was provided and submission occurring.

There is some inaccurate data within the Aurora Energy and PowerNet databases which is used to provide capacity information to EMS. This is recorded as non-compliance and discussed in **sections 2.4, 2.5, and 3.1.**

#### Audit outcome

Non-compliant

Non-compliance	Description		
<p>Audit Ref: 2.1</p> <p>With: Clause 11(1) of Schedule 15.3</p> <p>From: unknown</p> <p>To: 22-Mar-18</p>	<p>The databases contain some incorrect and missing information.</p> <ul style="list-style-type: none"> <li>• The Aurora Energy Heritage Estate database accuracy is assessed to be 98.3% indicating an estimated over submission of 440 kWh per annum.</li> <li>• The PowerNet database accuracy is assessed to be 93.7% indicating an estimated over submission of 7,500 kWh per annum.</li> <li>• Some lamps situated in Heritage Estate outside the Aurora Energy embedded network are not recorded in PowerNet’s database.</li> <li>• Two lamps in the PowerNet database do not have wattage information recorded.</li> <li>• Seven lamps in the PowerNet database had incorrect descriptions, but wattage was recorded correctly.</li> <li>• Some lamps have incorrect ballast wattages recorded. The total difference for the Aurora Energy Heritage Estate database is 1.5 watts (6 kWh per annum over reported), and the total difference for the PowerNet database is 146.5 watts (625 kWh per annum under reported).</li> </ul> <p>Potential impact: Low</p> <p>Actual impact: Low</p> <p>Audit history: Once previously</p> <p>Controls: Weak</p> <p>Breach risk rating: 3</p>		
Audit risk rating	Rationale for audit risk rating		
<p><b>Low</b></p>	<p>The controls are rated as weak, because they are not sufficient to ensure that lamp details are correct.</p> <p>The impact is assessed to be low based on the wattage differences described above.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
<p>The issues identified in both the Powernet and Aurora databases will be resolved through the validation work being carried out on SDC’s DUML database. This work is scheduled to be completed by the end of May.</p>		<p>31 May 2018</p>	<p>Identified</p>
Preventative actions taken to ensure no further issues will occur		Completion date	
<p>Meridian will transition to using SDC’s validated RAMM database as the source of information for settlement. This is currently planned for June submissions.</p>		<p>01 July 2018</p>	

## 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 PowerNet and Aurora Energy databases were checked to confirm an ICP is recorded for each item of load.

### Audit commentary

An ICP is recorded for each item of load.

One item of load in the PowerNet database appears to be incorrectly recorded against a rural ICP. Other lights on Gunn St, Te Anau are recorded against ICP 0008801024TPF77 (SDC LIGHTS - URBAN NORTH MAKAREWA).

PNL Light No	Location Street	ICP	ICP description
T6663	3/5 Gunn Street, Te Anau	0008801034TP5DA	SDC LIGHTS - RURAL NORTH MAKAREWA

I recommend that the ICP for this light should be checked and updated if necessary.

Description	Recommendation	Audited party comment	Remedial action
ICP identifier	Confirm the correct ICP identifier for light number T6663 3/5 Gunn St, Te Anau.	We will ensure this light is recorded against the correct ICP in SDC's database. We note that as both ICPs are relate to the same NSP this will have no impact on submissions.	Identified

### 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 PowerNet and Aurora Energy databases were checked to confirm the location is recorded for all items of load.



### Audit commentary

Street addresses and GPS coordinates are recorded for all items of load in the Aurora Energy database for Heritage Estate.

In the PowerNet database, all items of load have a location town, and most items of load have a location street. In some cases, the address information is not sufficient to allow the light to be readily located:

- 45 lights have no location street recorded
- Wapiti Floods Te Anau-Mossburn Highway could not be located using the address information in the database
- Te Runga entrance and Te Runga subdivision lights were found at Black Lane and Deaker Road - the address information was not sufficient to locate these easily
- eight lights on Northview Ave, Winton were listed against Welsh Road, Winton and Northview Ave was not separately listed in the database.

