2015
SUPPLEMENTARY MATERIAL

WASTEWATER TREATMENT PERFORMANCE

Watercare
An Auckland Council Organisation

Wastewater Treatment in Auckland

Each day, Watercare Services Limited (Watercare) supplies around 326 million litres of water to the people of Auckland and collects, treats and discharges around 400 million litres of wastewater. This includes stormwater where there is a combined wastewater and stormwater network.

Wastewater is 99.97 per cent water. The remainder includes organic waste, fats, oil and grease, and debris such as sand, grit and plastic. In addition, wastewater can include household chemicals, which can be harmful to the health of harbours and waterways, making effective treatment very important.

In simple terms, wastewater treatment entails the separation and extraction of organic and inorganic solids from the liquid waste stream, and the removal of nutrients to lower biochemical oxygen demand (BOD) levels. BOD is a measure of the pollution potential of the wastewater.

The most modern of Watercare's wastewater treatment plants – including the metropolitan plants at Mangere, Rosedale and Army Bay – use primary (mechanical), secondary (biological) and tertiary (filtration and disinfection) methods to treat wastewater. Composition of the final effluent must meet standards established to protect public health, the local environment, and Auckland's coasts, estuaries and harbours.

Watercare's non-metropolitan wastewater treatment plants range from small, pond-based schemes to advanced tertiary treatment plants. Significant investment is being made in some of the plants to improve their treatment processes and nutrient-removal standards. Over 90% of Auckland's wastewater is treated at either the Mangere or Rosedale treatment plants.

This report provides the detailed performance of Auckland's wastewater treatment plants for the 2014/15 financial year, as well as the metal contents of biosolids in the Mangere and Rosedale plants. The plants are ordered by volumes of wastewater treated, starting with the largest ones.

Compliance with consents at the metropolitan wastewater treatment plants was 99% against a target of 100%. This was due to a one-off, three-day incident at Mangere wastewater treatment plant in December 2014 where high inflows caused by storms limited the effectiveness of the secondary treatment process.

There was significant work undertaken this year to improve the performance of some of the non-metropolitan wastewater treatment plants inherited by Watercare from local councils during integration. As a result, the non-metropolitan plants performed at 77% against a target of 35%, well on track to achieve 100% compliance on this measure by 2020.

Wastewater Treatment Plant (WWTP)	Discharge Volume (m^3/year)	Volume of the discharge not compliant with the consented effluent quality (m^3/year)	Percentage of compliance
Metro WWTPs			
Mangere	116,522,212	1,098,970	99%
Rosedale	20,203,348	0	100%
Army Bay	3,437,273	0	100%
Total Metro WWTPs	140,162,833	1,098,970	99%
Non Metro WWTPs			
Pukekohe	2,596,108	313,205	88%
Beachlands	485,838	27,271	94%
Waiuku	750,736	120,486	84%
Clarks Beach	186,624	126,384	32%
Owhanake	7,979	7,979	0%
Kingseat	8,660	1,878	78%
Bombay*	1,365	0	100%
Kawakawa Bay	20,504	0	100%
Warkworth	372,241	0	100%
Omaha	151,002	13,090	91%
Snells/Algies	302,438	0	100%
Waiwera	109,971	0	100%
Denehurst	4,509	0	100%
Helensville	447,132	447,132	0%
Wellsford	255,783	237,083	7%
Total Non Metro WWTPs	5,700,890	1,294,508	77%
Total	145,863,723	2,393,478	98%

* Bombay consists of a septic tank system with land disposal and no actual discharge consent limits.

Locations of Auckland's Wastewater Treatment Plants (WWTP)

Mangere Wastewater Treatment Plant

The upgrade to Watercare's Mangere wastewater treatment plant between 1998 and 2003 reduced pathogens in the treated wastewater 10,000 fold, raising water quality in the Manukau Harbour to its highest level since the 1930s. The removal of the oxidation ponds not only enabled the restoration of coastal tidal flats and the rehabilitation of some 13 kilometres of coastline, it also means the harbour is no longer used as part of the treatment process.

Since 2003, the plant has continued to develop to ensure it has the capacity to cope with forecast population growth without compromising its environmental performance standards. The transformation of the surrounding area into a recreational area for all Aucklanders also continues to flourish, in particular the Watercare Coastal Walkway, which is now part of Te Araroa, New Zealand's Trail.

The Mangere plant's performance is closely scrutinised. Water quality test results are provided monthly to the Auckland Council at a review meeting, and form the basis of a quarterly report to Council. A report on plant performance is also presented at Watercare Board meetings, which are open to the public, and to a Community Liaison Group open to all interested stakeholders, which meets quarterly. The minutes are available on Watercare's website.

