

Section 2

Annual Performance Report Strategic Management Areas & Geographical Catchments

1 July 2017 to 30 June 2018

Final Draft

30 September 2018



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1 WASTEWATER NETWORK PERFORMANCE

1.1 Strategic Management Area 1: Wellsford

1.1.1 Overview

Wellsford is a rural township focusing on farming and horticulture. State Highway 1 (SH1), passing through both Wellsford and Te Hana townships, is the main road servicing the rural communities. The Wellsford and Te Hana townships are surrounded by rural pastoral land.

Wellsford is located approximately 20 km inland from the Kaipara Harbour. The serviced population of Wellsford was 2,069 (Census, 2013), with 854 connections.

	2014/15	2015/16	2016/17	2017/18
No. of connections	837	842	851	854
Length of sewer (km)	26	26	27	29

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1128	Worker Rd WWPS	DPWOR	1	Unnamed tributary (south) of Whakapirau Creek
1129	Armitage Rd WWPS	DPARM	1	Unnamed tributary (north) of Whakapirau Creek
1130	School Rd WWPS	DPSHR	1	Unnamed tributary (south) of Whakapirau Creek
1131	Cemetery WWPS	DPCEM	1	To land
1132	Kellys Hill WWPS	DPKYH	1	Stormwater detention pond
1133	Te Hana WWPS	DPTHA	1	Unnamed tributary of Te Hana Creek.

There have been no changes to the schedule of EOPs in this SMA.

1.1.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
24/07/2017	DPSHR	School Road Wastewater Pump Station	1130	Power failure	17	2.5
8/08/2017	DPARM	Armitage Wastewater Pump Station	1129	Power failure	67	4.9
8/08/2017	DPWOR	Worker Road Wastewater Pump Station	1128	Power failure	42	4.9
4/01/2018	DPWOR	Worker Road Wastewater Pump Station	1128	Power failure	35	0

Reported Incidents

There were a total of 11 reported incidents in the Wellsford catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

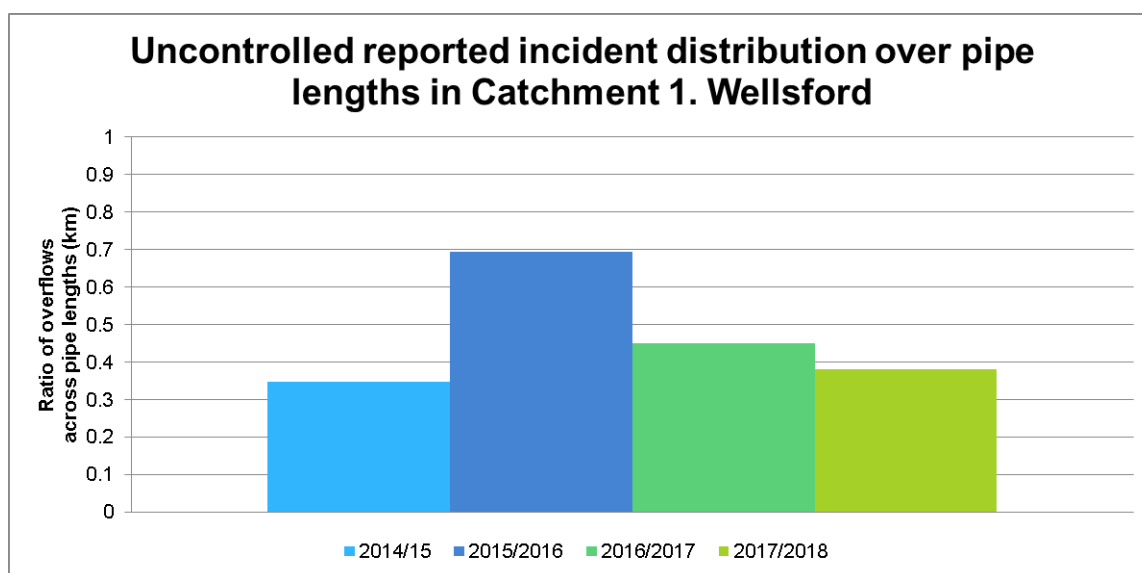
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

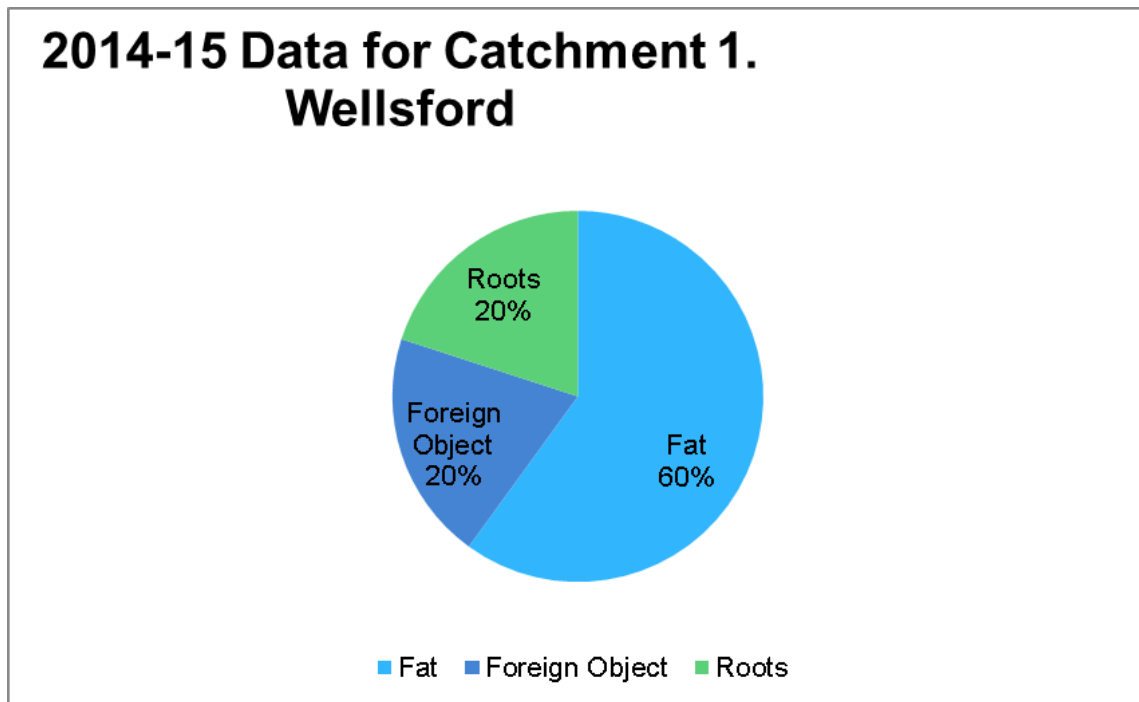
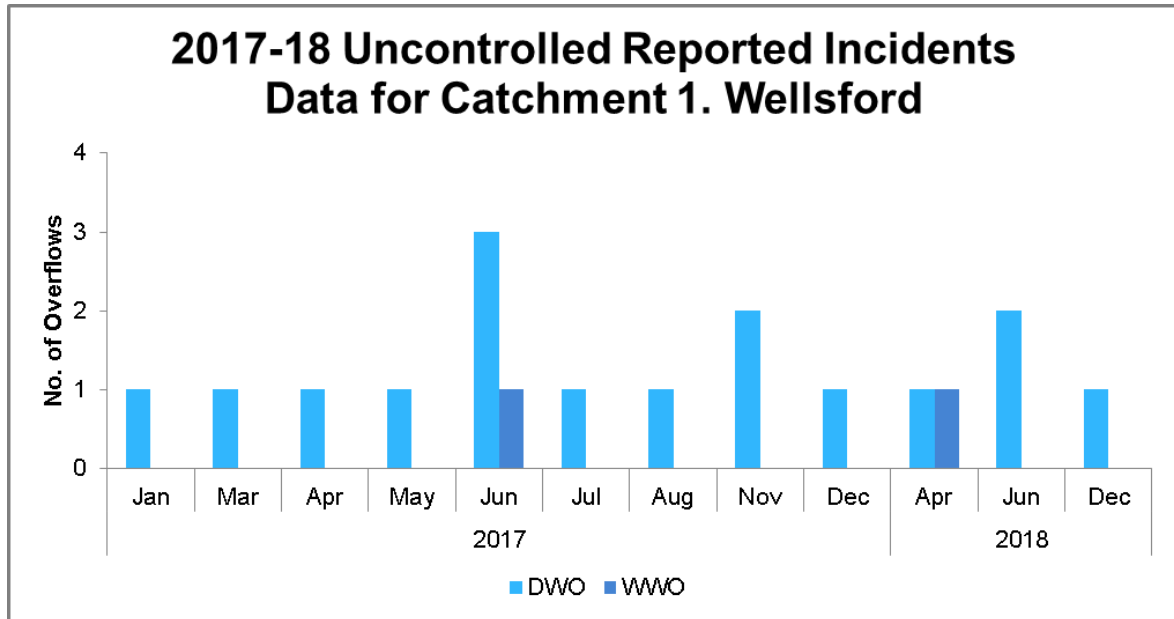
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
19/04/2017	21 Totara Vw	L1	190	Unknown	0	Dislodged pipe repaired
29/04/2017	15 Totara Vw	L1	414	Unknown	29.5	
16/12/2018	23 Totara Vw	L1	239	Broken Pipe	0	

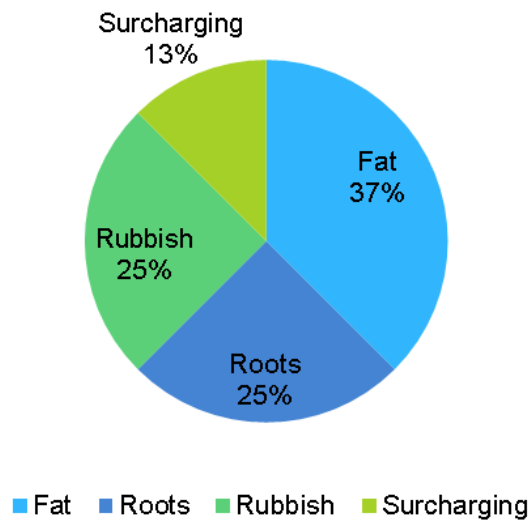
1.1.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.

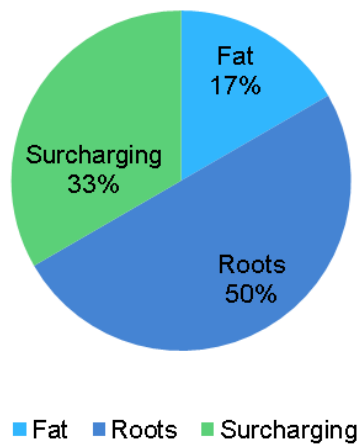


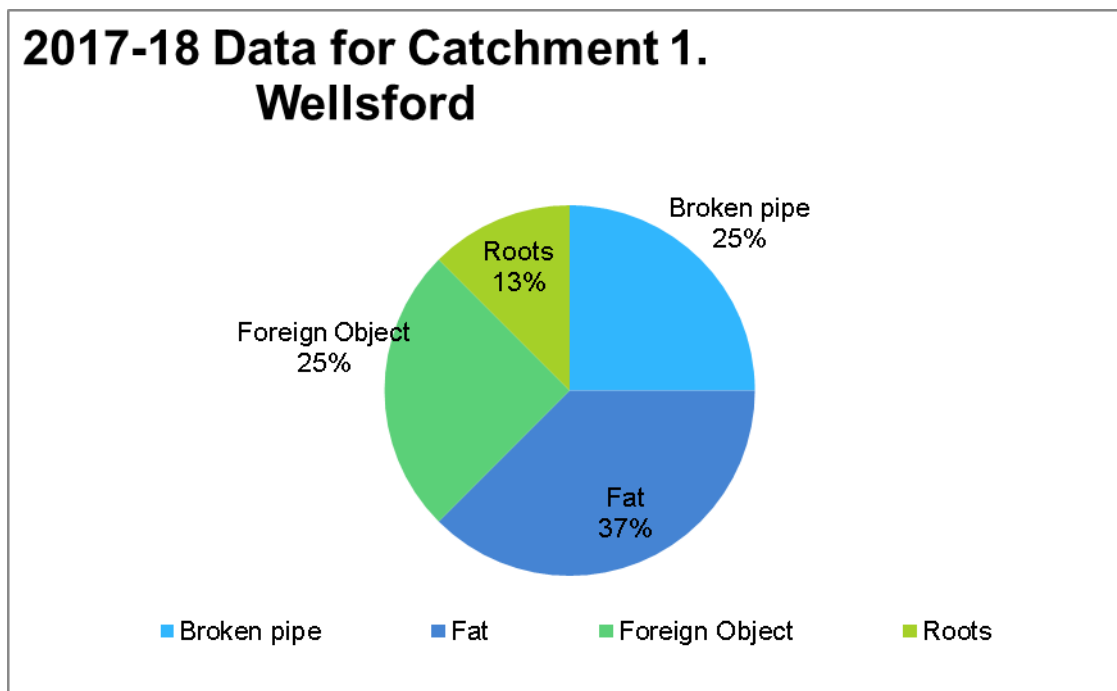


2015-16 Data for Catchment 1. Wellsford



2016-17 Data for Catchment 1. Wellsford





Trend analysis has been carried out where the cause has been identified.

1.1.4 Wet weather overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
6/01/2018	DPWOR	Worker Road Wastewater Pump Station	1128	Rain event	185	0
28/04/2018	DPARM	Armitage Wastewater Pump Station	1129	Rain event	9	64
3/06/2018	DPSHR	School Road Wastewater Pump Station	1130	Rain event	571	52.86
3/06/2018	DPARM	Armitage Wastewater Pump Station	1129	Rain event	60	52.86

Spatial and temporal variability of rain data may indicate that recorded rain data is not necessarily what is experienced at the site. The cause is taken from validated site data.

1.1.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1128	Worker Rd WWPS	2	2	3	3	1	2.25	Operational investigation
1129	Armitage Rd WWPS	2	1	3	1	2	1.75	Continue to monitor
1130	School Rd WWPS	0	0	0	0	1	0.25	Continue to monitor
1131	Cemetery WWPS	0.2	0	0	0	0	0	Continue to monitor
1132	Kellys Hill WWPS	1.4	0	0	0	0	0	Continue to monitor
1133	Te Hana WWPS	0.6	0	0	0	0	0	Continue to monitor

1.1.6 Inflow & Infiltration Programme

A desktop I&I assessment is currently being carried out of SCADA data to understand wastewater network I&I performance with field investigations to follow.

1.1.7 Improvement Works Programme

No significant network improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018, or are currently planned for the next reporting year.

1.1.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.1.9 Summary

The ratio of overflows across total pipe length has decreased from the reporting period of 2016-17. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended by 2.2km with no significant changes being made to the network as a whole. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.2 Strategic Management Area 2: Omaha

1.2.1 Overview

Omaha is a small beach town on Omaha Bay, north of Auckland. It is located approximately 75 km north of Auckland on a sand spit that adjoins Tawharanui Peninsula and separates Whangateau Harbour from Omaha Bay, and also includes the Matakana and Point Wells townships. The nearest sizable town is Warkworth, approximately 17 km south west of Omaha. The resident population of the Omaha SMA is approximately 1,600 people (Census, 2013), with 1,582 connections, but this population is significantly increased by seasonal tourism.

	2014/15	2015/16	2016/17	2017/18
No. of connections	1,490	1,553	1,575	1,582
Length of sewer (km)	45	45	47	55

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1117	Taumata Rd WWPS	DPTAU	1	To land
1118	Mangatawhiri Rd WWPS	DPMRI	1	To land
1119	Paraoa Cres WWPS	DPPOA	1	To land
1120	Kokopu St WWPS	DPKOK	1	To land
1121	Broadlands WWPS	DPBRO	1	To land
1122	Esme Grove WWPS	DPEGV	1	To land
1123	North West Anchorage WWPS	DPANC	1	Whangateau Harbour Beach
1124	Success Court WWPS	DPSUC	1	To land
1125	Boat Ramp WWPS	DPBOA	1	To land

There have been no changes to the schedule of EOPs in this catchment.

1.2.2 Dry weather overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 10 reported incidents in the Omaha catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

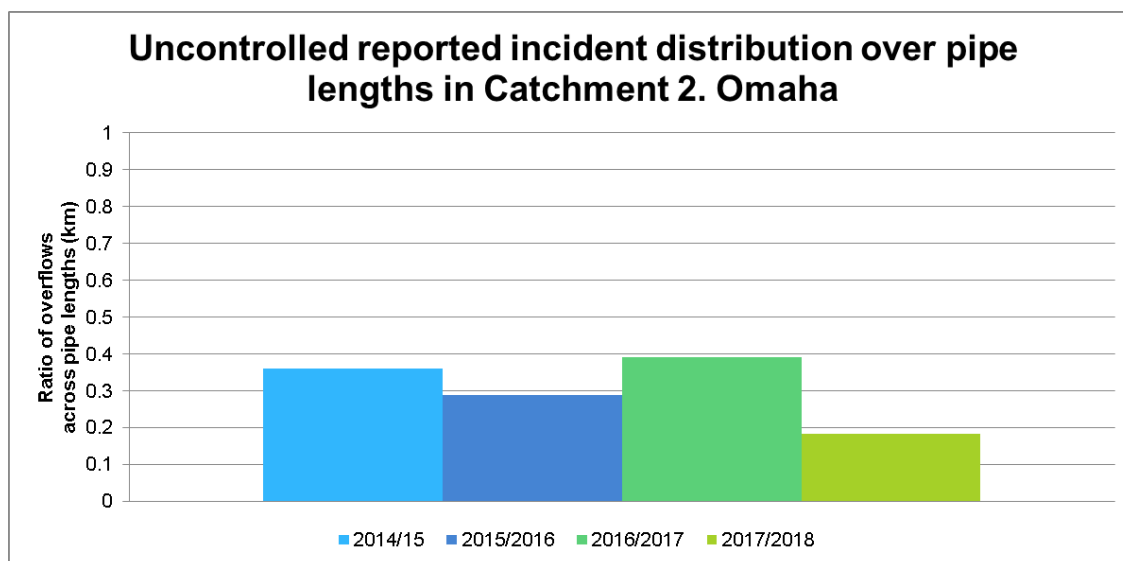
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

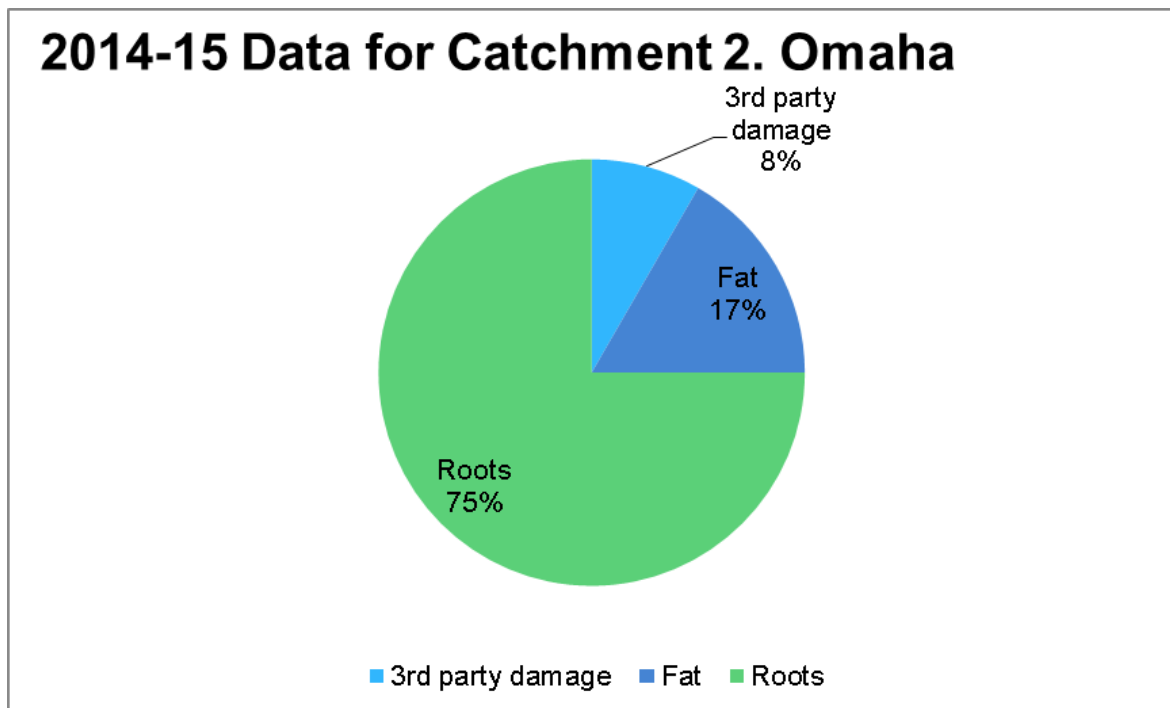
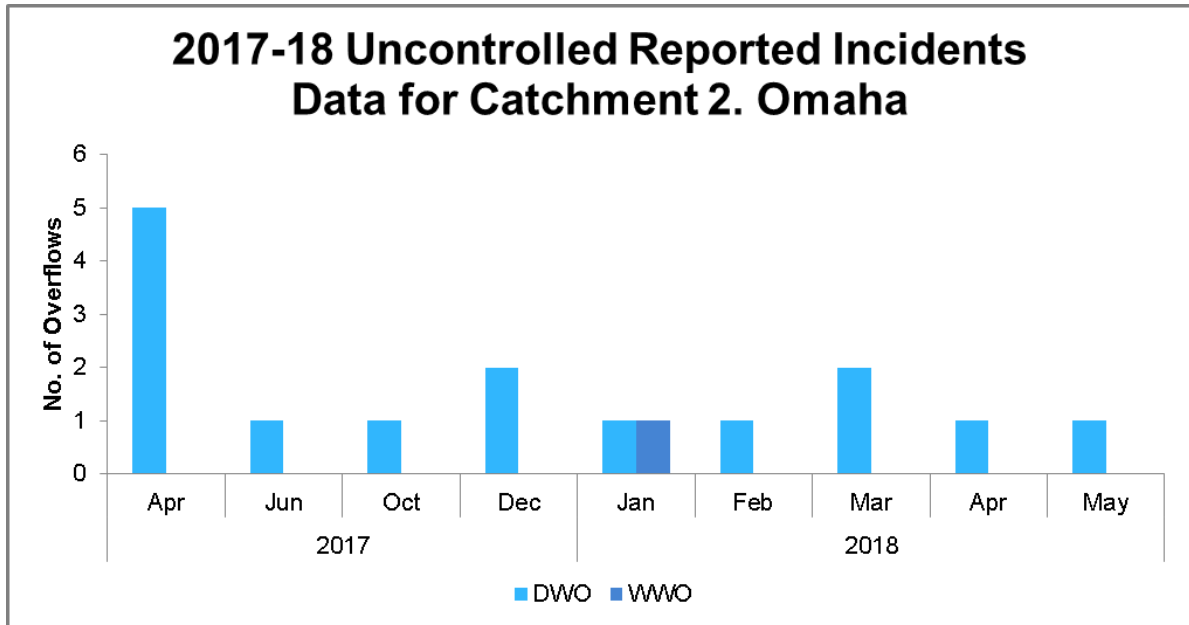
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
2/01/2018	30 Ida Way	L1	430	Roots	24	Five assets CCTV'd and rootcut
7/02/2018	9 Rita Way	L1	240	Unknown	1.5	

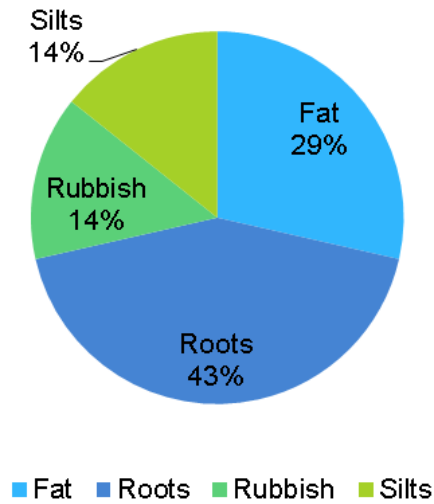
1.2.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.

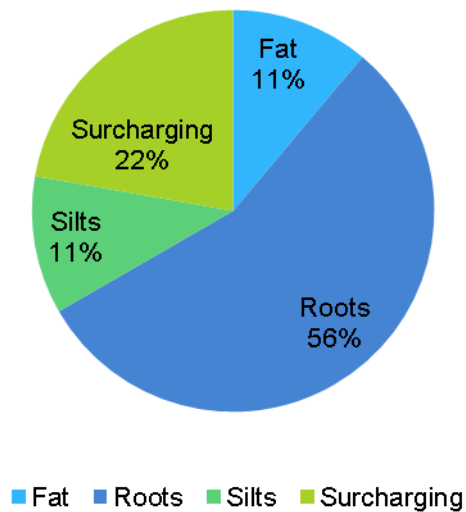


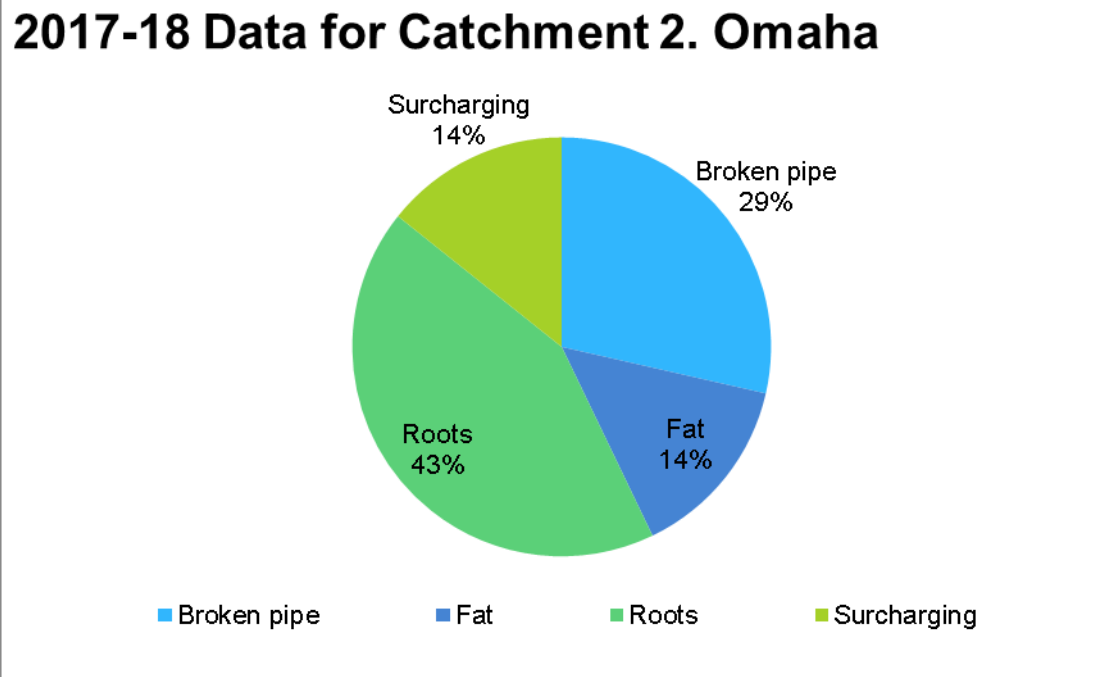


2015-16 Data for Catchment 2. Omaha



2016-17 Data for Catchment 2. Omaha





Trend analysis has been carried out where the cause has been identified.

1.2.4 Wet Weather Overflows

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2017 and 30 June 2018.

1.2.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1117	Taumata Rd WWPS	0	0	0	0	0	0	Continue to monitor
1118	Mangatawhiri Rd WWPS	0	0	0	0	0	0	Continue to monitor
1119	Paraoa Cres WWPS	0	0	0	0	0	0	Continue to monitor
1120	Kokopu St WWPS	0	0	0	0	0	0	Continue to monitor
1121	Broadlands WWPS	0.6	0	0	0	0	0	Continue to monitor
1122	Esme Grove WWPS	0	0	0	0	0	0	Continue to monitor
1123	North West Anchorage WWPS	0	0	0	0	0	0	Continue to monitor
1124	Success Court WWPS	0	1	0	0	0	0.3	Continue to monitor
1125	Boat Ramp WWPS	0	0	1	0	0	0.3	Continue to monitor

1.2.6 Inflow and Infiltration Programme

A review of I&I in this catchment will be carried out as part of Watercare's I&I programme; this catchment has not been identified as a priority to date.

1.2.7 Improvement Works Programme

No significant network improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018, or are currently planned for the next reporting year.

1.2.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.2.9 Summary

There have been no pump station overflows in the reporting period of 2017-18. Roots remain a primary cause of overflows, and the density of overflows across pipe length has decreased significantly. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended significantly to accommodate the population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.3 Strategic Management Area 3: Warkworth

1.3.1 Overview

Warkworth is situated on the banks of the Mahurangi River and at the head of the Mahurangi Harbour with tributaries of the Mahurangi River flowing through the existing and future urban areas. The population of Warkworth was approximately 4,587 in 2013 (Census, 2013), with 1,977 connections. The township is surrounded by rural pastoral land in lowland areas, and plantation and native forestry in the high country. Several indicative future urban areas have been identified surrounding Warkworth.

	2014/15	2015/16	2016/17	2017/18
No. of connections	1,819	1,859	1,993	1,977
Length of sewer (km)	47	48	50	59

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
790	Palmer St WWPS	DPPAL	1	Mahurangi River
792	Auckland Road Manhole	DSAUC	2	Unnamed tributary (1) of Mahurangi River
1258	Lilburn St WWPS	DPLIL	1	Mahurangi River
1540	1 Elizabeth St	-	2	Unnamed tributary (4) of Mahurangi River

The following EOP was decommissioned and has been removed from the schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
792	Auckland Road Manhole	DSAUC	2	Unnamed tributary (1) of Mahurangi River

1.3.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
21/06/2018	DPLIL	Lilburn Wastewater Pump Station	1258	Power outage	86	1

Reported Incidents

There were a total of 20 reported incidents in the Warkworth catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

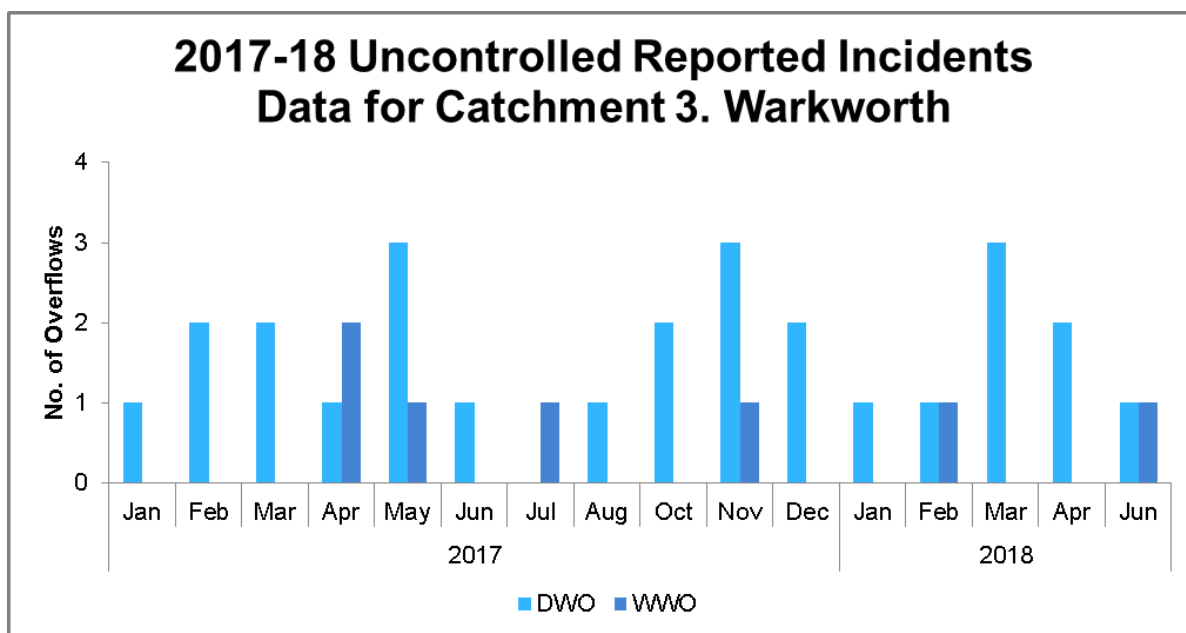
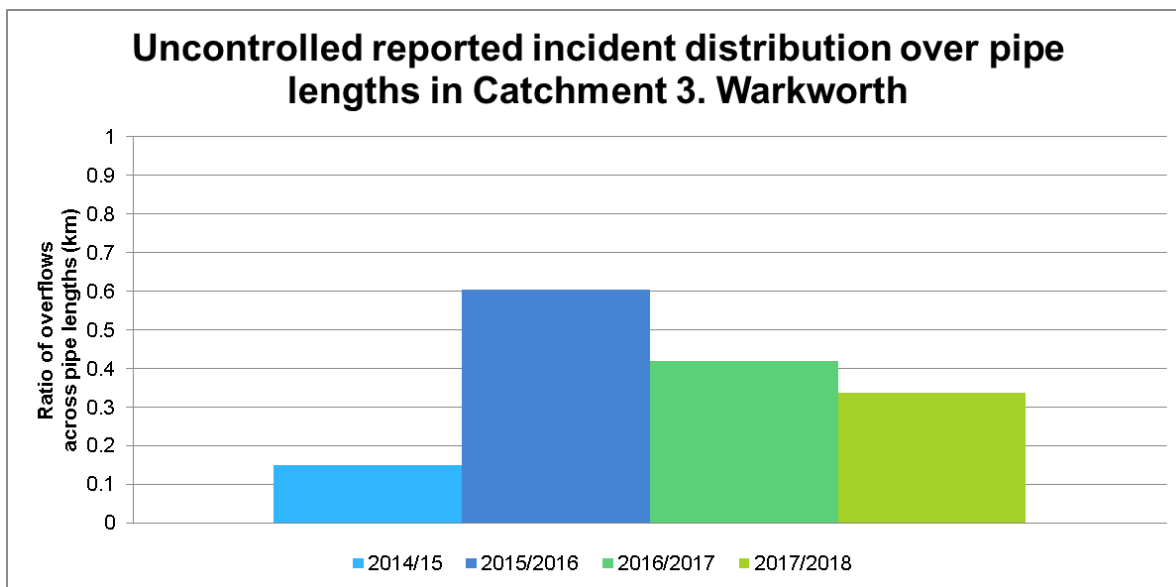
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

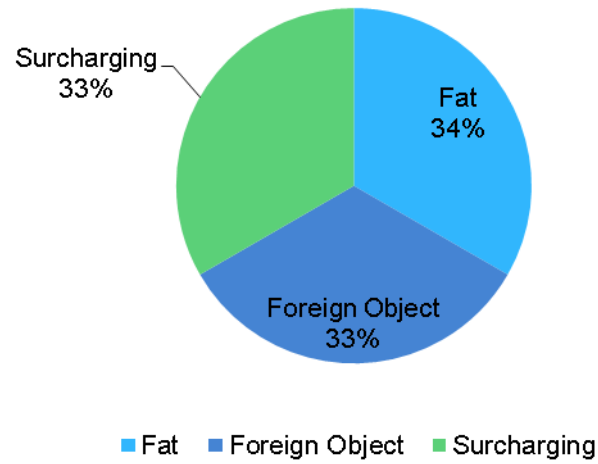
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
12/04/2017	15 Elizabeth St	L1	76	Surcharging	95	Trade Waste issue, fats in the line
5/08/2017	16 Elizabeth St	L1	184	Fat	0	
26/12/2017	10 Elizabeth St	L1	519	Fat	6	
26/12/2017	16 Elizabeth St	L1	501	Fat	6	
3/02/2018	16 Elizabeth St	L1	501	Fat	6	
5/03/2018	16 Elizabeth St	L1	124	Fat	0	CCTV, replaced broken pipe following suspected damage from deck installation
10/01/2017	9 Hexham St	L1	152	Unknown	1	
15/02/2017	9 Hexham St	L1	226	Unknown	11.5	
16/02/2018	9 Hexham St	L1	438	Unknown	0	Broken pipe repaired
25/04/2018	1 Matakana Rd	L2	421	Unknown	0.5	
12/06/2018	1 Matakana Rd	L2	129	Unknown	35.5	Roots removed and displaced joint repaired
31/10/2017	17 Brown Rd	L1	35	Broken Pipe	0	
12/01/2018	17 Brown Rd	L1	72	Unknown	0	Flat lines accumulate silts. Regular flushing
16/11/2017	10 Auckland Rd	L1	332	Silts	0	
22/11/2017	10 Auckland Rd	L1	422	Silts	0	

1.3.3 Trend analysis of reported incidents

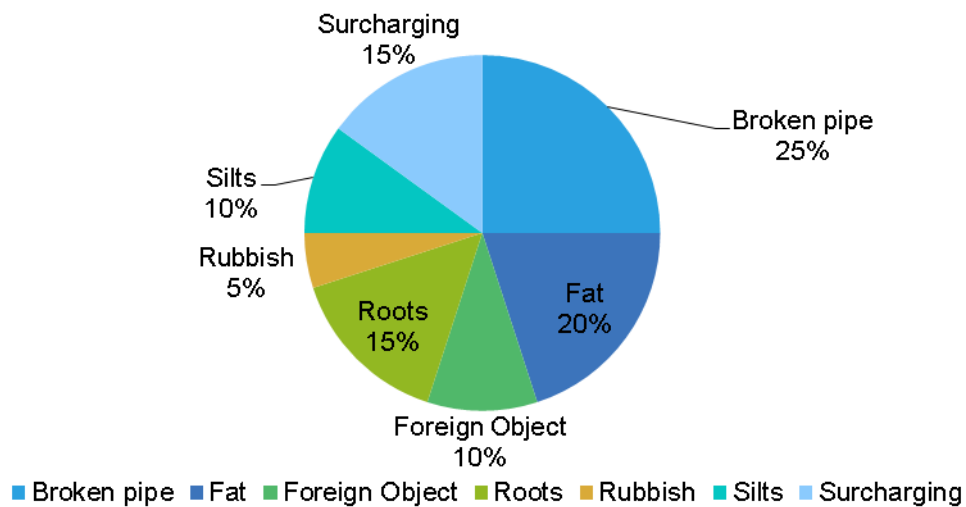
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



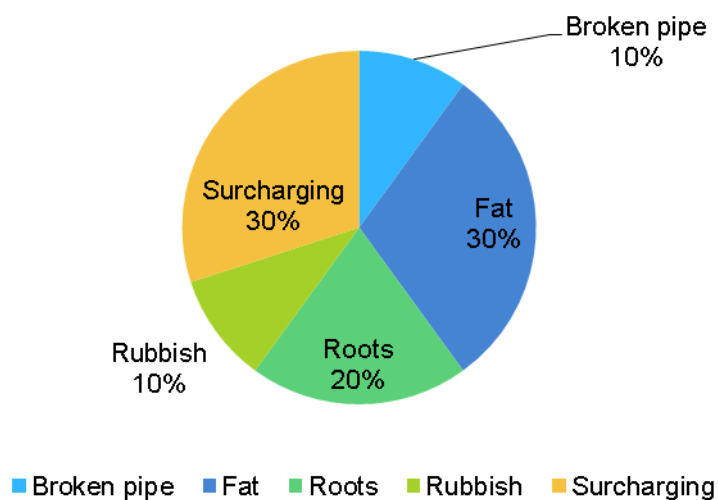
2014-15 Data for Catchment 3. Warkworth



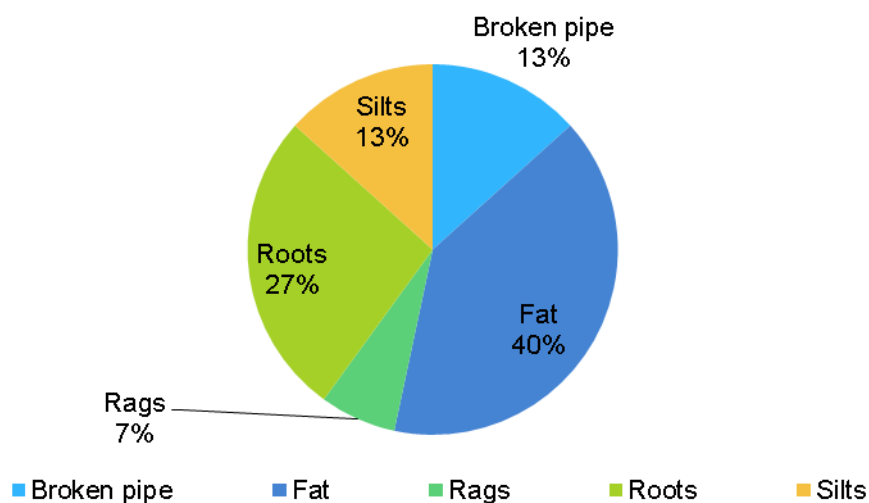
2015-16 Data for Catchment 3. Warkworth



2016-17 Data for Catchment 3. Warkworth



2017-18 Data for Catchment 3. Warkworth



Trend analysis has been carried out where the cause has been identified.

1.3.4 Wet Weather Overflows

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
30/08/2017	DPPAL	Palmer Wastewater Pump Station	790	Rain event	279	19
23/01/2018	DPPAL	Palmer Wastewater Pump Station	790	Rain event	198	6.5
4/02/2018	DPPAL	Palmer Wastewater Pump Station	790	Rain event	342	3
5/02/2018	DPPAL	Palmer Wastewater Pump Station	790	Rain event	187	11.5
10/02/2018	DPPAL	Palmer Wastewater Pump Station	790	Rain event	540	14
11/02/2018	DPPAL	Palmer Wastewater Pump Station	790	Rain event	732	39
28/04/2018	DPPAL	Palmer Wastewater Pump Station	790	Rain event	48	17
30/04/2018	DPPAL	Palmer Wastewater Pump Station	790	Rain event	358	3.5
3/06/2018	DPPAL	Palmer Wastewater Pump Station	790	Rain event	457	61
20/06/2018	DPPAL	Palmer Wastewater Pump Station	790	Rain event	1251	3.5

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. The cause is taken from validated site data.

1.3.5 Trend analysis of Pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
790	Palmer St WWPS	6	2	4	8	10	6	Expedited Pump Station Upgrade
1258	Lilburn St WWPS	1.6	0	0	0	0	0	Continue to monitor

1.3.6 Inflow & Infiltration Programme

I&I field investigations are commencing in November 2018 within the Elizabeth Street EOP and Palmer Street subcatchments.

1.3.7 Improvement Works Programme

The current status of the Improvement Works Programme for the Warkworth SMA is described overleaf. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Warkworth to Snells Transfer Pipeline	Design	Installation of a new conveyance sewer from Warkworth to Snells Wastewater Treatment Plant, including intermediate pump station	To cater for population growth	2017-2021
Underway	Warkworth Growth Servicing	Studies and investigations	Warkworth wastewater network expansion for growth	Cater for Auckland's growth	2019-2023

Other improvements works include:

- Operational and site investigations are continuing to identify opportunities for reducing wet weather overflows the Elizabeth St EOP.
- A pump station upgrade has been expedited for the Palmer St pump station.

1.3.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.3.9 Summary

The Palmer St WWPS discharges more frequently than two spills per year and a pump station upgrade has been expedited. Watercare has recognised population growth patterns in this area, and the 'Warkworth Master Planning / Detailed Catchment Study' improvement work is being planned by Watercare in this area to address the significant growth expected in this catchment; the scope and priority of network upgrades or any mitigation measures will be considered in this context. This network will continue to be monitored and will be responded to accordingly, as per Watercare's policies and procedures. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.4 Strategic Management Area 4: Snells Beach/Algies Bay

1.4.1 Overview

Snells Beach and Algies Bay are two adjacent settlements situated on the east coast of the Mahurangi Peninsula, approximately 10 kilometres from the nearby township of Warkworth. The combined population of Snells Beach and Algies Bay (Census, 2013) was 3,625 people, with 2,036 connections. The land use surrounding the townships on the Mahurangi Peninsula includes agricultural and horticultural land and residential development.

	2014/15	2015/16	2016/17	2017/18
No. of connections	1,946	1,971	2,000	2,036
Length of sewer (km)	53	55	56	64

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1101	Martins Bay Camp WWPS	DPMBC	1	Martins Bay Beach
1103	Willjames WWPS	DPWLI	1	Unnamed stream (flowing to Algies Bay)
1104	Brigitte View WWPS	DPBTE	1	Stormwater pond (Brigitte View Road)
1105	Alexander WWPS	DPALE	1	Algies Bay Beach
1106	Dalton WWPS	DPDAL	1	Snells Beach
1107	Cornell Circle WWPS	DPCNL	1	Northern arm of Mahurangi Harbour (Cornell Circle)
1109	Tamatea WWPS	DPTMT	1	Snells Beach
1110	Riverleigh WWPS	DPRGH	1	Stormwater pond (Riverleigh Drive)
1111	Sunburst WWPS	DPSNB	1	Snells Beach
1134	Mariners Grove WWPS	DPMRN	1	Algies Bay Beach

There have been no changes to the schedule of EOPs in this catchment.

1.4.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 17 reported incidents in the Snells Beach/Algies Bay catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

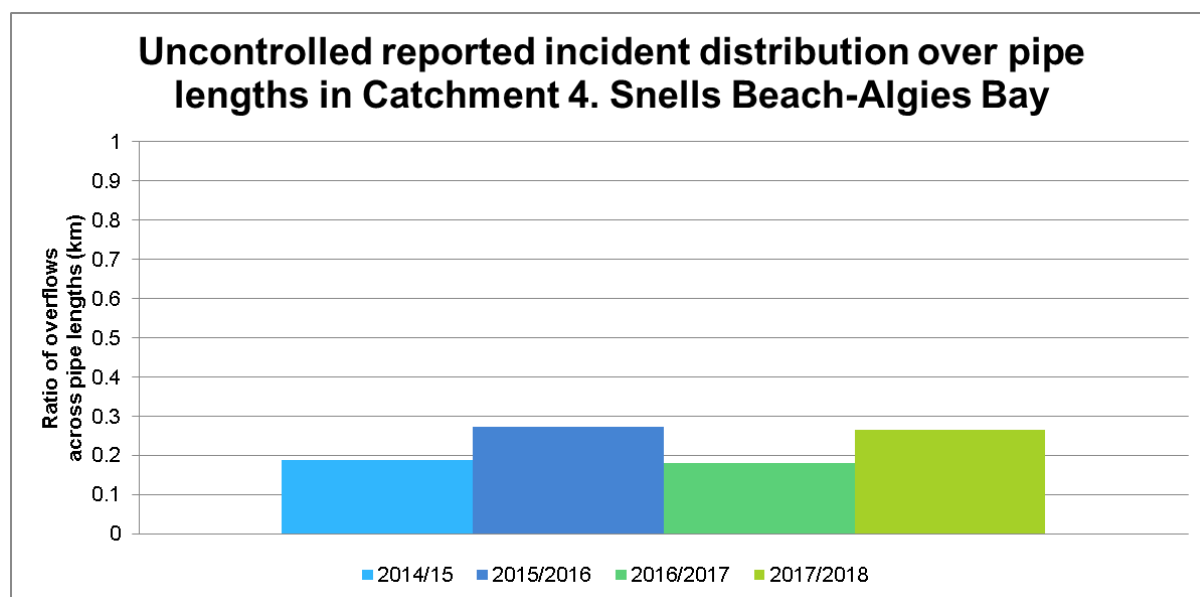
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

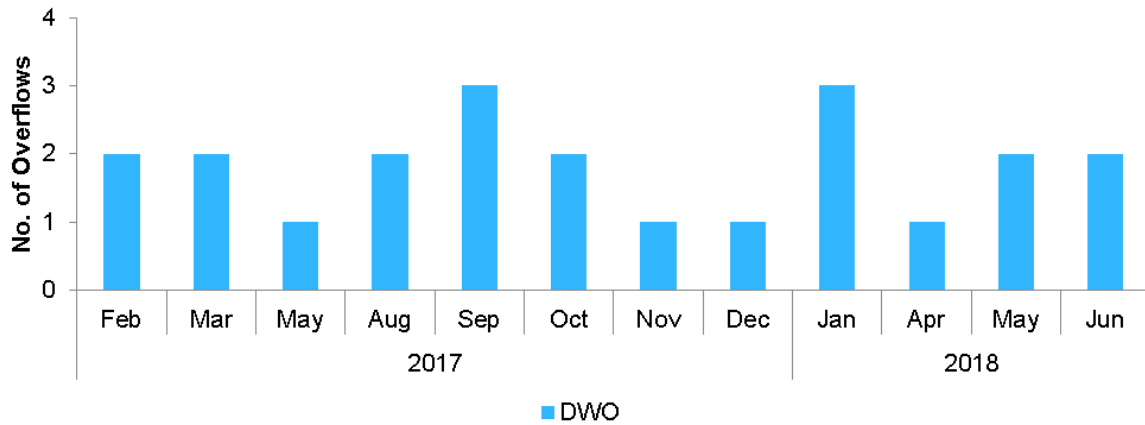
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
6/03/2017	18 Cornel Cir	L1	391	Unknown	0	Line flushed. Gravity line to pump station blocked with fat, blockage removed.
3/05/2018	31 Cornel Cir	L2	68	Fat	0	

1.4.3 Trend analysis of reported incidents

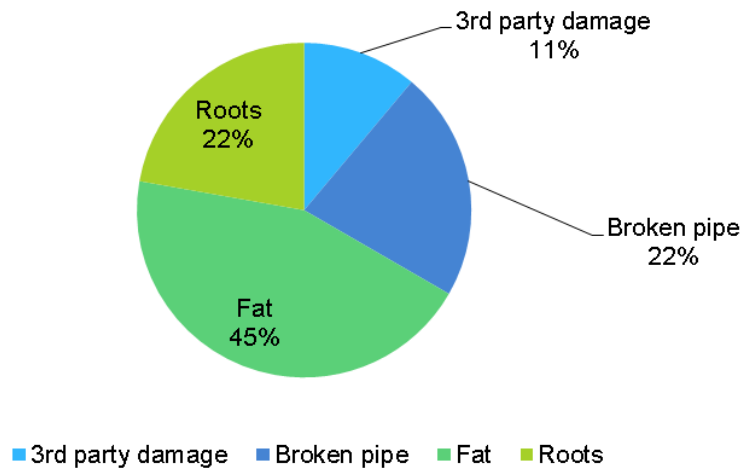
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



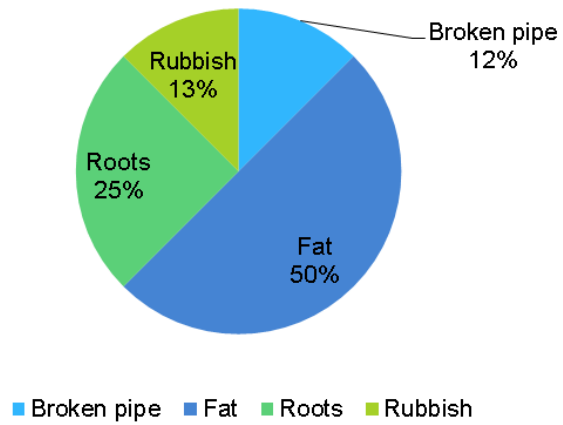
2017-18 Uncontrolled Reported Incidents Data for Catchment 4. Snells Beach/Algies Bay



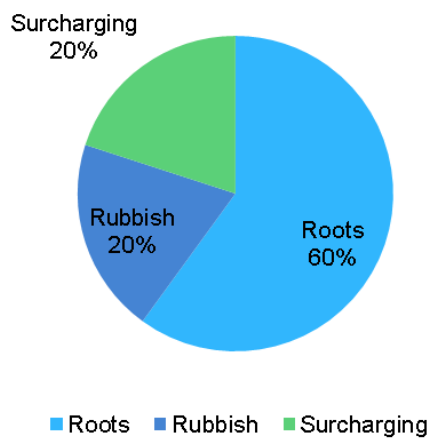
2014-15 Data for Catchment 4. Snells Beach/Algies Bay



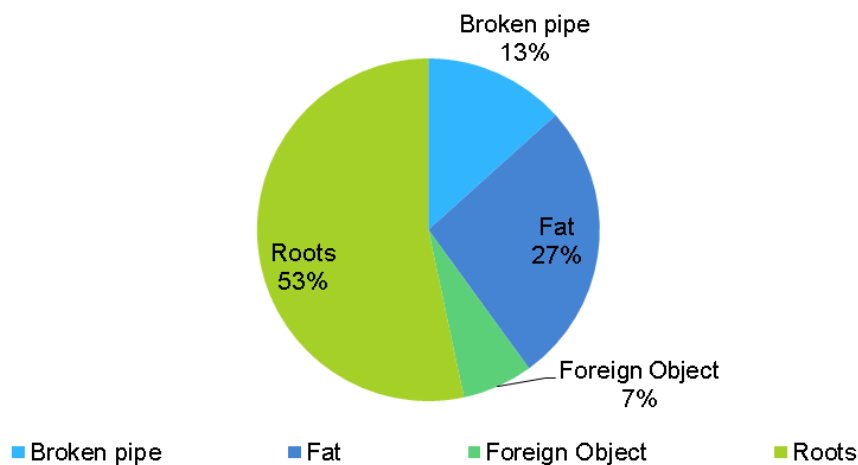
2015-16 Data for Catchment 4. Snells Beach/Algies Bay



2016-17 Data for Catchment 4. Snells Beach/Algies Bay



2017-18 Data for Catchment 4. Snells Beach/ Algies Bay



Trend analysis has been carried out where the cause has been identified.

1.4.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
1/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	663	24.5
2/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	57	9
2/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	13	9
2/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	797	9
3/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1016	10
6/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	2735	42.16
9/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1730	13.51
10/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	298	1.08
10/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	59	1.08
10/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	24	1.08
20/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	2067	16
22/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	61	15
22/07/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1107	15
9/08/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1009	14.5
28/08/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	89	10
28/08/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	308	10
28/08/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	25	10

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
30/08/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	467	20.5
2/09/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	449	18
6/09/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	254	11
6/09/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	37	11
10/09/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	233	6
10/09/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	513	6
17/09/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	234	8.5
18/09/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	728	9.5
19/09/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	23	3
26/09/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	997	8
1/10/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1586	17.5
2/10/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	5	3.5
8/10/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	669	13.5
8/10/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	29	13.5
8/11/2017	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	127	8.5
4/01/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	699	46
5/01/2018	DPCNL	Cornel Wastewater Pump Station	1107	Power failure	150	17
5/01/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	692	17
18/01/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	409	36
1/02/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	159	28.5
3/02/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1427	47.5
5/02/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	108	21
5/02/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	10	21
5/02/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	560	21
6/02/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	61	0
12/02/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1765	3
13/02/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	5	13
13/02/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	2426	13
15/02/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	49	0
7/03/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	67	6
8/03/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	247	2

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
12/03/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	702	14
24/03/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	262	19.5
24/03/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	92	19.5
25/03/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	12	0.5
13/04/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	263	15
14/04/2018	DPCNL	Cornel Wastewater Pump Station	1107	Power outage	109	53
14/04/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Power outage	1866	53
14/04/2018	DPDAL	Dalton Wastewater Pump Station	1106	Power outage	104	53
28/04/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1631	24
30/04/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	2027	3.5
30/04/2018	DPDAL	Dalton Wastewater Pump Station	1106	Rain event	444	3.5
30/04/2018	DPTMT	Tamatea Wastewater Pump Station	1109	Rain event	33	3.5
2/05/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	19	0
13/05/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	328	16
23/05/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1340	30.91
3/06/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1115	38.4
4/06/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1870	30.41
5/06/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	45	4.49
11/06/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	454	16
25/06/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1164	25.5
26/06/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	30	17.5
26/06/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	63	17.5
26/06/2018	DPBTE	Brigitte Wastewater Pump Station	1104	Rain event	1024	17.5

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. Root cause is taken from validated site data.

1.4.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1101	Martins Bay Camp WWPS	0.2	0	0	0	0	0	Continue to monitor
1103	Willjames WWPS	0.4	0	0	1	0	0.25	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1104	Brigitte View WWPS	0.8	1	16	34	66	29.25	Inflow investigation, capacity upgrade
1105	Alexander WWPS	0.6	0	0	0	0	0	Continue to monitor
1106	Dalton WWPS	1.2	0	0	2	2	1	Continue to monitor
1107	Cornell Circle WWPS	0.4	0	0	0	2	0.5	Continue to monitor
1108	Hamatana WWPS	0	0	0	0	0	0	Continue to monitor
1109	Tamatea WWPS	1	0	0	0	1	0.25	Continue to monitor
1110	Riverleigh WWPS	0.2	0	0	0	0	0	Continue to monitor
1111	Sunburst WWPS	0.	0	0	0	0	0	Continue to monitor
1134	Mariners Grove WWPS	0.8	0	0	0	0	0	Continue to monitor

1.4.6 Inflow & Infiltration Programme

Smoke testing within the Brigitte View WWPS catchment was undertaken to investigate high incoming flows to the pump station in 2017.

1.4.7 Improvement Works Programme

The current status of the Improvement Works Programme for the SMA is described overleaf. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	Brigitte View WWPS Operational Upgrade	Operational	Highly frequent wet weather overflows	Reduced frequency and volume of wet weather overflows	2018
Planned	Brigitte View WWPS Capacity Upgrade	Operational	High growth and development in the catchment	Development serviced and improved capacity	To be confirmed depending upon development

Detail of the progress of the Brigitte View WWPS investigations and operational improvements is summarised below:

- As mentioned above, smoke testing within the Brigitte View WWPS catchment was undertaken to investigate high wet weather flows.
- A new rising main was constructed at Brigitte View WWPS as part of the Alexander WWPS upgrade; however, the size of the new rising main was determined based upon an incorrect pump configuration and the current pumps could not achieve the expected flows.
- Investigations were undertaken to determine whether a suitable pump configuration to achieve the flows could be installed, however, this was found to be impossible.
- Proposed new development in the upstream catchment is not able to be serviced without an increase in capacity for this pump station, and hence a substantial

upgrade is required. This upgrade will be sized to accept growth mitigating wet weather overflows.

- Flow gauging has been undertaken and the property developer is proposing a new pump station be built for the development as well as the flows from Brigitte WWPS. Brigitte WWPS will then be decommissioned.

1.4.8 Erosion Control Measures

No works related to erosion control were carried out in this SMA between 1 July 2017 and 30 June 2018.

1.4.9 Summary

Brigitte View WWPS (Type 1 EOP) has discharged more frequently than two spills per year. This WWPS requires upgrading in order to service proposed development and major upgrades will relate to this need. There has been an increase in the ratio of overflows over pipe length. Trend analysis shows that roots and fats are the most predominant cause of overflows. The overflow history will be analysed and utilised when reviewing future network improvement programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.5 Strategic Management Area 5: Waiwera

1.5.1 Overview

Waiwera is located at the southern end of the Waiwera Estuary, and has 129 wastewater connections. This small coastal town is well known for its geothermal springs and coastal and estuarine environments. The town is a major tourism destination and characterised by holiday batches and apartments, motels and Waiwera Thermal Resort. There are also a significant number of residential properties and some light commercial properties. The township is surrounded by bush-clad hills, small farms and lifestyle blocks.

	2014/15	2015/16	2016/17	2016/17
No. of connections	128	128	128	129
Length of sewer (km)	3	3	3	4

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1098	Waiwera Camp WWPS	DPWAC	1	To land
1099	Waiwera Town WWPS	DPWWR	1	Waiwera Estuary
1100	Weranui Road WWPS	DPWER	1	Waiwera Estuary

There have been no changes to the schedule of EOPs in this catchment.

1.5.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

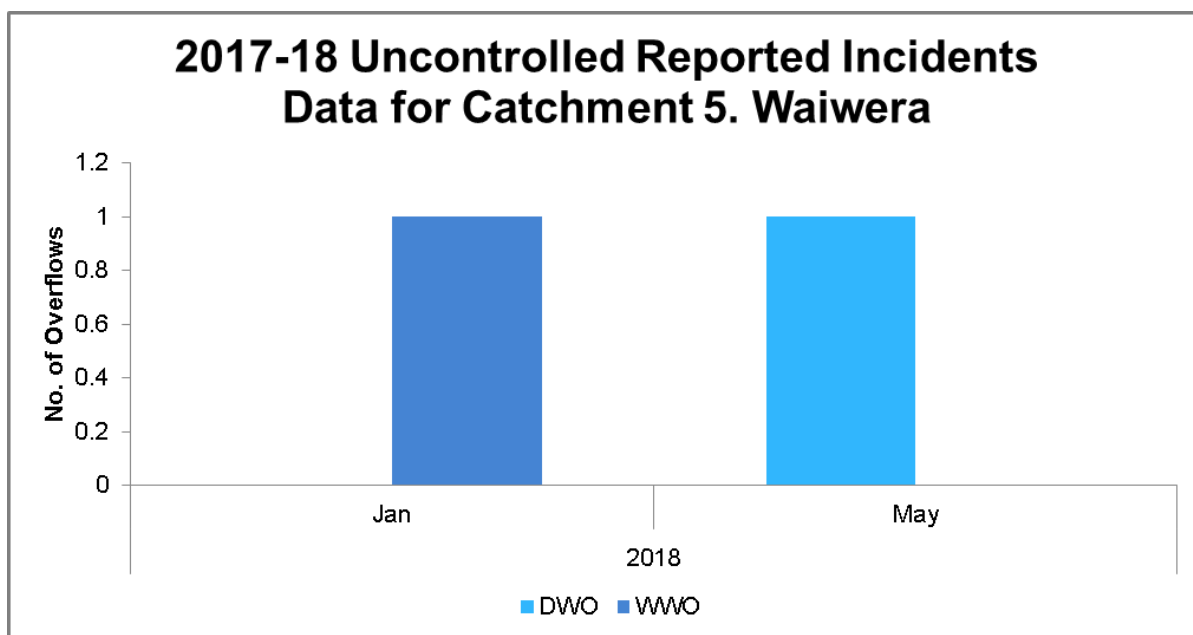
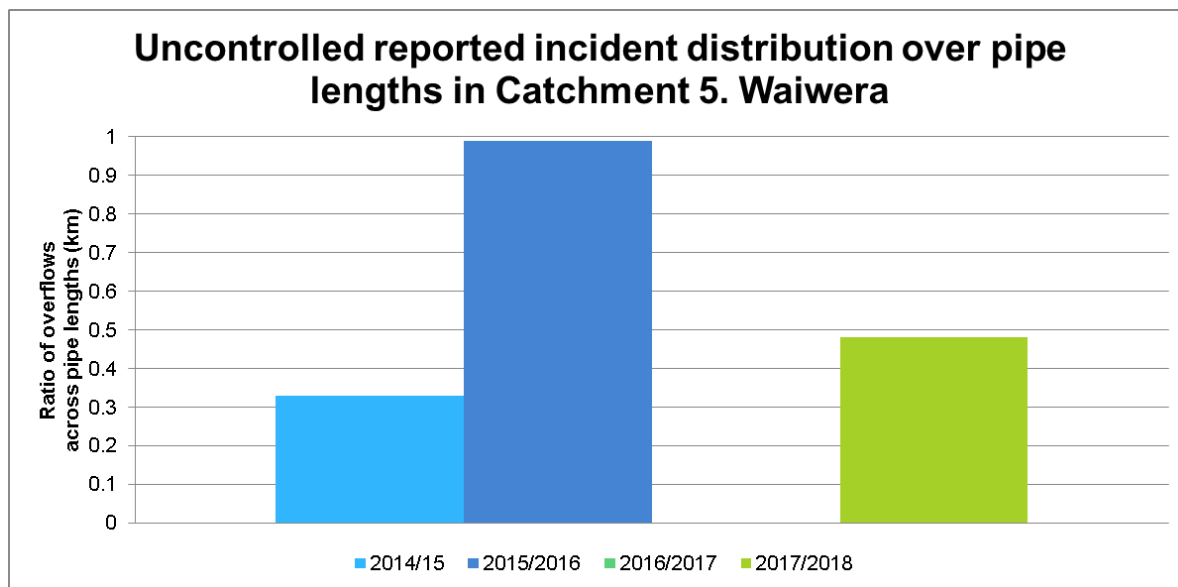
There were a total of 2 reported incidents in the Waiwera catchment.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

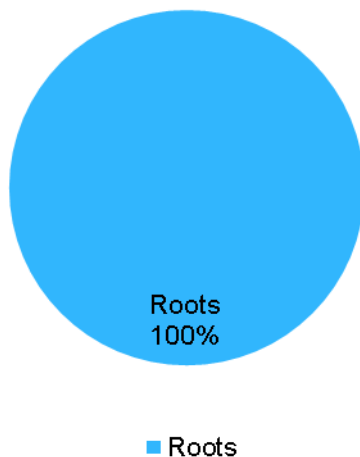
There were no repeat uncontrolled reported incidents in the Waiwera catchment.

1.5.3 Trend analysis of reported incidents

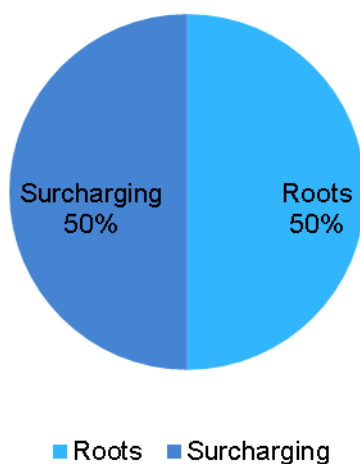
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



2014-15 Data for Catchment 5. Waiwera



2015-16 Data for Catchment 5. Waiwera

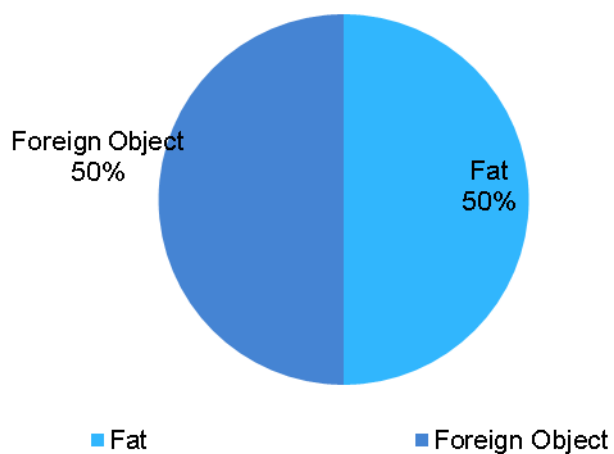


2016-17 Data for Catchment 5. Waiwera

No data to display.

■ Grand Total

2017-18 Data for Catchment 5. Waiwera



Trend analysis has been carried out where the cause has been identified. There were no overflow incidents in 2016-17 in this catchment.

1.5.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2017 and 30 June 2018.

1.5.5 Trend analysis of pump station overflows

There have been no wet weather overflows at the EOPs to trend.

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1098	Waiwera Camp WWPS	0.4	0	0	0	0	0	Continue to monitor
1099	Waiwera Town WWPS	0.4	0	0	0	0	0	Continue to monitor
1100	Weranui Road WWPS	-	0	0	0	0	0	Continue to monitor

1.5.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be carried out as part of Watercare's I&I programme. I&I may not have a significant impact on the network and other remedial works may better improve the network performance.

1.5.7 Improvement Works Programme

The current status of the Improvement Works Programme for this SMA is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Waiwera servicing study	Studies and investigations	To determine whether Waiwera will be connected to the Army Bay SMA	If this is identified as the preferred solution, future capital works will be required to convey flows. Discharge frequencies at these EOPs will not be affected.	2017-2018
Underway	Waiwera Diversion to Hatsfield	Concept Design	Provide a 20l/s pump station, 2,100m of 180mm rising main and 2,500 of 250mm gravity sewer	Cater for growth in the area	2019-2022

1.5.8 Erosion Control Measures

No works related to erosion control were carried out in this SMA between 1 July 2017 and 30 June 2018.

1.5.9 Summary

There continue to be no EOPs which discharged more frequently than two spills per year. The ratio of overflows to pipe length has decreased in this reporting period. The data indicates that dry weather overflows are not currently a concern in this catchment. No significant changes have been made to the network as a whole. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.6 Strategic Management Area 6: Helensville

1.6.1 Overview

Helensville is situated on the banks of the Kaipara River at the southern end of the Kaipara Harbour. The Kaipara River catchment comprises mostly rural land uses (predominantly pastoral farming), with some plantation forest, horticulture and, increasingly - lifestyle blocks. The Helensville wastewater network was installed in the 1970's, and services the townships of Parakai and Helensville. The Helensville wastewater treatment plant (WWTP) is located between the two townships on a peninsula created by a bend of the Kaipara River. The connected population is 3,953 (Census, 2013), with 1,476 wastewater connections.

	2014/15	2015/16	2016/17	2017/18
No. of connections	1,461	1,457	1,463	1,476
Length of sewer (km)	30	30	31	36

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1090	Kowhai WWPS	DPKOW	1	Kaipara River
1092	Mill WWPS	DPMIL	1	Kaipara River
1093	Miro WWPS	DPMRO	1	Awaroa Stream
1094	Outfall WWPS	DPOUT	1	Kaipara River
1095	Springs Rd WWPS	DPSPR	1	Kaipara River
1096	Parakai WWPS	DPPAI	1	Kaipara River
1097	Chic Gardens WWPS	DPCIC	1	Kaipara River

There have been no changes to the schedule of EOPs in this catchment.

1.6.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
10/04/2018	DPSPR	Springs Road Wastewater Pump Station	1095	Power outage	27	8.5

Reported Incidents

There were a total of 14 reported incidents in the Helensville catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

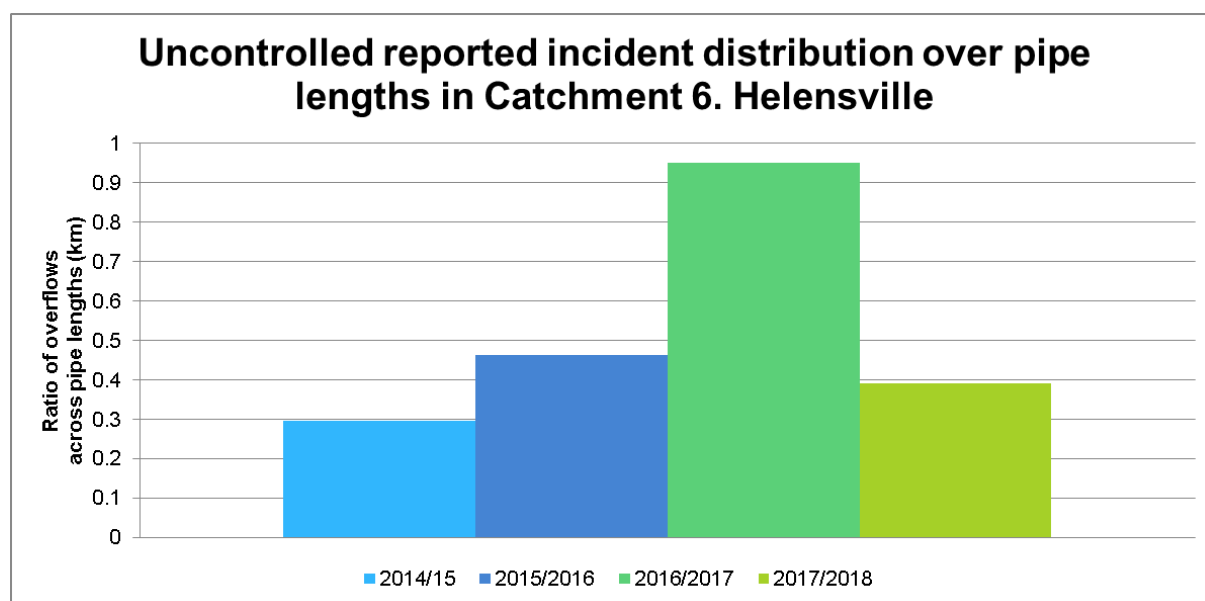
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

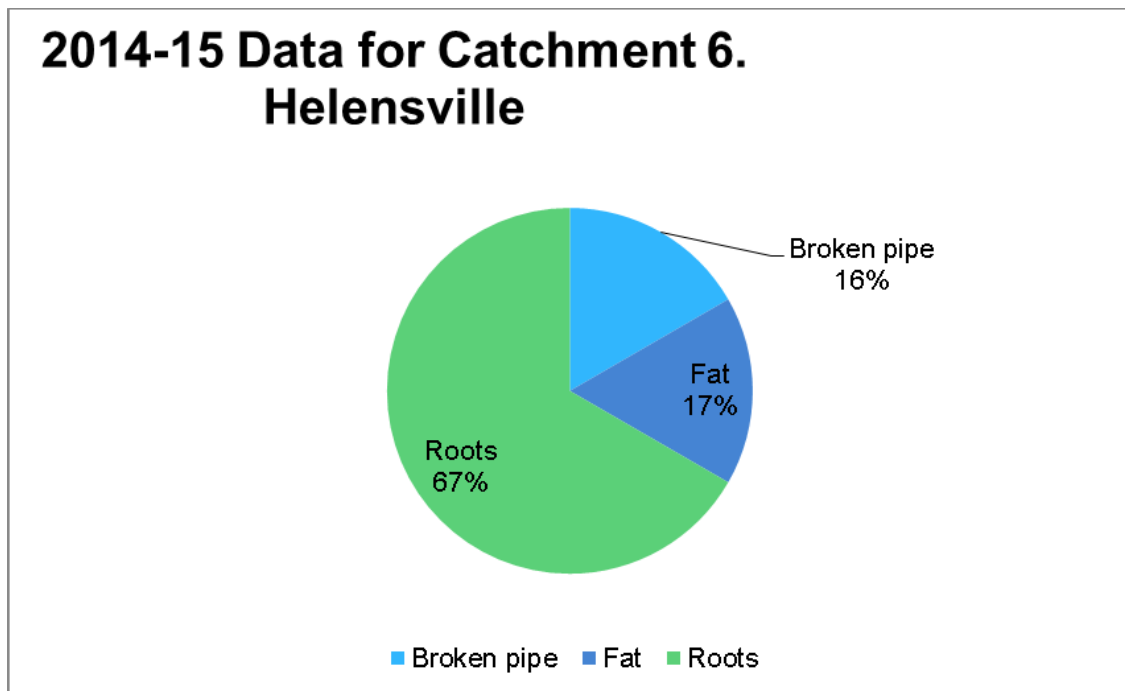
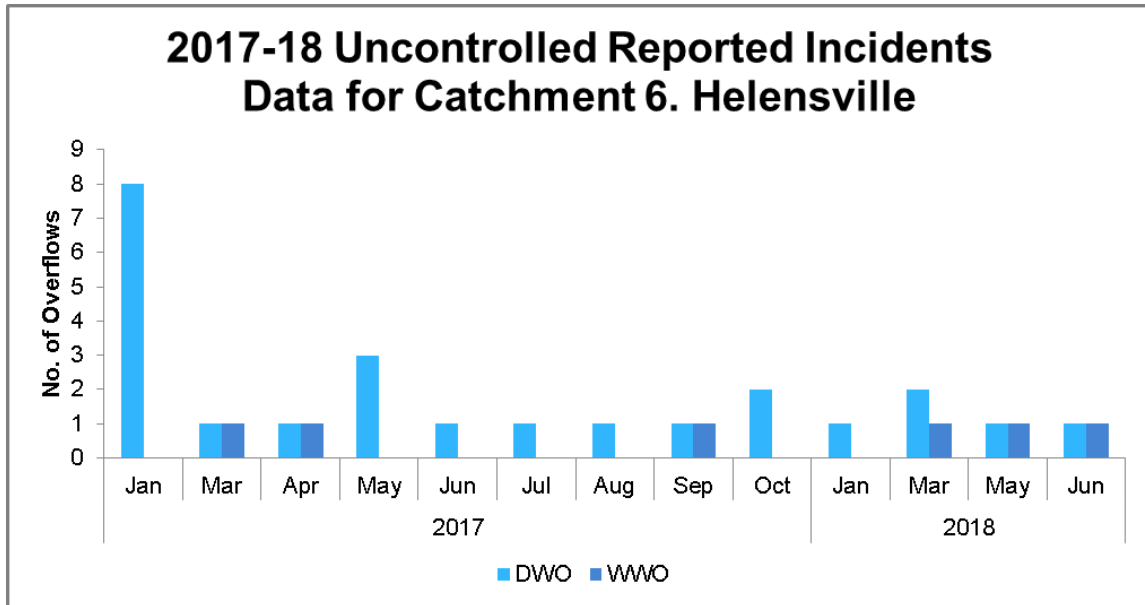
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
2/08/2016	6 Hand Rd	L1	201	Unknown	1	Lines cleaned, escalated to engineer for CCTV pipe condition assessment
20/06/2017	6 Hand Rd	L1	86	Roots	0	
27/09/2017	6 Hand Rd	L1	175	Surcharging	0.5	
7/05/2017	1/54 Garfield Rd	L1	334	Unknown	0	Cracked pipe, under investigation
20/10/2017	1/54 Garfield Rd	L1	447	Third Party Damage	0	

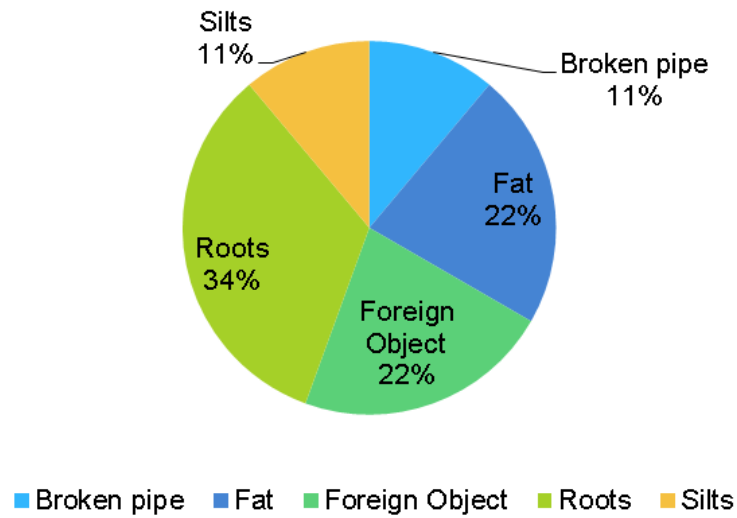
1.6.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.

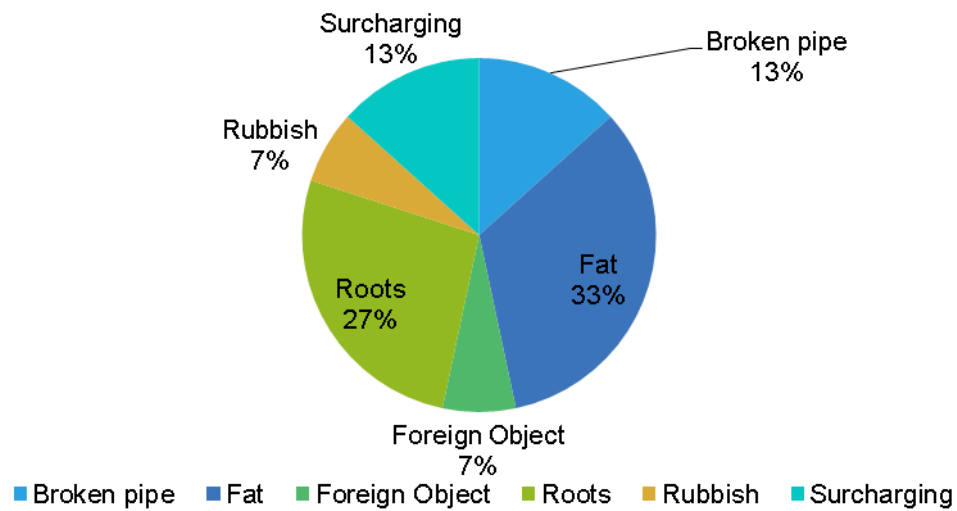


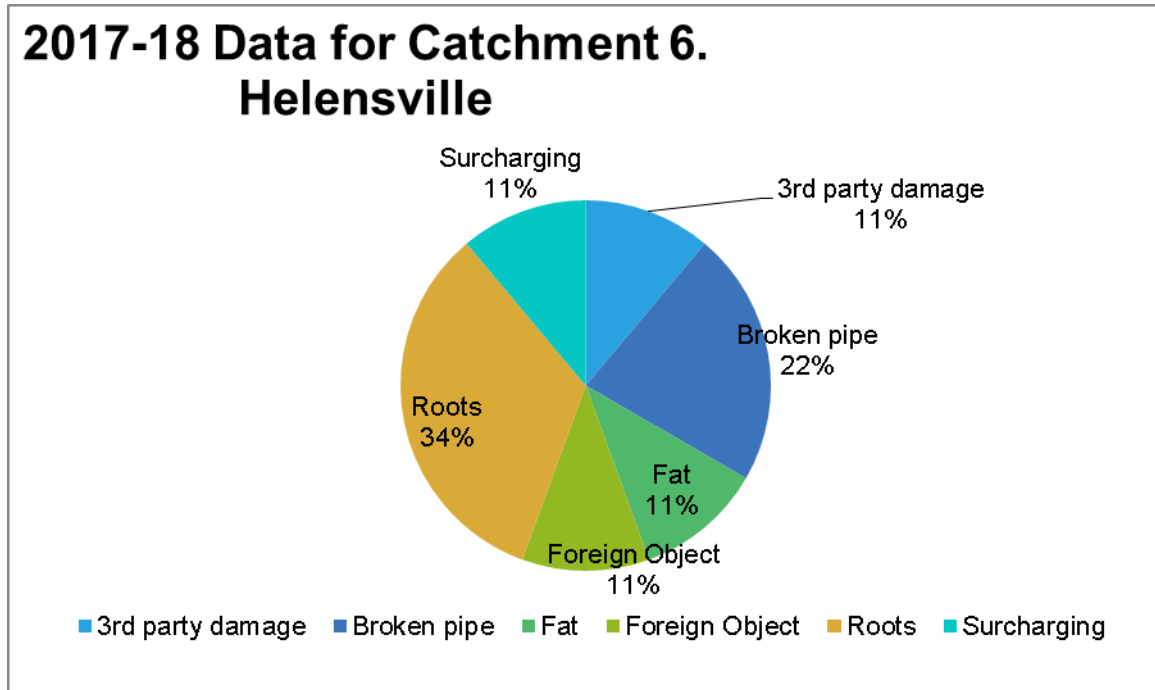


2015-16 Data for Catchment 6. Helensville



2016-17 Data for Catchment 6. Helensville





Trend analysis has been carried out where the cause has been identified.

1.6.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
13/02/2018	DPOUT	Outfall Wastewater Pump Station	1094	Rain event	306	37
11/04/2018	DPKOW	Kowhai Wastewater Pump Station	1090	Power outage	284	18.5
11/04/2018	DPPAI	Parakai Wastewater Pump Station	1096	Power outage	304	18.5
11/04/2018	DPSPR	Springs Road Wastewater Pump Station	1095	Power outage	193	18.5
13/04/2018	DPSPR	Springs Road Wastewater Pump Station	1095	Power outage	71	15

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. The cause is taken from validated site data.

1.6.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1090	Kowhai WWPS	0.80	1	1	0	1	0.75	Continue to monitor
1092	Mill WWPS	0.00	0	0	0	0	0	Continue to monitor
1093	Miro WWPS	0.20	0	0	0	0	0	Continue to monitor
1094	Outfall WWPS	1.20*	0	0	1	1	0.5	Continue to monitor
1095	Springs Rd WWPS	0.40*	0	0	1	2	0.75	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1096	Parakai WWPS	0.00	0	0	0	1	0	Continue to monitor
1097	Chic Gardens WWPS	0.00	0	0	0	0	0	Continue to monitor

*Based on 5 years of SCADA data (Jan 2007 – Dec 2011); not reported in NDC AEE.

1.6.6 Inflow & Infiltration Programme

A desktop I&I assessment is currently being carried out of SCADA data to understand wastewater I&I network performance with field investigations to follow.

1.6.7 Improvement Works Programme

No significant Improvement Works related to overflows have as yet been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.6.8 Erosion Control

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.6.9 Summary

There was one Type 1 EOP which discharged more frequently than two spills this year due to power failure; this will be investigated. There has been large decrease in overflow ratio from the previous reporting period. Trend analysis shows an increase in roots as the primary cause. The overflow history will be analysed and utilised when reviewing future network improvement programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

Strategic Management Area 7: Army Bay

1.7 Catchment 7 – Orewa

1.7.1 Overview

Orewa lies on the Hibiscus Coast, just north of the base of the Whangaparaoa Peninsula, approximately 40 km north of central Auckland. The population of Orewa was 12,597 in the 2013 census, with currently 7,738 wastewater connections. The Orewa wastewater network also serves Hatfield Beach, and Silverdale North. Current land use is predominantly residential, with several commercial nodes. Parts of the existing urban area are currently undeveloped and therefore not serviced by wastewater infrastructure. Further, there is an extensive area of indicative future urban area in the west of this catchment. The eastern boundary of the catchment is formed by the coastal environment of Whangaparaoa Bay.