This is recorded as non-compliance below.

### Audit outcome

Non-compliant

Non-compliance	Description		
Audit Ref: 2.3 With: Clause 11(2)(b) of Schedule 15.3 From: unknown To: 22-Mar-18	45 items of load do not have a street address recorded. Eleven items of load had incorrect or insufficient address information and could not be easily located. Potential impact: Low Actual impact: Low Audit history: Once previously Controls: Moderate Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	Controls are rated as moderate as they are sufficient to ensure that most items of load have address information recorded. The impact is rated as low because 56 ICPs (2.0%) have insufficient or incorrect address information.		
Actions taken to resolve the issue		Completion date	Remedial action status
The issues identified in both the Powernet and Aurora databases will be resolved through the work being carried out on SDC's DUML database. This work is scheduled to be completed by the end of May.		31 May 2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Meridian will transition to using SDC's validated RAMM database as the source of information for settlement. This is currently planned for June submissions.		01 July 2018	

## 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 PowerNet and Aurora Energy databases were checked to confirm that they contained a field for lamp type and wattage capacity and included any ballast or gear wattage.

### Audit commentary

A lamp type, lamp wattage, gear wattage and total wattage is included for each item of load in the Aurora Energy database for Heritage Estate.

Lamp type is recorded for all items of load in the PowerNet database, and most items also had a lamp rating and total wattage recorded. Lamp rating and total wattage are missing for the two lamps below:

Light number	Lamp Type	Lamp rating	Input wattage
T3835	Belisha Beacon		
T3836	Belisha Beacon		

The missing information is recorded as non-compliance below. Inaccurate description information is recorded as non-compliance in **section 3.1**.

### Audit outcome

Non-compliant

Non-compliance	Description
Audit Ref: 2.4 With: Clause 11(2)(b) of Schedule 15.3 From: unknown To: 22-Mar-18	Two items of load do not have lamp wattage or total wattage recorded. Potential impact: Low Actual impact: Low Audit history: None Controls: Strong Breach risk rating: 1
Audit risk rating	Rationale for audit risk rating
<b>Low</b>	Controls are rated as strong as they are sufficient to ensure that most items of load have wattage and model information recorded. The impact is rated as low because 2 lamps (0.07%) have missing load information.

<b>Actions taken to resolve the issue</b>	<b>Completion date</b>	<b>Remedial action status</b>
The issues identified in both the Powernet and Aurora databases will be resolved through the validation work being carried out on SDC's DUML database. This work is scheduled to be completed by the end of May.	31 May 2018	Identified
<b>Preventative actions taken to ensure no further issues will occur</b>	<b>Completion date</b>	
Meridian will transition to using SDC's validated RAMM database as the source of information for settlement. This is currently planned for June submissions.	01 July 2018	

## 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 381 items of load on 19 to 22 March 2018. The total population was divided into three strata:

- Aurora Energy's Heritage Estate Te Anau
- PowerNet's Southland DC urban; and
- PowerNet's Southland DC rural.

### Audit commentary

The field audit findings are detailed in the tables below.

#### Heritage Estate Te Anau

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Heritage Estate Te Anau					
Acheron Way	9	9	-	-	
Bligh Street	1	1	-	-	
Breaksea Street	19	19	-	-	
Broughton Place	6	6	-	-	
Chalky Way	6	6	-	-	

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Cunaris Way	10	9	-1	-	One 70W sodium was recorded in the database but not located.
Dusky Street	13	13	-	-	Ten other lights were located on Dusky Street, but they were situated outside the Aurora Network.
Howden Street	2	-	-2	-	These lights were positioned on Breaksea Street and included in the counts for that street.
Islet Place	3	3	-	-	
Paget Way	2	2	-	-	
Vancouver Place	5	6	1	-	One 70W sodium not recorded in the database was located.
Wet Jacket Place	5	5	-	1	One 70W sodium not recorded in the database was located. One 18W fluorescent recorded in the database was not located.
<b>Total</b>	<b>81</b>	<b>79</b>	<b>-2</b>	<b>1</b>	

For Aurora Energy's Heritage Estate database, I found two less lamps in the field than recorded in the database. These and the one lamp wattage difference are recorded as non-compliance in **section 3.1**.