The plant's performance is also regularly reviewed by several independent groups made up of internationally recognised experts in wastewater treatment, plant design and operation, marine water quality, microbiology, environmental virology, and public health. These groups include a Disinfection Review Group, which reviews the operation of the UV disinfection facility and a Microbiological Review Group, which reviews the operation of the plant in relation to the discharge of pathogens to the environment.

The consent conditions governing the operation of the plant require an independent Audit Group to ensure the plant's operation meets consent requirements in terms of technical effectiveness and public acceptability. The Audit Group reviews the monitoring of the environmental effects of the plant's operation and the management of regulatory matters to ensure compliance with the resource consents, and provides expert, independent advice to Watercare, to the Auckland Council, and to other interested groups. A copy of its most recent annual report can be found here.

Council also receives an annual independent report on water quality in the wider Manukau Harbour. The report's author, Dr Shane Kelly, presented a summary of its conclusions to the November 2014 Community Liaison Group meeting.

The land-based wastewater treatment plant at Mangere is designed to manage the bulk of Auckland's wastewater treatment needs well into the 21st century. The technology used at the plant has reduced the treatment cycle of wastewater from 21 days to 13 hours, and the treatment process reduces odours and significantly improves the water quality going into the Manukau Harbour. The most modern of Watercare's wastewater treatment plants (including the plants at Mangere and Rosedale) use primary (mechanical), secondary (biological) and tertiary (filtration and ultraviolet radiation) methods to treat wastewater comprising domestic and industrial waste, as well as the stormwater received from the combined network. Detailed information on the treatment process at Mangere is available here.

Assessment of Plant Performance

Effluent Discharge Volumes

Flow monitoring indicates that the discharge volumes have been met for this reporting year.

Effluent Quality Monitoring

The consented maximum BOD and NFR median limits were exceeded on December 14th in the afternoon discharge period and the next four consecutive discharges. The presence of an unusual microorganism species in the reactors resulted in poor solids settleability. The condition coincided with the wet weather flow conditions causing some solids carryover from the reactors and elevated BOD and NFR concentrations in the discharges. Chlorination was implemented but this exacerbated the condition. The reactors conditions recovered to normal on December 17th and no further problems occurred since then.

Complaints and Incidents

Ten odour and four insect complaints were received this year. No incidents have been reported for this reporting year.

Summary of Plant Performance

Mangere WWTP continues to operate effectively to provide effluent that routinely complies with all discharge standards, apart from one breach mentioned above.

Wastewater Treatment Plant Performance – Mangere

	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	No 30083 Consent Limits
Plant load													
Monthly mean													
BOD (g/m³)	2.4	1.9	3.2	2.6	2.2	8.0	1.8	1.6	1.3	1.1	2.9	2.9	‹ 15
NFR (g/m³)	3.4	3.5	4.2	4.1	5.0	28.9	5.5	4.5	3.6	4.0	6.5	4.4	‹ 15
Total petroleum hydrocarbons (g/m³)	0.30	0.32	0.30	0.30	0.30	0.30	0.30	0.35	0.30	0.30	0.30	0.30	‹ 0.5
Monthly maximum													
BOD (g/m³)	17.0	4.6	21.0	12.0	3.5	100.0	4.7	4.1	3.1	2.2	15.0	10.0	‹ 50
pH	7.4	7.4	7.4	7.5	7.5	8.0	7.7	7.7	7.7	7.6	7.5	7.3	‹ 9
Monthly minimum													
pH	6.8	6.8	6.7	7.0	7.0	7.0	6.9	7.1	7.1	7.0	6.8	6.9	› 6.5
95 percentile over three discreet months													
BOD (g/m³)	N.A.	N.A.	4.5	N.A.	N.A.	11.7	N.A.	N.A.	3.2	N.A.	N.A.	6.6	‹ 30
NFR (g/m³)	N.A.	N.A.	9.2	N.A.	N.A.	29.6	N.A.	N.A.	11.2	N.A.	N.A.	13.0	‹ 30
Nutrients													
Monthly mean													
Reactive phosphorus (g/m³)	2.1	2.2	1.5	1.4	1.7	2.0	2.9	2.4	2.1	1.9	1.0	2.3	‹ 9
Total nitrogen (g/m³) (Apr-Nov)	0.5	0.5	0.7	1.3	2.2					0.5	1.3	0.8	‹ 35
Nitrogen in ammoniacal form (g/m³) (Apr-Nov)	9.2	9.6	11.5	10.5	9.0					8.8	9.7	9.4	‹ 5
Total nitrogen (g/m³) (Dec-Mar)						0.5	0.4	0.4	0.5				‹ 9.5
Nitrogen in ammoniacal form (g/m³) (Dec-Mar)						8.5	7.2	7.8	7.6				‹ 3
Monthly maximum													
Nitrogen in ammoniacal form (g/m³) (Apr-Nov)	3.1	2.5	3.1	1.3	7.8					0.9	6.4	3.2	‹ 15
Nitrogen in ammoniacal form (g/m³) (Dec-Mar)						1.3	0.9	1.2	2.0				‹ 6
Disinfection													
% of duration receiving 35 mWs/cm²	100.00	100.00	100.00	99.95	99.96	97.97	99.74	100.00	100.00	100.00	100.00	100.00	≥ 99%
Monthly mean (% saturation)													
Dissolved oxygen % saturation	80.5	93.2	80.7	83.1	83.3	81.0	80.7	92.0	85.0	84.8	86.3	86.4	› 80%
Breaches of resource consents													YTD
Breaches of consent conditions	0	0	0	0	0	1	0	0	0	0	0	0	1
Resolved WTP source incidents and complaints													YTD / Target
Reportable odour incidents	0	0	0	0	0	0	0	0	0	0	0	0	0 / 0
Odour complaints	0	0	4	1	3	0	0	0	0	2	0	0	10 / 0
Insect complaints	1	0	0	2	0	1	0	0	0	0	0	0	4 / 0
Noise complaints	0	0	0	0	0	0	0	0	0	0	0	0	0 / 0
Other complaints (dust)	0	0	0	0	0	0	0	0	0	0	0	0	0 / 0
Total	1	0	4	3	3	1	0	0	0	2	0	0	14
Volumes (thousand m³) – Influent													Consent limit
Total month	10,638	9,923	12,686	9,209	8,091	8,001	6,662	6,510	7,661	7,502	9,880	9,614	
Average daily	343	320	423	297	270	258	215	232	247	250	319	320	
Rolling 12 month average	298	292	291	290	288	287	288	291	291	292	296	289	390
Peak day	673	515	825	513	335	546	256	295	360	381	716	682	1209