	2014/15	2015/16	2016/17	2017/18
No. of connections	6,216	6,791	7,402	7,738
Length of sewer (km)	132	147	155	187

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
803	Hatfields Beach WWPS	DPHAT	1	Otanerua Stream
807	Lakeside WWPS	DPLKE	1	Orewa River Estuary
814	Riverside Rd WWPS	DPRVS	1	Unnamed tributary of Orewa River Estuary (east)
819	Terminal WWPS	DPTER	1	Orewa River Estuary
1255	Jelas Rd WWPS	DPJEL	1	Southern arm of Orewa River Estuary
1259	Orewa WWPS	DPORE	1	Orewa River Estuary
1262	Florence Ave WWPS	DPFLO	1	To land
1265	Tauranga Place WWPS	DPTAP	1	Northern arm of Orewa River Estuary
1266	Maygrove WWPS	DPMAY	1	Orewa River Estuary
1269	Orewa Bridge WWPS	DPORB	1	Orewa River Estuary

There have been no changes to the schedule of EOPs in this catchment

1.7.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
14/05/2018	DPTER	Terminal Wastewater Pump Station	819	Mechanical Faults	30	1

Reported incidents

There were a total of 39 reported incidents in the Orewa catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

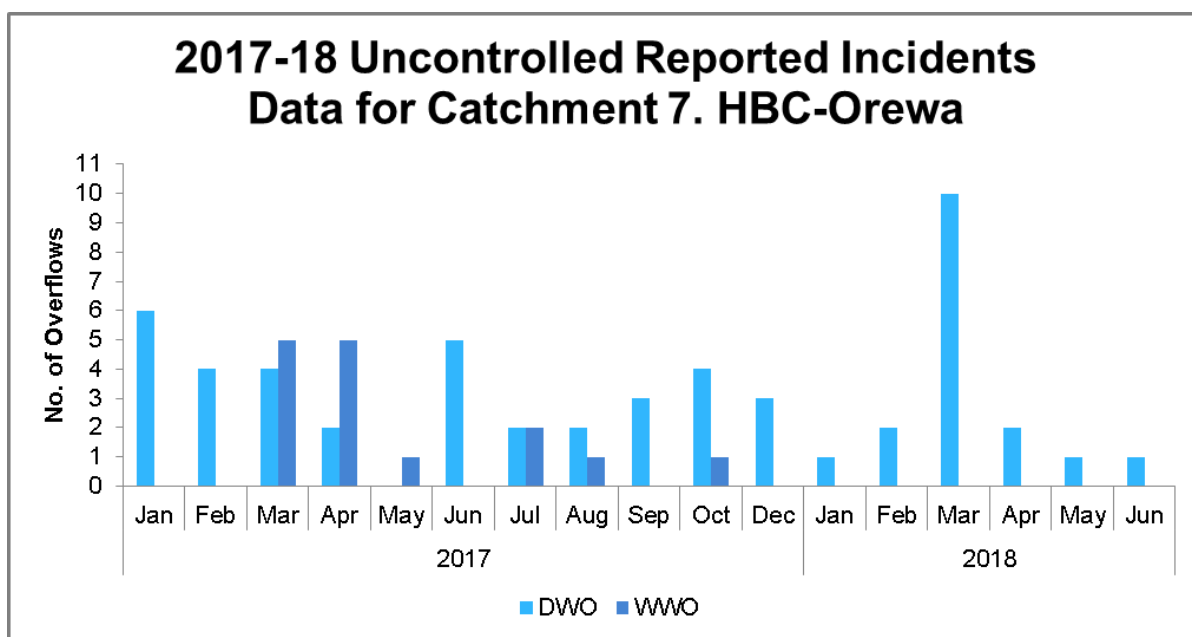
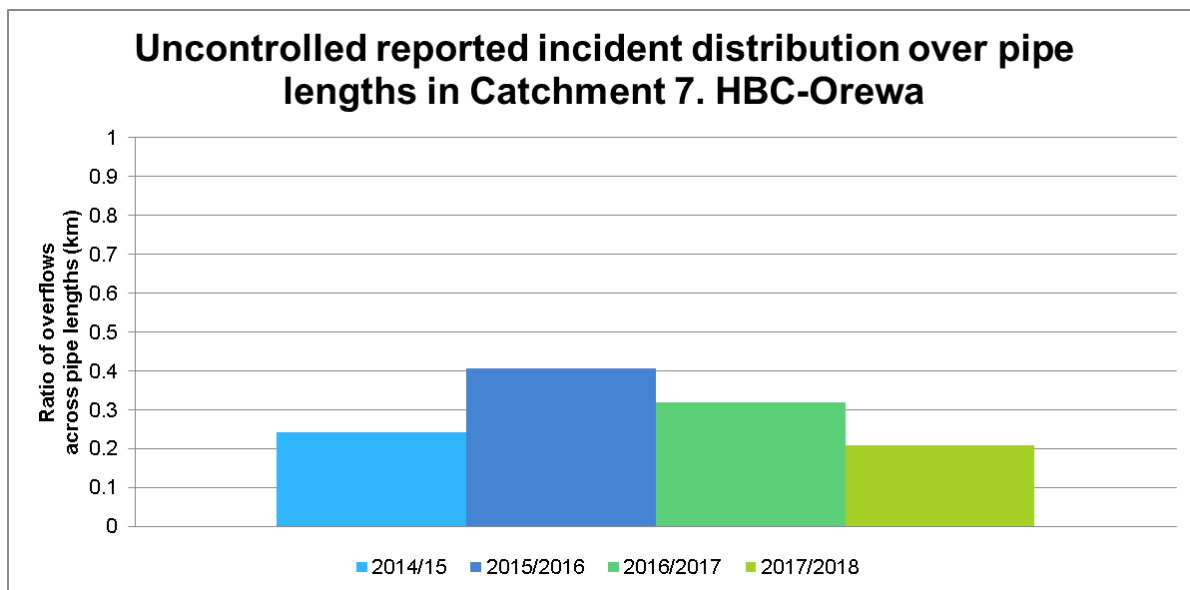
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

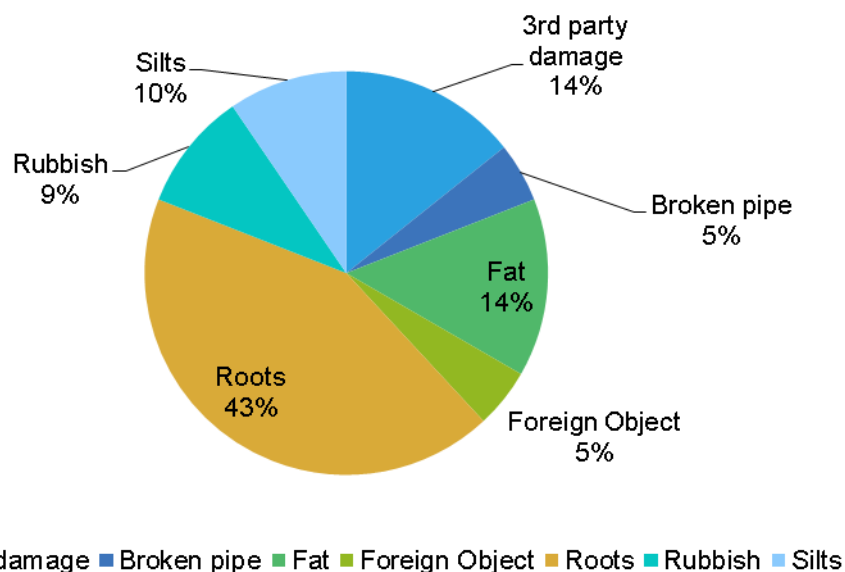
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
10/03/2017	2/14C Moffat Rd	L1	474	Roots	76.5	Line heavy flushed
5/04/2017	2/14C Moffat Rd	L1	361	Foreign object	35.5	
13/03/2017	2/14D Moffat Rd	L1	229	Fat	0.5	
25/03/2017	2/14D Moffat Rd	L1	270	Fat	0	
12/04/2017	2/14C Moffat Rd	L1	460	Fat	52	
2/07/2017	2/14C Moffat Rd	L1	185	Fat	9	
29/03/2018	Bonair Cres	L1	575	Rags	0	Fat in connection to LPS removed
31/03/2018	Bonair Cres	L3	482	Fat	0	
14/03/2018	8A Orewa Heights Cres	L1	559	Unknown	1	Rootcut
18/03/2018	8A Orewa Heights Cres	L1	542	Roots	0	
7/10/2016	7C Centreway Rd	L1	168	Unknown	6.84	Extensive fats and wet wipes removed
25/06/2017	7C Centreway Rd	L1	494	Fat	2.5	
16/04/2018	7C Centreway Rd	L1	565	Fat	1.5	
11/01/2017	Andrew Jack Rd	L1	194	Unknown	0	LPS valves repaired
21/03/2018	Andrew Jack Rd	L1	231	Unknown	2	
3/06/2017	4 Moffat Rd	L1	227	Fat	7	Joint displacement repaired
9/12/2017	4 Moffat Rd	L1	622	Fat	0	
5/10/2017	127 Grovenor Dr	L1	177	Unknown	0	Collapsed pipe repaired
9/10/2017	127 Grovenor Dr	L1	161	Broken pipe	1	
23/02/2018	28 Driftwood Dr	L1	558	Roots	0	Rootcut
1/03/2018	28 Driftwood Dr	L1	208	Roots	0	

1.7.3 Trend analysis of reported incidents

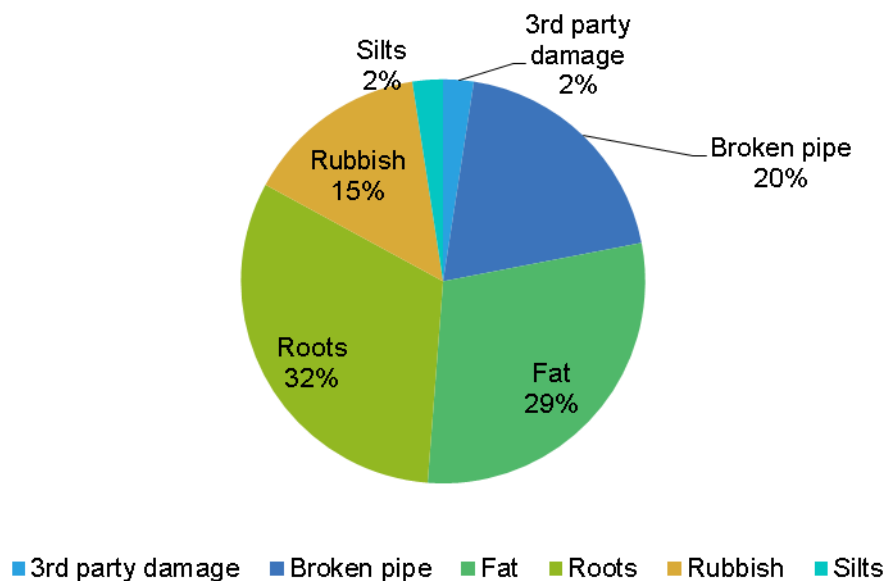
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



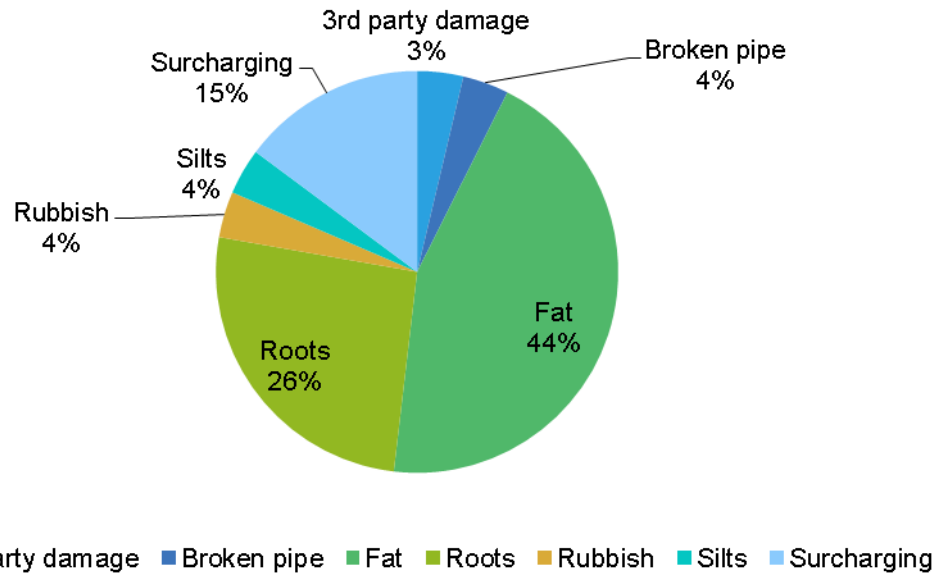
2014-15 Data for Catchment 7. Orewa



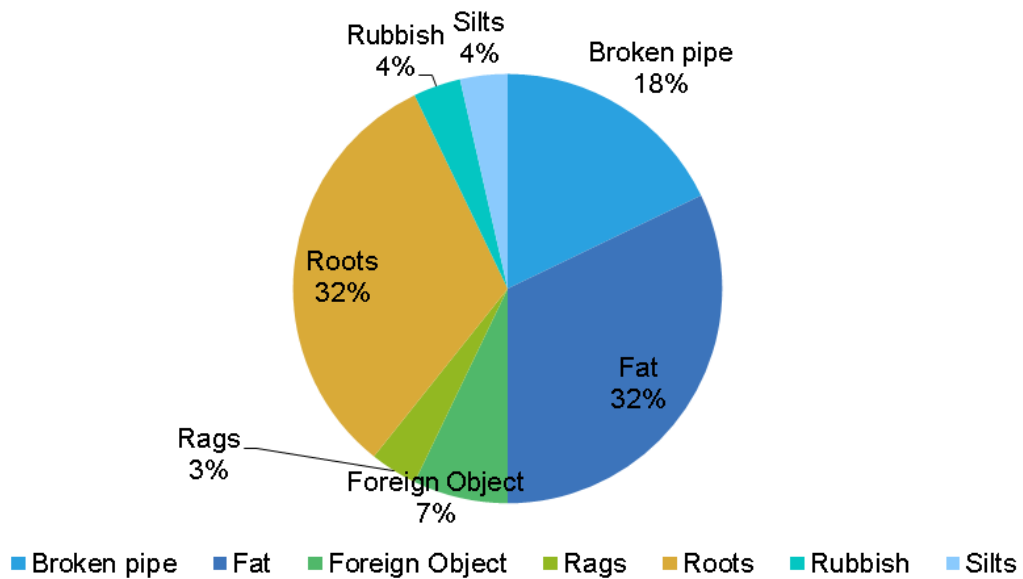
2015-16 Data for Catchment 7. Orewa



2016-17 Data for Catchment 7. Orewa



2017-18 Data for Catchment 7. Orewa



Trend analysis has been carried out where the cause has been identified.

1.7.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2017 and 30 June 2018.

1.7.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
803	Hatfields Beach WWPS	0.4	0	0	1	0	0.25	Continue to monitor
807	Lakeside WWPS	0.7	1	0	0	0	0.25	Continue to monitor
814	Riverside Rd WWPS	0	0	0	0	0	0	Continue to monitor
819	Terminal WWPS	0.1	0	0	0	0	0	Continue to monitor
1255	Jelas Rd WWPS	0.4	1	0	0	0	0.25	Continue to monitor
1259	Orewa WWPS	0.8	0	0	3	0	0.75	Continue to monitor
1262	Florence Ave WWPS	0	0	0	0	0	0	Continue to monitor
1265	Tauranga Place WWPS	0	1	0	0	0	0.25	Continue to monitor
1266	Maygrove WWPS	0.2	0	0	0	0	0	Continue to monitor
1269	Orewa Bridge WWPS	0	0	0	0	0	0	Continue to monitor

1.7.6 Inflow & Infiltration Programme

A review of I&I network performance for this catchment will be carried out as part of the Army Bay SMA modelling and planning study; this will inform I&I field investigations.

1.7.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Army Bay WWTP outfall	Project execution	Required to provide an alternative outfall for use during wet weather events	Will provide for growth and allow network restrictions related to WWTP constraints to be removed from trunk pump stations, reducing the risk of spills	2015-2019

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Army Bay SMA model update and calibration	Studies and investigations	Required to determine local network improvements to reduce overflows, and plan for growth	Calibrated model which can be used to develop options for achieving levels of service. Flow gauging complete.	2015 -2018
Planned	Army Bay SMA options assessment	Studies and investigations	Required to determine local network improvements to reduce overflows, and plan for growth	Identification of preferred upgrade options to manage growth without deteriorating wet weather overflow frequencies.	2018-2020
Future	Rodney Hibiscus Coast Servicing	Studies and investigations	Whangaparaoa wastewater transmission augmentation	Reduction of wet weather overflows	2020-2024
Complete	Whangaparaoa Chemical Dosing Trial	Complete	Trial of Magnesium Hydroxide to improve network integrity	Reduction of corrosion of assets	November 2017-April 2018

1.7.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.7.9 Summary

There have been no EOPs which discharged more frequently than two spills per year on average in this reporting period. There has been a decrease in the density of overflows across the pipe network. Trend analysis shows the most common cause of overflows being roots and fats. The overflow history will be analysed and utilised when reviewing future network improvement programmes. Hibiscus Coast is a major growth area. The Army Bay SMA modelling and planning study will inform network operational improvements and long-term network performance improvements. Growth in this catchment has led to the network being extended by 31.7km. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.8 Catchment 8 – Weiti

1.8.1 Overview

The Weiti catchment comprises two main town centres – Silverdale and Stillwater, which are both serviced by the Hibiscus Coast wastewater network. They are part of the area known as the Hibiscus Coast. Stillwater is situated on the west bank of the Weiti River, immediately west of the Whangaparaoa Peninsula. Silverdale is located further upstream, also on the banks of the Weiti River. The population of Silverdale, Stillwater and surrounds was 2,316 in 2013 (Census, 2013), with 1,128 wastewater connections.

The townships are surrounded by rural pastoral land, lifestyle blocks and Weiti Forest, which lies immediately south of Stillwater town. The Silverdale Township consists predominantly of industrial/commercial land use and a small amount of medium and low density residential development.

	2014/15	2015/16	2016/17	2017/18
No. of connections	1,093	1,100	1,112	1,128
Length of sewer (km)	39	39	39	45

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
795	Blue Gum WWPS	DPBLU	1	Weiti River
798	Duck Creek WWPS	DPDUC	1	Weiti Estuary
801	Foundry WWPS	DPFOU	1	Weiti River
806	Karaka Cove WWPS	DPKKC	1	Unnamed Stream (Karaka Cove)
812	Poplar WWPS	DPPOP	1	Weiti Estuary
817	Stillwater WWPS	DPSTW	1	Weiti Estuary
821	Wade River WWPS	DPWAD	1	Weiti Estuary
822	Weiti WWPS	DPWEI	1	Weiti River
1267	Coastal Heights WWPS	DPCOA	1	Weiti Estuary

There have been no changes to the schedule of EOPs in this catchment.

1.8.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported incidents

There were a total of 19 reported incidents in the Weiti catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the

reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

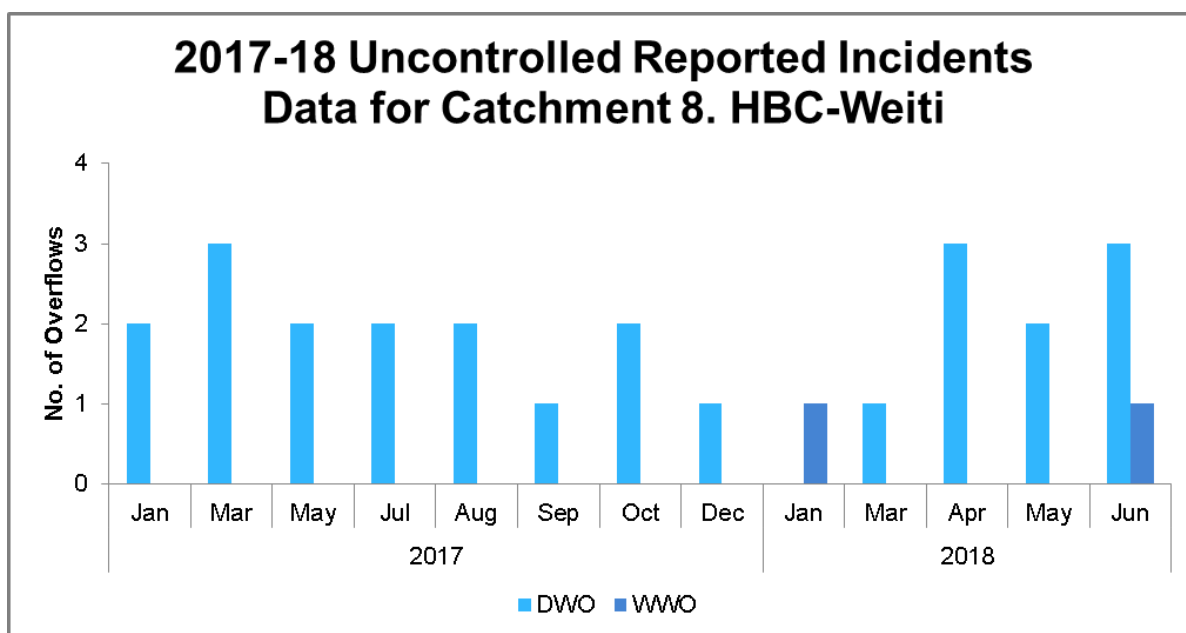
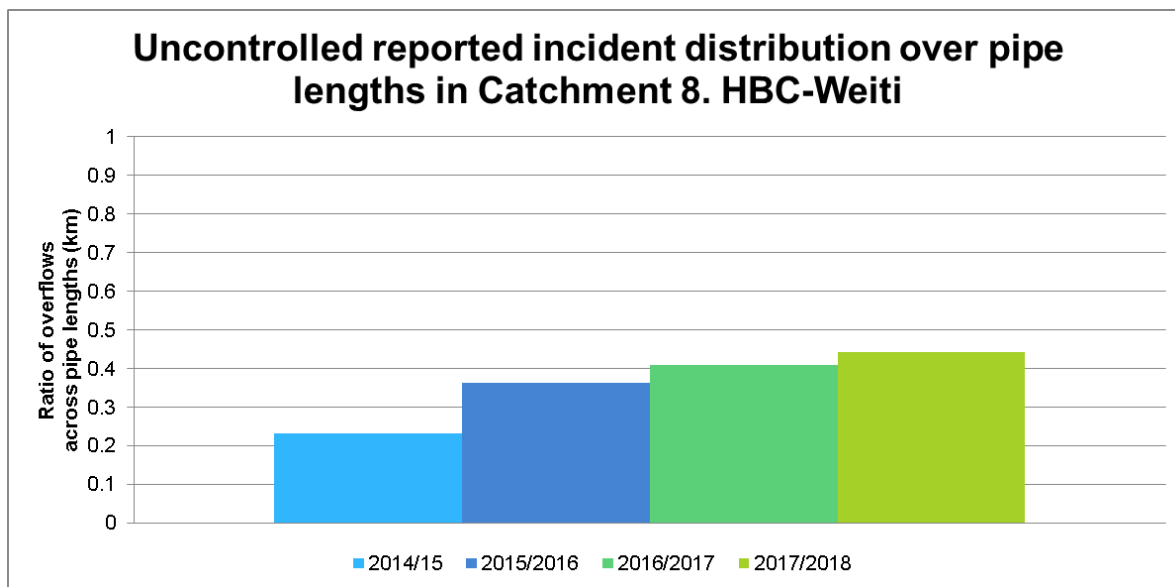
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

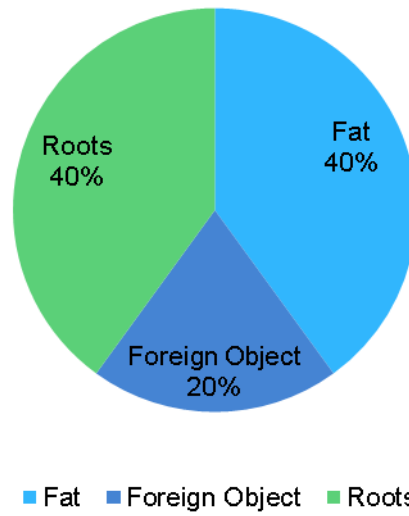
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
18/03/2017	Titan PI	L1	572	Unknown	0	Debris/fats build up in syphon. Under investigation. Flushed line, looking at long term solution
23/05/2017	15 Titan PI	L1	118	Unknown	0	
6/04/2018	11 Titan PI	L2	130	Unknown	0	
12/04/2018	15 Titan PI	L1	606	Foreign Object	4	
26/05/2018	15 Titan PI	L2	147	Silts	2.49	
15/08/2016	17 Titan PI	L1	128	Fat	0	
13/09/2016	17 Titan PI	L1	253	Surcharging	0	
17/09/2016	17 Titan PI	L1	448	Unknown	7.38	
19/04/2018	14 Titan PI	L1	422	Fat	0	
2/05/2018	17 Titan PI	L3	442	Fat	0	
23/06/2018	14 Titan PI	L2	505	Rubbish	2.5	
5/10/2016	16 Silverdale St	L1	62	Surcharging	8.5	Debris/fats build up in syphon. Under investigation by Network Engineer and Trade Waste team for heavy fats in the area.
3/03/2017	16A Silverdale St	L1	139	Fat	0	
31/07/2017	16 Silverdale St	L1	538	Fat	0	
4/06/2018	16 Silverdale St	L2	225	Fat	30.41	
27/12/2016	35 Duck Creek Rd	L1	138	Unknown	0	Heavy flushed main
15/08/2017	35A Duck Creek Rd	L1	406	Unknown	4.5	
17/03/2017	21 Poplar Rd	L1	510	Fat	0	Heavy fat build up in pipe bridge
5/01/2018	21 Poplar Rd	L1	83	Surcharging	17	
10/06/2018	21 Poplar Rd	L1	719	Rags	0.5	
29/08/2017	3 Coastal Hts	L1	160	Fat	0	Heavy flushed line
3/09/2017	3 Coastal Hts	L1	116	Fat	0	

1.8.3 Trend analysis of reported incidents

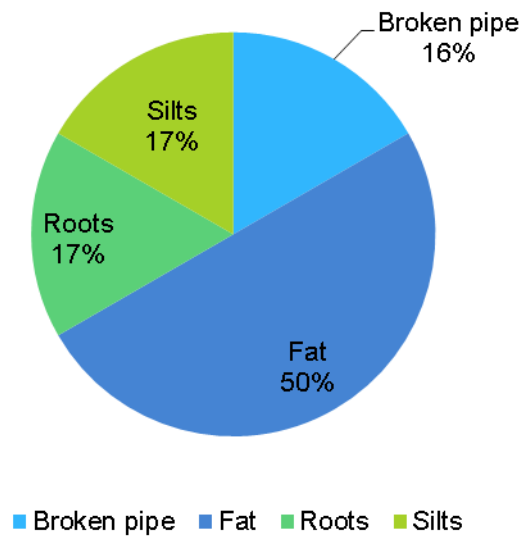
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



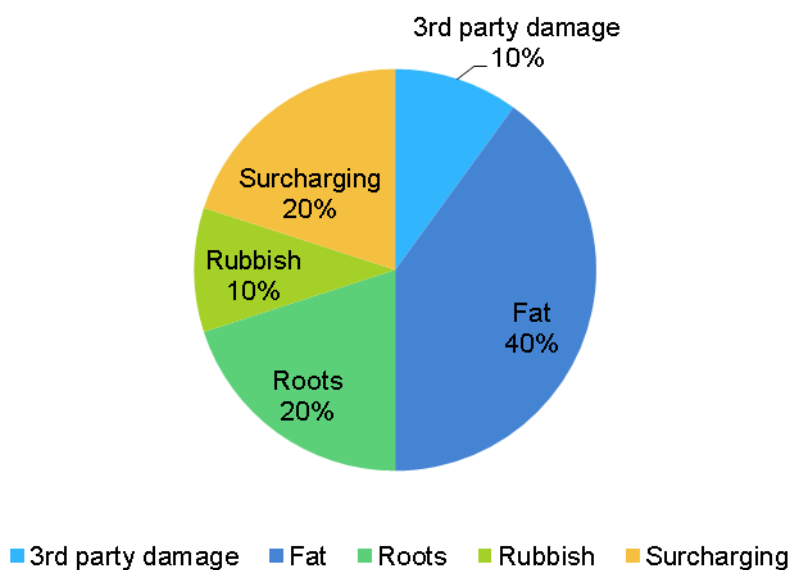
2014-15 Data for Catchment 8. Weiti



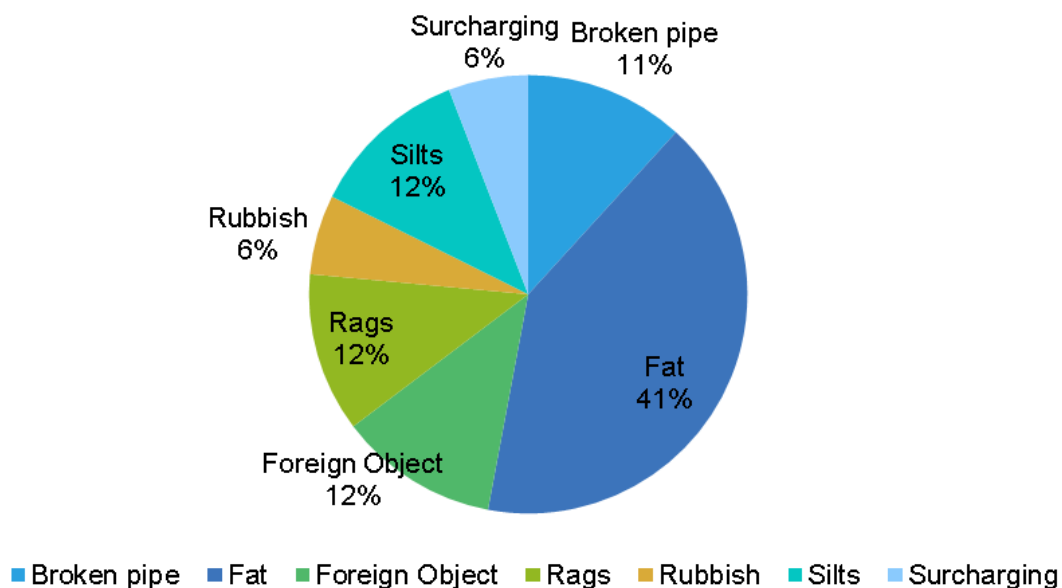
2015-16 Data for Catchment 8. Weiti



2016-17 Data for Catchment 8. Weiti



2017-18 Data for Catchment 8. Weiti



Trend analysis has been carried out where the cause has been identified.

1.8.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
11/02/2018	DPDUC	Duck Creek Wastewater Pump Station	798	Rain event	163	39
11/04/2018	DPFOU	Foundry Wastewater Pump Station	801	Power outage	28	18.5
11/04/2018	DPWEI	Weiti Wastewater Pump Station	822	Power outage	177	18.5
11/04/2018	DPBLU	Blue Gum Wastewater Pump Station	795	Power outage	10	18.5
11/04/2018	DPDUC	Duck Creek Wastewater Pump Station	798	Power outage	294	18.5
14/04/2018	DPWEI	Weiti Wastewater Pump Station	822	Power outage	128	53

1.8.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
795	Blue Gum WWPS	0	0	0	0	1	0.25	Continue to monitor
798	Duck Creek WWPS	0	0	0	1	2	0.75	Continue to monitor
801	Foundry WWPS	1.6	0	0	0	1	0.25	Continue to monitor
806	Karaka Cove WWPS	0	0	0	0	0	0	Continue to monitor
812	Poplar WWPS	0	0	0	0	0	0	Continue to monitor
817	Stillwater WWPS	0	0	0	0	0	0	Continue to monitor
821	Wade River WWPS	0	0	0	0	0	0	Continue to monitor
822	Weiti WWPS	5.5	1	0	1	2	1	Continue to monitor
1267	Coastal Heights WWPS	0.2	0	0	0	0	0	Continue to monitor

1.8.6 Inflow & Infiltration Programme

A review of I&I network performance for this catchment will be carried out as part of the Army Bay SMA modelling and planning study; this will inform I&I field investigations.

1.8.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Army Bay WWTP outfall	Project execution	Required to provide an alternative outfall for use during wet weather events	Will provide for growth and allow network restrictions related to WWTP constraints to be removed from trunk pump stations, reducing the risk of spills	2015-2019
Underway	Army Bay SMA model update and calibration	Studies and investigations	Required to determine local network improvements to reduce overflows, and plan for growth	Calibrated model which can be used to develop options for achieving levels of service. Flow gauging complete.	2015 -2018 (Flow gauging complete)
Planned	Army Bay SMA options assessment	Studies and investigations	Required to determine local network improvements to reduce overflows, and plan for growth	Identification of preferred upgrade options to manage growth without deteriorating wet weather overflow frequencies.	2018-2020
Future	Rodney Hibiscus Coast Servicing	Studies and investigations	Whangaparaoa wastewater transmission augmentation	Reduction of wet weather overflows	2020-2024

1.8.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.8.9 Summary

There was one Type 1 EOP which discharged more frequently than two spills per year, however this was due to power failure and this will be investigated. There has been a minor increase in the density of overflows across the pipe network. Trend analysis shows that fats remain the most common cause of overflows. The overflow history will be analysed and utilised when reviewing future network improvement programmes. Hibiscus Coast is a major growth area. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.9 Catchment 9 – Whangaparaoa

1.9.1 Overview

Whangaparaoa Peninsula is located around 25 km north of Auckland, extending east for 11 km into the waters of the Hauraki Gulf to the north of East Coast Bays. The town of Whangaparaoa sits on the peninsula's south-western shore. The population of Whangaparaoa Peninsula was estimated to be around 28,900 in 2013 (Census, 2013), with 11,721 wastewater connections. Communities along the peninsula include Red Beach, Stanmore Bay, Big Manly, Tindalls Beach, Army Bay, Gulf Harbour, Matakatia, Little Manly, and Arkles Bay. At the end of the peninsula is Shakespear Regional Park. The New Zealand Defence Force owns part of this area.

	2014/15	2015/16	2016/17	2017/18
No. of connections	11,136	11,316	11,563	11,721
Length of sewer (km)	271	274	276	318

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
793	Arkles Bay WWPS	DPARK	1	Arkles Bay Beach
794	Bay St WWPS	DPBAY	1	Unnamed stream flowing to Red Beach
796	Chelverton WWPS	DPCHE	1	Red Beach
797	Cooper WWPS	DPCOO	1	Stanmore Bay Beach
800	Duncansby WWPS	DPDUN	1	Puawai Bay Beach
802	Glenelg WWPS	DPGLG	1	Puawai Bay Beach
804	Hobbs Bay WWPS	DPHBB	1	Laurie Southwick Parade Stream
805	Hurdlow WWPS	DPHUR	1	Swann Beach
808	Little Manly WWPS	DPLIT	1	Little Manly Beach
809	Manly WWPS	DPMLY	1	Big Manly Beach
810	Matakatia WWPS	DPMIA	1	Matakatia Bay Beach
811	Okoromai WWPS	DPOKO	1	Okoromai Bay Beach
813	Puawai Bay WWPS	DPPUA	1	Puawai Bay Beach
815	Siesta WWPS	DPSIE	1	Coal Mine Bay Beach
816	Stanmore WWPS	DPSTA	1	Unnamed stream flowing to Stanmore Bay
818	Swann Beach WWPS	DPSWB	1	Swann Beach
820	Tindalls WWPS	DPTDL	1	Tindalls Beach
1256	Pine Crest WWPS	DPPIN	1	Stormwater pond at Gulf Harbour Country Club
1260	Pacific Parade WWPS	DPPAC	1	Army Bay Beach
1263	Island View WWPS	DPISV	1	Okoromai Bay

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1272	Roberts Road WWPS	DPROB	1	Laurie Southwick Parade Stream

There have been no changes to the schedule of EOPs in this catchment.

1.9.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 June 2017 and 30 July 2018.

Reported incidents

There were a total of 89 reported incidents in the Whangaparaoa catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

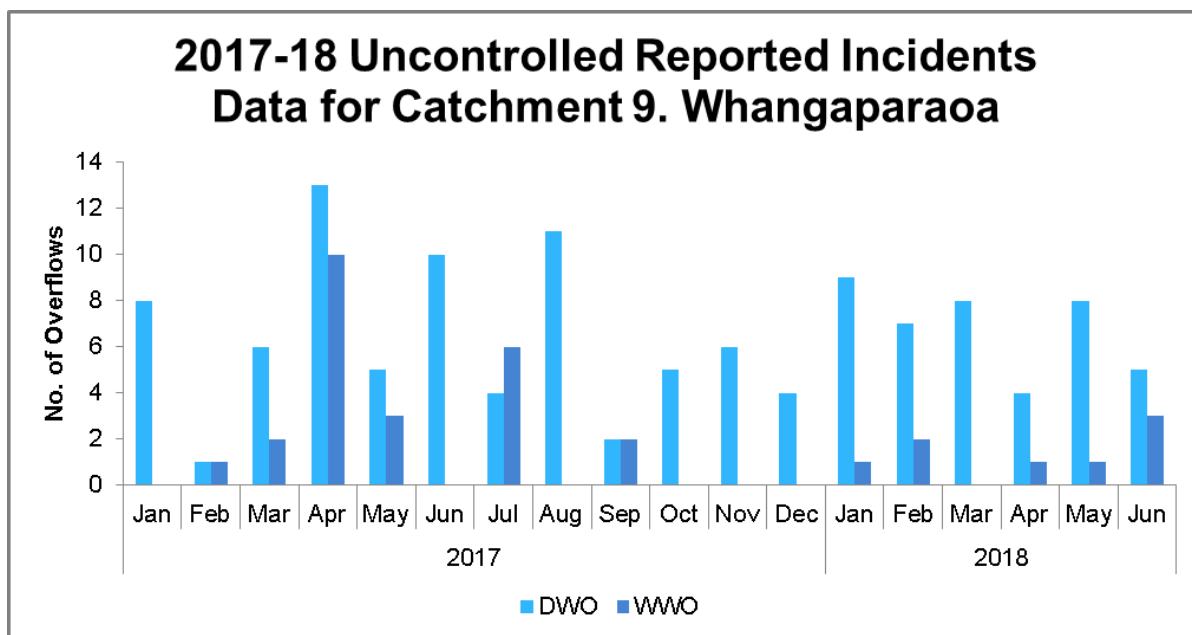
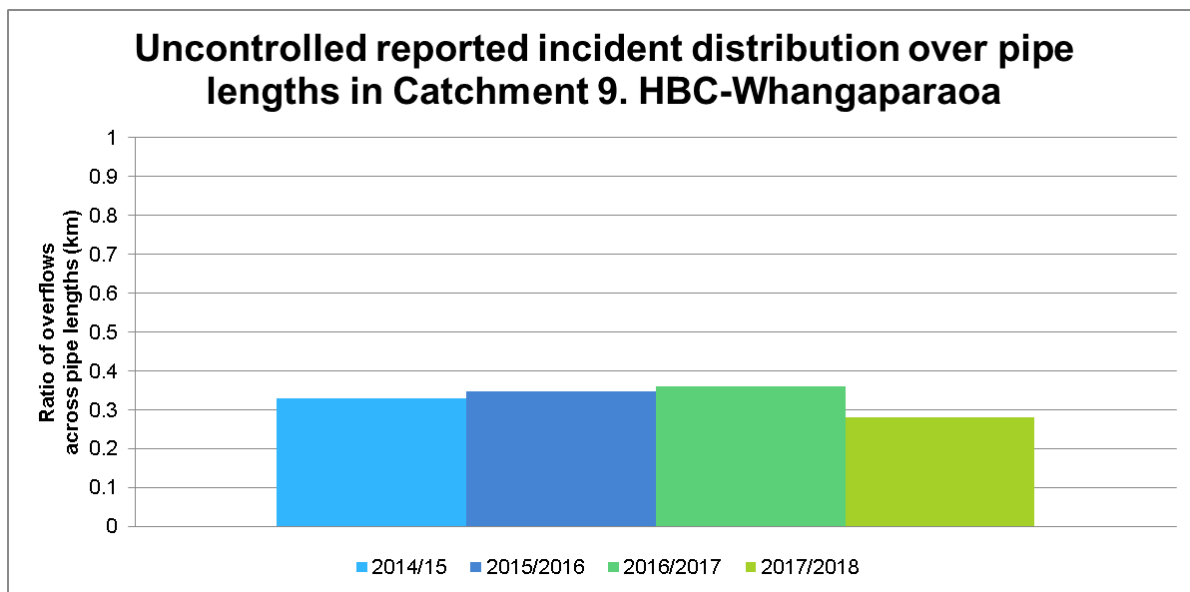
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
1/03/2017	180 Gulf Harbour Dr	L1	66	Unknown	0	Pipe broken inside dropper, has been repaired
24/04/2017	180 Gulf Harbour Dr	L1	419	Unknown	0	
28/05/2018	180 Gulf Harbour Dr	L1	260	Broken pipe	1	
8/05/2017	11/126 Whangaparaoa Rd	L1	133	Unknown	0	Tomo and ground subsidence, under investigation by Network Engineer
29/06/2017	11/126 Whangaparaoa Rd	L1	492	Rubbish	1	
12/04/2017	136 Whangaparaoa Rd	L1	127	Fat	89.5	
7/03/2018	136 Whangaparaoa Rd	L1	104	Broken pipe	6	
3/12/2016	918 Whangaparaoa Rd	L1	301	Fat	0	Dip in the line, heavy flushed
5/02/2017	918 Whangaparaoa Rd	L1	558	Unknown	0	
9/07/2017	918 Whangaparaoa Rd	L1	154	Silts	13.51	

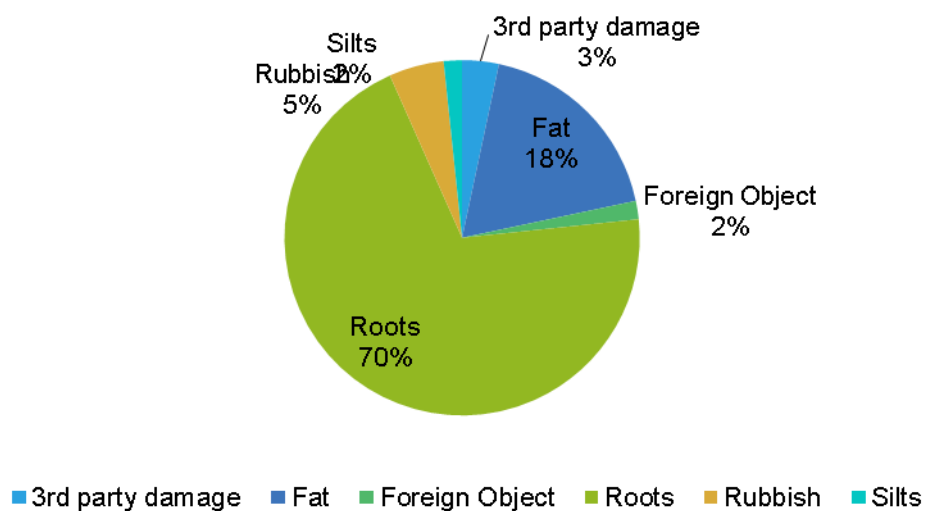
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
4/06/2018	918 Whangaparaoa Rd	L2	174	Fat	30.41	
31/07/2017	1089 Whangaparaoa Rd	L1	165	Roots	0	Broken manhole repaired
28/09/2017	1089 Whangaparaoa Rd	L1	143	Broken pipe	0	
19/04/2018	30 Vista Motu	L1	531	Rags	0	Heavy flushed, line is dipped
27/06/2018	30 Vista Motu	L1	230	Fat	0	
12/04/2017	136 Whangaparaoa Rd	L1	654	Surcharging	52	Tomo repaired
7/03/2018	136 Whangaparaoa Rd	L1	104	Broken pipe	6	
6/08/2016	22 Pacific Pde	L1	341	Unknown	8	Continue to monitor
9/07/2017	22 Pacific Pde	L1	594	Surcharging	13.51	
21/03/2017	75 Maylee Cres	L1	127	Roots	0	Rootcut, blockage removed
3/02/2018	75 Maylee Cres	L1	508	Rags	22	
7/02/2018	20 Beach Rd	L1	113	Unknown	0	Continue to monitor, CCTV
15/02/2018	20 Beach Rd	L1	540	Fat	0.2	
17/02/2018	58 Bay Vista Dr	L1	313	Roots	0	Blockage removed
26/02/2018	58 Bay Vista Dr	L1	108	Roots	0	
27/02/2018	2 Kestrel Hts	L1	135	Roots	0	Rootcut
2/03/2018	2 Kestrel Hts	L2	557	Roots	5	
3/05/2018	11B Ladies Mile	L1	262	Broken pipe	0	Pipe repaired
6/05/2018	11B Ladies Mile	L1	242	Broken pipe	3.5	

1.9.3 Trend analysis of reported incidents

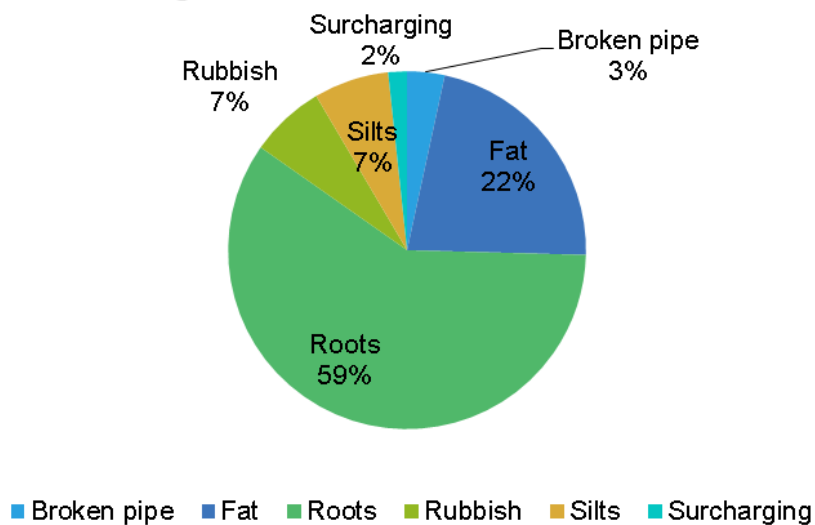
The graphs below reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



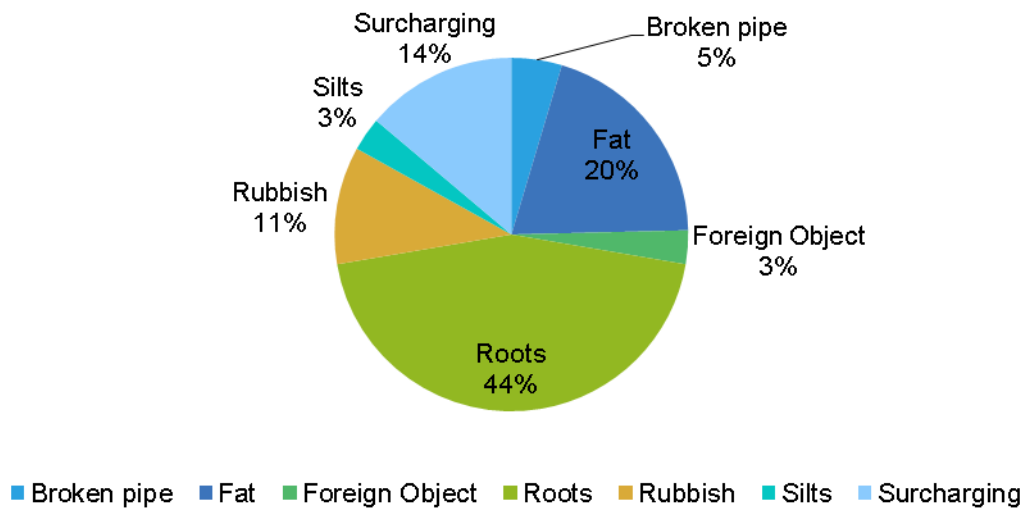
2014-15 Data for Catchment 9. Whangaparaoa



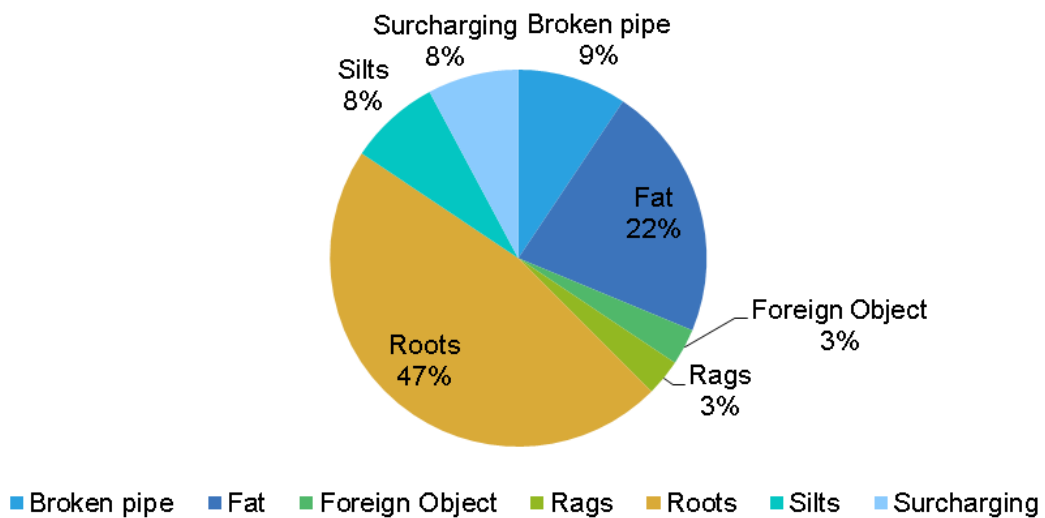
2015-16 Data for Catchment 9. Whangaparaoa



2016-17 Data for Catchment 9. Whangaparaoa



2017-18 Data for Catchment 9. Whangaparaoa



Trend analysis has been carried out where the cause has been identified.

1.9.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
3/06/2018	DPPIN	Pinecrest Wastewater Pump Station	1256	Power outage	821	38.4
3/06/2018	DPOKO	Okoromai Wastewater Pump Station	811	Rain event	389	38.4
20/06/2018	DPBAY	Bay Street Wastewater Pump Station	794	Rain event	67	9

1.9.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
793	Arkles Bay WWPS	0	0	0	0	0	0	Continue to monitor
794	Bay St WWPS	5.1	1	1	1	1	1	Continue to monitor
796	Chelverton WWPS	0	0	0	0	0	0	Continue to monitor
797	Cooper WWPS	0	0	0	0	0	0	Continue to monitor
800	Duncansby WWPS	0	0	0	0	0	0	Continue to monitor
802	Glenelg WWPS	11.7	1	0	0	0	0.25	Continue to monitor
804	Hobbs Bay WWPS	0	0	0	0	0	0	Interstation control upgrade – complete
805	Hurdlow WWPS	0	0	0	0	0	0	Continue to monitor
808	Little Manly WWPS	0	0	0	0	0	0	Continue to monitor
809	Manly WWPS	0	0	0	0	0	0	Continue to monitor
810	Matakatia WWPS	0	0	0	0	0	0	Continue to monitor
811	Okoromai WWPS	0	0	0	1	1	0.3	Continue to monitor
813	Puawai Bay WWPS	0	0	0	0	0	0	Continue to monitor
815	Siesta WWPS	0	0	0	0	0	0	Continue to monitor
816	Stanmore WWPS	0	1	0	1	0	0.5	Interstation control upgrade - complete
818	Swann Beach WWPS	0	0	0	0	0	0	Continue to monitor
820	Tindalls WWPS	0	0	0	0	0	0	Continue to monitor
1256	Pine Crest WWPS	0.2	1	1	0	1	0.6	Continue to monitor
1260	Pacific Parade	0	0	0	2	0	0.5	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
	WWPS							
1261	Onepu WWPS	0	0	0	0	0	0	Continue to monitor
1263	Island View WWPS	0.2	0	0	0	0	0	Continue to monitor
1272	Roberts Road WWPS	0.2	0	0	0	0	0	Continue to monitor

1.9.6 Inflow & Infiltration Programme

A review of I&I network performance for this catchment will be carried out as part of the Army Bay SMA modelling and planning study; this will inform I&I field investigations.

1.9.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Army Bay SMA Model Update and calibration	Studies and investigations	Required to determine local network improvements to reduce overflows, and plan for growth	Calibrated model which can be used to develop options for achieving levels of service. Flow gauging complete.	2015 -2018
Planned	Army Bay SMA Options Assessment	Studies and investigations	Required to determine local network improvements to reduce overflows, and plan for growth	Identification of preferred upgrade options to manage growth without deteriorating wet weather overflow frequencies.	2018-2020
Future	Rodney Hibiscus Coast Servicing	Studies and investigations	Whangaparaoa wastewater transmission augmentation	Reduction of wet weather overflows	2020-2024
Complete	Whangaparaoa Chemical Dosing Trial	Complete	Trial of Magnesium Hydroxide to improve network integrity	Reduction of corrosion of assets	November 2017-April 2018

1.9.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.9.9 Summary

There have been no EOPs which have discharged more frequently than two spills per year. There has been a decrease in the ratio of overflows across the pipe network. Trend analysis shows that roots are the primary cause of overflows with a decrease in surcharging events compared with the previous reporting period. The overflow history will be analysed and utilised when reviewing future network improvement programmes. Hibiscus Coast is a major growth area and in the long term, the network performance in this catchment will be managed and improved through upgrades identified with the 'Rodney Hibiscus Coast Wastewater Servicing' project. The network has been extended by 42.3km and developed to accommodate prospective population growth in the region. Further investigations in regards to population growth have been conducted by Watercare through improvement works projects. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

Strategic Management Area 8: Rosedale (North Shore)

1.10 Catchment 10 – Long Bay

1.10.1 Overview

The Long Bay/Okura catchment is located on the North Shore of Auckland and has a total land area of approximately 1,100 ha. The catchment is bounded by the Okura River to the north and Long Bay Beach to the east. Torbay and Glenvar are the main residential areas and these are located in the southern part of the catchment. The settlement of Okura is located within the northern part of the catchment and is separated from the suburbs by undeveloped land. At present, the wastewater system covers the residential suburbs and Okura only. The entire area is reticulated to the Rosedale WWTP.

The catchment has developed over recent years and is subject to urban growth. Development associated with the Long Bay Structure Plan area is located within the catchment. Development has already commenced and will continue in the coming years, covering approximately 360 ha and 2,500 lots, which will accommodate an estimated 7,000 people. It will involve some mixed use development and a range of housing. There are currently 2,894 wastewater connections.

	2014/15	2015/16	2016/17	2017/18
No. of connections	2,577	2,698	2,829	2,894
Length of sewer (km)	61	63	65	81

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
831	97 Awaruku Rd	-	2	Awaruku Creek
832	47 Glenvar Road	-	2	Awaruku Creek
850	14 Battenburg Place	-	2	Awaruku Creek
1228	Deborah WWPS	DPDEB	1	Okura Estuary
1235	Okura WWPS	DPOKU	1	Okura Estuary
1404	Long Bay WWPS	DPLGB	1	Awaruku Creek
1578	Okura River Rd WWPS	DPOKR	1	Unnamed tributary (1) to Vaughan Stream

There have been no changes to the schedule of EOPs in this catchment.

1.10.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 24 reported incidents in the Long Bay catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

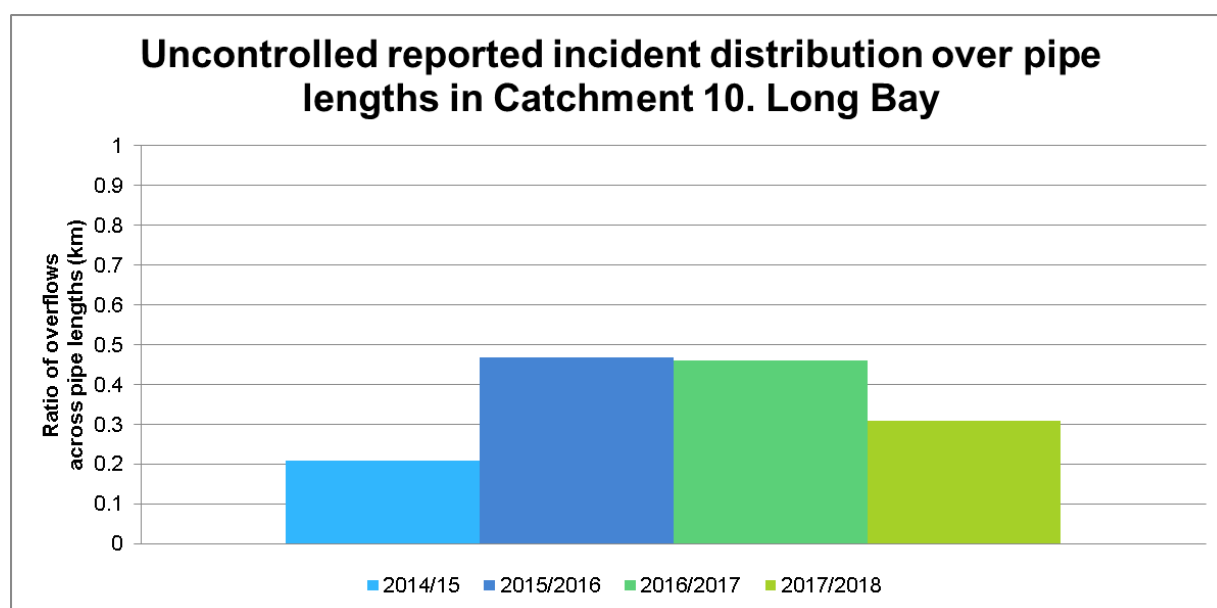
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period.

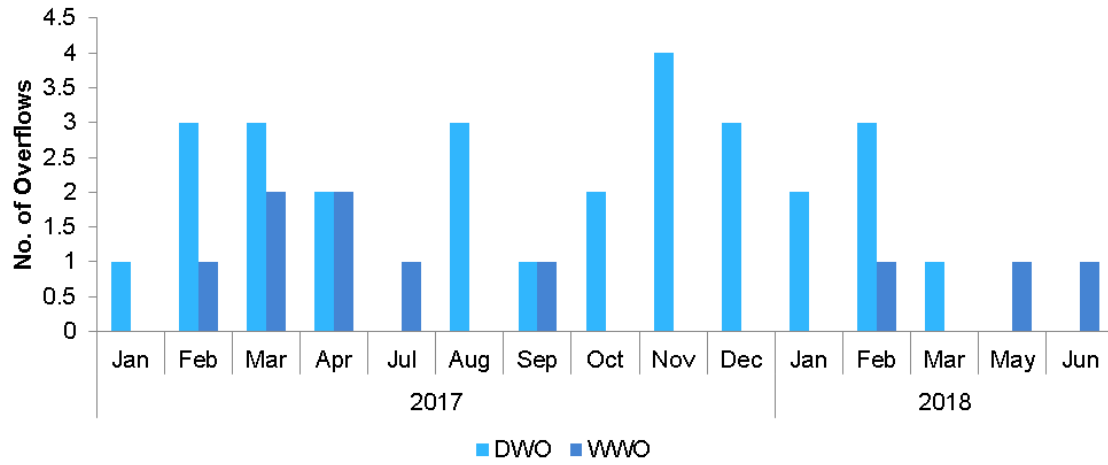
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
29/08/2017	54 Danbury Dr	L1	230	Roots	0.49	Removed roots, repaired pipe and benching
31/08/2017	54 Danbury Dr	L1	103	Roots	0.49	
1/09/2017	56 Danbury Dr	L1	180	Broken Pipe	0.49	
1/11/2017	26A Manuwai Rd	L1	615	Roots	0	Removed rod and plunger left in main by private contractor
11/11/2017	26A Manuwai Rd	L1	164	Unknown	0	
12/02/2018	26A Manuwai Rd	L1	156	Foreign Object	0.2	

1.10.3 Trend analysis of reported incidents

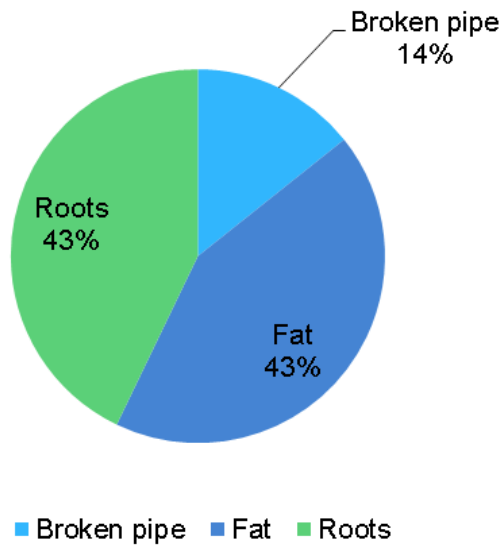
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



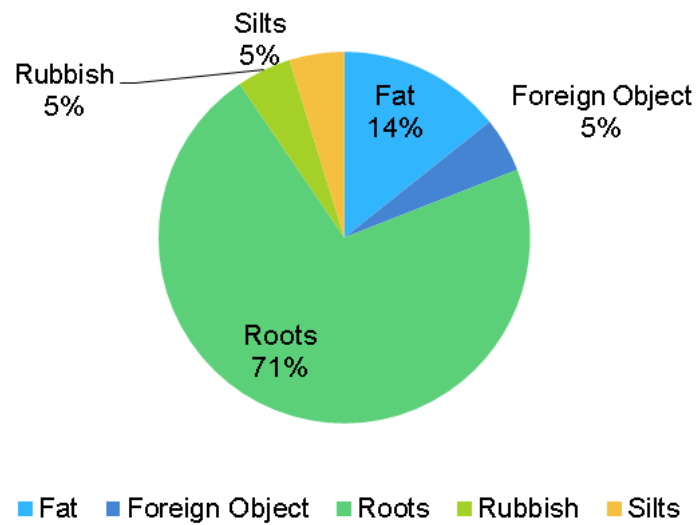
2017-18 Uncontrolled Reported Incidents Data for Catchment 10. Long Bay



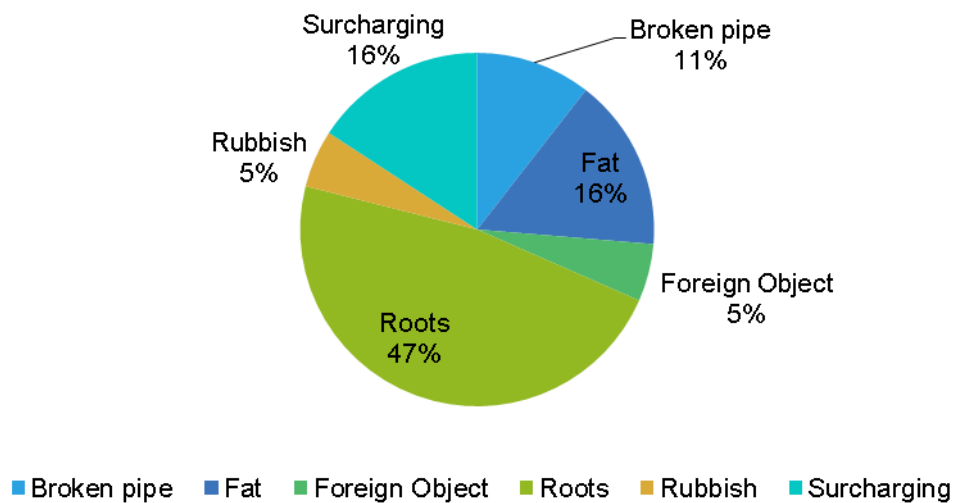
2014-15 Data for Catchment 10. Long Bay

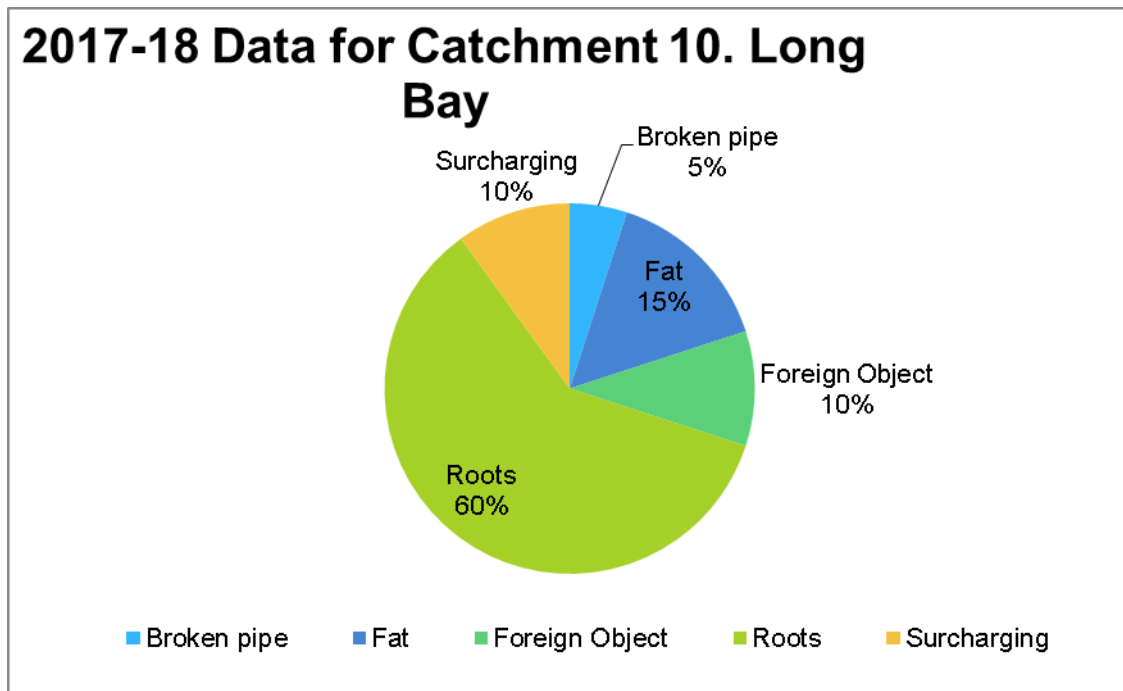


2015-16 Data for Catchment 10. Long Bay



2016-17 Data for Catchment 10. Long Bay





Trend analysis has been carried out where the cause has been identified.

1.10.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
3/06/2018	DPOKR	Okura River Rd Pump Station	1578	Rain event	149	52.86

1.10.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1228	Deborah WWPS	0	0	0	0	0	0	Continue to monitor
1235	Okura WWPS	0	0	0	0	0	0	Continue to monitor
1404	Long Bay WWPS	0	0	0	0	0	0	Continue to monitor
1578	Okura River Rd WWPS	-	0	0	1	1	0.5	Continue to monitor

1.10.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be carried out as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

1.10.7 Improvement Works Programme

No significant improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.10.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.10.9 Summary

There have been no EOPs which have discharged more frequently than two spills per year. Trend analysis shows root blockages remain the predominant cause of uncontrolled overflows while surcharging events have decreased. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended by 16.6km and developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.11 Catchment 11 – East Coast Bays

1.11.1 Overview

The East Coast Bays catchment is located on the North Shore of Auckland. The total land area is approximately 3,000 ha. Land use associated with the East Coast Bays and Lake Pupuke receiving environments, with the exception of Taiaotea Creek, is predominantly residential, with some associated business and recreational land uses. Taiaotea Creek contains the commercial areas of Browns Bay that comprise a significant proportion of the lower catchment, with the rest being residential. The Wairau Creek receiving environment also contains residential land use but has a significant proportion of commercial land use to the west of the Northern Motorway. There are currently 29,658 wastewater connections.

	2014/15	2015/16	2016/17	2017/18
No. of connections	29,400	29,481	29,551	29,658
Length of sewer (km)	489	489	489	597

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
834	28 Penning Road	-	2	Unnamed tributary of Wairau Creek
835	3 Sidmouth Road	-	2	Mairangi Bay Stream
853	Alma WWPS	DPALM	1	Wairau Stream
854	Sidmouth WWPS (overflow point north)	DPSI1	1	Mairangi Bay
855	Sidmouth WWPS (overflow point south)	DPSI1	1	Mairangi Bay
869	Browns Bay WWPS	DPBRB	1	To land
871	Castor Bay WWPS	DPCBY	1	Castor Bay Stream
909	Killarney WWPS	DPKIL	1	Lake Pupuke
910	Lake View WWPS	DPLAK	1	Lake Pupuke
911	Promenade WWPS	DPPRO	1	Lake Pupuke via stormwater pipe
912	Shea Hospital WWPS	DPSHE	1	Lake Pupuke
913	Hurstmere 3 WWPS	DPHM3	1	Lake Pupuke
914	Hurstmere 2 WWPS	DPHM2	1	Lake Pupuke
915	Hurstmere 1 WWPS	DPHM1	1	Lake Pupuke
916	Eric Place WWPS	DPERI	1	Lake Pupuke
918	Omana WWPS	DPONA	1	Wairau Creek
938	Gray WWPS	DPGYS	1	Winstones Cove
947	Black Rock WWPS	DPBLA	1	Thorne Bay
951	Silverfield Storage Tank	SSSIL, DPWAU	1	Wairau Stream

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1227	Craig Road WWPS	DPCRA	1	Wairau Creek
1229	Beach 2 (Torbay) WWPS	DPBE2	1	Deep Creek
1236	Beach 1 WWPS	DPBE2	1	Beach at Kennedy Park
1237	Churchill Road WWPS	DPCHU	1	Churchill Coast
1238	Portal Place WWPS	DPPTL	1	Churchill Coast
1239	Rock Isle Rd 2 WWPS	DPRO2	1	Waiake Beach
1240	Cliff Road WWPS	DPCLI	1	Toroa Point via open stormwater channel
1576	16 Jutland St	-	2	Unnamed Stream off Jutland Street

The following EOP has been identified as operational and added to the schedule.

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
1595	11 Jonathan Pl	-	2	Wairau Stream	1595

1.11.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 349 reported incidents in the East Coast Bays catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
7/01/2017	1/16 Tonkin Dr	L1	590	Fat	0	Heavy cleaned of extensive fats
8/07/2017	16 Tonkin Dr	L1	406	Fat	6.5	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
8/09/2017	2/16 Tonkin Dr	L1	210	Unknown	2.45	
24/12/2017	2/13 Jonathan Pl	L1	232	Unknown	0	Collapsed connection replaced. EOP pending
28/01/2018	2/13 Jonathan Pl	L3	145	Rags	0.4	
30/01/2018	2/13 Jonathan Pl	L2	224	Rags	0	
10/02/2018	2/13 Jonathan Pl	L1	411	Unknown	21.8	
13/02/2018	2/13 Jonathan Pl	L1	146	Broken pipe	37	
16/07/2017	19A Waterloo Rd	L2	494	Roots	0	Flushed main
5/10/2017	19A Waterloo Rd	L1	-	Fat	0	
1/02/2017	24 Kitchener Rd	L1	169	Fat	0	Flushed line
7/12/2017	24 Kitchener Rd	L1	234	Roots	0	
25/08/2016	6 Linwood Ave	L2	598	Roots	31.33	Added to 6 Monthly Flushing Schedule
25/09/2016	6 Linwood Ave	L1	205	Roots	42	
12/11/2016	6 Linwood Ave	L1	0	Fat	3	
11/03/2017	6 Linwood Ave	L1	81	Roots	35.33	
23/01/2018	6 Linwood Ave	L1	119	Surcharging	0	
2/10/2016	262A Beach Rd	L1	187	Unknown	19.5	Pipe dipped and at capacity. The line is on a yearly flushing program and under review for higher frequency
10/03/2017	262A Beach Rd	L1	144	Fat	74.14	
11/02/2018	262A Beach Rd	L2	635	Surcharging	29.8	
3/06/2018	262A Beach Rd	L1	666	Surcharging	52.86	
27/07/2016	335 East Coast Rd	L1	592	Surcharging	1.93	Lines heavy cleaned and heavy roots removed
10/11/2016	2/322 East Coast Rd	L1	223	Roots	0	
16/06/2017	322 East Coast Rd	L2	79	Roots	1	
24/10/2017	3/322 East Coast Rd	L1	341	Foreign Object	2.5	
19/12/2017	3/322 East Coast Rd	L1	190	Roots	0	
13/11/2016	3 Varlene Tce	L1	219	Unknown	0	Blockage removed
13/12/2016	3/1 Varlene Tce	L1	384	Unknown	0	
17/06/2017	1/1 Varlene Tce	L1	46	Fat	0	
20/10/2017	1/1 Varlene Tce	L1	303	Fat	3	
29/11/2016	2/26A Penning Rd	L2	284	Unknown	0	Removed trees causing ongoing root issues
11/01/2017	2/26A Penning Rd	L2	565	Unknown	0	
24/11/2017	1/26 Penning Rd	L1	603	Broken pipe	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
15/03/2017	57 Rock Isle Rd	L1	246	Rubbish	0	Under investigation
13/04/2017	57 Rock Isle Rd	L1	155	Unknown	32.5	
14/07/2017	57 Rock Isle Rd	L1	73	Surcharging	2	
22/03/2017	107 Deep Creek Rd	L2	195	Fat	1	Removed grout and concrete from line
31/03/2017	107 Deep Creek Rd	L2	237	Unknown	0.5	
5/04/2017	107 Deep Creek Rd	L1	512	Fat	0	
23/07/2017	107 Deep Creek Rd	L1	455	Unknown	25	
23/03/2017	3/43 Anzac Rd	L1	314	Unknown	0	Under investigation by Network Engineer. Four lines heavy cleaned and CCTV'd
15/04/2018	3/43 Anzac Rd	L1	580	Fat	34.5	
29/06/2018	3/43 Anzac Rd	L2	479	Fat	1.5	
6/04/2017	10 Regency Pl	L1	75	Surcharging	0.5	Continue to monitor
23/01/2018	10 Regency Pl	L1	88	Surcharging	27	
4/01/2017	10A Phillipa Pl	L1	488	Unknown	1	Broken pipe repaired
15/01/2017	10A Phillipa Pl	L1	558	Unknown	1.5	
21/01/2017	10A Phillipa Pl	L1	423	Unknown	15	
23/09/2017	10A Phillipa Pl	L1	464	Fat	0	
5/01/2017	31 Kitchener Rd	L1	165	Unknown	0	Continue to monitor
5/08/2017	31 Kitchener Rd	L1	383	Roots	0	
17/02/2017	60 Peter Tce	L1	129	Unknown	13	Pipe repaired
19/08/2017	60 Peter Tce	L1	473	Foreign Object	4.9	
31/01/2018	18 Sharon Rd	L1	137	Silts	0	Flushed and patched line
22/02/2018	18 Sharon Rd	L1	106	Rubbish	0	
15/09/2017	1/14 Morton Ave	L1	403	Unknown	4.41	Continue to monitor, access difficulties
21/09/2017	1/14 Morton Ave	L1	194	Unknown	9.36	
30/09/2017	1/14 Morton Ave	L1	528	Roots	2.5	
15/11/2017	6 Altona Rd	L1	466	Unknown	0.5	Continue to monitor
20/11/2017	6 Altona Rd	L1	176	Roots	0	
23/07/2017	23 Kitchener Rd	L1	135	Broken pipe	4.5	Inspection cap had fallen into the main. Blockage removed.
29/07/2017	23 Kitchener Rd	L1	444	Foreign Object	0	
10/08/2017	10 Foley Pl	L1	142	Roots	4.9	Rootcut

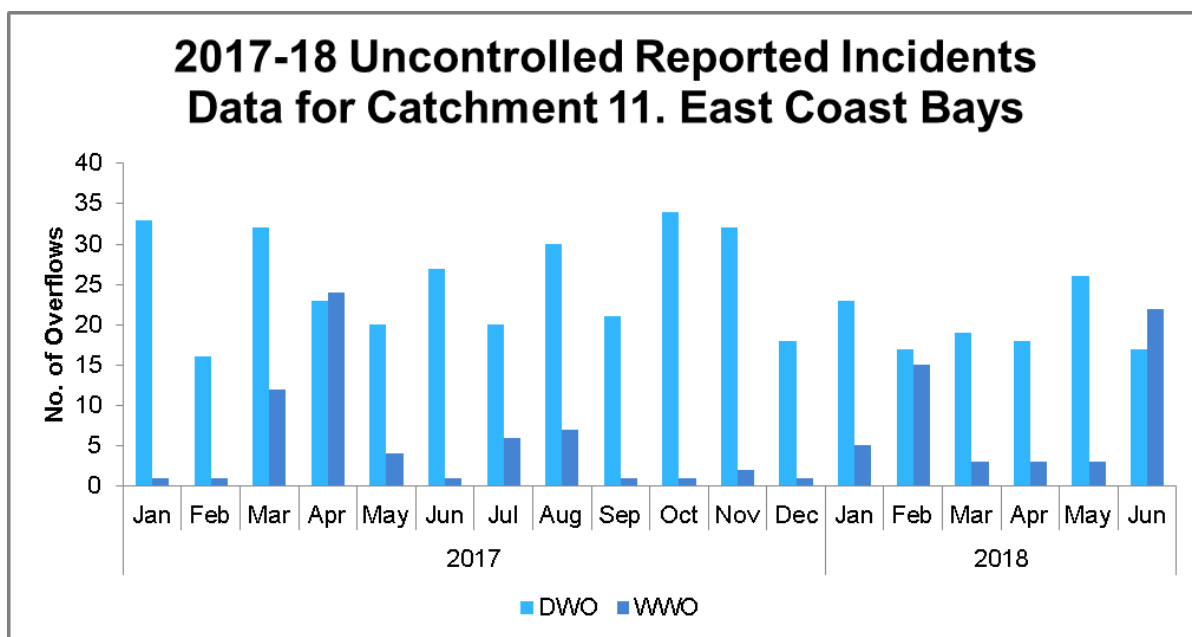
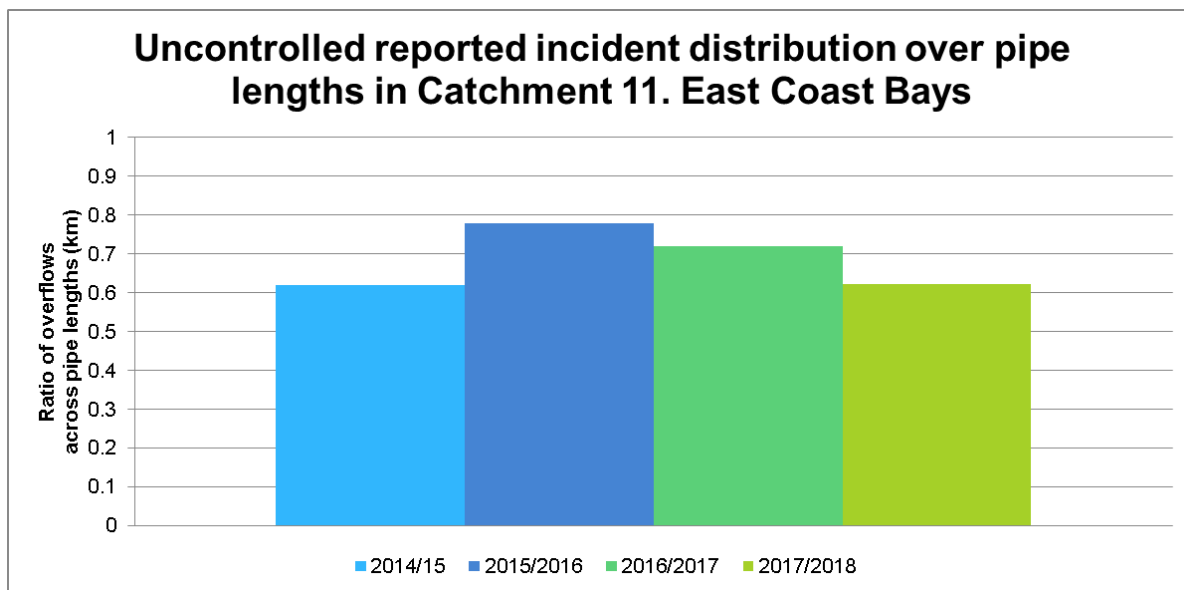
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
29/03/2018	10 Foley Pl	L1	193	Fat	0	
21/08/2017	11 Datura Pl	L1	134	Fat	0	Joint repaired
2/09/2017	11 Datura Pl	L1	101	Roots	17.64	
4/09/2016	3 Walnut Lane	L1	374	Fat	5.94	Heavy cleaned
29/08/2017	3 Walnut Lane	L1	129	Unknown	0.49	
31/08/2017	3 Walnut Lane	L1	463	Fat	0.49	
3/11/2016	18A Beulah Ave	L1	445	Rubbish	0	Concrete removed from line
7/10/2017	18A Beulah Ave	L1	422	Foreign Object	7.5	
26/01/2017	1/99 Oaktree Ave	L1	424	Roots	0	Pipe patched to prevent root intrusion
11/08/2017	1/99 Oaktree Ave	L1	197	Fat	3.43	
17/03/2017	40 Wolsley Ave	L1	441	Silts	0	Heavy rootcut
31/12/2017	40 Wolsley Ave	L1	65	Unknown	0	
5/04/2017	43 Forrest Hill Rd	L1	392	Rubbish	25	Continue to monitor
12/04/2017	43 Forrest Hill Rd	L2	170	Surcharging	49	
8/06/2017	13 Killarney Ave	L1	199	Fat	0.5	Heavy flushed line
12/12/2017	13 Killarney Ave	L1	157	Unknown	2	
17/05/2018	13 Killarney Ave	L1	95	Foreign Object	6.04	
6/07/2017	33 Sylvan Park Ave	L1	209	Rubbish	25.5	Heavy flushed
18/12/2017	33 Sylvan Park Ave	L1	482	Unknown	0.5	
8/07/2017	6 Celina Pl	L2	508	Unknown	6.5	Heavy roots removed
11/07/2017	6 Celina Pl	L1	234	Roots	6	
22/07/2017	1/8 Kennedy Ave	L1	603	Unknown	16.5	Rootcut
9/08/2017	1/8 Kennedy Ave	L1	462	Roots	17.63	
23/07/2017	26 Muritai Rd	L1	277	Roots	4.5	Dislodged pipe repaired
27/07/2017	26 Muritai Rd	L1	105	Roots	8	
25/08/2017	26 Muritai Rd	L1	535	Roots	0	
25/11/2017	1/60 Aberdeen Rd	L2	501	Unknown	0	Continue to monitor
21/08/2017	1/60 Aberdeen Rd	L2	375	Unknown	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
29/09/2017	26 Lake View Rd	L1	411	Roots	0.5	Rootcut and manholes exposed
4/10/2017	26 Lake View Rd	L1	492	Roots	0.5	
4/10/2017	2 Kegworth Pl	L1	149	Roots	0.5	Rootcut
11/11/2017	2 Kegworth Pl	L1	227	Roots	0	
9/11/2017	6 Crown Hill Cl	L2	310	Roots	0	Displaced joint repaired and heavy rootcut
9/11/2017	8 Kenmure Ave	L1	165	Broken pipe	0	
10/11/2017	8 Kenmure Ave	L1	202	Broken pipe	0	
3/12/2017	6 Crown Hill Cl	L1	77	Roots	0.5	
22/12/2017	83 Sunnynook Rd	L1	417	Fat	1.5	Blockage removed
1/04/2018	83 Sunnynook Rd	L1	573	Fat	0	
23/01/2018	81 Selwyn Cres	L1	86	Surcharging	14.2	Flushing program underway in addition to Alma WWPS Diversion Project
12/02/2018	81 Selwyn Cres	L1	229	Surcharging	0.2	
14/04/2018	81 Selwyn Cres	L1	90	Surcharging	35	
20/05/2018	81 Selwyn Cres	L1	99	Surcharging	12.8	
1/02/2018	85 Marlborough Ave	L1	448	Foreign Object	50.2	Repaired dropper
6/02/2018	85 Marlborough Ave	L1	181	Power failure	0.2	
9/02/2018	85 Marlborough Ave	L1	108	Broken pipe	18.2	
12/03/2018	1/21 Tobruk Cres	L1	125	Fat	32	Under investigation by Network Engineer
28/04/2018	1/21 Tobruk Cres	L1	180	Fat	64	
7/05/2018	1/21 Tobruk Cres	L1	119	Rags	0.5	
3/06/2018	1/21 Tobruk Cres	L1	48	Foreign Object	52.86	
17/03/2018	1/34 Ayton Dr	L1	624	Rubbish	0.5	Rags removed, heavy flushed
18/06/2018	1/34 Ayton Dr	L1	96	Rags	1	
6/05/2018	1/76 Velma Rd	L1	231	Roots	0.5	Roots removed
28/05/2018	1/76 Velma Rd	L1	105	Roots	2.01	
14/05/2018	1/15 Theban Pl	L1	436	Roots	0	Fat blockages removed and line rootcut
14/05/2018	1/47 Target Rd	L1	608	Fat	0	
23/05/2018	1/47 Target Rd	L1	521	Fat	38.77	

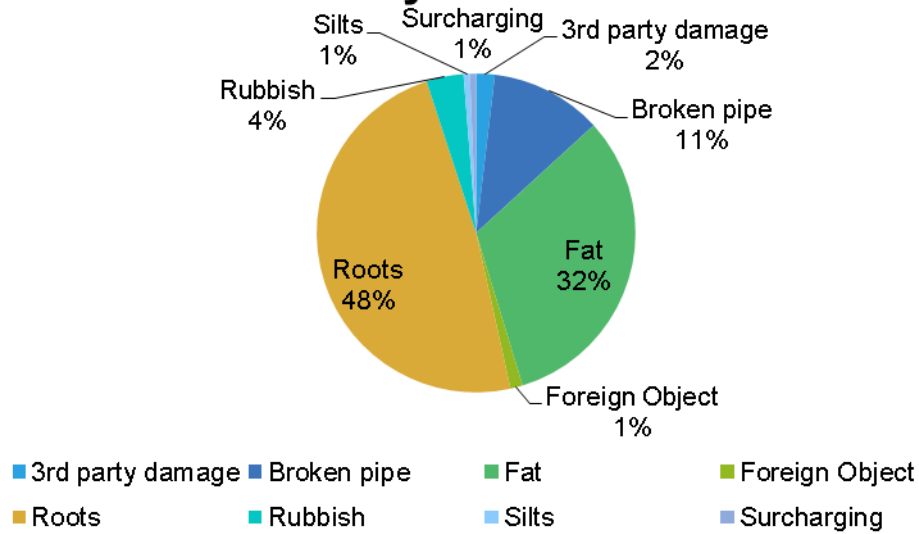
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
26/05/2018	69 Chivalry Rd	L1	506	Roots	4.53	Under investigation
28/05/2018	69 Chivalry Rd	L1	94	Unknown	2.01	
30/05/2018	69A Chivalry Rd	L1	198	Unknown	0	
19/07/2017	4/26 Kitchener Rd	L1	529	Roots	1	Rootcut
11/06/2018	4/26 Kitchener Rd	L1	166	Fat	0.5	
16/06/2018	39 Wolsley Ave	L1	448	Foreign Object	1	Pipe lining tape blockage removed
20/06/2018	39 Wolsley Ave	L1	475	Foreign Object	94	
11/08/2017	1/26 Becroft Dr	L2	262	Roots	3.43	Continue to monitor
14/08/2017	2/26 Becroft Dr	L1	43	Unknown	3.92	
2/10/2017	9 Woodstock Rd	L2	393	Fat	8	Heavy flushed
22/10/2017	9 Woodstock Rd	L1	346	Fat	1	
25/11/2017	2/75A Bruce Rd	L1	243	Unknown	0	Pipe repaired
29/11/2017	2/75A Bruce Rd	L1	82	Broken pipe	12.5	
25/11/2017	6 The Esplanade	L2	617	Unknown	0	Displaced pipe and root intrusion repaired
15/02/2018	6 The Esplanade	L1	444	Unknown	0	
16/12/2017	9 Mistletoe Pl	L2	457	Roots	0	Heavy flushed line
24/01/2018	9 Mistletoe Pl	L1	470	Fat	0	
12/02/2018	54 View Rd	L3	69	Fat	0.2	Heavy flushed line
6/03/2018	54 View Rd	L2	160	Fat	1.5	
23/01/2018	22 Porana Rd	L1	58	Surcharging	14.2	Heavy cleaned downstream lines
1/03/2018	22 Porana Rd	L2	554	Fat	1	

1.11.3 Trend analysis of reported incidents

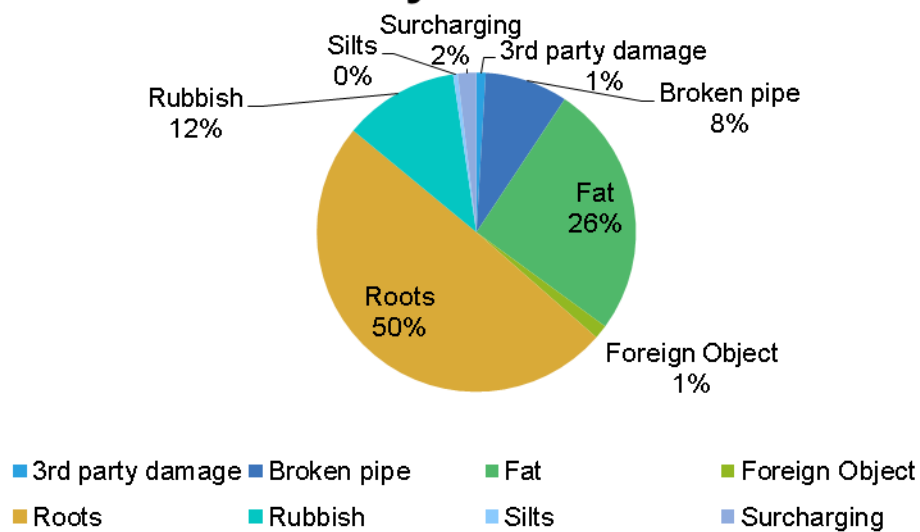
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



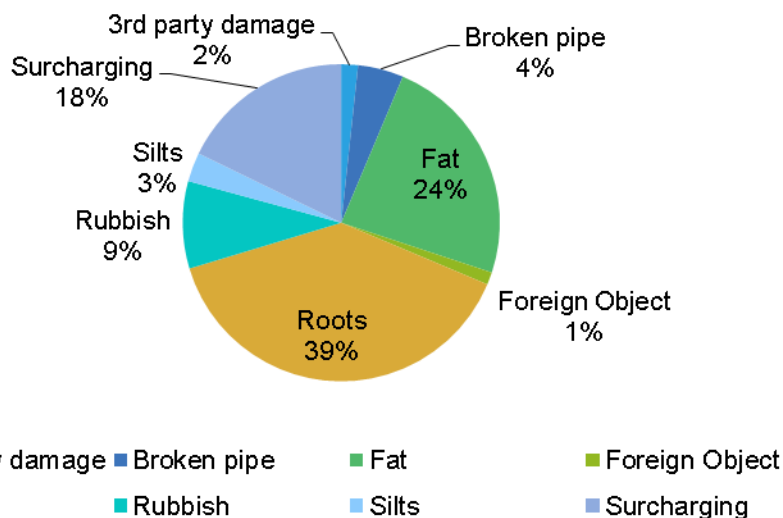
2014-15 Data for Catchment 11. East Coast Bays



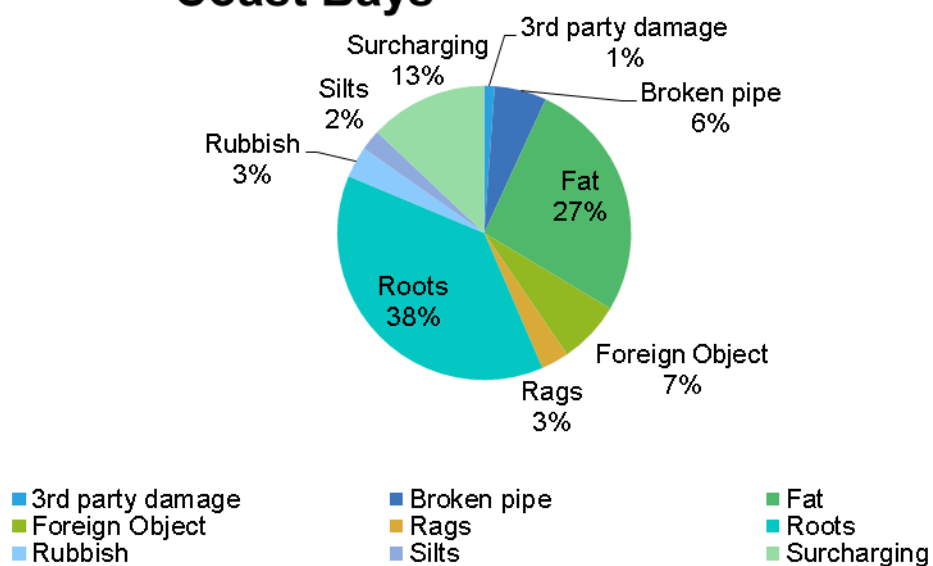
2015-16 Data for Catchment 11. East Coast Bays



2016-17 Data for Catchment 11. East Coast Bays



2017-18 Data for Catchment 11. East Coast Bays



Trend analysis has been carried out where the cause has been identified.

1.11.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
6/07/2017	DPCBY	Castor Bay Wastewater Pump Station	871	Rain event	131	25.5
7/07/2017	DPBLA	Black Rock Wastewater Pump Station	947	Rain event	196	2
6/01/2018	DPBLA	Black Rock Wastewater Pump Station	947	Rain event	11	0
23/01/2018	DPALM	Alma Wastewater Pump Station	853	Rain event	23	19.5
23/01/2018	DPCBY	Castor Bay Wastewater Pump Station	871	Rain event	39	19.5
11/02/2018	DPCBY	Castor Bay Wastewater Pump Station	871	Rain event	113	43.5
11/02/2018	DPSI1	Sidmouth Wastewater Pump Station (Northern Overflow)	854	Rain event	13	43.5
11/02/2018	DPBLA	Black Rock Wastewater Pump Station	947	Rain event	925	43.5
3/06/2018	DPCBY	Castor Bay Wastewater Pump Station	871	Rain event	167	52.86
3/06/2018	DPSI1	Sidmouth Wastewater Pump Station (Northern Overflow)	854	Rain event	48	52.86
3/06/2018	DPBLA	Black Rock Wastewater Pump Station	947	Rain event	653	52.86
11/02/2018	DPBRB	Browns Bay Pump Station	869	Rain event	508	43.5
3/06/2018	DPBRB	Browns Bay Pump Station	869	Rain event	472	61

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. The cause is taken from validated site data.

Type 2 EOPs – Network Relief Points

The Type 2 EOP 1576 has a permanent monitor installed. This information is provided as it is available, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the Wastewater Network Strategy and the overall network performance.

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
24/01/2018	-	16 Jutland St	1576	Rain event	170	17
11/02/2018	-	16 Jutland St	1576	Rain event	97	29.8
4/06/2018	-	16 Jutland St	1576	Rain event	188	24

1.11.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
853	Alma WWPS	1.8	2	3	7	1	3.25	Planned Alma Bay diversion (formerly Forrest Hill upgrade).
854	Sidmouth WWPS (overflow point north)	3.2	5	0	10	2	4.25	Sidmouth WWPS Upgrade and Mairangi Bay Rising Main
855	Sidmouth WWPS (overflow point south)	6.5						
871	Castor Bay WWPS	1.5	5	1	9	4	4.75	Castor Bay I&I
909	Killarney WWPS	0	0	0	0	0	0	Continue to monitor
910	Lake View WWPS	0	0	0	0	0	0	Continue to monitor
911	Promenade WWPS	0	0	0	0	0	0	Continue to monitor
912	Shea Hospital WWPS	0.2	0	0	0	0	0	Continue to monitor
913	Hurstmere 3 WWPS	0	0	0	0	0	0	Continue to monitor
914	Hurstmere 2 WWPS	0	0	0	0	0	0	Continue to monitor
915	Hurstmere 1 WWPS	0	0	0	0	0	0	Continue to monitor
916	Eric Place WWPS	0	0	0	0	0	0	Continue to monitor
918	Omana WWPS	0	0	0	0	0	0	Continue to monitor
938	Gray WWPS	0	0	0	0	0	0	Continue to monitor
947	Black Rock WWPS	1.8	3	0	5	4	3	Planned Alma Bay diversion (formerly Forrest Hill upgrade)
951	Silverfield Storage Tank	1.3	2	0	1	0	0.75	Continue to monitor
1227	Craig Road WWPS	0.2	0	0	0	0	0	Continue to monitor
1229	Beach 2 (Torbay) WWPS	0	0	0	0	0	0	Continue to monitor
1236	Beach 1 WWPS	0	0	0	0	0	0	Continue to monitor
1237	Churchill Road WWPS	0	0	0	2	0	0.5	Continue to monitor
1238	Portal Place	0	0	0	0	0	0	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
	WWPS							
1239	Rock Isle Rd 2 WWPS	0	0	0	0	0	0	Continue to monitor
1240	Cliff Road WWPS	0	0	0	0	0	0	Continue to monitor
869	Browns Bay Pump Station	-	0	0	0	2	0.5	Continue to monitor

Type 3 – uncontrolled overflow rolling WWO data from 1 July 2014 – 30 June 2018

The following locations are reported as Type 3 overflow locations.

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/28 WWOs	Rolling Avg	Improvement work (if applicable)
S17	81 Selwyn Crescent	3.6	-	-	-	4	1	Planned Alma Bay diversion (formerly Forrest Hill upgrade).
S18	129A Nile Road	8	-	-	-	-	-	Planned Alma Bay diversion (formerly Forrest Hill upgrade).
S19	11 Montrose Terrace	6.2	-	-	4	-	1	Sidmouth WWPS Upgrade and Mairangi Bay Rising Main

1.11.6 Inflow & Infiltration Programme

An option analysis study identified I&I reduction as the preferred option for addressing high wet weather overflows at the Castor Bay WWPS. The field I&I field investigations were planned to commence in the 2016/17 reporting year; this is now forecast to commence in early 2018.

1.11.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Alma WWPS catchment diversion (Formerly Forrest Hill Wastewater Catchment)	Option Analysis	Wet weather overflows in existing and future scenarios, and known repeat uncontrolled overflows with Forrest Hill Catchment and cater for growth within Milford/Takapuna	Will address wet weather overflows at Alma St WWPS, and known Type 3 overflows	2018-2022
Underway	Castor Bay I&I	I&I	Wet weather overflows in existing and future scenarios	Reduces overflow volume/ frequency and allows for growth	2017-2021
Planned	Wairau Valley wastewater network - Options Analysis	Studies and investigations	To resolve suspected Type 3 overflow(s). A detailed model is available for developing solutions	Reduce the frequency of suspected Type 3 overflows	2017-2019
Underway	Wairau pump station rising main upgrades	Project execution	Rising main failed and requires replacement. Will be upsized to increase capacity	Reduces risk of uncontrolled discharges due to asset failure	2017-2018
Underway	Wairau pump station (DPWAU) upgrades	Design	Reduce overflow frequency and risk to public health and environment, reduce risk of asset failure	Reduces overflow volume/ frequency for OF 951 and allows for growth and future improvements in multiple catchment	2015-2021
Underway	Sidmouth WWPS upgrade	Project Execution	Wet weather overflows in existing and future scenarios, and assets in poor condition	Reduces overflow volume/ frequency for OFs 854, 855 and uncontrolled overflows and allows for growth	2012-2020
Underway	East Coast Bays branch sewer upgrade	Project Execution	Wet weather overflows in existing and future scenarios, and assets in poor condition	Reduces overflow volume/ frequency and allows for growth	2015-2021

1.11.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.11.9 Summary

There are four EOPs which currently discharge more than two times per year on average, all of which have identified upgrades to resolve them. The density of overflows in this catchment has decreased in this reporting period, and the main cause was attributed to roots. In the long term, the network performance in this catchment will be improved with the 'Wairau Pump station rising main upgrades', Wairau Pump station (DPWAU) upgrades', 'Sidmouth WWPS Upgrade' and 'East Coast Bays Branch Sewer Upgrade' projects among others, which provide additional capacity in the wastewater network. The overflow history will be analysed and utilised when reviewing future network improvement programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.12 Catchment 12 – Devonport-Takapuna

1.12.1 Overview

The Devonport-Takapuna catchment is located on the North Shore of Auckland and comprises the eastern and southern coastal strips of the peninsula. The total land area within the catchment is approximately 280 ha. There are currently 2,528 wastewater connections. Within the catchment, there are no notable surface watercourses, and all discharges are to the marine environment. Land use within the catchment is predominately residential, with commercial areas in Takapuna, Hauraki Corner and Devonport. There are some notable larger land use activities within the area including the Devonport Naval Base and Narrow Neck Naval Facility.