#### PowerNet

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
PowerNet Rural - Athol					
Albion/Hythe Street Intersection	1	1	-	-	
Albion/SH6 Intersection	1	1	-	-	
Hall - Athol Five Rivers Highway	1	1	-	-	
Hythe Street	1	1	-	-	
Paddy's Alley Road	1	1	-	-	

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
SH6	5	5	-	-	
PowerNet Rural - Dipton					
Level St	6	6	-	-	
SH6	8	8	-	-	
SH6/Level St Intersection	1	1	-	-	
PowerNet Rural - Garston					
Car Park Beside Garage	1	1	-	-	
SH6	1	1	-	-	
The Terrace	4	4	-	-	
PowerNet Rural – Te Anau					
3/5 Gunn Street	1	1	-	-	This is an urban light, a recommendation to confirm the correct ICP is made in <b>section 2.2</b> .
Cnr Sandy Brown/Te Anau Milford Highway	1	1	-	-	
Cnr Sandy Brown Rd/Te Anau Mossburn Highway	1	1	-	-	
Inf Kiosk (Column) Te Anau-Mossburn Highway	1	1	-	-	
Inf Kiosk (PNL Pole) Te Anau-Mossburn Highway	1	1	-	-	
Inf Kiosk Floods Te Anau-Mossburn Highway	2	2	-	-	

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Kakapo Road	1	-	-1	-	No lights present, also recorded against urban ICP.
SH94/Hillside Cnr	1	1	-	-	
Te Anau-Milford Highway	2	2	-	-	
Te Anau-Mossburn Highway	2	2	-	-	
Te Runga Entrance, Te Anau-Mossburn Highway	1	1	-	-	
Te Runga Subdivision	1	1	-	-	
Wapiti Floods Te Anau-Mossburn Highway	1	Not located	-	-	
William Stephens Entrance	1	1	-	-	
PowerNet Urban - Edendale					
Brydone St	11	10	-1	10	10 lamps replaced with LED 28, one lamp was not located.
Hunter St	6	6	-	6	All lamps replaced with LED 28.
Seaward Downs Road	15	15	-	14	14 lamps replaced with LED 28.
Turner St	7	7	-	7	All lamps replaced with LED 28.
PowerNet Urban - Lumsden					
Avon St	1	1	-	-	
Flora Rd	17	17	-	3	Three lights recorded as 80W MV appear to be 150W sodium.
Garden St	6	6	-	-	

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Helena St	4	4	-	-	
Hill Rd	6	6	-	-	
Pasture St	1	1	-	-	
PowerNet Urban - Mossburn					
Bedford St	2	2	-	-	
Cornwall St	5	5	-	-	
Kent St	2	2	-	-	
Surrey St	3	3	-	-	
PowerNet Urban - Otautau					
Durham Street	1	1	-	-	
George Street	8	7	-1	-	One 70W sodium was recorded in the database but not located.
Mary Street	7	7	-	-	
PowerNet Urban - Riversdale					
Kent St	4	4	-	-	
PowerNet Urban - Riverton					
Carrol Street	2	2	-	-	
Evelyn St	1	1	-	-	One 70W sodium was recorded in the database as 40W fluorescent.
Herbert St	1	1	-	-	
Ivy St	6	5	-1	-	One 70W sodium recorded in the database was not located.
Leader St	6	6	-	-	
Walker St	15	15	-	-	One 70W sodium was recorded in the database as 40W fluorescent.
PowerNet Urban – Te Anau					
Kakapo Road	1	-	-1	-	No lights present, also against rural ICP.