	2014/15	2015/16	2016/17	2017/18
No. of connections	2,506	2,518	2,522	2,528
Length of sewer (km)	38	38	38	48

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
848	1 Old Lake Road	-	2	Narrow Neck Beach
859	Stanley Point 2 WWPS	DPSEW	1	To land
860	Northboro WWPS	DPNRO	1	St Leonards Beach
879	King Edward Parade WWPS	DPKED	1	Devonport Beach
886	Seacliffe WWPS	DPSFE	1	Seacliffe Coast
949	King Edward Parade Storage Tank	DSKED	1	North Head Reserve
1226	Arawa WWPS	DPAAW	1	Cheltenham Beach

There have been no changes to the schedule of EOPs in this catchment.

1.12.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Overflows

There were a total of 11 reported incidents in the Devonport-Takapuna catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

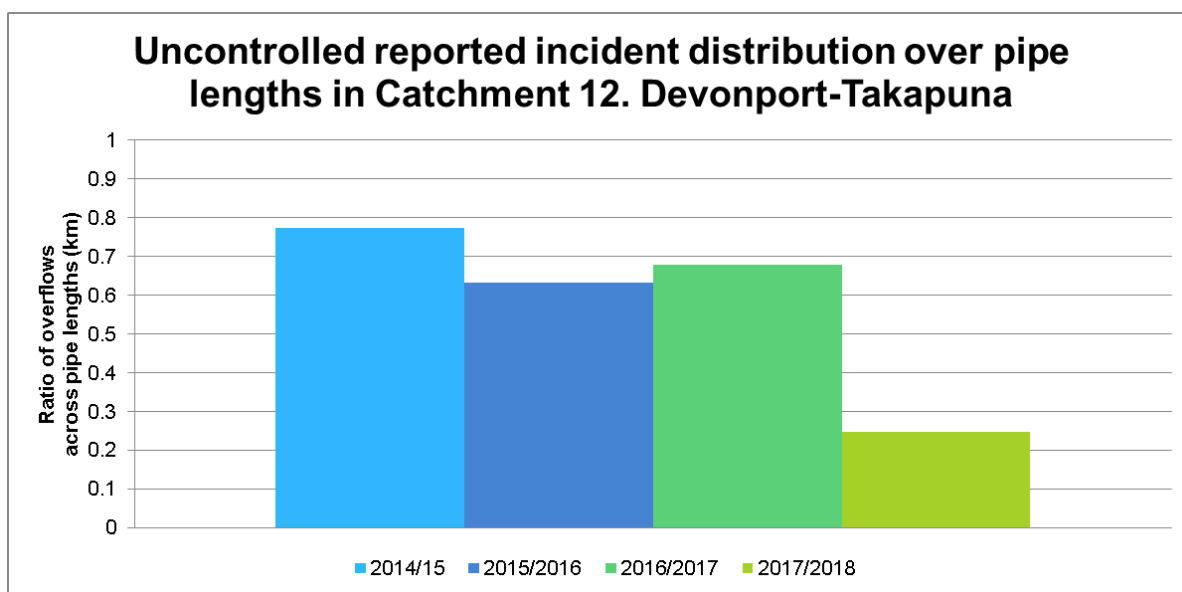
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

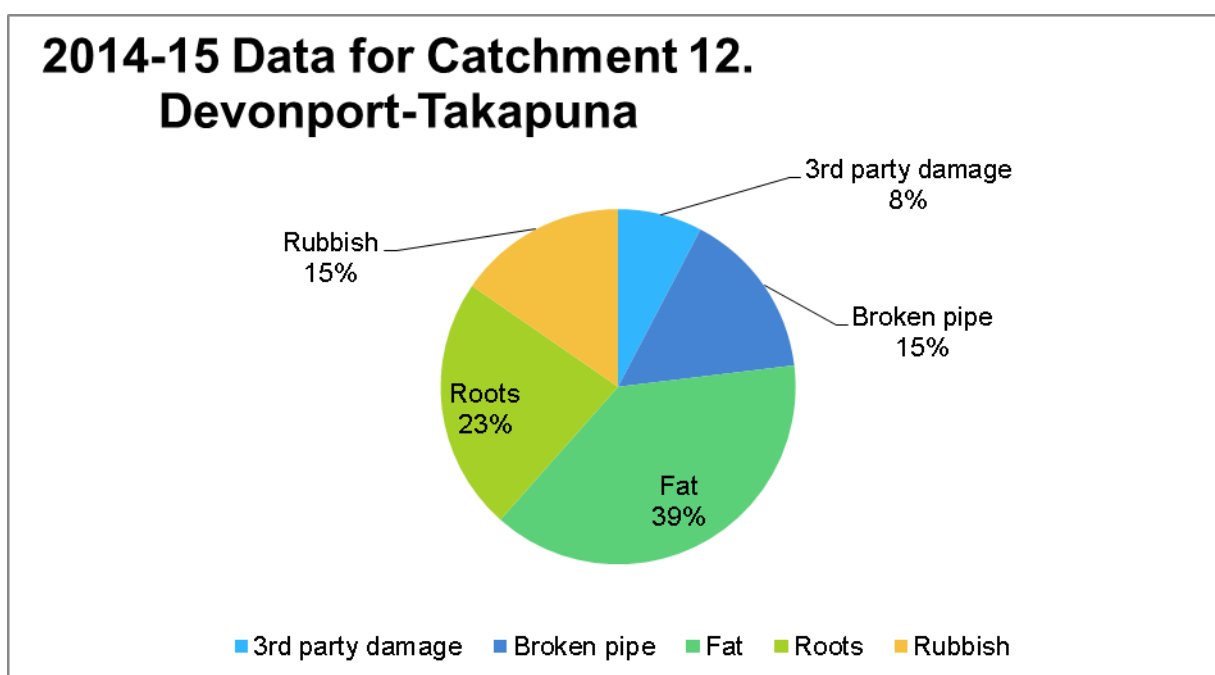
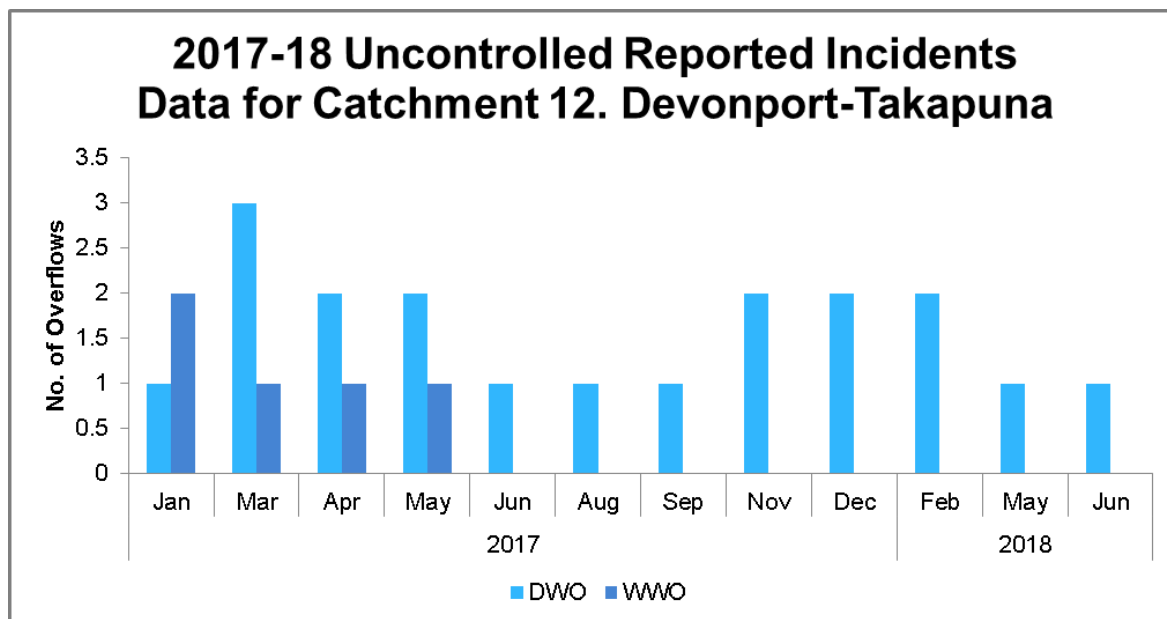
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
27/02/2018	10 Rarere Rd	L1	139	Roots	0	Rootcut
22/05/2018	9 Rarere Rd	L1	630	Roots	9.57	

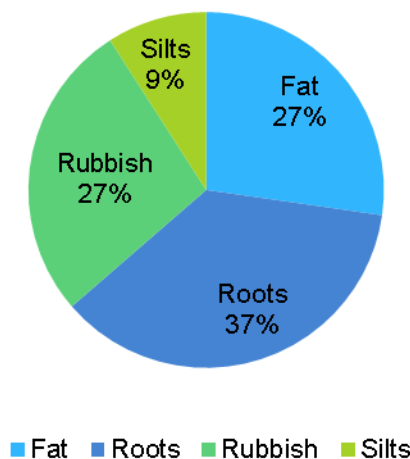
1.12.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.

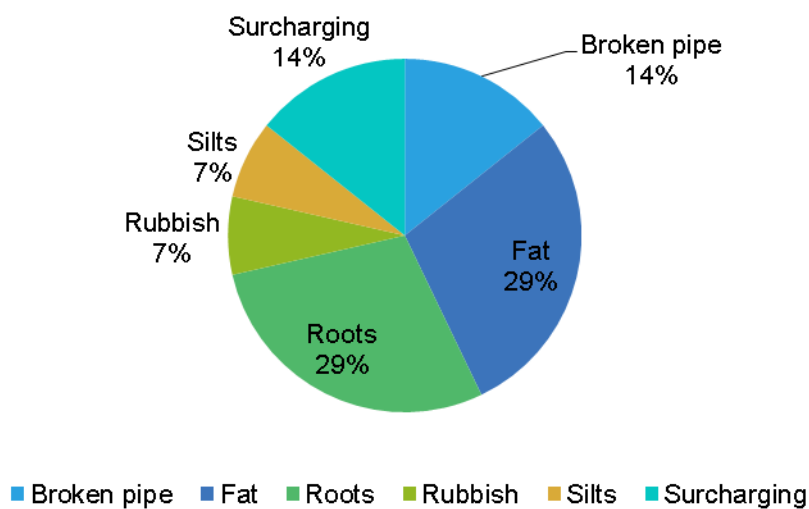




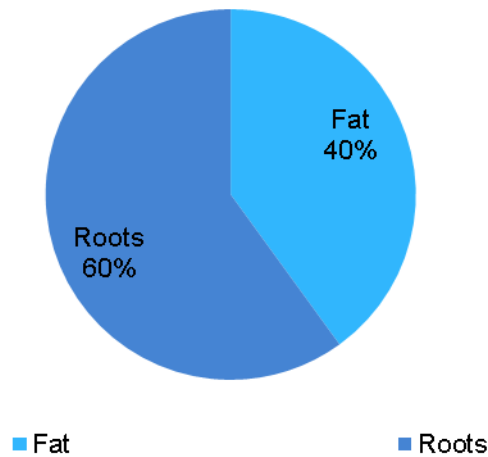
2015-16 Data for Catchment 12. Devonport-Takapuna



2016-17 Data for Catchment 12. Devonport-Takapuna



2017-18 Data for Catchment 12. Devonport-Takapuna



Trend analysis has been carried out where the cause has been identified.

1.12.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
6/07/2017	DPNRO	Northboro Tunnel Wastewater Overflow	860	Rain event	340	25.5
11/02/2018	DPNRO	Northboro Tunnel Wastewater Overflow	860	Rain event	476	29.8
19/05/2018	DPNRO	Northboro Tunnel Wastewater Overflow	860	Rain event	60	3.52
3/06/2018	DPNRO	Northboro Tunnel Wastewater Overflow	860	Rain event	132	52.86

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. The cause is taken from validated site data.

1.12.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
859	Stanley Point 2 WW WWPS	0	1	0	0	0	0.25	Continue to monitor
860	Northboro WWPS	5.1	6	1	12	4	5.75	Fred Thomas Drive WWPS and Storage Tank (mitigation); Northboro PS upgrade

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
879	King Edward Parade WWPS	0	3	0	1	0	1	Continue to monitor
886	Seacliffe WWPS	0	0	0	5	0	1.25	Continue to monitor
949	King Edward Parade Storage Tank	6.5	0	0	0	0	0	Continue to monitor
1226	Arawa WWPS	0	0	0	0	0	0	Continue to monitor

1.12.6 Inflow & Infiltration Programme

I&I investigations and reduction works have historically been carried out in this catchment to improve the network performance. No further works have been carried out in this period.

Extensive CCTV and flushing has been undertaken in this area with only minor issues found and remedied in the wastewater network.

An option analysis study is currently underway and may identify I&I reduction in targeted subcatchments.

1.12.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	Fred Thomas Drive WWPS and storage tank	Project execution	Project will address performance and reliability at EOP 852. This project will enable projects (Northboro WWPS upgrade and others) to commence	Will reduce overflow frequency at EOP852 and enable future growth and future projects in upstream catchment to address performance at EOP860	2017
Underway	Wairau pump station rising main upgrades	Project execution	Rising main failed and requires replacement. Will be upsized to increase capacity	Reduces risk of uncontrolled discharges due to asset failure	2017-2018
Underway	Wairau pump station (DPWAU) upgrades	Design	Reduce overflow frequency and risk to public health and environment, reduce risk of asset failure	Reduces overflow volume/ frequency for OF 951 and allows for growth and future improvements in multiple catchment	2015-2021
Planned	Devonport / Takapuna local network upgrades	Option Analysis (Feasibility)	Reduce Type 3 overflows.	Reduces overflow volume/ frequency for OF 951 and allows for growth	

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Planned	Northboro WWPS Upgrade	Studies and investigations	Study will identified preferred concept design to reduce overflows at DPNRO by increasing the capacity of the pump station	Reduces overflow volume and frequency for EOP 860 and allows for growth within the contributing catchment	2018 (study), project construction TBC
Underway	Wastewater Main Renewals and Lining Programme	Project Execution	Network wastewater pipe renewal at 38 sites	Upgraded network pipe condition	2015-2018
Complete	Fred Thomas Drive WWPS and storage tank	Project execution	Project will address performance and reliability at EOP 852. This project will enable projects (Northboro WWPS upgrade and others) to commence	Will reduce overflow frequency at EOP852 and enable future growth and future projects in upstream catchment to address performance at EOP860	2017

Minor improvements works include:

- Operational modifications at Northboro WWPS to divert additional catchment away from this pump station to the new Fred Thomas WWPS prior to Northboro WWPS upgrade.

1.12.8 Erosion Control Measures

No works related to erosion control were carried out in this SMA between 17 June 2017 and 30 June 2018.

1.12.9 Summary

The Northboro pump station has discharged more than twice this year. Trend analysis shows roots and fats as the primary causes of uncontrolled overflows. The ratio of overflows to pipe length has decreased in this reporting period. In the long term, the network performance in this catchment will be improved with the 'Wairau Pump station rising main upgrades', 'Wairau Pump station (DPWAU) upgrades' and 'Fred Thomas Drive WWPS and Storage Tank' projects, which will relieve the network. The Devonport / Takapuna local network upgrades have identified local minor upgrades that will be further scoped and implemented depending upon regional prioritisation processes. No significant changes have been made to the network as a whole. The overflow history will be analysed and utilised when reviewing future network improvement programmes.

This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.13 Catchment 13 – Shoal Bay

1.13.1 Overview

The Shoal Bay catchment is located on the North Shore of Auckland. The catchment comprises the areas from Chatswood in the west round to Stanley Bay in the east, and includes the suburbs of Birkenhead, Northcote, Takapuna and Belmont, among others. The area incorporates the coastal bays of Chelsea Bay, Little Shoal Bay, Shoal Bay and Ngataranga Bay around the Waitemata Harbour. Within these catchments are a number of freshwater watercourses including Duck Creek, Little Shoal Bay stream, Onepoto/ Waiurutoa Stream and Hillcrest Creek. The total land area is approximately 2,000 ha and there are currently 17,022 wastewater connections.

The catchment contains predominantly urban land use, with significant residential development. Commercial land uses occur in some centres between Northcote Central and Takapuna. Chelsea Sugar factory is a notable large industrial site within the catchment. There are large open space areas, including volcanic craters, recreational areas and schools. A significant roading network, including the northern motorway, traverses the catchment, including a major interchange area at Takapuna.

	2014/15	2015/16	2016/17	2017/18
No. of connections	16,900	16,929	16,972	17,022
Length of sewer (km)	277	277	277	338

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
829	28 Waitemata Road	-	2	Shoal Bay via stormwater pipe
830	Lake Northcote WWPS	DPLNO	1	Onepoto Stream
836	24 Patuone Place	-	2	Ngataranga Bay via stormwater pipe
837	10 Charles Street	-	2	Shoal Bay via stormwater pipe
838	39 Kiwi Road	-	2	Ngataranga Bay via stormwater pipe
839	51 Plymouth Cres	-	2	Ngataranga Bay
840	44 William Bond Street	-	2	Ngataranga Bay via stormwater pipe
841	14 Denby Lane	-	2	Shoal Bay via stormwater pipe
842	48 Richmond Ave	-	2	Shoal Bay via stormwater pipe
843	52 Richmond Ave	-	2	Shoal Bay via stormwater pipe
846	26 Waratah Street	-	2	Waiurutoa Stream
847	66 Stanley Point Road	-	2	Ngataranga Bay via stormwater pipe
849	Seabreeze WWPS	DPSEA	1	Ngataranga Stream
851	1 Kauri Glen Road	-	2	Waiurutoa Stream
852	Barrys Point WWPS	DPBRP	1	Stormwater pond
857	Stanley Point 1 WWPS	DPSN1	1	To land

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
861	Sulphur Beach WWPS	DPSUL	1	Shoal Bay via stormwater pipe
863	Maunganui WWPS	DPMNI	1	Chelsea Bay
880	Ewen Alison WWPS	DPEWE	1	Ngataringa Bay via stormwater pipe
881	Lake Devonport WWPS	DPLDE	1	To land
883	Norwood WWPS	DPNOD	1	Ngataringa Bay
884	Kawerau WWPS	DPKAW	1	Ngataringa Bay
885	Regent WWPS	DPREG	1	Unnamed tributary of Ngataringa Bay
887	Hinemoa WWPS	DPHNM	1	Little Shoal Bay
888	Homewood WWPS	DPHOM	1	Duck Creek and Chelsea Ponds
889	Alfred WWPS	DPAFD	1	Shoal Bay via stormwater pipe
890	Sylvan WWPS	DPSYV	1	Onepoto Stream
898	Havenwood	DPHVN	1	Waiurutoa Stream
899	Arahia WWPS	DPARH	1	Tuff Crater
904	Jim Titchener WWPS	DPJIM	1	Ngataringa Bay via stormwater pipe
905	Bayswater WWPS	DPBYS	1	Shoal Bay
906	Barrys Point Local WWPS	DPBPO	1	Shoal Bay
907	Kitewao WWPS	DPKWO	1	Hillcrest Creek
908	Dominion WWPS	DPDMN	1	Hillcrest Creek via stormwater pipe
948	Exmouth WWPS	DPEXM	1	Tuff Crater via stormwater pipe

There have been no changes to the schedule of EOPs in this catchment.

1.13.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Overflows

There were a total of 182 reported incidents in the Shoal Bay catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

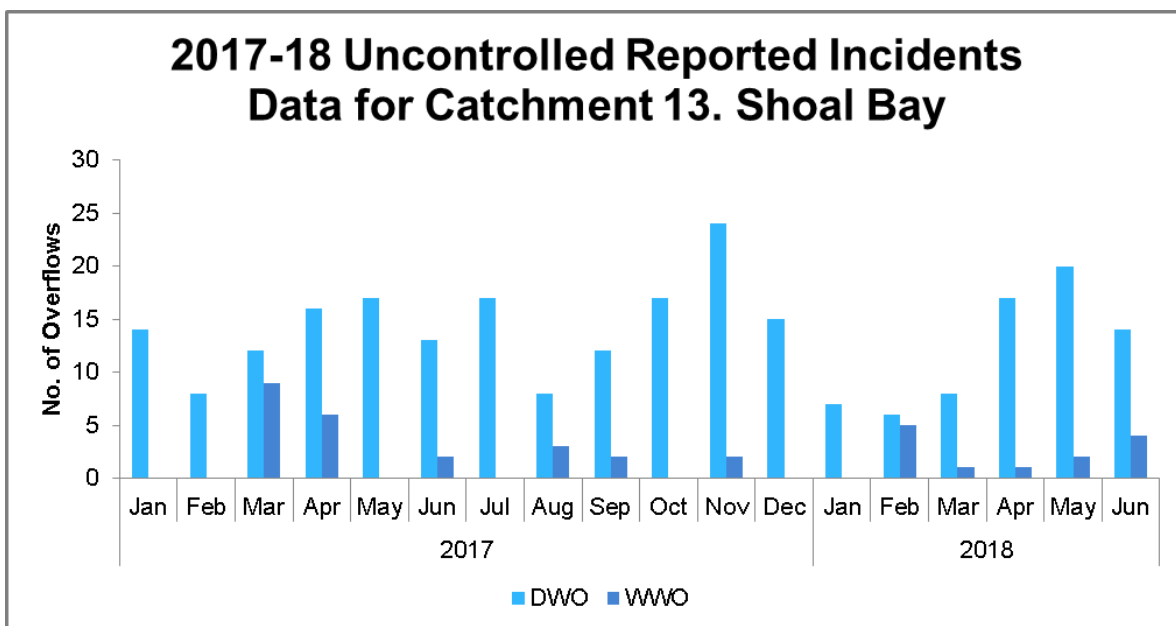
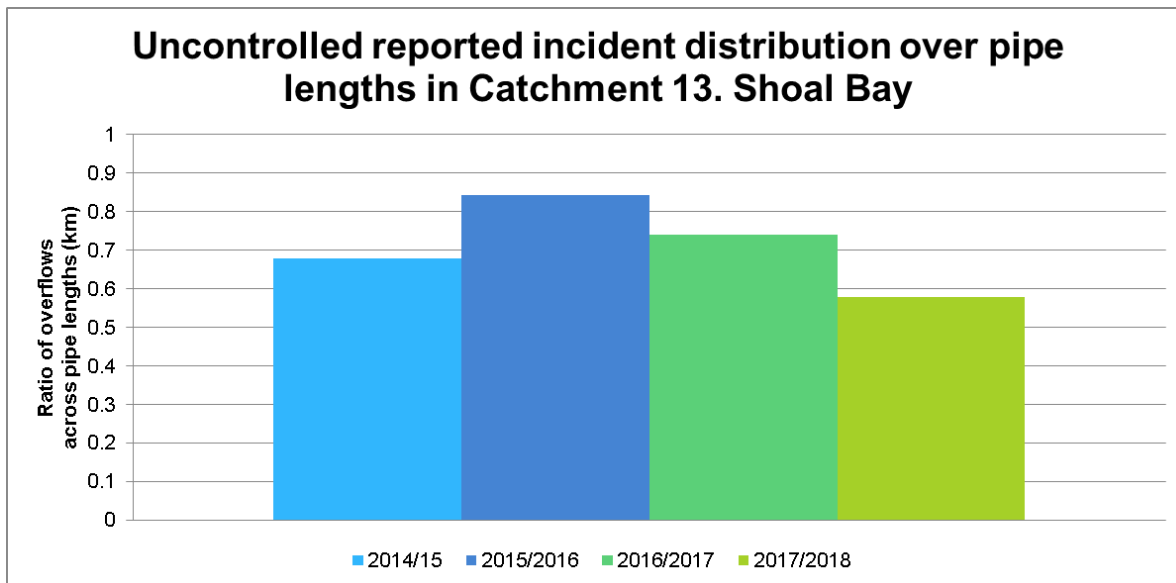
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
22/05/2018	1/76 Jutland Rd	L1	126	Unknown	9.57	Root blockage cleared
26/05/2018	1/76 Jutland Rd	L1	105	Unknown	4.53	
20/03/2017	100 Colonial Rd	L2	405	Unknown	0	Ongoing issue with landslip
24/05/2017	100 Colonial Rd	L2	274	Unknown	1.5	
24/11/2017	100 Colonial Rd	L2	327	Broken pipe	0	
12/01/2018	100 Colonial Rd	L1	71	Broken pipe	0	
30/01/2018	100 Colonial Rd	L1	203	Broken pipe	0	
1/12/2017	1/10 Rawene Rd	L2	127	Foreign Object	0	Removed blockage from line
3/12/2017	1/10 Rawene Rd	L1	494	Foreign Object	0.5	
4/11/2017	24 Inkster St	L1	7	Broken pipe	4.5	Multiple issues, Third Party Damage of cable thrusting, fats from upstream commercial area
7/11/2017	24 Inkster St	L2	121	Broken pipe	0	
21/11/2017	24 Inkster St	L2	163	Broken pipe	0	
23/11/2017	24 Inkster St	L2	204	Broken pipe	0	
25/11/2017	24 Inkster St	L3	152	Broken pipe	0	
2/02/2018	24 Inkster St	L3	237	Roots	0.2	
7/02/2018	26 Inkster St	L1	389	Fat	0	
21/12/2017	20 Inkster St	L1	256	Unknown	0	
17/03/2017	1/15 Alamein Ave	L1	508	Roots	0.5	4m drain snake removed from public main
26/05/2017	2/15 Alamein Ave	L2	483	Fat	2.5	
17/10/2017	1/15 Alamein Ave	L1	20	Unknown	1	
15/07/2017	2 Ngataranga Rd	L1	568	Unknown	0	Blockage cleared
24/07/2017	2 Ngataranga Rd	L1	119	Unknown	2.5	
24/06/2017	48 Deuxberry Ave	L1	417	Fat	29	Broken pipe repaired
21/12/2017	48 Deuxberry Ave	L1	191	Fat	0	
12/03/2017	28 Waitemata Rd	L1	617	Unknown	23	Continue to monitor

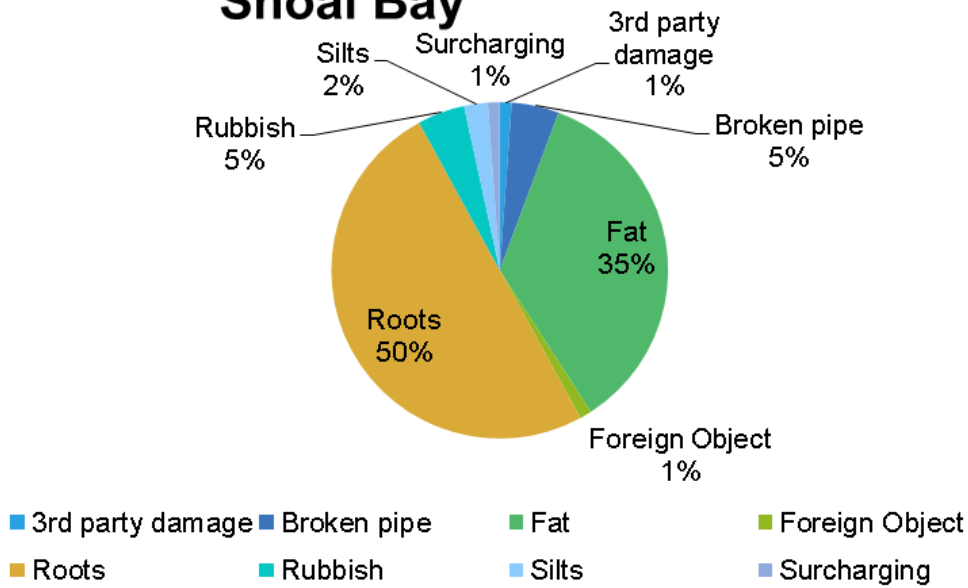
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)l	Measures to prevent repeat
11/02/2018	28 Waitemata Rd	L1	615	Surcharging	29.8	
4/05/2018	9 Tennyson St	L1	167	Fat	0	Debris and loose lining tape removed
12/06/2018	9 Tennyson St	L1	141	Rags	5.5	
2/05/2017	28 Glade Pl	L2	280	Rubbish	0	Stones removed
26/07/2017	28 Glade Pl	L1	111	Rubbish	1.5	
30/06/2017	2/24 Mariposa Cres	L1	462	Unknown	0.5	NRV failure after blockage
14/03/2018	2/24 Mariposa Cres	L2	484	Broken pipe	0.5	
28/08/2017	50-Ravenstone Pl	L1	210	Roots	11.76	Rootcut
4/09/2017	50-Ravenstone Pl	L1	188	Roots	0	
13/09/2017	52A Francis St	L1	169	Fat	0	Continue to monitor
26/12/2017	52A Francis St	L1	66	Unknown	6	
2/10/2017	10 Porritt Ave	L1	179	Roots	8	Rootcut, CCTV
4/10/2017	10 Porritt Ave	L1	519	Roots	0.5	
29/11/2017	89 Albert Rd	L1	79	Unknown	12.5	Removed rocks
13/12/2017	89 Albert Rd	L1	186	Foreign Object	0	
27/04/2018	72 Aramoana Ave	L1	482	Roots	0	Rags and plastic gloves removed
24/05/2018	72 Aramoana Ave	L2	501	Roots	2.51	
4/05/2018	9 Tennyson St	L1	167	Fat	0	Fats and rags removed, heavy flush
12/06/2018	9 Tennyson St	L1	141	Rags	5.5	
29/05/2018	38 William Bond St	L1	246	Foreign Object	0	Rootcut
11/06/2018	38 William Bond St	L1	166	Roots	0.5	
18/08/2017	5 Eban Ave	L1	171	Unknown	0.98	Rootcut
25/08/2017	5 Eban Ave	L1	426	Roots	0	

1.13.3 Trend analysis of reported incidents

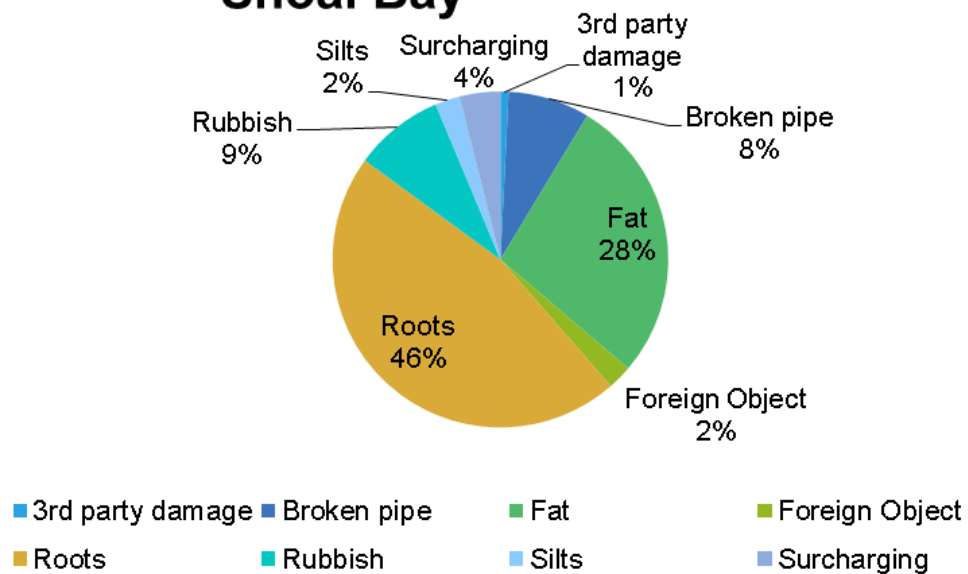
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



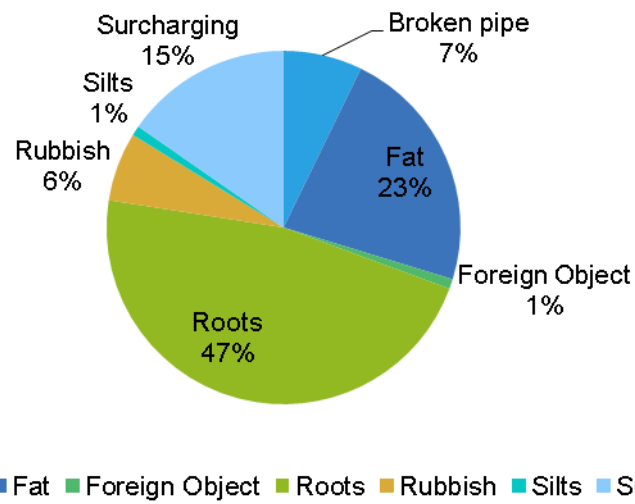
2014-15 Data for Catchment 13. Shoal Bay



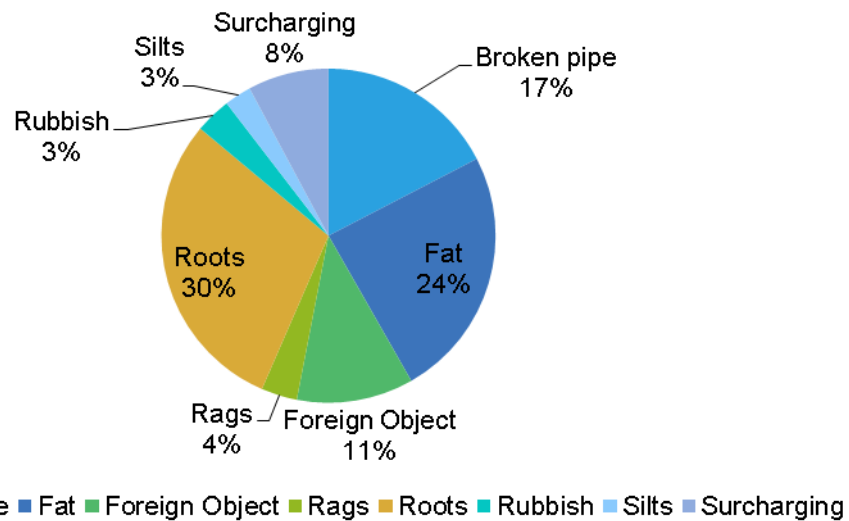
2015-16 Data for Catchment 13. Shoal Bay



2016-17 Data for Catchment 13. Shoal Bay



2017-18 Data for Catchment 13. Shoal Bay



Trend analysis has been carried out where the cause has been identified.

1.13.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
6/07/2017	DPJIM	Jim Tichener Wastewater Pump Station	904	Rain event	164	25.5
1/02/2018	DPJIM	Jim Tichener Wastewater Pump Station	904	Rain event	58	50
11/02/2018	DPJIM	Jim Tichener Wastewater Pump Station	904	Rain event	148	29.8
11/02/2018	DPKAW	Kawerau Wastewater Pump Station	884	Rain event	45	29.8
11/02/2018	DPMNI	Maunganui Storage Tank Overflow	863	Rain event	126	29.8
3/06/2018	DPMNI	Maunganui Storage Tank Overflow	863	Rain event	190	52.86
3/06/2018	DPJIM	Jim Tichener Wastewater Pump Station	904	Rain event	94	52.86
11/06/2018	DPJIM	Jim Tichener Wastewater Pump Station	904	Rain event	22	0.5

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. The cause is taken from validated site data.

1.13.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
830	Lake Northcote WWPS	5.6	0	0	1	0	0.25	Continue to monitor
849	Seabreeze WWPS	0	1	0	0	0	0.25	Continue to monitor
852	Barrys Point WWPS	7.3	0	0	0	0	0	Fred Thomas Drive WWPS and Storage Tank
857	Stanley Point 1 WWPS	-	0	0	0	0	0	Continue to monitor
861	Sulphur Beach WWPS	2.3	3	0	0	0	0.75	Continue to monitor
863	Maunganui WWPS	6.3	3	0	3	2	2	Chelsea WWPS Diversion
880	Ewen Alison WWPS	0	0	0	0	0	0	Continue to monitor
881	Lake Devonport WWPS	0	0	0	0	0	0	Continue to monitor
883	Norwood WWPS	1.4	0	0	0	0	0	Continue to monitor
884	Kawerau WWPS	1.6	0	0	3	1	1	Continue to monitor
885	Regent WWPS	0	1	0	0	0	0.25	Continue to monitor
887	Hinemoa WWPS	0	0	0	0	0	0	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
888	Homewood WWPS	0	1	0	0	0	0.25	Continue to monitor
889	Alfred WWPS	0	0	0	0	0	0	Continue to monitor
890	Sylvan WWPS	2.9	0	0	0	0	0	Continue to monitor
898	Havenwood	0.4	0	0	0	0	0	Continue to monitor
899	Arahia WWPS	4.1	1	0	5	0	1.5	Continue to monitor
904	Jim Titchener WWPS	2	2	0	1	5	2	Continue to monitor
905	Bayswater WWPS	0	0	0	0	0	0	Continue to monitor
906	Barrys Point Local WWPS	0	0	0	0	0	0	Continue to monitor
907	Kitewao WWPS	0	1	0	0	0	0.25	Continue to monitor
908	Dominion WWPS	0	1	0	0	0	0.25	Continue to monitor
948	Exmouth WWPS	0.7	0	0	0	0	0	Continue to monitor

1.13.6 Inflow & Infiltration Programme

I&I reduction works have historically been carried out in Chatswood, Takapuna foreshore, Forrest Hill, Northcote Point to improve the network performance. No further works have been carried out in this period.

1.13.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	Fred Thomas Drive WWPS and storage tank	Project execution	Project will address performance and reliability at EOP 852. This project will enable projects (Northboro WWPS upgrade and others) to commence	Will reduce overflow frequency at EOP852 and enable future growth and future projects in upstream catchment to address performance at EOP860	2017
Underway	Wairau pump station rising main upgrades	Project execution	Rising main failed and requires replacement. Will be upsized to increase capacity	Reduces risk of uncontrolled discharges due to asset failure	2017-2018

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Wairau pump station (DPWAU) upgrades	Design	Reduce overflow frequency and risk to public health and environment, reduce risk of asset failure	Reduces overflow volume/ frequency for OF 951 and allows for growth and future improvements in multiple catchment	2015-2021
Underway	Northcote branch sewer (DSNCT) upgrade works (formerly TS8)	Project execution	Required to maintain service delivery and to reduce the risk of failure.	Will provide for growth in the contributing wastewater catchments and allow for an improved level of service	2016-2019
Underway	Chelsea Pump Station diversion to Birkdale	Option Analysis (Feasibility)	Considered to reduce risk of overflows and replace critical asset	Would reduce frequency of overflows	2016-2020
Planned	Northboro WW Pump Station Upgrade	Studies and investigations	Study will identified preferred concept design to reduce overflows at DPNRO by increasing the capacity of the pump station	Will enable future growth and future projects in the Shoal Bay catchment.	2018 (study), project construction TBC
Underway	Northcote-Chatswood Wastewater Network Upgrades	Studies and investigations	Provide 60l/s pump station, 900m of 315mm rising main and 700m of 450mm gravity sewer	Cater for Auckland's growth	2018-2021
Underway	North Shore Transmission Control Upgrade	Project Execution	Upgrade of electrical and control systems of 20 wastewater Transmission sites	Reduction of uncontrolled wet weather overflows from MH10 Chatswood Branch Sewer and EOP 830 at MH1 Northcote Point Branch Sewer	2017-2019

1.13.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.13.9 Summary

There were no EOPs which discharged more frequently than two times per year on average. In the long term, the network performance in this catchment will be improved with such projects as the 'Wairau Pump station rising main upgrades', 'Wairau Pump station (DPWAU) upgrades', 'Fred Thomas Drive WWPS and Storage Tank', 'Northcote branch sewer (DSNCT) upgrade works (formerly TS8)' and 'Chelsea Pump Station Upgrade', which will provide wastewater network capacity. The ratio of overflows to pipe length decreased in this reporting period and the main cause of these uncontrolled overflows was attributed to roots. The overflow history will be analysed and utilised when reviewing future network

improvement programmes. No significant changes have been made to the network as a whole. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.14 Catchment 14 – Upper Harbour North

1.14.1 Overview

The Upper Harbour North catchment is located on the North Shore of Auckland. The catchment includes the suburbs of Greenhithe, Wainoni, North Harbour, Albany, Albany Village and Rosedale. The northern limit of the catchment follows the boundary of the former North Shore City from Paremoremo Creek, along Brookdale Road, Ridge Road and O'Brien Road to State Highway 17. The northern boundary then continues along Albany Heights Road and Lonely Track Road to East Coast Road. The southern boundary of the catchment generally follows Upper Harbour Drive (State Highway 18) from Greenhithe to the Albany Highway and then Sunset Road to East Coast Road. The eastern extent of the catchment is the ridge following East Coast Road. The total land area is approximately 3,000 ha. There are currently 14,267 wastewater connections.

The catchment contains a mix of urban and rural land uses, including many residential areas that are currently being developed. There have been numerous subdivisions, large medium-density developments in specially zoned areas and infill growth throughout this catchment. There are two large commercial/industrial areas at Albany and North Harbour, as well as the North Harbour Stadium and the Massey University Campus.

	2014/15	2015/16	2016/17	2017/18
No. of connections	13,753	13,923	14,098	14,267
Length of sewer (km)	302	307	311	368

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
826	Atlas WWPS	DPATL	1	Alexandra Stream
874	Church House WWPS	DPCHH	1	Greenhithe Stream
876	Rosedale WWPS	DPRLE	1	Oteha Stream
877	Kyle No. 1 WWPS	DPKY1	1	Kyle Stream
878	Albany WWPS	DPALB	1	Oteha Stream
920	Kerema WWPS	DPKER	1	Lucas Creek
923	Van Der Bilt WWPS	DPVAN	1	Oteha Stream
924	Remu WWPS	DPREM	1	Greenhithe Coast
925	Koki WWPS	DPKKI	1	Greenhithe Coast
926	Rahui WWPS	DPRAH	1	Greenhithe Coast
927	Awatahi WWPS	DPAWA	1	Lucas Creek
928	Wainoni WWPS	DPWNI	1	Te Wharau Creek
934	Aberly WWPS	DPALY	1	Aberley Creek
944	Mahoney WWPS	DPMHO	1	Lucas Creek
945	Carol Lee Place	DPCLP	1	To Land

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
	WWPS			
946	Kyle No. 2 WWPS	DPKY2	1	Kyle Stream
1231	Oscar WWPS	DPOSC	1	Lucas Creek
1232	Bush WWPS	DPBUS	1	Oteha Stream
1234	Chester WWPS	DPCHS	1	Kyle Stream
1241	Dressage WWPS	DPDRE	1	Orwell Stream

There have been no changes to the schedule of EOPs in this catchment

1.14.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 106 reported incidents in the Upper Harbour North catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

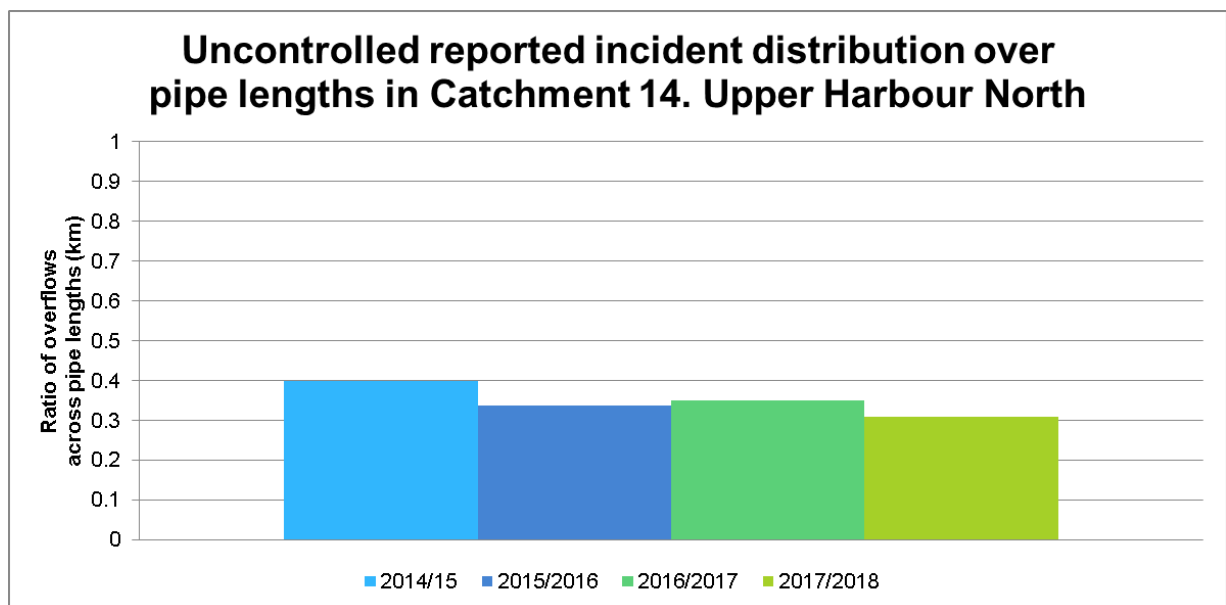
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
27/06/2017	17 Rahui Rd	L1	213	Unknown	0	Under investigation
24/04/2018	15 Rahui Rd	L1	126	Roots	0	
31/01/2017	20 Remu Pl	L1	468	Unknown	0	Pump Station manhole rehaunched
9/07/2017	30 Remu Pl	L1	96	Fat	10.5	
19/10/2017	20 Remu Pl	L2	206	Unknown	0	
5/01/2017	18 Almond Grv	L1	403	Unknown	0	Heavy flushed fat blockage
21/08/2017	18 Almond Grv	L1	321	Fat	0	

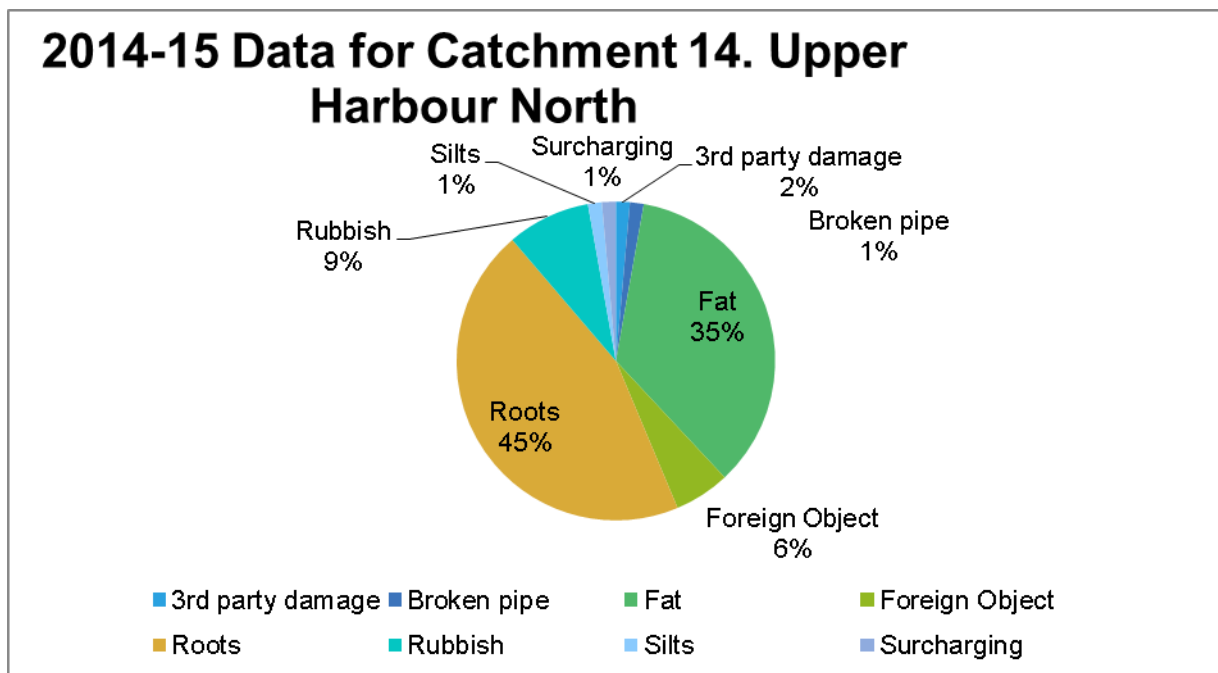
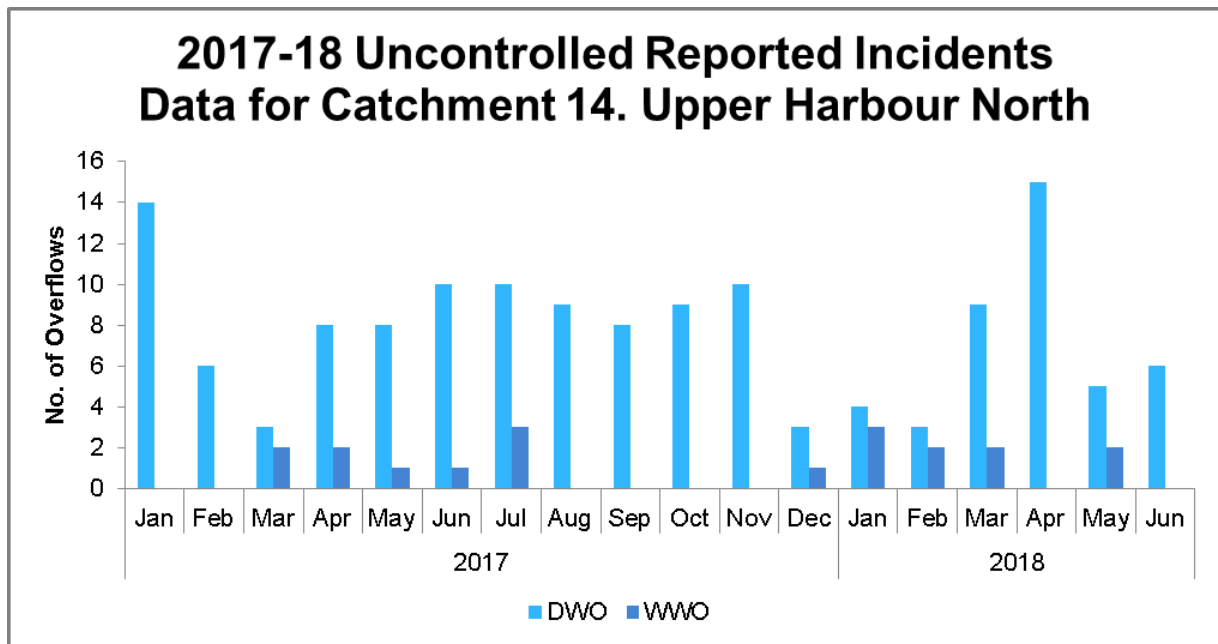
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
21/04/2018	15 Kingfisher Grv	L1	160	Roots	2	Rootcut
26/04/2018	15 Kingfisher Grv	L1	106	Roots	0	
23/05/2017	105 Apollo Dr	L1	266	Unknown	0	Third Party Damage repaired
21/11/2017	105 Apollo Dr	L2	419	3rd party damage	0	
5/04/2017	25 Ballyboe Pl	L1	254	Rubbish	25	Rootcut
23/01/2018	25 Ballyboe Pl	L1	231	Surcharging	14.2	
15/02/2018	25 Ballyboe Pl	L1	232	Roots	0	
15/05/2017	71 Roland Rd	L1	168	Unknown	0	Pipe bridge repaired
15/02/2018	71 Roland Rd	L3	426	Broken pipe	0	
15/10/2017	35 Outlook Rd	L3	304	Fat	0.5	Heavy flushed
17/06/2018	35 Outlook Rd	L2	530	Roots	0	
9/11/2016	21 Fairview Ave	L1	486	Foreign Object	0	Debris removed
20/10/2017	21 Fairview Ave	L2	289	Unknown	0.5	
23/05/2017	105 Apollo Dr	L1	600	Unknown	0	Third Party Damage
21/11/2017	105 Apollo Dr	L2	419	3rd party damage	0	
16/12/2016	1/222 Albany Hwy	L2	128	Unknown	5	Heavy flushed
15/07/2017	1/222 Albany Hwy	L1	274	Fat	0	
24/12/2016	28 Devonshire Rd	L1	492	Foreign Object	0	Main flushed
5/08/2017	28 Devonshire Rd	L1	490	Fat	0	
12/07/2017	3 Windsor Pl	L1	104	Roots	7	Rootcut and heavy flush
14/07/2017	3 Windsor Pl	L2	543	Roots	2	
27/06/2017	492A East Coast Rd	L1	146	Fat	0	Added to Annual flushing programme
14/11/2017	492A East Coast Rd	L1	549	Unknown	3.5	
27/11/2017	492A East Coast Rd	L1	366	Fat	0	
27/06/2017	556 East Coast Rd	L1	259	Foreign Object	0	Removed large amount of toilet paper
24/07/2017	556 East Coast Rd	L3	499	Rubbish	2.5	
17/07/2017	91 Roland Rd	L1	299	Unknown	0	Pipe bridge added to annual flushing programme
4/04/2018	91 Roland Rd	L1	434	Unknown	1.51	
22/04/2018	91 Roland Rd	L3	501	Unknown	1	
14/08/2017	696 East Coast Rd	L1	358	Unknown	3.92	Rootcut
19/08/2017	696A East Coast Rd	L1	412	Roots	4.9	
1/09/2017	16 Mercury Lane	L1	90	Roots	0.49	Connection

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
13/09/2017	16 Mercury Lane	L1	273	Roots	0	and dropper repaired
4/09/2017	2/12 Parkhead Pl	L2	111	Fat	0	Heavy flushed
9/04/2018	2/12 Parkhead Pl	L1	183	Rags	0	
12/12/2017	45 Centorian Dr	L1	128	Unknown	0	Removed blockage from manhole
19/04/2018	41 Centorian Dr	L2	87	Roots	0	
23/03/2018	63 Greenhithe Rd	L2	174	Fat	3	Rootcut
7/04/2018	67 Greenhithe Rd	L1	543	Roots	1.5	
6/05/2018	16 Oakford Park Cres	L2	171	Fat	0.5	Heavy flushed
10/05/2018	16 Oakford Park Cres	L3	535	Roots	0.5	
22/02/2018	21- Oteha Valley Rd Extension	L1	534	Unknown	0	Continue to monitor
8/03/2018	21- Oteha Valley Rd Extension	L2	435	Unknown	21	

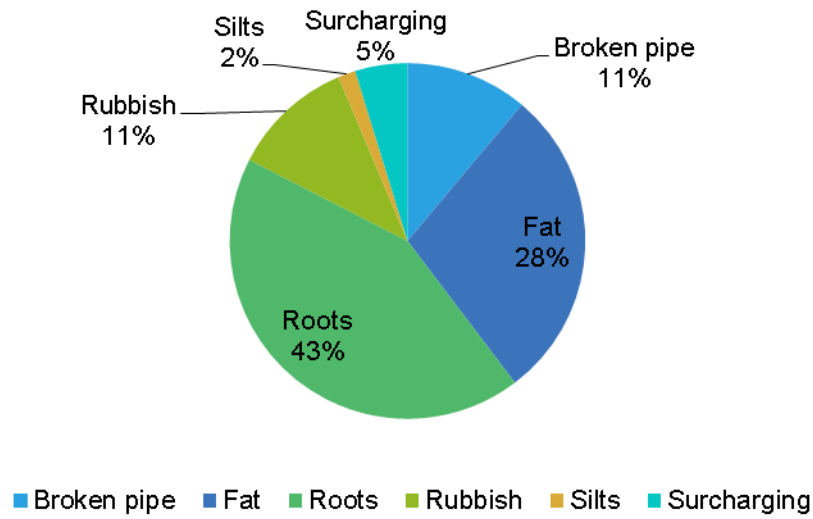
1.14.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.

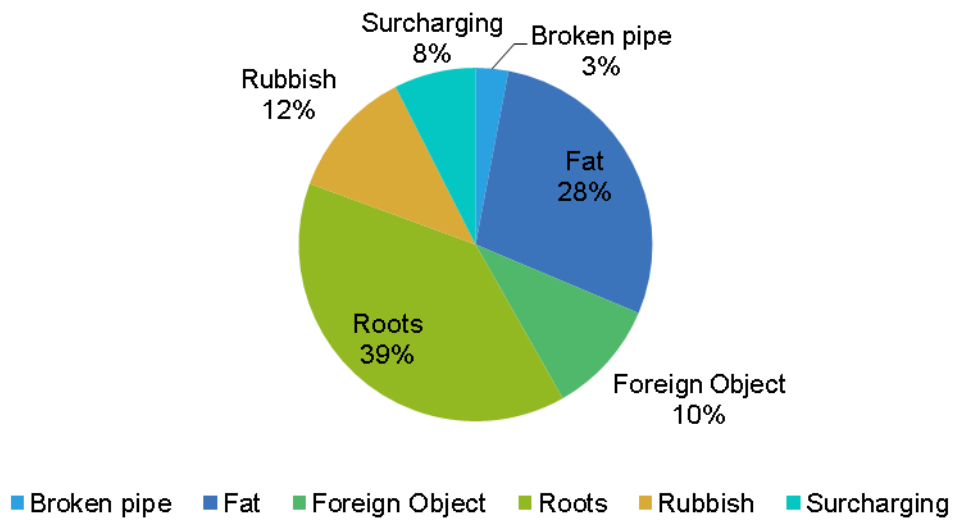


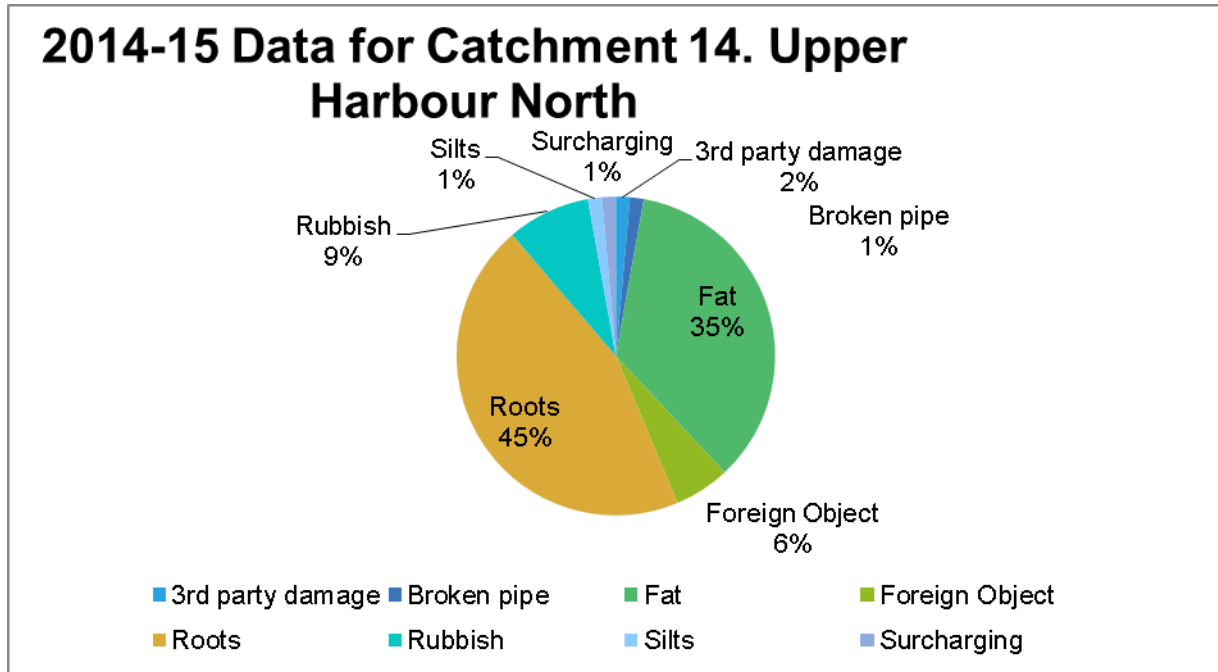


2015-16 Data for Catchment 14. Upper Harbour North



2016-17 Data for Catchment 14. Upper Harbour North





Trend analysis has been carried out where the cause has been identified.

1.14.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
6/07/2017	DPKY1	Kyle 1 Wastewater Pump Station	877	Rain event	113	25.5
23/01/2018	DPVAN	Van Der Bilt Wastewater Pump Station	923	Rain event	77	14.2
23/01/2018	DPRLE	Rosedale Wastewater Pump Station	876	Rain event	63	14.2
11/02/2018	DPKY1	Kyle 1 Wastewater Pump Station	877	Rain event	236	29.8
11/02/2018	DPRLE	Rosedale Wastewater Pump Station	876	Rain event	69	29.8
11/02/2018	DPCHH	Church House Wastewater Pump Station	874	Rain event	95	29.8
28/04/2018	DPAWA	Awatahi Wastewater Pump Station	927	Rain event	7	64
29/04/2018	DPKY1	Kyle 1 Wastewater Pump Station	877	Rain event	48	1
3/06/2018	DPKY1	Kyle 1 Wastewater Pump Station	877	Rain event	234	52.86
3/06/2018	DPRLE	Rosedale Wastewater Pump Station	876	Rain event	144	52.86
3/06/2018	DPCHH	Church House Wastewater Pump Station	874	Rain event	79	52.86

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. Root cause is taken from validated site data.

1.14.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
826	Atlas WWPS	0	0	0	0	0	0	Continue to monitor
874	Church House WWPS	0.4	0	2	2	2	1.5	Continue to monitor
876	Rosedale WWPS	0.3	0	0	6	3	2.25	Continue to monitor
877	Kyle No. 1 WWPS	1.2	0	2	4	4	2.5	Continue to monitor
878	Albany WWPS	0	0	0	0	0	0	Continue to monitor
920	Kerema WWPS	0	0	0	0	0	0	Continue to monitor
923	Van Der Bilt WWPS	0	0	0	0	1	0.25	Continue to monitor
924	Remu WWPS	0	0	0	0	0	0	Continue to monitor
925	Koki WWPS	0	1	0	0	0	0.25	Continue to monitor
926	Rahui WWPS	0	0	0	0	0	0	Continue to monitor
927	Awatahi WWPS	0.2	0	0	0	1	0.25	Continue to monitor
928	Wainoni WWPS	0	0	0	0	0	0	Continue to monitor
934	Aberly WWPS	0	1	0	0	0	0.25	Continue to monitor
944	Mahoney WWPS	0	0	0	0	0	0	Continue to monitor
945	Carol Lee Place WWPS	0	0	0	0	0	0	Continue to monitor
946	Kyle No. 2 WWPS	0	0	0	0	0	0	Continue to monitor
1231	Oscar WWPS	0	0	0	0	0	0	Continue to monitor
1232	Bush WWPS	0	0	0	0	0	0	Continue to monitor
1234	Chester WWPS	0	0	0	0	0	0	Continue to monitor
1241	Dressage WWPS	0	0	0	0	0	0	Continue to monitor

1.14.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be carried out as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

1.14.7 Improvement Works Programme

No significant network improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018. This network will continue to be monitored and the overflow history will be analysed and utilised when reviewing future network improvement programmes.

1.14.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.14.9 Summary

There were two EOPs which have discharged more frequently than two spills per year, with Rosedale and Kyle No. 1 pump stations both exceeding two spills in 2017/18. The ratio of blockages to pipe length has decreased in this reporting period. Trend analysis shows that roots and fats are the predominant cause of uncontrolled overflows. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended by 56 km and developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.15 Catchment 15 – Upper Harbour South

1.15.1 Overview

The Upper Harbour South catchment is located on the North Shore of Auckland. The catchment includes the suburbs of Beach Haven, Birkdale and parts of Glenfield. The northern limit of the catchment follows Upper Harbour Drive and the Albany Highway and follows Glenfield Road to Mokoia Road to form the eastern boundary. The southern boundary follows Mokoia Road, Balmain Road and Onetaunga Road to west of the Chelsea Sugar Refinery. To the west of the catchment is the inner Waitemata Harbour. The total catchment size is approximately 1,770 ha and there are currently 13,136 wastewater connections.

Land use within the Upper Harbour South catchment is predominantly residential with small areas of commercial activities and a number of schools. The residential land use is reasonably low density compared to other areas in the former NSCC. North of Hellyers Creek and Lignite Creek is mainly rural and reserve land and there are also large reserve areas along Eskdale Stream and Kauri Point.

	2014/15	2015/16	2016/17	2017/18
No. of connections	13,008	13,053	13,117	13,136
Length of sewer (km)	219	219	220	260

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
844	28 Gazelle Rd	-	2	Hellyers Creek
856	Island Bay WWPS	DPISL	1	Island Bay
862	Kahika WWPS	DPKAH	1	Kaipatiki Creek
891	Valkyria WWPS	DPVIA	1	Soldiers Bay
893	Hadfield 1 WWPS	DPHD1	1	Island Bay
894	Hadfield 2 WWPS	DPHD2	1	Island Bay
897	Caram WWPS	DPCAM	1	Eskdale Stream
900	Rosecamp WWPS	DPRMP	1	Charcoal Bay
901	Cronin WWPS	DPCRO	1	Beach Haven Beach
902	Beachaven WWPS	DPBEN	1	Hellyers Creek
903	Cresta WWPS	DPCRE	1	Hellyers Creek
917	Glendhu WWPS	DPGLU	1	Lignite Stream
930	Albany Church WWPS	DPALC	1	Lignite Stream
943	Neptune WWPS	DPNEP	1	Beach Haven Coast
1442	140 Birkdale Road	-	2	Rangatira Stream
1443	128 Spinella Drive	-	2	Glendhu Reserve Stream

There have been no changes to the Schedule of Engineered Overflow Points.

1.15.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
14/04/2018	DPCRO	Cronin Wastewater Pump Station	901	Power outage	49	3

Reported Incidents

There were a total of 110 reported incidents in the Upper Harbour South catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

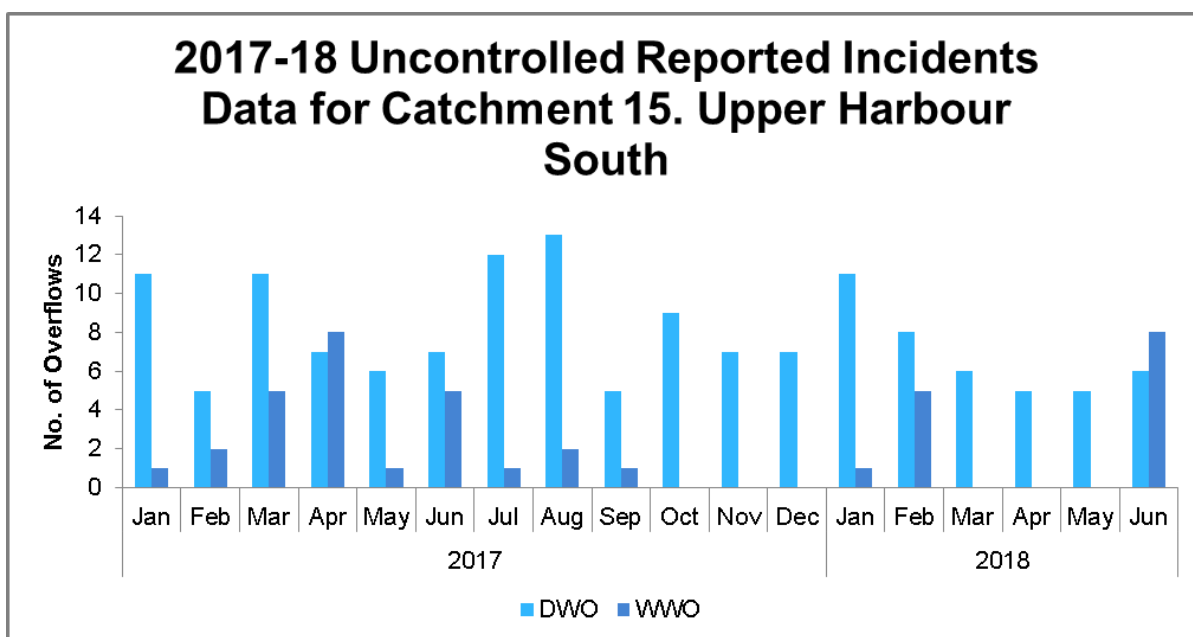
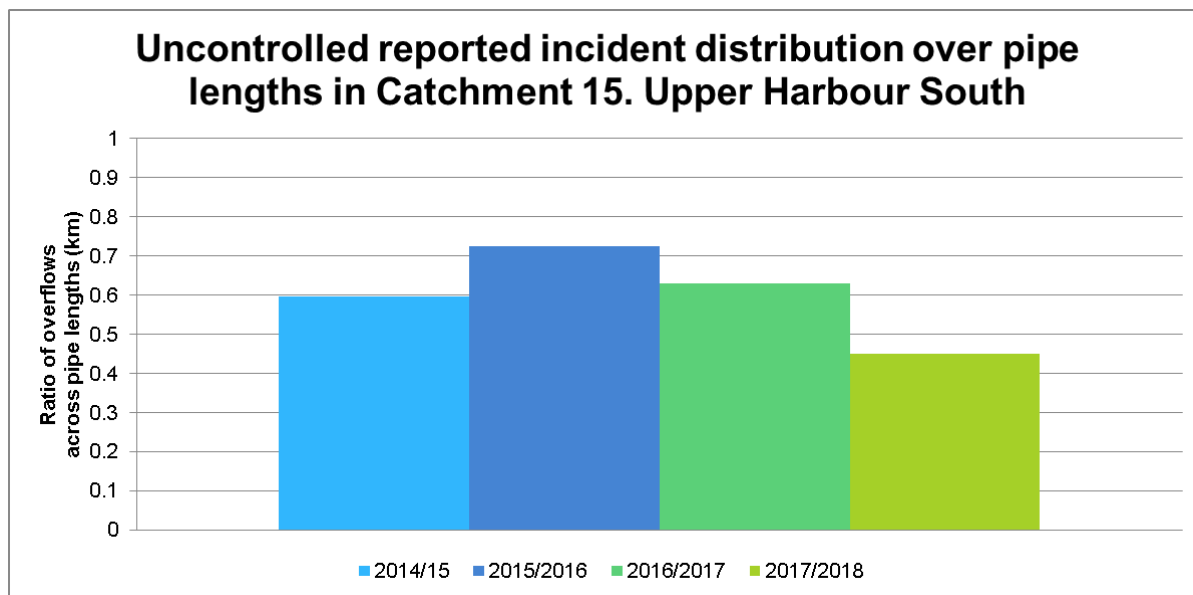
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
10/12/2016	3 Anchor Pl	L1	71	Rubbish	6.5	Heavy flushed
30/11/2017	3 Anchor Pl	L1	189	Roots	3	
6/01/2018	2/45 Castleton St	L2	86	Roots	0	Rootcut line
26/02/2018	2/45 Castleton St	L1	456	Roots	0	
5/06/2018	2/45 Castleton St	L1	427	Roots	4.02	
4/04/2017	1/47 Flaxdale St	L1	292	Surcharging	83	Continue to monitor
11/02/2018	1/47 Flaxdale St	L1	270	Surcharging	29.8	
4/04/2017	10/17 Abbeygate St	L1	282	Surcharging	83	NRV replaced, under investigation
14/04/2017	10/17 Abbeygate St	L1	19	Unknown	0.5	
11/02/2018	10/17 Abbeygate St	L1	446	Surcharging	29.8	
4/11/2016	27 Telstar Pl	L1	181	Unknown	0	Flushed line
20/10/2017	27 Telstar Pl	L2	242	Unknown	0.5	
18/08/2017	54 Stott Ave	L1	180	Fat	0.98	Flushed line
16/03/2018	54 Stott Ave	L1	424	Fat	0	

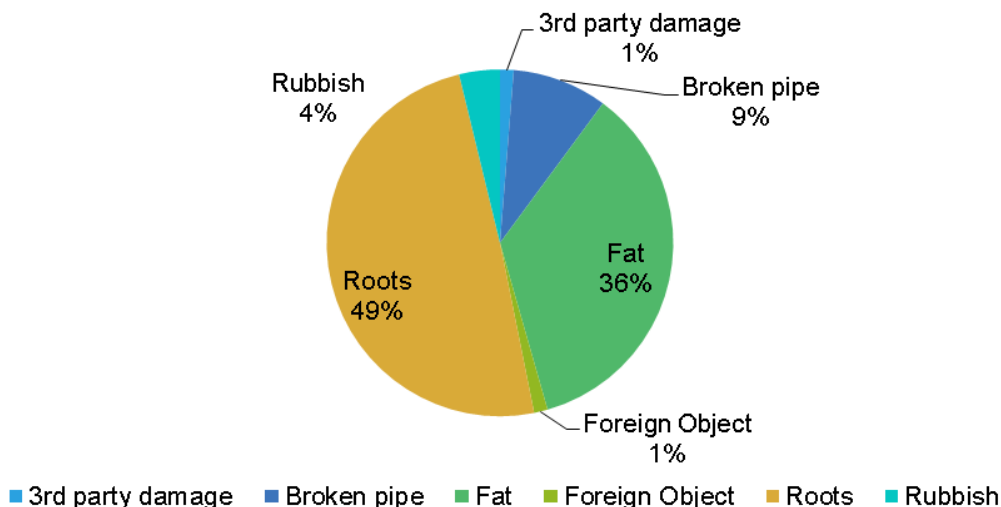
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
28/10/2016	69 Powrie St	L1	226	Fat	0	Flushed line
3/08/2017	69 Powrie St	L1	458	Rubbish	10	
31/05/2017	12 Titiwai Pl	L1	245	Roots	3	Under investigation
22/02/2018	12 Titiwai Pl	L1	188	Unknown	0	
28/06/2017	21 Ridgewood Cres	L1	538	Surcharging	0	Roots and debris removed
17/07/2017	21 Ridgewood Cres	L1	132	Fat	0	
8/07/2017	2/37 Manuka Rd	L1	486	Unknown	6.5	Heavy flushed line
28/01/2018	2/37 Manuka Rd	L1	147	Unknown	0	
17/07/2017	3/62 Rambler Cres	L1	308	Roots	0	Heavy flushed line
9/08/2017	3/62 Rambler Cres	L1	210	Unknown	17.63	
10/08/2017	13 Lauderdale Rd	L1	329	3rd party damage	4.9	Third Party Damage repaired
15/08/2017	13 Lauderdale Rd	L1	60	3rd party damage	0.49	
14/08/2017	7 Hale Cres	L1	164	Roots	3.92	Rootcut
6/09/2017	7 Hale Cres	L1	117	Roots	17.15	
21/09/2017	7 Hale Cres	L1	300	Roots	9.36	
18/09/2017	26 Park Hill Rd	L1	592	Broken pipe	6.86	Ongoing landslip issues, under investigation
14/10/2017	26 Park Hill Rd	L1	96	Broken pipe	2.5	
17/11/2017	26 Park Hill Rd	L1	183	Broken pipe	0.5	
19/11/2017	26 Park Hill Rd	L1	117	Broken pipe	2	
20/11/2017	26 Park Hill Rd	L1	444	Broken pipe	0	
24/11/2017	26 Park Hill Rd	L1	364	Broken pipe	0	
4/06/2018	26 Park Hill Rd	L1	441	Broken pipe	15.11	
17/01/2018	37 Mayall Ave	L1	202	Unknown	0	Rock removed
20/01/2018	37 Mayall Ave	L1	555	Foreign Object	0	
5/02/2018	2/78 Brigantine Dr	L2	165	Unknown	0	Roots removed
9/05/2018	2/78 Brigantine Dr	L3	143	Roots	0	
29/03/2018	2/35 Dakota Ave	L1	120	Unknown	0	Removed blockage
6/04/2018	2/35 Dakota Ave	L1	165	Unknown	2	
16/05/2018	1/35 Dakota Ave	L1	136	Unknown	2.01	

1.15.3 Trend analysis of reported incidents

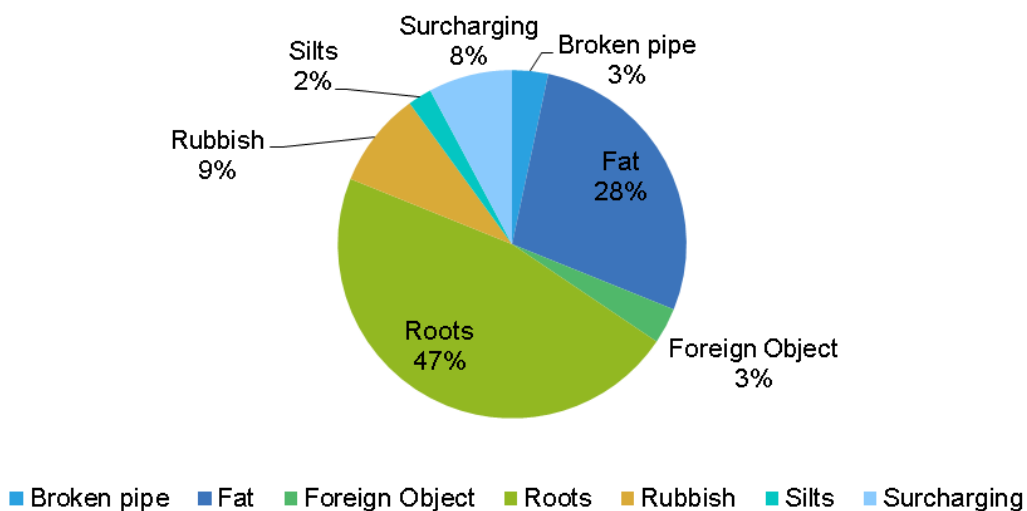
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



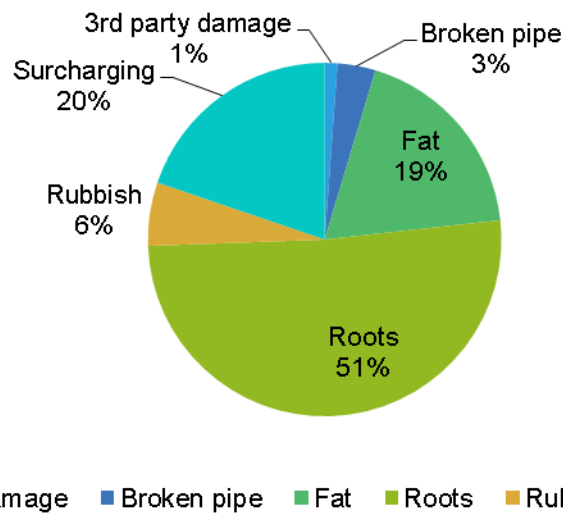
2014-15 Data for Catchment 15. Upper Harbour South



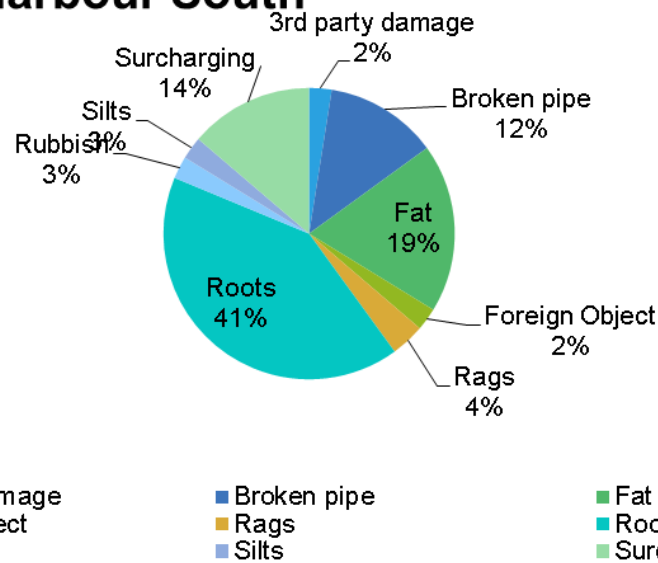
2015-16 Data for Catchment 15. Upper Harbour South



2016-17 Data for Catchment 15. Upper Harbour South



2017-18 Data for Catchment 15. Upper Harbour South



Trend analysis has been carried out where the cause has been identified.

1.15.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
6/07/2017	DPCRO	Cronin Wastewater Pump Station	901	Rain event	69	25.5
22/08/2017	DPKAH	Kahika Wastewater Pump Station	862	Rain event	790	0
11/02/2018	DPCRO	Cronin Wastewater Pump Station	901	Rain event	117	29.8
28/04/2018	DPCRO	Cronin Wastewater Pump Station	901	Rain event	23	64
19/05/2018	DPCRO	Cronin Wastewater Pump Station	901	Rain event	38	3.52
3/06/2018	DPCRO	Cronin Wastewater Pump Station	901	Rain event	189	52.86
3/06/2018	DPISL	Island Bay Wastewater Pump Station	856	Rain event	21	52.86
3/06/2018	DPALC	Albany Church Wastewater Pump Station	930	Rain event	94	52.86
3/06/2018	DPKAH	Kahika Wastewater Pump Station	862	Rain event	174	52.86
4/06/2018	DPKAH	Kahika Wastewater Pump Station	862	Rain event	121	15.11
25/06/2018	DPCRO	Cronin Wastewater Pump Station	901	Rain event	23	18.5

Spatial and temporal variability of rain data can mean that recorded rain data is not necessarily what is experienced at the site. Root cause is taken from validated site data.

1.15.5 Trend analysis of pump stations

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
856	Island Bay WWPS	1.2	0	2	2	1	1.25	Continue to monitor
862	Kahika WWPS	1	1	0	4	3	2	Continue to monitor
891	Valkyria WWPS	0.4	0	0	0	0	0	Continue to monitor
893	Hadfield 1 WWPS	0	0	0	0	0	0	Continue to monitor
894	Hadfield 2 WWPS	0.2	0	0	0	0	0	Continue to monitor
897	Caram WWPS	0	0	0	0	0	0	Continue to monitor
900	Rosecamp WWPS	0	0	0	0	0	0	Continue to monitor
901	Cronin WWPS	1.8	3	4	7	6	5	Study required
902	Beachaven WWPS	0	0	0	0	0	0	Continue to monitor
903	Cresta WWPS	0	0	0	0	0	0	Continue to monitor
917	Glendhu WWPS	0	0	0	0	0	0	Continue to monitor
930	Albany Church WWPS	1.2	0	1	2	1	1	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
943	Neptune WWPS	0	0	0	0	0	0	Continue to monitor

1.15.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

1.15.7 Improvement Works Programme

No significant network improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018. This network will continue to be monitored. A study is required to investigate performance at the Cronin WWPS. The overflow history will be analysed and utilised when reviewing future network improvement programmes.

1.15.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.15.9 Summary

One EOP discharged more than two wet weather overflows per year on average in this reporting period; this pump station will be investigated for options to address this performance. The ratio of overflows to pipe length has decreased in the 2017/18 period, and roots are the leading cause of uncontrolled overflows. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been slightly extended by 41km and developed. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

Strategic Management Area 9: Mangere (Metropolitan Auckland)

1.16 Catchment 16 – Upper Harbour West

1.16.1 Overview

The Upper Harbour West catchment is located to the west of central Auckland on the western side of the Waitemata Harbour. The catchment contains the suburbs of West Harbour, Hobsonville, Whenuapai and Herald Island. The total land area within the catchment is approximately 1,100 ha. The population living in this catchment was approximately 9,270 (Census, 2013) with 4,702 wastewater connections. Land use within the catchment is predominantly residential on the south-eastern side of Hobsonville Road and at Herald Island. The remaining area comprises lifestyle blocks and farm land on the northwest side of the catchment and horticultural land use in the north-east towards Hobsonville.

Parts of the existing urban area are currently not serviced and there are also extensive areas within the catchment identified as future urban area, with proposed future overflow points.

	2014/15	2015/16	2016/17	2017/18
No. of connections	3,348	3,760	4,415	4,702
Length of sewer (km)	74.5	80.0	112.1	116.7

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1274	Hobsonville No. 1 WWPS	DPHOB	1	Te Okoriki Inlet
1275	Hobsonville WWPS	DPHOP	1	Wallace Inlet
1529	Whenuapai WWPS	DPWHN	1	Waiarohia Stream
1530	Massey North WWPS	DPMSN	1	Totara Creek
1543	Hobsonville 5 WWPS	DPHO5	1	Bomb Bay
1545	Brickworks Bay WWPS	DPBRK	1	Limeburners Bay
1572	Hobsonville 2 WWPS	DPHO2	1	Te Okoriki Inlet
1573	Hobsonville 4 WWPS	DPHO4	1	Bomb Bay
1582	Scott Point 2 WWPS	DPSC2	1	Nimrod Inlet
1584	Whenuapai Village WWPS	DPWHV	1	Stormwater pond (Tamiro Rd)
1588	Scott Point 3 WWPS	DPSC3	1	Nimrod Inlet
1594	Scott Point 1 WWPS	DPSC1	1	Bomb Bay

The following EOP has been constructed and added to the EOP schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
1602	Hobsonville 3 WWPS	DPHO3	1	Harrier Point	Was future EOP N29.

1.16.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 27 reported incidents in the Upper Harbour West catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

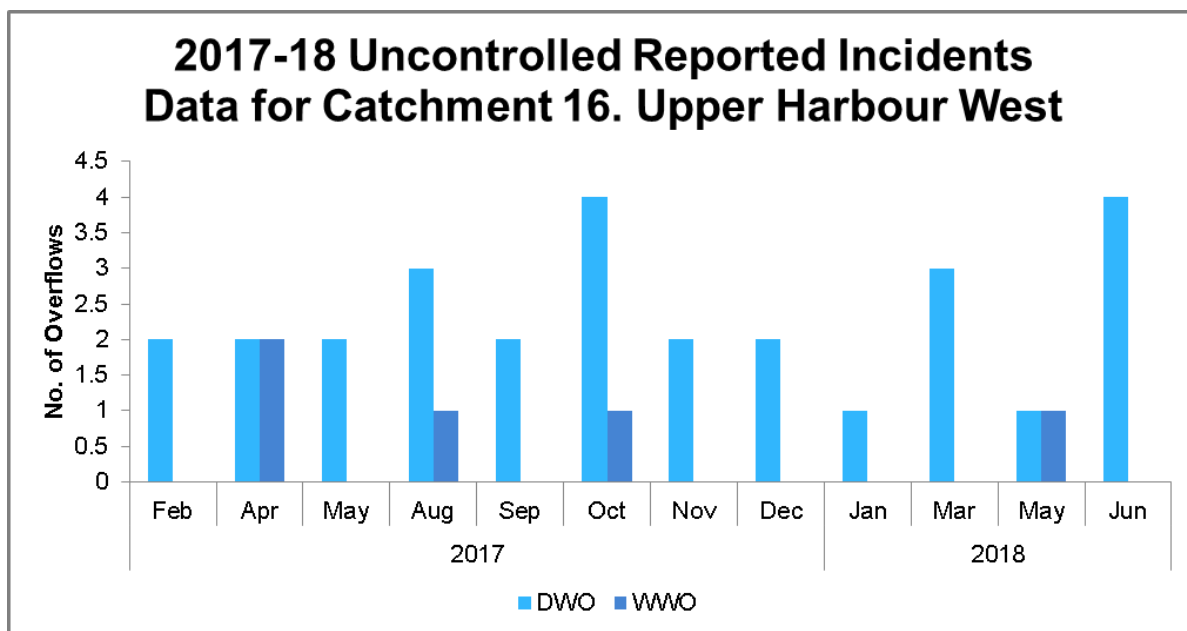
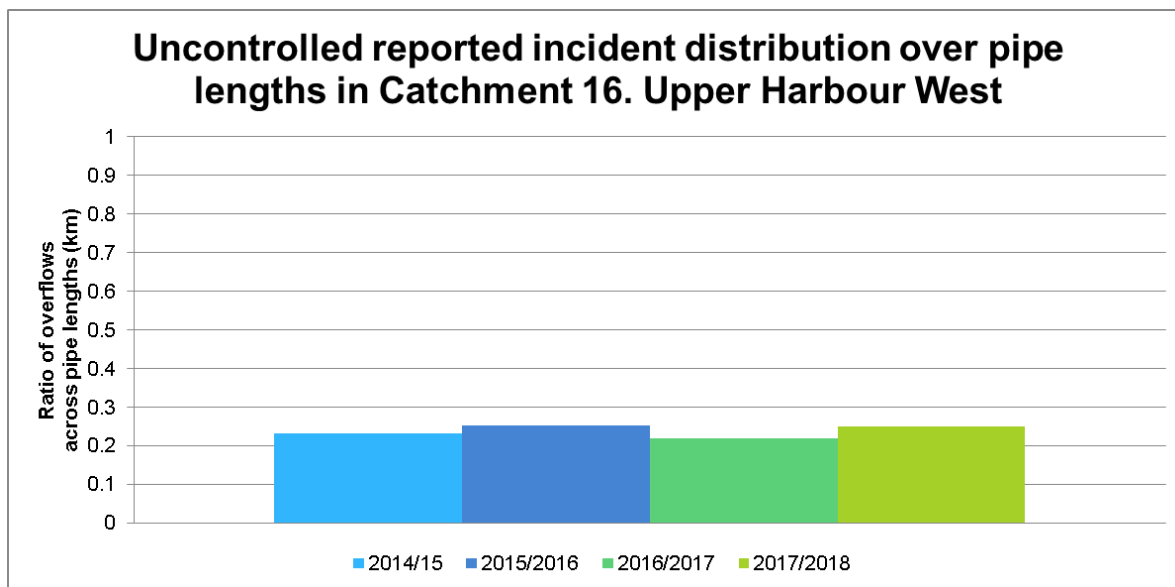
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

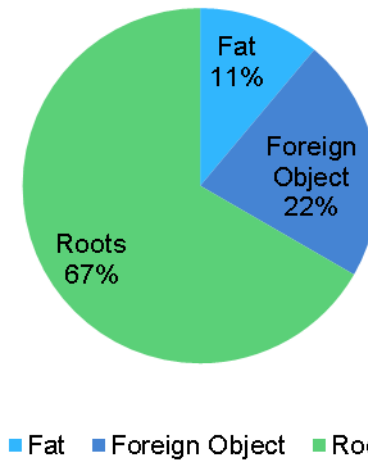
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
28/08/2017	38 Lockheed St	L1	196	Fat	11.76	Removed rags
19/10/2017	38 Lockheed St	L1	450	Foreign Object	0	
9/05/2017	44 Lockheed St	L1	133	3rd Party Damage	0	Third Party Damage repaired
7/08/2017	44 Lockheed St	L1	88	3rd party damage	0	
23/12/2016	46 Cherub Pl	L1	134	Roots	8.5	CCTV and rootcut
27/09/2017	46 Cherub Pl	L1	91	Roots	2	

1.16.3 Trend analysis of reported incidents

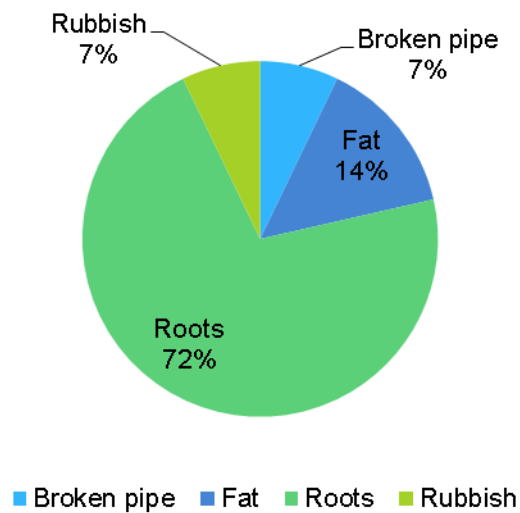
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



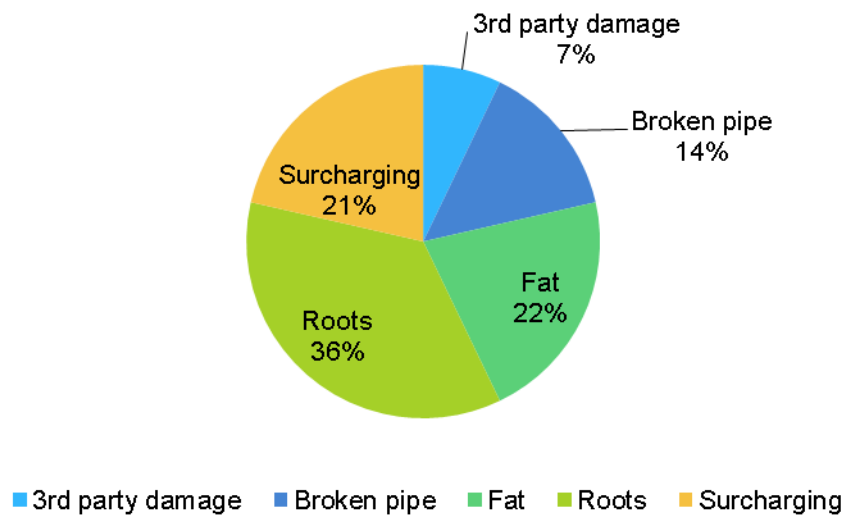
2014-15 Data for Catchment 16. Upper Harbour West



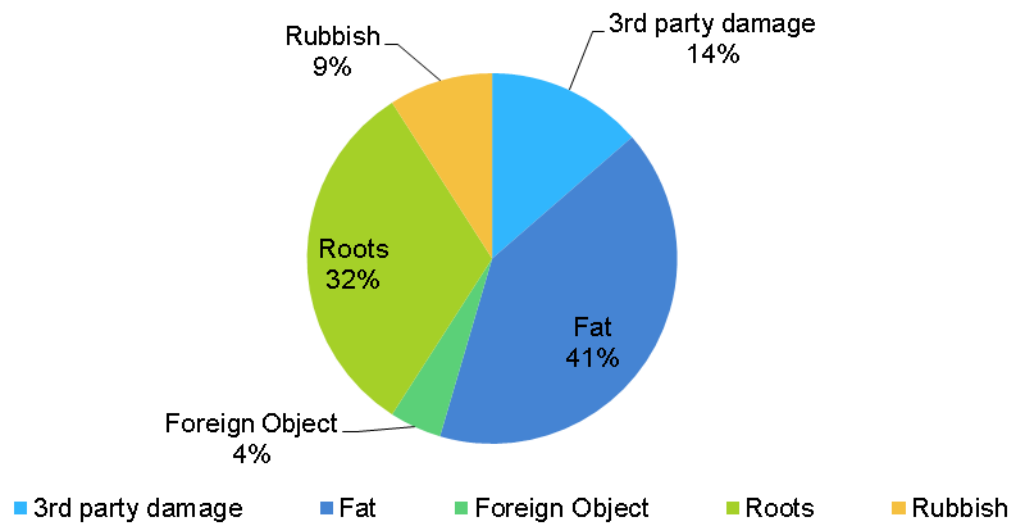
2015-16 Data for Catchment 16. Upper Harbour West



2016-17 Data for Catchment 16. Upper Harbour West



2017-18 Data for Catchment 16. Upper Harbour West



Trend analysis has been carried out where the cause has been identified.