Address	Database Count	Field Count	Count differences	Wattage differences	Comments
Milford Crescent	10	10	-	8	Eight 150W sodium are labelled 70W sodium in the database.
Paton Place	4	4	-	-	
Ped X Flood - Lake Front Drive	2	2	-	2	Pedestrian crossing appears the same as the one on Te Anau Terrace.
Te Anau Terrace	13	13	-	1	One 150W sodium is labelled 70W sodium in the database.
<b>PowerNet Urban – Wallacetown</b>					
Kirkoswald Street	7	7	-	-	Labelled as HPS 28 but are LED 28. Wattages are correct, so no discrepancy is recorded. This is discussed further in <b>section 2.4</b> .
<b>PowerNet Urban – Winton</b>					
Airth Street	1	1	-	-	
Anne Street	5	5	-	-	
Arthur Street	7	7	-	-	
Clyde Street	6	6	-	1	One 70W sodium was recorded in the database as 40W fluorescent.
Durham Street	16	16	-	1	One 70W sodium was recorded in the database as 40W fluorescent.
George Street	1	1	-	-	
Grange Street	8	8	-	-	
Hillary Street	5	5	-	-	
Mary Street	5	5	-	-	
McWilliam Avenue	5	5	-	-	
Prince Street	6	6	-	-	
Welsh Road	13	13	-	-	Includes eight lights on Northview Ave, discussed in <b>section 2.3</b> .
<b>Total</b>	<b>252</b>	<b>248</b>	<b>4</b>	<b>53</b>	

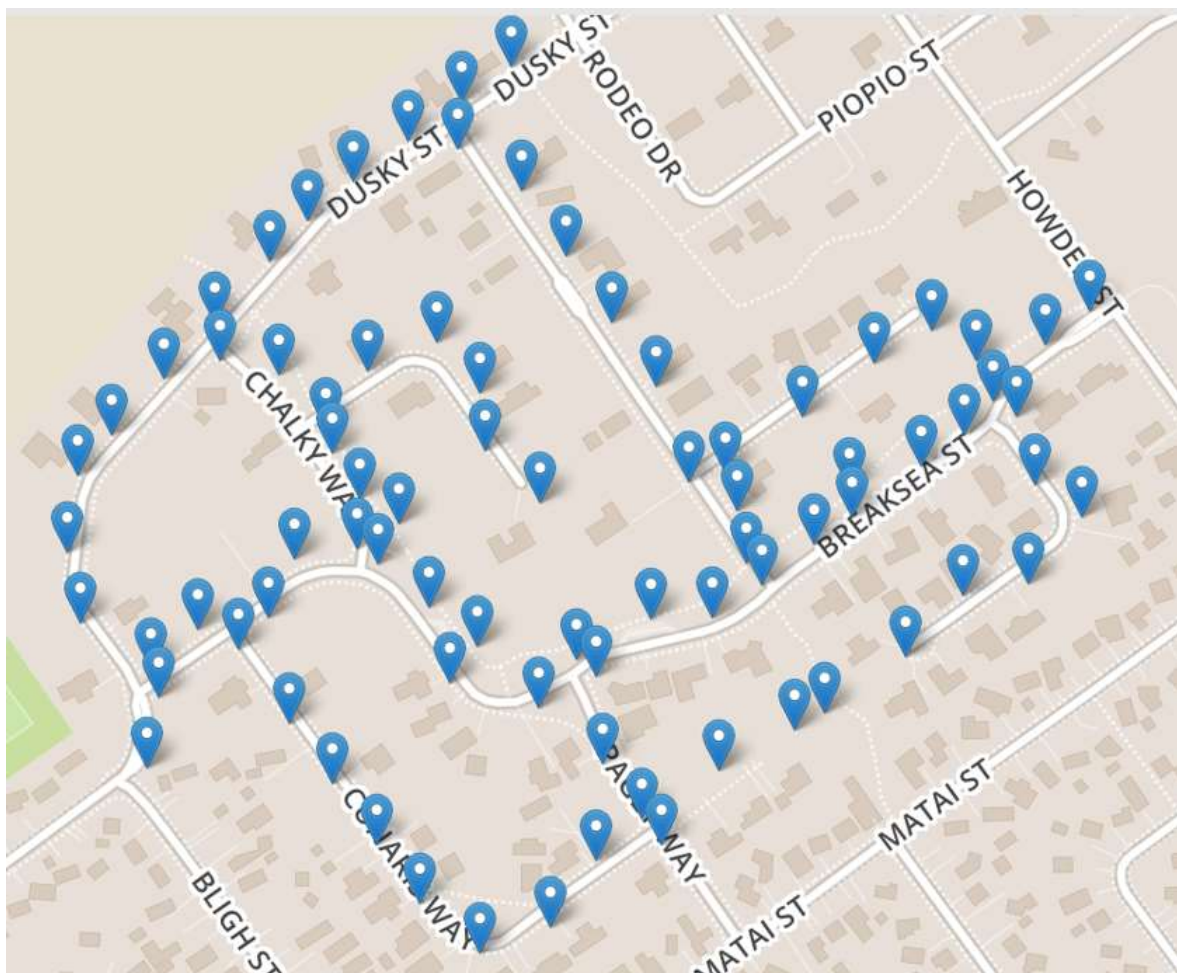


For the PowerNet database I found four less lamps in the field than were recorded in the database and 53 lamp wattage differences. These differences are recorded as non-compliance in **section 3.1**.

Aurora Energy's embedded network covers part of the Heritage Estate subdivision as shown in the map below. The remaining lights in the Heritage Estate are expected to be recorded in PowerNet's database. I found that some lights in Heritage Estate outside the Aurora Energy embedded network were not recorded in PowerNet's database, including:

- Some lights on Dusky Street, east of Rodeo Drive
- All lights on Rodeo Drive
- All lights on Asher Avenue
- All lights on Pounamu Drive; and
- All lights on Piopio Street.

This is recorded as non-compliance below.



**Audit outcome**

Non-compliant

Non-compliance	Description		
Audit Ref: 2.5 With: Clause 11(2A) of Schedule 15.3  From: unknown To: 22-Mar-18	Some lamps situated in Heritage Estate outside the Aurora Energy embedded network are not recorded in PowerNet's database.  Potential impact: Low  Actual impact: Low  Audit history: Once previously  Controls: Moderate  Breach risk rating: 2		
Audit risk rating	Rationale for audit risk rating		
<b>Low</b>	The controls are rated as moderate, as they are sufficient to ensure that most database information is recorded correctly.  The impact is expected to be low.		
Actions taken to resolve the issue		Completion date	Remedial action status
The issues identified in both the Powernet and Aurora databases will be resolved through the validation work being carried out on SDC's DUML database. This work is scheduled to be completed by the end of May.		31 May 2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Meridian will transition to using SDC's validated RAMM database as the source of information for settlement. This is currently planned for June submissions.		01 July 2018	

## 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 Aurora Energy and PowerNet databases were 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 20 September 2012, the Authority sent a memo to retailers and auditors advising that tracking of load changes at a daily level was not required if the database contained an audit trail. I have interpreted this to mean that the provision of a copy of the report to Meridian when changes occur is sufficient to achieve compliance.

The processes were reviewed for new lamp connections and the tracking of load changes due to faults and maintenance.

#### **Aurora Energy’s Heritage Estate Te Anau database**

PowerNet has the maintenance contract for this estate but there is not a direct mechanism for updated information to be provided from the contractors to Aurora Energy. This is recorded as non-compliance below.

The fittings at Heritage Estate are decorative and there are no plans to replace these with LED lights. No Christmas lights are used.

Outage patrols are carried out by PowerNet as part of their maintenance contract.