1.16.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2017 and 30 June 2018.

1.16.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1274	Hobsonville No. 1 WWPS	0	0	0	0	0	0	Continue to monitor
1275	Hobsonville WWPS	0	0	0	0	0	0	Continue to monitor
1529	Whenuapai WWPS	n/a	0	0	0	0	0	Continue to monitor
1530	Massey North WWPS	n/a	0	0	0	0	0	Continue to monitor
1543	Hobsonville 5 WWPS	n/a	n/a	0	0	0	0	Continue to monitor
1545	Brickworks Bay WWPS	n/a	0	0	0	0	0	Continue to monitor
1572	Hobsonville 2 WWPS	n/a	n/a	n/a	0	0	0	Continue to monitor
1573	Hobsonville 4 WWPS	n/a	n/a	n/a	0	0	0	Continue to monitor
1582	Scott Point 2 WWPS	n/a	n/a	n/a	n/a	0	0	Continue to monitor
1584	Whenuapai Village WWPS	n/a	n/a	n/a	n/a	0	0	Continue to monitor
1588	Scott Point 3 WWPS	n/a	n/a	n/a	n/a	0	0	Continue to monitor
1594	Scott Point 1 WWPS	n/a	n/a	n/a	n/a	0	0	Continue to monitor

1.16.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be carried out as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

1.16.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Northern Interceptor - Stage 1	Project Execution	To allow wastewater flows to be diverted from the Northern Strategic Growth Area (NorSGA) and South Rodney (Kumeu / Huapai/Riverhead) to the Rosedale wastewater treatment plant. This balances flows at the treatment plants and provides additional capacity to the Western Interceptor	This project is required to service greenfield growth and avoid capacity-related dry weather overflows. Will reduce the load on the Western Interceptor and also reduce Type 3 overflows S20, S21 and S24	2012-2021
Underway	Waitakere Northern and KHR servicing	Studies and investigations	Capacity - major greenfield development is scheduled in this area. A servicing plan is required.	Ultimately the provision of trunk servicing capacity for north-west FUZ area - distinct from Northern interceptor	Before 2022
Future	Northern Interceptor – Hobsonville to Westgate	Studies and investigations	Northern Interceptor gravity tunnel from Westgate to Hobsonville pump station	Cater to Auckland's growth	2019-2025

1.16.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.16.9 Summary

There were no EOPs which have discharged more frequently than two spills this year. The ratio of uncontrolled overflows to pipe length has marginally increased in this reporting period. Fats were the most common cause of uncontrolled overflows. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended by 5 km and developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.17 Catchment 17 – Henderson Creek

1.17.1 Overview

The Henderson Creek catchment is located to the west of central Auckland and contains the suburbs of Massey, Ranui, Henderson, Te Atatu Peninsula, Te Atatu South, Glen Eden and North Titirangi. The total land area within the catchment is approximately 5,300 ha with 41,733 wastewater connections. There are several notable watercourses in the catchment, including the Waikumete Stream and Oratia Stream, all of which converge on the Henderson Creek. Land use within the catchment is predominantly residential, with commercial areas in Te Atatu Peninsula, Henderson and Glen Eden. Light industrial uses are concentrated in the Henderson Valley and Lincoln areas.

	2014/15	2015/16	2016/17	2017/18
No. of connections	41,004	41,227	41,488	41,733
Length of sewer (km)	727	730	732	893

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
2	25 Blethyn Place	-	2	Henderson Creek (southern arm)
3	13 Ascot Avenue	-	2	Taikata Stream
4	144-160 Triangle Road	-	2	Rarawaru Stream
5	9 Glenford Lane	-	2	Henderson Creek
6	50 Kingdale Road	-	2	Lincoln Stream
7	14B Woodglen Road	-	2	Waikumete Stream
8	16 Chilcot Road	-	2	Henderson Creek (southern arm)
690	Western WWPS	DPFLN	1	Henderson Creek (southern arm)
691	Te Atatu Central WWPS	DPTEA	1	Harbourview Beach
692	Te Atatu North WWPS	DPTEN	1	Estuary at Orukawai Point
748	Glen Eden Branch MH16	DSGLE	2	Henderson Creek (southern arm)
749	Swanson Branch MH15	DSSWN	2	Huruhuru Creek
1278	135 Millbrook Road	-	2	Waikumete Stream
1539	Blethyn Place Reserve	-	2	Henderson Creek (southern arm)

The following EOPs have been constructed and added to the EOP schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
1556	Upper Glen Eden Storage Tank - Downstream	-	2	Waikumete Stream	New EOP
1583	Matipo Road	-	2	Henderson Creek	New EOP

1.17.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 316 reported incidents in the Henderson Creek catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
12/03/2017	23 Ribblesdale Rd	L1	80	Unknown	49.64	Concrete, rocks, timber removed with CSE
4/09/2017	21C Ribblesdale Rd	L1	345	Foreign Object	0	
3/02/2018	78 Royal Rd	L1	366	Surcharging	18	Under investigation, NRV to be installed
5/02/2018	78 Royal Rd	L1	254	Unknown	0	
11/02/2018	78 Royal Rd	L1	360	Unknown	0	
4/02/2018	133A Henderson Valley Rd	L1	200	Surcharging	47.2	Line diversion in design stage to divert high flows
11/02/2018	133A Henderson Valley Rd	L1	767	Surcharging	29.8	
29/04/2018	133A Henderson Valley Rd	L1	177	Surcharging	1	
21/05/2018	133A Henderson Valley Rd	L1	237	Surcharging	5.53	
13/02/2018	133A Henderson Valley Rd	L1	358	Surcharging	37	
14/04/2018	133A Henderson Valley Rd	L1	185	Surcharging	3	
28/04/2018	129 Henderson Valley Rd	L1	348	Surcharging	64	
24/05/2018	133A Henderson Valley Rd	L1	107	Rubbish	2.51	
4/02/2018	153 Don Buck Rd	L1	171	Surcharging	47.2	Continue to monitor
13/02/2018	153 Don Buck Rd	L1	203	Surcharging	37	
3/07/2017	7 Surman Pl	L1	132	Unknown	0	Under investigation by Network
5/07/2017	7 Surman Pl	L1	224	Unknown	7.5	

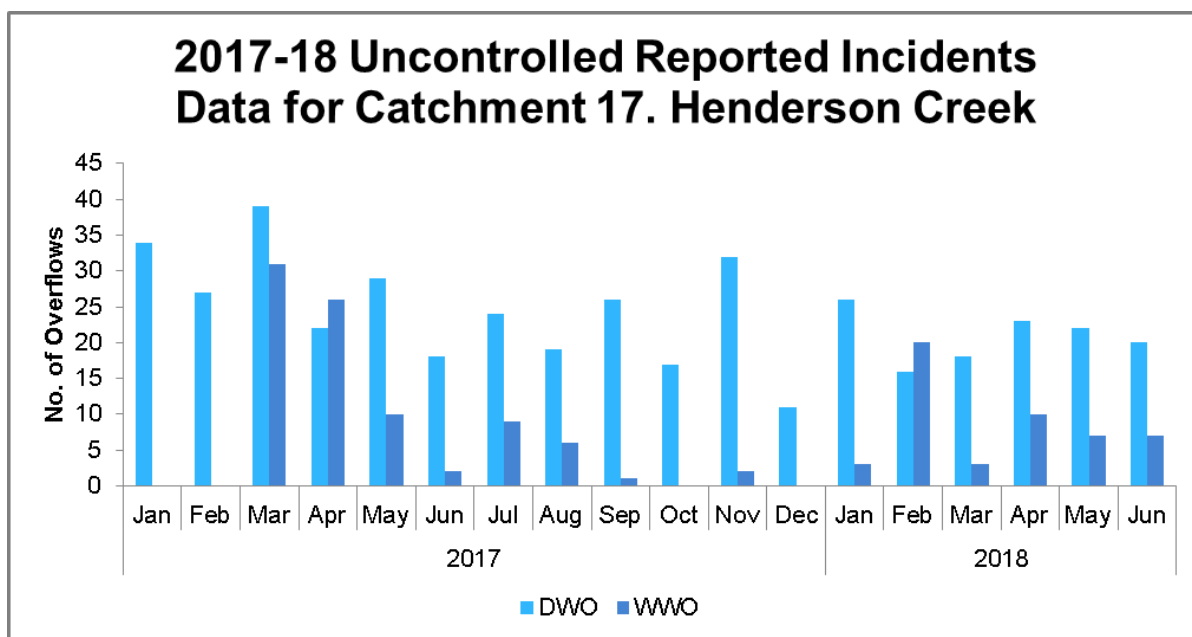
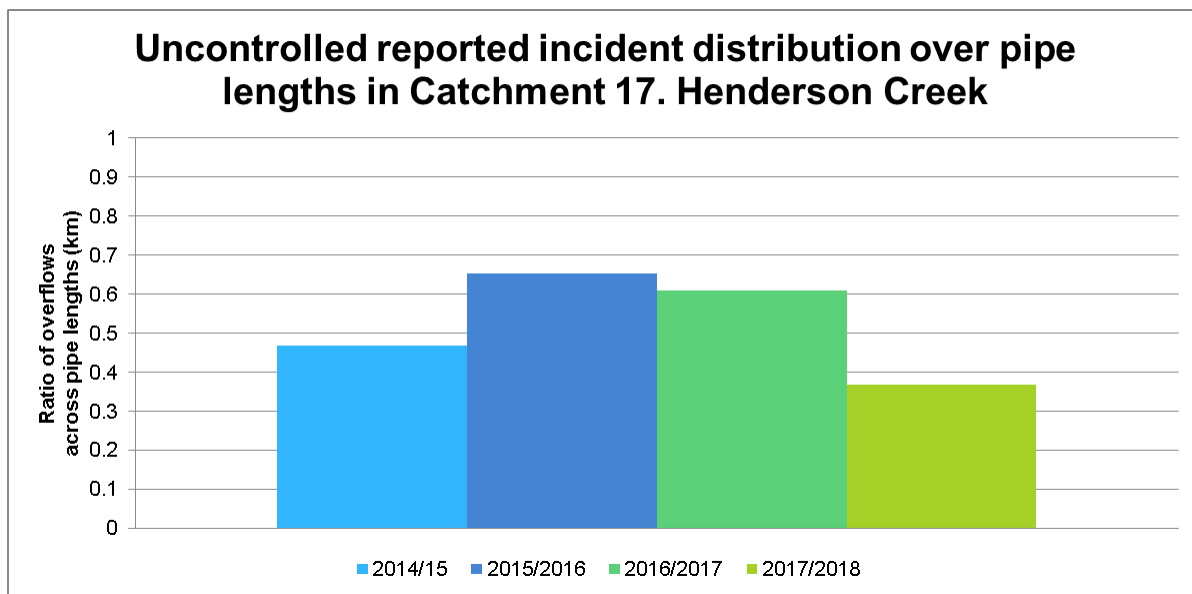
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
7/03/2018	7 Surman Pl	L1	608	Unknown	2.5	Engineer for private silt infiltration
14/06/2018	7 Surman Pl	L2	398	Fat	0.5	
6/01/2018	163 Atkinson Rd	L1	187	Roots	0	Removed roots and wipes, rehaunched manhole
3/03/2018	163 Atkinson Rd	L1	135	Unknown	2.5	
28/04/2018	1/1 Takapu St	L1	217	Surcharging	54.6	Under investigation
13/02/2018	1/1 Takapu St	L1	538	Surcharging	37	
22/05/2018	207- Lincoln Rd	L1	275	3rd party damage	9.57	Debris blockage removed
5/06/2018	207- Lincoln Rd	L1	493	3rd party damage	4.02	
13/02/2018	10 Celsmere Lane	L1	615	Surcharging	37	Under investigation with Planning team for EOP
3/06/2018	10 Celsmere Lane	L1	547	Surcharging	52.86	
28/04/2018	10 Celsmere Lane	L1	391	Surcharging	64	
21/09/2017	167 Rathgar Rd	L1	229	Broken Pipe	9.36	Heavy flush
29/09/2017	167 Rathgar Rd	L1	258	Unknown	0.5	
25/11/2017	38 Sunline Ave	L1	159	Roots	0	6 Monthly Flushing Programme
3/01/2018	Sunline Ave	L2	567	Fat	0	
16/02/2018	38 Sunline Ave	L1	402	Fat	0	
12/05/2017	18 Candia Rd	L1	65	Surcharging	17	Heavy flushed fat blockages
30/04/2018	18 Candia Rd	L1	78	Surcharging	31	
20/10/2017	184 Ralside Ave	L2	157	Foreign Object	0.5	Blockage removed
24/10/2017	184 Ralside Ave	L2	129	Foreign Object	2.5	
3/02/2018	9 Waitoro Lane	L1	304	Surcharging	18	Line diversion in design stage to divert high flows
13/02/2018	9 Waitoro Lane	L1	133	Surcharging	37	
12/03/2018	9 Waitoro Lane	L1	290	Fat	32	
28/04/2018	9 Waitoro Lane	L1	393	Surcharging	64	
24/11/2017	1/136 Triangle Rd	L1	307	Unknown	0	Heavy flushed
1/12/2017	1/136 Triangle Rd	L1	100	Unknown	0	
9/06/2017	36 Ruze Vida Dr	L1	417	Unknown	0.4	Raised manhole
26/06/2017	36 Ruze Vida Dr	L1	104	Unknown	0.4	
2/07/2017	36 Ruze Vida Dr	L1	57	Unknown	11	
3/05/2017	6 Swanson Rd	L1	153	Unknown	0.39	Debris removed
13/05/2017	6 Swanson Rd	L1	252	Fat	0	
8/03/2018	6 Swanson Rd	L1	644	Rubbish	21	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
20/01/2018	30 Barnea Cir	L1	577	Unknown	0	Third Party Damage repaired
10/02/2018	30 Barnea Cir	L1	153	Unknown	0	
10/05/2018	30 Barnea Cir	L1	443	Third Party Damage	0.5	
29/11/2016	20 Queen Natalie Pl	L1	181	Unknown	0	Rootcut
17/09/2017	20 Queen Natalie Pl	L1	637	Roots	6.37	
24/01/2018	16 Seakens Way	L1	142	Unknown	0	Heavy flushed
13/03/2018	16 Seakens Way	L1	295	Rubbish	0	
26/12/2016	73 Simpson Rd	L1	557	Roots	0	Heavy flushed
27/11/2017	73 Simpson Rd	L1	407	Unknown	0	
9/12/2017	18 Withers Rd	L1	186	Unknown	0.5	Blockage removed
3/03/2018	18 Withers Rd	L2	420	Fat	2.5	
19/03/2017	2/5A Konini Rd	L1	405	Unknown	0	Removed large rag blockage
22/03/2017	2/5A Konini Rd	L1	322	Fat	0.5	
23/12/2017	2/5A Konini Rd	L1	232	Fat	0	
23/05/2018	2 Mayfair Pl	L1	460	Surcharging	38.77	Heavy flush
26/06/2018	2 Mayfair Pl	L1	503	Surcharging	16.5	
25/11/2017	22 Buscomb Ave	L1	159	Unknown	0	Third Party Damage repaired
2/01/2018	24 Buscomb Ave	L1	507	Unknown	0	
22/04/2018	14 Waikura Dr	L1	413	Fat	1	Fats removed
8/05/2018	14 Waikura Dr	L1	430	Fat	0	
14/09/2017	2/10 Jarrah Pl	L1	474	Fat	0	Heavy flush
14/11/2017	2/12 Jarrah Pl	L1	148	Fat	3.5	
6/03/2018	12 Jarrah Pl	L1	182	Fat	1.5	
2/05/2017	72A View Rd	L1	133	Unknown	0	Heavy flushed
25/01/2018	72A View Rd	L1	140	Unknown	0	
30/08/2017	125 Flanshaw Rd	L1	126	Unknown	29.88	Heavy flushed
12/10/2017	125 Flanshaw Rd	L1	154	Fat	2.5	
21/07/2017	8 Tolich Pl	L1	498	Rubbish	27	Rags removed
27/07/2017	8 Tolich Pl	L1	100	Rubbish	8	
29/10/2017	185 Konini Rd	L1	246	Unknown	0	Fat blockages flushed
27/06/2018	185 Konini Rd	L2	562	Fat	0	
17/01/2017	36 Larnoch Rd	L1	135	Unknown	0	Flushed line

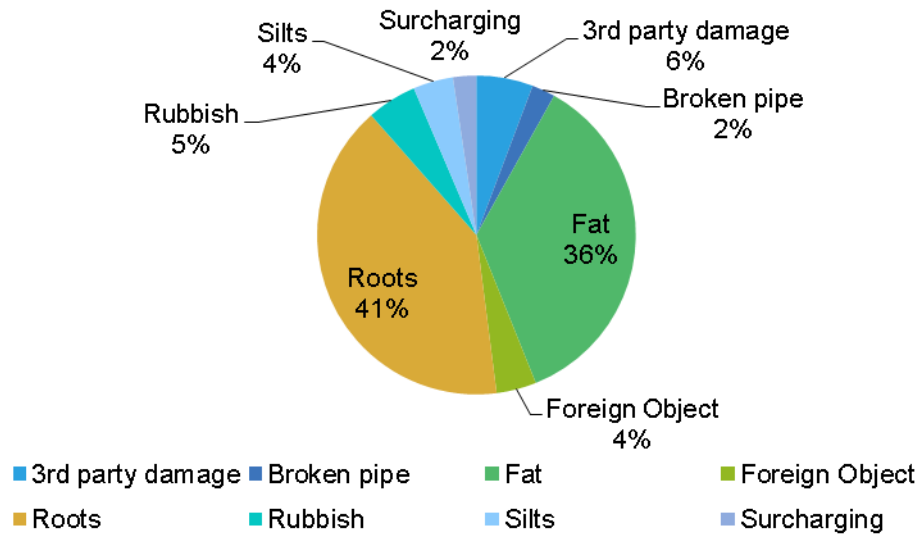
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
21/09/2017	36 Larnoch Rd	L1	144	Unknown	9.36	
14/02/2017	1 Rewarewa Rd	L1	392	Fat	3.5	Removed rag blockage
31/01/2018	1 Rewarewa Rd	L1	507	Rags	0	
18/03/2017	11 Derwent Cres	L1	627	Rubbish	0	Cleared blockage
2/02/2018	11 Derwent Cres	L1	419	Unknown	0	
6/07/2017	16 Backhurst Grv	L2	517	Fat	25.5	Removed fat and root blockages
17/08/2017	16 Backhurst Grv	L1	165	Unknown	2.45	
11/07/2017	11 Sheehan Rd	L1	390	Unknown	6	Heavy flushed
13/07/2017	11 Sheehan Rd	L1	218	Surcharging	10	
15/07/2017	1/11 Sheehan Rd	L2	329	Unknown	0	
27/09/2017	1/11 Sheehan Rd	L2	55	Roots	2	
13/08/2017	414 Don Buck Rd	L1	434	Fat	2.94	Heavy flushed to remove fats
9/04/2018	414 Don Buck Rd	L1	221	Fat	0	
23/08/2017	41A Woodglen Rd	L1	141	Broken Pipe	0	Heavy flushed
25/08/2017	41A Woodglen Rd	L1	91	Fat	0	
2/11/2017	3 Fernhaven Pl	L1	228	Foreign Object	1	Concrete removed from manhole
17/02/2018	3 Fernhaven Pl	L1	81	Rubbish	0	
9/11/2017	59 Don Buck Rd	L1	240	Broken pipe	0	Pipe repaired
17/11/2017	59 Don Buck Rd	L1	482	Broken pipe	0.5	
8/12/2017	59 Don Buck Rd	L1	144	Broken pipe	0	
13/04/2018	1 Starling Pl	L1	177	Fat	0	Heavy flushed
27/06/2018	1 Starling Pl	L2	82	Fat	0.5	
6/04/2018	4 Kopi Pl	L1	206	Unknown	2	Pipe repaired after damage by fence post
19/04/2018	4 Kopi Pl	L1	158	Fat	0	

1.17.3 Trend analysis of reported incidents

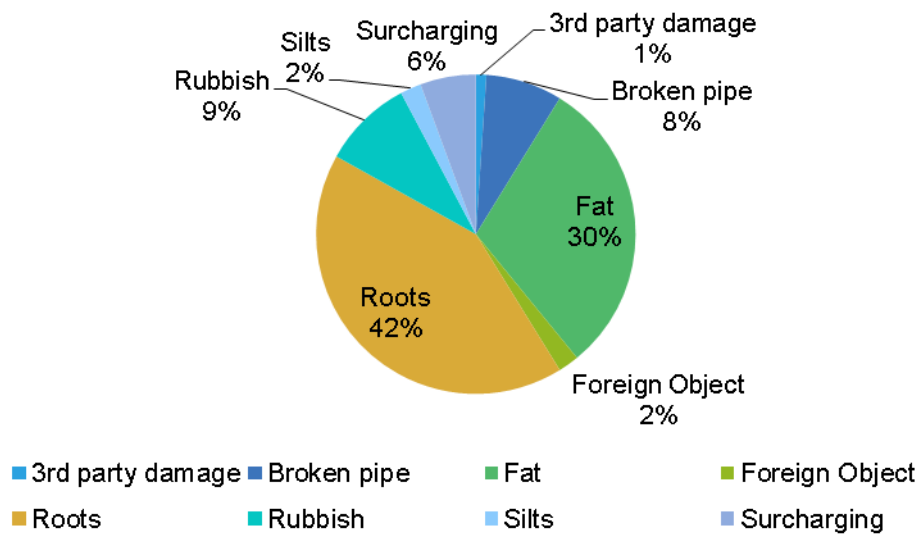
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



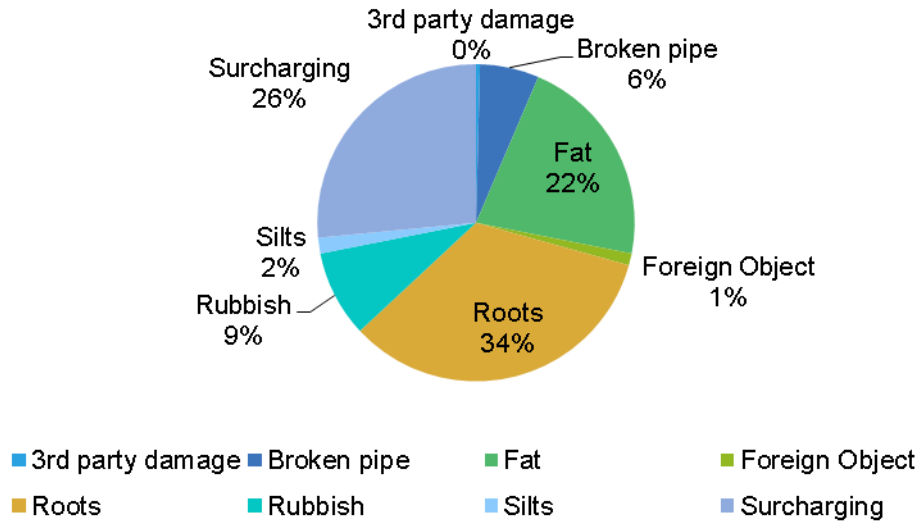
2014-15 Data for Catchment 17. Henderson Creek



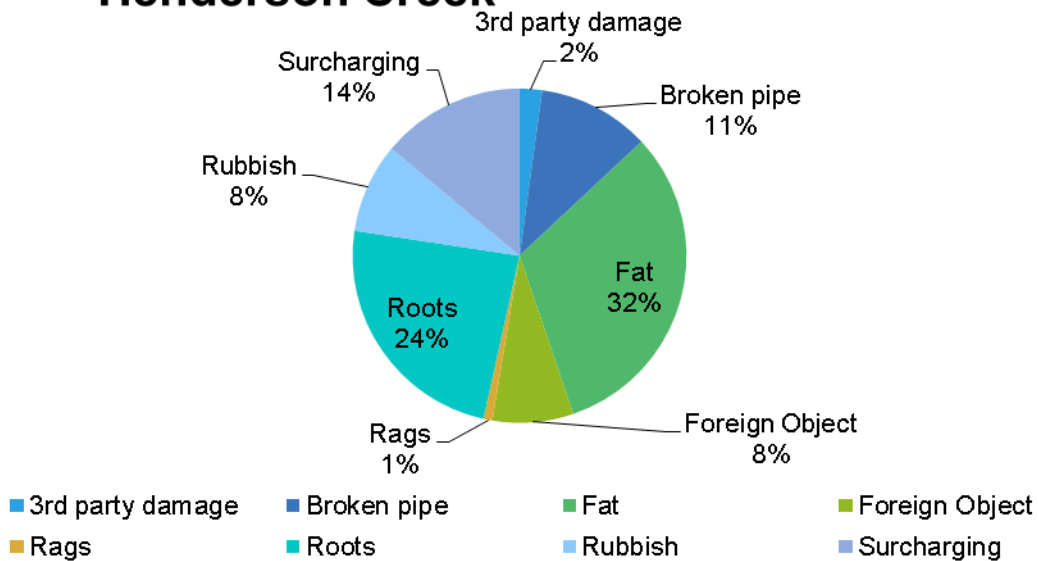
2015-16 Data for Catchment 17. Henderson Creek



2016-17 Data for Catchment 17. Henderson Creek



2017-18 Data for Catchment 17. Henderson Creek



Trend analysis has been carried out where the cause has been identified.

1.17.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
6/07/2017	DPTEN	Te Atatu North Wholesale Wastewater Pump Station	692	Rain event	287	25.5
7/07/2017	DPFLN	Western Wholesale Wastewater Pump Station	690	Rain event	6	6.49
22/07/2017	DPTEN	Te Atatu North Wholesale Wastewater Pump Station	692	Rain event	125	16.5
22/07/2017	DPFLN	Western Wholesale Wastewater Pump Station	690	Rain event	207	15.7
11/02/2018	DPTEN	Te Atatu North Wholesale Wastewater Pump Station	692	Rain event	227	43.5
11/02/2018	DPFLN	Western Wholesale Wastewater Pump Station	690	Rain event	357	43.5
13/02/2018	DPTEN	Te Atatu North Wholesale Wastewater Pump Station	692	Rain event	612	23.5
13/02/2018	DPFLN	Western Wholesale Wastewater Pump Station	690	Rain event	294	23.5
14/04/2018	DPEAS	Easter Parade Wastewater Pump Station	1217	Rain event	52	53
28/04/2018	DPTEN	Te Atatu North Wholesale Wastewater Pump Station	692	Rain event	168	64
28/04/2018	DPEAS	Easter Parade Wastewater Pump Station	1217	Rain event	45	24
28/04/2018	DPFLN	Western Wholesale Wastewater Pump Station	690	Rain event	183	24
23/05/2018	DPTEN	Te Atatu North Wholesale Wastewater Pump Station	692	Rain event	219	38.77
23/05/2018	DPFLN	Western Wholesale Wastewater Pump Station	690	Rain event	6	30.91
3/06/2018	DPTEN	Te Atatu North Wholesale Wastewater Pump Station	692	Rain event	254	52.86
4/06/2018	DPTEN	Te Atatu North Wholesale Wastewater Pump Station	692	Rain event	181	15.11
26/06/2018	DPFLN	Western Wholesale Wastewater Pump Station	690	Rain event	63	17.5

1.17.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
690	Western WWPS	1.2	2	0	5	6	3.25	Northern Interceptor
691	Te Atatu Central WWPS	0	0	0	0	0	0	Continue to monitor
692	Te Atatu North WWPS	1.2	2	2	12	8	6	Massey Siphon Upgrade & Northern Interceptor
1217	Easter Parade Wastewater Pump Station	-	0	0	0	2	0.5	Continue to monitor

Type 3 – uncontrolled overflow rolling WWO data from 1 July 2014 – 30 June 2018

The following locations are reported as Type 3 overflow locations.

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
S20	Te Atatu North Branch Sewer MH 1	0.7	0	1	0	0	0.25	Operational mitigation measures undertaken. Northern Interceptor project
S21	Te Atatu North Branch Sewer MH 2	2.2	0	0	0	0	0	Operational mitigation measures undertaken. Northern Interceptor project
S22	Te Atatu North Branch Sewer MH 5	2.7	2	4	3	2	2.75	Operational mitigation measures undertaken. Northern Interceptor project
S23	Te Atatu North Branch Sewer MH 6	3.1	4	5	4	1	3.5	Operational mitigation measures undertaken. Northern Interceptor project
S24	Whenuapai Branch Sewer MH 10	3	4	2	5	3	3.5	Operational mitigation measures undertaken. Northern Interceptor project
S63	Whenuapai Branch Sewer MH 9A	n/a	n/a	3	3	0	2	Operational mitigation measures undertaken. Northern Interceptor project
S11	Glen Eden Branch Sewer MH 62	1.7	3	3	1	0	1.75	Upper Glen Eden Storage Tank and Branch Sewer - construction underway
S23	Glen Eden Branch Sewer MH 63	0.9	3	1	2	0	1.5	Upper Glen Eden Storage Tank and Branch Sewer - construction underway
S13	Glen Eden Branch Sewer MH 64	2	-	4	-	0	1	Upper Glen Eden Storage Tank and Branch Sewer - construction underway
S14	Glen Eden Branch Sewer MH 69A	1.6	-	3	-	1	1	Upper Glen Eden Storage Tank and Branch Sewer - construction underway
S15	Glen Eden Branch Sewer MH 79	1	0	1	0	0	0.25	Upper Glen Eden Storage Tank and Branch Sewer - construction underway
S16	Glen Eden Branch Sewer MH 88	0.9	-	2	-	1	0.75	Upper Glen Eden Storage Tank and Branch Sewer - construction underway

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
S17	Glen Eden Branch Sewer MH 93A	1.2	2	5	4	2	3.25	Upper Glen Eden Storage Tank and Branch Sewer - construction underway
S18	Massey Branch Sewer MH10	3	4	2	4	4	3.5	Massey and Swanson Siphon upgrades – design underway
S19	Massey Branch Sewer MH14	1.3	2	1	0	1	1	Massey and Swanson Siphon upgrades – design underway
S30	121A Millbrook Road	n/a (previously a Type 2)	-	-	-	0	0	Continue to monitor

1.17.6 Inflow & Infiltration Programme

Inflow investigations have been completed in the Te Atatu North catchment and compliance is in progress to address private drainage issues. Additional I&I field investigations are planned for 2018.

1.17.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Northern Interceptor - Stage 1 – diversion of NorSGA and KHR flows	Project execution	To allow wastewater flows to be diverted from the Northern Strategic Growth Area (NorSGA) and South Rodney (Kumeu / Huapai/Riverhead) to the Rosedale Wastewater Treatment Plant.	This will reduce the load on the Western Interceptor and reduce the frequency of overflows. It will service greenfield growth.	2017-2021
Underway	Northern Interceptor - Stage 2 – diversion of additional catchments	Option Development (Feasibility)	To allow additional wastewater flows to be diverted from the Waitakere catchments to the Rosedale Wastewater Treatment Plant.	This will reduce the load on the Western Interceptor and reduce the frequency of overflows at Type 3 EOPs S19, 20, 21, 22, 23 and 24.	Dependent upon timing of growth

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	Upper Glen Eden storage tank and branch sewer upgrade	Project execution	Glen Eden branch sewer has insufficient capacity to convey flows during wet weather and has limited capacity for future growth	Reduction in volume and frequency of wet weather overflows, addresses numerous Type 3 overflows	2018
Underway	Massey and Swanson siphon upgrades	Project execution	These are critical assets with a high risk of failure, and require additional capacity to address growth and levels of service	Will reduce risk of asset failure and address Type 3 overflows	2014-2021
Complete	Matipo Rd EOP	Construction	New EOP to mitigate uncontrolled overflow to land with a high risk of adverse public health impacts	Will reduce the frequency and volume of overflows at Type 3 locations	2017
Underway	Whenuapai Branch Type 3 mitigation	Studies and investigations	Further reductions of uncontrolled overflow frequencies prior to resolution through major capital projects	Depending upon the outcomes, further minor capital works with uncontrolled overflows further reduced	2018
Underway	Lawsons Creek Branch Sewer Duplication	Project Execution	Lawsons Creek Branch Sewer duplication to cater for growth in West Harbour	Reduces overflow volume/ frequency and allows for growth	2017-2019
Future	Northern Interceptor – Hobsonville to Westgate	Studies and investigations	Northern Interceptor gravity tunnel from Westgate to Hobsonville pump station	This will reduce the load on the Western Interceptor and reduce the frequency of overflows. It will service greenfield growth.	2019-2025
Underway	Red Hills Wastewater Upgrade	Project Execution	Installation of transmission sewer and pump station to service growth	Ready for development by 2022-2026 with bulk wastewater services	2017-2019
Underway	Wastewater Main Renewals and Lining Programme	Project Execution	Network wastewater pipe renewal at 38 sites	Upgraded network pipe condition	2015-2018

1.17.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.17.9 Summary

There were two EOPs which have discharged more frequently than two spills per year. The ratio of uncontrolled overflows in this catchment decreased in comparison with the previous reporting period. Fat and roots contributed to the majority of overflows, with surcharging events also contributing a large proportion. In the long term, the network performance in this catchment will be improved with the 'Upper Glen Eden storage tank', 'Massey and Swanson siphon upgrades' and 'Northern Interceptor' and other projects, which will relieve the network. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended by 161km and developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.18 Catchment 18 – Whau River

1.18.1 Overview

The Whau River catchment covers an area of approximately 25 km² in the western part of the Auckland Isthmus. The Whau River catchment boundary reflects a combination of the topographic and wastewater network catchment boundaries. The catchment includes all or part of the suburbs Te Atatu South, Glendene, Kelston, North Titirangi, Green Bay, Glen Eden, New Lynn, Blockhouse Bay and Avondale, with 21,932 wastewater connections.

The Whau has a long history of commercial and industrial development. Current land use in the catchment is predominantly residential, with substantial pockets of light industrial and commercial development in the Rosebank, Avondale, New Lynn and Glendene areas.

	2014/15	2015/16	2016/17	2017/18
No. of connections	21,663	21,743	21,840	21,932
Length of sewer (km)	349	349	349	406

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
10	38 La Rosa Street	-	2	Avondale Stream
38	Sceptre Place WWPS	DPSTR	1	Whau River Estuary
41	Riversdale Rd WWPS	DPRVD	1	Whau River Estuary
42	Lidcombe Place WWPS	DPLID	1	Waterview Embayment
44	Ash St WWPS	DPASH	1	Whau River Estuary
607	Rosebank Rd No.1 WWPS	DPRB1	1	Waterview Embayment
609	Endeavour St WWPS	DPEND	1	Blockhouse Bay
617	Holly St No .1 WWPS	DPHS1	1	Waterview Embayment
618	Holly St No. 2 WWPS	DPHS2	1	Waterview Embayment
621	Kenley Place WWPS	DPKEY	1	Whau River Estuary
622	Lewis St WWPS	DPLEW	1	Blockhouse Bay
625	Mead St WWPS	DPMED	1	Whau River Estuary
629	Patiki Rd WWPS	DPPKI	1	Whau River Estuary
634	Rosebank Rd No. 2 WWPS	DPRB2	1	Waterview Embayment
644	Timothy Place WWPS	DPTIM	1	Whau River Estuary
656	Esmeralda Ave WWPS	DPESM	1	Whau River Estuary
695	St George WWPS	DPWIN	1	Whau Creek
752	Network overflow, Rosebank siphon	DSRSB	2	Whau River Estuary
1536	103 Seabrook Ave	-	2	Manawa Stream

There have been no changes to the Schedule of EOPs.

1.18.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
20/02/2018	DPLEW	Lewis Street Wastewater Pump Station	622	Mechanical Faults	409	9.8

Reported Incidents

There were a total of 199 reported incidents in the Whau River catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
8/02/2017	5 Links Rd	L1	115	Unknown	0.8	Gib bolt replaced
4/10/2017	11 Links Rd	L1	249	Unknown	0	
6/10/2017	259 Hepburn Rd	L1	199	Roots	0	Rootcut
21/06/2018	259 Hepburn Rd	L1	314	Fat	6.4	
22/04/2017	172 Godley Rd	L1	26	Unknown	0	Routine flushing, Rahahuia Reserve with fat/root issues in dense bush area
6/11/2017	172 Godley Rd	L2	164	Rubbish	0	
20/03/2018	172 Godley Rd	L1	409	Fat	2.4	
23/04/2018	172 Godley Rd	L3	166	Fat	1	
3/01/2017	3 Metric Pl	L1	109	Unknown	7	CCTV, heavy flush
2/10/2017	3 Metric Pl	L1	384	Fat	5.8	
10/03/2017	3/43 Parker Ave	L1	196	Unknown	78.99	Annual planned flushing programme due to dip in the pipe. Flushing in conjunction
5/02/2018	3/43 Parker Ave	L1	52	Surcharging	10	
11/02/2018	3/43 Parker Ave	L1	381	Surcharging	29.8	
5/01/2017	31 Maple St	L1	253	Rubbish	0	Under investigation,

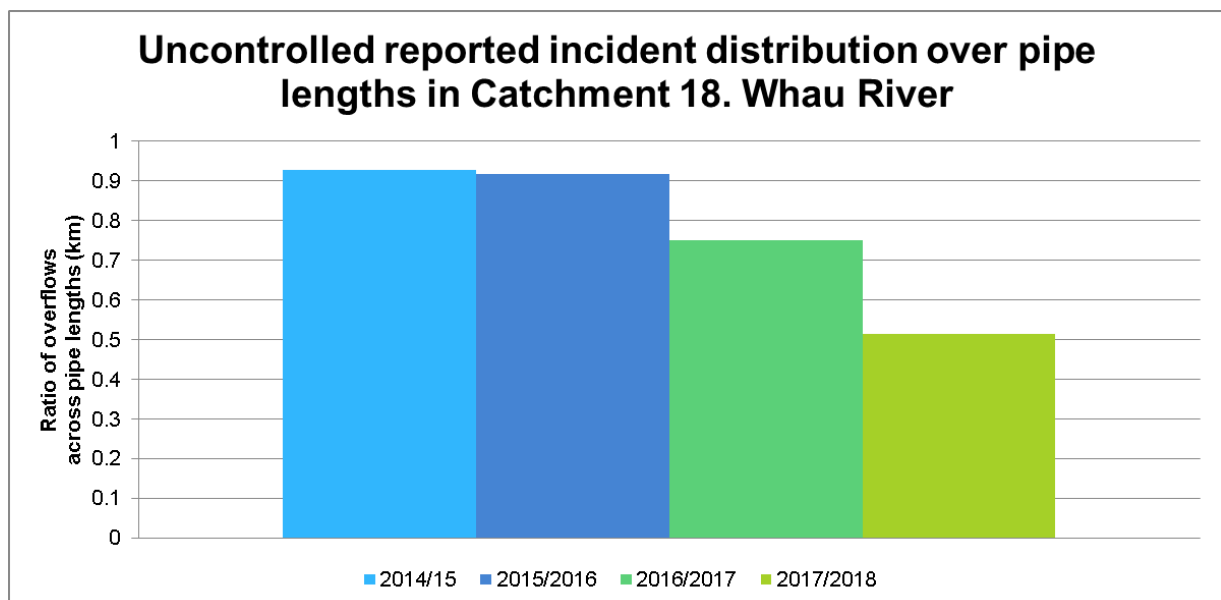
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
21/01/2017	31 Maple St	L1	88	Roots	17	heavy fats and rags removed. Connection to rising main being investigated
10/03/2017	31 Maple St	L1	144	Surcharging	78.99	
27/06/2017	35 Maple St	L1	428	Unknown	0.2	
29/10/2017	37 Maple St	L1	254	Fat	0.2	
19/04/2018	37 Maple St	L1	347	Fat	0	
15/10/2017	2/34 Copley St	L1	120	Roots	0	Line placed on Programmed Flushing List
23/05/2018	4/36 Copley St	L1	70	Unknown	38	
3/06/2018	4/36 Copley St	L1	643	Surcharging	33.8	
14/12/2016	9C Christina Ave	L1	149	Fat	0	Continue to monitor, heavy flushed dip in line
8/12/2017	9C Christina Ave	L1	233	Unknown	0	
5/07/2017	18 Ayrton St	L1	102	Broken pipe	7.4	CCTV, rocks removed. Heavy flushed.
19/07/2017	1/20 Ayrton St	L1	182	Foreign Object	1.8	
25/07/2017	1/20 Ayrton St	L1	628	Fat	14.2	
27/01/2017	27 Bodi Pl	L1	371	Roots	0	Rootcut
21/01/2018	27 Bodi Pl	L1	420	Roots	2.6	
8/08/2017	217 Rosebank Rd	L1	495	Broken pipe	2.62	Pipe repaired and flushed
1/09/2017	217 Rosebank Rd	L1	249	Foreign Object	12.74	
4/09/2017	217 Rosebank Rd	L1	137	Unknown	0	
27/05/2018	395 Rosebank Rd	L1	583	Unknown	8.6	Flushed main, removed rag blockage
11/06/2018	395 Rosebank Rd	L1	163	Rags	15.4	
3/07/2017	2/19 Manhattan Hts	L1	632	Surcharging	7.03	Rootcut
21/08/2017	2/19 Manhattan Hts	L1	134	Fat	2.44	
2/06/2018	119 Bolton St	L2	352	Unknown	0	Heavy flushed, under investigation
9/06/2018	119 Bolton St	L1	437	Foreign Object	0	
27/09/2017	58A Lantana Rd	L1	449	Unknown	0.2	Large dipped section of pipe, under investigation by Network Engineer. Heavy flushed
25/11/2017	58A Lantana Rd	L1	121	Rubbish	0	
9/12/2017	58A Lantana Rd	L1	121	Unknown	0	
18/06/2018	58A Lantana Rd	L1	174	Unknown	2.4	
11/12/2017	56 Glen Marine Pde	L1	151	Surcharging	0	Heavy cleaned surrounding lines
15/01/2018	56 Glen Marine Pde	L2	294	Fat	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
18/01/2018	56 Glen Marine Pde	L2	237	Rags	47.6	
5/02/2018	25 Tomo St	L1	144	Unknown	10	Line heavy flushed, under investigation
11/02/2018	25 Tomo St	L1	94	Surcharging	29.8	
13/02/2018	25 Tomo St	L1	364	Surcharging	37	
14/04/2018	25 Tomo St	L1	164	Surcharging	35	
6/03/2018	3/23 Kelwyn Rd	L1	444	Fat	0.6	Manhole rehaunched
24/05/2018	3/23 Kelwyn Rd	L1	203	Fat	8.8	
16/12/2017	84 Sabulite Rd	L1	212	Fat	0	Removed roots and fat, manhole to be raised
20/12/2017	84 Sabulite Rd	L1	175	Roots	4.4	
29/11/2016	122 Takahe Rd	L1	102	Unknown	0	Rootcut
29/10/2017	122 Takahe Rd	L1	141	Roots	0.2	
30/12/2016	8 Kirby St	L1	481	Unknown	0	Rootcut
11/08/2017	8 Kirby St	L1	522	Roots	14.41	
28/03/2017	2/61 Beaubank Rd	L1	144	Unknown	0.19	Fat blockage removed
8/11/2017	2/61 Beaubank Rd	L1	207	Fat	7.2	
6/04/2017	24 Covil Ave	L1	57	Surcharging	1.97	Continue to monitor
6/07/2017	24 Covil Ave	L1	55	Surcharging	28	
25/06/2017	1/14 Craigbank Ave	L1	197	Unknown	2.8	Relined pipe
28/07/2017	1/14 Craigbank Ave	L2	195	Roots	7	
29/06/2017	20 Lemnos Pl	L1	91	Unknown	0	Large tree root removed
7/09/2017	20 Lemnos Pl	L1	596	Unknown	6.18	
26/07/2017	30 Westward Ho	L3	162	Rubbish	1	Heavy flushed
28/03/2018	30 Westward Ho	L1	80	Rubbish	0	
29/07/2017	3102 Great North Rd	L1	209	Unknown	0.2	Joint displacement repaired
26/09/2017	3102 Great North Rd	L1	155	Fat	12.2	
19/10/2017	3102 Great North Rd	L1	477	Fat	0	
16/09/2017	34 Lyndhurst Rd	L2	240	Rubbish	9	Heavy flushed
13/02/2018	34 Lyndhurst Rd	L1	534	Surcharging	37	
28/09/2017	9 Prior Pl	L1	357	Unknown	0	Removed rocks. Under investigation
10/10/2017	9 Prior Pl	L1	126	Foreign Object	1	

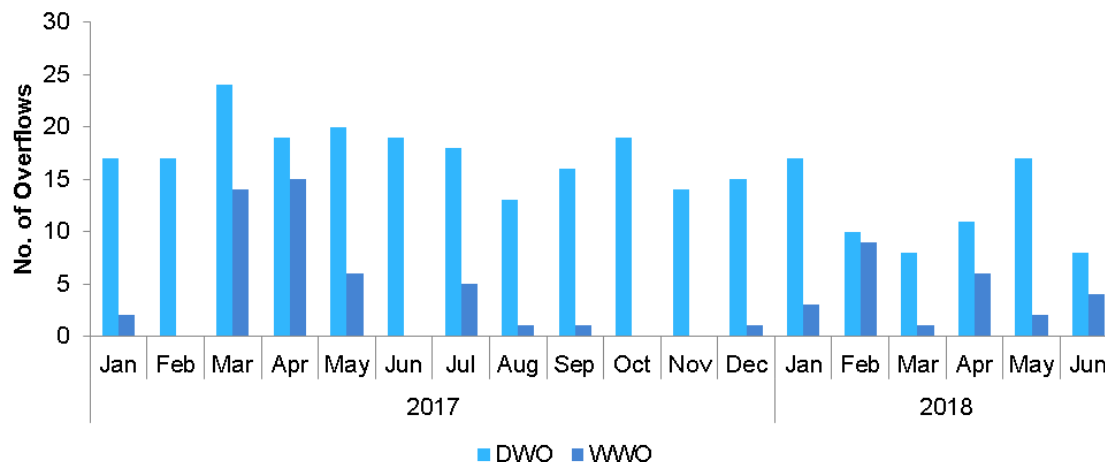
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
11/11/2017	9 Prior Pl	L1	420	Rubbish	0	
20/11/2017	9 Prior Pl	L1	194	Foreign Object	0	
6/12/2017	110A Mcleod Rd	L1	196	Unknown	1	Rag blockage removed
22/05/2018	110 Mcleod Rd	L1	140	Rags	7.4	
5/02/2018	60 Rua Rd	L1	287	Unknown	10	Piece of steel removed
13/04/2018	60 Rua Rd	L1	298	Surcharging	11.6	
27/04/2018	60 Rua Rd	L3	245	Unknown	0	
4/05/2018	60 Rua Rd	L2	254	Foreign Object	0	
25/02/2018	43 Hill Cres	L1	247	Foreign Object	0	Off-cut pipe removed
12/03/2018	43 Hill Cres	L1	145	Unknown	14.2	
12/05/2018	43 Hill Cres	L1	182	Unknown	8	
8/05/2018	4313A Great North Rd	L1	165	Unknown	0	Heavy flush and rootcut
14/05/2018	4313A Great North Rd	L1	48	Unknown	0	
23/05/2018	4313A Great North Rd	L1	133	Unknown	38	

1.18.3 Trend analysis of reported incidents

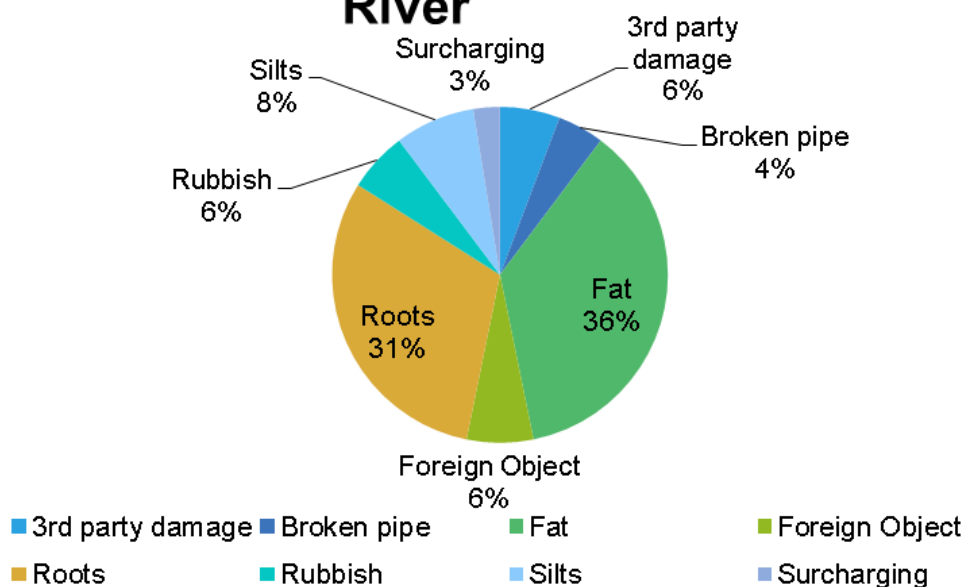
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



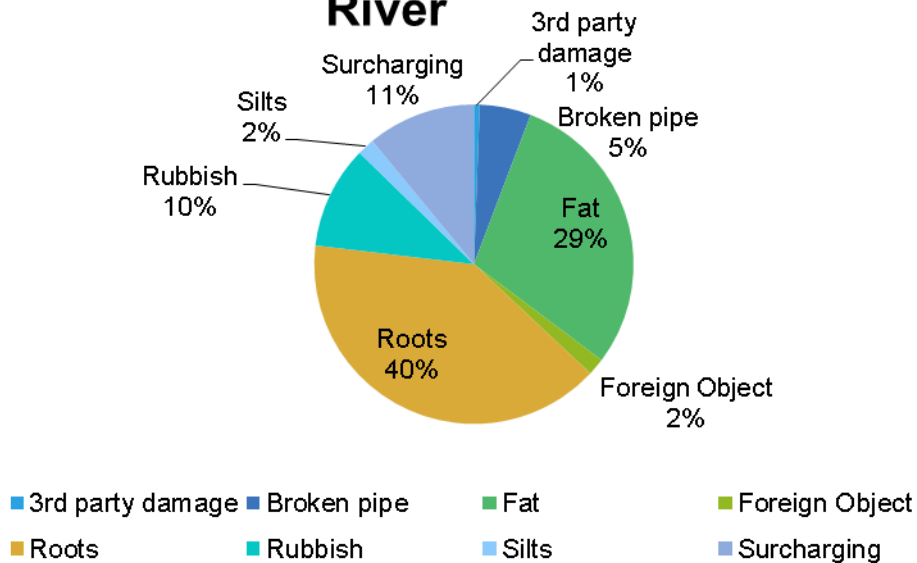
2017-18 Uncontrolled Reported Incidents Data for Catchment 18. Whau River



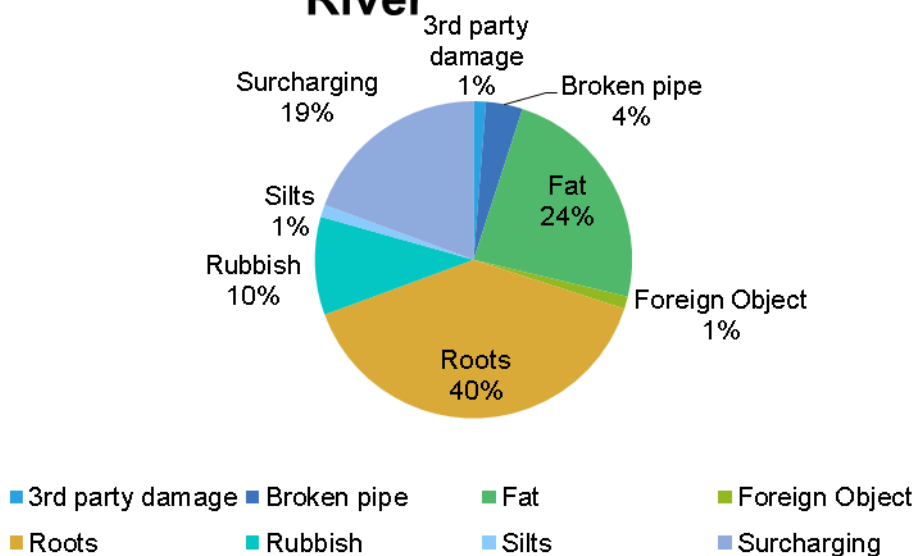
2014-15 Data for Catchment 18. Whau River



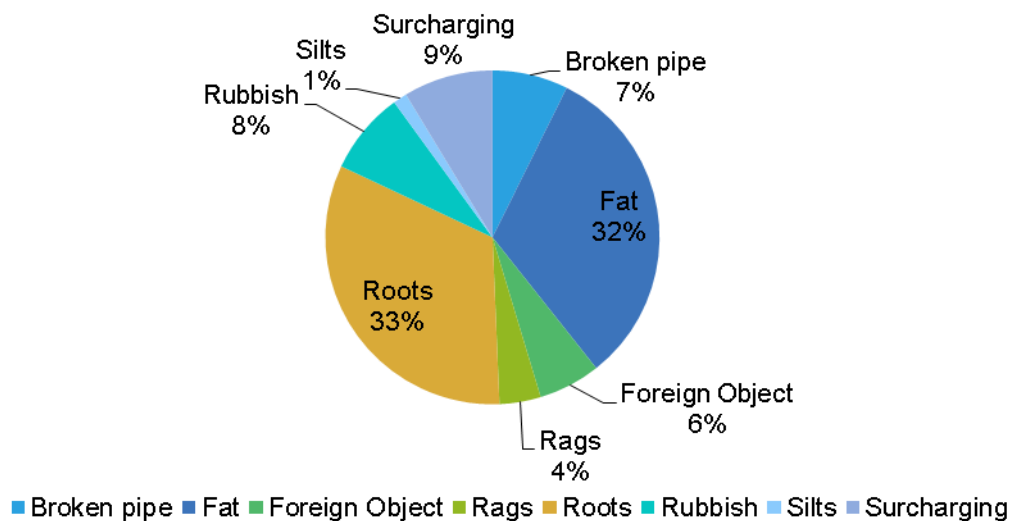
2015-16 Data for Catchment 18. Whau River



2016-17 Data for Catchment 18. Whau River



2017-18 Data for Catchment 18. Whau River



Trend analysis has been carried out where root cause has been identified.

1.18.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
30/08/2017	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	74	24.16
5/02/2018	DPASH	Ash Street Wastewater Pump Station	44	Rain event	127	10
11/02/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	257	29.8
11/02/2018	DPASH	Ash Street Wastewater Pump Station	44	Rain event	187	29.8
13/02/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	268	37
23/03/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	13	15.2
9/04/2018	DPHS2	Holly Street 2 Wastewater Pump Station	618	Rain event	60	0
10/04/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	244	14.6
14/04/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	176	35
28/04/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	39	54.6
19/05/2018	DPLEW	Lewis Street Wastewater Pump Station	622	Rain event	701	18.2
21/05/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	19	26.8
23/05/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	156	38
23/05/2018	DPASH	Ash Street Wastewater Pump Station	44	Rain event	60	38
28/05/2018	DPLID	Lidcombe Place Wastewater Pump Station	42	Rain event	62	3.2
3/06/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	185	33.8

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
25/06/2018	DPWIN	St George Wholesale Wastewater Pump Station	695	Rain event	38	25

1.18.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
38	Sceptre Place WWPS	1	0	0	0	0	0	Continue to monitor
41	Riversdale Rd WWPS	1	0	1	1	0	0.5	Continue to monitor
42	Lidcombe Place WWPS	1	0	0	1	1	0.5	Continue to monitor
44	Ash St WWPS	1	2	1	2	3	2	Continue to monitor
607	Rosebank Rd No.1 WWPS	1	0	0	0	0	0	Continue to monitor
609	Endeavour St WWPS	1	1	1	0	0	0.5	Continue to monitor
617	Holly St No .1 WWPS	1	0	0	0	0	0	Continue to monitor
618	Holly St No. 2 WWPS	1	0	0	0	1	0.25	Continue to monitor
621	Kenley Place WWPS	1	0	0	0	0	0	Continue to monitor
622	Lewis St WWPS	1	1	3	0	1	1.25	Continue to monitor
625	Mead St WWPS	1	1	0	0	0	0.25	Continue to monitor
629	Patiki Rd WWPS	1	0	1	0	0	0.25	Continue to monitor
634	Rosebank Rd No. 2 WWPS	1	0	0	0	0	0	Continue to monitor
644	Timothy Place WWPS	1	0	0	0	0	0	Continue to monitor
656	Esmeralda Ave WWPS	1	0	0	0	0	0	Continue to monitor
695	St George WWPS	3.4	3	6	8	11	7	Central Interceptor Main Works

1.18.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

1.18.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Northern Interceptor - Stage 1 – diversion of NorSGA and KHR flows	Project Execution	To allow wastewater flows to be diverted from the Northern Strategic Growth Area (NorSGA) and South Rodney (Kumeu / Huapai/Riverhead) to the Rosedale Wastewater Treatment Plant.	This will reduce the load on the Western Interceptor and reduce the frequency of overflows. It will service greenfield growth.	2017-2021
Underway	Northern Interceptor - Stage 2 – diversion of additional catchments	Option Development (Feasibility)	To allow additional wastewater flows to be diverted from the Waitakere catchments to the Rosedale Wastewater Treatment Plant.	This will reduce the load on the Western Interceptor and reduce the frequency of overflows at Type 3 EOPs S19, 20, 21, 22, 23 and 24.	2022-2036
Underway	Central Interceptor – Main Works and Link Sewers	Project Execution	This project, as well as addressing numerous wet weather overflows, will also address the risk of failure of the Manukau siphon, and also provide for urban growth	Reduction in overflows at EOP 695 in the Whau catchment, and will provide for growth in the catchment.	2017-2025
Future	Avondale/Whau Wastewater Catchment Improvements	Studies and investigations	Programme of work to enable growth and reduce wet weather overflows	Reduction of wet weather overflows	2018-2022

1.18.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.18.9 Summary

There was one EOP which discharged more frequently than two spills per year on average to date; St George WWPS will be addressed by the Central Interceptor improvements. Trend analysis shows that roots and fats cause the majority of blockages in this catchment, with a decrease in surcharging this year. In the long term, the network performance in this catchment will be improved with the Central Interceptor project, which will relieve the network. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended by 56.8km and developed to accommodate for population growth in the region. This network will continue to be monitored

and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.19 Catchment 19 – Laingholm

1.19.1 Overview

The Laingholm catchment is located in the west of Auckland, along the northern border of the Manukau Harbour, stretching from Green Bay west along the coast to Bokel Bay/Laingholm. The catchment covers an area of approximately 1,030 ha, with the catchment boundary reflecting a combination of topographic and wastewater network catchment boundaries. There are 3,061 wastewater connections.

Land use in the catchment is characterised by residential living in a bush environment, with regenerating bush in the Waitakere Ranges Regional Park bordering the catchment to the west. The catchment includes the suburbs of Laingholm, South Titirangi, a part of Green Bay to the south of Godley Road, and small area of Blockhouse Bay.

	2014/15	2015/16	2016/17	2017/18
No. of connections	3,039	3,055	3,061	3,054
Length of sewer (km)	103.4	103.5	103.5	103.5

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
693	Laingholm WWPS	DPLNG	1	Waiohua Creek
694	Wood Bay WWPS	DPWDB	1	Wood Bay

There have been no changes to the Schedule of EOPs.

1.19.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 42 reported incidents in the Laingholm catchment.

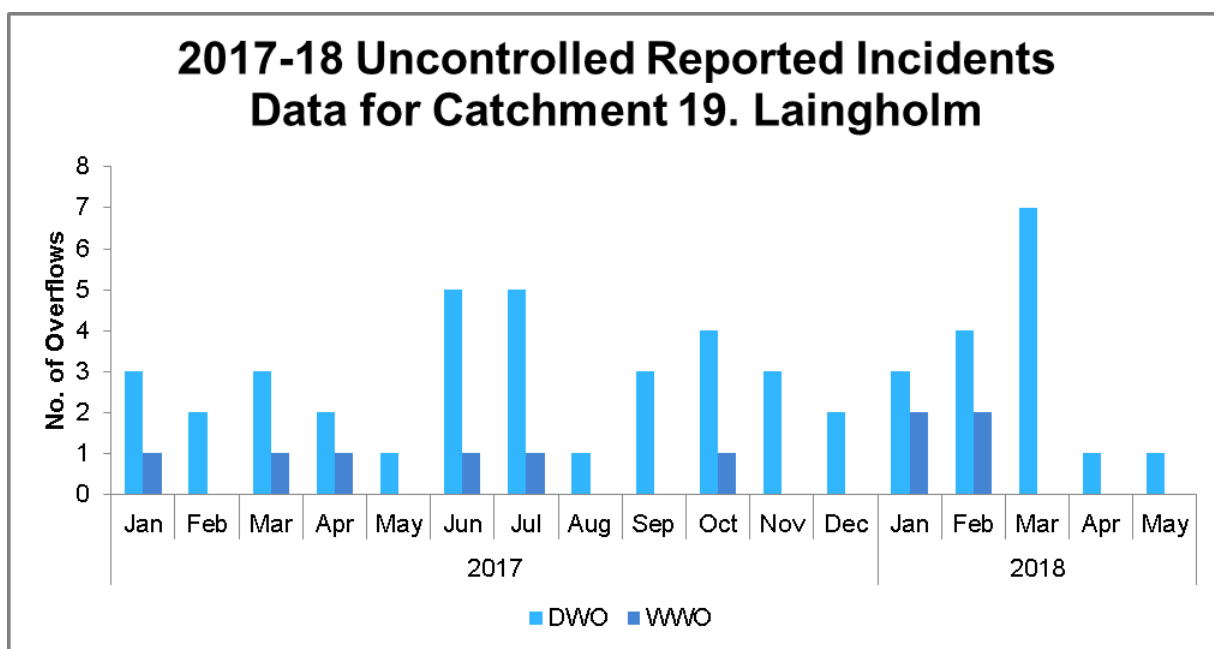
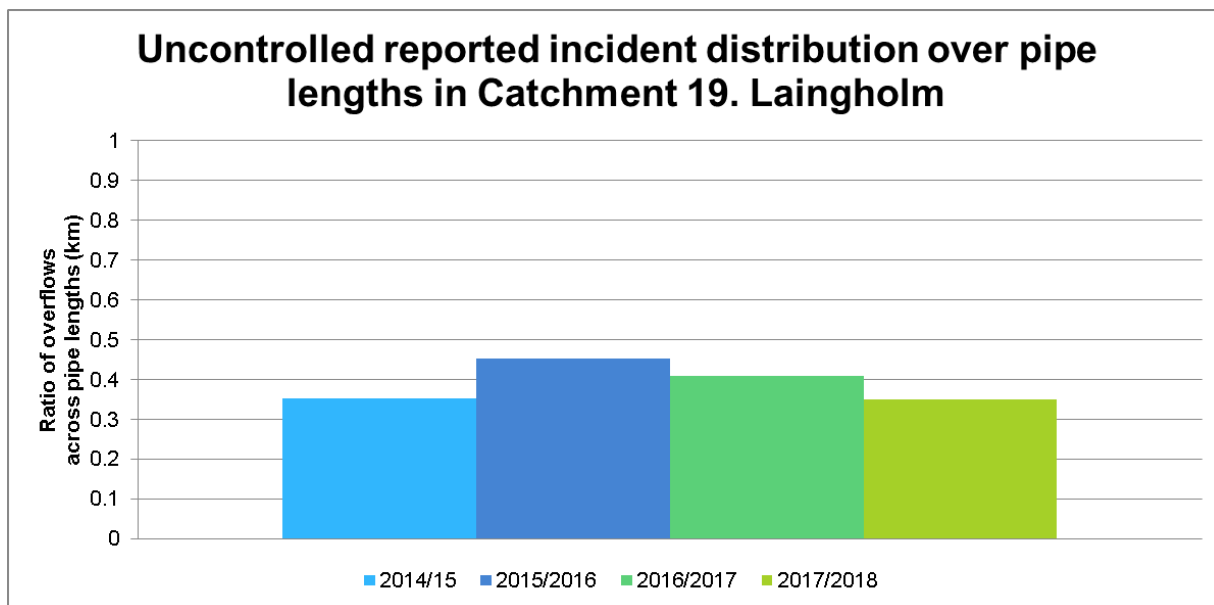
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table overleaf shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

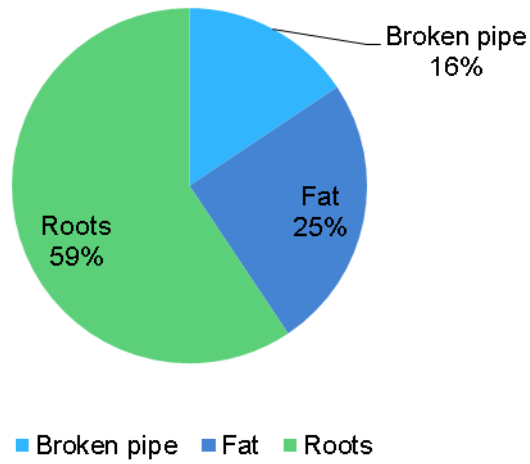
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
28/03/2017	7 Dorothy Rd	L1	198	Unknown	0.19	Continue to monitor
14/07/2017	5 Dorothy Rd	L1	349	Fat	2.8	
15/10/2017	12 Dorothy Rd	L1	522	Broken Pipe	0	Pipe repaired
19/10/2017	12 Dorothy Rd	L1	285	Broken pipe	0	
5/06/2017	27 Western Rd	L1	251	Unknown	1	Under investigation
25/07/2017	27 Western Rd	L1	385	Surcharging	14.2	
2/02/2018	27 Western Rd	L1	402	Unknown	0.2	
7/01/2017	524 South Titirangi Rd	L1	510	Fat	0	Flat lines, added to annual flushing programme
18/03/2017	524 South Titirangi Rd	L1	599	Unknown	0	
30/07/2017	524 South Titirangi Rd	L1	444	Unknown	0.2	
5/01/2018	8 Rangiwai Rd	L1	628	Roots	0.2	CCTV, rootcut. Continue to monitor
17/02/2018	6 Rangiwai Rd	L1	578	Unknown	0	
1/03/2018	23 Scenic Dr	L1	218	3rd Party Damage	0.6	Third Party Damage repaired
5/03/2018	25 Scenic Dr	L1	171	3rd party damage	0	
21/01/2018	166 Woodlands Park Rd	L1	322	Fat	3.56	Blockage removed from pipe bridge
3/02/2018	166 Woodlands Park Rd	L1	430	Surcharging	2.6	
10/01/2018	128 Otitori Bay Rd	L1	215	Broken pipe	0	Pipe repaired
6/04/2018	128 Otitori Bay Rd	L1	225	Broken Pipe	0	
26/04/2017	16 Ngaio Rd	L1	145	Unknown	0	Flushed line
31/10/2017	16 Ngaio Rd	L1	534	Surcharging	0	

1.19.3 Trend analysis of reported incidents

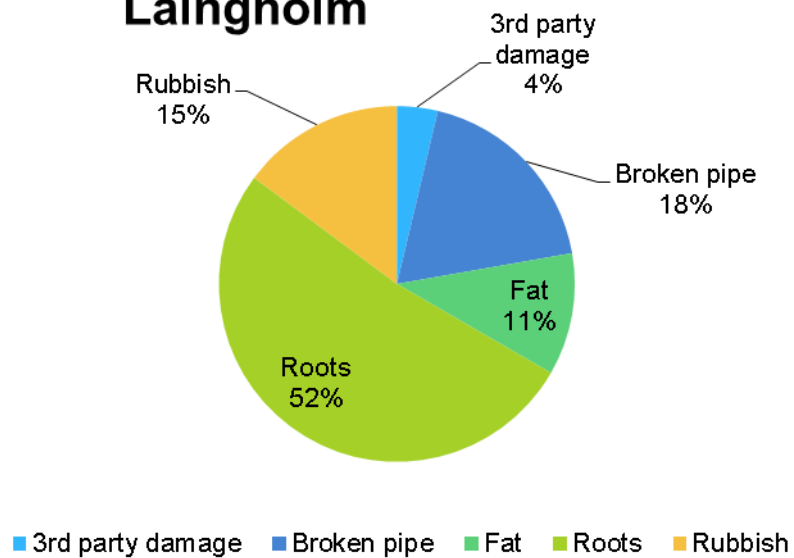
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



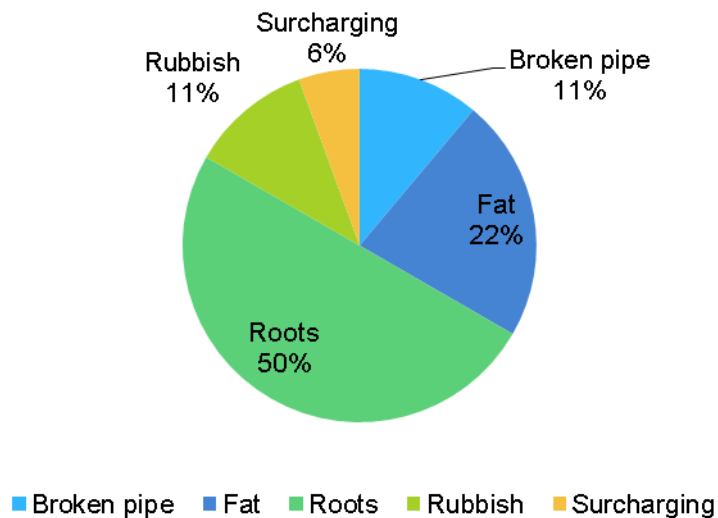
2014-15 Data for Catchment 19. Laingholm



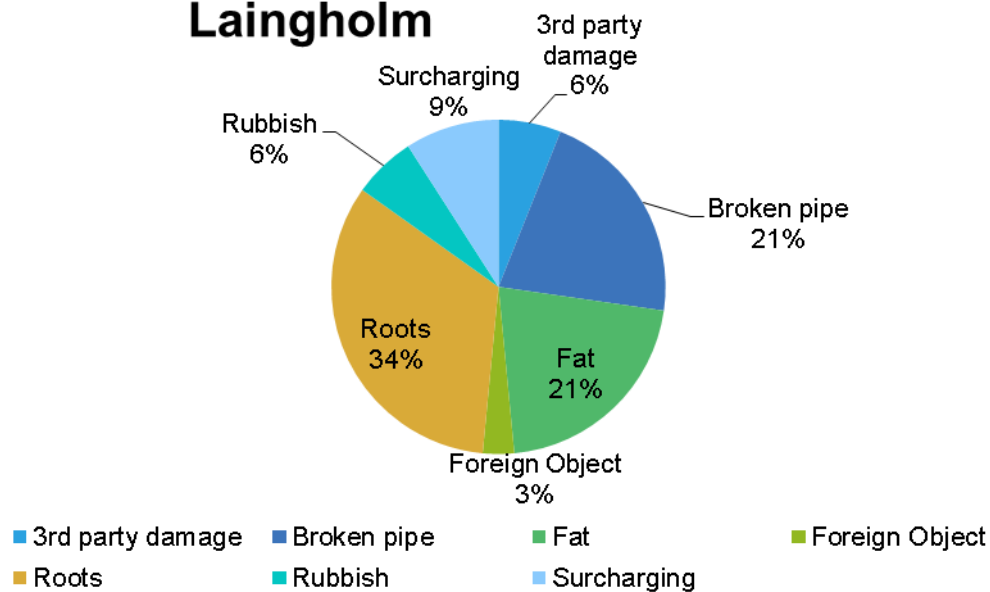
2015-16 Data for Catchment 19. Laingholm



2016-17 Data for Catchment 19. Laingholm



2017-18 Data for Catchment 19. Laingholm



Trend analysis has been carried out where the cause has been identified.

1.19.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
14/04/2018	DPTR2	Tamariki Reserve 2 Wastewater Pump Station	1208	Power outage	344	53
14/04/2018	DPJEN	Jenkins Bay Wastewater Pump Station	27	Power outage	141	53

1.19.5 Trend analysis of pump station overflows

There were no wet weather overflows at EOP's to trend.

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
693	Laingholm WWPS	0	0	0	0	0	0	Continue to monitor
694	Wood Bay WWPS	0	0	0	0	0	0	Continue to monitor
1208	Tamariki Reserve 2 Wastewater Pump Station	0	0	0	0	1	0.25	Continue to monitor
27	Jenkins Bay Wastewater Pump Station	0	0	0	0	1	0.25	Continue to monitor

1.19.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

1.19.7 Improvement Works Programme

No improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.19.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.19.9 Summary

There were no EOPs which have discharged more frequently than two spills per year. The overflow history will be analysed and utilised when reviewing future network improvement programmes. Roots remain the predominant cause of uncontrolled overflows. The network has been slightly extended and no significant changes have been made to the network as a whole. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.20 Catchment 20 – Cox’s Bay

1.20.1 Overview

The Cox’s Bay catchment covers an area of approximately 25 km² in the western part of the central Auckland Isthmus. The catchment boundary reflects a combination of the topographic and wastewater network catchment boundaries. The Cox’s Bay catchment extends from Meola Reef in the west through to Arch Hill and the ridge along Great North Road, Surrey Crescent and Old Mill Road in the south, and the Ponsonby Road ridge line which forms the eastern extent of the catchment. There are 7,598 wastewater connections.

The catchment area is highly developed, being largely residential with local centres in Ponsonby, Grey Lynn and Herne Bay. The pockets of open space dotted throughout the catchment serve mainly as local parks and sports fields.

The wastewater network in the Cox’s Bay area is largely combined, which is reflected in the high number of network EOPs in the catchment.

	2014/15	2015/16	2016/17	2017/18
No. of connections	7,562	7,572	7,590	7,598
Length of sewer (km)	96	96	96	97

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
194	28 Sarsfield Street	-	2	Home Bay
195	54 Sarsfield Street	-	2	Home Bay
196	8 Sarsfield Street	-	2	Home Bay
197	1 Marine Parade	-	2	Herne Bay
198	22 Marine Parade	-	2	Cox’s Bay
199	57 Marine Parade	-	2	Cox’s Bay
200	28 Sentinel Road	-	2	Home Bay
201	97 Sarsfield Street	-	2	Home Bay
202	69 Hamilton Road	-	2	Home Bay
222	Sussex Street/ Williamson Avenue	-	2	Cox’s Creek
223	36 Scanlon Street	-	2	Cox’s Creek
224	49 Ariki Street	-	2	Cox’s Creek
225	Grey Lynn Park/ Williamson Avenue	-	2	Cox’s Creek
226	123 Williamson Avenue	-	2	Cox’s Creek
227	Elgen Street	-	2	Cox’s Creek
228	Selbourne Street/ Firth Street	-	2	Cox’s Creek
229	30 West End Road	-	2	Cox’s Creek
230	42 Wharf Road	-	2	Kelmarna Creek

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
233	65 Kelmarna Avenue	-	2	Kelmarna Creek
234	75 West End Road	-	1	Cox's Bay
235	52 Fife Street	-	2	Edgars Creek
237	91 Rose Road	-	2	Cox's Creek
238	61 Dryden Street	-	2	Cox's Creek
240	73 Dryden Street	-	2	Cox's Creek
241	55 Hakanoa Street	-	2	Cox's Creek
242	38 Sackville Street	-	2	Cox's Creek
243	58 Hakanoa Street	-	2	Cox's Creek
244	32 Tawariki Street B	-	2	Cox's Creek
246	32 Tawariki Street D	-	2	Cox's Creek
248	Wellpark Reserve	-	2	Edgars Creek
249	5 Larchwood Ave	-	2	Edgars Creek
250	25 Francis Street	-	2	Edgars Creek
251	33 Regina Street	-	2	Cox's Creek
252	22 Parawai Crescent	-	2	Cox's Creek
253	14 Parawai Cr	-	2	Cox's Creek
254	58 Fife Street	-	2	Edgars Creek
256	63a Warnock Street	-	2	Edgars Creek
260	34 Notley Street	-	2	Motions Creek
261	18 Meola Road	-	2	Motions Creek Estuary
262	26 Westmere Crescent	-	2	Motions Creek Estuary
263	36a Westmere Crescent	-	2	Motions Creek Estuary
264	25 Savage Street	-	2	Motions Creek
265	15 Notley Street	-	2	Motions Creek
266	25 Tirotai Crescent	-	2	Motions Creek Estuary
267	216 Garnet Road	-	2	Motions Creek Estuary
268	40 Lemington Road	-	2	Motions Creek Estuary
269	7 Weona Place	-	2	Motions Creek Estuary
270	1 Westmere Park Avenue	-	2	Motions Creek Estuary
271	22 Winsomere Crescent	-	2	Motions Creek Estuary
624	Masefield Avenue WWPS	DPMAC	1	Home Bay
627	Meola Road WWPS	DPMLA	1	Motions Creek Estuary

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
636	Sarsfield Street WWPS	DPSAR	1	Home Bay
652	Webber Street WWPS	DPWEB	1	Cox's Creek
699	Westmere Park Wholesale WWPS	DPWPA	1	Motions Creek Estuary
713	Branch 6 Cox Creek MH2	DSB06MH2	2	Cox's Creek
714	Branch 6 Cox Creek MH11	DSB06 MH11	2	Cox's Bay
715	Branch 7 Arch Hill MH1	DSB07 MH1	2	Motions Creek
738	Orakei Main Sewer MH31	DSORM MH31	2	Cox's Creek
740	Branch 5 Herne Bay MH23	DSB05 MH23	2	Herne Bay
741	Branch 5 Herne Bay MH25	DSB05 MH25	2	Cox's Bay
1019	15 Cremorne Street	-	2	Home Bay

The following EOP has been identified as non-operational:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
205	6 Curran Street	-	2	Home Bay	Inactive

1.20.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 56 reported incidents in the Cox's Bay catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

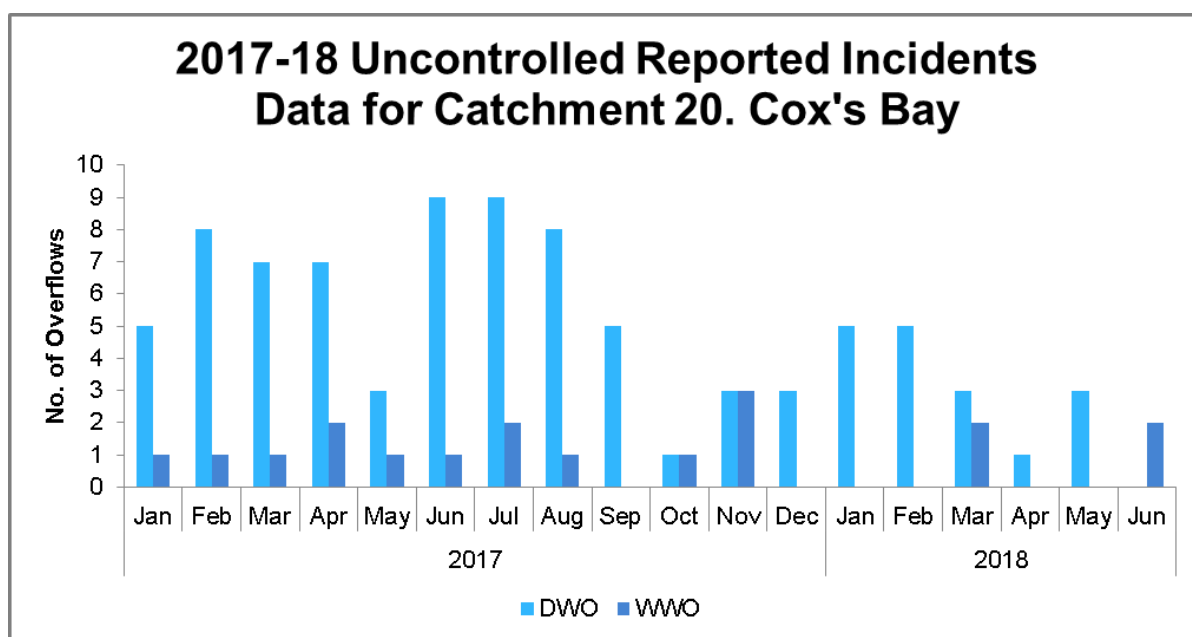
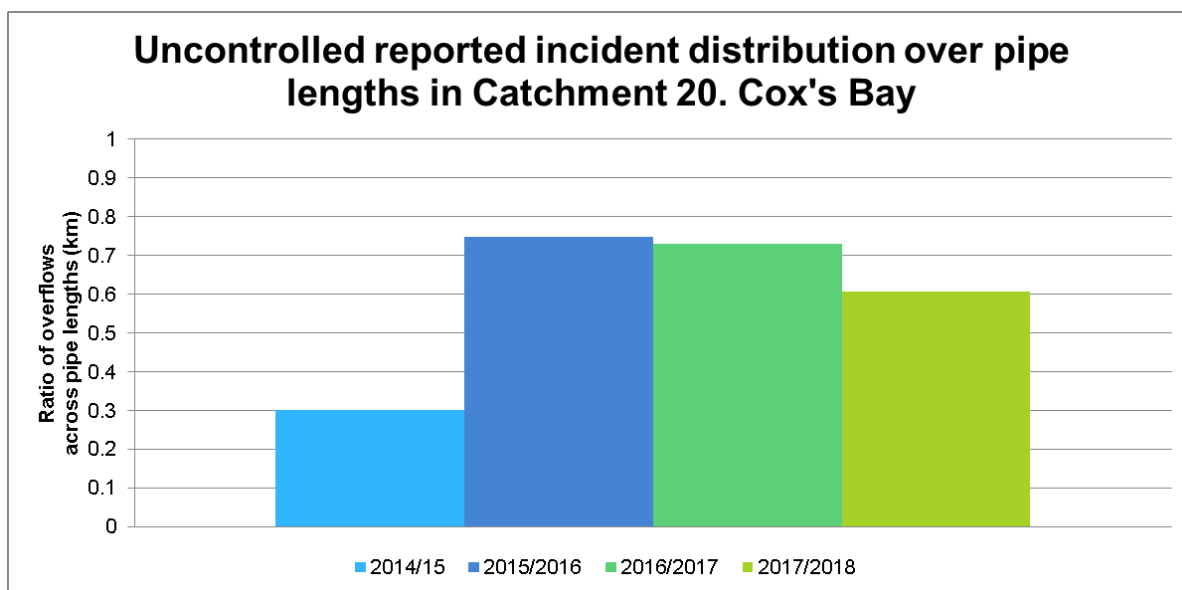
The table overleaf shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
25/08/2017	38 Francis St	L1	439	Roots	0	Rocks and roots removed
23/03/2018	38 Francis St	L1	79	Rubbish	18.5	
14/09/2016	71 Francis St	L1	466	Roots	0	Continue to monitor
2/07/2017	71 Francis St	L1	33	Roots	9	
4/08/2017	454 Great North Rd	L1	87	3rd party damage	0	Rootcut
17/08/2017	454 Great North Rd	L1	313	Unknown	1	
21/07/2017	69 Kelmarna Ave	L1	184	Unknown	18.5	Pump station screens replaced
4/08/2017	69 Kelmarna Ave	L1	47	Unknown	0	
13/08/2017	69 Kelmarna Ave	L1	564	Unknown	10.5	
14/08/2017	69 Kelmarna Ave	L1	456	Unknown	5.5	
16/08/2017	69 Kelmarna Ave	L1	238	Unknown	0	
22/08/2017	69 Kelmarna Ave	L1	184	Unknown	0	
11/07/2017	50 Lincoln St	L1	230	Unknown	3.24	Debris removed from main
21/07/2017	50 Lincoln St	L1	32	Broken Pipe	18.5	
10/08/2016	1/69 Hamilton Rd	L2	467	Silts	3.73	Debris and rags removed
27/07/2017	1/69 Hamilton Rd	L2	102	Rubbish	9	
24/03/2017	22 Pollen St	L1	77	Unknown	0	Damage repaired. Continue to monitor
6/06/2017	22 Pollen St	L1	492	Unknown	0	
26/07/2017	22 Pollen St	L1	106	3rd party damage	0.5	
22/03/2017	75 West End Rd	L1	623	Fat	0	Channel repaired
14/11/2017	75 West End Rd	L2	360	Fat	12	
25/04/2017	52 Larchwood Ave	L1	267	Broken Pipe	0	Broken pipe repaired
8/01/2018	52 Larchwood Ave	L1	463	Fat	0	
15/06/2017	15 Faulder Ave	L1	375	Silts	0.5	Dipped pipe, heavy flushed. Under review for addition to flushing programme
25/07/2017	15 Faulder Ave	L1	106	Fat	4.5	
23/02/2018	15 Faulder Ave	L1	163	Fat	0	
7/07/2017	27 Cowan St	L1	131	Rubbish	6.49	Rootcut
10/07/2017	27 Cowan St	L1	571	Roots	1.08	
4/08/2017	454 Great North Rd	L1	87	3rd party damage	0	Connection to main replaced
17/08/2017	454 Great North Rd	L1	313	Unknown	1	
25/08/2017	38 Francis St	L1	439	Roots	0	Roots and rocks

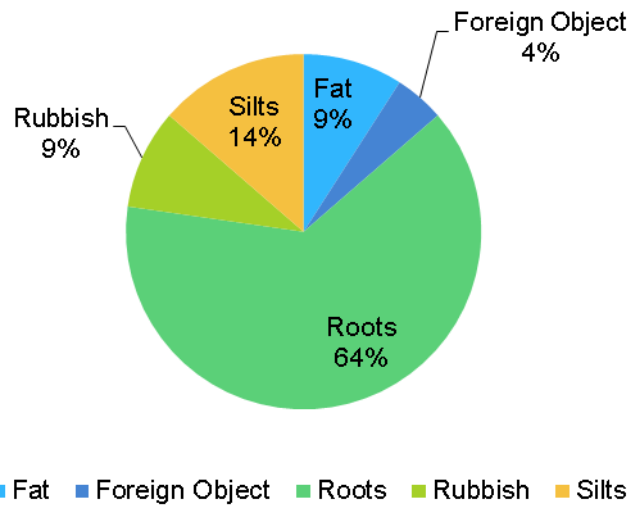
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
23/03/2018	38 Francis St	L1	79	Rubbish	18.5	removed
28/10/2017	83 Garnet Rd	L1	139	Rags	6.5	Fats and debris cleared from line
10/05/2018	83 Garnet Rd	L1	247	Fat	0	

1.20.3 Trend analysis of reported incidents

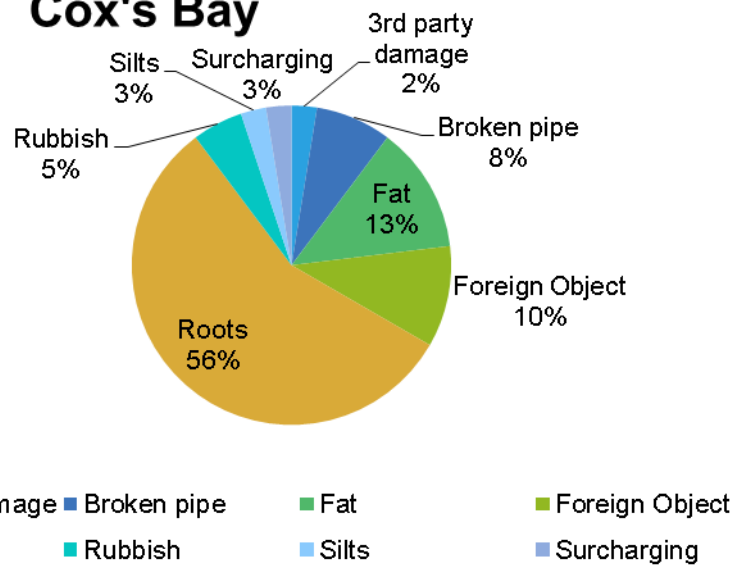
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



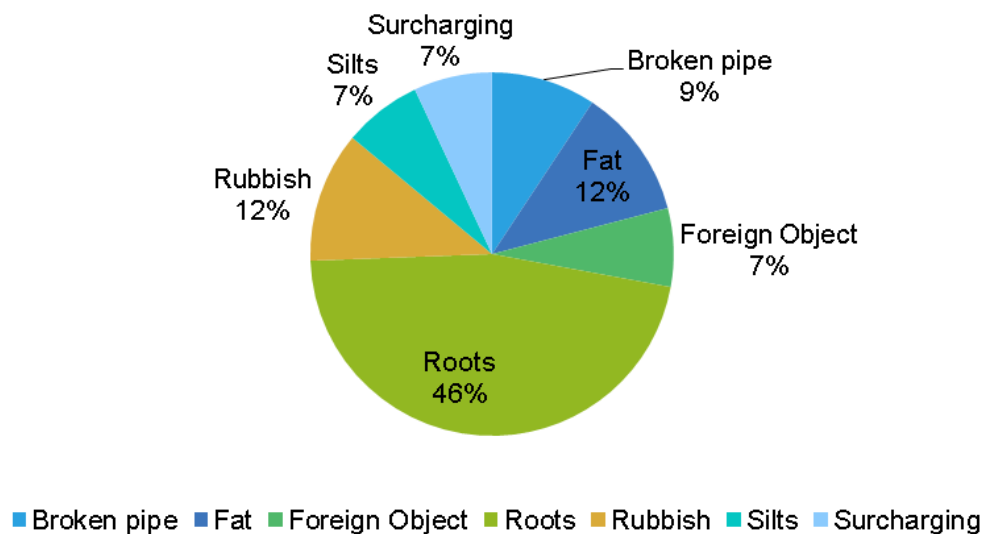
2014-15 Data for Catchment 20. Cox's Bay



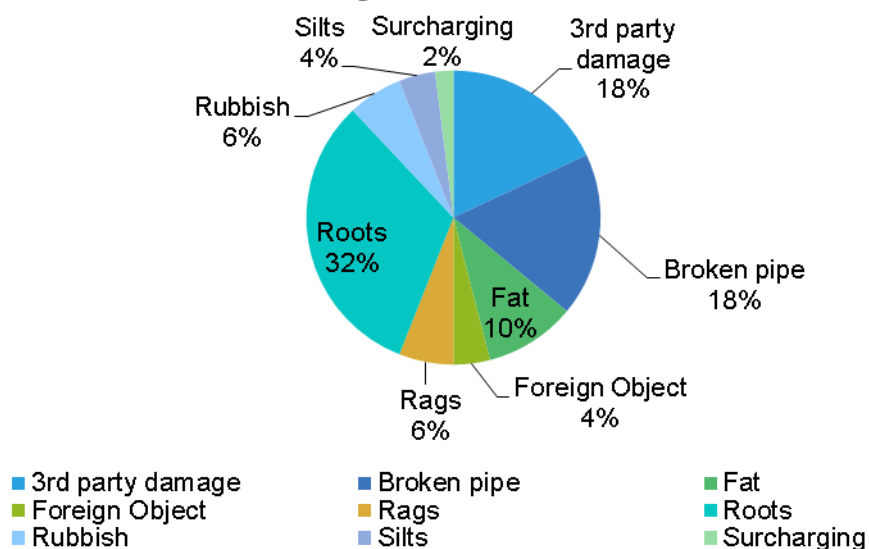
2015-16 Data for Catchment 20. Cox's Bay



2016-17 Data for Catchment 20. Cox's Bay



2017-18 Data for Catchment 20. Cox's Bay



Trend analysis has been carried out where the cause has been identified.

1.20.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
11/04/2018	DPWEB	Webber Street Wastewater Pump Station	652	Power outage	422	18.5
11/04/2018	DPEDC	75 West End Road	234	Rain event	60	18.5

1.20.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
234	75 West End Rd	0	0	0	0	1	0.25	Continue to monitor
624	Masefield Avenue WWPS	2	1	0	0	0	0.25	Continue to monitor
627	Meola Road WWPS	0	0	0	0	0	0	Continue to monitor
636	Sarsfield Street WWPS	0.8	0	0	0	0	0	Continue to monitor
652	Webber Street WWPS	0.6	0	2	0	1	0.75	Continue to monitor
699	Westmere Park Wholesale	0	0	1	1	0	0.5	Continue to monitor

The Type 2 EOP 738 has a permanent monitor installed. This information is provided as it is available, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the Wastewater Network Strategy and the overall network performance. The monitor at EOP 233 has been non-operational for the majority of 2016-18 due to a fault.

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
738	Richmond Road, Orakei Main Sewer MH31	0	N/A	5	2	0	1.75	Western Isthmus Water Quality Improvement Programme

1.20.6 Inflow & Infiltration Programme

Due to the combined drainage network in this catchment, I&I work is related to the separation of the combined sewer network and is currently being investigated as part of Western Isthmus Water Quality Improvement Programme of improvement works to reduce wet weather overflows.

1.20.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Grey Lynn Wastewater Model Build and Calibration	Studies and investigations	To be able to identify the preferred works programme to meet target wet weather overflow frequencies and accommodate growth in the catchment.	To identify performance issues and develop network solutions to reduce overflows throughout the catchment and provide for urban growth	2014-2018
Underway	Meola Reef Wastewater Model Build and Calibration	Studies and investigations	To be able to identify the preferred works programme to meet target wet weather overflow frequencies and accommodate growth in the catchment.	To identify performance issues and develop network solutions to reduce overflows throughout the catchment and provide for urban growth	2017-2020
Underway	Central Interceptor – main works and link sewers	Project Execution	This project, as well as addressing numerous wet weather overflows, will also address the risk of failure of the Manukau siphon, and also provide for urban growth. To address growth, level of service, and asset condition risks	The Central Interceptor will have multiple and widespread benefits through immediate improvements in wet weather overflow frequency and enabling upgrades for growth and level of service upgrades through the isthmus	2017-2025
Underway	Western Isthmus Water Quality Improvement Programme	Studies and investigations	To address growth, level of service, and asset condition risks in the Western isthmus and wider catchments. These EOPs typically have very high overflow frequency, as many are in combined wastewater and stormwater catchments	Development of upgrade suite to achieve reduction in wet weather overflow frequencies and to allow for growth. The final scope of this project is under investigation	2018-2028

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Motions Wastewater Catchment Improvements Part of Western Isthmus Programme	Studies and investigations, Option Analysis	Programme of work to enable growth and reduce wet weather overflows	Reduces overflow volume/ frequency and allows for growth	2019-2026
Underway	Herne Bay Wastewater Catchment Improvements	Studies and investigations, Option Analysis	Programme of work to enable growth and reduce wet weather overflows	Reduces overflow volume/ frequency and allows for growth	2019-2024
Underway	Westmere Wastewater Catchment Improvement Works	Studies and investigations, Option Analysis	Programme of work to enable growth and reduce wet weather overflows	Reduces overflow volume/ frequency and allows for growth	2022-2028

1.20.8 Erosion Control Measures

No works related to erosion control were carried out in this catchment between 1 July 2017 and 30 June 2018.

1.20.9 Summary

The Cox's Bay area is a historically combined area, and is therefore designed to spill from the Type 2 EOPs in the network. There have been no Type 1 EOPs which have discharged more frequently than two spills per year on average. Trend analysis shows that this catchment has a high proportion of overflows caused by roots. The performance of the network overflows will be addressed primarily by the Central Interceptor main works and the suite of options identified through the Western Isthmus Water Quality Improvement Programme. The overflow history will be analysed and utilised when reviewing future network improvement programmes, and the Grey Lynn and Meola Reef wastewater models will be used to ensure that network upgrades to manage levels of service and new development are appropriately managed. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.21 Catchment 21 – Central Auckland (CBD)

1.21.1 Overview

The Central Auckland (CBD) catchment is approximately 9 km² in size, extending from Westhaven Marina in the west to Mechanics Bay in the east, and bordered by the Waitemata Harbour in the north. The landward extent of the catchment is bordered by Shelly Beach Road, Ponsonby Road, Karangahape Road, Khyber Pass Road and Parnell Road. The catchment is characterised by commercial development (low and high-rise office blocks and retail shops), cafes and restaurants, industrial activities (light, automotive), hotels, low, medium and high-density residential living, entertainment complexes, car parks, churches and reserve areas. The harbour edge also incorporates port, ferry and marina activities. Significant open spaces within the catchment include the Auckland Domain, Albert Park and Victoria Park. There are 4,884 wastewater connections.

The wastewater network in the CBD is a mix of combined areas, separated from historically combined, and developed as separated areas, and this is reflected in the number of EOPs in the catchment.

	2014/15	2015/16	2016/17	2017/18
No. of connections	4,842	4,845	4,858	4,884
Length of sewer (km)	116	116	117	120

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
47	Short Street/ Anzac Avenue	-	2	Waitemata Harbour, CBD Edge
49	Quay Street	-	2	Waitemata Harbour, CBD Edge
50	61 Beach Road	-	2	Waitemata Harbour, CBD Edge
58	41 Kitchener Street	-	2	Waitemata Harbour, CBD Edge
59	27 Victoria Street	-	2	Waitemata Harbour, CBD Edge
74	3a Lower Albert St	-	2	Waitemata Harbour, CBD Edge
76	242 Queen Street	-	2	Waitemata Harbour, CBD Edge
80	Lorne Street/ Victoria Street East	-	2	Waitemata Harbour, CBD Edge
89	292 Queen Street	-	2	Waitemata Harbour, CBD Edge
93	89 Mayoral Drive	-	2	Waitemata Harbour, CBD Edge
95	327 Queen Street	-	2	Waitemata Harbour, CBD Edge
97	301 Queen Street A	-	2	Waitemata Harbour, CBD Edge
99	1 Greys Avenue	-	2	Waitemata Harbour, CBD Edge
108	301 Queen Street B	-	2	Waitemata Harbour, CBD Edge
109	267 Queen Street	-	2	Waitemata Harbour, CBD Edge
112	Wellesley Street West	-	2	Waitemata Harbour, CBD Edge
113	8 Mayoral Drive	-	2	Waitemata Harbour, CBD Edge

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
114	15 Mayoral Drive	-	2	Waitemata Harbour, CBD Edge
115	12 Mayoral Drive A	-	2	Waitemata Harbour, CBD Edge
116	15 Mayoral Drive B	-	2	Waitemata Harbour, CBD Edge
117	67 Vincent Street A	-	2	Waitemata Harbour, CBD Edge
118	162 Cook Street	-	2	Waitemata Harbour, CBD Edge
119	67 Vincent Street B	-	2	Waitemata Harbour, CBD Edge
120	14 Mayoral Drive	-	2	Waitemata Harbour, CBD Edge
121	11 Mayoral Drive	-	2	Waitemata Harbour, CBD Edge
123	12 Mayoral Drive B	-	2	Waitemata Harbour, CBD Edge
127	1 Victoria Street West	-	2	Waitemata Harbour, CBD Edge
128	11 Victoria Street East	-	2	Waitemata Harbour, CBD Edge
129	19 Victoria Street West	-	2	Waitemata Harbour, CBD Edge
130	15 Albert Street	-	2	Waitemata Harbour, CBD Edge
131	Wolfe Street/ Hobson Street	-	2	Waitemata Harbour, CBD Edge
134	Durham Lane	-	2	Waitemata Harbour, CBD Edge
167	74 Cook Street	-	2	Waitemata Harbour, CBD Edge
169	Fanshawe Street/ Nelson Street	-	2	Waitemata Harbour, CBD Edge
172	1 London Street	-	2	Waitemata Harbour, CBD Edge
176	Union Street	-	2	Waitemata Harbour, CBD Edge
178	43 College Hill	-	2	Waitemata Harbour, CBD Edge
180	16 Hackett Street	-	2	Waitemata Harbour, CBD Edge
183	95 Wellington Street	DPWTN	2	Waitemata Harbour, CBD Edge
477	69 St Georges Bay Road	-	2	Waitemata Harbour, CBD Edge
478	22 Avon Street	-	2	Waitemata Harbour, CBD Edge
479	22 Stratford Street	-	2	Waitemata Harbour, CBD Edge
482	11 Farnham Street	-	2	Waitemata Harbour, CBD Edge
487	106 St Georges Bay Road	-	2	Waitemata Harbour, CBD Edge
518	5 Cheshire Street	-	2	Waitemata Harbour, CBD Edge
521	6 Ngahere Terrace	-	2	Waitemata Harbour, CBD Edge
522	3 Domain Drive	-	2	Waitemata Harbour, CBD Edge
524	8 Grafton Road	-	2	Waitemata Harbour, CBD Edge
528	2 Stanley Street	DPCNH	1	Waitemata Harbour, CBD Edge
529	6 - 18 Symonds Street	-	2	Waitemata Harbour, CBD Edge

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
530	5 Alten Street	-	2	Waitemata Harbour, CBD Edge
532	1 Augustus Terrace	-	2	Waitemata Harbour, CBD Edge
534	Mutu Street	-	2	Waitemata Harbour, CBD Edge
535	Bedford Street	-	2	Waitemata Harbour, CBD Edge
536	3 Ferncroft Street	-	2	Waitemata Harbour, CBD Edge
542	38 Whitaker Place	-	2	Waitemata Harbour, CBD Edge
545	Symonds Street/ Grafton Road	-	2	Waitemata Harbour, CBD Edge
551	2 Kari Street	-	2	Waitemata Harbour, CBD Edge
557	3 Glenside Crescent	-	2	Waitemata Harbour, CBD Edge
593	31 Cheshire Terrace	-	2	Waitemata Harbour, CBD Edge
658	Farnham Street Wholesale WWPS	DPFRN	1	Waitemata Harbour, CBD Edge
659	Fanshawe Street Wholesale WWPS	DPFAN	1	Waitemata Harbour, CBD Edge
712	Branch 5 Herne Bay MH2A	DSB05, MH2A	2	Waitemata Harbour, CBD Edge
735	Orakei Main Sewer MH19A	DSORM, MH19A	2	Waitemata Harbour, CBD Edge
737	Branch 4B Hardings Street MH2A	DSB4B, MH2A	2	Waitemata Harbour, CBD Edge
1020	27 New Street	-	2	Waitemata Harbour, CBD Edge

The following EOPs have been added to the schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
116	15 Mayoral Drive B	-	2	Waitemata Harbour, CBD Edge	Located and modelled in Upper CBD Study
1591	Wynyard Quarter PS	DPWYQ	1	Waitemata Harbour, CBD Edge	Commissioned

1.21.2 Dry Weather Overflows (DWOs)

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 72 reported incidents in the Central Auckland (CBD) catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

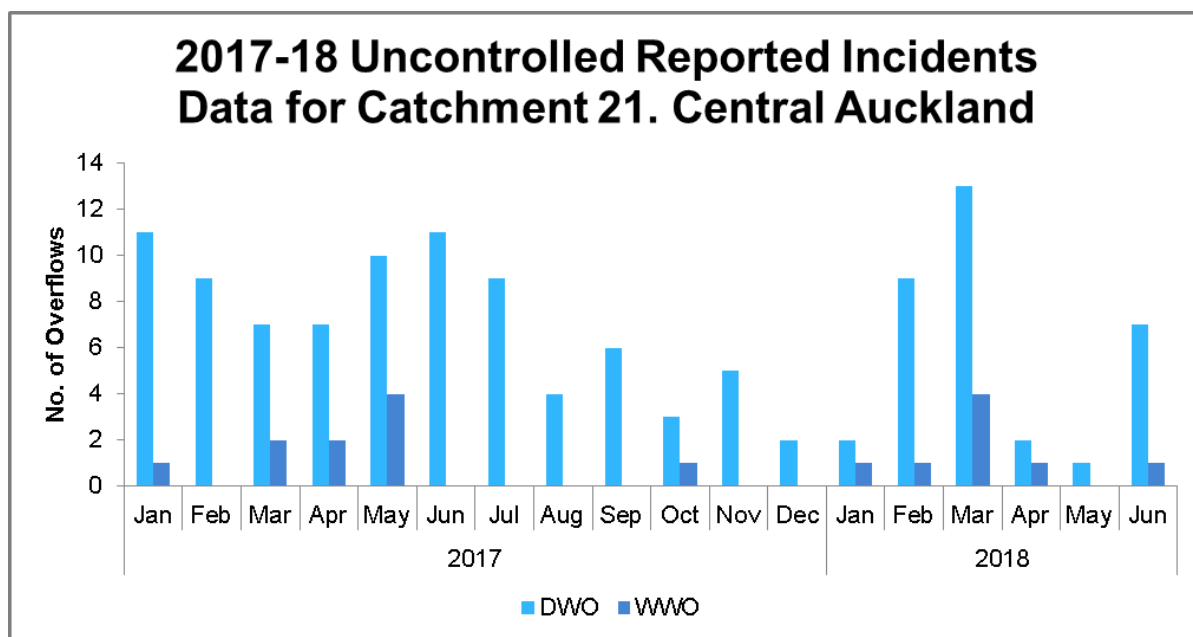
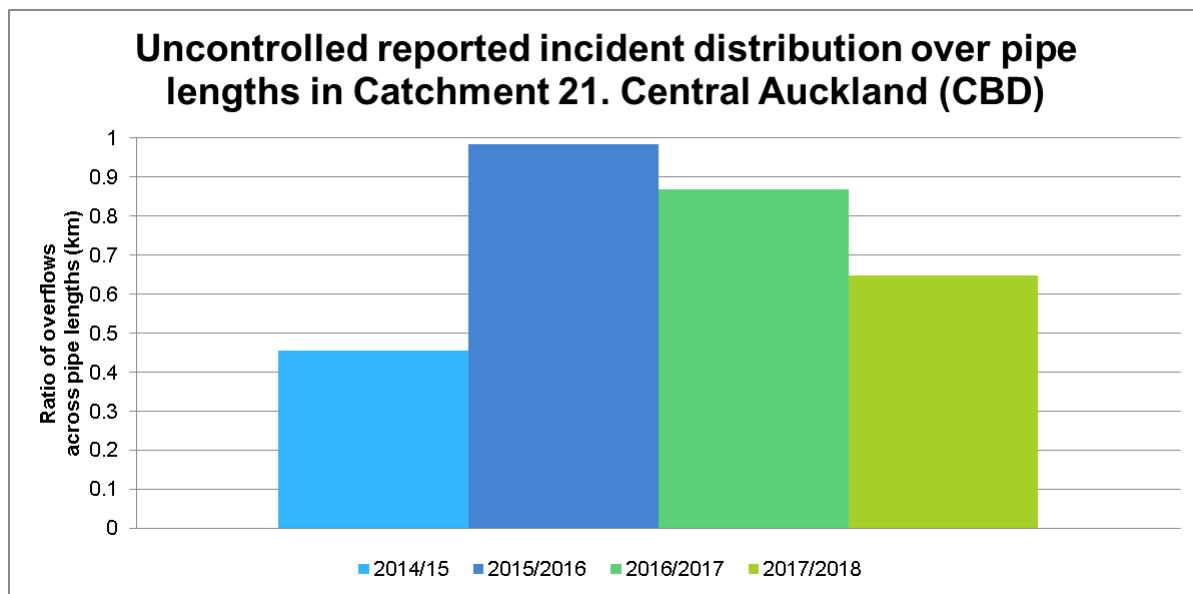
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

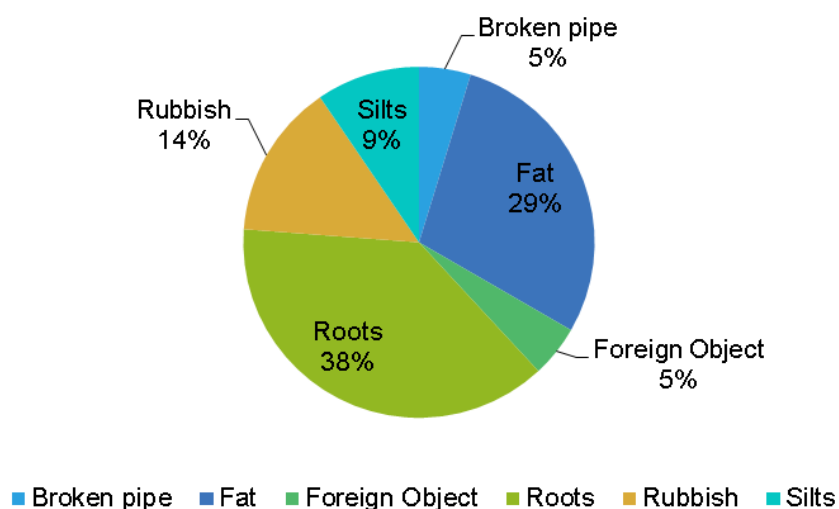
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
26/07/2017	20 Pakenham St-E	L1	144	Fat	0.5	Dips in line, heavy fat build up being investigated by Trade Waste. Restaurants in the area do not seem to be complying with fat discharge limits.
16/11/2017	14-18 Pakenham St-E	L1	468	Fat	0	
23/02/2018	14-18 Pakenham St-E	L1	550	Unknown	0	
4/03/2018	14-18 Pakenham St-E	L1	218	Fat	0	
30/06/2018	Wtr/14-18 Pakenham St-E	L1	157	Fat	0	
20/02/2018	86-102 Customs St-W	L1	367	Fat	0	Under investigation, heavy flushed
19/06/2018	86-102 Customs St-W	L1	503	Foreign Object	1.5	
27/06/2018	86-102 Customs St-W	L1	470	Foreign Object	0	
31/05/2017	487A Parnell Rd	L1	161	Unknown	1.5	Rootcut and heavy flushed
17/07/2017	487A Parnell Rd	L1	133	Fat	3.5	
12/09/2017	487A Parnell Rd	L1	60	Unknown	3	
2/02/2018	Lv1+/60 Stanley St	L1	370	Broken pipe	0	Rocks removed
28/02/2018	Lv1+/60 Stanley St	L1	296	Foreign Object	0	
29/08/2017	135 Albert St	L1	185	Fat	0	Fat blockage removed
11/09/2017	135 Albert St	L1	192	Fat	7	
7/03/2018	27-31 Victoria St-E	L1	185	Fat	6	Fat blockage removed
11/03/2018	27-31 Victoria St-E	L1	528	Fat	0	

1.21.3 Trend analysis of reported incidents

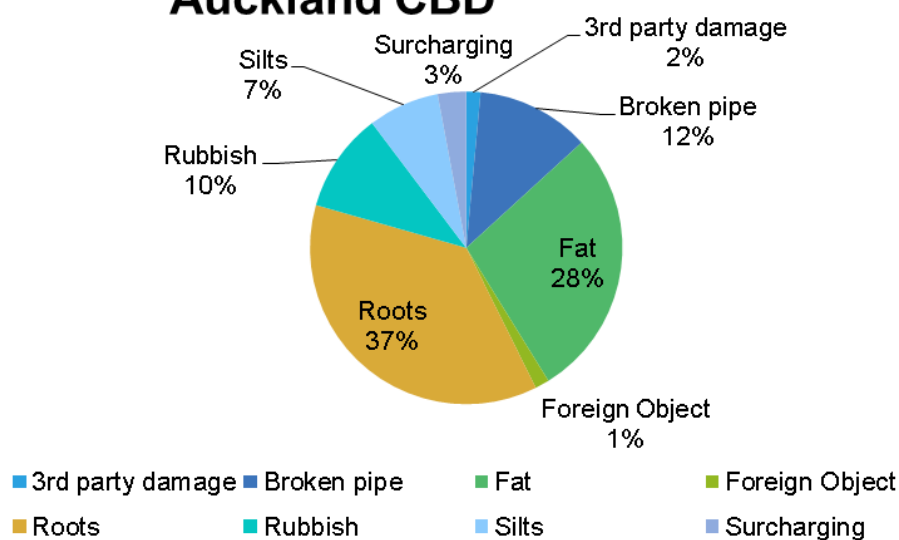
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



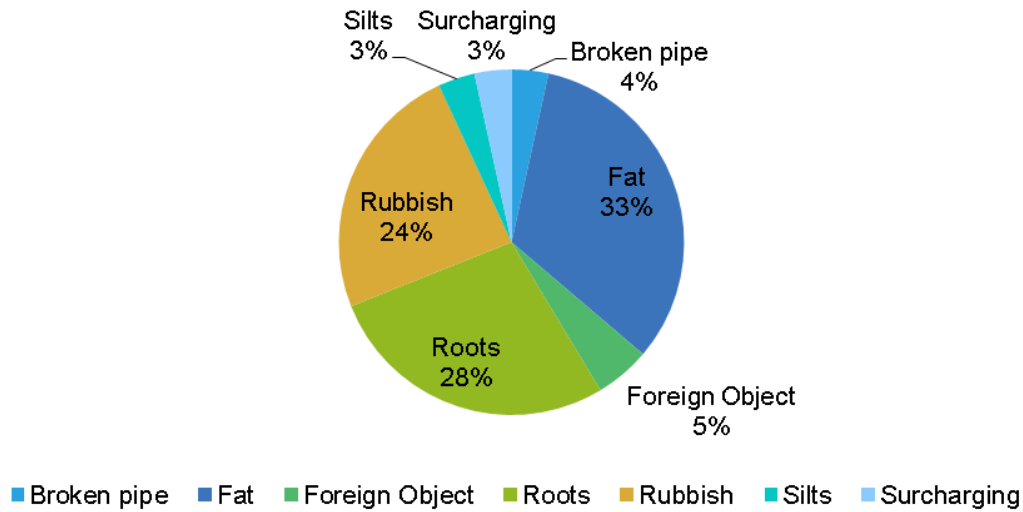
2014-15 Data for Catchment 21. Central Auckland CBD



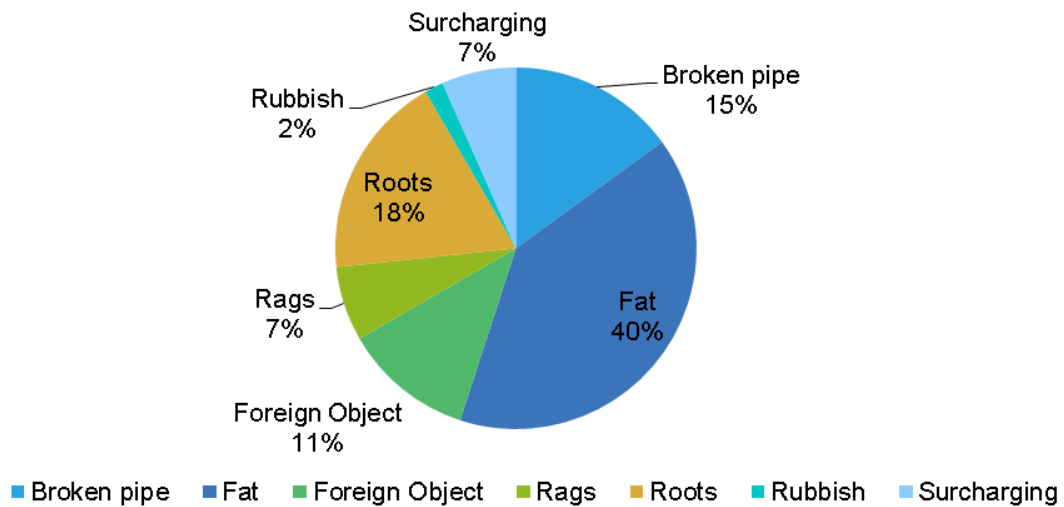
2015-16 Data for Catchment 21. Central Auckland CBD



2016-17 Data for Catchment 21. Central Auckland CBD



2017-18 Data for Catchment 21. Central Auckland CBD



Trend analysis has been carried out where the cause has been identified.

1.21.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
5/01/2018	DPFRN	Farnham Street Wholesale Wastewater Pump Station	658	Rain event	91	17
1/02/2018	DPFRN	Farnham Street Wholesale Wastewater Pump Station	658	Rain event	67	50

1.21.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
528	2 Stanley Street	1	0	0	0	0	0	Continue to monitor
658	Farnham Street Wholesale WWPS	0	0	0	1	2	0.75	Continue to monitor
659	Fanshawe Street Wholesale WWPS	0	0	0	0	0	0	Wynyard Quarter Pump station will service growth and divert part of the existing catchment

Where reliable data is available for Type 2 locations, this has been provided, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the Wastewater Network Strategy and the overall network performance in this catchment.

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
712	Branch 5 Herne Bay MH2A	49	N/A	N/A	64	0	32	Central Interceptor and Western Isthmus Water Quality Improvement Programme
180	16 Hackett Street	109	N/A	N/A	61	111	N/A	Central Interceptor and Western Isthmus Water Quality Improvement Programme

1.21.6 Inflow & Infiltration Programme

Parts of this catchment comprised of a combined drainage network, in these areas I&I are currently not being considered and other programme of works are being investigated to address the wet weather overflows. In the separated areas I&I will be considered as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

1.21.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	Franklin Road, Collingwood Street Targeted Wastewater Separation	Project execution	This area is combined and the existing network is in poor condition. Separation will reduce the flows to the EOPs. The network will also be rehabilitated to ensure low I&I in future	The proposal will provide for growth, remove two EOPs (185 and 182) and significantly reduce wet weather overflows from EOP 183	2018
Underway	Picton St, Anglesea St, Hepburn St, Collingwood Rd Separation and Sewer Rehabilitation	Options analysis (Feasibility)	This area is combined and the existing network is in poor condition. Separation will reduce flows to the downstream EOPs. The network will also be rehabilitated to ensure low I&I in future	Will reduce the frequency of overflow EOP 183	2015-2020
Complete	Pump station and rising main to service Wynyard Quarter	Project execution	The capacity of the existing wastewater system servicing Wynyard Quarter is insufficient to cater for the proposed change in land use and associated growth	The new pump station will divert flows currently going to EOP 659, reducing overflows at that location and providing for growth	2018
Complete	New gravity sewerage in Wynyard Quarter	Project execution	The sewers are in poor condition, with high I&I and tidal ingress. Flat grades have also resulted in operational issues	Reduced overflow frequency and volume at EOP659, and reduced risk of uncontrolled spills from the network	2019 (timing of all upgrades dependent upon Auckland Transport upgrades)
Underway	Queen St Diversion Sewer	Option analysis (Feasibility)	To address growth in the CBD area and the risk of aging assets in poor condition	Proposed to address asset risk and frequent discharges at EOP128	By 2025

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Central Interceptor – main works and link sewers	Project Execution	This project, as well as addressing numerous wet weather overflows, will also address the risk of failure of the Manukau siphon, and also provide for urban growth. To address growth, level of service, and asset condition risks	The Central Interceptor will have multiple and widespread benefits through immediate improvements in wet weather overflow frequency and enabling upgrades for growth and level of service upgrades through the isthmus	2017-2025
Underway	Western Isthmus Water Quality Improvement Programme	Studies and investigations	To address growth, level of service, and asset condition risks in the Western isthmus and wider catchments. These EOPs typically have very high overflow frequency, as many are in combined wastewater and stormwater catchments	Development of upgrade suite to achieve reduction in wet weather overflow frequencies and to allow for growth. The final scope of this project is under investigation	2018-2028
Underway	St Marys Bay Wastewater Catchment Improvements	Studies and investigations	Programme of work to enable growth and reduce wet weather overflows	Reduces overflow volume/ frequency and allows for growth	2018-2022

1.21.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.21.9 Summary

There have been no Type 1 EOPs which have discharged more frequently than two spills per year on average. The CBD catchment is undergoing significant change, with network reconfiguration and upgrades likely to occur in the longer term to accommodate growth and take advantage of associated projects such as the City Rail Link and Light Rail. The performance of the network overflows will be addressed primarily by the Central Interceptor main works and the suite of options identified through the Western Isthmus Water Quality Improvement Programme, separation projects, and the Wynyard Quarter upgrades. The network is currently performing well, with some improvements identified under the Upper CBD Options study. Fat has replaced roots as the leading cause of uncontrolled overflows in previous years. The network has been slightly extended by 3.3km and network performance will also be improved with the implementation of the Central and Northern Interceptors. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.22 Catchment 22 – Hobson Bay

1.22.1 Overview

The Hobson Bay catchment is located in the central part of the Auckland Isthmus immediately to the east of the Central Business District (CBD). The catchment covers an area of approximately 3,300 ha, with the catchment boundary reflecting a combination of topographic and wastewater network catchment boundaries. There are 30,900 wastewater connections.

The catchment includes the suburbs of Orakei, Parnell, Newmarket, Remuera, Meadowbank, St Heliers and Mission Bay. It is heavily developed, but mainly residential in character with limited business and industrial activity which is predominantly centred around Newmarket and, to a lesser extent, Parnell.

The wastewater network in this catchment is a mix of combined areas, separated from historically combined, and developed as separated areas, and this is reflected in the number of EOPs in the catchment.

	2014/15	2015/16	2016/17	2017/18
No. of connections	30,602	30,695	30,835	30,900
Length of sewer (km)	429	431	432	436

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
160	45 Ascot Avenue	-	2	Waaiatarua Reserve Stream
164	23A Inverary Avenue	-	2	To land
193	35 Yattendon Road	-	2	St Heliers Bay
212	54 Speight Road	-	2	Madill's Stream
213	59 Baddeley Avenue	-	2	Madill's Stream
214	64 Hawera Road	-	2	Madill's Stream
215	74 Hawera Road	-	2	Madill's Stream
272	159 Orakei Road	-	2	Unnamed stream flowing to Hobson Bay
273	35 Entrican Avenue	-	2	Unnamed stream flowing to Hobson Bay
274	Tonks Street WWPS	DPTON	1	Hobson Bay
276	58 Kelvin Road	-	2	Meadowbank Stream West
277	126 Ngapuhi Road	-	2	Orakei Creek
279	188 Upland Road	-	2	Hobson Bay
280	12a Woodley Avenue	-	2	Orakei Basin
281	49 Ngapuhi Road	-	2	Meadowbank Stream West
282	118 Ngapuhi Road	-	2	Orakei Creek
284	84 Meadowbank Road	-	2	Orakei Creek
285	77 Meadowbank Road	-	2	Orakei Creek

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
286	44a Benson Road	-	2	Orakei Basin
287	148 Lucerne Road	-	2	Orakei Creek
288	2 Bonnie Brae Road	-	2	Orakei Creek
289	93 Waiatarua Road	-	2	Orakei Creek
295	14 Rangitoto Avenue	-	2	Orakei Basin
296	17 Benson Road	-	2	Orakei Basin
350	44 Rukutai Street	-	2	Unnamed stream - Mission Bay
351	125 Aotea Street	-	2	Unnamed stream - Mission Bay
352	49 Rukutai Street	-	2	Unnamed stream - Mission Bay
353	2b Nihill Crescent	-	2	Unnamed stream - Mission Bay
420	14 Mahuru Street	-	2	Newmarket Stream
421	29 Ayr Street A	-	2	Newmarket Stream
422	27 Morrow Street	-	2	Newmarket Stream
423	8 Remuera Road B	-	2	Newmarket Stream
424	29 Ayr Street B	-	2	Newmarket Stream
425	10 St Marks Road	-	2	Newmarket Stream
427	Kingdon Street	-	2	Newmarket Stream
428	6 Parkfield Terrace	-	2	Newmarket Stream
448	17 Watene Crescent	-	2	Okahu Bay
449	66 Paritai Drive	-	2	Orakei Marina
451	27 Ngapipi Road	-	2	Lower Purewa Creek
452	18 Ngapipi Road	-	2	Lower Purewa Creek
453	12a Okahu Street	-	2	Okahu Bay
454	34-36 Apihai Street	-	2	Okahu Bay
455	63 Reihana Street	-	2	Okahu Bay
456	88 Reihana Street	-	2	Okahu Bay
457	20 Reihana Street	-	2	Okahu Bay
458	88 Paritai Drive	-	2	Lower Purewa Creek
493	32 Takutai Street	-	2	Hobson Bay
494	3 Papahia Street	-	2	Hobson Bay
495	43 Tohunga Street	-	2	Hobson Bay
496	28 Crescent	-	2	Hobson Bay
498	Portland Road North Pump Station	DPPL1	1	Waitaramoa Stream

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
500	20 Spencer Street	-	2	Waitaramoa Stream
501	23a Portland Road	-	2	Waitaramoa Stream
502	21 Ingram Road	-	2	Waitaramoa Stream
503	68 Portland Road	-	2	Waitaramoa Stream
504	20 Standen Avenue	-	2	Waitaramoa Stream
505	9 Scherff Road	-	2	Waitaramoa Stream
506	20 Hapua Road	-	2	Unnamed stream in Thomas Bloodworth Park
507	Portland Road South Pump Station	DPPL2	1	Waitaramoa Stream
508	32 Hapua Street	-	2	Unnamed stream in Thomas Bloodworth Park
509	113 Brighton Road A	-	2	Newmarket Stream
511	158 Bassett Road	-	2	Newmarket Stream
512	3A Laxon Terrace A	-	2	Newmarket Stream
513	3A Laxon Terrace B	-	2	Newmarket Stream
514	63 Tahapa Crescent	-	2	Upper Purewa Creek
515	11 Purewa Road	-	2	Upper Purewa Creek
586	39 Manawa Road	-	2	Remuera Stream
587	24 Manawa Road	-	2	Remuera Stream
588	24 Mahor Avenue	-	2	Remuera Stream
597	296 Victoria Avenue	-	2	Waitaramoa Stream
598	Abbotts Way WWPS	DPABB	1	Waiatarua Reserve Stream
602	Atkin Avenue WWPS	DPATK	1	Unnamed stream - Mission Bay
603	Averill Avenue WWPS	DPAVE	1	Kohimarama Beach
611	Gillies Avenue Pump Station	DPGIL	1	To land
613	Grand Drive WWPS	DPGRA	1	Waiatarua Reserve Stream
620	John Rymer Place WWPS	DPJRP	1	Purewa Stream
626	Meadowbank Road WWPS	DPMEA	1	Meadowbank Stream East
632	Purewa Road WWPS	DPPUR	1	To land
641	St Heliers WWPS	DPSTH	1	St Heliers Bay
642	Tamaki Drive WWPS	DPTAM	1	Madill's Stream
643	Tamaki Yacht Club WWPS	DPTYC	1	Tamaki Yacht Club
663	Kohimarama Wholesale WWPS	DPKOH	1	Madill's Stream
696	Orakei Wholesale WWPS	DPORM	1	Okahu Bay
704	Shore Road Wholesale WWPS	DPSHO	1	Unnamed stream in Thomas Bloodworth Park

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
709	Branch 1A Remuera MH1	DSB01A	2	Okahu Bay
711	Branch 3 Newmarket MH29	DSB03	2	Newmarket Stream
730	Branch 3B Newmarket MH2	DSB03B	2	Judges Bay
733	Branch 3C Newmarket MH1	DSB03C	2	Newmarket Stream
760	Hobson DS Branch MH1	DSB1H	2	Hobson Bay
1405	Stonefields Pump Station	DPSTF	1	Waiatarua Reserve Stream
1520	Orakei Sewer Main Hobson Diversion - Logan Terrace drop shaft	DSMHD	2	Hobson Bay
1522	15 Dempsey Street	-	2	Unnamed stream flowing to Hobson Bay
1532	84 Reihana St	-	2	Okahu Bay
1574	21 Judges Bay Rd	-	2	Judges Bay
1580	4 St Marks Bay Rd	-	2	Newmarket Stream
1598	21 Ayr St	-	2	Newmarket Stream

The following EOP has been identified as non-operational:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
192	21 Yattendon Road	-	2	St Heliers Bay	Decommissioned

The following EOPs have been identified and added to the schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
611	Gillies Avenue Pump Station	DPGIL	1	To land	Added to schedule following survey
1598	21 Ayr St	-	2	Newmarket Stream	Added to schedule following manhole inspection

1.22.2 Dry Weather Overflows (DWOs)

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
27/06/2018	DPSHO	Shore Road Wholesale Wastewater Pump Station	704	Mechanical Fault	2040	0

Reported Incidents

There were a total of 329 reported incidents in the Hobson Bay catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
11/03/2017	23 Benson Rd	L1	680	Unknown	27.39	Displaced lateral repaired and relined
16/03/2017	23 Benson Rd	L1	44	Silts	0	
28/08/2017	23 Benson Rd	L1	637	Fat	13.5	
7/04/2018	102A Wheturangi Rd	L1	117	Fat	0.5	Heavy flushed
3/04/2018	102 Wheturangi Rd	L1	184	Unknown	0	
10/05/2017	29 Market Rd	L1	128	Roots	0.5	CCTV, under investigation
10/02/2018	29 Market Rd	L1	43	Unknown	19.5	
27/10/2016	34A Awarua Cres	L1	598	Roots	0.97	Flushed and rootcut main
26/09/2017	34A Awarua Cres	L1	476	Roots	11	
25/09/2016	6/52 Amy St	L1	265	Unknown	51.66	Continue to monitor
20/08/2017	6/52 Amy St	L1	297	Unknown	4	
25/08/2017	11 Ayr St	L2	490	Foreign Object	0	Broken pipes on public and private side repaired
28/08/2017	11 Ayr St	L1	286	Fat	13.5	
5/06/2018	9 Ayr St	L1	77	Broken pipe	3	
13/05/2017	48 Atkin Ave	L1	480	Surcharging	0	NRV installed
7/07/2017	48 Atkin Ave	L1	190	Surcharging	3.5	
9/02/2017	27A Armadale Rd	L2	80	Unknown	1.01	Removed rags
6/10/2017	27A Armadale Rd	L1	149	Foreign Object	1.5	
19/12/2017	72 Tamaki Dr	L1	566	Roots	0	Rootcut
20/12/2017	72 Tamaki Dr	L1	569	Foreign Object	3.5	
8/05/2018	72 Tamaki Dr	L2	119	Unknown	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
17/07/2017	46 Waiatarua Rd	L1	53	Roots	0	Rootcut
3/09/2017	46 Waiatarua Rd	L1	159	Roots	0.5	
17/09/2017	46 Waiatarua Rd	L1	660	Roots	14.5	
16/12/2016	14A Somerfield St	L1	71	Fat	0	Debris removed
6/10/2017	14A Somerfield St	L1	259	Broken Pipe	1.5	
25/06/2017	25A Piccadilly Pl	L1	545	Roots	4	Rootcut
21/03/2018	25A Piccadilly Pl	L1	69	Roots	0	
6/04/2017	3/60 Comins Cres	L1	393	Surcharging	1.02	Continue to monitor
11/02/2018	3/60 Comins Cres	L1	520	Surcharging	47.5	
24/03/2017	140A St Johns Rd	L1	180	Unknown	0	Continue to monitor
22/07/2017	140A St Johns Rd	L1	496	Unknown	14	
6/08/2017	8 Grand Dr	L1	500	Unknown	1	Under investigation
5/12/2017	8 Grand Dr	L1	186	Fat	0	
3/10/2017	132 Bassett Rd	L2	176	Unknown	0.5	Removed concrete in the line
17/10/2017	132 Bassett Rd	L2	135	Foreign Object	0	
25/10/2017	17 Herne Bay Rd	L1	229	Roots	0	Rootcut
30/10/2017	17 Herne Bay Rd	L1	308	Roots	0	
11/01/2018	3 Kentucky St	L1	107	Unknown	0	Protruding lateral repaired
10/03/2018	3 Kentucky St	L1	118	Unknown	0	
27/10/2016	118 Grand Dr	L1	157	Fat	0.97	Fat blockage jetted and removed
14/10/2017	116 Grand Dr	L1	118	Fat	2	
26/03/2017	84-86 Great South Rd	L1	20	Foreign Object	38.04	Manhole repaired
30/10/2017	84-86 Great South Rd	L1	235	Broken pipe	0	
18/04/2017	119A Atkin Ave	L1	420	Rubbish	0	Broken pipe repaired
27/11/2017	119A Atkin Ave	L2	291	Broken pipe	0	
2/06/2017	233 Main Highway	L1	170	Surcharging	17	CCTV, Plug removed from line
15/10/2017	233 Main Highway	L2	596	Fat	0	
24/06/2017	2/38 Rangiatea Rd	L1	386	Unknown	3.5	Flushed main
4/07/2017	2/38 Rangiatea Rd	L1	389	Unknown	0.5	
29/06/2017	6-22 Mt Carmel Pl	L1	178	Fat	0	Heavy flushed
28/11/2017	6-22 Mt Carmel Pl	L1	578	Unknown	0	

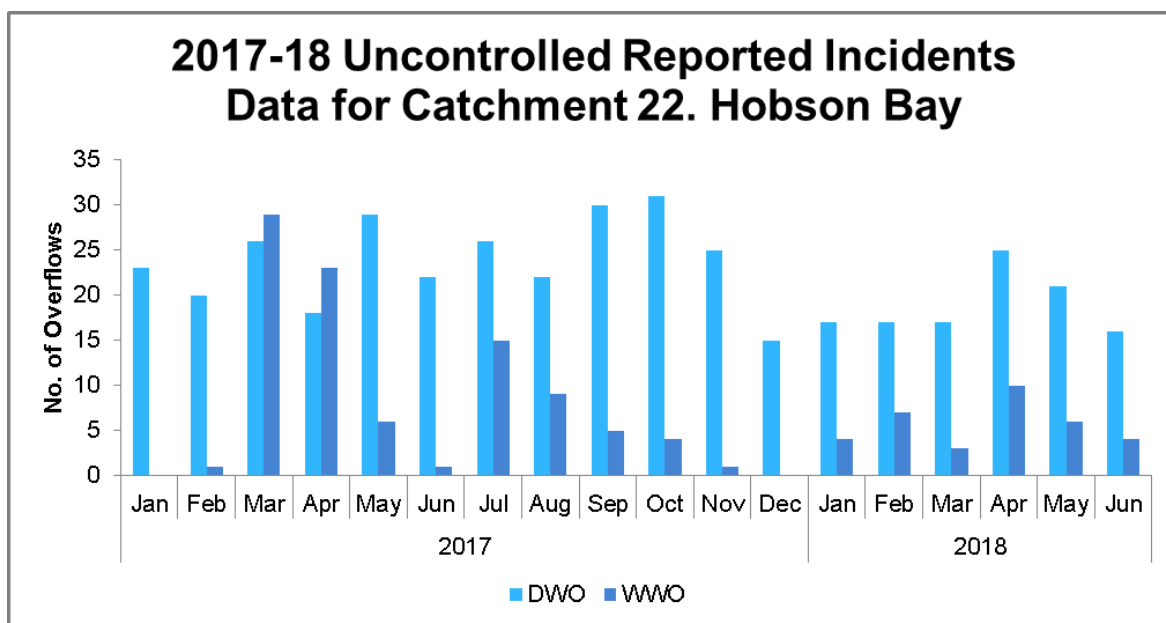
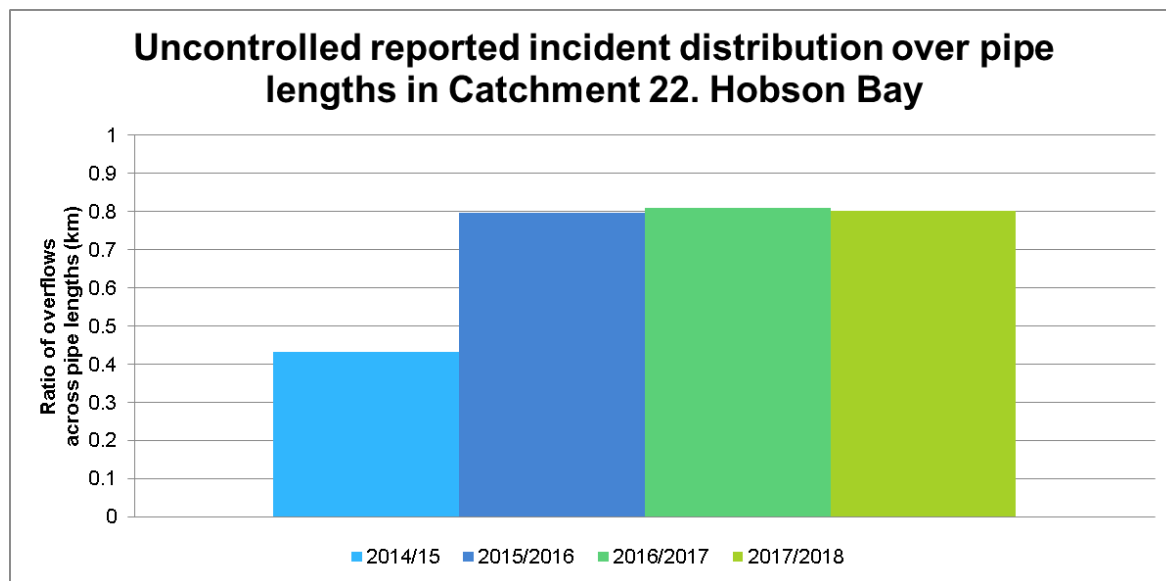
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
30/06/2017	14 Koraha St	L1	60	Unknown	0	Roots removed
7/07/2017	14 Koraha St	L1	503	Roots	3.5	
15/07/2017	1/7 Lucerne Rd	L1	575	Unknown	0	Heavy debris removed
24/07/2017	1/7 Lucerne Rd	L1	66	Surcharging	3	
29/08/2017	195 Main Highway	L1	96	Fat	0	Heavy flushed
6/09/2017	195 Main Highway	L1	102	Fat	9	
3/09/2017	31 John Rymer Pl	L1	259	Fat	0.5	Roots, fat, debris removed
5/09/2017	31 John Rymer Pl	L1	126	Rubbish	0.5	
11/09/2017	8 Appleyard Cres	L1	20	Foreign Object	4	Removed concrete and roots
29/09/2017	8 Appleyard Cres	L1	145	Roots	0.5	
23/10/2017	6 Liley Pl	L1	301	Unknown	9.5	Hole in manhole repaired
28/10/2017	6 Liley Pl	L1	308	Silts	4.5	
31/10/2017	64- St Vincent Ave	L1	150	Unknown	0	Rootcut
3/11/2017	64- St Vincent Ave	L1	248	Roots	1	
18/11/2017	1/16 Glover Rd	L1	308	Roots	3.5	Rocks and mud in line removed, pipe replaced
27/11/2017	1/16 Glover Rd	L1	19	Silts	0	
27/11/2017	73 Celtic Cres	L1	143	Fat	0	Heavy fats and debris jetted from line
3/03/2018	73 Celtic Cres	L1	218	Fat	0.5	
29/12/2017	47 Godden Cres	L1	76	3rd party damage	0	Third Party Damage repaired
4/02/2018	47 Godden Cres	L1	137	3rd party damage	9	
23/01/2018	446- Manukau Rd	L1	75	Surcharging	0.5	Large rag blockage removed, heavy flush
24/01/2018	446- Manukau Rd	L2	458	Rags	0	
28/01/2018	17 Coldham Cres	L1	436	Unknown	0	Heavy fats and roots removed
11/03/2018	17 Coldham Cres	L1	486	Fat	0	
17/02/2018	26 Dell Ave	L1	201	Unknown	0	Continue to monitor
20/05/2018	26 Dell Ave	L1	347	Unknown	2	
9/03/2018	30 Seascape Rd	L1	475	Foreign Object	0	Fixed cracked pipe
26/05/2018	30 Seascape Rd	L2	407	Broken pipe	1	
7/04/2018	10 Pohutukawa Pl	L1	216	Fat	0.5	CCTV, heavy flush, continue to monitor
28/04/2018	14 Pohutukawa Pl	L1	305	Rags	25	
14/04/2018	14 Robert St	L1	685	Surcharging	67	Heavy flushed

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
21/04/2018	14 Robert St	L1	118	Unknown	5	
9/05/2018	156 Ladies Mile	L1	142	Roots	0	Flushed and CCTV
19/06/2018	156 Ladies Mile	L1	560	Roots	2.5	
16/04/2017	43 Tawera Rd	L1	97	Fat	0	Continue to monitor
19/01/2018	43 Tawera Rd	L1	78	Surcharging	6.5	
27/10/2016	34A Awarua Cres	L1	598	Roots	0.97	Rootcut and heavy flushed
26/09/2017	34A Awarua Cres	L1	476	Roots	11	
9/11/2017	68 Selwyn Ave	L1	68	Roots	0	Roots and fat removed
10/11/2017	68 Selwyn Ave	L1	147	Fat	0	
10/08/2017	4 Berowald Pl	L1	240	Unknown	1	Heavy flushed
23/04/2018	4 Berowald Pl	L1	97	Unknown	0	
15/02/2018	27 Shore Rd	L1	152	Silts	0.5	Abandoned storm water system with cross connection
26/05/2018	27 Shore Rd	L1	79	Broken Pipe	1	
29/05/2017	1/8 Macmurray Rd	L1	406	Unknown	0.5	Junction repaired, CCTV, rootcut
21/08/2017	1/8 Macmurray Rd	L1	253	Roots	0.5	
22/07/2017	31 Rutherford Tce	L1	414	Unknown	14	Rags and debris removed, heavy flush
19/02/2018	31 Rutherford Tce	L1	109	Rubbish	0.5	
1/06/2018	8 Lawry St	L1	60	Unknown	0	Heavy flushed, potential dip in line
11/06/2018	8 Lawry St	L1	245	Unknown	17.5	
10/05/2018	9 Castle Dr	L1	116	Unknown	0.5	Rootcut
19/05/2018	9 Castle Dr	L1	546	Roots	18.5	
14/01/2017	81 Market Rd	L1	335	Unknown	0	Heavy flushed
2/07/2017	81 Market Rd	L1	126	Rubbish	10	
29/06/2018	81 Market Rd	L1	167	Unknown	0.5	
12/08/2017	48A Patteson Ave	L3	379	Silts	0	Heavy silts and rocks removed
5/06/2018	48A Patteson Ave	L1	221	Surcharging	3	
4/07/2017	7 Laxon Tce	L1	598	Unknown	0.5	Pipe repaired
6/07/2017	7 Laxon Tce	L1	190	Unknown	42.5	
20/07/2017	7 Laxon Tce	L1	157	Surcharging	16.5	
28/09/2017	50A Patteson Ave	L1	135	Roots	0	Ongoing investigation, large silt and rock removal
1/10/2017	50A Patteson Ave	L1	744	Silts	20	

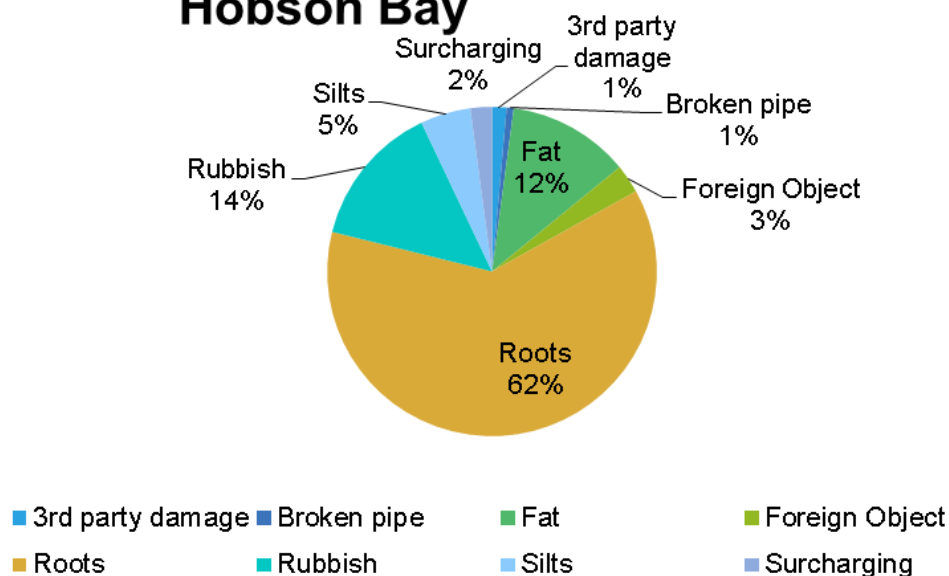
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
3/10/2017	50 Patteson Ave	L1	73	Silts	0.5	
31/01/2018	3A Haast St	L1	510	Roots	0	Removed concrete in the line
2/02/2018	3A Haast St	L1	650	Unknown	0	
12/02/2018	3A Haast St	L1	113	Unknown	0	
8/07/2017	122 Norman Lesser Dr	L1	149	Roots	9	Rootcut
23/09/2017	122 Norman Lesser Dr	L2	566	Roots	0	
25/08/2017	49 Ballarat St	L1	220	Fat	0	Heavy flushed
30/05/2018	49 Ballarat St	L1	130	Unknown	0	
14/05/2017	17 Seccombes Rd	L1	430	Roots	0	Pipe displacement repaired
6/07/2017	17 Seccombes Rd	L1	286	Rubbish	42.5	
13/07/2017	17 Seccombes Rd	L1	383	Broken Pipe	9	
7/07/2017	77 Portland Rd	L1	303	Rubbish	3.5	Rootcut
6/09/2017	77 Portland Rd	L1	116	Roots	9	
9/01/2018	3/211 Manukau Rd	L1	668	Unknown	0	Under investigation, roots removed
11/01/2018	3/211 Manukau Rd	L1	111	Unknown	0	
22/01/2018	4/211 Manukau Rd	L1	126	Unknown	14.5	
31/01/2018	4/211 Manukau Rd	L1	227	Unknown	0	
17/04/2018	4/211 Manukau Rd	L1	570	Unknown	3.5	

1.22.3 Trend analysis of reported incidents

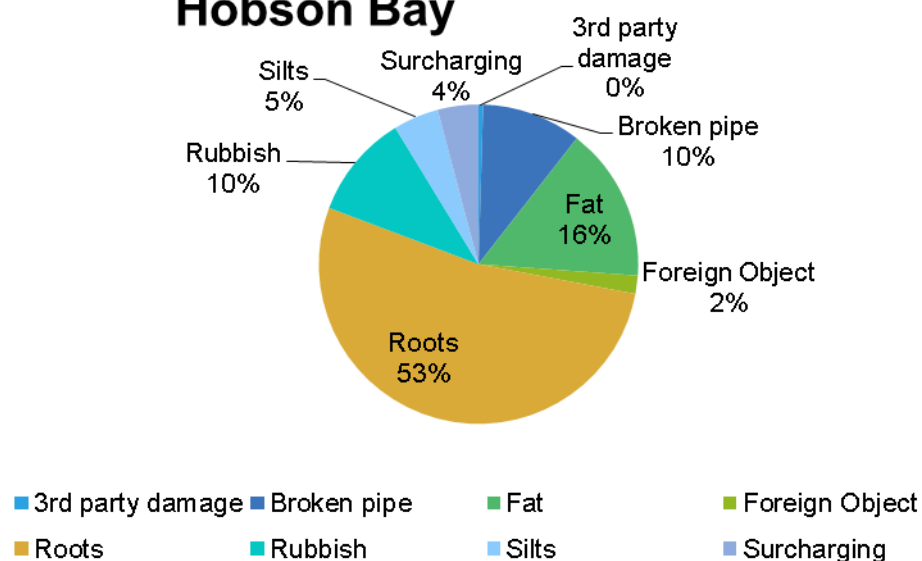
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



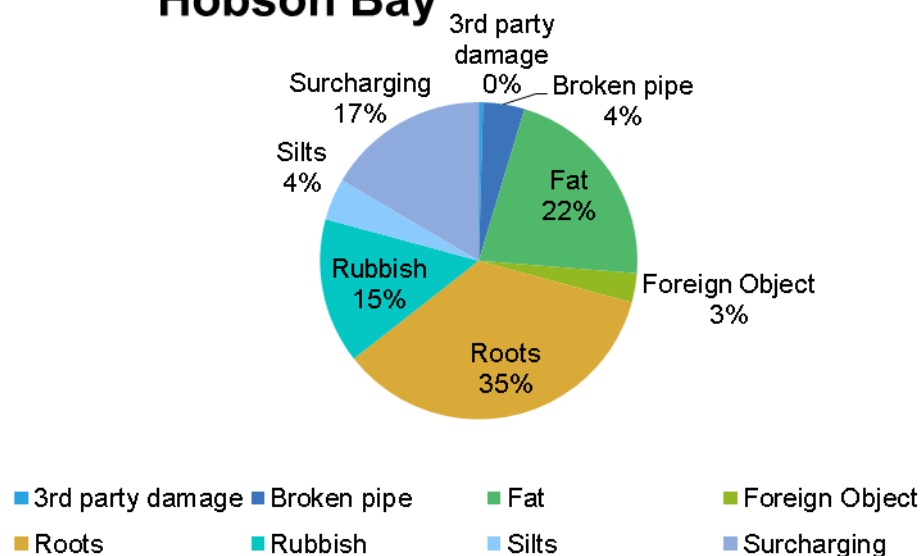
2014-15 Data for Catchment 22. Hobson Bay



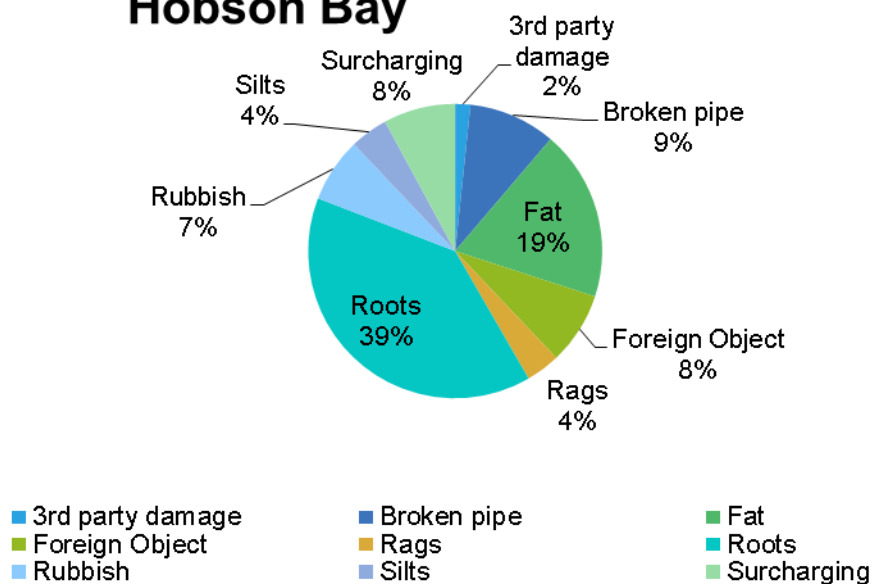
2015-16 Data for Catchment 22. Hobson Bay



2016-17 Data for Catchment 22. Hobson Bay



2017-18 Data for Catchment 22. Hobson Bay



Trend analysis has been carried out where the cause has been identified.

1.22.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
6/07/2017	DPORM	Orakei Wholesale Wastewater Pump Station	696	Rain event	232	42.5
4/01/2018	DPTYC	Tamaki Yacht Club Wastewater Pump Station	643	Power outage	38	45.5
11/02/2018	DPORM	Orakei Wholesale Wastewater Pump Station	696	Rain event	1187	47.5
14/04/2018	DPJRP	John Rymer Place Wastewater Pump Station	620	Rain event	150	67
14/04/2018	DPORM	Orakei Wholesale Wastewater Pump Station	696	Rain event	654	67
3/06/2018	DPORM	Orakei Wholesale Wastewater Pump Station	696	Rain event	203	43.5
4/06/2018	DPORM	Orakei Wholesale Wastewater Pump Station	696	Rain event	745	52

1.22.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
274	Tonks Street WWPS	1	0	0	0	0	0	Continue to monitor
498	Portland Road North Pump Station	0.2	0	0	0	0	0	Continue to monitor
507	Portland Road South Pump Station	0.2	0	0	0	0	0	Continue to monitor
598	Abbotts Way WWPS	1	0	0	0	0	0	Continue to monitor
602	Atkin Avenue WWPS	1	1	0	0	0	0.25	Continue to monitor
603	Averill Avenue WWPS	1	0	0	0	0	0	Continue to monitor
611	Gillies Avenue WWPS	0	0	0	2	0	0.5	Continue to monitor
613	Grand Drive WWPS	1	0	0	0	0	0	Continue to monitor
620	John Rymer Place WWPS	1	2	2	3	1	2	Operational upgrades to address poor performance of pumps.
626	Meadowbank Road WWPS	0.2	0	0	0	0	0	Continue to monitor
632	Purewa Road WWPS	-	0	0	0	0	0	Continue to monitor
641	St Heliers WWPS	5	0	0	0	0	0	Continue to monitor
642	Tamaki Drive WWPS	1	0	0	0	0	0	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
643	Tamaki Yacht Club WWPS	1	0	0	0	1	0.25	Continue to monitor
663	Kohimarama Wholesale WWPS	5	5*	1	2	0	2	Kohimarama Storage Tank (completed)
696	Orakei Wholesale WWPS	2	1	2	9	5	4.25	Continue to monitor
704	Shore Road Wholesale WWPS	0	1	1	2	0	1	Continue to monitor
1405	Stonefields WWPS	-	0	0	0	0	0	Continue to monitor

Type 3 – uncontrolled overflow rolling WWO data from 1 July 2014 – 30 June 2018

The following locations are reported as Type 3 overflow locations.

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
S25	Branch 3 MH 14	2.5	n/a	2	2	0	1.3	Separation works mitigating performance.

1.22.6 Inflow & Infiltration Programme

Parts of this catchment comprise of a combined drainage network, in these areas I&I is currently not being considered and other programmes of works are being investigated to address the wet weather overflows such as stormwater and wastewater separation. In the separated areas I&I will be considered as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

1.22.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	St Heliers Reactive I&I Investigations	Inflow and Infiltration	Current system is strained due to growth resulting in increased amount of uncontrolled overflows.	Reduce the amount of uncontrolled overflows in the area.	2017-2018

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Branch 1 and 2 Model Build, Calibration and Options study	Studies and investigations	Model required re-calibration to account for new information on drainage types. Reliable model required, which can then be utilised to develop options to address overflows and predicted growth in the catchment	Identified capital and operational solutions which will be implemented to service growth and meet levels of service	2018 (model has required partial recalibration)
Underway	Okahu Bay Separation	Design	To address wet weather overflows in the partially combined areas. Requires additional wastewater upgrades to ensure level of service outcomes are required.	Is expected to reduce high overflow frequencies at EOPs 448, 453, 455, 456, 457 and 696.	2020
On hold	St Heliers Bay Wastewater Network Upgrade	Project execution	Required to cater to population growth in the area. Current system is strained due to growth resulting in increased amount of uncontrolled overflows.	Will provide for future growth and reduce the amount of uncontrolled overflows in the area.	TBC following results of I&I investigation
Future	Newmarket Gully	Studies and investigations	Pipe tunnelled between Hells Gate and Hobson tunnel	Cater for Auckland's growth	2022-

Minor improvements works include:

- Newmarket (Carlton Gore) Separation. This is a separation project driven primarily by stormwater. The separation will have a minor impact upon the wet weather overflow performance at Newmarket Gully (EOP 733).
- Norman Lesser Drive sewer replacement. This renewals project will reduce the risk of DWOs at uncontrolled locations as a result of asset failure.
- EOP 733 is planned to have screens installed to mitigate the visual and amenity impacts of highly frequent overflows at Hells Gate.
- John Rymer Place WWPS will have operational investigations undertaken to improve the pump performance. It is expected this will result in improved wet weather performance.

1.22.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.22.9 Summary

There is one Type 1 EOP which discharged more frequently than two spills per year on average. In the long term, the network performance in this catchment will be improved with the 'St Heliers Bay Wastewater Network upgrade', 'St Heliers Reactive I&I Investigations'. The Branch 1 and 2 (Hobson) wastewater model will be used to ensure that network upgrades to manage levels of service and new development are appropriately development and managed. Roots are the leading cause of uncontrolled overflows in this catchment. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended (by 1.0km) and developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.23 Catchment 23 – Onehunga

1.23.1 Overview

The Onehunga catchment covers an area of approximately 23 km² and is located on the northern shores of Mangere Inlet and the Manukau Harbour. The catchment extends from Lynfield Cove in the west to Southdown in the east. To the north, the catchment includes the suburbs of Penrose, Greenlane, Royal Oak and Three Kings, and covers the open space areas of Cornwall Park and One Tree Hill Domain. The catchment boundary reflects a combination of topographic and wastewater network catchment boundaries. There are 18,017 wastewater connections.

The catchment is heavily developed, with a large area of business and industrial activity located along the coastal margins of Mangere Inlet and Onehunga Township. Further to the north, the catchment is largely residential and open space zoned land.

	2014/15	2015/16	2016/17	2017/18
No. of connections	17,836	17,901	17,982	18,017
Length of sewer (km)	254	254	255	258

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
208	25 Aldersgate Rd WWPS	DPAL1	1	Unnamed stream (flowing to Wesley Bay)
209	72 Aldersgate Rd WWPS	DPAL2	1	Wesley Bay
210	Gilleta Rd WWPS	DPGLT	1	Lynfield Cove
470	Walls Rd WWPS	DPWAL	1	Stormwater Detention Pond
604	Ben James Dr WWPS	DPBJD	1	Unnamed stream (flowing to Wesley Bay)
605	Captain Springs Rd WWPS	DPCSR	1	Mangere Inlet North
615	Himalaya Cr WWPS	DPHIM	1	Manukau Harbour edge (between Lynfield Cove and Wattle Bay)
640	44 Sylvania Cr WWPS	DPSY2	1	Manukau Harbour edge (between Lynfield Cove and Wattle Bay)
653	Wesley Bay Glade WWPS	DPWBG	1	Unnamed stream (flowing to Wesley Bay)
668	Hillsborough WWPS	DPONE	1	Onehunga Bay
669	Mt Smart WWPS	DPSMT	1	Mangere Inlet North
674	Pikes Point WWPS	DPPPT	1	Unnamed stream (Miami Parade)
679	Onehunga WWPS	DPONT	1	Mangere Inlet North
705	Lynfield WWPS	DPLYF	1	Wairaki Stream
1178	420 Hillsborough Rd WWPS	DPHBH	1	Waikowhai Bay
1179	25 Royal Viking WWPS	DPRVK	1	Wairaki Stream
1541	40 Beachcroft Avenue	-	2	Onehunga Bay

There have been no changes to the Schedule of EOPs in this catchment.

1.23.2 Dry Weather Overflows (DWOs)

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Uncontrolled Overflows

There were a total of 131 reported incidents in the Onehunga catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

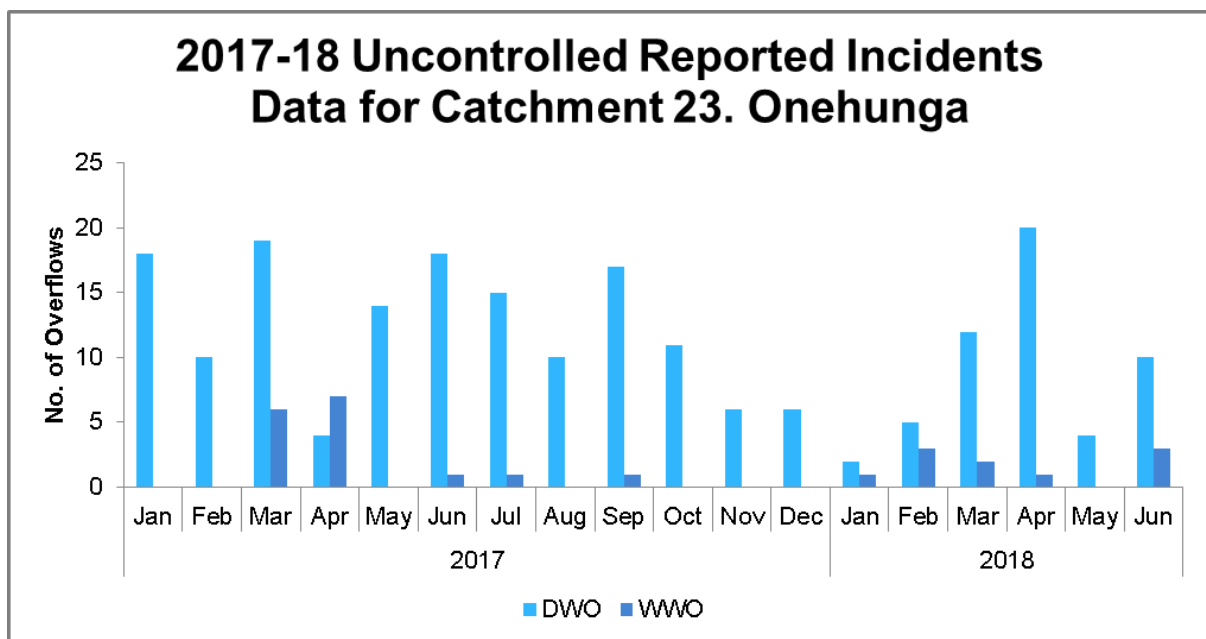
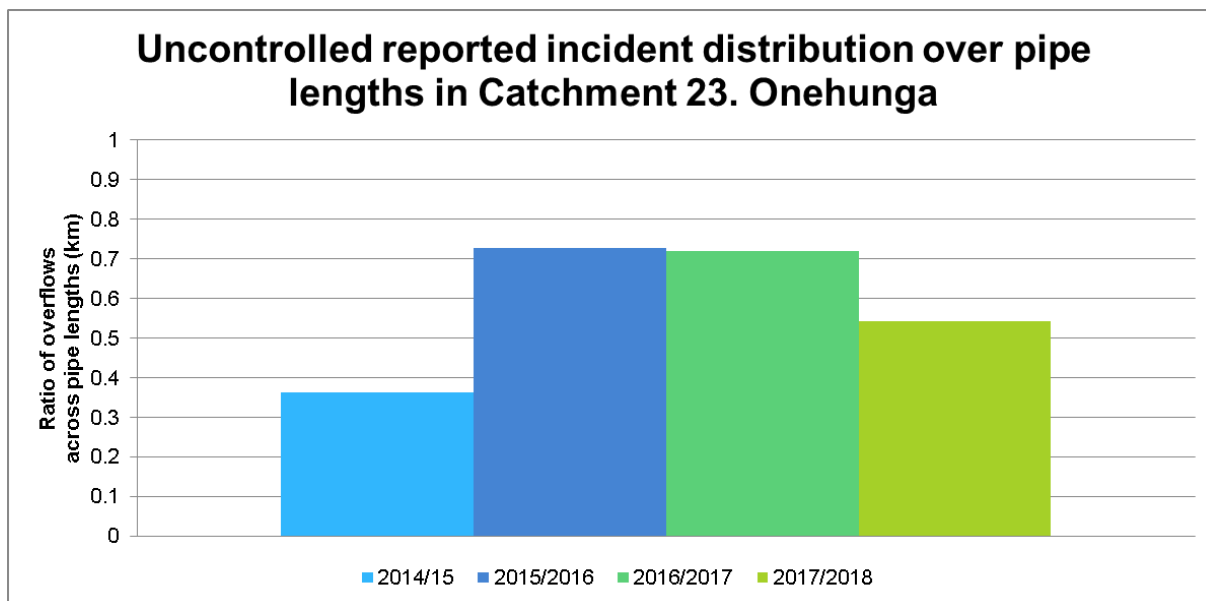
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
22/07/2017	1/38 Inkerman St	L1	203	Unknown	13	CCTV, under investigation. Silts removed
10/03/2018	1/38 Inkerman St	L1	193	Silts	0	
26/06/2017	12 Church St	L1	561	Rubbish	0	Broken pipe repaired
2/07/2017	12 Church St	L1	169	Fat	8	
31/01/2018	12 Church St	L1	120	Broken pipe	0	
7/08/2017	A/691 Mt Albert Rd	L1	604	Rags	0	Heavy rags removed
14/08/2017	A/691 Mt Albert Rd	L1	469	Foreign Object	3	
12/03/2017	614A Manukau Rd	L1	318	Surcharging	28.5	Continue to monitor
12/02/2018	614A Manukau Rd	L1	94	Surcharging	0	
5/11/2017	29 Canberra Ave	L1	88	Unknown	0	Rootcut and rags removed
15/12/2017	29 Canberra Ave	L1	644	Roots	0	
16/11/2017	30G Beachcroft Ave	L1	103	Unknown	0	Continue to monitor
6/04/2018	30G Beachcroft Ave	L1	151	Unknown	0	
6/04/2017	52A Empire Rd	L1	330	Rubbish	1	Added to Annual Flushing Schedule
6/08/2017	52A Empire Rd	L1	522	Roots	1.5	
21/09/2017	52A Empire Rd	L1	104	Foreign Object	3	
26/06/2017	1/42 Oranga Ave	L2	44	Unknown	0	Rootcut, heavy

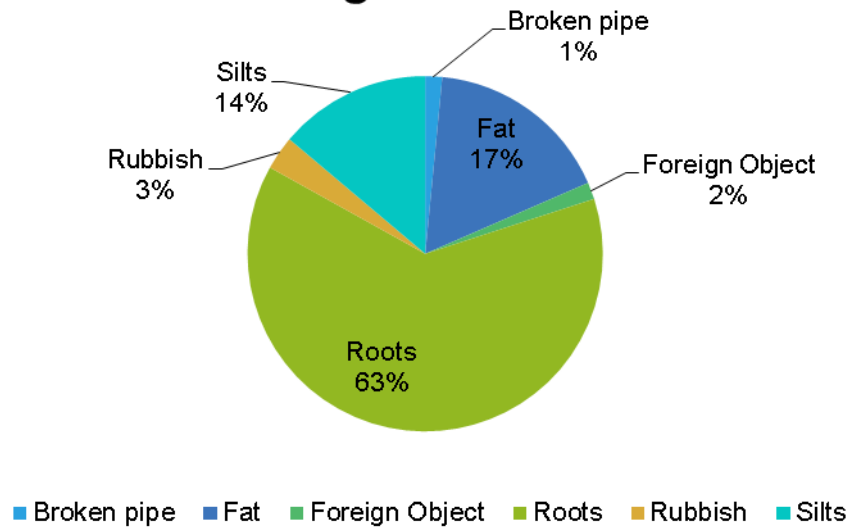
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
20/09/2017	1/42 Oranga Ave	L1	132	Foreign Object	1.02	debris removed
5/06/2017	28 Wheturangi Rd	L1	251	Roots	0.5	Pipe to be relined manhole to manhole. Rootcut
8/06/2017	28 Wheturangi Rd	L1	642	Roots	0	
27/01/2017	3A Cameron St	L1	162	Unknown	0	Rootcut, heavy flushed
27/11/2017	3A Cameron St	L1	164	Roots	0	
5/04/2017	9 Aliford Ave	L1	51	Unknown	37.5	Under investigation, heavy flushed
12/02/2018	9 Aliford Ave	L1	16	Unknown	0	
11/06/2018	9 Aliford Ave	L1	60	Fat	15	
18/03/2017	30 Stephen Lysnar Pl	L1	411	Roots	0	Rootcut, heavy flushed, root infiltration patched
6/09/2017	30 Stephen Lysnar Pl	L1	585	Fat	8	
24/06/2017	84 Paihia Rd	L1	188	Roots	7.5	Rootcut
10/09/2017	84 Paihia Rd	L1	515	Roots	8.5	
27/03/2018	84 Paihia Rd	L1	222	Roots	0	
21/08/2017	1 Athenic Ave	L1	125	Foreign Object	2	Heavy flushed
17/04/2018	1 Athenic Ave	L1	347	Unknown	2	
24/08/2017	62 Buckley Rd	L1	158	Unknown	0	Root blockage jetted
28/10/2017	62 Buckley Rd	L1	257	Roots	5	
16/09/2017	1/27 Seacliffe Rd	L1	132	Unknown	5.5	Under investigation
21/12/2017	2/27 Seacliffe Rd	L1	101	Unknown	0	
7/06/2018	1/27 Seacliffe Rd	L1	81	Unknown	1.5	
9/02/2018	2/18 Nolan Rd	L1	441	Roots	19	CCTV and rootcut
14/02/2018	2/18 Nolan Rd	L1	108	Fat	3.5	
9/05/2018	6/18 Nolan Rd	L1	118	Roots	0	
17/06/2018	1/16 Turama Rd	L1	368	Unknown	0	Leaves and bark removed, new inspection cap
21/06/2018	1/16 Turama Rd	L1	53	Unknown	0.5	
14/10/2017	161 The Drive	L1	548	Unknown	1.5	Fats and debris removed
19/10/2017	161 The Drive	L1	102	Fat	0	

1.23.3 Trend analysis of reported incidents

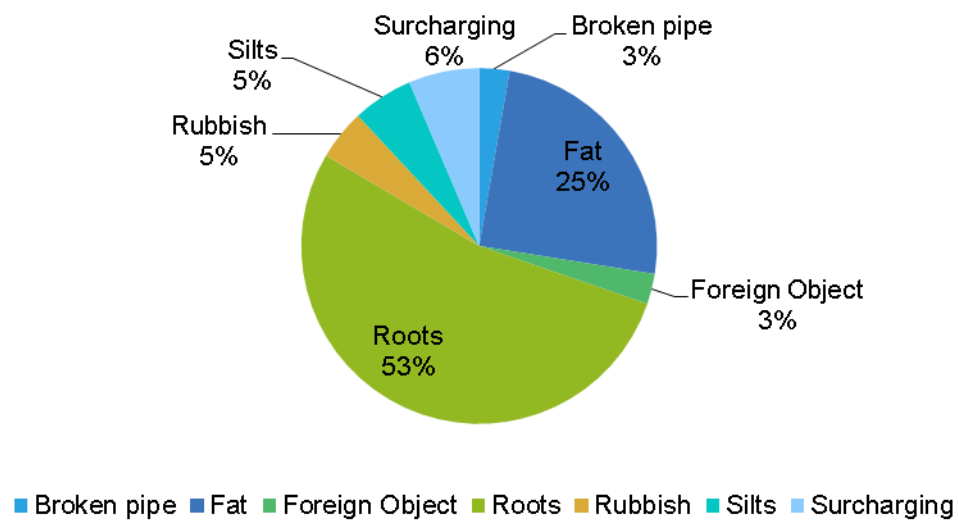
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



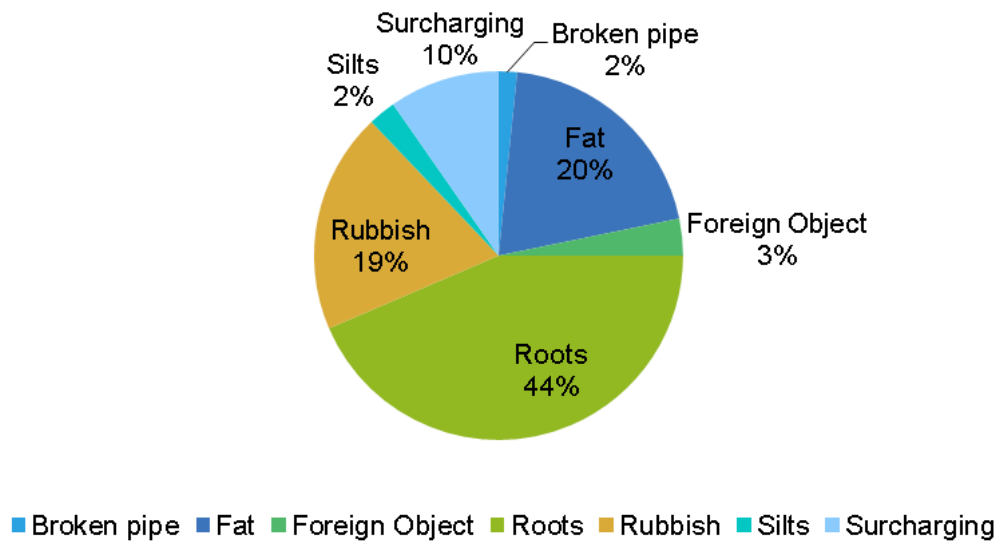
2014-15 Data for Catchment 23. Onehunga



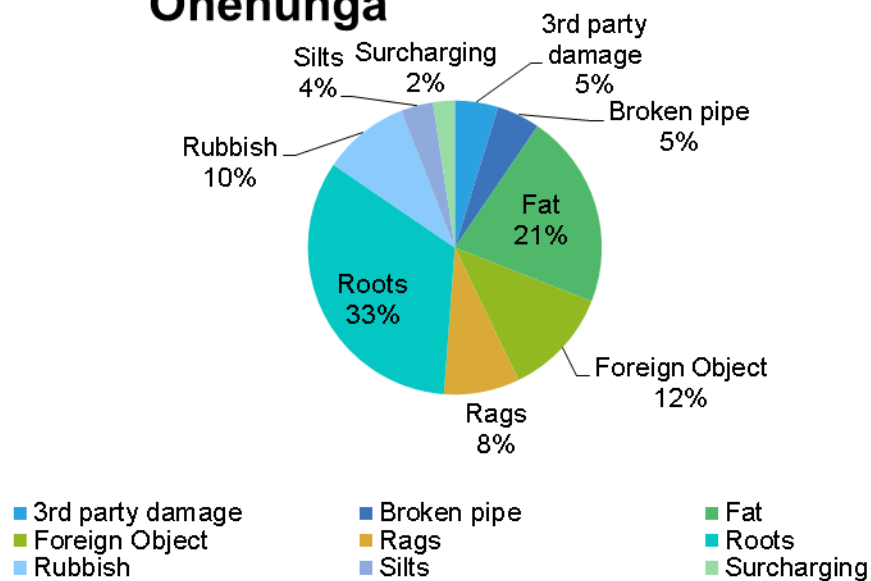
2015-16 Data for Catchment 23. Onehunga



2016-17 Data for Catchment 23. Onehunga



2017-18 Data for Catchment 23. Onehunga



Trend analysis has been carried out where the cause has been identified.

1.23.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
11/02/2018	DPAL1	Aldersgate Road 1 Wastewater Pump Station	208	Rain event	634	55.5
11/02/2018	DPAL2	Aldersgate Road 2 Wastewater Pump Station	209	Rain event	179	55.5
11/02/2018	DPONE	Hillsborough Wholesale Wastewater Pump Station	668	Rain event	55	55.5
13/02/2018	DPAL1	Aldersgate Road 1 Wastewater Pump Station	208	Rain event	289	21.5
14/04/2018	DPAL2	Aldersgate Road 2 Wastewater Pump Station	209	Rain event	116	73.5
14/04/2018	DPONE	Hillsborough Wholesale Wastewater Pump Station	668	Rain event	29	73.5
14/04/2018	DPAL1	Aldersgate Road 1 Wastewater Pump Station	208	Rain event	145	73.5
23/05/2018	DPAL1	Aldersgate Road 1 Wastewater Pump Station	208	Rain event	128	22.5
3/06/2018	DPAL1	Aldersgate Road 1 Wastewater Pump Station	208	Rain event	293	39
3/06/2018	DPAL2	Aldersgate Road 2 Wastewater Pump Station	209	Rain event	127	39
3/06/2018	DPONE	Hillsborough Wholesale Wastewater Pump Station	668	Rain event	40	39
4/06/2018	DPAL1	Aldersgate Road 1 Wastewater Pump Station	208	Rain event	388	36
4/06/2018	DPAL2	Aldersgate Road 2 Wastewater Pump Station	209	Rain event	35	36
12/06/2018	DPAL1	Aldersgate Road 1 Wastewater Pump Station	208	Rain event	255	28.5
25/06/2018	DPAL1	Aldersgate Road 1 Wastewater Pump Station	208	Rain event	225	31.5

1.23.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
208	25 Aldersgate Rd WWPS	1	0	3	10	8	5.25	Western Isthmus Water Quality Improvement Programme
209	72 Aldersgate Rd WWPS	4	1	3	7	4	3.75	Western Isthmus Water Quality Improvement Programme
210	Gilleta Rd WWPS	1	0	0	0	0	0	Continue to monitor
470	Walls Rd WWPS	-	0	0	0	0	0	Continue to monitor
604	Ben James Dr WWPS	1	0	0	0	0	0	Continue to monitor
605	Captain Springs Rd WWPS	1	0	0	0	0	0	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
615	Himalaya Cr WWPS	2	0	0	0	0	0	Continue to monitor
640	44 Sylvania Cr WWPS	1	0	0	0	0	0	Continue to monitor
653	Wesley Bay Glade WWPS	1	0	0	0	0	0	Continue to monitor
668	Hillsborough WWPS	1	2	1	2	3	2	Central Interceptor Spine and Links
669	Mt Smart WWPS	0.1	0	0	0	0	0	Continue to monitor
674	Pikes Point WWPS	0	0	0	0	0	0	Continue to monitor
679	Onehunga WWPS	2	0	0	0	0	0	Continue to monitor
705	Lynnfield WWPS	0.8	0	0	0	0	0	Continue to monitor
1178	420 Hillsborough Rd WWPS	0.6	0	0	1	0	0.25	Continue to monitor
1179	25 Royal Viking WWPS	0	0	0	0	0	0	Continue to monitor

1.23.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined. This will be confirmed from the outcomes of the Onehunga Wastewater Catchment Options study.

1.23.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Central Interceptor	Project Execution	This project, as well as addressing numerous wet weather overflows, will also address the risk of failure of the Manukau siphon, and also provide for urban growth. To address growth, level of service, and asset condition risks	The Central Interceptor will have multiple and widespread benefits through immediate improvements in wet weather overflow frequency and enabling upgrades for growth and level of service upgrades through the isthmus	Underway

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Onehunga Catchment Option analysis Investigations	Studies and investigations	Will identify options to address level of service issues and future growth in the catchment	Identification of capital and operational works programme for regional prioritisation	Underway
Underway	Oakley Wastewater Model Build and Calibration	Studies and investigations	Will identify options to address level of service issues and future growth in the catchment.	Identification of capital and operational works programme for regional prioritisation	Underway
Underway	Western Isthmus Water Quality Improvement Programme	Option Development (Feasibility)	To address growth, level of service, and asset condition risks in the Western Isthmus catchment.	Reduction in wet weather overflow volumes and frequencies	Underway

1.23.8 Erosion Control Measures

No works related to erosion control were carried out in this catchment between 1 July 2017 and 30 June 2018.

1.23.9 Summary

There are two Type 1 EOPs which discharged more frequently than two spills per year; options for managing these will be addressed under the Western Isthmus Water Quality Improvement Programme. Trend analysis shows the ratio of overflow incidents to pipe length is decreasing. In the long term, the network performance in this catchment will be planned and managed using the recently calibrated Onehunga wastewater network model and the options implemented from the Western Isthmus Water Quality Improvement Programme investigations, noting that the Central Interceptor project will relieve the trunk network. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended by 2.5km with no significant changes made to the network as a whole. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.24 Catchment 24 - Mangere

1.24.1 Overview

The Mangere catchment is located to the south of central Auckland and contains the suburbs of Otahuhu, Mangere East, Mangere and Mangere Bridge. There are several watercourses in the area, including Tararata Creek, Harania Creek and Tui Creek, that all converge in the Mangere Inlet. Oruarangi Creek, in the western part of the catchment, drains directly to the Manukau Harbour. There are 13,969 wastewater connections.

Land use within the catchment is largely urban with commercial/industrial uses focused around the Mangere Inlet.

	2014/15	2015/16	2016/17	2017/18
No. of connections	13,703	13,747	13,894	13,969
Length of sewer (km)	304	305	307	354

Schedule of Engineered Overflow Points

EOP ID	EOP Name	Facility Code	EOP Type	Receiving Environment Name
466	20 Chelsea Avenue	-	2	To Land
468	Saleyards Rd WWPS	DPSAL	1	Tui Creek
582	Sylvia Park WWPS	DPSYL	1	Ann's Creek
664	Favona Rd	DPFAV	1	Harania Creek
672	Westfield WWPS	DPWTF	1	Ann's Creek
677	Black Bridge WWPS	DPTRC	1	Tararata Creek
678	Mangere Bridge	DPMGB	1	Ambury Shoreline via stormwater pipe
680	Otahuhu West	DPOTW	1	Tui Creek
744	Hellabys Trade Waste network overflow	DSHLT	2	Ann's Creek
963	62 Chelburn Crescent	-	2	Unnamed tributary to Harania Creek (south)
973	4 Chalfont Street	-	2	Unnamed tributary to Harania Creek (south)
999	James Fletcher Drive WWPS	DPJFD	1	Harania Creek
1011	Mackenzie Road WWPS	DPMCK	1	Tararata Creek
1015	Savil Drive Link WWPS	DPSAV	1	Unnamed tributary of Harania Creek (East)
1136	Ruaiti Road WWPS	DPRUA	1	Oruarangi Creek
1159	Lambie Court WWPS	DPLAM	1	To Land
1192	Portage Rd WWPS	DPPO1	1	Ann's Creek
1194	Huia Rd WWPS	DPHRD	1	To Land
1577	Oruarangi WWPS	DPORU	1	Oruarangi Creek

EOP 1577, Oruarangi Pump Station has been included within this catchment for reporting purposes, although it is technically outside the consented area. It is consented under discharge permit 48840.