#### **PowerNet database**

Fault, maintenance and LED upgrade work is completed by PowerNet as a contractor, who maintain their own database. PowerNet also advise SDC when work is complete, and SDC will use this information to maintain their own RAMM database.

The PowerNet network has advised SDC that they are no longer updating their database in relation to the maintenance of lamps. If items of load are removed these will be updated but not if lamp type is changed. Therefore, the tracking load changes is no longer being carried out for all changes. This is recorded as non-compliance below.

SDC advised that there have been no new connections for at least four years. If a new connection is required a request will be issued to PowerNet.

An LED upgrade is underway, and SDC does not intend to use a central management system or dimming.

Southland has a rolling outage patrols in place that ensure that the complete district is checked every six months. Any discrepancies found are now updated directly into RAMM.

#### **Audit outcome**

Non-compliant

<b>Non-compliance</b>	<b>Description</b>
<p>Audit Ref: 2.6 With: Clause 11(3) of schedule 15.3  From: entire audit period</p>	<p>The tracking of load changes is not being carried out in relation to changing of light type on existing items of load for the PowerNet database. Changes are not being tracked in Aurora Energy’s Heritage Estate database. Potential impact: Medium Actual impact: Low Audit history: None Controls: Weak Breach risk rating: 3</p>
<b>Audit risk rating</b>	<b>Rationale for audit risk rating</b>
<b>Low</b>	<p>The controls are rated as weak, because changes to light type are not being captured for exiting items of load.  The impact is assessed to be low; over reporting caused by database inaccuracy is expected to be around 4500 kWh per annum.</p>

Actions taken to resolve the issue	Completion date	Remedial action status
The issues identified in both the Powernet and Aurora databases will be resolved through the validation work being carried out on SDC's DUML database. This work is scheduled to be completed by the end of May.	31 May 2018	Identified
<b>Preventative actions taken to ensure no further issues will occur</b>	<b>Completion date</b>	
Meridian will transition to using SDC's validated RAMM database as the source of information for settlement. This is currently planned for June submissions.	01 July 2018	

## 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 Aurora Energy and PowerNet databases were checked for audit trails.

### Audit commentary

PowerNet and Aurora Energy demonstrated a complete audit trail of all additions and changes to the database information.

### Audit outcome

Compliant

### 3. ACCURACY OF DUML DATABASE

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

##### Code reference

Clause 15.2 and 15.37B(b)

##### Code related audit information

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

##### Audit observation

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

##### Aurora Energy's Heritage Estate Database

Plan Item	Comments
Area of interest	Heritage Estate Te Anau
Strata	The database contains items of load in Heritage Estate Te Anau. The processes for the management of all Heritage Estate items of load are the same, the population was selected from one strata.
Area units	All 81 items of load recorded in the database were selected.
Total items of load	81 items of load were checked.

##### PowerNet Database

Plan Item	Comments
Area of interest	SDC excluding the Heritage Estate Te Anau embedded network
Strata	The database contains items of load in Southland area. The area has two distinct sub regions of urban and rural. The processes for the management of all SDC items of load are the same, but I decided to place the items of load into two strata, as follows: <ol style="list-style-type: none"> <li>1. PowerNet's Southland DC urban; and</li> <li>2. PowerNet's Southland DC rural.</li> </ol>
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 68 sub-units.
Total items of load	252 items of load were checked.

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

## Audit commentary

### Aurora Energy's Heritage Estate database

The Aurora Energy database was found to contain some inaccuracies and missing data.

The field audit found:

- two less lamps in the field than were recorded in the database
- one lamp wattage difference.

The field data was 98.3% of the database data for the sample checked, the database is assessed to be 98.3% accurate. The total wattage recorded in the database for the sample was 6,408 watts. The total wattage found in the field for the sample checked was 6,305 watts, a difference of 103 watts. This will result in estimated over submission of 440 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority supplemented with the Veritek wattage table for those wattages not included in the standardised wattage table. The following discrepancies were identified:

Light Type	Count	Database total wattage	Expected total wattage	Total Difference (watts)
18W Fluorescent	3	20	19.5	-1.5

### PowerNet Database

The PowerNet database was found to contain some inaccuracies and missing data.