1.24.2 Dry Weather Overflows (DWOs)

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 143 reported incidents in the Mangere catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

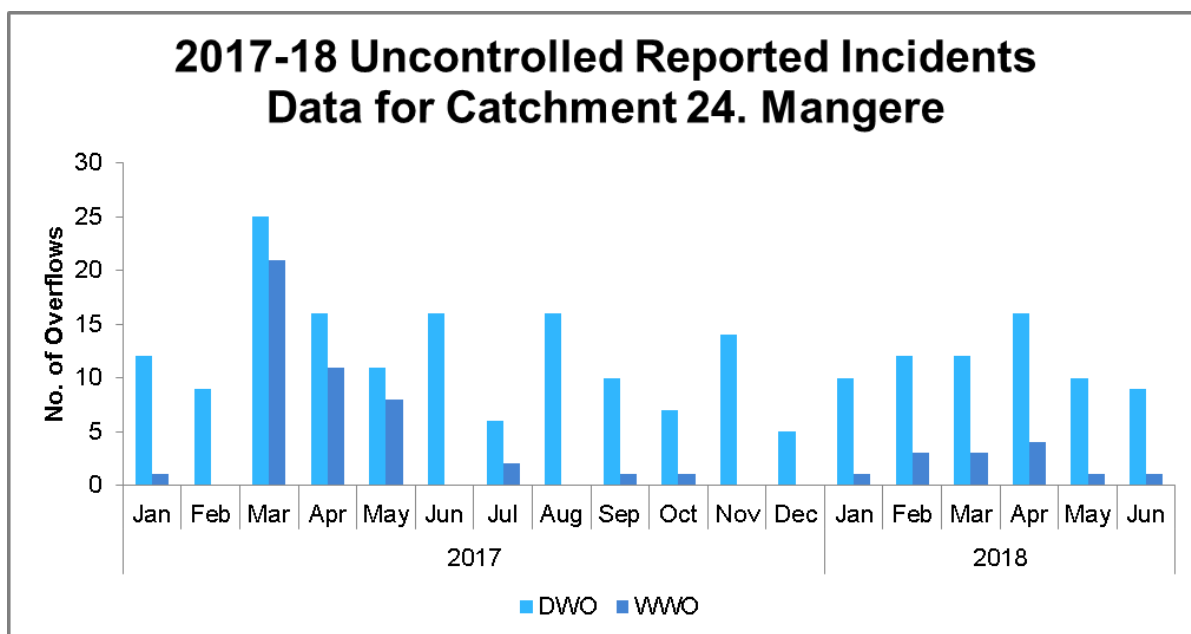
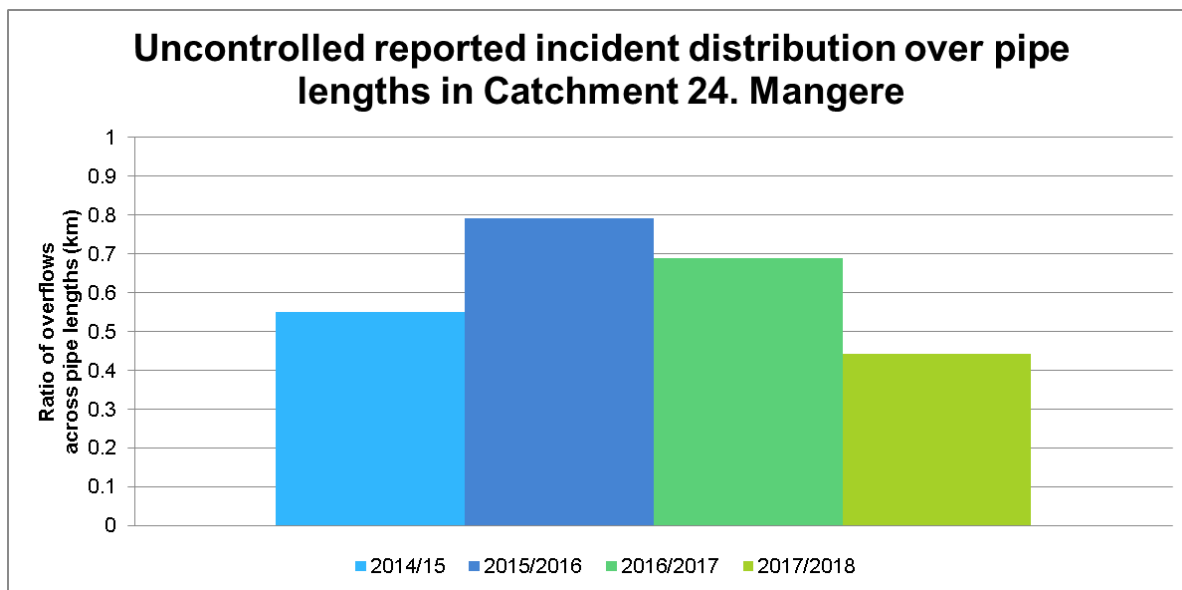
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
13/04/2017	22 Imrie Ave	L1	48	Fat	7.5	On 36 Monthly Planned Flushing Schedule
2/02/2018	22 Imrie Ave	L1	216	Rubbish	0.5	
13/04/2018	22 Imrie Ave	L1	172	Fat	7.5	
2/10/2016	56 Imrie Ave	L1	94	Unknown	13.71	Fats in main removed, heavy flushed
5/08/2017	56 Imrie Ave	L1	165	Unknown	0	
1/02/2018	56 Imrie Ave	L1	77	Fat	47	
12/02/2018	29 Ferguson St	L1	137	Fat	0	Continue to monitor
1/03/2018	29 Ferguson St	L1	212	Fat	0.5	
28/04/2018	48 Ferguson St	L1	464	Broken Pipe	25	Collapsed pipe repaired
30/04/2018	48 Ferguson St	L1	266	Broken pipe	3.5	
23/04/2018	28 Lyncroft St	L1	66	Unknown	0	Connection repaired
14/05/2018	28 Lyncroft St	L1	159	Fat	2	
5/04/2017	26B Royton Ave	L1	704	Unknown	37.5	Heavy flushed
5/12/2017	26B Royton Ave	L1	545	Fat	0	
18/06/2017	17 Chelburn Cres	L1	136	Unknown	1.5	Inspection lid and

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
27/12/2017	17 Chelburn Cres	L1	666	Fat	0	fats removed from line
21/01/2018	17 Chelburn Cres	L1	335	Fat	0	
30/07/2016	20 Fort Richard Rd	L1	100	Fat	4.59	Fat blockage removed, flushed main
6/07/2017	20 Fort Richard Rd	L1	589	Fat	30.5	
12/05/2017	1 Humphreys Pl	L1	151	Surcharging	47	Under investigation
14/04/2018	1 Humphreys Pl	L1	184	Surcharging	73.5	
12/06/2018	1 Humphreys Pl	L1	675	Surcharging	28.5	
2/02/2018	203S Robertson Rd	L1	158	Roots	0.5	Rootcut
5/02/2018	203S Robertson Rd	L1	395	Roots	0.5	
2/03/2017	33S Robertson Rd	L1	91	Unknown	0	Continue to monitor
17/11/2017	33S Robertson Rd	L1	87	Third Party Damage	0	
23/08/2017	7 Tua Pl	L1	237	Unknown	0	T-shirt removed from line, heavy flushed
4/02/2018	7 Tua Pl	L1	65	Rubbish	5.5	
6/02/2018	7 Tua Pl	L1	199	Unknown	0	
9/02/2018	7 Tua Pl	L1	133	Foreign Object	19	
17/11/2016	46 Hastie Ave	L1	235	Fat	23.5	Heavy flushed
20/09/2017	46 Hastie Ave	L1	115	Rubbish	0	
12/02/2018	267 Buckland Rd	L1	138	Unknown	0	Under investigation for I&I
17/04/2018	267 Buckland Rd	L1	585	Broken Pipe	2	
21/03/2017	47 Robertson Rd	L1	98	Fat	0.5	Heavy flushed
30/09/2017	47 Robertson Rd	L1	105	Rubbish	1.5	
28/05/2017	7 Waterfront Rd	L1	109	Foreign Object	0.5	Under investigation, heavy flushed line
4/04/2018	7 Waterfront Rd	L1	132	Fat	1.5	
19/07/2017	96 Chingford Cl	L1	89	Unknown	0	Rubbish removed from main
9/01/2018	96 Chingford Cl	L1	70	Rubbish	0	
1/09/2016	55 Montgomerie Rd	L1	547	Unknown	0	Heavy flushed to remove fat buildup
28/07/2017	55 Montgomerie Rd	L1	132	Rubbish	5.5	
17/10/2016	53 Hall Ave	L1	227	Fat	0	Heavy flushed
8/08/2017	53 Hall Ave	L1	108	Fat	4.01	
16/03/2018	35 Mascot Ave	L1	81	Fat	0	Fats and debris flushed from main
21/04/2018	35W Mascot Ave	L1	293	Fat	3	
27/11/2017	132 Coronation Rd	L1	107	Fat	0	Fat and debris flushed from main

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
22/06/2018	132 Coronation Rd	L1	115	Fat	0	
3/09/2017	1 Tussock Ave	L1	639	Surcharging	0	Under investigation, fats removed from line
28/11/2017	1 Tussock Ave	L1	153	Fat	0	
18/02/2018	1 Tussock Ave	L1	540	Roots	0	
22/12/2016	5 Nevis Pl	L1	74	Rubbish	0	Heavy flushed
16/08/2017	5 Nevis Pl	L1	616	Fat	2.5	
22/08/2017	11 Molesworth Pl	L1	80	Foreign Object	0	Rubbish and debris removed from line
4/08/2017	13 Molesworth Pl	L1	618	Rubbish	0	
6/09/2017	13 Molesworth Pl	L1	144	Unknown	8	
12/09/2017	51 Crawford Ave	L1	158	Rubbish	2	Heavy flush, silts and fat removed
21/05/2018	51 Crawford Ave	L1	228	Rubbish	15	
25/09/2017	6 Blake Rd	L1	588	Fat	0	Fats removed from main
27/09/2017	6 Blake Rd	L1	642	Unknown	0	
19/01/2018	31 Gadsby Rd	L1	269	Foreign Object	9.5	Rubbish blocking satellite into Transmission line removed
3/03/2018	31 Gadsby Rd	L1	67	Rubbish	0	
3/03/2018	37 Gadsby Rd	L1	531	Rubbish	0	
22/03/2018	37 Gadsby Rd	L1	154	Surcharging	0	
11/04/2018	37 Gadsby Rd	L1	338	Surcharging	14	
13/01/2018	47 Gadsby Rd	L1	173	Fat	0	
3/03/2018	47 Gadsby Rd	L1	562	Rubbish	0	
21/03/2018	47 Gadsby Rd	L1	380	Surcharging	2.5	
28/04/2018	48 Ferguson St	L1	464	Broken Pipe	25	Collapsed pipe repaired
30/04/2018	48 Ferguson St	L1	266	Broken pipe	3.5	

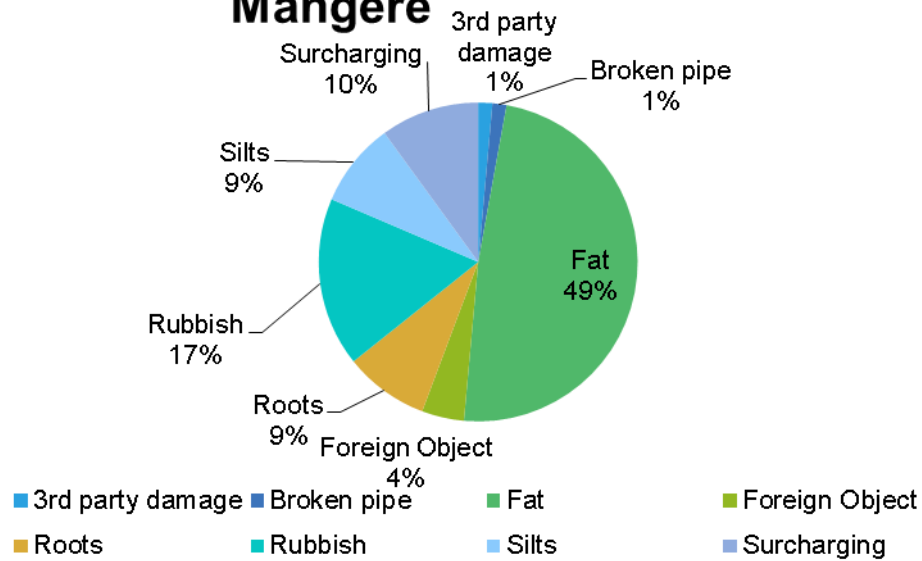
1.24.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



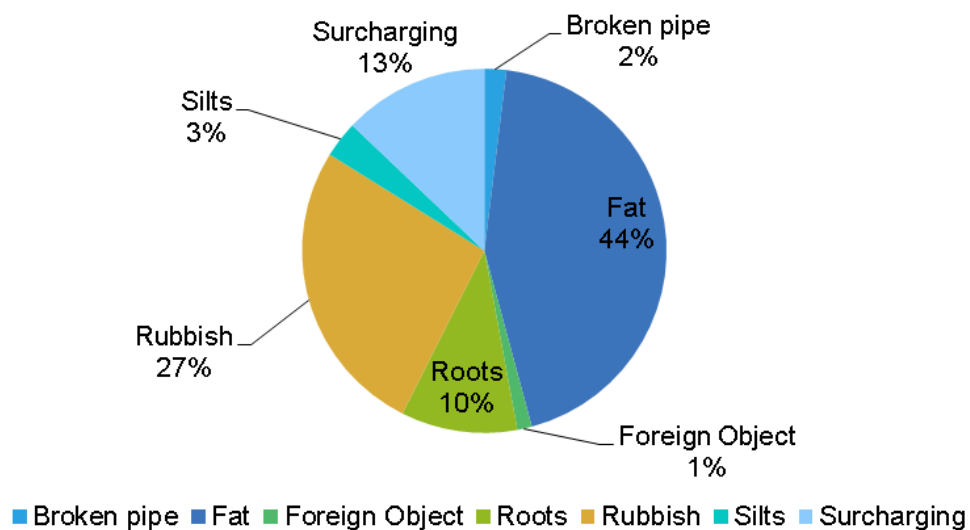
2014-15 Data for Catchment 24.

Mangere

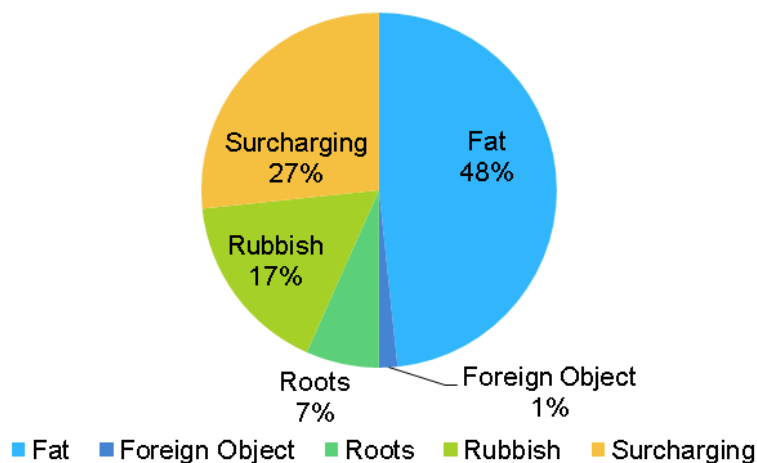


2015-16 Data for Catchment 24.

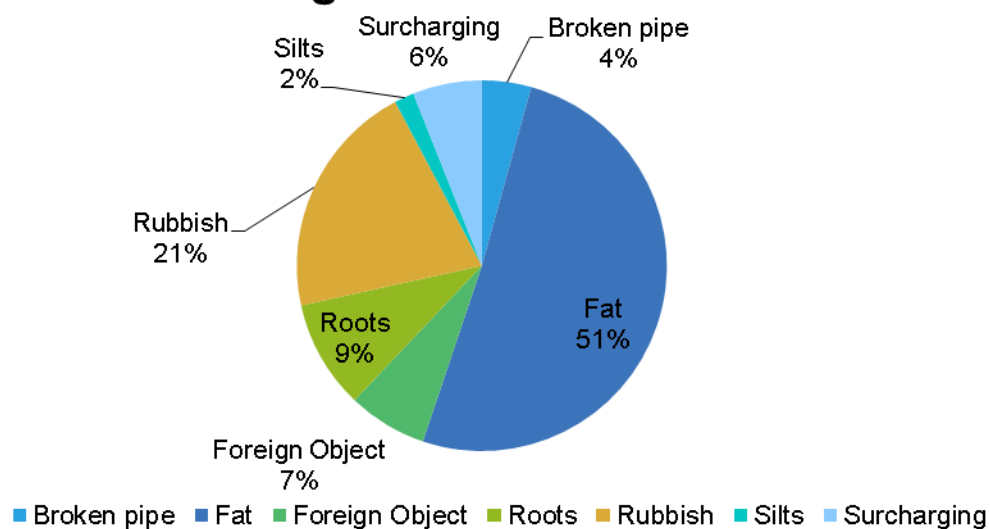
Mangere



2016-17 Data for Catchment 24. Mangere



2017-18 Data for Catchment 24. Mangere



Trend analysis has been carried out where root cause has been identified.

1.24.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
1/02/2018	DPOTW	Otahuhu West Wholesale Wastewater Pump Station	680	Rain event	71	47
11/02/2018	DPOTW	Otahuhu West Wholesale Wastewater Pump Station	680	Rain event	995	55.5
7/03/2018	DPKIW	Kiwi Esplanade Wastewater Pump Station	991	Rain event	240	11

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
19/03/2018	DPLAM	Lambie Court Wastewater Pump Station	1159	Rain event	7	0
11/04/2018	DPOTW	Otahuhu West Wholesale Wastewater Pump Station	680	Rain event	100	14
11/04/2018	DPTRC	Black Bridge Wholesale Wastewater Pump Station	677	Rain event	242	14
11/04/2018	DPMIR	Miro Road Wastewater Pump Station	1161	Power outage	295	18.5
14/04/2018	DPOTW	Otahuhu West Wholesale Wastewater Pump Station	680	Rain event	1007	73.5
14/04/2018	DPTRC	Black Bridge Wholesale Wastewater Pump Station	677	Rain event	450	73.5
3/06/2018	DPOTW	Otahuhu West Wholesale Wastewater Pump Station	680	Rain event	372	39
4/06/2018	DPOTW	Otahuhu West Wholesale Wastewater Pump Station	680	Rain event	1008	36
12/06/2018	DPOTW	Otahuhu West Wholesale Wastewater Pump Station	680	Rain event	748	28.5

1.24.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
468	Saleyards Rd WWPS	1	0	0	0	0	0	Continue to monitor
582	Sylvia Park WWPS	1	0	0	0	0	0	Continue to monitor
664	Favona Rd	1	0	0	0	0	0	Continue to monitor
672	Westfield WWPS	4	0	0	0	0	0	Continue to monitor
677	Black Bridge WWPS	8	0	3	9	2	3.5	Pump Station upgrade completed. Operational I&I investigation (planned)
678	Mangere Bridge	0	0	0	0	0	0	Continue to monitor
680	Otahuhu West	0	1	0	8	7	4	Continue to monitor
999	James Fletcher Drive WWPS	0	0	0	0	0	0	Continue to monitor
1011	Mackenzie Road WWPS	0.2	0	0	0	0	0	Continue to monitor
1015	Savil Drive Link WWPS	0	0	0	0	0	0	Continue to monitor
1136	Ruaiti Road WWPS	0.6	0	0	0	0	0	Continue to monitor
1159	Lambie Court WWPS	0.2	0	0	0	1	0.25	Continue to monitor
1192	Portage Rd WWPS	0.2	0	0	0	0	0	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1194	Huia Rd WWPS	0	0	0	0	0	0	Continue to monitor
1577	Oruarangi WWPS	0	0	0	0	0	0	Continue to monitor
991	Kiwi Esplanade Wastewater Pump Station	-	0	0	0	1	0.25	Continue to monitor
1161	Miro Road Wastewater Pump Station	-	0	0	0	1	0.25	Continue to monitor

Type 3 – uncontrolled overflow rolling WWO data from 1 July 2014 – 30 June 2018

The following locations are reported as Type 3 overflow locations.

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
S1	34-36 Mascot Ave	1.3	4	2	4	1	2.75	Manukau West Catchment Upgrades

1.24.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be done as part of Watercare's I&I programme, where the priority of this catchment will be determined.

1.24.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Manukau West upgrades	Variable	Known Type 3 issue locations were identified under this study. A large suite of isolated upgrades were identified to be progressively implemented	Address Type 3 overflows S1 to S5 inclusive) for current and future flows	2017-2025
Underway	Wastewater Main Renewals and Lining Programme	Project Execution	Network wastewater pipe renewal at 38 sites	Upgraded network pipe condition	2015-2018

1.24.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.24.9 Summary

There were two Type 1 EOPs which have discharged more frequently than two spills per year on average; the performance will continue to be monitored noting that there has been a recent upgrade where the local network upgrades have conveyed more flow to the pump station. Trend analysis shows that fat and rubbish blockages have contributed the most to uncontrolled overflows in this reporting period. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended by 47.4km and developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.25 Catchment 25 – Lower Tamaki River

1.25.1 Overview

The Lower Tamaki River catchment is in the east of Auckland. The catchment covers areas around the Tamaki River Estuary including the suburbs of Panmure, Mount Wellington, Tamaki, Point England, Saint Johns, Glen Innes and Glendowie on the west of the estuary and Pakuranga, Sunnyhills, Farm Cove, Half Moon Bay and Bucklands Beach on the east of the estuary. The total land area in the catchment is approximately 2,500 hectares. There are 18,218 wastewater connections.

Land use within the bay is predominantly residential, especially to the east and northwest of the estuary. To the southwest of the estuary, there are areas of commercial/industrial land running from Panmure through Glen Innes. There are also numerous recreational sports fields and schools in the catchment. There has recently been significant residential development adjacent to Mt Wellington in the former Mt Wellington quarry.

	2014/15	2015/16	2016/17	2017/18
No. of connections	17,806	17,927	18,070	18,218
Length of sewer (km)	303	304	307	327

Schedule Engineered Overflow Points

EOP ID	EOP Name	Facility Code	EOP Type	Receiving Environment Name
161	155 Riverside Avenue	-	2	Lower Tamaki River
162	49 Dunkirk Road	-	2	Lower Tamaki River
163	34 Riverview Road	-	2	Lower Tamaki River
188	6 Concord Place	-	1	Omaru Creek
189	109 Taniwha Street	-	2	Omaru Creek
191	West Tamaki Rd WWPS	DPWTR	1	Lower Tamaki River
596	197-209 Taniwha Street	-	2	Omaru Creek
612	Karaka Bay WWPS	DPKRA	1	Karaka Bay
633	Riddell Rd WWPS	DPRID	1	Riddell Road Beach
681	Pt England WWPS	DPENG	1	Omaru Creek
682	Glendowie WWPS	DPGND	1	Glendowie Stream
706	Dunkirk WWPS	DPDNK	1	Lower Tamaki River
707	Panmure Basin WWPS	DPS018	1	Panmure Basin
745	Glendowie Branch Sewer Relief MH13	DSGLD	2	Omaru Creek
958	Belmire Rise WWPS	DPBEL	1	Wakaaranga Creek
985	Pakuranga North WWPS	DPPKN	1	Wakaaranga Creek
990	Buckland Beach WWPS	DPBBH	1	Little Bucklands Beach

EOP ID	EOP Name	Facility Code	EOP Type	Receiving Environment Name
993	The Parade WWPS	DPTPD	1	Bucklands Beach
1008	Bramley Drive WWPS	DPBRA	1	Lower Tamaki River
1168	Halfmoon Bay Marina WWPS	DPHMB	1	Half Moon Bay Marina via stormwater pipe
1174	Granger Point WWPS	DPGRP	1	Lower Tamaki River
1187	Panmure Wharf WWPS	DPPNM	1	Lower Tamaki River
1188	Bridge St WWPS	DPBDG	1	Lower Tamaki River
1189	Watene Rd WWPS	DPWAT	1	Panmure Basin
1406	61 - 67 Felton Matthew Ave	-	2	Omaru Creek
1533	208 Riddell Road	-	2	Stormwater channel
1581	54 Line Road	-	2	Omaru Creek

The following EOP has been identified and added to the schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
1581	54 Line Road	-	2	Omaru Creek	Added to schedule following site identification

1.25.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
26/07/2017	DPENG	Pt England Wholesale Wastewater Pump Station	681	Power failure	17	1.5

Reported Incidents

There were a total of 216 reported incidents in the Lower Tamaki River catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
17/04/2017	114 Prince Regent Dr	L1	137	Unknown	3	Flushed and CCTV, under investigation
30/01/2018	114 Prince Regent Dr	L1	122	Unknown	0	
13/06/2017	170 West Tamaki Rd	L1	714	Roots	3.93	Heavy flushed
4/07/2017	170 West Tamaki Rd	L1	118	Rubbish	0.5	
16/08/2017	63 Tripoli Rd	L1	98	Unknown	0	Continue to monitor. Currently being assessed for addition to planned flushing schedule
18/08/2017	63 Tripoli Rd	L1	60	Foreign Object	0.5	
5/09/2017	63 Tripoli Rd	L1	90	Unknown	0.5	
24/11/2017	63 Tripoli Rd	L1	447	Fat	0	
1/10/2017	1 Mansfield St	L1	334	Roots	20	Heavy flushed
3/01/2018	1 Mansfield St	L1	153	Fat	0	
29/11/2016	80 Castledine Cres	L1	79	Unknown	69.5	Continue to monitor
20/07/2017	80 Castledine Cres	L1	41	Roots	16.5	
7/10/2017	2/335 St Johns Rd	L1	152	Unknown	6	Manhole repaired
2/12/2017	2/335 St Johns Rd	L1	406	Fat	0	
10/06/2017	46 Pakuranga Rd	L1	56	Unknown	1.47	Pipe repaired
4/12/2017	46 Pakuranga Rd	L1	654	Fat	5	
11/12/2017	21 Riddell Rd	L1	230	Unknown	0	Pipe repaired
14/02/2018	21 Riddell Rd	L1	117	Broken pipe	8.5	
30/04/2018	21 Riddell Rd	L1	275	Unknown	3	
19/06/2017	2/123 Riddell Rd	L1	313	Unknown	0	Rag blockage removed, under investigation
3/02/2018	2/123 Riddell Rd	L1	82	Surcharging	26.5	
6/07/2017	137 Taniwha St	L1	84	Surcharging	42.5	Under investigation
14/04/2018	137 Taniwha St	L1	98	Surcharging	67	
19/01/2017	18 Emerson St	L1	131	Fat	5.77	At capacity, under investigation for re-engineering
30/11/2017	18 Emerson St	L1	126	Unknown	2.5	
19/12/2017	18 Emerson St	L1	618	Fat	0	
2/05/2017	10 Steeple Rise	L1	69	Unknown	0	Under investigation
14/08/2017	10 Steeple Rise	L1	210	Unknown	3	
3/06/2018	10 Steeple Rise	L1	161	Surcharging	43.5	
26/05/2018	1/28A The Parade	L1	136	Roots	1	NRV installed, very flat grades
3/06/2018	1/30 The Parade	L1	696	Surcharging	43.5	

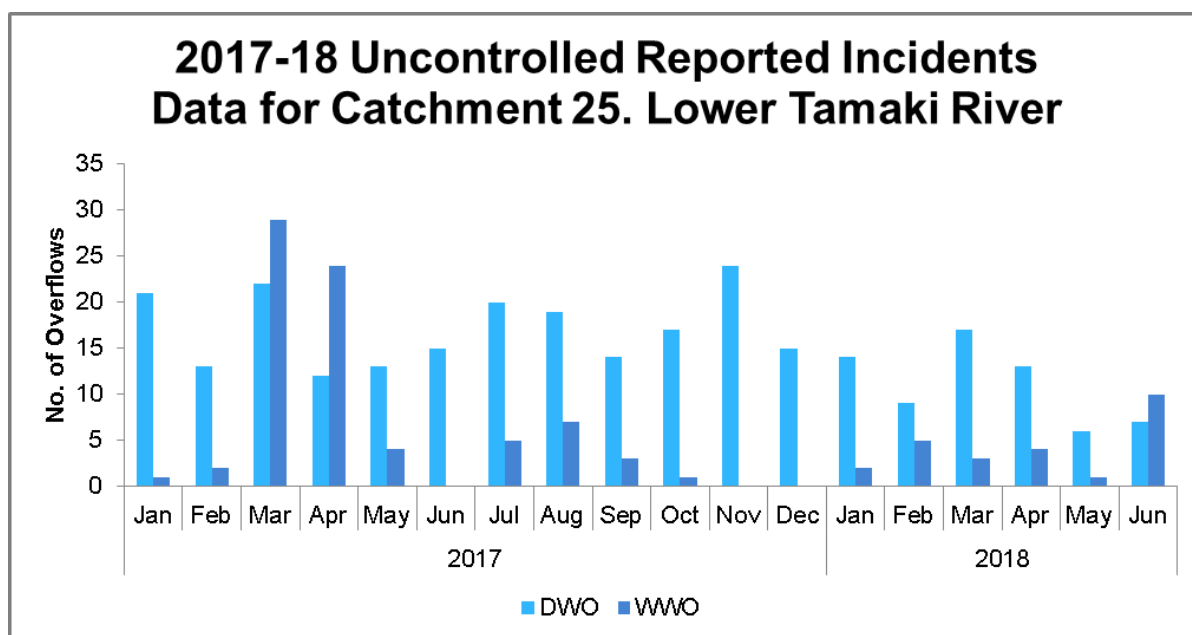
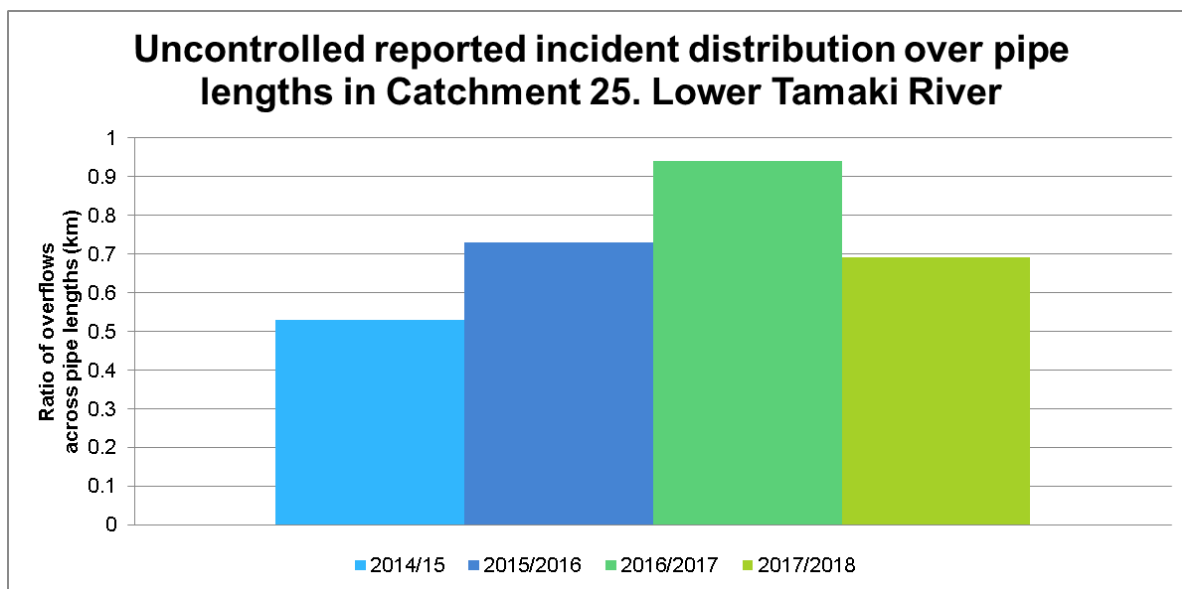
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
21/11/2016	80 Mt Wellington Highway	L1	503	Roots	0	Heavy fats removed
18/09/2017	80 Mt Wellington Highway	L1	92	Unknown	12	
2/10/2017	80 Mt Wellington Highway	L1	142	Unknown	3.5	
15/03/2018	76 Kings Rd	L1	528	Rubbish	0	Heavy flushed
23/03/2018	76 Kings Rd	L1	130	Roots	14	
3/07/2017	7 Fraser Rd	L1	303	Foreign Object	0	Rocks removed from main
14/07/2017	7 Fraser Rd	L1	420	Unknown	2	
24/08/2017	23 Heatherbank St	L1	74	Roots	2.5	Rootcut
6/09/2017	23 Heatherbank St	L1	165	Roots	9	
15/08/2017	58 Lagoon Dr	L1	284	Unknown	3.5	Heavy rag blockages removed, main flushed
23/03/2018	58 Lagoon Dr	L1	135	Rags	14	
27/04/2018	58 Lagoon Dr	L1	63	Rags	0	
6/01/2017	250 St Heliers Bay Rd	L1	122	Roots	0	Rootcut
18/07/2017	250 St Heliers Bay Rd	L1	198	Roots	0	
18/09/2017	105 Mt Wellington Highway	L1	173	Fat	12	Heavy fats removed
2/10/2017	105 Mt Wellington Highway	L1	393	Fat	3.5	
1/05/2017	12 Matapan Rd	L1	354	Unknown	3	Continue to monitor
15/11/2017	12 Matapan Rd	L1	134	Unknown	0	
21/01/2017	55 Fordyce Ave	L1	64	Fat	15.38	Rootcut, fats removed
23/09/2017	55 Fordyce Ave	L1	104	Roots	0	
2/01/2017	30 Venus Pl	L1	268	Unknown	1.44	Debris removed from main
13/11/2017	30 Venus Pl	L1	230	Rubbish	0.5	
2/08/2016	24 Sarah Pl	L1	0	Unknown	1	Added to 6 Monthly Planned Flushing Schedule for large dips
24/07/2017	24 Sarah Pl	L1	75	Fat	3	
3/09/2017	7 Birman Cl	L1	79	Roots	0.5	Roots removed from manhole
5/09/2017	7 Birman Cl	L1	122	Unknown	0.5	
8/02/2017	6 Concord Pl	L1	182	Unknown	2.03	Flat lines, silts and fats removed
10/08/2017	6 Concord Pl	L1	126	Rubbish	1	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
17/02/2018	268B St Heliers Bay Rd	L1	389	Unknown	0	Added to Annual Planned Flushing Schedule
2/03/2018	272A St Heliers Bay Rd	L1	320	Unknown	2	
10/03/2018	272A St Heliers Bay Rd	L1	588	Silts	0	
29/03/2017	36 Tamatea Ave	L1	176	Rubbish	51.74	Fats removed from main
26/07/2017	36 Tamatea Ave	L1	297	Fat	1.5	
4/04/2017	31 Birman Cl	L1	357	Surcharging	89.78	Third Party Damage, concrete removed from line
11/11/2017	31 Birman Cl	L2	136	3rd Party Damage	0	
22/09/2017	91 Fisher Pde	L1	237	Fat	4	Broken pipe repaired, Third Party Damage under investigation
6/10/2017	91 Fisher Pde	L1	88	Unknown	1.5	
11/11/2017	91 Fisher Pde	L1	112	Roots	0	
13/11/2017	91 Fisher Pde	L1	626	Unknown	0.5	
6/02/2018	91 Fisher Pde	L1	486	Unknown	0	
14/04/2018	91 Fisher Pde	L1	148	3rd Party Damage	67	
11/07/2017	28 Venus Pl	L1	118	Roots	3	Rootcut
8/03/2018	28 Venus Pl	L1	77	Roots	3	
28/07/2017	1 Riverlea Ave	L1	217	Fat	4.5	Heavy flushed, silt, sand and shells removed
10/12/2017	1 Riverlea Ave	L1	231	Silts	0	
31/08/2017	3-35 Ireland Rd	L1	297	Unknown	18	Under investigation
8/04/2018	3-35 Ireland Rd	L1	489	Rags	0	
29/01/2018	3/35 Ireland Rd	L1	96	Rubbish	0	
24/02/2018	3/35 Ireland Rd	L1	87	Rags	0	
26/09/2017	11A Kerswill Pl	L1	42	Fat	11	Heavy flushed
22/10/2017	11A Kerswill Pl	L1	116	Fat	1.5	
30/10/2017	49 Elstree Ave	L1	105	Unknown	0	Heavy fats removed
22/03/2018	49 Elstree Ave	L1	232	Fat	0	
10/11/2017	82A Bay Rd	L1	458	Roots	0	Roots, fat and debris removed
11/12/2017	82A Bay Rd	L1	255	Fat	0	
5/02/2018	25 Merfield St	L1	564	Unknown	13.5	Under investigation
14/04/2018	25 Merfield St	L1	298	Surcharging	67	
20/04/2018	25 Merfield St	L1	65	Fat	0.5	

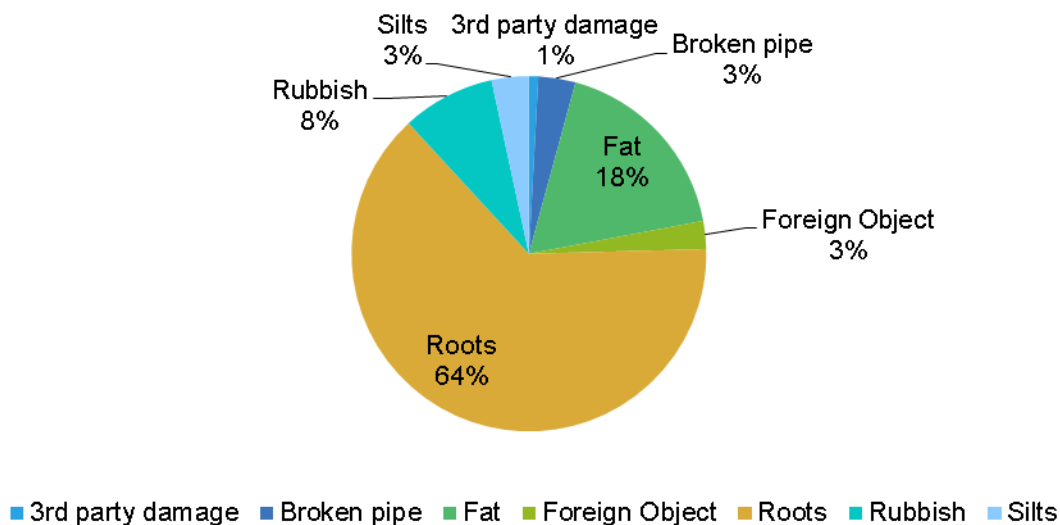
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
3/06/2018	25 Merfield St	L1	255	Surcharging	43.5	

1.25.3 Trend analysis of Uncontrolled Overflows

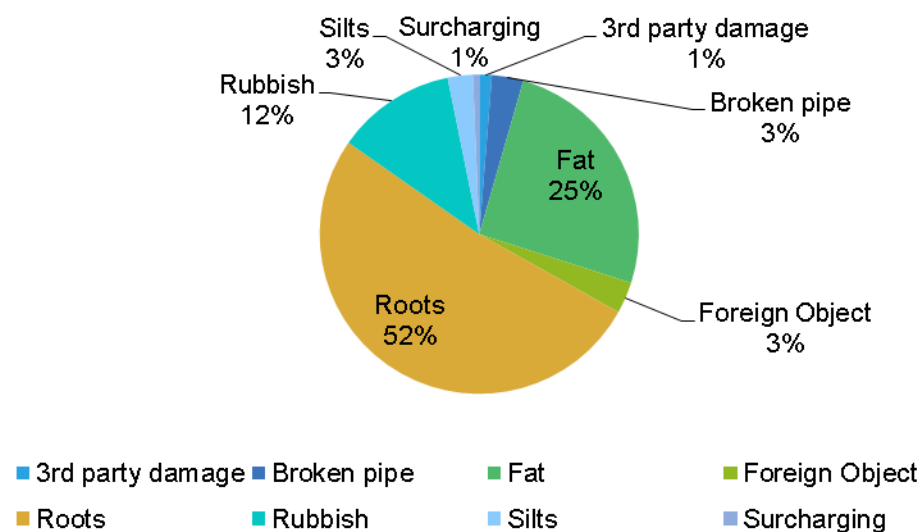
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



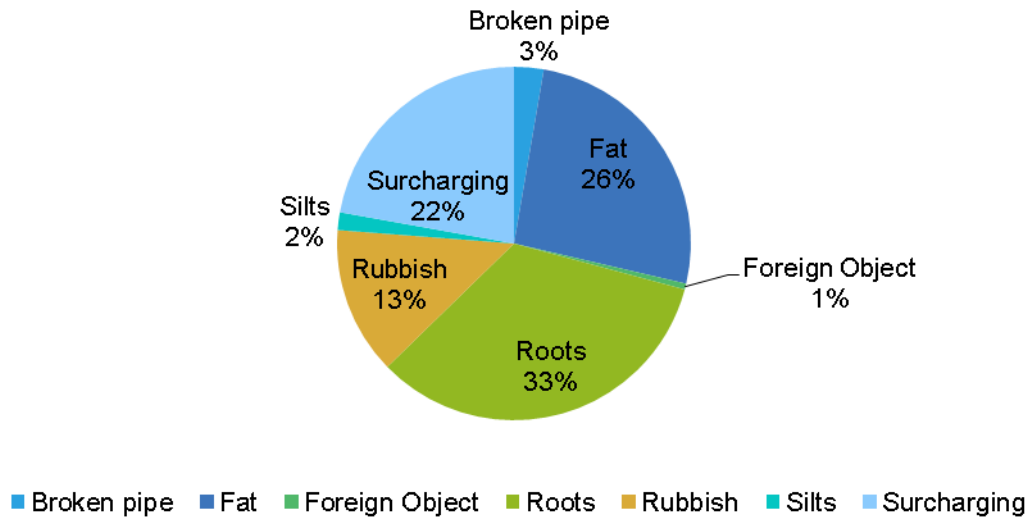
2014-15 Data for Catchment 25. Lower Tamaki River



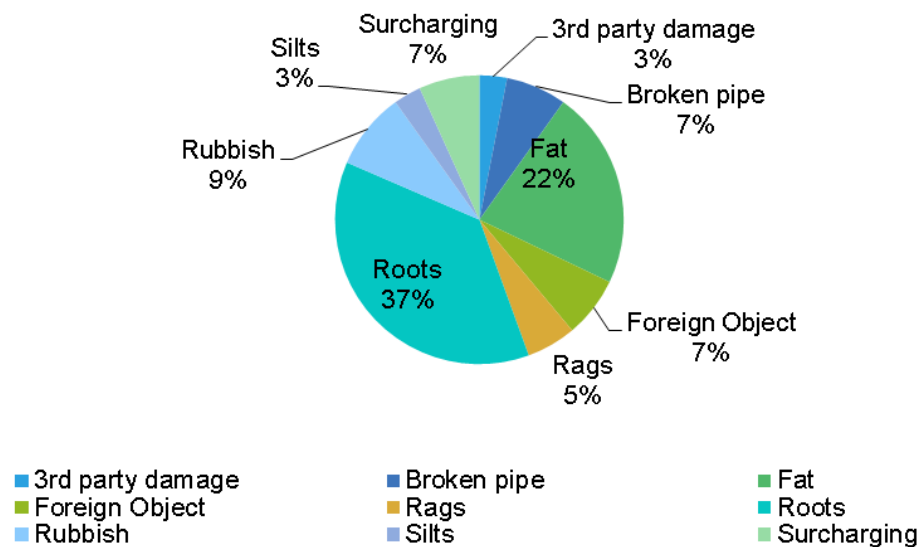
2015-16 Data for Catchment 25. Lower Tamaki River



2016-17 Data for Catchment 25. Lower Tamaki River



2017-18 Data for Catchment 25. Lower Tamaki River



Trend analysis has been carried out where root cause has been identified.

1.25.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
1/07/2017	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	525644	27.5
6/07/2017	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	362	42.5
6/07/2017	DPGND	Glendowie Wholesale Wastewater Pump Station	682	Rain event	107	42.5
11/02/2018	DPBEL	Belmere Rise Wastewater Pump Station	958	Rain event	216	47.5
11/02/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	765	47.5
13/02/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	73	23
14/04/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	871	67
14/04/2018	DPGND	Glendowie Wholesale Wastewater Pump Station	682	Rain event	97	67
14/04/2018	DPBBH	Bucklands Beach Wholesale Wastewater Pump Station	990	Rain event	50	67
3/06/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	505	43.5
3/06/2018	DPBEL	Belmere Rise Wastewater Pump Station	958	Rain event	25	43.5
3/06/2018	DPBBH	Bucklands Beach Wholesale Wastewater Pump Station	990	Rain event	98	43.5
3/06/2018	DPBRA	Bramley Drive Wastewater Pump Station	1008	Rain event	146	43.5
3/06/2018	DPGND	Glendowie Wholesale Wastewater Pump Station	682	Rain event	90	43.5
3/06/2018	DPMNR	Manor Park	1145	Rain event	401	43.5
4/06/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	1227	52
4/06/2018	DPBEL	Belmere Rise Wastewater Pump Station	958	Rain event	186	52
4/06/2018	DPBRA	Bramley Drive Wastewater Pump Station	1008	Rain event	86	52
4/06/2018	DPMNR	Manor Park	1145	Rain event	844	52
4/06/2018	DPGND	Glendowie Wholesale Wastewater Pump Station	682	Rain event	64	52
12/06/2018	DPENG	Pt England Wholesale Wastewater Pump Station	681	Rain event	505	21.5

1.25.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
191	West Tamaki Rd WWPS	1	0	0	0	0	0	Continue to monitor
612	Karaka Bay WWPS	1	0	0	0	0	0	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
633	Riddell Rd WWPS	1	0	0	1	0	0.25	Continue to monitor
681	Pt England WWPS	5	4	5	15	9	8.25	Glendowie Branch Sewer Upgrade
682	Glendowie Wholesale WWPS	0	0	0	5	4	2.25	Continue to monitor
706	Dunkirk WWPS	2	2	0	1	0	0.75	Continue to monitor
707	Panmure Basin WWPS	0.2	0	0	2	0	0.5	Continue to monitor
958	Belmire Rise WWPS	1	0	0	0	3	0.75	Continue to monitor
985	Pakuranga North WWPS	0	0	0	0	0	0	Continue to monitor
990	Buckland Beach WWPS	0	0	0	4	2	1.5	Continue to monitor
993	The Parade WWPS	0.8	0	0	0	0	0	Continue to monitor
1008	Bramley Drive WWPS	1.6	0	0	0	2	0.5	Continue to monitor
1168	Halfmoon Bay Marina WWPS	0.4	0	0	0	0	0	Continue to monitor
1174	Granger Point WWPS	0	0	0	0	0	0	Continue to monitor
1187	Panmure Wharf WWPS	0.2	0	0	0	0	0	Continue to monitor
1188	Bridge St WWPS	0.2	1	0	0	0	0.25	Continue to monitor
1189	Watene Rd WWPS	0	0	0	0	0	0	Continue to monitor
1145	Manor Park	-	0	0	0	2	0.5	Continue to monitor

1.25.6 Inflow & Infiltration Programme

207 properties were surveyed in the Wai O Taiki Bay area to identify potential I&I sources. Three downpipes to gully traps and sever low gully traps were found. These defects were remedied.

A further review of I&I in this catchment will be done as part of Watercare's I&I programme, where the priority of this catchment will be determined.

1.25.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Glendowie Branch sewer upgrade	Project Execution	Overflows from the Point England pump station, and network overflows exceed two spills per year and this is predicted to increase over time as a result of growth in catchment	Reduced frequency of wet weather overflows at EOPs 188, 189, and 681	2012-2020
Underway	Tamaki redevelopment catchment upgrades	Options analysis (Feasibility)	There are known high frequency and volume EOPs in this catchment, and high growth with the proposed HNZ redevelopment	The preferred suite and timing of upgrades for this catchment to achieve reduced frequency of wet weather overflows at multiple EOPs and optimising the performance of the Glendowie branch sewer upgrade	2017-2024

1.25.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.25.9 Summary

There were two Type 1 EOPs which has discharged more frequently than two spills per year on average. In the long term, the network performance in this catchment will be improved with the 'Glendowie Branch Sewer Upgrade' and the 'Tamaki Redevelopment catchment upgrade' projects, which will provide capacity in the network. Roots contributed to the largest proportion of uncontrolled overflows, and the density of overflows has decreased in this reporting period. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended by 19.4km and developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.26 Catchment 26 – Upper Tamaki River

1.26.1 Overview

The Upper Tamaki River catchment is in the southeast of Auckland. The catchment primarily covers areas that drain to the Tamaki River above the Lagoon Drive Bridge. It is the largest geographical catchment of the Auckland wastewater network, and covers the suburbs of Richmond, Middlemore, Mangere East and parts of Mt Wellington in the east, through East Tamaki and Flat Bush to the south, and East Tamaki, Pakuranga Heights, Botany Downs, Highland Park and parts of Howick in the west. There are 59,149 wastewater connections.

Land use within the catchment includes large areas of industrial/commercial land around Mt Wellington and Richmond, as well as significant areas of East Tamaki. The northeast and south of the catchment area is generally residential land, with medium density and more intensive residential development, particularly around Botany Downs. Botany Downs and East Tamaki Heights are areas of the catchment which have very recently developed through expansion and growth. There are rural areas to the east of Flat Bush.

	2014/15	2015/16	2016/17	2017/18
No. of connections	57,714	58,076	58,593	59,149
Length of sewer (km)	1034.6	1039.0	1060.9	1248.1

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
464	Jane Cowie Place WWPS	DPJAN	1	Upper Tamaki River (Middlemore Arm)
465	Otahuhu North East Wholesale WWPS	DPOTA	1	Otahuhu Creek
581	5 Johnson Road	-	2	Unnamed stream (Mt Wellington)
583	18 Skinner Road	-	2	Unnamed stream (Mt Wellington)
584	14 Skinner Road	-	2	Unnamed stream (Mt Wellington)
628	Panama Road WWPS	DPPNA	1	Otahuhu Creek
630	Penrose Road WWPS	DPPEN	1	To Land
648	Tahatai Street WWPS	DPTAH	1	Upper Tamaki River (Middlemore Arm)
666	Otahuhu North Wholesale WWPS	DPOTN	1	Otahuhu Creek
667	Pakuranga Wholesale WWPS	DPHIN	1	Upper Tamaki River
670	Sylvia Park Wholesale WWPS	DPSPK	1	Upper Tamaki River
673	Tamaki East Wholesale WWPS	DPTIN	1	Upper Tamaki River
675	Botany Wholesale WWPS	DPBOT	1	Pakuranga Creek
676	Pakuranga South Wholesale WWPS	DPPKS	1	Pakuranga Creek
683	Otara Wholesale WWPS	DPOTB	1	Upper Tamaki River (Middlemore Arm)
684	Middlemore Wholesale WWPS	DPMID	1	Upper Tamaki River (Middlemore Arm)

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
698	Ormiston Wholesale WWPS	DPOSN	1	Unnamed tributary of Otara Creek (east)
747	Otahuhu East Diversion Branch MH4A	DSOTD	2	Upper Tamaki River (Middlemore Arm)
751	Otahuhu North Branch MH12	DSOTN	2	Otahuhu Creek
957	38 Whiteacres Drive	-	2	Unnamed tributary of Pakuranga Creek (Whiteacres Drive)
959	12 Udall Place	-	2	Unnamed tributary of Pakuranga Creek (Highland Park)
960	30 Minaret Drive	-	2	Unnamed tributary of Pakuranga Creek (Highland Park)
961	16 Ingram Crescent	-	2	Unnamed tributary of Otara Creek (west)
969	3 Ross Avenue	-	2	Upper Tamaki River (Middlemore Arm)
970	77 Shirley Road	-	2	Upper Tamaki River (Middlemore Arm)
972	123 Ennis Ave	-	2	Pakuranga Creek
975	16 Windsong Ct	-	2	Unnamed tributary of Pakuranga Creek (Botany Downs)
984	Aviemoore Drive WWPS	DPAVI	1	Unnamed tributary of Pakuranga Creek (Highland Park)
998	Burswood Drive WWPS	DPBUR	1	Pakuranga Creek
1004	Stonedon Drive WWPS	DPSDN	1	Pakuranga Creek
1005	Highland Park WWPS	DPHIP	1	Unnamed tributary of Pakuranga Creek (Highland Park)
1010	Hannah Road WWPS	DPHAN	1	Unnamed tributary of Otara Creek (west)
1141	Lloyd Elsmore Park WWPS	DPLLO	1	Unnamed tributary of Pakuranga Creek (Highland Park)
1142	Cascades Road WWPS	DPCAS	1	Pakuranga Creek
1143	Gossamer Drive WWPS	DPGOS	1	Pakuranga Creek
1149	Pelorus Place WWPS	DPPEL	1	Upper Tamaki River
1150	Riverhills Park WWPS	DPRHP	1	Pakuranga Creek
1152	Cryers Road WWPS	DPCRY	1	Pakuranga Creek
1153	Harris Road WWPS	DPHIS	1	Pakuranga Creek
1154	Highbrook Park WWPS	DPHIB	1	Upper Tamaki River
1155	Luke Place WWPS	DPLUK	1	Otara Creek
1156	Lawrence Place WWPS	DPLAW	1	Unnamed tributary of Otara Creek (east)
1181	Ballarat Street 1 WWPS	DPBA1	1	To Land
1182	McDonald Crescent WWPS	DPMCD	1	To Land
1183	Harris Road WWPS	DPHAR	1	To Land

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1184	Motu Place WWPS	DPMOT	1	To Land
1185	Ferndale Road WWPS	DPFER	1	To Land
1186	Banks Street WWPS	DPBNK	1	To Land
1190	Mount Richmond 1 WWPS	DPRD1	1	Otahuhu Creek
1191	Mount Richmond 2 WWPS	DPRD2	1	Otahuhu Creek
1193	Rodney Street WWPS	DPRNY	1	Upper Tamaki River (Middlemore Arm)
1195	Ballarat Street 2 WWPS	DPBA2	1	To Land
1196	Carrs Place WWPS	DPCAR	1	To Land
1200	Joe Stanley Place WWPS	DPJOE	1	Otahuhu Creek
1417	13 Lynley Place, Pakuranga	-	2	Pakuranga Creek
1534	22 Graeme Avenue	-	2	Upper Tamaki River (Middlemore Arm)
1546	Otahuhu North Diversion MH07	DPOTN	1	Otahuhu Creek
1549	14 McLean Ave	-	2	Troon Creek

There have been no changes to the schedule of EOPs in this catchment.

1.26.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
1/09/2017	DPSPK	Sylvia Park Wholesale Wastewater Pump Station	670	Power failure	28	0.49
17/05/2018	DPMID	Middlemore Wholesale Wastewater Pump Station	684	Unknown	6	2.5

Reported incidents

There were a total of 567 reported incidents in the Upper Tamaki River catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
24/01/2018	17 Clutha Cres	L1	338	Surcharging	0	Under investigation. Installed NRV
2/02/2018	17 Clutha Cres	L1	92	Surcharging	0.5	
11/02/2018	23 Clutha Cres	L1	342	Surcharging	42.5	
3/06/2018	23 Clutha Cres	L1	121	Surcharging	67.5	
4/12/2017	27 Edward Ave	L1	59	Fat	5	Under investigation
12/12/2017	1/27 Edward Ave	L1	196	Unknown	1.5	
9/03/2017	1/37 Clydesdale Ave	L1	133	Roots	0	Rootcut
17/01/2018	38 Clydesdale Ave	L1	116	Unknown	0.5	
7/10/2017	3 Mcdonald Cres	L1	148	Fat	6.76	Heavy fats removed
30/04/2018	1/6 Mcdonald Cres	L1	393	Fat	1.5	
26/10/2017	14 Dryden Ave	L1	274	Rubbish	2	Heavy fats in main, heavy flushed.
29/10/2017	14 Dryden Ave	L1	177	3rd party damage	0	
8/11/2017	14 Dryden Ave	L1	157	Fat	13	
29/08/2017	14 Ingram Cres	L1	583	Foreign Object	0	Under investigation
12/06/2018	12 Ingram Cres	L1	139	Surcharging	38.5	
25/06/2018	12 Ingram Cres	L1	42	Surcharging	27.5	
21/06/2017	73 Preston Rd	L1	500	Fat	0	Under investigation
4/01/2018	73 Preston Rd	L1	84	Fat	47.5	
24/08/2017	135 Rangitoto Rd	L1	84	Fat	0	Roots and Fats in main, heavy flushed
6/09/2017	2/136 Rangitoto Rd	L1	80	Fat	8.69	
5/11/2017	135 Rangitoto Rd	L1	124	Roots	0	
8/11/2017	135 Rangitoto Rd	L1	491	Fat	13	
4/03/2018	10 Tiraumea Dr	L1	110	Fat	0	CCTV, multiple lines heavy flushed to remove root intrusion
6/03/2018	10 Tiraumea Dr	L1	87	Unknown	0	
5/05/2017	7/2 Hillside Rd	L1	517	Rubbish	0	Large baby wipe blockage removed
12/10/2017	6/2 Hillside Rd	L1	136	Foreign Object	0	
29/12/2016	157 Edgewater Dr	L1	555	Fat	0	High fat cause occurrence, under investigation
14/08/2017	157 Edgewater Dr	L1	201	Fat	1.98	
13/08/2017	15A Edgewater Dr	L1	552	Foreign Object	7.91	Continue to monitor, brick removed
14/04/2018	15A Edgewater Dr	L1	628	Fat	84	
13/05/2017	16 Fisher Cres	L1	73	Unknown	0	High fat cause occurrence,

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
24/02/2018	1/16 Fisher Cres	L1	129	Fat	0	under investigation
23/01/2017	163 East Tamaki Rd	L1	559	Unknown	0.49	Under investigation
30/10/2017	163 East Tamaki Rd	L1	147	Fat	1	
4/03/2018	1/107 East Tamaki Rd	L1	273	Fat	0	Fat blockage removed
14/04/2018	1/107 East Tamaki Rd	L1	497	Surcharging	84	
21/05/2018	185 East Tamaki Rd	L1	124	Roots	21	Continue to monitor, rootcut
28/06/2018	185 East Tamaki Rd	L1	294	Fat	6.5	
2/12/2017	19 Rongomai Rd	L1	89	Unknown	0	Heavy flushed main
1/02/2018	19 Rongomai Rd	L1	110	Surcharging	28	
2/02/2018	17 Rongomai Rd	L1	106	Fat	0.5	
11/09/2017	5 Gordon Rd	L1	120	3rd party damage	3.86	Under investigation
28/09/2017	5 Gordon Rd	L1	542	Fat	0	
11/10/2017	5 Gordon Rd	L1	385	Fat	4.35	
13/11/2017	22 Pearl Baker Dr	L1	396	Unknown	1.5	Under investigation
30/04/2018	22 Pearl Baker Dr	L1	56	Rubbish	1.5	
6/04/2017	27 Hallberry Rd	L1	371	Surcharging	0.99	Under investigation
12/02/2018	27 Hallberry Rd	L1	89	Rubbish	0.5	
16/04/2018	40 Bairds Rd	L1	221	Unknown	3	Under investigation
23/05/2018	40 Bairds Rd	L1	104	Surcharging	25.5	
12/06/2018	40 Bairds Rd	L1	363	Surcharging	38.5	
3/11/2017	396 Panama Rd	L1	436	Rags	0.5	Displaced dropper repaired
6/11/2017	396 Panama Rd	L1	120	Fat	0	
13/05/2018	230A Panama Rd	L1	310	Unknown	29	Blockage removed from main
16/05/2018	230A Panama Rd	L1	640	Unknown	4	
1/06/2017	40 Ashton Ave	L1	102	Fat	3	Heavy flushed, fats and rags removed
13/03/2018	40 Ashton Ave	L1	147	Fat	29	
3/06/2018	9 Cornwall Rd	L2	435	Surcharging	67.5	Under investigation
13/06/2018	9 Cornwall Rd	L1	463	Surcharging	2.5	
23/11/2017	53A Hain Ave	L1	90	Rubbish	0	Under investigation
31/01/2018	53 Hain Ave	L2	277	Unknown	0	
28/05/2018	53 Hain Ave	L1	124	Fat	1	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
18/10/2017	71 Hamill Rd	L1	541	Unknown	2.5	Under investigation, issue with stormwater and surcharging
21/10/2017	71 Hamill Rd	L1	221	Unknown	0	
30/10/2017	71 Hamill Rd	L1	60	Unknown	1	
23/01/2018	71 Hamill Rd	L1	476	Surcharging	6.5	
16/04/2018	58 Woolfield Rd	L1	484	Fat	3	Under investigation
3/06/2018	58 Woolfield Rd	L1	570	Surcharging	67.5	
22/05/2017	31 Kudu Rd	L1	73	Unknown	0	Fats removed from main
22/01/2018	31 Kudu Rd	L1	60	Unknown	15.5	
7/07/2017	41 Stanniland St	L1	400	Rubbish	6.5	Third party damage repaired
9/07/2017	41 Stanniland St	L1	612	Rubbish	17.5	
5/03/2017	59 Stanniland St	L1	193	Unknown	0.51	Continue to monitor
18/06/2017	59 Stanniland St	L1	59	Unknown	0	
21/07/2017	29 Tamaki Ave	L1	224	Rubbish	21	Debris and roots removed
24/09/2017	29 Tamaki Ave	L1	551	Fat	0	
17/04/2018	18 Water St	L1	608	Surcharging	1	Heavy flushed
3/06/2018	18 Water St	L1	26	Surcharging	67.5	
31/01/2018	22 Capstick Rd	L1	165	Unknown	0	Continue to monitor
9/03/2018	22 Capstick Rd	L1	72	Unknown	0	
12/07/2017	10 Walters Rd	L1	291	Fat	9	High flows, under investigation
22/07/2017	10 Walters Rd	L1	560	Surcharging	14	
13/08/2017	10 Walters Rd	L1	94	Unknown	7.91	
15/07/2017	477 Great South Rd	L1	76	Fat	0	Continue to monitor
24/10/2017	477 Great South Rd	L1	128	Foreign Object	0.5	
1/07/2017	731A Great South Rd	L1	642	Fat	25	Customer to install grease trap
30/08/2017	731A Great South Rd	L1	509	Foreign Object	16.42	
9/04/2018	731A Great South Rd	L1	491	Fat	0.5	
9/06/2018	731A Great South Rd	L1	462	Fat	0	
17/10/2016	30 Ashlynn Ave	L1	107	Fat	0	Fats and debris removed, heavy flush
4/07/2017	30 Ashlynn Ave	L1	50	Fat	0.49	
17/04/2018	267B Mt Wellington Highway	L1	167	Unknown	1	Continue to monitor
19/04/2018	267B Mt Wellington	L1	62	Unknown	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
	Highway					
12/06/2017	40 Tyrone St	L1	106	Unknown	0.5	Continue to monitor
23/01/2018	40 Tyrone St	L1	391	Surcharging	6.5	
30/04/2017	55 High St	L1	79	Unknown	3.95	Heavy flushed
8/03/2018	55 High St	L1	486	Fat	2	
15/01/2018	6 Riverina Ave	L1	167	Rubbish	0	Roll of paper towels removed
3/06/2018	4 Riverina Ave	L1	465	Surcharging	67.5	
29/08/2017	26 Colum Pl	L1	155	Roots	0	Continue to monitor
30/08/2017	26 Colum Pl	L1	105	Fat	16.42	
13/02/2018	17 Lorien Pl	L1	531	3rd party damage	24.5	Heavy flushed, fat blockage removed
16/06/2018	17 Lorien Pl	L1	128	Fat	7.5	
25/04/2017	147 Gossamer Dr	L1	144	Roots	0	Rootcut, heavy fats removed, commercial area
25/07/2017	147 Gossamer Dr	L1	493	Fat	1	
27/03/2017	13A Fiesta Dr	L1	299	Surcharging	25.16	NRV installed
7/07/2017	13A Fiesta Dr	L1	123	Surcharging	6.5	
15/03/2018	5B Earlsworth Rd	L1	93	Fat	0	Heavy fats removed
3/04/2018	5B Earlsworth Rd	L1	96	Fat	0	
6/07/2017	33 Awatere St	L1	248	Surcharging	37.23	Under investigation, heavy fats in area
27/11/2017	31 Awatere St	L1	109	Fat	0	
7/06/2018	31 Awatere St	L1	138	Fat	1	
4/09/2017	23 Lynton Rd	L1	93	Unknown	0.49	Under investigation
2/05/2018	23 Lynton Rd	L1	361	Unknown	0	
29/06/2018	23 Lynton Rd	L1	100	Unknown	1.5	
6/11/2017	18 Billabong Pl	L1	511	Roots	0	Manhole haunching repaired
3/06/2018	18 Billabong Pl	L1	111	Surcharging	67.5	
31/03/2017	42 Wedgwood Ave	L1	52	Fat	0	Fat blockages removed
1/08/2017	42 Wedgwood Ave	L1	82	Fat	0	
21/09/2017	1 Lansdown Ave	L1	139	Unknown	4.35	Heavy flush, debris and fat removed
8/04/2018	1 Lansdown Ave	L1	102	Fat	0	
16/10/2017	3A Frank Grey Pl	L1	188	Rubbish	0	Heavy debris removed
30/10/2017	3A Frank Grey Pl	L1	174	Rubbish	1	
11/11/2017	3A Frank Grey Pl	L1	425	Rubbish	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
1/06/2017	711 Great South Rd	L1	645	Fat	0	Heavy flushed
17/07/2017	711 Great South Rd	L1	110	Unknown	0	
2/11/2017	28 Burnaston Crt	L1	136	Roots	0	Rootcut
24/11/2017	28 Burnaston Crt	L1	69	Roots	0	
3/08/2017	200 Burswood Dr	L1	74	Unknown	0	Rootcut
7/03/2018	200 Burswood Dr	L1	106	Roots	9	
26/09/2017	19 Driscoll Pl	L1	102	Fat	8.21	Heavy fats removed
1/02/2018	2/19 Driscoll Pl	L1	197	Fat	28	
21/04/2017	37 Swaffield Rd	L1	93	Fat	0	Heavy flushed, fat blockages removed
7/03/2018	37 Swaffield Rd	L1	148	Fat	9	
19/01/2018	6 Wood Ave	L1	181	Roots	14	Rootcut, under investigation
4/06/2018	6 Wood Ave	L1	33	Surcharging	31	
10/07/2017	1/26 Pandora Pl	L1	101	Unknown	3	Flushed, removed rag blockage
28/12/2017	1/26 Pandora Pl	L1	106	Rubbish	0	
23/12/2017	5 Bruce Pl	L1	101	Unknown	0	Heavy flush, rubbish removed from main
4/03/2018	5 Bruce Pl	L1	132	Rubbish	0	
24/02/2017	16 Chesley Pl	L1	173	Roots	0.51	Rootcut
22/08/2017	16 Chesley Pl	L1	580	Roots	0	
24/09/2017	14 Tomuri Pl	L1	209	Roots	0	Rootcut
21/03/2018	14 Tomuri Pl	L1	230	Roots	0	
3/03/2017	2/71 Boundary Rd	L1	143	Fat	0	Heavy fats removed from main
5/12/2017	2/71 Boundary Rd	L1	125	Fat	0	
21/02/2018	3 Golf Ave	L1	127	Unknown	3.5	Broken pipe repaired
6/03/2018	3 Golf Ave	L1	238	Broken pipe	0	
20/08/2017	188 Pakuranga Rd	L1	175	Roots	2.97	Under investigation
18/10/2017	188 Pakuranga Rd	L1	284	Unknown	2.5	
21/10/2017	188 Pakuranga Rd	L1	511	Unknown	0	
13/11/2017	188 Pakuranga Rd	L1	58	Unknown	1.5	
20/02/2018	188 Pakuranga Rd	L1	610	Unknown	2.5	
14/08/2017	24 Aberfeldy Ave	L1	525	Unknown	1.98	Heavy flushed main
29/11/2017	24 Aberfeldy Ave	L1	76	Unknown	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
27/08/2017	28 Windoma Cir	L1	643	Unknown	3.38	Heavy flushed to remove fats
28/11/2017	28 Windoma Cir	L1	107	Fat	0	
10/03/2018	28 Windoma Cir	L1	454	Fat	0	
30/10/2017	83 Kilkenny Dr	L1	92	Roots	1	Rootcut
18/01/2018	83 Kilkenny Dr	L1	59	Fat	34	
16/11/2017	34 Church St	L1	118	3rd party damage	0	Pipe repaired
24/11/2017	34 Church St	L1	81	3rd party damage	0	
10/08/2017	36 Lunn Ave	L1	230	Broken pipe	0.49	Tomo, pipe relaid
20/09/2017	36 Lunn Ave	L1	505	Unknown	0	
26/09/2017	36 Lunn Ave	L1	512	Unknown	8.21	
29/09/2017	36 Lunn Ave	L1	357	Unknown	0.48	
22/11/2017	1/294 Ellerslie-Panmure Highway	L1	45	Rubbish	0	CCTV, heavy flush
22/06/2018	1/294 Ellerslie-Panmure Highway	L1	102	Fat	0.5	
16/11/2016	2/329 Pakuranga Rd	L1	122	Fat	2.96	Heavy fats removed
22/07/2017	2/329 Pakuranga Rd	L1	534	Fat	14	
18/10/2017	13 Nevada Ave	L1	526	Fat	2.5	Rootcut and heavy flush
9/05/2018	13 Nevada Ave	L1	402	Unknown	1	
28/08/2017	90 Franklyne Rd	L1	619	Fat	11.11	Roots and mortar removed
2/09/2017	90 Franklyne Rd	L1	86	Rubbish	16.42	
11/01/2017	11 Glennandrew Dr	L1	83	Fat	0	Heavy flushed, fats removed
30/11/2017	11 Glennandrew Dr	L1	88	Unknown	1	
24/01/2017	18 Marendellas Dr	L1	87	Fat	0	Rootcut
8/08/2017	18 Marendellas Dr	L1	636	Roots	3.46	
29/01/2017	42 Albert St	L1	150	Roots	0	Heavy flushed
9/10/2017	42 Albert St	L1	618	Roots	0.97	
13/02/2017	95 Te Irirangi Dr	L1	64	Unknown	1.48	Heavy flushed, removed heavy fat buildup
26/05/2018	2/95 Te Irirangi Dr	L1	418	Fat	0.5	
14/02/2017	6 Church St	L1	533	Rubbish	3.44	Concrete removed from main
18/07/2017	6 Church St	L1	144	3rd party damage	0	
9/03/2017	242 Princes St-E	L1	226	Roots	0	Fats and debris removed

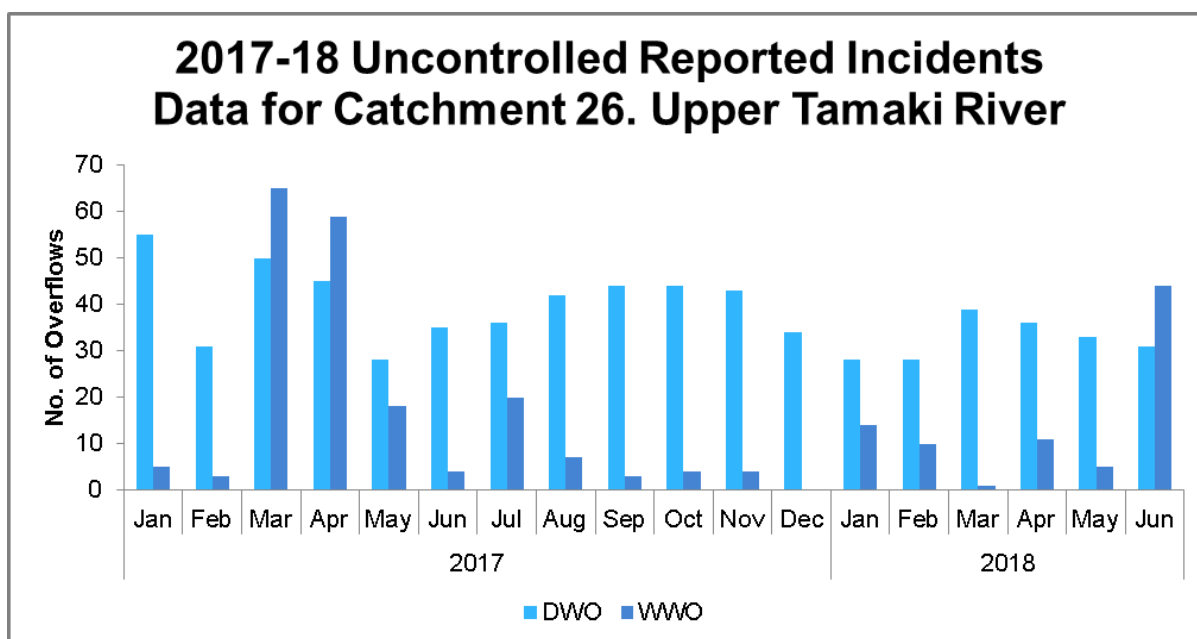
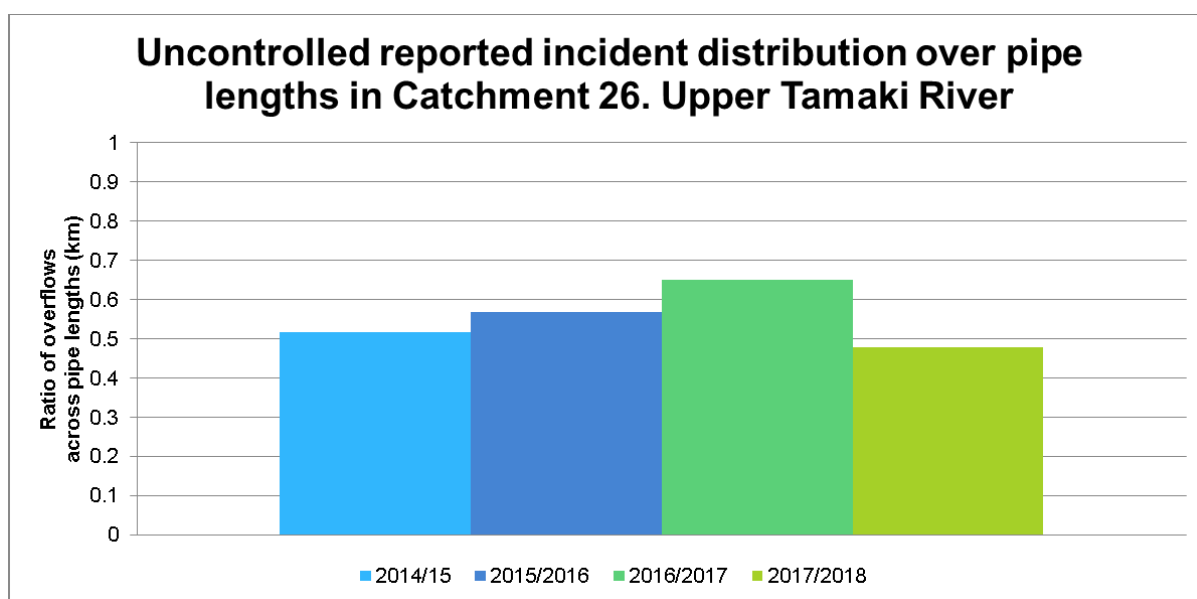
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
8/03/2018	242 Princes St-E	L1	201	Silts	2	
21/03/2017	10 Nevada Ave	L1	437	Fat	0	Fats and roots removed
29/09/2017	10 Nevada Ave	L1	65	Unknown	0.48	
5/04/2017	31 Atkinson Ave	L1	504	Surcharging	32.57	Silts removed, heavy flush
4/07/2017	31 Atkinson Ave	L1	211	Silts	0.49	
14/04/2018	165 Avenue Rd-E	L1	176	Surcharging	84	Under investigation
3/06/2018	165 Avenue Rd-E	L1	31	Surcharging	67.5	
15/04/2018	18 Covina Pl	L1	218	Surcharging	5	Under investigation for cross connections
3/06/2018	18 Covina Pl	L1	407	Surcharging	67.5	
22/05/2017	186 Panama Rd	L1	118	Unknown	0	Heavy flushed, heavy fats removed
7/08/2017	186 Panama Rd	L1	158	Fat	0	
26/06/2017	248- Marua Rd	L1	142	Rubbish	0.5	Heavy flushed, large dips and rock in main
18/09/2017	248- Marua Rd	L1	88	Fat	10.62	
25/06/2017	160 Waipuna Rd-E	L1	429	Unknown	2	Heavy fats removed
27/10/2017	160 Waipuna Rd-E	L3	528	Fat	5	
16/07/2017	15 Miramar Pl	L1	84	Unknown	0	Continue to monitor
21/03/2018	15 Miramar Pl	L1	266	Unknown	0	
17/07/2017	4 Nixon Ave	L1	123	Rubbish	0	Large rag blockage removed
20/07/2017	4 Nixon Ave	L1	563	Rubbish	10	
7/08/2017	23 Bartells Dr	L1	96	Roots	0	Rootcut
21/08/2017	23 Bartells Dr	L1	109	Roots	1.48	
18/08/2017	24 Whiteacres Dr	L1	100	Fat	0	Heavy flushed main of fats
25/01/2018	24 Whiteacres Dr	L1	49	Rubbish	0	
5/06/2018	24 Whiteacres Dr	L1	265	Fat	4	
19/08/2017	3 Bruce Pl	L1	442	Surcharging	4.94	Rags and debris removed from manhole
25/09/2017	3 Bruce Pl	L2	677	Unknown	0	
15/02/2018	3 Bruce Pl	L1	148	Rubbish	0.5	
25/03/2018	3 Bruce Pl	L1	173	Unknown	4	
24/09/2017	2/35 Voltaire Crt	L1	100	Fat	0	Roots and fats removed from several lines in the area
1/10/2017	2/35 Voltaire Crt	L1	77	Fat	16.9	
11/10/2017	2/35 Voltaire Crt	L1	71	Fat	4.35	
25/09/2017	46 Botany Rd	L1	86	Unknown	0	Debris in main removed

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
15/10/2017	46 Botany Rd	L1	96	Foreign Object	0	
24/10/2017	46 Botany Rd	L1	73	Fat	0.5	
27/09/2017	D/14 Arwen Pl	L1	136	Fat	0.48	Under investigation for Trade Waste compliance
23/02/2018	D/14 Arwen Pl	L1	165	Fat	0.5	
28/09/2017	40 Neales Rd	L1	479	Unknown	0	Rootcut
14/11/2017	40 Neales Rd	L1	166	Roots	5	
24/10/2017	88 Highbrook Dr	L1	157	Fat	0.5	Heavy flushed, large fat blockages
27/10/2017	88 Highbrook Dr	L2	174	Unknown	5	
26/10/2017	70 Franklyne Rd	L1	163	Fat	2	Blockage of roots and mortar removed
17/11/2017	70 Franklyne Rd	L1	607	Fat	0	
27/06/2018	70 Franklyne Rd	L3	16	Fat	0.5	
6/11/2017	19 Sean Fitzpatrick Pl	L1	265	Unknown	0	Heavy flushed
8/11/2017	19 Sean Fitzpatrick Pl	L1	133	Fat	13	
11/11/2017	29 Whiteacres Dr	L1	59	Unknown	0	Large rag blockage removed
5/04/2018	29 Whiteacres Dr	L1	96	Fat	0.5	
1/01/2018	3 Shrute Pl	L1	594	Fat	5	Heavy fats, heavy flushed main
4/01/2018	3 Shrute Pl	L1	643	Fat	47.5	
17/01/2018	32 Flat Bush Rd	L1	69	Fat	0.5	Surcharging issue, blockage removed
20/01/2018	32 Flat Bush Rd	L1	69	Foreign Object	0	
23/01/2018	32 Flat Bush Rd	L1	494	Surcharging	6.5	
14/02/2018	47 Mataroa Rd	L1	158	Unknown	3.5	Continue to monitor
23/02/2018	47 Mataroa Rd	L1	188	Unknown	0.5	
25/02/2018	35 Ngaio St	L1	520	Unknown	0	6 monthly flushing schedule
27/02/2018	35 Ngaio St	L1	85	Unknown	4	
25/03/2018	10 Williams Cres	L1	74	Fat	4	Debris removed from main
17/05/2018	10 Williams Cres	L1	152	Rubbish	2.5	
30/03/2018	29 Hamlin Rd	L1	63	Unknown	3.5	Heavy flushed
1/04/2018	29 Hamlin Rd	L1	273	Unknown	0	
25/04/2018	2/14 Israel Ave	L1	455	Fat	0.5	Heavy fats and rubbish removed
28/04/2018	2/14 Israel Ave	L1	153	Rubbish	15	
30/08/2017	37 Church St	L1	149	Broken Pipe	16.42	Dislodged pipe repaired
1/09/2017	37 Church St	L1	158	Broken Pipe	0.49	

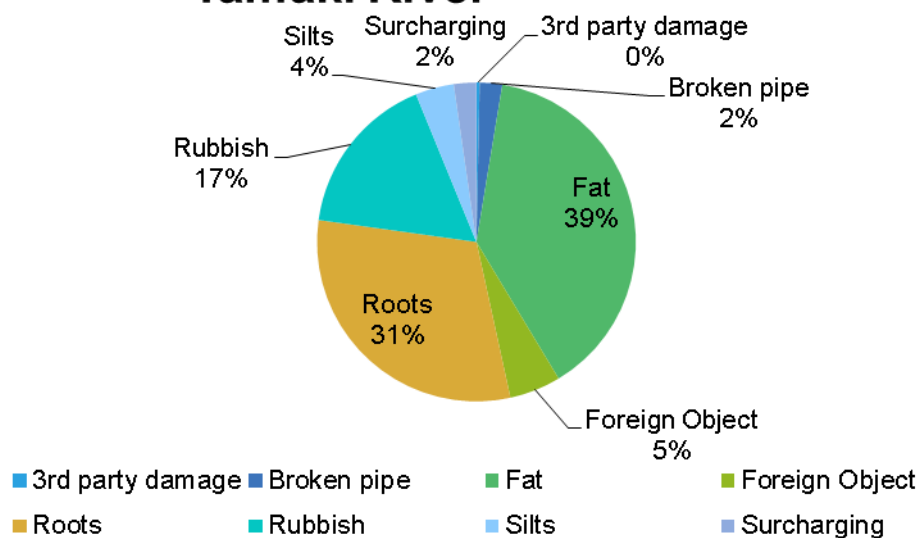
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
16/10/2017	14 Nogat Ave	L1	548	Fat	0	Heavy fats removed
16/05/2018	14 Nogat Ave	L1	86	Fat	4	

1.26.3 Trend analysis of reported incidents

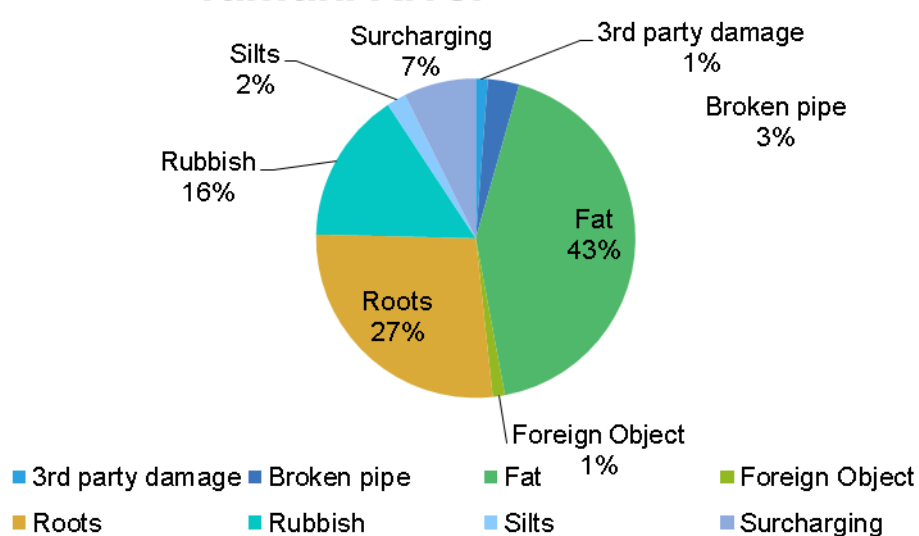
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



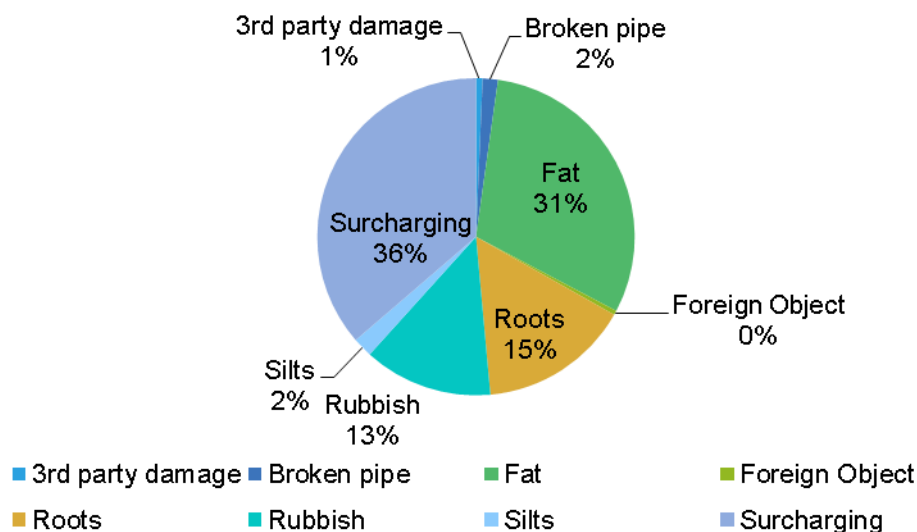
2014-15 Data for Catchment 26. Upper Tamaki River



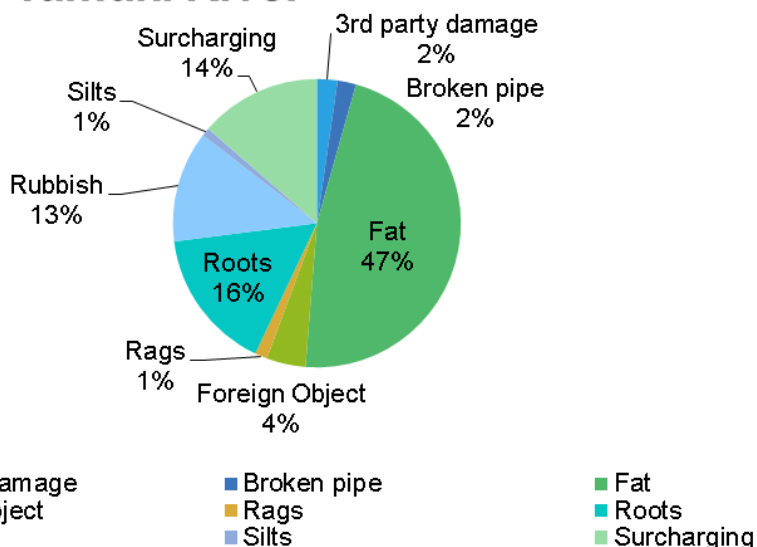
2015-16 Data for Catchment 26. Upper Tamaki River



2016-17 Data for Catchment 26. Upper Tamaki River



2017-18 Data for Catchment 26. Upper Tamaki River



Trend analysis has been carried out where the cause has been identified.

1.26.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
6/07/2017	DPOTN	Otahuhu North Diversion MH07	1546	Rain event	197	37.23
6/07/2017	DPOTB	Otara Wholesale Wastewater Pump Station	683	Rain event	332	37.23
9/08/2017	DPHIN	Pakuranga Wholesale Wastewater Pump Station	667	Rain event	52	19.29
1/02/2018	DPPKS	Pakuranga South Wholesale Wastewater Pump Station	676	Rain event	118	28

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
11/02/2018	DPOTN	Otahuhu North Diversion MH07	1546	Rain event	161	42.5
11/02/2018	DPHIP	Highland Park Wastewater Pump Station	1005	Rain event	192	42.5
12/02/2018	DPMID	Middlemore Wholesale Wastewater Pump Station	684	Rain event	194	0.5
13/03/2018	DPARW	Arwen Place Wastewater Pump Station	1009	Rain event	200	3
10/04/2018	DPMID	Middlemore Wholesale Wastewater Pump Station	684	Rain event	92	27
14/04/2018	DPOTN	Otahuhu North Diversion MH07	1546	Rain event	510	84
14/04/2018	DPSPK	Sylvia Park Wholesale Wastewater Pump Station	670	Rain event	179	84
3/06/2018	DPOTN	Otahuhu North Diversion MH07	1546	Rain event	189	67.5
3/06/2018	DPHIP	Highland Park Wastewater Pump Station	1005	Rain event	232	67.5
3/06/2018	DPSPK	Sylvia Park Wholesale Wastewater Pump Station	670	Rain event	137	67.5
3/06/2018	DPPEL	Pelorus Place Wastewater Pump Station	1149	Rain event	268	67.5
3/06/2018	DPBUR	Burswood Drive Wastewater Pump Station	998	Rain event	23	67.5
4/06/2018	DPHIP	Highland Park Wastewater Pump Station	1005	Rain event	228	31
4/06/2018	DPOTN	Otahuhu North Diversion MH07	1546	Rain event	552	31
4/06/2018	DPPEL	Pelorus Place Wastewater Pump Station	1149	Rain event	123	31
4/06/2018	DPSPK	Sylvia Park Wholesale Wastewater Pump Station	670	Rain event	195	31
12/06/2018	DPAVI	Aviemore Drive Wastewater Pump Station	984	Rain event	14	38.5
12/06/2018	DPSPK	Sylvia Park Wholesale Wastewater Pump Station	670	Rain event	130	38.5
13/06/2018	DPMID	Middlemore Wholesale Wastewater Pump Station	684	Rain event	3	2.5

1.26.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
464	Jane Cowie Place WWPS	1	0	0	0	0	0	Continue to monitor
465	Otahuhu North East Wholesale WWPS	1	0	0	8	0	2.7	Continue to monitor
628	Panama Road WWPS	1	0	0	0	0	0	Continue to monitor
630	Penrose Road WWPS	0.6	1	0	0	0	0.25	Continue to monitor
648	Tahatai Street WWPS	1	0	0	0	0	0	Continue to monitor
666	Otahuhu North Wholesale WWPS	6	1	2	0	5	2	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
667	Pakuranga Wholesale WWPS	8	2	2	13	1	4.5	Howick Diversion / Catchment upgrades
670	Sylvia Park Wholesale WWPS	2	0	0	2	4	1.5	Continue to monitor
673	Tamaki East Wholesale WWPS	0.1	0	0	0	0	0	Continue to monitor
675	Botany Wholesale WWPS	0	0	1	0	0	0.3	Continue to monitor
676	Pakuranga South Wholesale WWPS	0.1	0	0	1	1	0.5	Continue to monitor
683	Otara Wholesale WWPS	0	0	2	13	1	4	Otara Branch Sewer / Catchment Upgrades
684	Middlemore Wholesale WWPS	4	1	0	9	3	3.25	Continue to monitor
698	Ormiston Wholesale WWPS	0	0	0	0	0	0	Continue to monitor
984	Aviemore Drive WWPS	0.4	0	0	0	1	0.25	Continue to monitor
998	Burswood Drive WWPS	1	0	0	0	1	0.25	Continue to monitor
1004	Stonedon Drive WWPS	0.4	0	0	0	0	0	Continue to monitor
1005	Highland Park WWPS	1.2	0	0	0	3	0.75	Continue to monitor
1010	Hannah Road WWPS	0.4	0	0	0	0	0	Continue to monitor
1141	Lloyd Elsmore Park WWPS	0	0	0	0	0	0	Continue to monitor
1142	Cascades Road WWPS	0.4	0	0	0	0	0	Continue to monitor
1143	Gossamer Drive WWPS	2.8	0	0	0	0	0	Continue to monitor
1149	Pelorus Place WWPS	1.8	0	0	0	2	0.5	Continue to monitor
1150	Riverhills Park WWPS	0.8	0	0	0	0	0	Continue to monitor
1152	Cryers Road WWPS	0.6	0	0	0	0	0	Continue to monitor
1153	Harris Road WWPS	0.4	0	0	0	0	0	Continue to monitor
1154	Highbrook Park WWPS	0	0	0	0	0	0	Continue to monitor
1155	Luke Place WWPS	0.2	0	0	0	0	0	Continue to monitor
1156	Lawrence Place WWPS	0	0	0	0	0	0	Continue to monitor
1181	Ballarat Street 1 WWPS	0.2	1	0	0	0	0.3	Continue to monitor
1182	McDonald Crescent WWPS	0.4	0	1	1	0	0.6	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1183	Harris Road WWPS	0	0	0	0	0	0	Continue to monitor
1184	Motu Place WWPS	0	0	0	0	0	0	Continue to monitor
1185	Ferndale Road WWPS	0	0	0	0	0	0	Continue to monitor
1186	Banks Street WWPS	0.2	0	0	0	0	0	Continue to monitor
1190	Mount Richmond 1 WWPS	0	0	0	0	0	0	Continue to monitor
1191	Mount Richmond 2 WWPS	0.8	0	0	0	0	0	Continue to monitor
1193	Rodney Street WWPS	1.4	6	0	0	0	2	Suspected 2014/15 year was over-reported.
1195	Ballarat Street 2 WWPS	0.6	0	0	0	0	0	Continue to monitor
1196	Carrs Place WWPS	0.4	0	0	0	0	0	Continue to monitor
1200	Joe Stanley Place WWPS	1.2	0	0	0	0	0	Continue to monitor
1009	Arwen Place Wastewater Pump Station	-	0	0	0	1	0.25	Continue to monitor

Type 2 EOPs – Network Relief rolling WWO data from 1 July 2014 – 30 June 2018

The Type 2 EOPs 1534 and 1549 have a permanent monitor installed at these facilities. This information is provided as it is available, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the Wastewater Network Strategy and the overall network performance in this catchment.