The field audit found:

- four less lamps in the field than were recorded in the database
- 53 lamp wattage differences.

The field data was 93.7% of the database data for the sample checked, the database is assessed to be 93.7% accurate. The total wattage recorded in the database for the sample was 27,900 watts. The total wattage found in the field for the sample checked was 26,144 watts, a difference of 1,756 watts. This will result in estimated over submission of 7,500 kWh per annum (based on annual burn hours of 4,271 as detailed in the DUML database auditing tool).

I found that some lights in Heritage Estate outside the Aurora Energy embedded network were not recorded in PowerNet's database, including:

- some lights on Dusky Street, east of Rodeo Drive
- all lights on Rodeo Drive
- all lights on Asher Avenue
- all lights on Pounamu Drive; and
- all lights on Piopio Street.

Wattages for all items of load were checked against the published standardised wattage table produced by the Electricity Authority. The following discrepancies were identified:

Light Type	Count	Database total wattage	Expected total wattage	Total Difference (watts)
20W Fluorescent	10	25	29	40

Light Type	Count	Database total wattage	Expected total wattage	Total Difference (watts)
18W Fluorescent	3	18	19.5	4.5
18W Fluorescent	12	21	19.5	-18
Belisha Beacon	2	0	60	120
<b>Total</b>	<b>25</b>			<b>146.5</b>

Description information for seven lamps on Kirkoswald Street, Wallacetown were incorrect. The lamps were recorded as HPS 28 but were LED 28. Wattages were correctly recorded.

### Audit outcome

Non-compliant

Non-compliance	Description
<p>Audit Ref: 3.1</p> <p>With: Clause 15.2 and 15.37B(b)</p> <p>From: unknown</p> <p>To: 22-Mar-18</p>	<p>The databases contain some incorrect and missing information.</p> <ul style="list-style-type: none"> <li>The Aurora Energy Heritage Estate database accuracy is assessed to be 98.3% indicating an estimated over submission of 440 kWh per annum.</li> <li>The PowerNet database accuracy is assessed to be 93.7% indicating an estimated over submission of 7,500 kWh per annum.</li> <li>Some lamps situated in Heritage Estate outside the Aurora Energy embedded network are not recorded in PowerNet's database.</li> <li>Two lamps in the PowerNet database do not have wattage information recorded.</li> <li>Seven lamps in the PowerNet database had incorrect descriptions, but wattage was recorded correctly.</li> <li>Some lamps have incorrect ballast wattages recorded. The total difference for the Aurora Energy Heritage Estate database is 1.5 watts (6 kWh per annum over reported), and the total difference for the PowerNet database is 146.5 watts (625 kWh per annum under reported).</li> </ul> <p>Potential impact: Low</p> <p>Actual impact: Low</p> <p>Audit history: None</p> <p>Controls: Weak</p> <p>Breach risk rating: 3</p>

Audit risk rating	Rationale for audit risk rating		
Low	<p>The controls are rated as weak, because they are not sufficient to ensure that lamp details are correct.</p> <p>The impact is assessed to be low based on the wattage differences described above.</p>		
Actions taken to resolve the issue		Completion date	Remedial action status
The issues identified in both the Powernet and Aurora databases will be resolved through the validation work being carried out on SDC's DUML database. This work is scheduled to be completed by the end of May.		31 May 2018	Identified
Preventative actions taken to ensure no further issues will occur		Completion date	
Meridian will transition to using SDC's validated RAMM database as the source of information for settlement. This is currently planned for June submissions.		01 July 2018	

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

#### Code reference

Clause 15.2 and 15.37B(c)

#### Code related audit information

The audit must verify that:

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

#### Audit observation

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

- checking the registry to confirm that all ICPs have the correct profile and submission flag
- checking the data submitted to EMS to prepare reconciliation submissions.