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1534	Graeme Ave	n/a	n/a	1	9	7	5.67	Continue to monitor
1549	14 Mclean Ave	-	-	-	-	1	1	Continue to monitor

Type 3 locations rolling WWO data from 1 July 2014 – 30 June 2018

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
S6	Millhouse Reserve	1.3	0	0	0	2	0.5	Howick Diversion / Catchment Upgrade
S59	Otara Branch MH17	n/a	n/a	2	5	4	3.6	Otara Branch Sewer / Catchment Upgrades
S60	Otara Branch	n/a	n/a	2	6	5	3.25	Otara Branch Sewer /

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
	MH16A							Catchment Upgrades
S58	Otara Branch MH18	n/a	n/a	2	5	3	3.33	Otara Branch Sewer / Catchment Upgrades
S7	11 Crown Crescent	2	0	0	0	0	0	Otara Branch Sewer / Catchment Upgrades
S66	Bucklands Beach Branch MH19A	-	2	0	7	3	3	Howick Diversion / Catchment Upgrade

1.26.6 Inflow & Infiltration Programme

Smoke testing of 1,500 properties has been completed in Papatoetoe, Mclean Avenue. Defects have been identified in 41 properties. These have been sent to Auckland Council who will notify the property owners of the defect and the required remedial measures.

A review of I&I in this catchment will be done as part of Watercare's I&I programme, where the priority of this catchment will be determined.

1.26.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Manukau North local wastewater network improvements	Various stages	Network is under capacity for current and future demands	Reduce frequency of overflows to less than two per year for current and future flows.	2015-2020
Underway	Manukau West upgrades	Variable	Known Type 3 issue locations were identified under this study. A large suite of isolated upgrades were identified to be progressively implemented	Address Type 3 overflows S1 to S5 inclusive) for current and future flows	2017-2025
Underway	Tamaki redevelopment catchment upgrades	Options analysis (Feasibility)	There are known high frequency and volume EOPs in this catchment, and high growth with the proposed HNZ redevelopment	The preferred suite and timing of upgrades for this catchment to achieve reduced frequency of wet weather overflows at multiple EOPs	2017-2024

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
				and optimising the performance of the Glendowie branch sewer upgrade	
Underway	Otara branch sewer / catchment upgrades (Otara diversion sewer)	Design	Overflows from the Otara catchment currently exceed two spills per year from both controlled and uncontrolled locations	Expected to reduce overflows in Otara to less than 2 per year and address suspected Type 3 overflows for current and future populations	2015-2023

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Howick diversion / catchment upgrades	Option analysis (Feasibility)	Several overflows from the Howick catchment currently exceed two spills per year from both controlled and uncontrolled locations. This will increase with predicted growth	Expected to reduce overflows in this catchment to less than two per year for current and future flows. This project will be scoped to consider the current and future flows from the Cockle Bay catchment	2015-2025
Future	Otara Catchment Capacity Upgrades	Options Analysis (Feasibility)	Programme of work to enable growth and reduce wet weather overflows	Reduction of discharges of wastewater to the environment	2018-2021
Complete	Pakuranga Pipe Work Replacement PS28	Closure	Upgrade of aging pipework at WWPS DPS028	Reduction of discharges of wastewater to the environment	2011-2017
Underway	Glendowie Branch sewer upgrade	Project Execution	Overflows from the Point England pump station, and network overflows exceed two spills per year and this is predicted to increase over time as a result of growth in catchment	Reduced frequency of wet weather overflows at EOPs 188, 189, and 681	2012-2020

Minor improvements works include:

- Howick and Sylvia Park pump replacements: These are renewal projects that will improve the wet weather performance at EOPs 662 and 670 (although these are compliant), and reduce the risk of dry weather overflows.
- Middlemore and Otahuhu North East Pump Stations: Concept options to manage the wet weather performance of these pump station will be investigated in the Mangere SMA model for further detailed investigation and regional prioritisation.

1.26.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.26.9 Summary

Three Type 1 EOPs discharged more than two times per year on average in this reporting period. The Otara and Howick upgrade projects will provide significant additional network capacity and improve the wet weather performance in this catchment. The overflow history will be analysed and utilised when reviewing future network improvement programmes. I&I will be reviewed in this Catchment as part of the region-wide programme. The ratio of uncontrolled overflows to pipe length decreased in 2017/18, with the predominant factor being fats. The

network has been extended by 187km and developed to accommodate for population growth in the region due to substantial Greenfield expansion in this catchment. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.27 Catchment 27 – Cockle Bay

1.27.1 Overview

The Cockle Bay catchment is located along the eastern coast of the Bucklands Beach peninsula. It is a long narrow catchment, which extends along the coastline from Musick Point in the north to Shelly Park and the Maungamaungaroa Creek in the south, incorporating Eastern Beach, Mellons Bay, Howick Beach and Cockle Bay. There are 5,146 wastewater connections.

Land use in the Cockle Bay catchment is predominantly low to medium density residential, with pockets of open space and local retail and commercial areas. There are no industrial sites within the catchment. The many beaches, reserves and walkways in this catchment provide significant recreation opportunities for residents and visitors to the area, particularly through access to the coast.

	2014/15	2015/16	2016/17	2017/18
No. of connections	5,131	5,131	5,146	5,149
Length of sewer (km)	104	104	104	123

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
662	Howick WWPS	DPHOW	1	Howick Beach
976	Sandspit Road WWPS	DPSAN	1	Shelly Park Beach
1013	Estuary Views WWPS	DPEST	1	Maungamaungaroa Creek
1139	Chisbury Terrace WWPS	DPCHI	1	Maungamaungaroa Creek
1140	Ramoana Mews WWPS	DPRNA	1	Maungamaungaroa Creek
1172	Mellons Bay WWPS	DPMEB	1	Mellons Bay
1173	Cockle Bay WWPS	DPCOC	1	Cockle Bay

There have been no changes to the schedule of EOPs in this catchment.

1.27.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported incidents

There were a total of 44 reported incidents in the Cockle Bay catchment.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

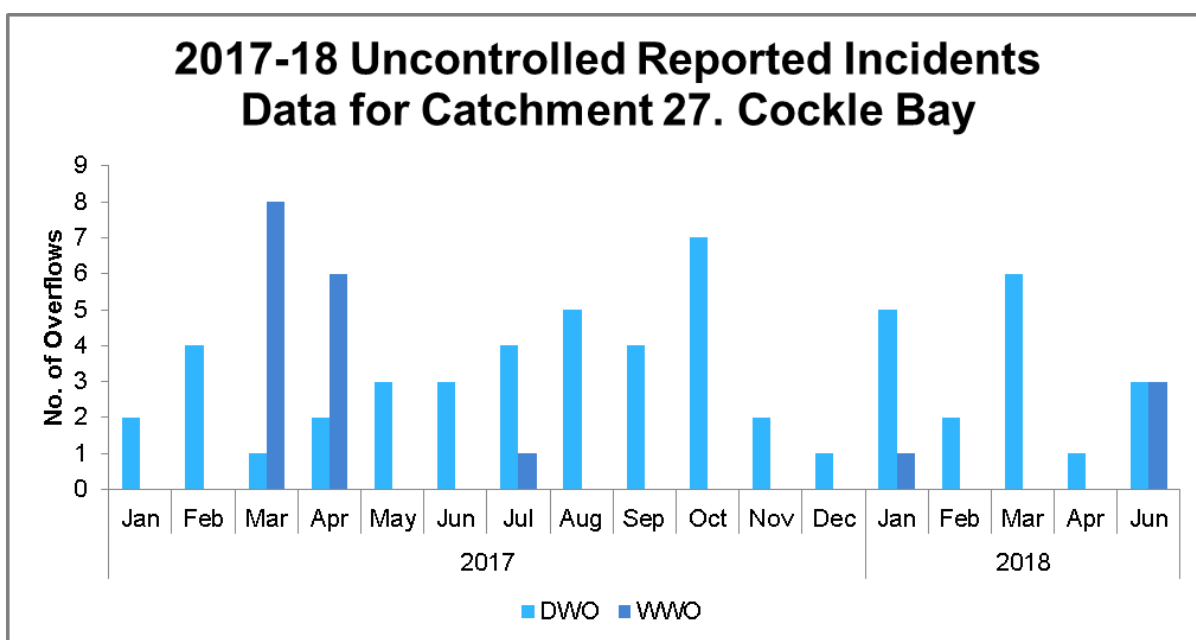
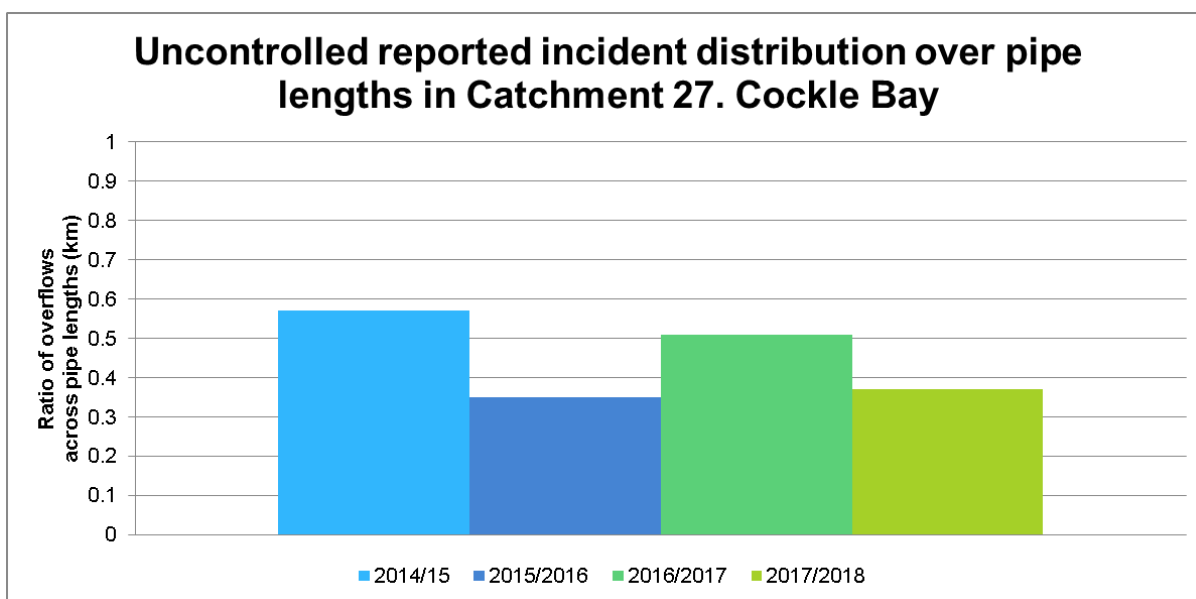
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over

a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
12/03/2017	1 The Esplanade	L1	100	1 The Esplanade	16.78	Heavy flushed
19/07/2017	1/1A The Esplanade	L1	149	1/1A The Esplanade	0.5	
15/02/2017	23 John Gill Rd	L1	144	Fat	0	Fat in mains, heavy flushed
18/03/2017	23 John Gill Rd	L1	125	Unknown	0	
30/07/2017	23 John Gill Rd	L1	90	Unknown	0	
10/08/2017	1 Holbrook Pl	L1	4	Fat	0.49	NRV installed
17/03/2018	1 Holbrook Pl	L1	107	Rubbish	0	
18/03/2018	1/14 Trident Pl	L1	75	Roots	1	Rootcut, fats removed
21/03/2018	1/14 Trident Pl	L1	120	Fat	0	
28/08/2017	41 Seymour Rd	L1	124	Foreign Object	11.11	Rubbish removed from mains
11/09/2017	41 Seymour Rd	L1	651	Unknown	3.86	
3/06/2018	43A Advane Rd	L1	61	Surcharging	67.5	Under investigation
14/06/2018	43A Advane Rd	L1	121	Surcharging	1	
23/02/2018	18 Burford Pl	L1	147	Rubbish	0.5	Concrete block removed from main
9/06/2018	18 Burford Pl	L1	120	Foreign Object	0	

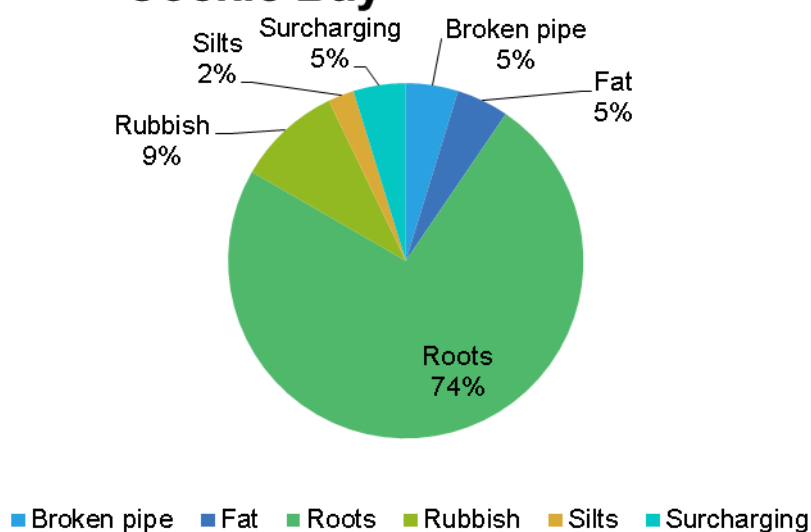
1.27.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



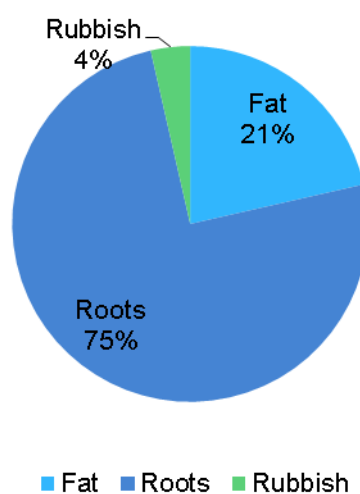
2014-15 Data for Catchment 27.

Cockle Bay

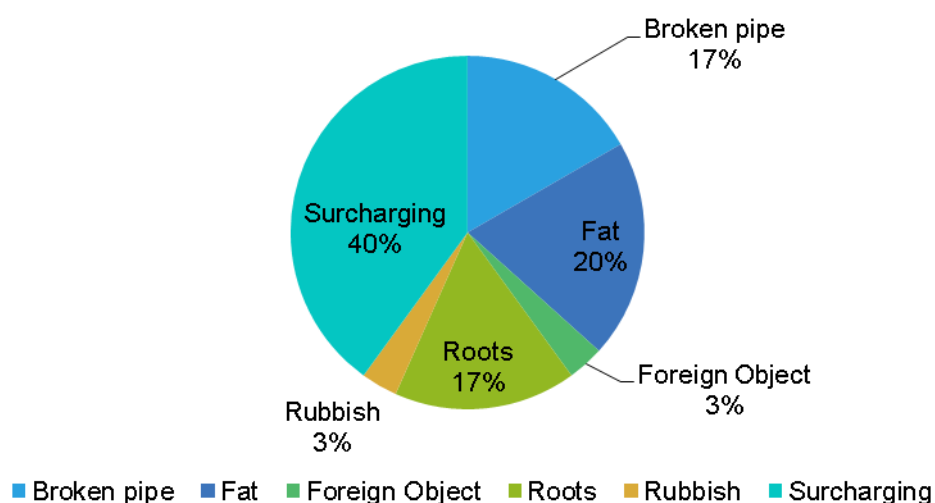


2015-16 Data for Catchment 27.

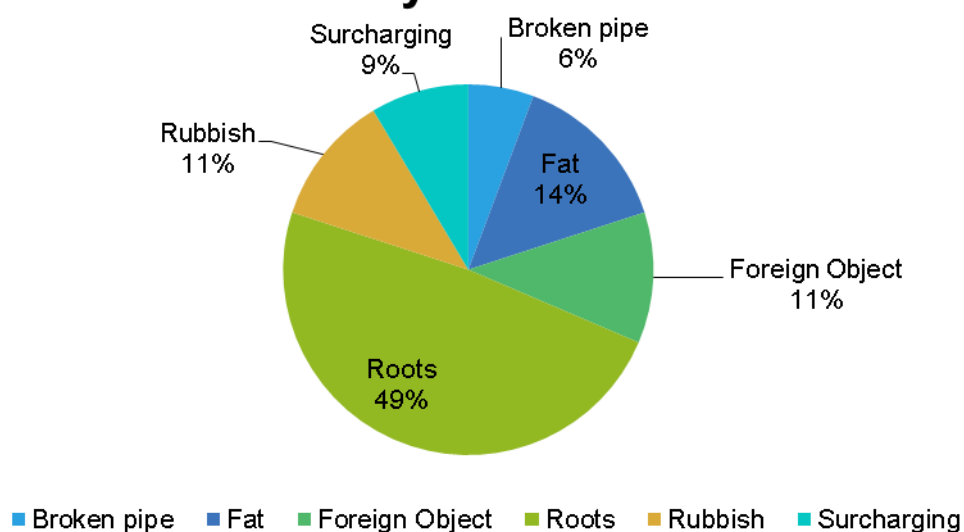
Cockle Bay



2016-17 Data for Catchment 27. Cockle Bay



2017-18 Data for Catchment 27. Cockle Bay



Trend analysis has been carried out where root cause has been identified.

1.27.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
6/07/2017	DPHOW	Howick Wholesale Wastewater Pump Station	662	Rain event	161	37.23
14/04/2018	DPHOW	Howick Wholesale Wastewater Pump Station	662	Rain event	114	84
3/06/2018	DPHOW	Howick Wholesale Wastewater Pump Station	662	Rain event	175	67.5

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
5/06/2018	DPHOW	Howick Wholesale Wastewater Pump Station	662	Rain event	23	4

1.27.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
662	Howick WWPS	0	0	2	4	4	2.5	Howick interceptor diversion / Catchment Upgrade
976	Sandspit Road WWPS	0.8	0	0	0	0	0	Continue to monitor
1013	Estuary Views WWPS	0.8	0	0	0	0	0	Continue to monitor
1139	Chisbury Terrace WWPS	0.2	0	0	0	0	0	Continue to monitor
1140	Ramoana Mews WWPS	0.4	0	0	0	0	0	Continue to monitor
1172	Mellons Bay WWPS	0	0	0	0	0	0	Continue to monitor
1173	Cockle Bay WWPS	0	0	0	0	0	0	Continue to monitor

Type 3 locations rolling WWO data from 1 July 2014 – 30 June 2018

Type 3 ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
S63	Mellons Bay Branch MH16	n/a	n/a	n/a	6	3	4.5	I&I investigations underway to reduce wet weather flows. Reconfigure EOP at storage tank to protect against uncontrolled spills
S64	204 Mellons Bay Rd	n/a	n/a	n/a	3	2	2.5	I&I investigations underway Reconfigure EOP at storage tank to protect against uncontrolled spills

1.27.6 Inflow & Infiltration Programme

In Mellon's Bay 1,560 properties inspected in 2016-17, 27 were confirmed with incorrect stormwater connections to wastewater sewerage system. A further 21 properties require further investigations as evidence suggests that there is interconnection between the storm drains and wastewater sewers. The owners of the 27 properties confirmed as non-conformance have been notified in writing and Council compliance staff informed. Currently carrying out further I&I investigations including CCTV and completing &I remedial works in the Mellons Bay and Cockle Bay catchments.

1.27.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Network improvements – Mellons Bay	Option analysis (Feasibility)	Type 3 overflows have been recently identified in this location	Along with I&I remediation, network changes to mitigate wet weather overflows	2017-Ongoing
Underway	Howick Diversion (Howick Catchment Upgrades)	Option Analysis (Feasibility)	Several overflows from the Howick catchment currently exceed two spills per year from both controlled and uncontrolled locations. This will increase with predicted growth	This project will be scoped to consider the current and future flows from the Cockle Bay catchment.	2015-2025

1.27.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.27.9 Summary

This catchment was greatly affected by storm events in recent years. These surcharging overflows have decreased from 40% to 9% after Inflow and Infiltration investigations in the area. The ratio of overflows to pipe length has decreased, with roots and surcharging making up the majority of overflows in this reporting period. There was one EOP which discharged more frequently than two spills per year on average. There are network performance constraints associated with high inflow and infiltration which is evident in the recently identified Type 3 overflow locations; these will be addressed through the I&I programme and network improvements. The Howick Diversion/Catchment upgrade project will enable future network improvements and provide for growth. The overflow history will be analysed and utilised when reviewing future network improvement programmes. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.28 Catchment 28 – Puhinui

1.28.1 Overview

The Puhinui catchment includes a number of suburbs within Manukau, including Papatoetoe, Puhinui, Wiri, Homai, Mangere and Weymouth. The catchment is located about 18 km southeast of Auckland city centre, to the north-east of Manukau Harbour. There are 19,290 wastewater connections.

The catchment consists predominantly of residential, industrial and commercial land uses, with a small amount of horticultural land. The Auckland Airport is located to the west of the catchment, on the northern side of the Manukau Harbour.

	2014/15	2015/16	2016/17	2017/18
No. of connections	18,780	18,933	19,058	19,290
Length of sewer (km)	372	368	375	446

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
685	Puhinui WWPS	DPPUH	1	Puhinui Stream
688	Papatoetoe West WWPS	DPPPW	1	Unnamed stream – Hillside Rd
689	Weymouth North WWPS	DPWYN	1	Puhinui Creek
962	53R Raglan Street	-	2	Unnamed Stream in Aorere Park
971	35 St George Street	-	2	Unnamed stream – Hillside Rd
1138	McLaughlins Road 1 WWPS	DPMC1	1	Puhinui Stream
1163	Manurewa West WWPS	DPMNW	1	Puhinui Creek
1164	Settlers Cove WWPS	DPSET	1	Unnamed stream (flowing to Weymouth Beach)
1165	Weymouth Domain WWPS	DPWEY	1	Weymouth Beach
1175	McLaughlins Road 2 WWPS	DPMC2	1	Unnamed tributary of Puhinui Stream – McLaughlin Rd
1177	Malaspina Place 1 WWPS	DPMP1	1	Unnamed stream – Kohuora Park
1535	145-147 Wyllie Rd	-	2	Puhinui Stream
1586	Harbour Ridge Drive Pump Station	DPHAB	1	Puhinui Stream

The following EOP has been added to the schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
1586	Harbour Ridge Drive Pump Station	DPHAB	1	Puhinui Stream	New EOP from Developments

1.28.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 193 reported incidents in the Puhinui catchment. No overflows discharged into, or around the Tangata Whenua Management Area watercourse. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
15/01/2018	1/10 Phoenix Pl	L1	95	Fat	0	Under investigation, fats and roots removed
15/03/2018	Phoenix Pl	L1	137	Roots	2.5	
11/06/2018	1/10 Phoenix Pl	L1	135	Fat	20.5	
7/06/2018	103 Park Ave	L1	493	Fat	1	Under investigation. Heavy fats and debris flushed
11/06/2018	103 Park Ave	L1	260	Fat	20.5	
19/09/2017	1/147 Wyllie Rd	L1	613	Foreign Object	2.5	Debris and fats removed from main
15/11/2017	147 Wyllie Rd	L1	52	Fat	0.5	
17/07/2017	35 Finlayson Ave	L1	99	Unknown	0	Heavy fat and debris removed. Under investigation
20/07/2017	35 Finlayson Ave	L1	528	Fat	11	
25/04/2018	35 Finlayson Ave	L1	129	Fat	0.5	
7/03/2018	57 Raglan St	L2	112	Fat	11	Heavy flushed
27/03/2018	57 Raglan St	L2	183	Fat	0	
3/02/2017	88 Puhinui Rd	L1	82	Rubbish	2.5	Under investigation. Fats and rubbish removed from main
8/02/2017	88 Puhinui Rd	L1	56	Fat	1	
14/08/2017	88 Puhinui Rd	L1	78	Unknown	3	
15/09/2017	116 Puhinui Rd	L1	219	Fat	5	Roots, fat, debris,

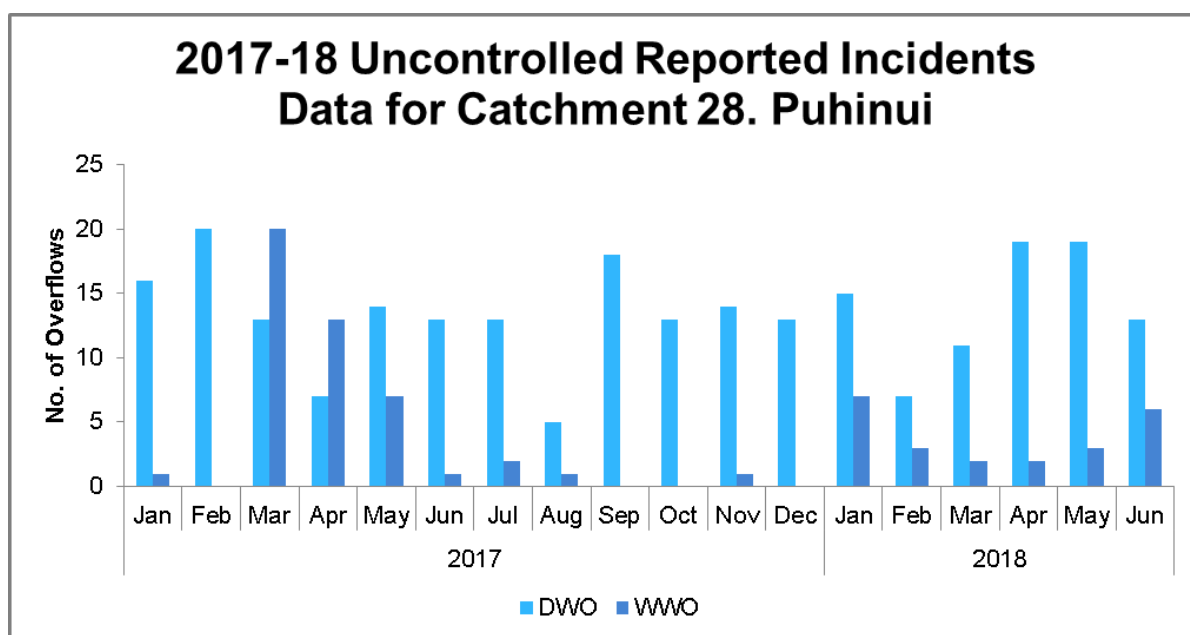
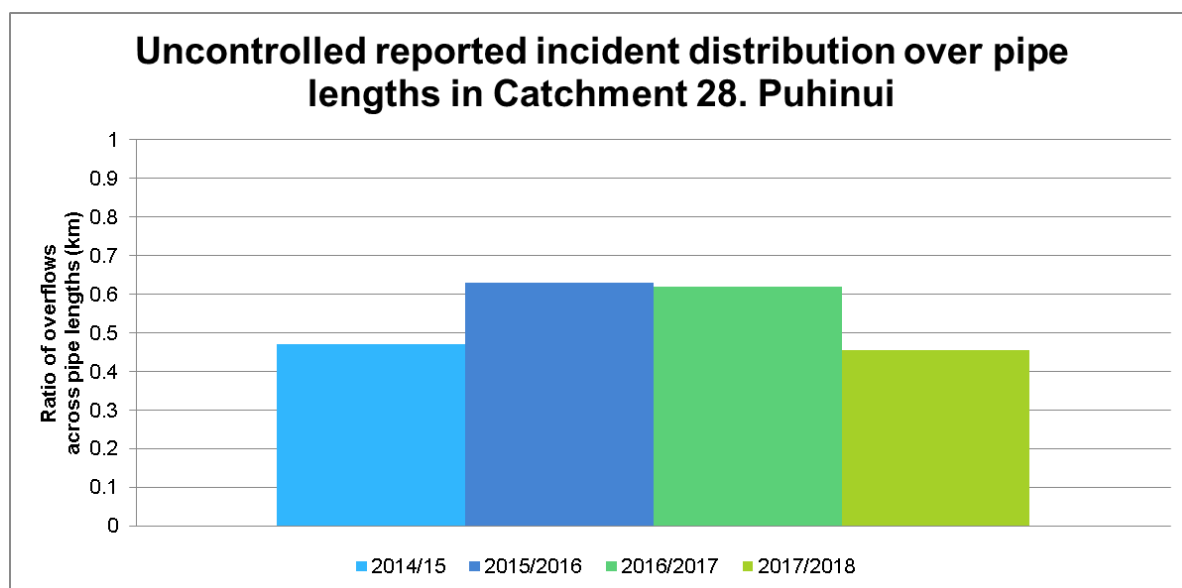
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
6/10/2017	116 Puhinui Rd	L1	38	Fat	1.45	wipes removed from main
6/06/2017	20 Burbank Ave	L1	533	Unknown	0	Fats and debris removed from main
7/09/2017	20 Burbank Ave	L1	562	Fat	4.5	
12/09/2017	20 Burbank Ave	L1	30	Rubbish	2.5	
2/11/2017	55 Burbank Ave	L1	86	Fat	0	Rubbish and fats in main
13/01/2018	55 Burbank Ave	L1	75	Unknown	0	
17/01/2018	55 Burbank Ave	L1	94	Rubbish	0	
11/05/2017	38 Skipton St	L1	496	Rubbish	16	Under investigation by Planning
16/07/2017	38 Skipton St	L1	192	Fat	0	
6/10/2017	38 Skipton St	L1	661	Foreign Object	1.45	
23/11/2017	97 Malaspina Pl	L1	228	Rubbish	0	Lines in area flushed
26/11/2017	86 Malaspina Pl	L1	641	Rubbish	0	
18/01/2018	86 Malaspina Pl	L1	120	Surcharging	33.5	
18/01/2018	99 Malaspina Pl	L1	64	Surcharging	33.5	
20/01/2018	99 Malaspina Pl	L1	456	Unknown	0	
10/03/2017	2/50 Ramsey St	L1	95	Unknown	76.5	Under investigation. Lines flushed and CCTV
14/09/2017	2/50 Ramsey St	L1	153	Fat	0	
12/05/2017	54 Moncrieff Ave	L1	549	Surcharging	59.5	Under investigation
14/09/2017	54 Moncrieff Ave	L1	124	Foreign Object	0	
5/10/2017	2/21 Elizabeth Ave	L1	86	Unknown	0	Under investigation
27/10/2017	2/21 Elizabeth Ave	L1	178	Unknown	7	
30/10/2017	21 Elizabeth Ave	L1	74	Unknown	1.5	
19/01/2018	2/21 Elizabeth Ave	L1	71	Rubbish	14	
12/05/2018	2/21 Elizabeth Ave	L1	49	Broken pipe	11.5	
17/05/2018	2/21 Elizabeth Ave	L1	565	Rubbish	2	
24/06/2017	38 Lendenfeld Dr	L1	78	Rubbish	4.5	Broken pipe repaired
4/08/2017	38 Lendenfeld Dr	L1	82	Broken pipe	0.5	
2/03/2018	5/17A Idesia Pl	L1	214	Unknown	2	Fats and debris removed, manhole repaired
14/05/2018	5/17A Idesia Pl	L1	472	Fat	2	
9/06/2018	5/17A Idesia Pl	L1	232	Unknown	0	
22/06/2017	86 Burundi Ave	L1	588	Rubbish	9.5	6 Monthly Flushing Programme
23/04/2018	88 Burundi Ave	L1	192	Foreign Object	0	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
23/05/2017	80A Station Rd	L1	112	Roots	0	Rootcut, heavy flush
12/03/2018	80A Station Rd	L1	181	Fat	15	
26/08/2016	49R Pah Rd	L1	307	Fat	1.7	Line unblocked
15/07/2017	49R Pah Rd	L1	218	Unknown	0	
21/01/2017	142 Wyllie Rd	L1	313	Unknown	13	Continue to monitor. Heavy fats removed
14/11/2017	142 Wyllie Rd	L1	585	Fat	3	
2/12/2017	29 Templeton Pl	L1	66	Unknown	0	Fats and rags removed
15/12/2017	29 Templeton Pl	L1	193	Fat	0	
19/04/2018	29 Templeton Pl	L1	181	Rags	0	
21/11/2017	73B Fitzroy St	L1	78	Unknown	0	Heavy flushed
29/01/2018	73A Fitzroy St	L1	76	Unknown	0	
7/11/2017	34 Henwood Rd	L1	499	Fat	0	Heavy flush, fats and rubbish removed from main
2/02/2018	34 Henwood Rd	L1	572	Rubbish	0.5	
3/05/2017	11 Topaz Pl	L1	150	Fat	0	Heavy flushed
20/02/2018	11 Topaz Pl	L1	120	Rubbish	7.5	
13/05/2017	1 Heathberry Cl	L1	532	Unknown	0	Heavy fats removed from main. On 36 Monthly Planned Flushing Schedule
4/11/2017	1 Heathberry Cl	L1	93	Fat	10.5	
19/10/2017	12 Ferndown Ave	L1	148	Unknown	0	
13/03/2018	13 Ferndown Ave	L2	79	Fat	2.5	
6/05/2018	1 Heathberry Cl	L1	629	Rubbish	1	
13/01/2017	58 Alabaster Dr	L1	527	Fat	1.5	Fats removed from main
3/09/2017	58 Alabaster Dr	L1	222	Fat	0.5	
2/02/2017	35 Cyclamen Rd	L1	126	Roots	0	Rootcut, rubbish removed
8/07/2017	35 Cyclamen Rd	L1	86	Rubbish	5	
15/01/2018	1/10 Phoenix Pl	L1	95	Fat	0	Heavy flushed
11/06/2018	1/10 Phoenix Pl	L1	135	Fat	20.5	
8/05/2018	4 Brooks Way	L1	470	Unknown	0	Ongoing issue with a siphoned service lateral. Collaborating with Healthy Waters
15/05/2018	4 Brooks Way	L1	476	Broken pipe	0.5	
21/05/2018	4 Brooks Way	L1	477	Broken pipe	5.5	
26/05/2018	4 Brooks Way	L1	544	Unknown	1.5	
28/05/2018	4 Brooks Way	L1	19	Broken pipe	1	
3/06/2018	4 Brooks Way	L1	115	Broken pipe	61	

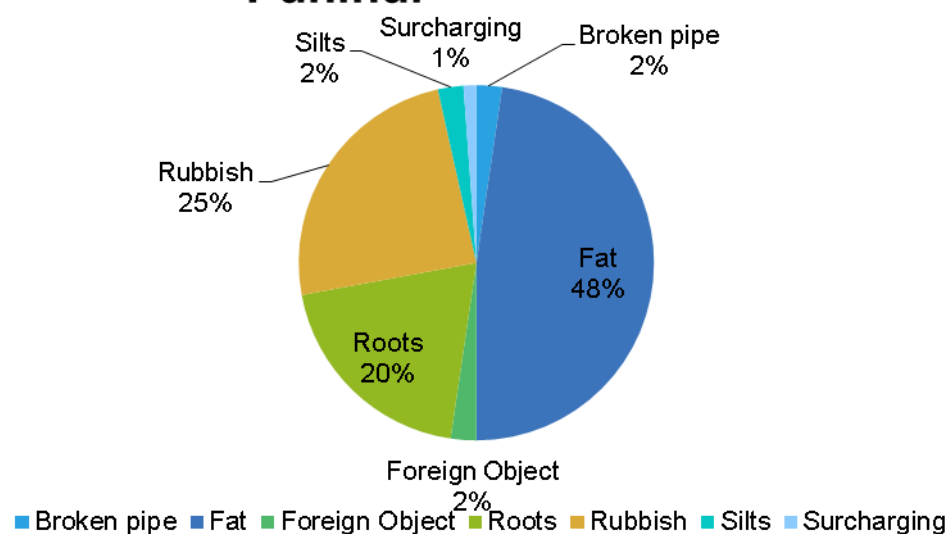
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
7/06/2018	4 Brooks Way	L1	54	Broken pipe	1	
9/06/2018	4 Brooks Way	L1	82	Broken pipe	0	
23/06/2018	4 Brooks Way	L1	394	Broken pipe	0.5	
30/06/2018	4 Brooks Way	L1	156	Broken pipe	0	
2/04/2018	5 Ransom Smyth Dr	L1	585	Broken Pipe	0	Broken pipe repaired
9/04/2018	5 Ransom Smyth Dr	L1	237	Broken pipe	1	
22/03/2017	18 Elsted Pl	L1	96	Roots	0.5	Rootcut
31/07/2017	18 Elsted Pl	L1	560	Roots	0	
12/04/2017	2/140A Browns Rd	L1	239	Unknown	69	Continue to monitor
2/07/2017	2/140A Browns Rd	L1	643	Unknown	9.5	
17/05/2017	16 Dalgety Dr	L1	595	Fat	32.5	Heavy flushed
3/11/2017	16 Dalgety Dr	L1	614	Fat	1	
23/05/2017	57 Pitt Ave	L1	468	Unknown	0	Heavy flushed
29/09/2017	57 Pitt Ave	L1	89	Unknown	0.5	
18/06/2017	5 Celadon Pl	L1	626	Unknown	0	Heavy flushed
4/12/2017	5 Celadon Pl	L1	134	Unknown	5.5	
5/10/2017	10B Cramond Dr	L1	331	Fat	0	Heavy fat jetted from main
19/10/2017	10B Cramond Dr	L1	168	Unknown	0	
14/11/2017	35 Dagenham St	L1	614	Roots	3	Rootcut
19/12/2017	35 Dagenham St	L1	621	Roots	0	
10/02/2018	56 Lawrence Cres	L1	290	Unknown	14	Fats and debris removed from main
3/06/2018	56 Lawrence Cres	L1	9	Surcharging	61	
6/06/2018	56 Lawrence Cres	L1	510	Fat	9.5	
26/04/2018	2 Nicholas Gibbons Dr	L1	525	Rubbish	0	Fats and rubbish removed from main
7/06/2018	2 Nicholas Gibbons Dr	L1	116	Fat	1	
28/05/2018	14 Healy Rd	L1	387	Rubbish	1	Heavy flushed fats from main
12/06/2018	14 Healy Rd	L1	261	Fat	35.5	
18/08/2017	2/44 Plunket Ave	L1	111	Unknown	0.5	Heavy flushed fats from main
30/08/2017	2/44 Plunket Ave	L1	122	Fat	19	
22/05/2018	1/17 Gloucester Rd	L1	8	3rd party damage	2	Third party damage, fibre cable thrustured through service lateral. Damage repaired
25/05/2018	1/17 Gloucester Rd	L1	311	3rd party damage	6.5	

1.28.3 Trend analysis of reported incidents

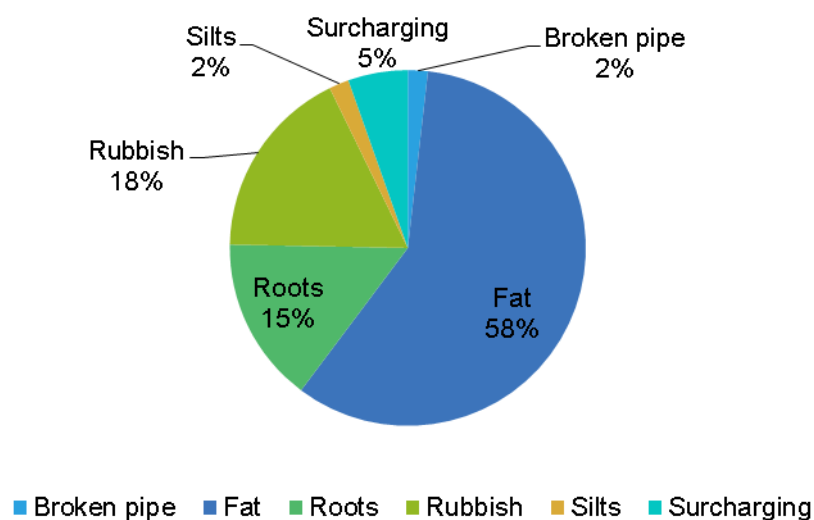
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



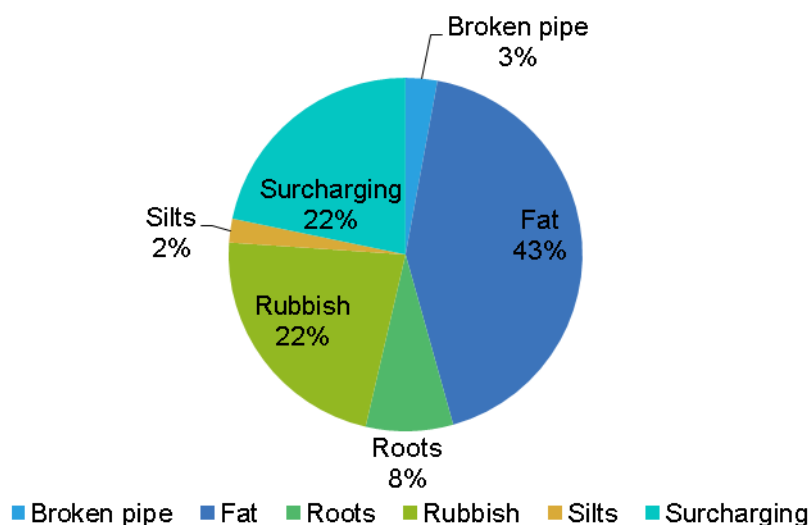
2014-15 Data for Catchment 28. Puhinui



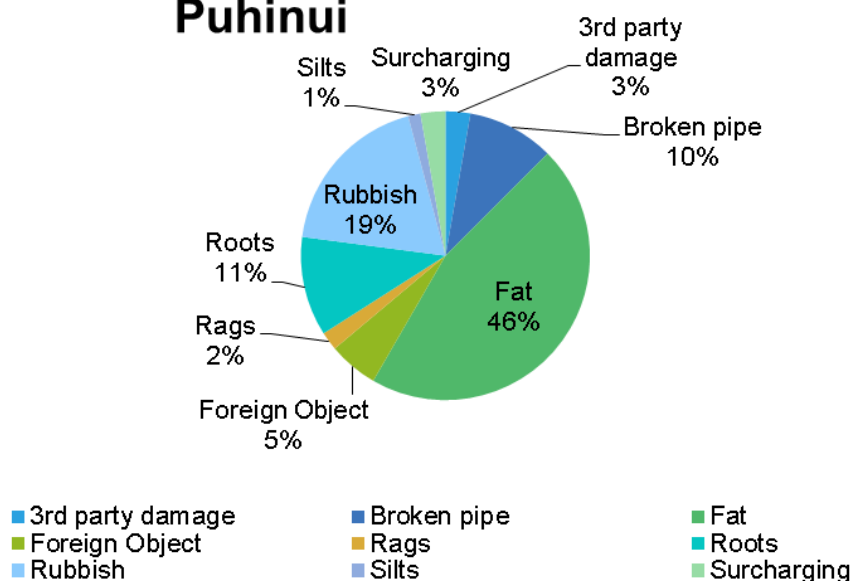
2015-16 Data for Catchment 28. Puhinui



2016-17 Data for Catchment 28. Puhinui



2017-18 Data for Catchment 28. Puhinui



Trend analysis has been carried out where root cause has been identified.

1.28.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
1/02/2018	DPPPW	Papatoetoe Wholesale Wastewater Pump Station	688	Rain event	28	50
10/04/2018	DPPPW	Papatoetoe Wholesale Wastewater Pump Station	688	Rain event	223	33
14/04/2018	DPPPW	Papatoetoe Wholesale Wastewater Pump Station	688	Rain event	59	79.5

1.28.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
685	Puhinui WWPS	0	1	0	2	0	0.75	Continue to monitor
688	Papatoetoe West WWPS	0	0	0	0	3	0.75	Continue to monitor
689	Weymouth North WWPS	0	0	1	1	0	0.5	Continue to monitor
1138	McLaughlins Road 1 WWPS	0.2	0	0	0	0	0	Continue to monitor
1163	Manurewa West WWPS	0.8	1	0	0	0	0.25	Continue to monitor
1164	Settlers Cove WWPS	0.8	0	0	0	0	0	Continue to monitor
1165	Weymouth Domain WWPS	1.4	0	0	0	0	0	Continue to monitor
1175	McLaughlins Road 2 WWPS	0.8	0	0	0	0	0	Continue to monitor
1177	Malaspina Place 1 WWPS	1	0	0	0	0	0	Continue to monitor

Type 2 EOPs – Network Relief rolling WWO data from 1 July 2014 – 30 June 2018

The Type 2 EOP 1535 has a permanent monitor installed. This information is provided as it is available, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the Wastewater Network Strategy and the overall network performance in this catchment.

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1535	Wyllie Rd	n/a	n/a	n/a	7	14	10.5	I&I investigations

1.28.6 Inflow & Infiltration Programme

Smoke testing of approximately 300 properties has been completed around Wyllie Rd in a sub-catchment in Papatoetoe. Currently 13 properties have been identified where their stormwater is discharging into the wastewater system. 10 properties have rectified their issues. Auckland Council is continuing to work with the remaining property owners to rectify their defects.

A review of I&I in the remainder of this catchment will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

1.28.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Option Analysis (Feasibility)	Hingaia WWPS and storage Upgrade	Studies and investigations	Major greenfield growth is projected in the Southern Region, with significant development progressing short term in the Hingaia PS which needs to be serviced	Provide capacity for immediate growth without increasing wet weather overflows.	Before 2022
Planned	Southern Interceptor Augmentation	Studies and investigations	Major greenfield growth is projected in the Southern Region, and significant upgrades are required to service this growth without deterioration in capacity.	Provide capacity for growth without increasing wet weather overflows.	2017-2035

1.28.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.28.9 Summary

There have been no Type 1 EOPs which have discharged more frequently than two spills per year on average. Trend analysis shows that fats, roots, and rubbish contribute to the majority of uncontrolled overflows. In the long term, the network performance in this catchment will be improved with the 'Southern Interceptor Augmentation' projects, which will provide additional capacity in the network. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended by 71.7km and developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.29 Catchment 29 – Pahurehure Inlet

1.29.1 Overview

The Pahurehure Inlet catchment is located in south Auckland, encompassing Manurewa, Weymouth, Wattle Downs, Takanini, Hingaia, and Drury. The total land area within the catchment is around 2,430 ha. The Papakura Stream discharges on the northern side of the Inlet and several other smaller streams also drain to the Inlet. There are 14,429 wastewater connections.

Land use within the catchment is predominately residential, with commercial areas in Manurewa and Papakura, a small commercial area in Drury, and a large industrial/commercial area in Takanini.

	2014/15	2015/16	2016/17	2017/18
No. of connections	14,066	14,220	14,355	14,429
Length of sewer (km)	548	558	565	626

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
686	PS 84 Manurewa South	DPSIN	1	Papakura Stream
687	Manurewa West WWPS	DPMW	1	Waimahia Creek
708	Weymouth Wholesale WWPS	DPWYM	1	Hazards Rd Foreshore
746	Southern Interceptor transmission system overflow	DSSIN	2	Pahurehure Inlet Basin 1
759	Drury/Hingaia Wastewater WWPS	DPHNG	1	To land
965	105R Beaumonts Way	-	2	Papakura Stream
966	17 McDougall Street	-	2	Papakura Stream
967	14 Percival Street	-	2	Unnamed stream near Percival Street
974	2 Browning Street	-	2	Papakura Stream
987	St Anne's Cres WWPS	DPSAC	1	St Anne's Foreshore
997	Waimarino Rd WWPS	DPWNO	1	Waimahia Creek
1012	Horlicks Place WWPS	DPHOR	1	Papakura Stream
1166	Roys Road WWPS	DPRYS	1	Te Pua Point
1171	Aberdeen Cres WWPS	DPABE	1	To land
1575	Papakura North MH08	-	2	Papakura Stream to Inlet

There have been no changes to the schedule of EOPs in this catchment.

1.29.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2017.

Reported Incidents

There were a total of 151 reported incidents in the Pahurehure catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

NOTE: No wastewater discharges reached the Tangata Whenua Management Area.

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

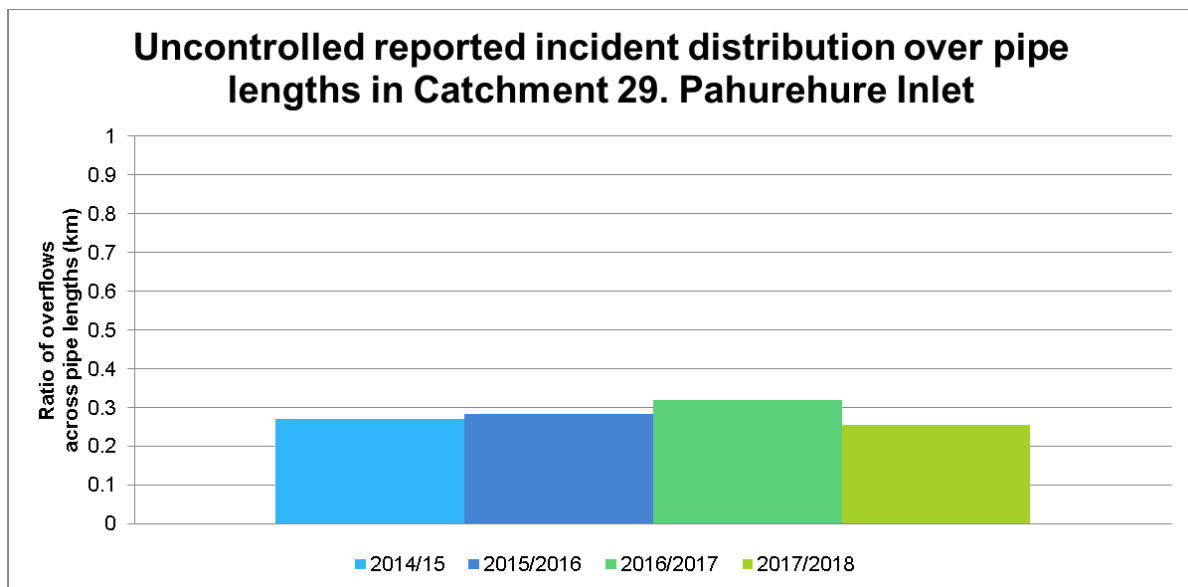
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
12/04/2017	210 Great South Rd	L1	240	Surcharging	69	Under investigation, CCTV and heavy flush
3/07/2017	210 Great South Rd	L1	606	Fat	0	
5/04/2017	2 Dreadon Rd	L1	360	Surcharging	38	Fats in the main, under investigation
27/10/2017	2 Dreadon Rd	L1	150	Fat	7	
28/10/2017	4 Dreadon Rd	L1	76	Fat	7	
24/10/2017	6 Limond St	L1	90	Roots	3	Under investigation
2/04/2018	6 Limond St	L1	618	Fat	0	
1/07/2017	29 Aarts Ave	L1	418	533	32	NRV Installed
2/07/2017	1/29 Aarts Ave	L1	105	84	9.5	
2/07/2017	4 Freshney Pl	L1	150	Surcharging	9.5	Continue to monitor
3/06/2018	4 Freshney Pl	L1	657	Fat	61	
15/06/2018	34 Marr Rd	L1	47	Fat	10.5	Manhole repaired
25/06/2018	34 Marr Rd	L1	238	Surcharging	38	
8/03/2017	4 Hywell Pl	L1	55	Fat	1	Continue to monitor
27/12/2017	4 Hywell Pl	L1	626	Unknown	1.5	

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
25/11/2017	52 Bowater Pl	L1	127	Unknown	0	Continue to monitor
30/11/2017	52 Bowater Pl	L1	285	Unknown	28	
2/08/2017	33 Foxlaw St	L1	566	Fat	7	NRV installed, under investigation
21/08/2017	33 Foxlaw St	L1	181	Fat	3	
3/10/2017	33 Foxlaw St	L1	132	Unknown	0	
29/07/2017	29 Beihlers Rd	L1	106	Unknown	0	Root infiltration, under investigation
20/06/2018	29 Beihlers Rd	L1	211	Rags	3.5	
21/02/2018	30 Sandwick Dr	L1	158	Fat	2.5	Heavy flush, fats and debris removed
25/02/2018	30 Sandwick Dr	L1	164	Fat	0	
18/01/2017	59 Beaumonts Way	L1	595	Fat	0	Continue to monitor
12/01/2018	59 Beaumonts Way	L1	197	Unknown	0	
25/09/2017	76S Russell Rd	L1	236	Fat	0	Fats and debris removed. Large rock removed following CCTV
12/12/2017	76S Russell Rd	L1	198	Fat	1	
20/12/2017	76S Russell Rd	L1	333	Rubbish	1	
20/02/2018	76S Russell Rd	L1	92	Unknown	7.5	
5/04/2017	10 Jutland Rd	L1	516	Surcharging	38	Rag blockage removed
24/01/2018	10 Jutland Rd	L1	111	Unknown	0	
12/04/2017	6 Rimu Rd	L1	181	Unknown	69	Rubbish removed from main
15/02/2018	6 Rimu Rd	L2	172	Rubbish	0.5	
19/02/2018	6 Rimu Rd	L1	611	Rubbish	0	
1/06/2017	18A Thompson Tce	L1	-	Unknown	0	Heavy flushed
10/07/2017	18A Thompson Tce	L1	81	Fat	2	
5/04/2017	2/21 Mcinnes Rd	L1	55	Surcharging	38	Under investigation
5/02/2018	2/21 Mcinnes Rd	L1	654	Surcharging	11.5	
8/07/2017	Becker Dr	L1	66	Surcharging	5	Under investigation
5/06/2018	Becker Dr	L1	657	Surcharging	11.5	
13/07/2017	67 Thompson Tce	L1	255	Fat	4.5	Rootcut
30/04/2018	67 Thompson Tce	L1	223	Fat	3.5	
1/05/2018	67 Thompson Tce	L1	345	Roots	1	
7/08/2017	8 Sandwick Dr	L1	100	Rubbish	0	Debris and fat removed from dropper
2/12/2017	8 Sandwick Dr	L1	83	Unknown	0	

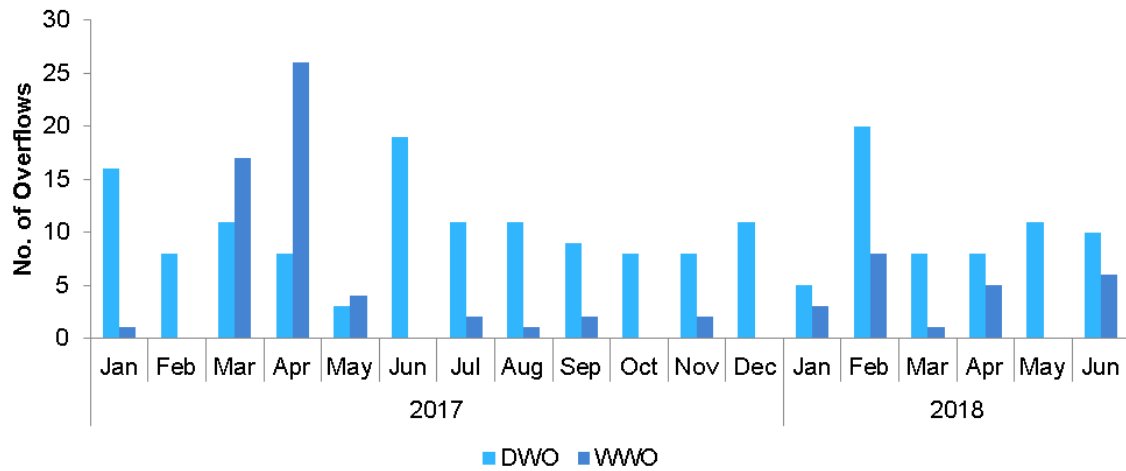
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
27/08/2017	1 Ramwall PI	L1	594	Unknown	3.5	Silts and rocks removed
10/02/2018	1 Ramwall PI	L1	197	Silts	14	
27/10/2017	49 Winsford St	L1	72	Fat	7	Heavy flushed
14/04/2018	49 Winsford St	L1	528	Fat	79.5	
24/11/2017	33 Leaver PI	L1	263	Rubbish	0	Heavy flushed, rubbish removed from main
7/03/2018	33 Leaver PI	L1	231	Rubbish	11	
27/01/2018	10 Nield Rd	L1	244	Surcharging	2	I&I under investigation
11/02/2018	10 Nield Rd	L1	192	Unknown	39	
16/02/2018	1/22 Montilla PI	L1	235	Fat	0	Large rock removed from manhole
28/04/2018	1/22 Montilla PI	L1	145	Unknown	17	
14/04/2018	2/22 Montilla PI	L1	69	Unknown	79.5	
24/04/2018	2/22 Montilla PI	L1	419	Rubbish	0.5	
16/06/2018	121 Beaumonts Way	L1	150	Fat	11.5	Heavy fats removed
30/06/2018	121 Beaumonts Way	L1	103	Fat	0	

1.29.3 Trend analysis of reported incidents

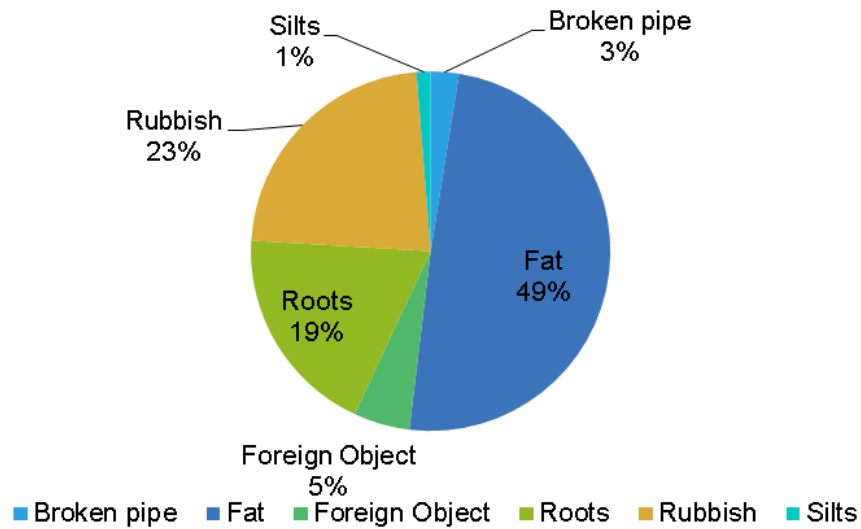
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



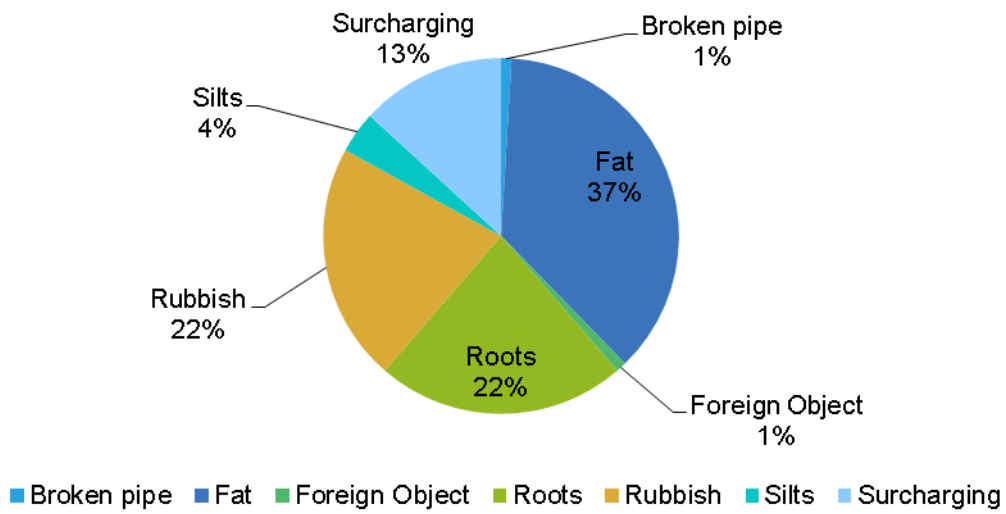
2017-18 Uncontrolled Reported Incidents Data for Catchment 29. Pahurehure Inlet



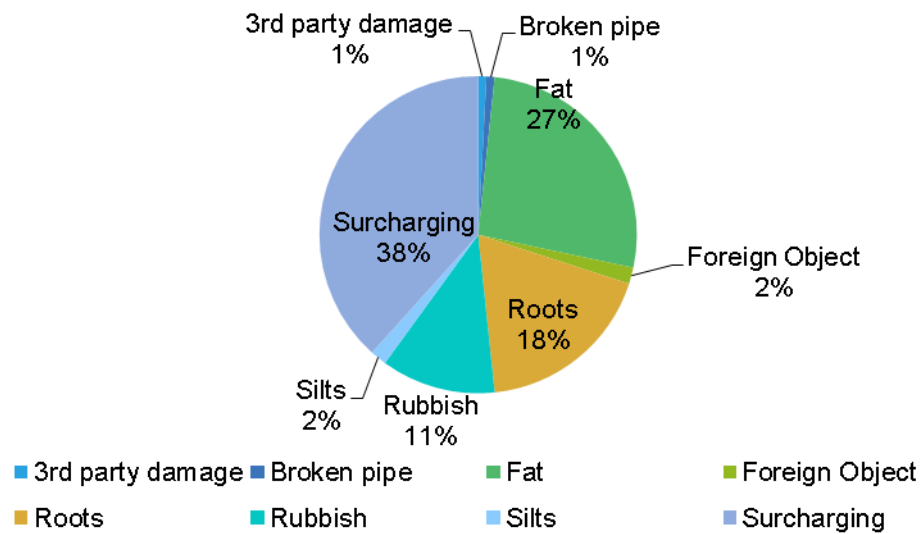
2014-15 Data for Catchment 29. Pahurehure Inlet



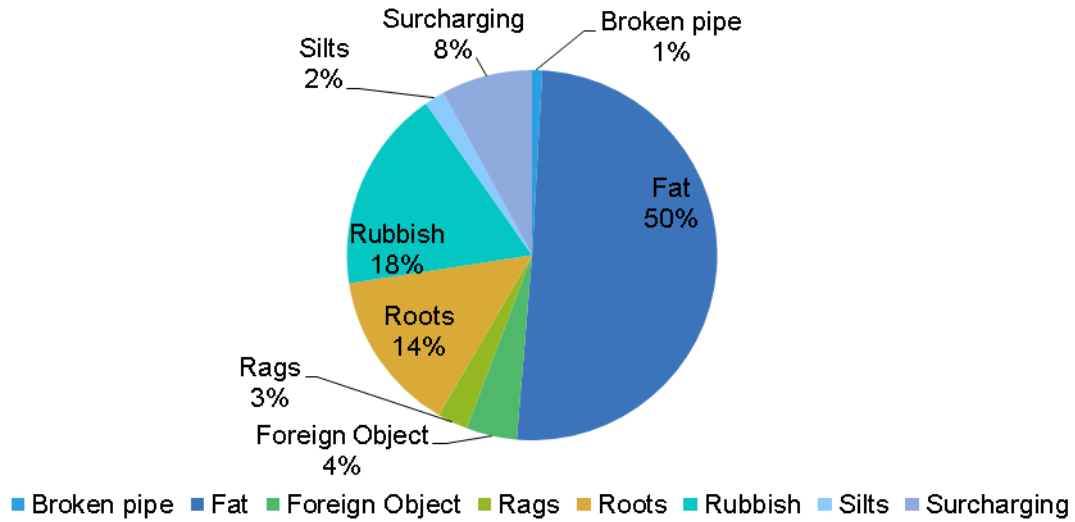
2015-16 Data for Catchment 29. Pahurehure Inlet



2016-17 Data for Catchment 29. Pahurehure Inlet



2017-18 Data for Catchment 29. Pahurehure Inlet



Trend analysis has been carried out where root cause has been identified.

1.29.4 Wet Weather Overflow (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
28/08/2017	DPSIN	PS 84 Manurewa South	686	Rain event	58	13.5
5/02/2018	DPWYM	Weymouth Wholesale Wastewater Pump Station	708	Rain event	184	11.5
11/02/2018	DPMW	Manurewa West Wholesale Wastewater Pump Station	687	Rain event	523	39
11/02/2018	DPWYM	Weymouth Wholesale Wastewater Pump Station	708	Rain event	7	39
14/04/2018	DPMW	Manurewa West Wholesale Wastewater Pump Station	687	Rain event	1117	79.5
3/06/2018	DPMW	Manurewa West Wholesale Wastewater Pump Station	687	Rain event	148	61
3/06/2018	DPHNG	Drury/Hingaia Wholesale Wastewater Pump Station	759	Rain event	61	61

1.29.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
686	PS 84 Manurewa South	1	0	0	2	1	0.75	Continue to monitor
687	Manurewa West WWPS	6	1	3	4	3	2.75	Continue to monitor
708	Weymouth Wholesale WWPS	-	0	0	3	2	1.25	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
759	Drury/Hinga Wastewater WWPS	-	0	2	6	1	2.25	Hingaia WWPS and storage Upgrades
987	St Anne's Cres WWPS	1	0	0	0	0	0	Continue to monitor
997	Waimarino Rd WWPS	0.8	1	0	0	0	0.25	Continue to monitor
1012	Horlicks Place WWPS	0.4	0	0	0	0	0	Continue to monitor
1166	Roys Road WWPS	0	1	0	0	0	0.25	Continue to monitor
1171	Aberdeen Cres WWPS	0.4	0	0	0	0	0	Continue to monitor

1.29.6 Inflow & Infiltration Programme

Inspections of properties were undertaken in the past year. In total 41 properties with defects were identified, 7 of which had direct connections to the network. Auckland Council continued to work with the 3 remaining property owners to rectify the defects.

A review of I&I in the remainder of this catchment will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

1.29.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Drury Opaheke Servicing Study	Studies and investigations	Capacity - Major greenfield development is scheduled in this area. A servicing plan is required.	Ultimately the provision of trunk servicing capacity for Southern FUZ area - distinct from Southern interceptor Projects to be defined.	Before 2022
Underway	Hingaia WWPS and storage Upgrade	Option Analysis (Feasibility)	Major greenfield growth is projected in the Southern Region, with significant development progressing short term in the Hingaia PS which needs to be serviced	Provide capacity for immediate growth without increasing wet weather overflows.	Before 2022

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Planned	Southern Interceptor Augmentation	Studies and investigations	Major greenfield growth is projected in the Southern Region, and significant upgrades are required to service this growth without deterioration in capacity.	Provide capacity for growth without increasing wet weather overflows.	2017-2035

Minor improvements works include:

- Mahia Trunk Main: This renewal project will reduce the risk of Dry Weather Overflows at uncontrolled locations as a result of asset failure.

1.29.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.29.9 Summary

There were two Type 1 EOPs which discharged more frequently than two spills per year on average in this reporting period. In the long term, the network performance in this catchment will be improved with the Hingaia WWPS and Storage Upgrade, the 'Southern Interceptor'. Trend analysis shows that roots are the primary cause of overflows, and the density of overflows has decreased. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been significantly extended and developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.30 Catchment 35 – Kumeu-Huapai-Riverhead

1.30.1 Overview

The Kumeu-Huapai-Riverhead catchment covers an area of approximately 1,270 ha in rural north-west Auckland. There are no existing EOPs in the catchment; the proposed overflows would cater for future growth identified in the Auckland Plan and proposed Auckland Unitary Plan. There are currently 1,643 wastewater connections.

The catchment includes the settlements of Kumeu and Huapai and the surrounding rural area, and the small settlement of Riverhead to the east. It takes in the catchments of many small streams and unnamed tributaries to Kumeu River, as well as part of the catchment of Kumeu River. There are no coastal environments within the catchment.

	2014/15	2015/16	2016/17	2017/18
No. of connections	735	1,087	1,430	1,643
Length of sewer (km)	47	53	59	72

There are no EOPs in the Kumeu-Huapai-Riverhead area.

1.30.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

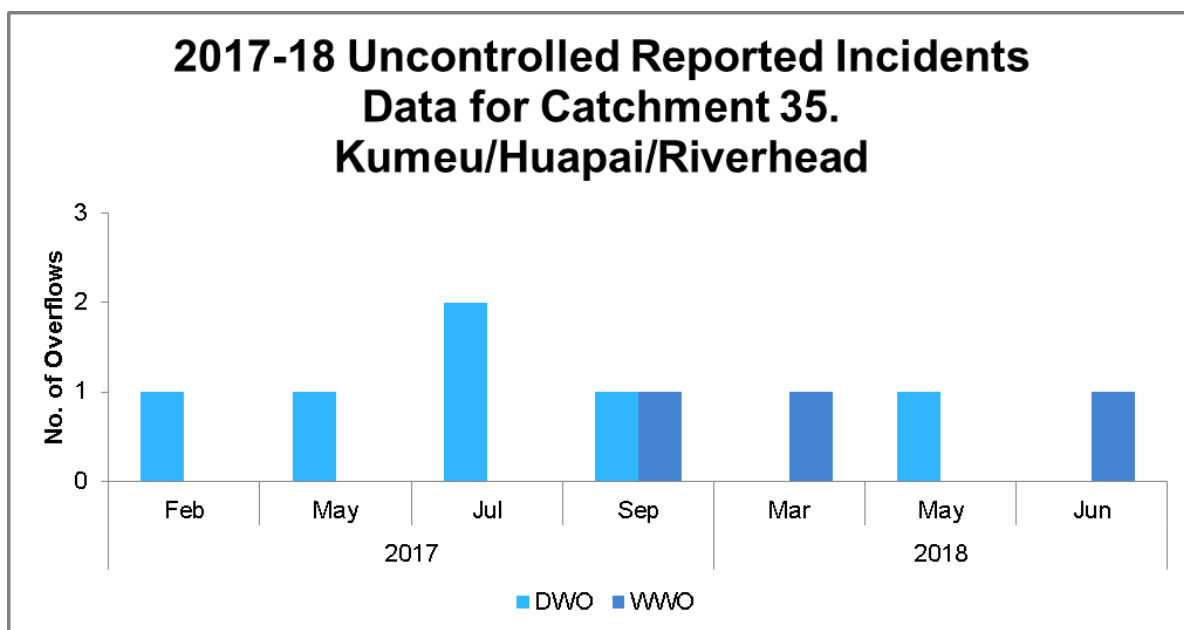
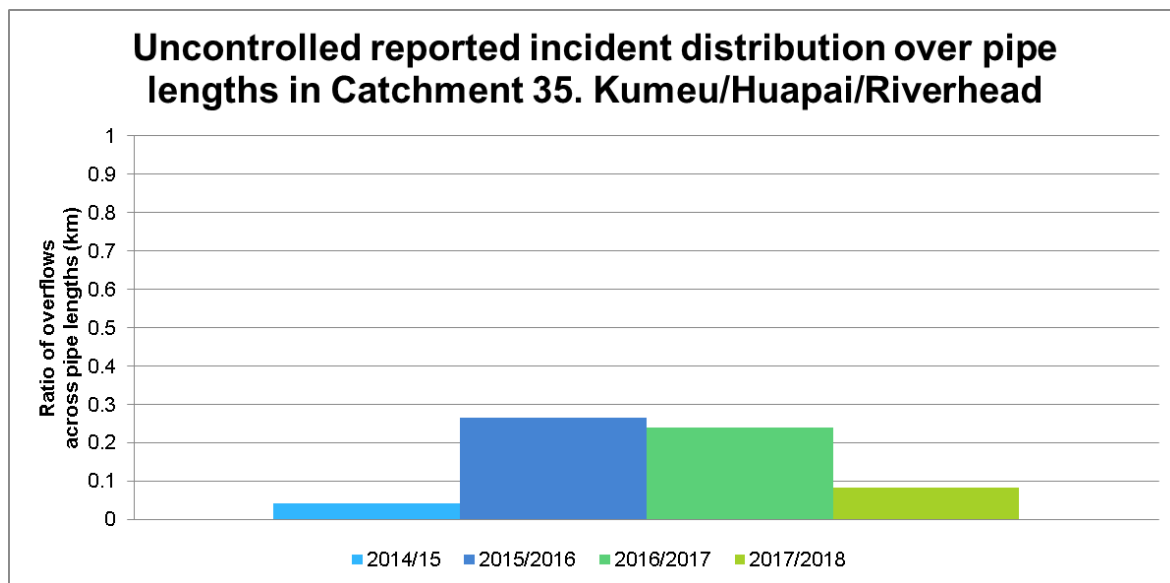
Reported Incidents

There were a total of 6 reported incidents in the Kumeu/Huapai/Riverhead catchment; however no repeat overflows occurred in this catchment for the period of 2017-2018.

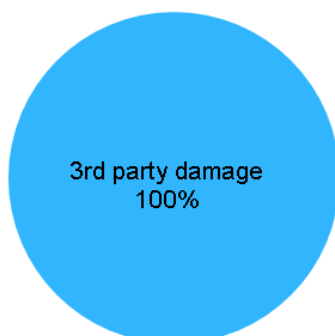
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

1.30.3 Trend analysis of reported incidents

The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.

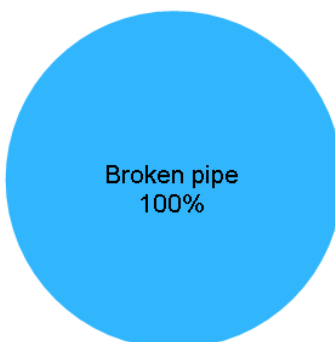


2014-15 Data for Catchment 35. Kumeu/Huapai/Riverhead



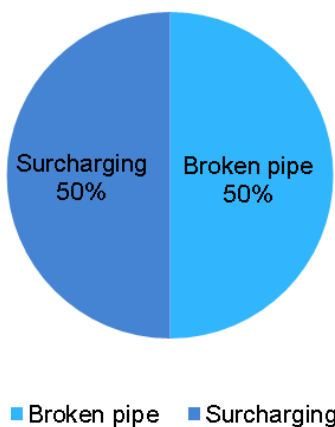
■ 3rd party damage

2015-16 Data for Catchment 35. Kumeu/Huapai/Riverhead

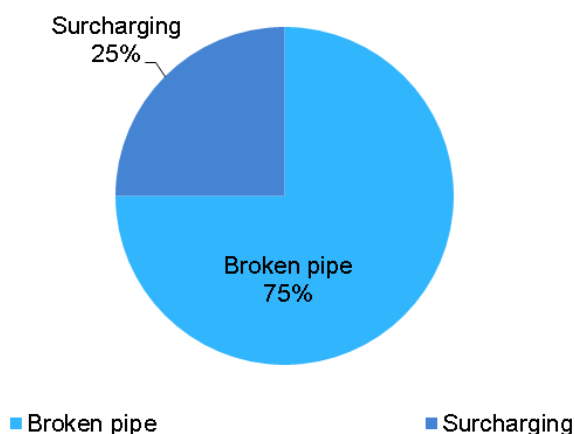


■ Broken pipe

2016-17 Data for Catchment 35. Kumeu/Huapai/Riverhead



2017-18 Data for Catchment 35. Kumeu/Huapai/Riverhead



Trend analysis has been carried out where root cause has been identified.

1.30.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2017 and 30 June 2018.

1.30.5 Trend analysis of pump station overflows

Note: There are no pump stations in this catchment.

1.30.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be done as part of Watercare's region-wide programme; this catchment has not been identified as a priority to date.

1.30.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Northern Interceptor - Stage 1	Project Execution	To allow wastewater flows to be diverted from the Northern Strategic Growth Area (NorSGA) and South Rodney (Kumeu / Huapai/Riverhead) to the Rosedale wastewater treatment plant. This balances flows at the treatment plants and provides additional capacity to the Western Interceptor	This project is required to service greenfield growth and avoid capacity-related dry weather overflows. Will reduce the load on the Western Interceptor and also reduce Type 3 overflows S20, S21 and S24	2012-2021
Underway	Waitakere Northern and KHR servicing	Studies and investigations	Capacity - major greenfield development is scheduled in this area. A servicing plan is required.	Ultimately the provision of trunk servicing capacity for north-west FUZ area - distinct from Northern interceptor	Before 2022

1.30.8 Erosion Control Measures

No works related to erosion control were carried out in this SMA between 1 July 2017 and 30 June 2018.

1.30.9 Summary

There are currently no EOPs within this area, and no network performance issues relating to overflows. Trend analysis shows a decrease ratio of overflows to pipe length in this region. This area is expecting to have high growth, and this will need to be accommodated without system performance deteriorating; this will be achieved by capital works identified in the servicing strategies and the Northern Interceptor project. The network has been extended by 12.8km and developed to accommodate for population growth in the region. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.31 Catchment 36 – Western Isthmus (Central Interceptor)

1.31.1 Overview

The Central Interceptor catchment covers an area of approximately 43 km² in the western part of the Auckland Isthmus. Approximately 85% of the Central Interceptor catchment is residential. A further 9 % is industrial and the remainder is made up of relatively small proportions of commercial property, open space and motorways. The Central Interceptor catchment extends across the catchments of four urban streams. The catchment boundary reflects a combination of topographic and wastewater network catchment boundaries. While network upgrading works have occurred over the years, the network in the Central Interceptor catchment area effectively remains a combined sewer system. There are 44,443 wastewater connections in the Western Isthmus.

	2014/15	2015/16	2016/17	2017/18
No. of connections	43,983	44,095	44,270	44,443
Length of sewer (km)	617	618	619	625

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
36	37 Saltaire Street	-	2	Waterview Inlet (Saltire Street)
37	3 Kelvinside Terrace	-	2	Small tributary of Whau Creek 2
39	Avondale Racecourse	-	2	Small tributary of Whau Creek 1
40	17 Victor Street	-	2	Waterview Inlet (Saltire Street)
139	18 Wainoni Avenue	-	2	Coast near Bambury Close
146	68 Smale Street	-	2	To land
148	64 Smale Street	-	2	To land
152	Joan Street WWPS	DPJOA	1	Point Chevalier Beach
211	520 Blockhouse Bay Road	-	2	Tributary of Whau Creek (Blockhouse Bay Reserve)
308	94 Haverstock Road	-	2	Meola Creek (Haverstock Road)
309	29 Euston Road	-	2	Meola Creek (Haverstock Road)
316	98 Moa Road	-	2	Lower Meola Creek
317	1102 Great North Road	-	2	Meola Creek (north of SH 16)
319	1064 Motions Road	-	2	Lower Meola Creek
320	71 Moa Road	-	2	Lower Meola Creek
321	76 Premier Avenue	-	2	Lower Meola Creek
322	20 Kanuka Street	-	2	Lower Meola Creek
323	53 Premier Avenue A	-	2	Lower Meola Creek

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
324	53 Premier Avenue B	-	2	Lower Meola Creek
325	28 Pasedena Road	-	2	Lower Meola Creek
327	3 Parr Road	-	2	Meola Creek (north of SH 16)
328	1054 Great North Road	-	2	Meola Creek (north of SH 16)
333	79 Moa Road	-	2	Lower Meola Creek
337	252 Meola Road	-	2	Lower Meola Creek
338	99 Moa Road	-	2	Lower Meola Creek
341	25 Parkdale Road	-	2	Meola Creek (Rawalpindi)
342	13 Rawalpindi Street	-	2	Meola Creek (Rawalpindi)
346	13 Segar Avenue	-	2	Meola Creek (Rawalpindi)
347	13 Novar Place	-	2	Meola Creek (north of SH 16)
349	58 Walmer Road	-	2	Lower Meola Creek
354	29 East St	-	2	Upper Motions Creek
355	4a West Terrace	-	2	Upper Motions Creek
357	1 Ian McKinnon Drive	-	2	Upper Motions Creek
359	17-23 Exmouth Street	-	2	Upper Motions Creek
360	5 Harold Street	-	2	Upper Motions Creek
362	9 Karaka Street	-	2	Upper Motions Creek
369	5 Suffolk Street	-	2	Upper Motions Creek
375	39 King Street	-	2	Upper Motions Creek
376	31 Bond Street	-	2	Upper Motions Creek
377	36 King Street	-	2	Upper Motions Creek
378	10 Burgoyne Street	-	2	Upper Motions Creek
379	30 Potatau Street	-	2	Upper Motions Creek
382	24 Central Road A	-	2	Upper Motions Creek
383	24 Central Road B	-	2	Upper Motions Creek
385	52 Cooper Street	-	2	Upper Motions Creek
386	39 Commercial Road	-	2	Upper Motions Creek
389	21 Gundry Street	-	2	Upper Motions Creek
390	21 Edinburgh Street	-	2	Upper Motions Creek
392	400 Great North Road	-	2	Upper Motions Creek
394	42a Tuarangi Road	-	2	Upper Motions Creek
395	15 Fourth Street	-	2	Upper Motions Creek

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
397	52 Kingsland Avenue	-	2	Upper Motions Creek
398	27 Fourth Street	-	2	Upper Motions Creek
404	31 Ivanhoe Road	-	2	Upper Motions Creek
409	731 Great North Road	-	2	Upper Motions Creek
411	28 Springfield Road	-	2	Upper Motions Creek
412	PSW25 Overflow	-	2	Upper Motions Creek
413	727 Great North Road	-	2	Upper Motions Creek
430	5 Gifford Avenue	-	2	Oakley Creek (Wesley)
432	2 Mayn Avenue	-	2	Oakley Creek (Wesley)
439	17 Tait Street B	-	2	Oakley Creek near New North Road
440	3 Waitati Place	-	2	Oakley Creek near New North Road
559	1401 Great North Road A	-	2	Lower Oakley Creek
561	49 Herdman Street	-	2	Lower Oakley Creek
562	11 Waterbank Crescent	-	2	Lower Oakley Creek
563	1443 Great North Road	-	2	Oakley Creek (Oakley Creek Walkway)
565	65 Oakley Avenue	-	2	Waterview Inlet (Seaside Avenue)
566	64 Fir Street	-	2	Waterview Inlet (Seaside Avenue)
567	16 Seaside Avenue	-	2	Waterview Inlet (Seaside Avenue)
568	71 Alverstone Street	-	2	Waterview Inlet (Seaside Avenue)
571	102 Penney Avenue	-	2	Whau Creek (White Swan Road)
572	375 Blockhouse Bay Road	-	2	Whau Creek
573	4 Margate Road	-	2	Whau Creek
574	5 Shoreham Street	-	2	Tributary of Whau Creek (Shoreham Street)
575	164 St Georges Road	-	2	Whau Creek
578	32 Miranda Street	-	2	Whau Creek
594	75 Wolverton Street	-	2	Whau Creek
606	Connolly Avenue WWPS	DPCLY	1	To land
608	Cowley Street WWPS	DPCOW	1	To land
616	Waterbank Crescent WWPS	DPWTB	1	Lower Oakley Creek
650	Walker Road 1 WWPS	DPWA1	1	Walker Road
700	Wainui Avenue Wholesale WWPS	DPWNU	1	Meola Creek Mouth
701	Oliver Road Wholesale WWPS	DPOLV	1	Meola Creek Mouth

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
702	Harbour View Road Wholesale WWPS	DPHRB	1	Raymond Reserve
703	Wright Road Wholesale WWPS	DPWRI	1	Coast near Wright Road
716	Branch 7 Arch Hill MH22	DSB07	2	Upper Motions Creek
717	Branch 7 Arch Hill MH42C	DSB07	2	Upper Motions Creek
718	Branch 7 Arch Hill MH44	DSB07	2	Upper Motions Creek
719	Branch 7 Arch Hill MH46	DSB07	2	Upper Motions Creek
720	Branch 7 Arch Hill MH48	DSB07	2	Upper Motions Creek
721	Branch 7 Arch Hill MH49	DSB07	2	Upper Motions Creek
722	Branch 7 Arch Hill MH52	DSB07	2	Upper Motions Creek
723	Branch 8 Mt Albert MH2	DSB08	2	Meola Creek (Rawalpindi)
724	Branch 8 Mt Albert MH3	DSB08	2	Meola Creek (Rawalpindi)
725	Branch 8 Mt Albert MH6	DSB08	2	Meola Creek (Rawalpindi)
726	Branch 8 Mt Albert MH18	DSB08	2	Meola Creek (Rawalpindi)
727	Branch 8 Mt Albert MH30 (Haverstock Road)	DSB08	2	Meola Creek (Haverstock Road)
728	Branch 8 Mt Albert MH31	DSB08	2	Meola Creek (Haverstock Road)
732	Orakei Main Sewer MH38	DSORM	2	Lower Meola Creek
734	Edendale Branch MH1	DSEDB	2	Meola Creek (Lyon Avenue)
736	Orakei Main Sewer MH51A	DSORM	2	Oakley Creek (Oakley Creek Walkway)
739	Branch 8 Mt Albert MH7	DSB08	2	Meola Creek (Rawalpindi)
742	Branch 7A MH1	DSB07A	2	Upper Motions Creek
1197	Great North Road WWPS	DPGN2	1	Small tributary of Whau Creek 1
1198	Wingate Street WWPS	DPWNG	1	Whau River
1461	4 Haycock Avenue	-	2	Whau Creek (White Swan Road)
1479	29 New Bond Street	-	2	Upper Motions Creek
1502	84 Wolverson Rd	-	2	Whau Creek
1505	13 Sefton Ave	-	2	Upper Motions Creek
1506	1/94 School Rd	-	2	Upper Motions Creek
1508	37 Commercial Rd	-	2	Upper Motions Creek
1511	2 Harold Street	-	2	Upper Motions Creek
1514	Heron Park	-	2	Waterview Inlet (Saltaire Street)
1515	Branch 7 MH34	-	2	Upper Motions Creek

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1518	Hendon Ave (New Branch 9 Diversion)	DSB09B	2	Oakley Creek (Allan Wood Reserve)
1519	Phyllis reserve	-	2	Oakley Creek (Oakley Creek Walkway)
1523	Suffolk Street (A)	-	2	Upper Motions Creek
1524	17 Fleet Street	-	2	Upper Motions Creek
1525	22 - 24 Randolph Street	-	2	Upper Motions Creek
1526	Branch 9 MH91A	DSB09	2	Oakley Creek (Keith Hay Park)
1531	62 Olsen Ave	-	2	Tributary of Oakley Creek
1537	Suffolk Street (B)	-	2	Upper Motions Creek
1538	30 Potatau St (B)	-	2	Upper Motions Creek
1547	Miranda Reserve (B)	-	2	Whau Creek
1548	3/42 Fairlands Ave	-	2	Waterview Inlet (Saltaire Street)
1589	153 Whitney St	-	2	Whau Creek

EOP 1549 has been amended to EOP 1589.