#### Audit commentary

Meridian reconciles this DUML load using the DST profile. The on and off times are derived from a data logger read by EMS and are used to create a shape file. Meridian supplies EMS with the capacity information and EMS calculates the kWh figure for each ICP and includes this in the relevant AV080 file. This process was audited during Meridian's reconciliation participant and EMS' agent audit, and its accuracy and compliance was confirmed.

I compared the Aurora Energy database for Heritage Estate provided during February 2018 to the capacity information Meridian supplied to EMS in February 2018 and found it matched exactly.

I compared the PowerNet database provided during February 2018 to the capacity information Meridian supplied to EMS in February 2018 and found it matched exactly for seven ICPs. For ICP



0008801034TP5DA, there was a small timing difference due to the changes made to the database between the time the extract was provided and submission occurring.

There is some inaccurate data within the Aurora Energy and PowerNet databases which is used to provide capacity information to EMS. This is recorded as non-compliance and discussed in **sections 2.4, 2.5 and 3.1**.

**Audit outcome**

Non-compliant

Non-compliance	Description
<p>Audit Ref: 3.2</p> <p>With: Clause 15.2 and 15.37B(c)</p> <p>From: unknown</p> <p>To: 22-Mar-18</p>	<p>The databases contain some incorrect and missing information.</p> <ul style="list-style-type: none"> <li>• The Aurora Energy Heritage Estate database accuracy is assessed to be 98.3% indicating an estimated over submission of 440 kWh per annum.</li> <li>• The PowerNet database accuracy is assessed to be 93.7% indicating an estimated over submission of 7,500 kWh per annum.</li> <li>• Some lamps situated in Heritage Estate outside the Aurora Energy embedded network are not recorded in PowerNet’s database.</li> <li>• Two lamps in the PowerNet database do not have wattage information recorded.</li> <li>• Seven lamps in the PowerNet database had incorrect descriptions, but wattage was recorded correctly.</li> <li>• Some lamps have incorrect ballast wattages recorded. The total difference for the Aurora Energy Heritage Estate database is 1.5 watts (6 kWh per annum over reported), and the total difference for the PowerNet database is 146.5 watts (625 kWh per annum under reported).</li> </ul> <p>Potential impact: Low</p> <p>Actual impact: Low</p> <p>Audit history: Once previously</p> <p>Controls: Weak</p> <p>Breach risk rating: 3</p>
Audit risk rating	Rationale for audit risk rating
<p><b>Low</b></p>	<p>The controls are rated as weak, because they are not sufficient to ensure that lamp details are correct.</p> <p>The impact is assessed to be low based on the wattage differences described above.</p>

<b>Actions taken to resolve the issue</b>	<b>Completion date</b>	<b>Remedial action status</b>
The issues identified in both the Powernet and Aurora databases will be resolved through the validation work being carried out on SDC's DUML database. This work is scheduled to be completed by the end of May.	31 May 2018	Identified
<b>Preventative actions taken to ensure no further issues will occur</b>	<b>Completion date</b>	
Meridian will transition to using SDC's validated RAMM database as the source of information for settlement. This is currently planned for June submissions.	01 July 2018	

## CONCLUSION

The SDC lights are recorded in two databases, and PowerNet is responsible for all field work.

- Lights connected to the Heritage Estate Te Anau embedded network are recorded in Aurora Energy's database.
- All other lights are recorded in the PowerNet network's database.

SDC also maintains their own RAMM database which includes streetlight information. SDC is in the process of validating and updating their own database, including determining accurate locations for each item of load. Once validation is complete, Meridian intends to base its submissions on the RAMM database.

The future risk rating of 17 indicates that the next audit be completed in 12 months. Seven non-compliances were identified, and one recommendations was raised.

## PARTICIPANT RESPONSE

Meridian have reviewed the report and their comments are contained within its body.