The following EOP has been removed from the schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
346	13 Segar Avenue	-	2	Meola Creek (Rawalpindi)	Sealed

1.31.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
1/09/2017	DPSPK	Sylvia Park Wholesale Wastewater Pump Station	670	Power failure	28	0.49
17/05/2018	DPMID	Middlemore Wholesale Wastewater Pump Station	684	Other	6	2.5

Reported Incidents

There were a total of 348 reported incidents in the Western Isthmus (Central Interceptor) catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
20/12/2017	34 Stoddard Rd	L1	476	Unknown	3	On Annual Planned Flushing Schedule
26/12/2017	34B Stoddard Rd	L1	228	Unknown	4	
4/01/2018	40 Stoddard Rd	L1	525	Unknown	46	
30/05/2018	34C Stoddard Rd	L2	141	Rags	0	
8/08/2016	805 Great North Rd	L1	606	Rubbish	0.53	Monthly checks, heavy flushed
2/06/2017	805 Great North Rd	L3	320	Rubbish	16.5	
17/02/2017	554- Great North Rd	L1	231	Foreign Object	14	Debris removed from main
30/08/2017	584 Great North Rd	L1	196	Foreign Object	20.5	
20/06/2017	2165 Great North Rd	L1	131	Unknown	0	Silts removed from main
28/08/2017	2165 Great North Rd	L1	251	Silt	10	
15/08/2017	16 Crayford St	L1	411	Broken pipe	4.5	Displaced dropper repaired
14/09/2017	16 Crayford St	L1	436	Foreign Object	0	
16/09/2017	15 Crayford St	L1	244	Unknown	3	
8/07/2017	11A Donegal St	L1	251	Surcharging	8.65	Under Investigation. On Annual Flushing Schedule
2/09/2017	11A Donegal St	L1	190	Rubbish	18	
17/09/2017	11A Donegal St	L1	199	Broken Pipe	8.5	
20/09/2017	11A Donegal St	L1	185	Broken pipe	0	
11/02/2018	11A Donegal St	L1	70	Surcharging	39	
21/06/2018	38 Margate Rd	L1	105	Fat	4	Under investigation for Third Party Damage
23/06/2018	38 Margate Rd	L1	481	Unknown	2.5	
29/03/2017	20 Boyce Ave	L1	108	Rubbish	36	Heavy roots and displaced joint repaired
16/12/2017	20 Boyce Ave	L1	363	Roots	0	
3/07/2017	6/26 Seaview Tce	L1	524	Rubbish	0	Fixed broken pipe, rootcut
12/07/2017	6/26 Seaview Tce	L1	66	Broken pipe	6.49	
19/01/2018	1288 New North Rd	L1	367	Unknown	8	Root intrusions patched

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
1/03/2018	1288 New North Rd	L1	170	Rags	0	
13/03/2018	1288 New North Rd	L1	139	Unknown	1	
12/02/2018	1189 New North Rd	L1	598	Fat	0	Heavy flushed
18/06/2018	1189 New North Rd	L1	149	Foreign Object	1.5	
18/05/2017	994A New North Rd	L1	245	Silts	9.86	Rootcut, silts removed
11/04/2018	994B New North Rd	L1	79	Fat	18.5	
22/08/2017	46A Roseman Ave	L2	599	Foreign Object	0	Under investigation, CCTV and flushed
10/12/2017	46 Roseman Ave	L2	305	Unknown	0	
2/04/2018	46A Roseman Ave	L1	336	Unknown	0	
6/09/2017	103 White Swan Rd	L1	383	Surcharging	11	Extremely shallow manhole which always overflows during rain. Under investigation
10/09/2017	103 White Swan Rd	L1	203	Surcharging	6	
12/09/2017	103 White Swan Rd	L1	250	Surcharging	3	
16/09/2017	103 White Swan Rd	L1	90	Surcharging	3	
30/11/2017	103 White Swan Rd	L1	117	Surcharging	9	
2/02/2018	103 White Swan Rd	L1	150	Surcharging	0	
12/02/2018	103 White Swan Rd	L1	454	Surcharging	0	
14/04/2018	103 White Swan Rd	L1	143	Surcharging	53	
17/04/2018	103 White Swan Rd	L1	230	Surcharging	2	
12/07/2017	86 Ivanhoe Rd	L1	226	Fat	6.49	Heavy flushed
18/05/2018	86 Ivanhoe Rd	L1	407	Fat	0	
28/05/2017	5/16 Knight Ave	L1	138	Unknown	1	Large dip in line, heavy flushed
3/04/2018	1/16 Knight Ave	L1	525	Broken Pipe	0	
21/06/2017	14 Skipper Ave	L1	175	Rubbish	0	Large rag blockage removed
24/01/2018	14 Skipper Ave	L1	646	Rags	0	
11/02/2018	123 Haverstock Rd	L1	547	Rubbish	0	Heavy debris removed
14/04/2018	123 Haverstock Rd	L1	474	Surcharging	53	
5/04/2017	13 Mt Roskill Rd	L1	527	Surcharging	30.5	Rootcut
17/02/2018	13 Mt Roskill Rd	L1	448	Roots	0	
5/04/2017	68 Haycock Ave	L1	2	Surcharging	30.5	Grout removed from main

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
4/04/2018	68 Haycock Ave	L1	136	Foreign Object	0.5	
15/12/2017	8 Prospect Tce	L1	241	Roots	0	Rootcut
18/12/2017	8 Prospect Tce	L1	108	Roots	0	
12/07/2017	985 Mt Eden Rd	L1	346	Unknown	6.49	Heavy flushed
25/10/2017	Rt/985 Mt Eden Rd	L1	39	Unknown	0.5	
28/02/2018	92 School Rd	L1	183	Rags	0	6 Monthly Flushing Program
1/03/2018	92 School Rd	L1	544	Unknown	0	
6/03/2018	92 School Rd	L1	136	Unknown	0	
8/03/2018	92 School Rd	L1	76	Surcharging	2	
16/04/2018	1388 Dominion Rd	L1	320	Roots	0	Under investigation
30/04/2018	1388 Dominion Rd	L1	249	Unknown	3.5	
21/11/2017	Brabham Pl	L1	139	Unknown	0	CCTV, heavy flush
28/04/2018	Brabham Pl	L1	204	Fat	0	
25/09/2016	78 Methuen Rd	L1	396	Rubbish	2	Rootcut
21/12/2017	78 Methuen Rd	L1	60	Roots	0	
22/08/2017	46A Roseman Ave	L2	599	Foreign Object	0.53	Heavy flushed
2/04/2018	46A Roseman Ave	L1	336	Unknown	4.74	
15/06/2018	198 Whitney St	L1	89	Roots	3	Rootcut and pipe repaired
22/06/2018	198 Whitney St	L1	90	Roots	0	
25/06/2018	198 Whitney St	L1	183	Broken pipe	25.5	
7/07/2017	5A Marconi Pl	L1	270	Surcharging	6.49	Rootcut
11/07/2017	5A Marconi Pl	L1	168	Roots	3.24	
25/06/2017	127A May Rd	L1	387	Unknown	2.5	Rootcut and heavy flush
17/02/2018	127A May Rd	L1	177	Unknown	0	
3/07/2017	14 Nash Rd	L1	375	Unknown	0	Heavy flush
11/10/2017	14 Nash Rd	L1	106	Unknown	4	
31/08/2016	37 Grande Ave	L1	600	Roots	0	Rootcut, CCTV
31/07/2017	41 Grande Ave	L1	146	Unknown	0	
27/09/2016	32 Fearon Ave	L1	386	Unknown	0	Continue to monitor
8/07/2017	32 Fearon Ave	L1	182	Unknown	8.65	
10/10/2016	1/115A Landscape Rd	L1	179	Rubbish	0	Service lead repaired, trees removed

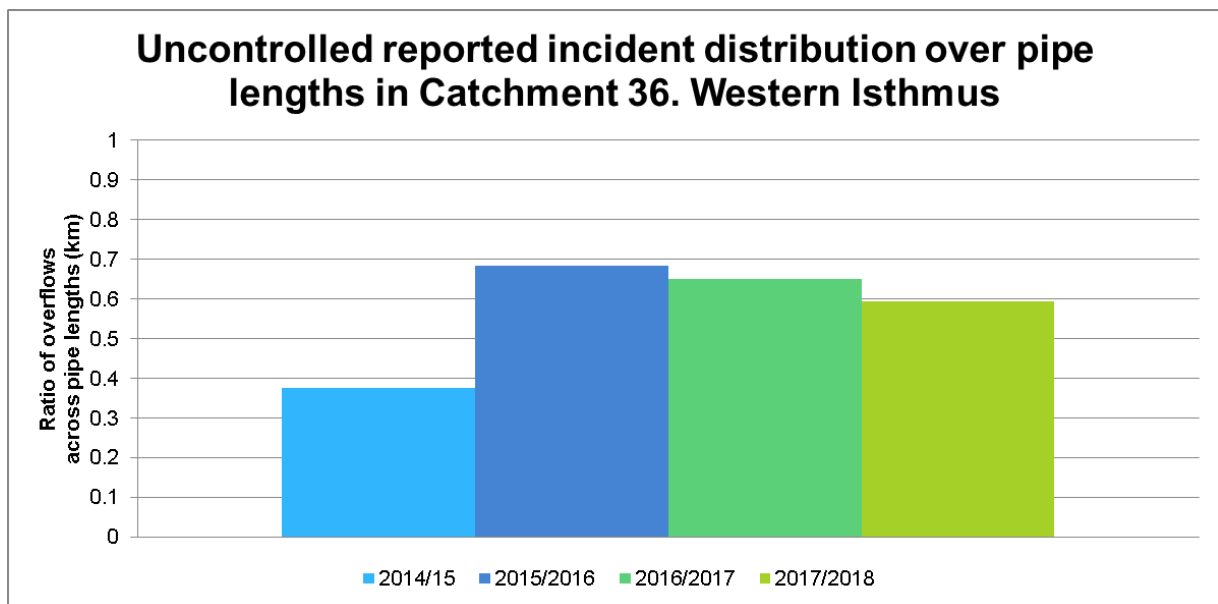
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
17/09/2017	1/115A Landscape Rd	L1	437	Unknown	8.5	
18/05/2017	137 Whitney St	L1	101	Unknown	9.86	Heavy flushed
16/03/2018	137 Whitney St	L1	154	Roots	0	
17/12/2016	29A Kingsway Ave	L1	158	Rubbish	0	Continue to monitor
27/10/2017	29A Kingsway Ave	L1	210	Unknown	6	
21/08/2017	18 St Jude St	L1	227	Broken pipe	1	Broken pipe repaired, heavy flushed
16/09/2017	18 St Jude St	L1	93	Unknown	3	
31/03/2017	55 Fifth Ave	L1	173	Fat	2.5	Rootcut
10/03/2018	55 Fifth Ave	L1	519	Roots	0	
27/05/2017	10 Littlejohn St	L1	518	Roots	4	Rootcut
10/03/2018	10 Littlejohn St	L1	214	Roots	0	
29/05/2017	54 Fir St	L1	639	Broken Pipe	0.5	Continue to monitor
22/01/2018	54 Fir St	L1	200	Unknown	14	
3/07/2017	6/26 Seaview Tce	L1	524	Rubbish	0	Fixed broken pipe, rootcut
12/07/2017	6/26 Seaview Tce	L1	66	Broken pipe	6.49	
9/06/2017	169 Mt Eden Rd	L1	152	Fat	1	Heavy flushed
3/08/2017	173 Mt Eden Rd	L1	427	Unknown	0.5	
20/06/2017	706 Mt Eden Rd	L1	439	Unknown	0	Heavy flushed
14/06/2018	706 Mt Eden Rd	L1	89	Unknown	0.5	
9/08/2017	4 Kimber Hall Ave	L1	230	3rd party damage	14.5	Broken pipe from construction in the area, concrete in line. Damage repaired
23/08/2017	4 Kimber Hall Ave	L1	53	3rd party damage	0	
25/08/2017	4 Kimber Hall Ave	L1	216	3rd party damage	0	
1/09/2017	4 Kimber Hall Ave	L1	144	3rd party damage	0.5	
15/09/2017	4 Kimber Hall Ave	L1	574	3rd party damage	7	
17/09/2017	4 Kimber Hall Ave	L1	336	3rd party damage	8.5	
19/09/2017	4 Kimber Hall Ave	L1	82	3rd party damage	3	
22/06/2017	131 Owairaka Ave	L1	254	Fat	8.5	Rootcut, fats removed from main
7/07/2017	131 Owairaka Ave	L1	269	Fat	6.49	
13/07/2017	1/59 New Windsor Rd	L1	236	Broken pipe	9.19	Broken pipe fixed, CCTV
20/07/2017	1/59 New Windsor Rd	L1	578	Fat	16	
6/08/2017	62A Parau St	L1	9	Unknown	1	Heavy flushed

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
8/08/2017	62A Parau St	L1	143	Unknown	3	
13/08/2017	5A Eden View Rd	L1	86	Unknown	10.5	CCTV, roots removed, manhole uncovered, ongoing issue with lodged foreign object
21/08/2017	5A Eden View Rd	L1	161	Roots	1	
25/08/2017	5A Eden View Rd	L1	348	Foreign Object	0	
15/08/2017	16 Crayford St	L1	411	Broken pipe	4.5	Cleared fat, fixed broken pipe
14/09/2017	16 Crayford St	L1	436	Foreign Object	0	
6/09/2017	25 Alanbrooke Cres	L1	511	Broken Pipe	11	Landslip issue affected pipe. Pipe has been relined
6/10/2017	25 Alanbrooke Cres	L1	712	Broken Pipe	0.5	
11/12/2017	25 Alanbrooke Cres	L1	572	Rags	0	
25/09/2017	35 Alanbrooke Cres	L1	199	Broken Pipe	0	
10/10/2017	35 Alanbrooke Cres	L1	716	Broken Pipe	1	
22/12/2017	35 Alanbrooke Cres	L1	166	Broken pipe	0	
16/10/2017	165 Hendon Ave	L1	456	Silts	0	Potential dip in line, heavy flushed
18/10/2017	165 Hendon Ave	L1	558	Rubbish	0	
7/11/2017	6 Old Mill Rd	L1	123	Broken Pipe	0	Pipe relaid
20/11/2017	6 Old Mill Rd	L1	590	Broken pipe	0	
14/11/2017	1/111 Balmoral Rd	L1	93	Unknown	12	Heavy flushed
18/02/2018	1/111 Balmoral Rd	L1	288	Rags	0	
14/11/2017	11 Plumpton Ave	L1	73	Rubbish	12	Heavy flushed
11/12/2017	11 Plumpton Ave	L1	113	Unknown	0	
15/12/2017	8 Prospect Tce	L1	241	Roots	0	Rootcut
18/12/2017	8 Prospect Tce	L1	108	Roots	0	
4/01/2018	101A Sandringham Rd	L1	142	Unknown	46	Heavy flushed
6/01/2018	101A Sandringham Rd	L1	160	Unknown	0	
28/01/2018	12 Hayr Rd	L1	124	Roots	0	Rootcut
4/06/2018	12 Hayr Rd	L1	629	Surcharging	30.41	
5/02/2018	2/29 Rogan St	L1	704	Surcharging	11.5	Under investigation
11/02/2018	2/29 Rogan St	L1	26	Surcharging	47.5	
14/02/2018	7 Martin Ave	L1	136	Fat	0	Rootcut, fats removed from main
28/04/2018	7 Martin Ave	L1	94	Unknown	24	

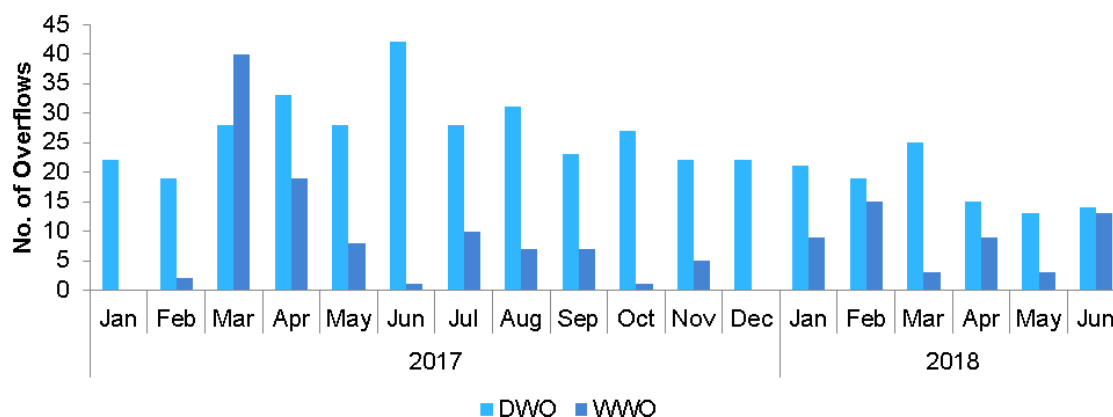
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
3/04/2018	28 Quona Ave	L1	92	Roots	0	Heavy flushed, potential broken pipe under investigation
8/06/2018	28 Quona Ave	L1	187	Broken pipe	0	
11/04/2018	81 Kimber Hall Ave	L1	148	Roots	18.5	Heavy flushed, block of wood removed from main
16/04/2018	81 Kimber Hall Ave	L1	294	Foreign Object	1.5	
1/04/2017	Mcgehan Cl	L1	308	Rubbish	0	Safety grille had dropped into chamber and caused buildup of rags
3/04/2017	Mcgehan Cl	L1	30	Unknown	1.5	
12/02/2018	3/254 Blockhouse Bay Rd	L1	620	Unknown	0	Pipe repair underway
30/06/2018	3/254 Blockhouse Bay Rd	L1	82	Broken pipe	0	

1.31.3 Trend analysis of reported incidents

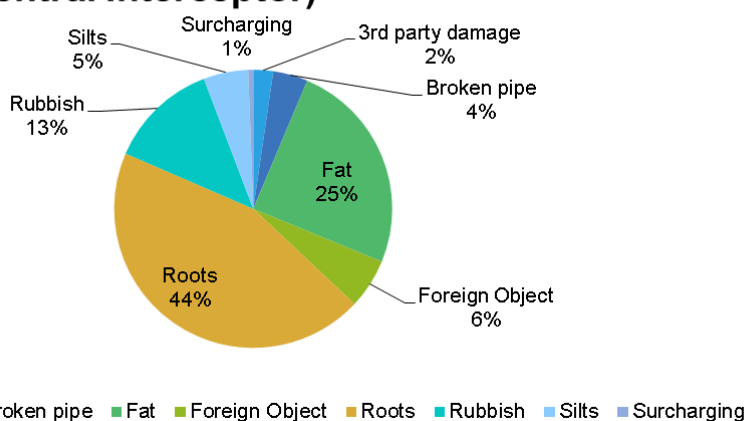
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



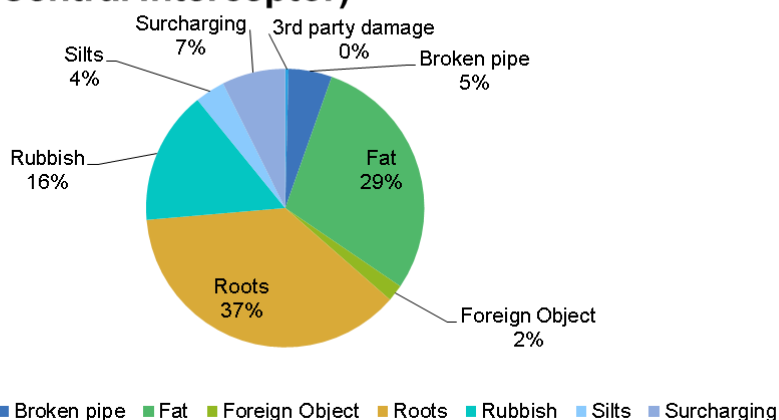
2017-18 Uncontrolled Reported Incidents Data for Catchment 36. Western Isthmus (Central Interceptor)



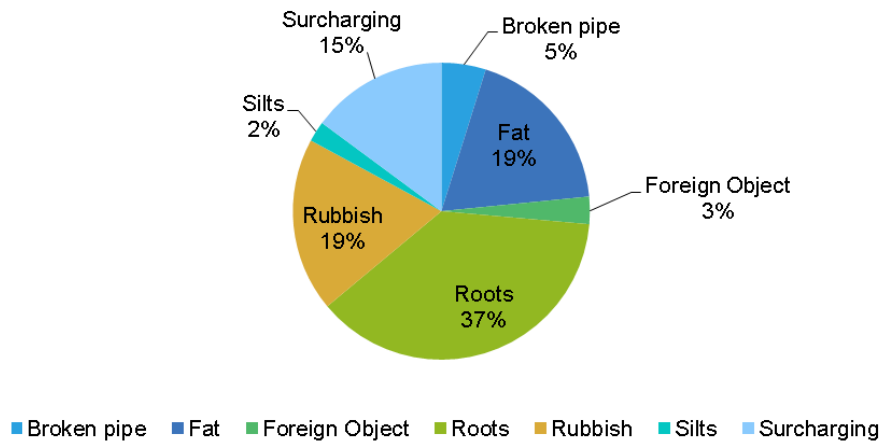
2014-15 Data for Catchment 36. Western Isthmus (Central Interceptor)



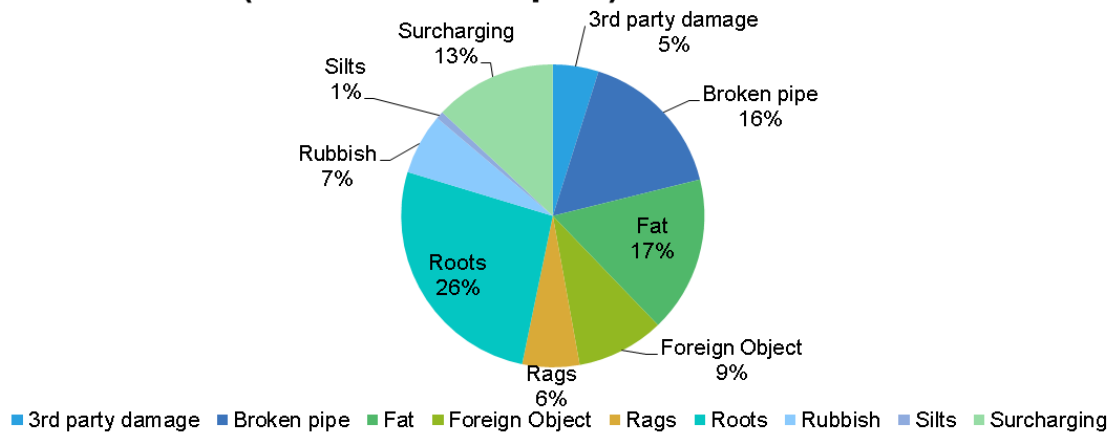
2015-16 Data for Catchment 36. Western Isthmus (Central Interceptor)



2016-17 Data for Catchment 36. Western Isthmus (Central Interceptor)



2017-18 Data for Catchment 36. Western Isthmus (Central Interceptor)



Trend analysis has been carried out where root cause has been identified.

1.31.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
1/02/2018	DPOLV	Oliver Road Wholesale Wastewater Pump Station	701	Rain event	35	39
2/02/2018	DPOLV	Oliver Road Wholesale Wastewater Pump Station	701	Rain event	30	0
15/04/2018	DPOLV	Oliver Road Wholesale Wastewater Pump Station	701	Rain event	472	7
3/06/2018	DPOLV	Oliver Road Wholesale Wastewater Pump Station	701	Rain event	151	38.4

1.31.5 Trend analysis of wet weather overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
152	Joan St WWPS	-	0	0	0	0	0	Continue to monitor
606	Connolly Avenue WWPS	-	0	0	0	0	0	Continue to monitor
608	Cowley Street WWPS	-	0	0	0	0	0	Continue to monitor
616	Waterbank Crescent WWPS	-	0	0	0	0	0	Continue to monitor
650	Walker Road 1 WWPS	-	0	0	0	0	0	Continue to monitor
700	Wainui Avenue Wholesale WWPS	-	0	0	5	0	1.25	Continue to monitor
701	Oliver Road Wholesale WWPS	-	13	13	11	4	10.25	Oliver St Catchment Diversion
702	Harbour View Road Wholesale WWPS	-	0	0	0	0	0	Continue to monitor
703	Wright Road Wholesale WWPS	-	0	0	0	0	0	Continue to monitor
1197	Great North Road WWPS	-	0	0	0	0	0	Continue to monitor
1198	Wingate Street WWPS	-	0	1	1	0	0.5	Continue to monitor

Type 2 EOPs – Network Relief points rolling WWO data from 1 July 2014 – 30 June 2018

The following Type 2 EOPs 725, 727 732 and 734 have permanent monitors installed. This information is provided as it is available, although it is noted for reference that very few Type 2 locations have monitors installed and this needs to be interpreted with reference to the wastewater network description in the AEE document. This is a combined catchment and the overflows are operating as designed. EOPs 725 and 732 have not had reliable data throughout the year and are not included.

EOP ID	Facility Name	AEE Frequency (CI)	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
727	Branch 8 Mt Albert MH31 (Haverstock Road)	103	N/A	63	69	76	69.3	Central Interceptor Main Works
734	Edendale Branch Sewer MH 01 (Lyon Ave)	86	N/A	N/A	71	56	63.5	Central Interceptor Main Works

Type 3 location rolling WWO data from 1 July 2014 – 30 June 2017

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
S49	43 Dundale Ave	n/a	n/a	n/a	4	3	3.5	Western Isthmus Water Quality Improvement Programme

1.31.6 Inflow & Infiltration Programme

Parts of this catchment comprise of a combined drainage network, in these areas I&I is currently not being considered and other programmes of works are being investigated to address the wet weather overflows such as separation investigation projects. In the separated areas I&I will be considered as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

1.31.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Central Interceptor – main works and link sewers	Project Execution	This project, as well as addressing numerous wet weather overflows, will also address the risk of failure of the Manukau siphon, and also provide for urban growth. To address growth, level of service, and asset condition risks	The Central Interceptor will have multiple and widespread benefits through immediate improvements in wet weather overflow frequency and enabling upgrades for growth and level of service upgrades	2017-2025

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Underway	Western Isthmus Water Quality Improvement Programme	Studies and investigations	To address growth, level of service, and asset condition risks in the Western isthmus and wider catchments. These EOPs typically have very high overflow frequency, as many are in combined wastewater and stormwater catchments	Development of upgrade suite to achieve reduction in wet weather overflow frequencies and to allow for growth. The final scope of this project is under investigation	2018-2028
Complete	Oliver St WWPS catchment diversion	Complete	The Oliver St WWPS is undersized for the current contributing catchment, resulting in frequency wet weather overflows	Reduction in overflows from EOP 701	Completed
Underway	Waterview North and South separation	Design, option analysis (Feasibility)	To address wet weather overflows in the partially combined areas. May require additional wastewater upgrades to ensure level of service outcomes are required	Is expected to reduce high overflow frequencies at EOPs 559, 561, 562, 566, 568, 568	2015-2022
Underway	Oakley Wastewater Model Build and Calibration	Studies and investigations	To be able to identify the preferred works programme to meet target wet weather overflow frequencies and accommodate growth in the catchment.	To identify performance issues and develop network solutions to reduce overflows throughout the catchment and provide for urban growth	2015-2018
Underway	Meola Reef Wastewater Model Build and Calibration	Studies and investigations	To be able to identify the preferred works programme to meet target wet weather overflow frequencies and accommodate growth in the catchment.	To identify performance issues and develop network solutions to reduce overflows throughout the catchment and provide for urban growth	2017-2020
Underway	Bremner, Developer led	Design, option analysis (Feasibility)	To address wet weather overflows in the partially combined areas. May require additional wastewater upgrades to ensure level of service outcomes are required	Is expected to reduce high overflow frequencies at EOPs 559, 561, 562, 566, 568, 568	2015-2022
Underway	Grey Lynn Wastewater	Project Execution	A new 4.5m (initial estimate only)	Increased capacity and	On-going

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
	Tunnel		diameter tunnel 1.6km long	reduction in wet weather overflows at EOPs 244 and 246, and to facilitate future catchment improvements	
Future	Meola Wastewater Catchment Improvements	Studies and investigations	Programme of work to enable growth and reduce wet weather overflows	Reduction of wet weather overflows	2022-2025
Future	Avondale/Whau Wastewater Catchment Improvements	Studies and investigations	Programme of work to enable growth and reduce wet weather overflows	Reduction of wet weather overflows	2018-2022
Future	Oakley Wastewater Catchment Improvements	Studies and investigations	Programme of work to enable growth and reduce wet weather overflows	Reduction of wet weather overflows	2020-2023
Future	Point Chevalier Catchment Improvements	Studies and investigations	Programme of work to enable growth and reduce wet weather overflows	Reduction of wet weather overflows	2022-2025

Minor improvements works include:

- Mewburn uncontrolled overflow remediation: There is a known Type 3 location (not previously identified as it is within the Western Isthmus (Central Interceptor) catchment. It is proposed to improve the manhole hydraulics to reduce the risk of uncontrolled discharges.
- Waterview Glade EOP reconstruction: This project is required due to transport works, and will marginally improve the wet weather performance at EOP 563, and reduce the likelihood of asset failure and risk of Dry Weather Overflows.
- Installation of screens: EOPs 572, 568, 566, and 342 will have screens installed to mitigate the visual and amenity impacts of highly frequent overflows as planned works.
- Releasing throttles: the continuation pipe at EOP 409 has been upgraded to allow greater flows to be passed forward prior to a spill, resulting in a predicted decrease in overflow frequency from > 52 times per year to less than 2, and a reduced risk of dry weather overflows related to blockages.

1.31.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this catchment between 1 July 2017 and 30 June 2018.

1.31.9 Summary

There was one Type 1 EOP which discharged more frequently than two times per year on average which will be addressed by the Oliver St Diversion. Roots and fat were the main contributors to uncontrolled overflows. This catchment is primarily combined, and the wet weather overflows will be addressed in the long term under the Central Interceptor project

and the suite of improvement works identified under the Western Isthmus Water Quality Improvement Programme and related initiatives. The network has been slightly extended and will continue to be monitored and responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this catchment can be found in Appendix 1.

1.32 Strategic Management Area 10: Oneroa

1.32.1 Overview

Waiheke Island is located in the Hauraki Gulf approximately 17 km east of the Auckland CBD. At 9,324 ha in size, Waiheke is the second largest island in the Hauraki Gulf. It is 26 km long and 19 km across at its widest point, and has rolling hills that reach 230 m in height.

The island is the most populated of the Hauraki Gulf Islands, with approximately 8,000 permanent residents and 3,400 temporary residents (e.g. holiday home owners), although the population swells to over 25,000 people in the summer holiday season. Only a small proportion of the island is currently serviced, with a connected population of only 36, with the rest of the connections being non-residential.

	2014/15	2015/16	2016/17	2017/18
No. of connections	36	36	36	36
Length of sewer (km)	3	3	3	3

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
657	Oneroa WWPS	DPONR	1	Oneroa Beach

There have been no changes to the schedule of EOPs in the Oneroa SMA.

1.32.2 Dry Weather Overflows (DWOs)

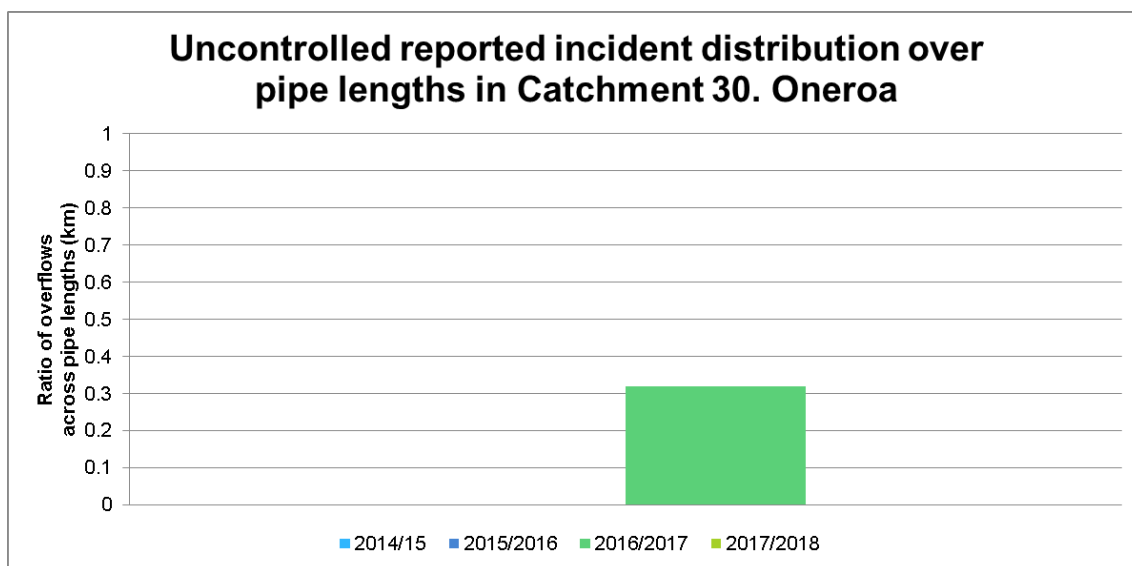
Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported incidents

There were 0 reported incidents in the Oneroa catchment.

1.32.3 Trend analysis of reported incidents



1.32.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2017 and 30 June 2018.

1.32.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
657	Oneroa Waiheke WWPS	1.2	0	0	5	0	1.25	Pumps replaced

1.32.6 Inflow & Infiltration Programme

I&I investigations began in 2017 to investigate high wet flows arriving at the Wastewater Treatment Plant. This include smoke testing and visual property inspections.

1.32.7 Improvement Works Programme

No significant improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.32.8 Erosion Control Measures

No works related to erosion control were carried out in this SMA between 1 July 2017 and 30 June 2018.

1.32.9 Summary

The network in this SMA is extremely small, and the pump station does not discharge more frequently than two times per year on average. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur, with

proposals for growth and development in Waiheke being monitored. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.33 Strategic Management Area 11: Beachlands-Maraetai

1.33.1 Overview

The Beachlands-Maraetai catchment includes two seaside suburbs located about 23 km east of central Auckland. The serviced population living in the Beachlands-Maraetai area was estimated to be around 7,000 in 2013 (Census, 2013), with 2,863 wastewater connections. The total land area within the catchment is approximately 530 ha. Land use within the catchment is predominantly residential. Beachlands has marina facilities at Pine Harbour Marina, and Maraetai has a small boat ramp and breakwater.

	2014/15	2015/16	2016/17	2017/18
No. of connections	2,440	2,562	2,750	2,863
Length of sewer (km)	70	73	78	89

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1016	Hawke Crescent WWPS	DPHAW	1	Sunkist Bay (via stormwater pipe)
1017	Omana Esplanade WWPS	DPOMA	1	Omana Beach (via stormwater pipe)
1079	Maraetai Domain WWPS	DPMTI	1	Unnamed stream flowing to Maraetai Beach
1080	Te Pene WWPS	DPTPN	1	To Land
1081	Te Puru WWPS	DPTPP	1	Unnamed stream flowing to Kelly's Beach (south)
1083	Third View WWPS	DPTVW	1	Unnamed stream flowing to Kelly's Beach (north) (via stormwater pipe)
1084	Karaka Road WWPS	DPKKA	1	Unnamed stream flowing to Pine Harbour Marina (south)
1085	Sunkist Bay Reserve WWPS	DPSKB	1	Sunkist Bay Beach
1086	Toomer Place WWPS	DPTOO	1	Unnamed stream flowing to Pine Harbour Marina (north)
1087	Pine Harbour Marina WWPS	DPPHM	1	Unnamed stream flowing to Pine Harbour Marina (south)
1542	New Avenues WWPS	DPNAV	1	Unnamed stream flowing to Pine Harbour Marina Beach (south)

There have been no changes to the schedule of EOPs in the Beachlands-Maraetai SMA.

1.33.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 16 reported incidents in the Beachlands-Maraetai catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

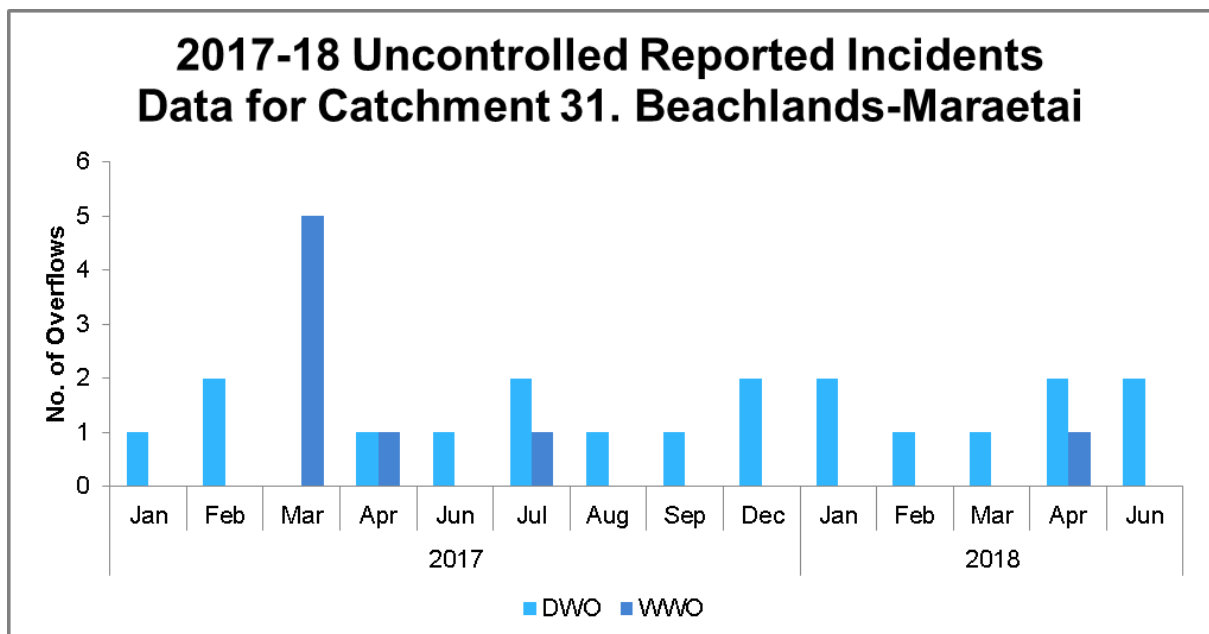
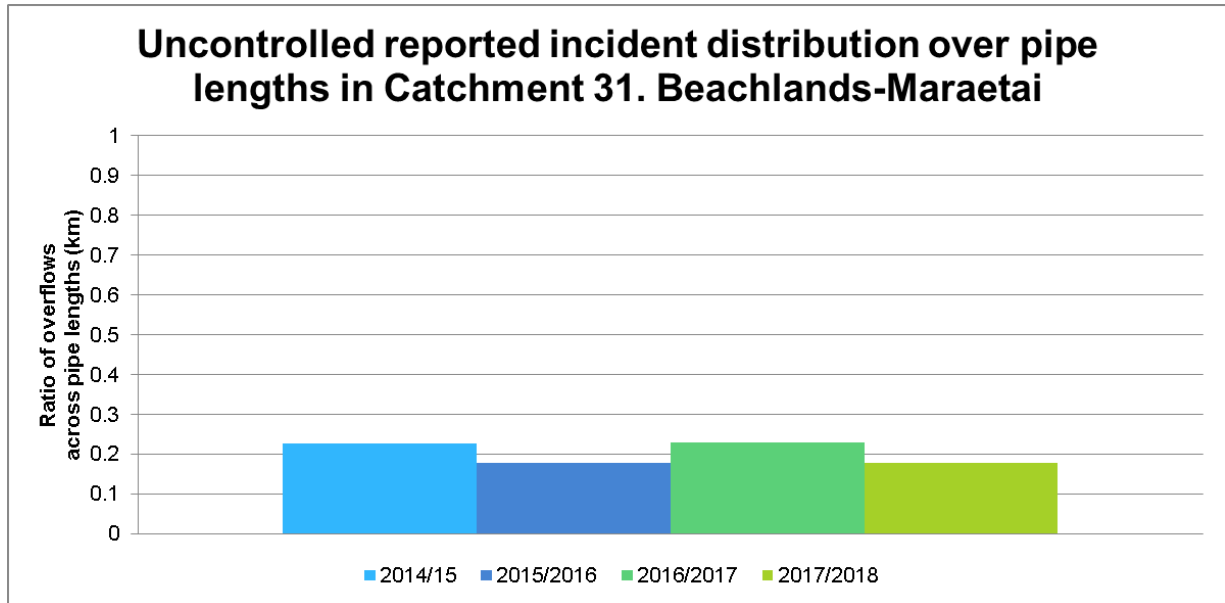
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

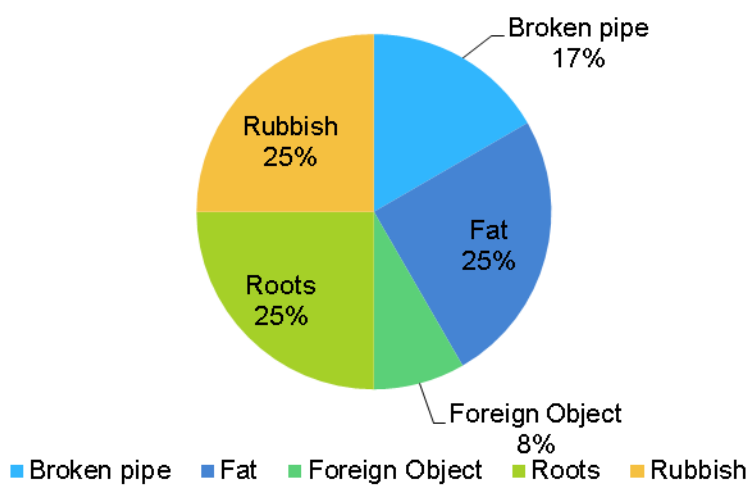
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
17/07/2017	76 Maraetai Dr	L1	204	Unknown	0	Under investigation
4/04/2018	76 Maraetai Dr	L1	117	Unknown	3	
15/06/2017	143 Second View Ave	L1	435	Unknown	0	CCTV requested, removed fat and roots
27/07/2017	143 Second View Ave	L1	148	Fat	5.5	
6/08/2017	113 Third View Ave	L1	160	Rubbish	3	Heavy flushed
14/04/2018	113 Third View Ave	L1	106	Surcharging	84	
28/01/2018	8 Sunkist Bay Rd	L1	500	Broken pipe	0	Broken dropper repaired
19/02/2018	8 Sunkist Bay Rd	L1	149	Unknown	0	

1.33.3 Trend analysis of reported incidents

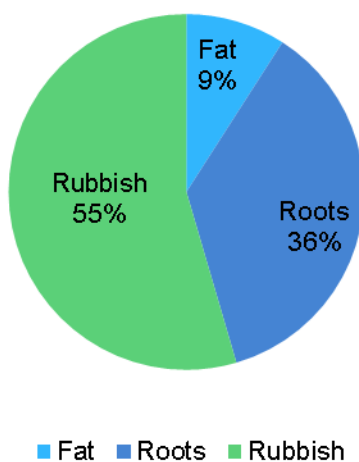
The graphs overleaf reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



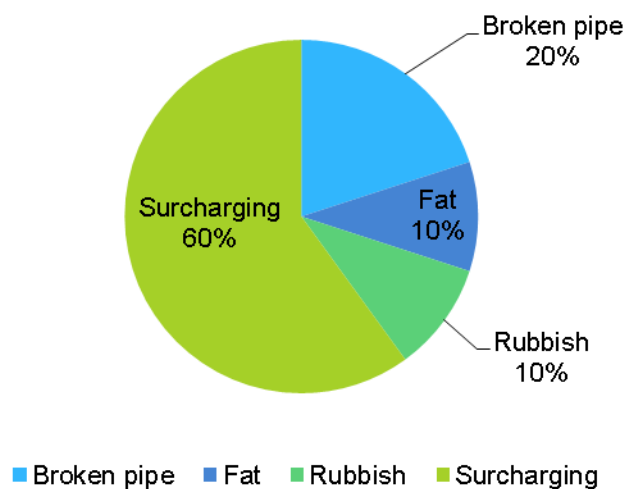
2014-15 Data for Catchment 31. Beachlands Maraetai



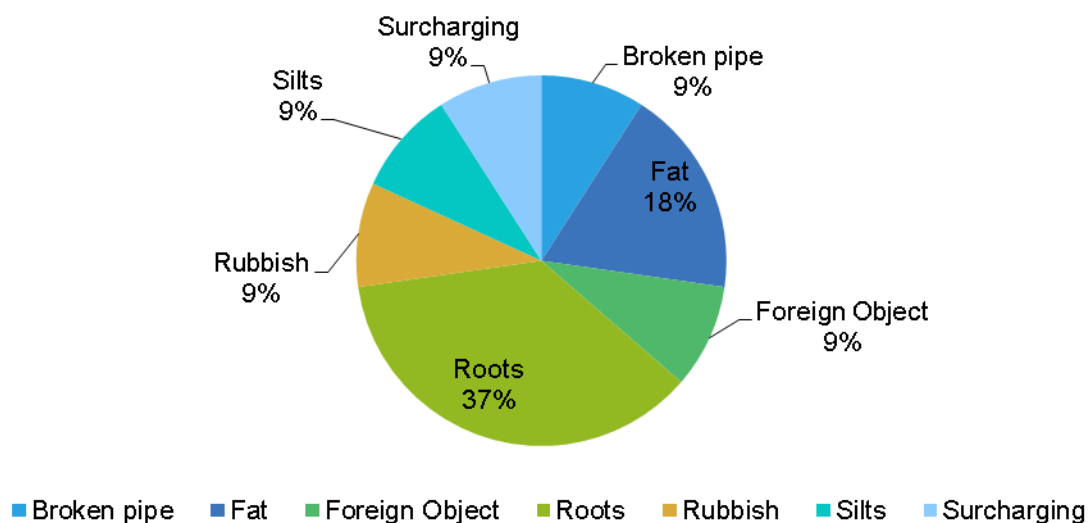
2015-16 Data for Catchment 31. Beachlands Maraetai



2016-17 Data for Catchment 31. Beachlands Maraetai



2017-18 Data for Catchment 31. Beachlands Maraetai



Trend analysis has been carried out where the cause has been identified.

1.33.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
5/01/2018	DPMTI	Maraetai Domain Wastewater Pump Station	1079	Rain event	280	13.5
1/02/2018	DPMTI	Maraetai Domain Wastewater Pump Station	1079	Rain event	164	28
11/02/2018	DPMTI	Maraetai Domain Wastewater Pump Station	1079	Rain event	224	42.5

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
13/02/2018	DPMTI	Maraetai Domain Wastewater Pump Station	1079	Rain event	223	24.5
14/04/2018	DPMTI	Maraetai Domain Wastewater Pump Station	1079	Rain event	713	84
14/04/2018	DPTVW	Third Avenue Wastewater Pump Station	1083	Rain event	893	84
24/05/2018	DPHAW	Hawke Crescent Wastewater Pump Station	1016	Rain event	442	7
3/06/2018	DPMTI	Maraetai Domain Wastewater Pump Station	1079	Rain event	270	67.5
3/06/2018	DPSKB	Sunkist Bay Wastewater Pump Station	1085	Rain event	153	67.5
3/06/2018	DPTVW	Third Avenue Wastewater Pump Station	1083	Rain event	422	67.5
3/06/2018	DPOMA	Omana Esplanade Wastewater Pump Station	1017	Rain event	42	67.5
3/06/2018	DPTOO	Toomer Place Wastewater Pump Station	1086	Rain event	330	67.5
12/06/2018	DPTVW	Third Avenue Wastewater Pump Station	1083	Rain event	638	38.5
12/06/2018	DPMTI	Maraetai Domain Wastewater Pump Station	1079	Rain event	290	38.5

1.33.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1016	Hawke Crescent WWPS	1.2	1	0	2	1	1	Continue to monitor
1017	Omana Esplanade WWPS	1.2	0	0	2	1	0.75	Continue to monitor
1079	Maraetai Domain WWPS	0	0	0	5	7	3	Pump replaced
1080	Te Pene WWPS	0.4	0	0	0	0	0	Continue to monitor
1081	Te Puru Park WWPS	1	0	0	0	0	0	Continue to monitor
1082	Te Puru WWPS	1.8	0	0	0	0	0	Previously completed upgrade
1083	Third view WWPS	0	1	0	2	1	1	Continue to monitor
1084	Karaka Road WWPS	0.6	0	0	1	0	0.25	Continue to monitor
1085	Sunkist Bay Reserve WWPS	1.2	1	0	2	1	1	Continue to monitor
1086	Toomer Place WWPS	1.4	0	0	4	1	1.25	Continue to monitor
1087	Pine Harbour Marina WWPS	0	0	0	2	0	0.5	Continue to monitor

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1542	New Avenues WWPS	0	0	0	0	0	0	Continue to monitor

1.33.6 Inflow & Infiltration Programme

I&I investigations have been delayed and are planned to commence in 2018.

1.33.7 Improvement Works Programme

No significant improvement works related to overflows have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018. The Okaroro Drive Rising Main is currently being monitored for surges in pressure as a cause of overflows in recent years.

1.33.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.33.9 Summary

The Maraetai Domain WWPS was affected by storm events and king tides in 2018, and discharged more than two times on average in this reporting period. The overflow history will be analysed and utilised when reviewing future network improvement programmes. There has been significant growth in the Beachlands-Maraetai catchment, with the network being extended by 11.4km and the New Avenues WWPS being constructed to service new development. There are no significant issues with the performance of the network over the period covered by this report. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.34 Strategic Management Area 12: Clarks Beach

1.34.1 Overview

Clarks Beach is a small coastal village located on the south-western shore of the Manukau Harbour between the Waiuku River and Clarks Creek. The Clarks Beach wastewater network services the townships of Waiau Beach, Glenbrook and Clarks Beach. Land use includes residential properties along with the Clarks Beach Golf Club, Clarks Beach Camping Ground and surrounding rural activities. There are 703 wastewater connections.

	2014/15	2015/16	2016/17	2017/18
No. of connections	696	699	701	703
Length of sewer (km)	15	15	16	16

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1034	Yacht Club WWPS	DPYAC	1	Waiuku Estuary
1035	Wilsons Access WWPS	DPWAS	1	Clarks Beach
1036	Stella Dr WWPS	DPSLA	1	To Land
1037	Halls Access WWPS	DPHLA	1	Clarks Beach
1040	Clarks Beach Oxidation Ponds WWPS	DPCBO	1	To Land
1041	Stevenson Rd WWPS	DPSTV	1	To Land
1042	Knights Walkway WWPS	DPKNI	1	Clarks Beach
1043	Hoskins Clarks Beach WWPS	DPHOS	1	Clarks Beach
1044	Crisp Rd WWPS	DPCRI	1	Clarks Beach
1045	Keven Rd WWPS	DPKEV	1	Waiau Beach
1046	Channel View Rd WWPS	DPCHV	1	Waiau Beach
1047	Glenbrook Beach St WWPS	DPGLB	1	Glenbrook Beach

The following EOP has been added to the schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
1603	84 Torkar Rd	-	2	Clarks Beach	Identified historical EOP from FDC

1.34.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 3 reported incidents in the Clarks Beach catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

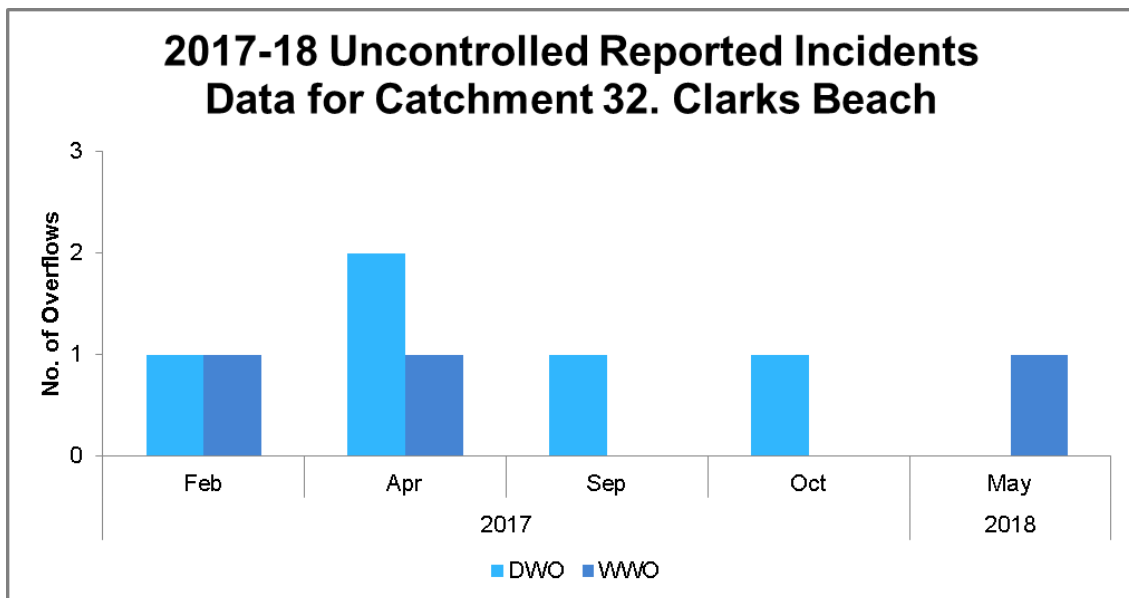
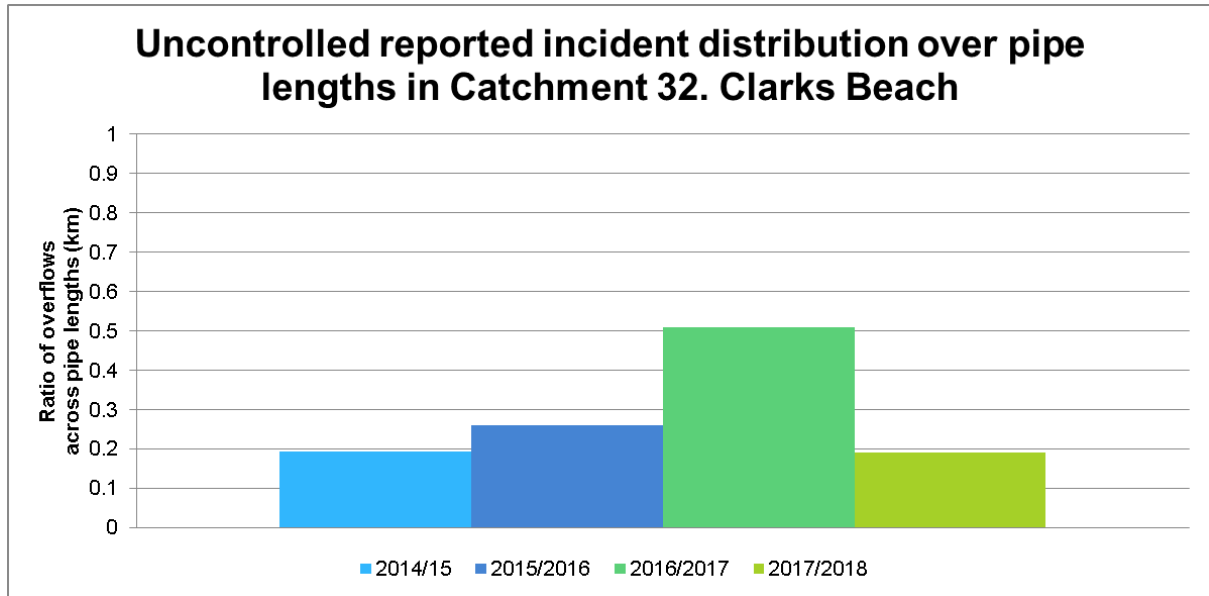
There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

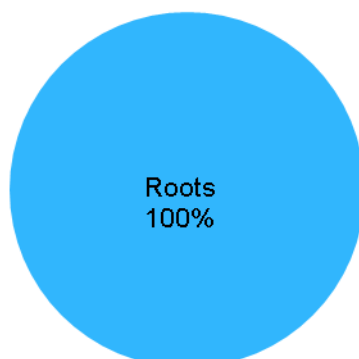
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
3/09/2017	41 Clarks Beach Rd	L1	150	Unknown	0	CCTV, under investigation
23/05/2018	41 Clarks Beach Rd	L1	110	Fat	29	

1.34.1 Trend analysis of reported incidents

The below overleaf reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.

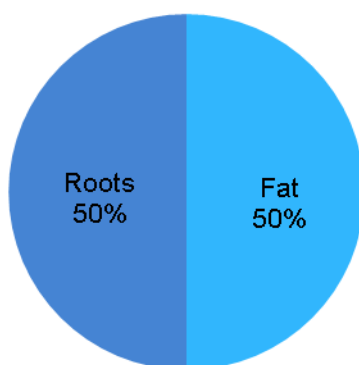


2014-15 Data for Catchment 32. Clarks Beach



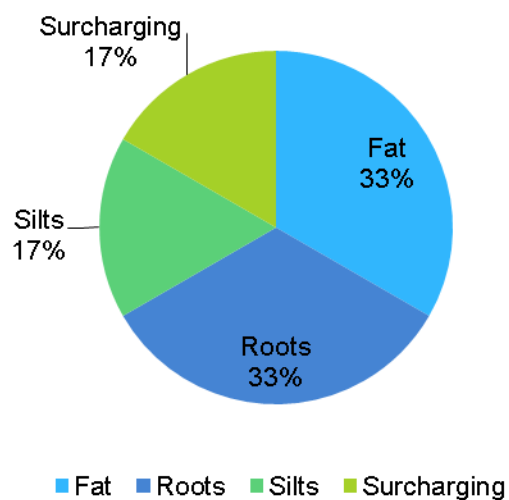
■ Roots

2015-16 Data for Catchment 32. Clarks Beach

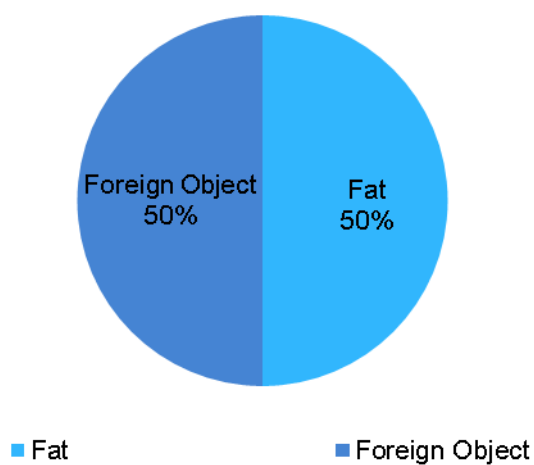


■ Fat ■ Roots

2016-17 Data for Catchment 32. Clarks Beach



2017-18 Data for Catchment 32. Clarks Beach



1.34.2 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2017 and 30 June 2018.

1.34.3 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1034	Yacht Club WWPS	0	0	0	1	0	0.25	Continue to monitor
1035	Wilsons Access WWPS	0	0	0	0	0	0	Continue to monitor
1036	Stella Dr WWPS	0	0	0	0	0	0	Continue to monitor
1037	Halls Access WWPS	0	0	0	0	0	0	Continue to monitor
1040	Clarks Beach Oxidation Ponds WWPS	0	0	0	0	0	0	Continue to monitor
1041	Stevenson Rd WWPS	0	0	0	0	0	0	Continue to monitor
1042	Knights Walkway WWPS	0	0	0	0	0	0	Continue to monitor
1043	Hoskins Clarks Beach WWPS	0	0	0	0	0	0	Continue to monitor
1044	Crisp Rd WWPS	0	0	0	0	0	0	Continue to monitor
1045	Keven Rd WWPS	0.6	0	0	0	0	0	Continue to monitor
1046	Channel View Rd WWPS	0	0	0	0	0	0	Continue to monitor
1047	Glenbrook Beach St WWPS	0.2	0	0	0	0	0	Continue to monitor

1.34.4 Inflow & Infiltration Programme

Detailed inspections of 700 properties and smoke testing in Clarks Beach, Waiau Beach and Glenbrook beach have been carried out. Further I&I investigations are planned.

1.34.5 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on work completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Planned	South West Servicing Study	Studies and investigations	Significant population growth is expected to be enabled through the proposed South West servicing scheme	Forecast growth will be accommodated without deterioration in performance.	2019-2025

Clarks Beach is located within the South West Growth area, which Watercare has identified as requiring a strategic management approach. There is expected to be minimal impact upon the Clarks Beach wastewater network performance as a direct result of this project, although this will be confirmed following future stages of the servicing strategy; network capacity for growth will be managed in accordance with Watercare's policies and procedures.

Minor improvements works include:

- Pump drawdown testing throughout the catchment to confirm operational performance has been completed.
- Renewal of the Keven Road Pump station to reduce the risk of wet well failure resulting in dry weather overflows (planned works).

1.34.6 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.34.7 Summary

This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.35 Strategic Management Area 13: Waiuku

1.35.1 Overview

Waiuku Township is located at the southern end of the Waiuku Estuary, a tidal arm of the Manukau Harbour, and has a population of approximately 8,700 residents, with 3,070 wastewater connections. The remaining population is located outside of the reticulated wastewater network and is serviced by on-site wastewater disposal.

The Waiuku Catchment consists of approximately 420 ha of predominantly residential and rural land, with some light commercial land. There is one golf course, eight parks of significant size, and several schools.

	2014/15	2015/16	2016/17	2017/18
No. of connections	2,951	2,993	3,045	3,070
Length of sewer (km)	59	59	59	60

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
1022	NZ Steel WWPS	DPNZS	1	Rangiwhea Creek
1023	Bayview WWPS	DPBYV	1	Rangiwhea Creek
1024	Lina Place WWPS	DPLNA	1	Rangiwhea Creek Tributary
1025	Kowhai Place WWPS	DPKAI	1	Golf Course Creek
1026	King St WWPS	DPKNG	1	Waiuku Creek
1027	Ferneleigh Ave WWPS	DPFGH	1	Waiuku Stream Tributary
1028	Kitchener Rd WWPS	DPKAO	1	Waiuku Stream
1029	Rangiwhea Rd WWPS	DPRGW	1	Sandspit Beach
1030	Edgewater Parade WWPS	DPEDP	1	Waiuku Creek
1031	Owens Rd WWPS	DPOWE	1	Waiuku Creek
1032	Kendallvale Dr WWPS	DPKEN	1	Awaroa River Tributary
1033	Breaker Grove WWPS	DPBCR	1	To Land

There have been no changes to the schedule of EOPs in the SMA.

1.35.2 Dry Weather Overflows (DWOs)

Type 1 EOPs – Pump stations

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported Incidents

There were a total of 29 reported incidents in the Waiuku catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

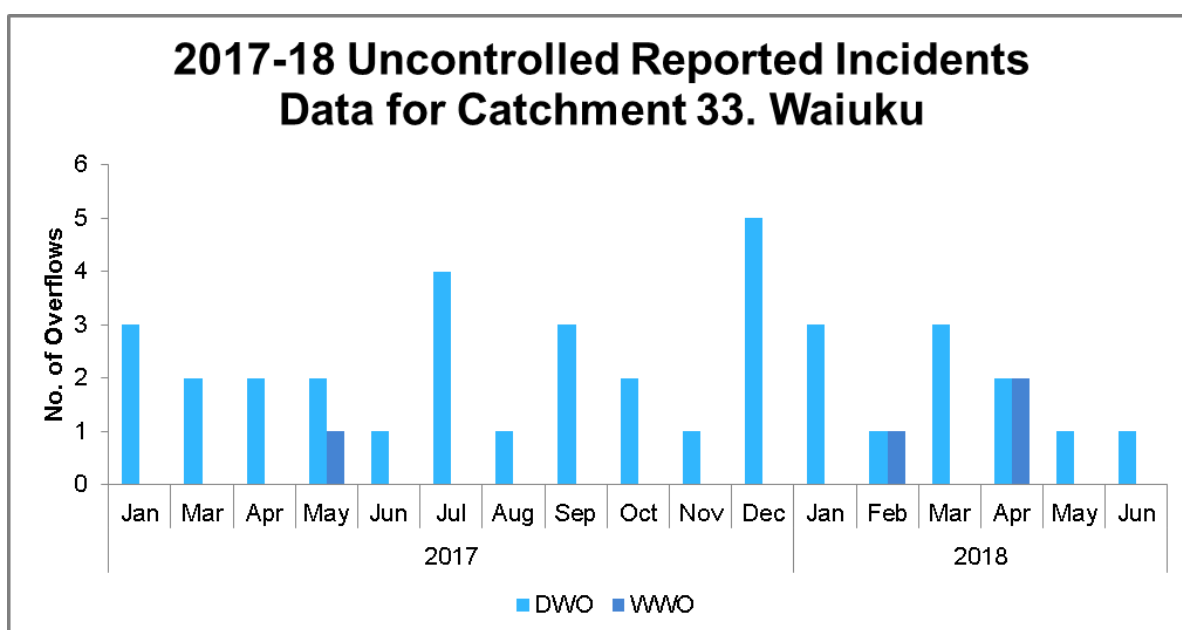
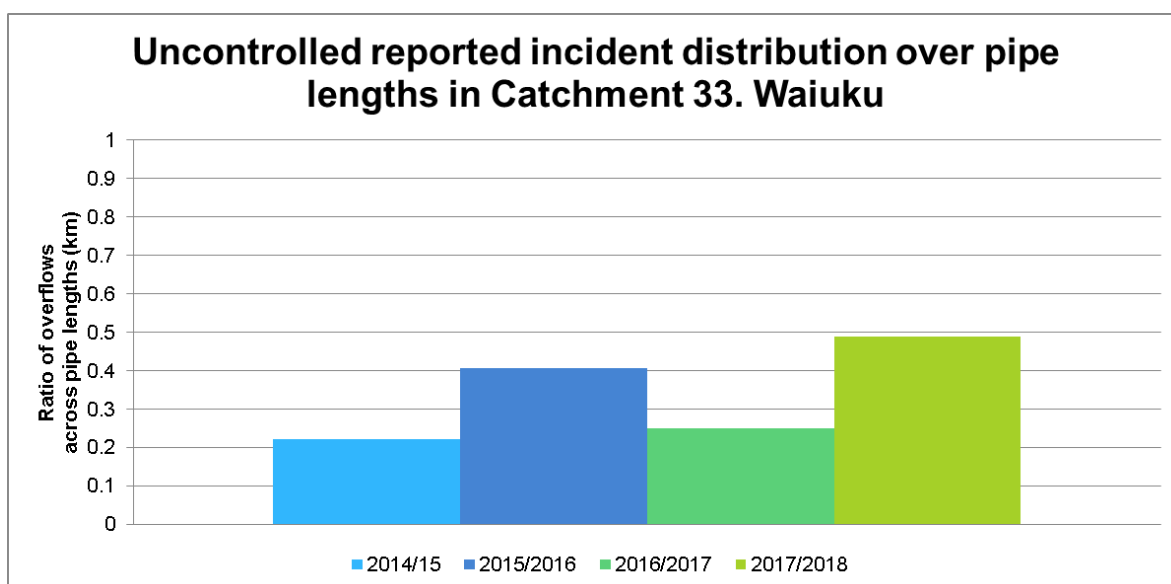
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
30/01/2017	2 Totara St	L1	352	Fat	0	Heavy flush, fats removed
14/12/2017	2 Totara St	L1	48	Fat	10	
31/07/2017	50 Victoria Ave	L1	92	Roots	0	CCTV, roots removed
11/02/2018	50 Victoria Ave	L1	485	Unknown	0	
13/05/2017	106 Racecourse Rd	L1	106	Unknown	0	Continue to monitor
2/12/2017	106 Racecourse Rd	L1	535	Unknown	0	
28/09/2017	4 Owens Rd	L1	81	Fat	0	Fats in main removed with heavy flushing and line patched
30/09/2017	4 Owens Rd	L1	98	Fat	0.5	
9/03/2018	4 Owens Rd	L1	581	Fat	0	
17/05/2018	4 Owens Rd	L1	143	Fat	6	
3/11/2016	36 Victoria Ave	L1	513	Surcharging	1	NRV installed, heavy fats removed from main
20/08/2017	36 Victoria Ave	L1	161	Fat	10	
25/11/2017	41 Kendallvale Dr	L1	94	Rubbish	0	Heavy flushed, debris and rubbish removed from main
11/12/2017	41 Kendallvale Dr	L1	53	Rubbish	0	
17/12/2017	22 Lina Pl	L1	560	Roots	0.5	Rootcut
12/04/2018	22 Lina Pl	L1	461	Roots	7	
10/01/2018	34 Martyn St	L1	240	Foreign Object	0	Manholes rehaunched
16/01/2018	34 Martyn St	L1	117	Rubbish	0	
12/02/2018	14 Bella Villa Dr	L1	372	Unknown	0	Downstream lines flushed to remove

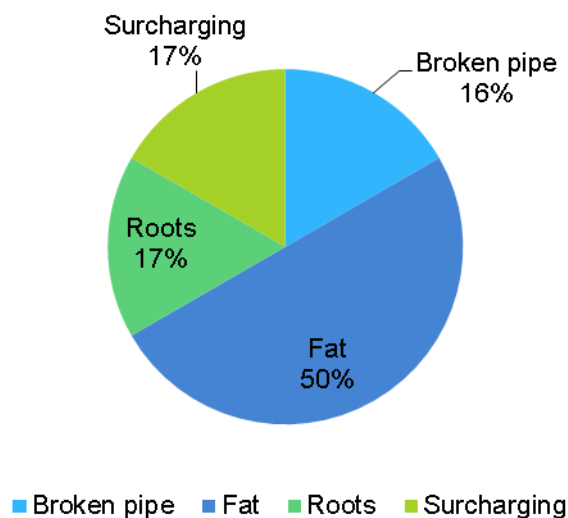
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
17/03/2018	14 Bella Villa Dr	L1	150	Roots	0	debris and roots
30/04/2018	14 Bella Villa Dr	L1	301	Rubbish	11.5	
12/05/2017	4 Elm St	L1	272	Surcharging	68.5	NRV installed
14/04/2018	4 Elm St	L1	126	Surcharging	39.5	
3/03/2017	A/37 Constable Rd	L1	163	Fat	0	Suspected Third Party Damage
6/09/2017	A/37 Constable Rd	L1	82	Broken Pipe	5	

1.35.3 Trend analysis of reported incidents

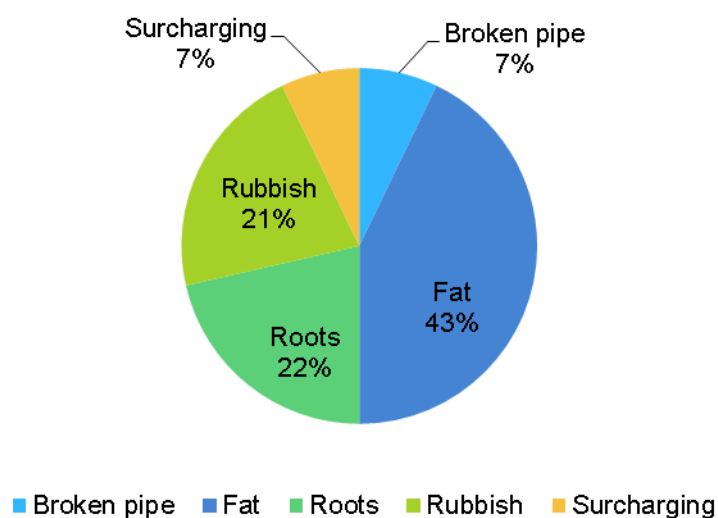
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



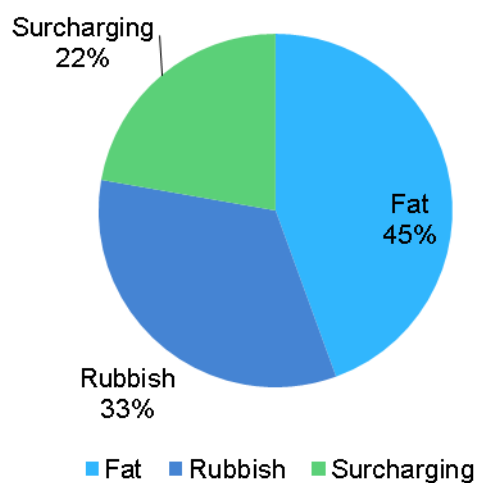
2014-15 Data for Catchment 33. Waiuku



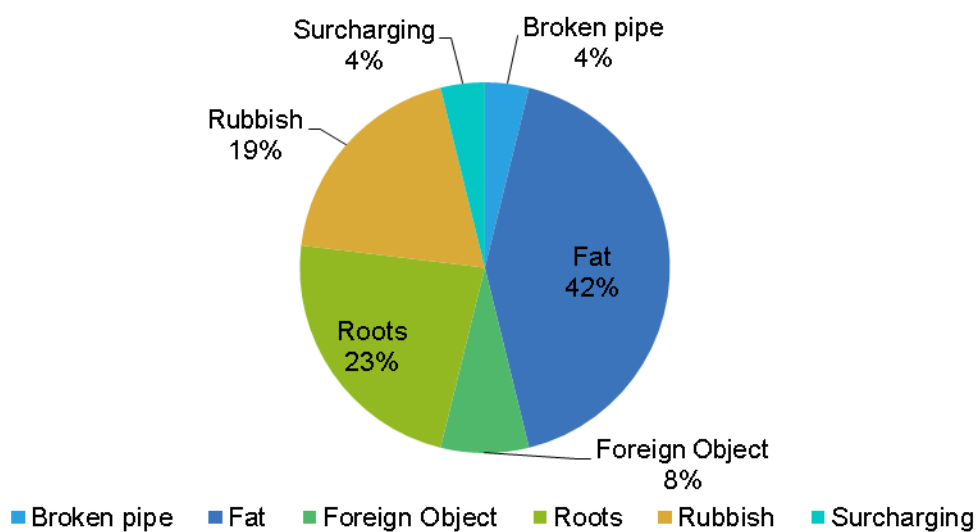
2015-16 Data for Catchment 33. Waiuku



2016-17 Data for Catchment 33. Waiuku



2017-18 Data for Catchment 33. Waiuku



Trend analysis has been carried out where the cause has been identified.

1.35.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

There were no wet weather overflows at pump stations between 1 July 2017 and 30 June 2018.

1.35.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
1022	NZ Steel WWPS	0	1	0	2	0	0.75	Continue to monitor
1023	Bayview WWPS	0	0	0	0	0	0	Continue to monitor
1024	Lina Place WWPS	0	0	0	0	0	0	Continue to monitor
1025	Kowhai Place WWPS	0	0	0	0	0	0	Continue to monitor
1026	King St WWPS	0	0	0	0	0	0	Continue to monitor
1027	Fernleigh Ave WWPS	0	0	0	0	0	0	Continue to monitor
1028	Kitchener Rd WWPS	0	0	0	0	0	0	Continue to monitor
1029	Rangiwhera Rd WWPS	0	0	0	0	0	0	Continue to monitor
1030	Edgewater Parade WWPS	0	0	0	0	0	0	Continue to monitor
1031	Owens Rd WWPS	0	0	0	0	0	0	Continue to monitor
1032	Kendallvale Dr WWPS	0	0	0	0	0	0	Continue to monitor
1033	Breaker Grove WWPS	0	0	0	0	0	0	Continue to monitor

1.35.6 Inflow & Infiltration Programme

A review of I&I in this catchment will be done as part of Watercare's region-wide programme, where the priority of this catchment will be determined.

1.35.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on work completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Planned	South West Servicing Study	Studies and investigations	Significant population growth is expected to be enabled through the proposed South West servicing scheme	Forecast growth will be accommodated without deterioration in performance.	2019-2025

Waiuku is located within the South West Growth area, which Watercare has identified as requiring a strategic management approach. There is expected to be minimal impact upon the Waiuku wastewater network performance as a direct result of this project; network capacity for growth will be managed in accordance with Watercare's policies and procedures.

1.35.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.35.9 Summary

There were no EOPs which discharged more frequently than two spills per year on average in 2017/18. Trend analysis shows an increase in the density of overflows in this region with fat, roots and rubbish being major factors. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been slightly extended and no significant changes have been made to the network as a whole. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.

1.36 Strategic Management Area 14: Pukekohe

1.36.1 Overview

The Pukekohe catchment is situated at the southern edge of the Auckland Region, approximately 50 km south of central Auckland. The population of the catchment was approximately 20,700 in 2013 (Census, 2013), with 8,262 wastewater connections. The catchment is made up of the Pukekohe urban area, as well as the Patumahoe Township and Paerata Business Park to the north, and Buckland and Tuakau townships to the south.

	2014/15	2015/16	2016/17	2017/18
No. of connections	7,772	7,929	8,153	8,262
Length of sewer (km)	152	153	168	164

Schedule of Engineered Overflow Points

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name
825	Franklin Rd WWPS	DPFRA	1	Unnamed tributary of Whangapouri Creek (Franklin Rd)
1243	Fletchers WWPS	DPFRS	1	Stormwater pond (Fletcher Lane)
1244	Wecks WWPS	DPWEC	1	To Land
1245	Mareretu WWPS	DPMTU	1	To Land
1246	North east WWPS	DPNES	1	To Land
1247	Cape Hill Rd WWPS	DPCHR	1	Whangapouri Creek
1248	Lochview WWPS	DPLOC	1	Stormwater pond (Lochview Reserve)
1249	Isabella Dr WWPS	DPISA	1	To Land
1250	Dublin Rd WWPS	DPDUB	1	To Land
1251	Marble Wood WWPS	DPMRW	1	To Land
1252	Kauri Road WWPS	DPKRD	1	To Land
1253	Colin Lawrie 2 WWPS	DPCL2	1	Whangapouri Creek
1254	Anselmi Ridge WWPS	DPANS	1	Whangapouri Creek
1579	Pamela Christine WWPS	DPPAM	1	Stormwater Pond (Pamela Christine Rd)

The following EOPs have been added to the schedule:

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
1550	Pukekohe Raceway Pump Station	DPPKE	1	Unnamed tributary of Tutaenui Stream	As part of the Pukekohe Trunk Sewer
1551	Buckland's Pump Station	DPBUK	1	Tutaenui Stream	As part of the Pukekohe Trunk Sewer

EOP ID	Facility Name	Facility Code	EOP Type	Receiving Environment Name	Comment
1585	Rowles Rd Pump Station	DPROW	1	Stormwater pond (Wai Shing Place)	New EOP from Developments
1587	Jutland Road Pump Station	DPJUT	1	Unnamed tributary of Whangapouri Creek (Adams Rd)	New EOP from Developments, was N67

1.36.2 Dry Weather Overflows (DWOs)

Type 1 – Pump station

There were no dry weather overflows at pump stations between 1 July 2017 and 30 June 2018.

Reported incidents

There were a total of 86 reported incidents in the Pukekohe catchment. Note that the job duration refers to the length of time between the service request being raised until it was closed in the reporting systems, and does not reflect the duration of the overflow. It should also be noted that the daily recorded rainfall also does not always account for incidents identified or occurring after days of heavy rain.

There is a full list of all uncontrolled overflows included in Appendix 3. All overflows were responded to, contained and cleaned up in accordance with the *Wastewater Overflow Regional Response Manual* (Auckland Council and Watercare, 2013).

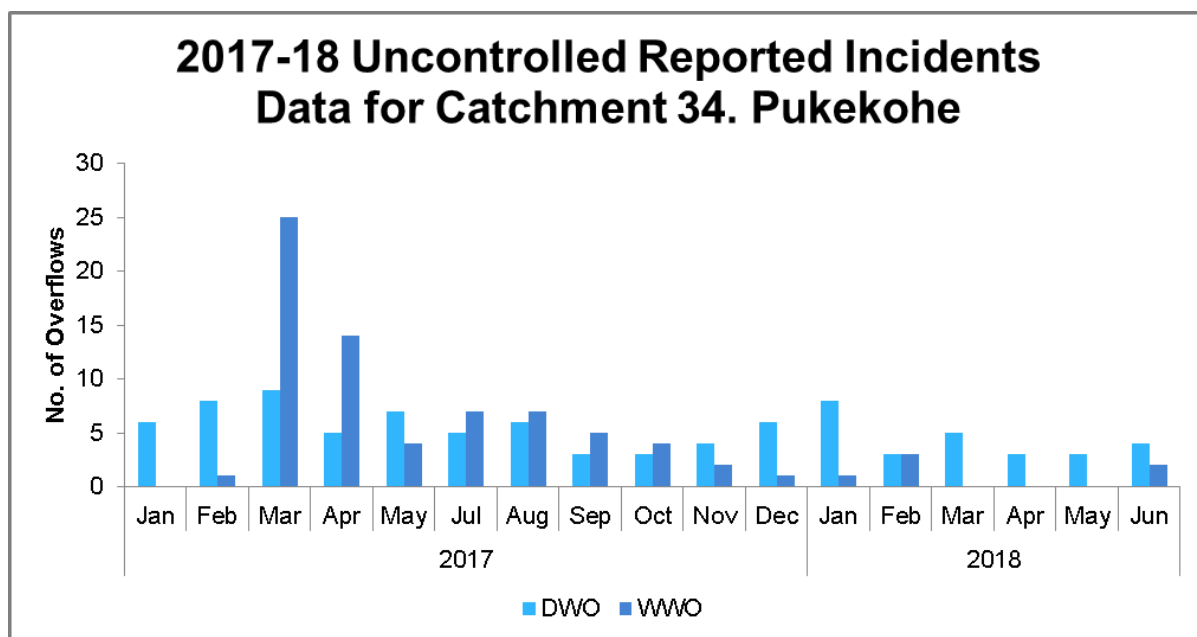
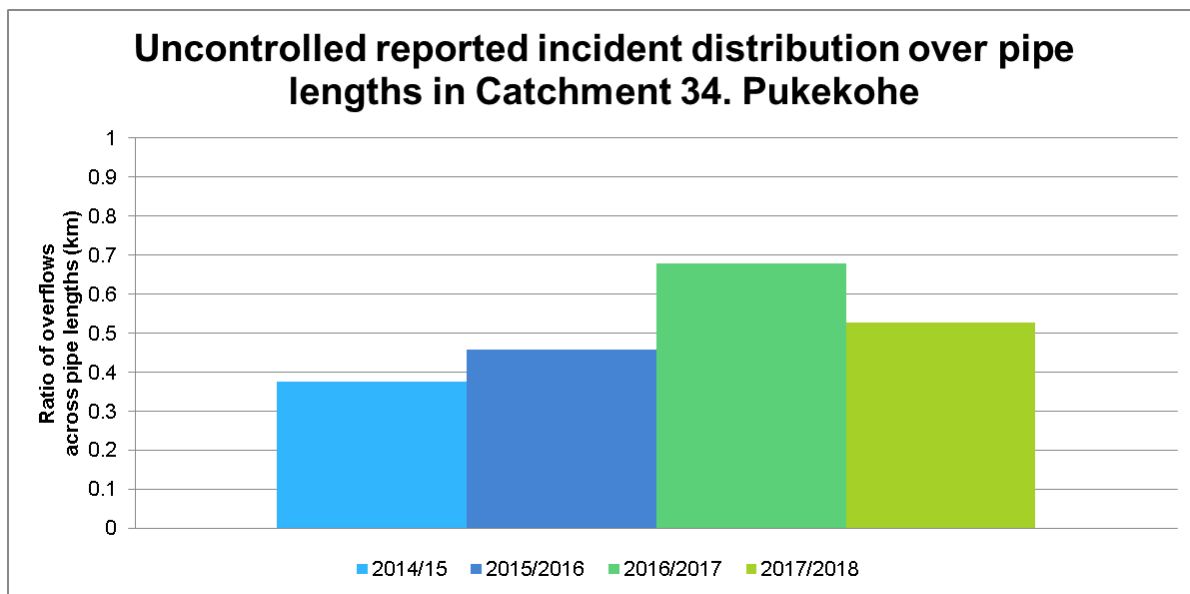
The table below shows the repeat uncontrolled overflows in the catchment. Repeat overflow incidents are defined as those which have occurred more than once in the same location over a 12 month period. Where these have spanned multiple reporting years, all incidents that meet these criteria are included.

Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
29/07/2017	2 Eastside Dr	L1	215	Roots	0	Under investigation
14/08/2017	Eastside Dr	L1	207	Surcharging	7.38	
13/06/2018	2 Eastside Dr	L1	227	Surcharging	4.5	
6/07/2017	Buckland Rd	L3	46	Surcharging	12.44	Surcharging overflows now prevented by large capacity at downstream pump station
14/07/2017	Buckland Rd	L1	95	Surcharging	2.59	
24/07/2017	Buckland Rd	L3	34	Surcharging	3	
26/07/2017	Buckland Rd	L1	58	Surcharging	1	
28/07/2017	Buckland Rd	L1	83	Surcharging	10	
9/08/2017	Buckland Rd	L3	90	Surcharging	24.22	
21/08/2017	Buckland Rd	L3	59	Surcharging	5	
29/08/2017	Buckland Rd	L1	230	Surcharging	0.5	
30/08/2017	Buckland Rd	L3	17	Surcharging	16.5	
6/09/2017	Buckland Rd	L3	10	Surcharging	5	

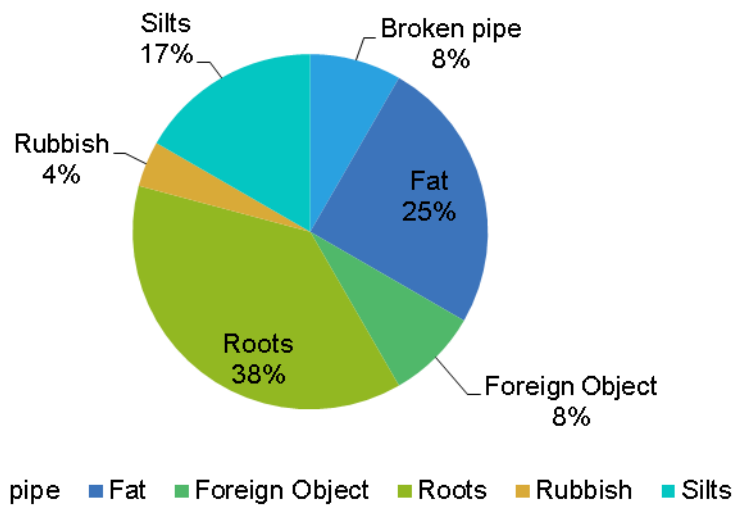
Date	Address	DWO Level	Job closed in reporting system	Cause	Rainfall (mm)	Measures to prevent repeat
11/09/2017	Buckland Rd	L3	52	Surcharging	4.5	
20/09/2017	Buckland Rd	L3	60	Surcharging	0	
9/10/2017	Buckland Rd	L3	22	Surcharging	1.5	
19/10/2017	Buckland Rd	L3	7	Surcharging	0	
24/10/2017	Buckland Rd	L3	656	Surcharging	1.5	
30/10/2017	Buckland Rd	L1	23	Surcharging	1.5	
7/11/2017	Buckland Rd	L3	96	Surcharging	0	
22/12/2017	Buckland Rd	L3	7	Surcharging	0.5	
3/04/2017	10 Russell Ave	L1	709	Unknown	1	Rubbish removed from mains
29/09/2017	10 Russell Ave	L1	167	Rubbish	0	
13/05/2018	9 Bale Way	L1	169	Unknown	10	Under investigation
27/05/2018	9 Bale Way	L1	204	Unknown	10	
30/08/2016	15 London St	L1	88	Unknown	0	Continue to monitor
2/07/2017	15 London St	L1	563	Unknown	8.5	
4/08/2017	6 Lieshout Way	L1	300	Unknown	0	Debris and rubbish removed from main
13/08/2017	6 Lieshout Way	L1	137	Rubbish	11.58	
2/12/2017	36 Victoria Ave	L1	219	Unknown	0	Heavy buildup of fats and debris removed
10/01/2018	36 Victoria Ave	L1	189	Fat	0	
5/09/2017	5 Lynley Tce	L1	125	Fat	1.5	Rootcut
13/12/2017	3 Lynley Tce	L1	171	Roots	0	
9/11/2017	4 Frank Hewitt St	L1	125	Rubbish	0	Rag blockage removed
13/11/2017	4 Frank Hewitt St	L1	127	Rubbish	0	
30/12/2017	6 Holland St	L1	609	Fat	0	Under investigation, CCTV dropper
10/02/2018	6 Holland St	L1	225	Unknown	0	
13/02/2018	6 Holland St	L1	263	Rubbish	0	
10/03/2018	3 Stile Pl	L1	252	Unknown	0	Heavy fats removed
21/04/2018	3 Stile Pl	L1	539	Fat	8	
2/10/2017	91 Seddon St	L1	125	Unknown	4.5	Root intrusion repaired
18/10/2017	91 Seddon St	L1	64	Unknown	0.5	

1.36.3 Trend analysis of reported incidents

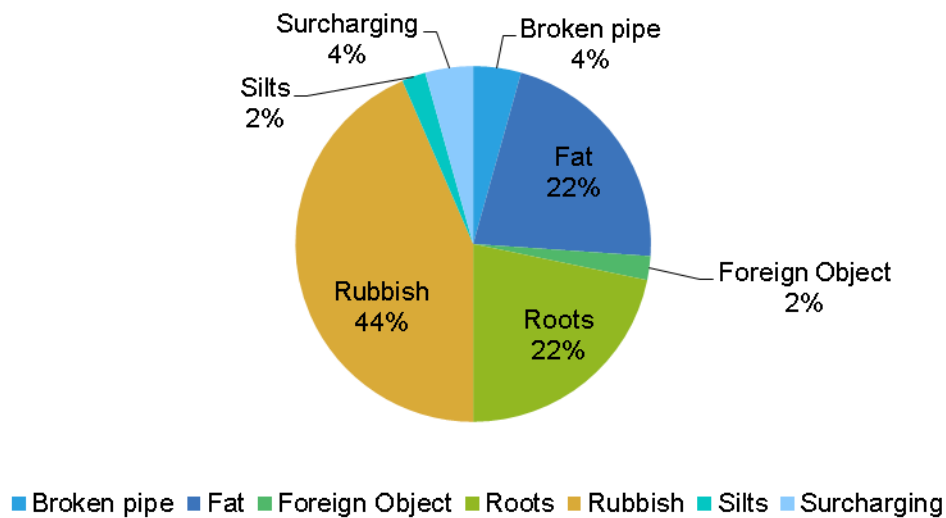
The below graphs reflect the trends distributed along pipe lengths, annual trends, and overflow cause proportions. Trends are displayed over months where overflows occurred.



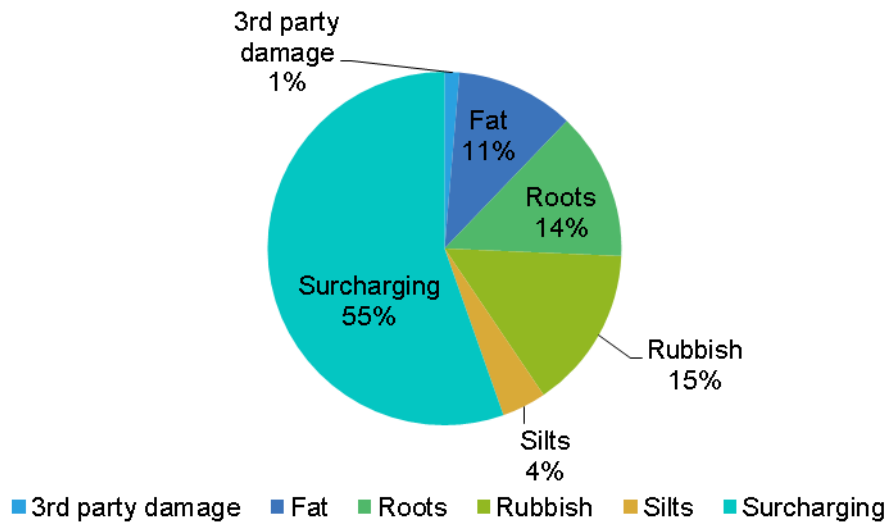
2014-15 Data for Catchment 34. Pukekohe



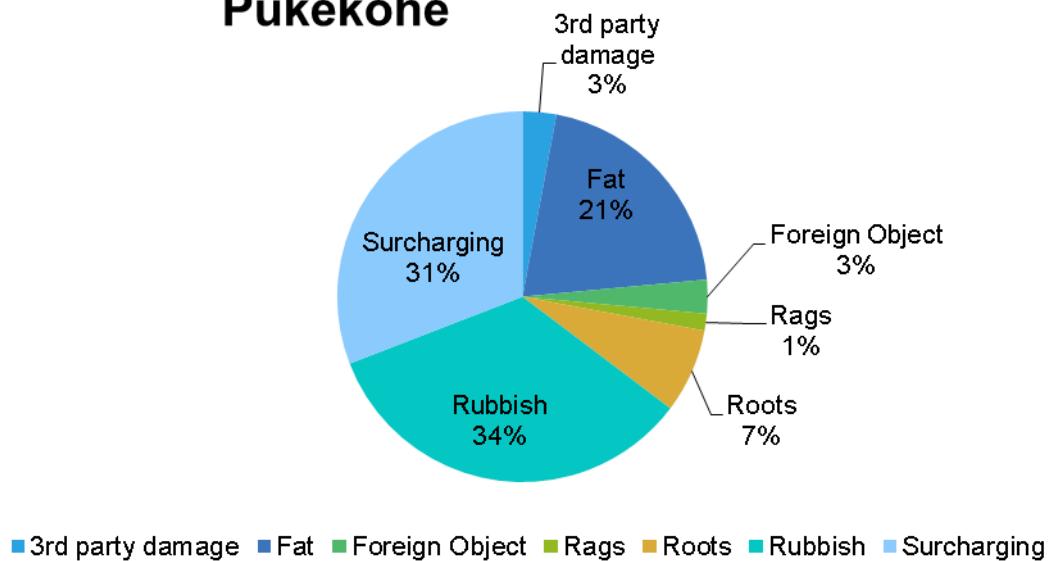
2015-16 Data for Catchment 34. Pukekohe



2016-17 Data for Catchment 34. Pukekohe



2017-18 Data for Catchment 34. Pukekohe



Trend analysis has been carried out where the cause has been identified.

1.36.4 Wet Weather Overflows (WWOs)

Type 1 EOPs – Pump stations

Date	Facility code	Facility Name	EOP ID	Cause	Duration (minutes)	Rainfall (mm)
23/03/2018	DPPAM	Pamela Christine Pump Station	1579	Rain event	1062	6

1.36.5 Trend analysis of pump station overflows

Type 1 – Pump Station rolling WWO data from 1 July 2014 – 30 June 2018

EOP ID	Facility Name	AEE Frequency	2014/15 WWOs	2015/16 WWOs	2016/17 WWOs	2017/18 WWOs	Rolling Avg	Improvement work (if applicable)
825	Franklin Rd WWPS	0.3	0	0	0	0	0	Continue to monitor
1243	Fletchers WWPS	0	0	0	0	0	0	Continue to monitor
1244	Wecks WWPS	0	0	0	3	0	1	Continue to monitor
1245	Mareretu WWPS	0	0	0	0	0	0	Continue to monitor
1246	North east WWPS	0	0	0	0	0	0	Continue to monitor
1247	Cape Hill Rd WWPS	1	0	0	0	0	0	Continue to monitor
1248	Lochview WWPS	0	0	0	0	0	0	Continue to monitor
1249	Isabella Dr WWPS	0.6	0	0	4	0	1	Continue to monitor
1250	Dublin Rd WWPS	0	0	0	0	0	0	Continue to monitor
1251	Marble Wood WWPS	0	0	0	0	0	0	Continue to monitor
1252	Kauri Road WWPS	0	0	0	0	0	0	Continue to monitor
1253	Colin Lawrie 2 WWPS	0.6	0	0	0	0	0	Continue to monitor
1254	Anselmi Ridge WWPS	0	0	0	0	0	0	Continue to monitor
1579	Pamela Christine Pump Station	-	0	0	0	1	0.25	Continue to monitor

1.36.6 Inflow & Infiltration Programme

In response to reported illegal direct connections of private drainage, the northern Pukekohe area has been investigated as part of a reactive programme to remove these inflows to the wastewater network. This process involves smoke testing and serving notice upon residents for remediation.

Detailed inspections and smoke testing on over 500 properties was completed, with one defect identified in this process.

Further I&I investigations are planned in 2018.

1.36.7 Improvement Works Programme

The current status of the Improvement Works Programme for this catchment is described below. It provides an update on works completed or underway for the current reporting year, works planned to commence within the next reporting period, and the results expected from these.

Status	Project Name	Current Stage	Reason for Project	Anticipated Outcome	Timeframe (to project completion)
Complete	Pukekohe trunk sewer upgrade	Closure	Required in order to provide additional conveyance capacity to cater for the planned growth	Will improve the level of wastewater overflow performance and provide for growth	2013-2017
Underway (enforcement stage)	Northern Pukekohe Reactive I&I Investigations	Inflow and Infiltration	Mitigate high flows entering the northern pump stations to improve operational performance in wet weather.	Lower risk of wet weather overflows and provision of capacity for future growth.	2016-2018
Underway	Wastewater Main Renewals and Lining Programme	Project Execution	Network wastewater pipe renewal at 38 sites	Upgraded network pipe condition	2015-2018

1.36.8 Erosion Control Measures

No works related to erosion control have been identified as necessary or carried out in this SMA between 1 July 2017 and 30 June 2018.

1.36.9 Summary

There were no EOPs which discharged more frequently than two spills per year, although there has been a large frequency of wet weather discharges from the network related to the extreme rainfall events experienced this year. The density of overflows has decreased in this reporting period with surcharging and rubbish blockages causing the majority of overflows. The overflow history will be analysed and utilised when reviewing future network improvement programmes. The network has been extended and developed to accommodate for population growth in the region; the Pukekohe Trunk Sewer Upgrade will service the Pukekohe catchment and is sized to cater for future growth. This network will continue to be monitored and will be responded to as per Watercare's policies and procedures as changes occur. The full Schedule of EOPs in this SMA can be found in Appendix 1.