Rosedale Wastewater Treatment Plant

The Rosedale WWTP is located at 2 Jack Hinton drive Rosedale Albany. It is an activated sludge plant that utilises the following treatment devices and processes for treatment of wastewater and management of biosolids:

- Screening and grit removal
- The Primary Sedimentation Tanks (PSTs) to remove Raw Sludge and Scum by settling and flotation respectively.
- The Modified Ludzack Ettinger (MLE) Process for biological nitrogen reduction and final effluent Clarifiers
- Anaerobic digestion to reduce the organic and bacterial content of the sludge
- UV disinfection, and
- Sludge dewatering (gravity belt thickener and centrifuge).

Treated effluent is discharged into the Hauraki Gulf. All dewatered biosolids are taken to a permitted solid waste landfill at Redvale landfill for disposal. The Rosedale WWTP has been operating in a stable and satisfactory state during this reporting year.

The next stage of the plant upgrade is underway. It includes upgrades to the primary, secondary and tertiary treatment capacity to ensure the plant is able to cope with population growth in the region.

Assessment of Plant Performance

Effluent Discharge Volumes

The results indicate that effluent volume discharge limits were met for the reporting year.

Effluent Quality Monitoring

Compliance with all discharge standards was achieved during each quarter for all parameters.

Air Discharge Monitoring

Compliance with the air discharge consent was achieved during this reporting year.

Complaints

No complaints other than insect (Midge) complaints have been received in regards to the operation and maintenance of the WWTP for this reporting year. There were eight instances of insect complaints, between September 2014 and January 2015.

Summary of Plant Performance

Rosedale WWTP continues to operate effectively to provide effluent that routinely complies with all discharge standards. No breaches were recorded in 2014-2015 and the plant performed well.

Wastewater Treatment Plant Performance – Rosedale

	Standard	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Annual Median	
Pollutant load	**Median**														
Monthly median															
BOD (g/m^3)	≤ 20	1.5	0.9	1.2	0.5	3.5	2.8	2.0	2.2	1.0	1.4	2.9	1.0	1.5	
NFR (g/m^3)	≤ 35	3.5	3.8	4.5	4.4	6.6	6.6	9.8	10.8	6.6	13.0	11.0	10.5	6.6	
Nutrients															
Monthly median															
Dissolved reactive phosphorus (g/m^3)	≤ 10	2.3	2.6	2.7	2.8	3.7	3.8	3.0	3.5	3.20	3.8	2.9	2.9	3.0	
Total nitrogen (g/m^3)	≤ 30	7.5	11.0	10.0	5.6	12.0	12.0	9.3	8.2	8.9	11.0	9.6	9.3	9.5	
Ammonia (g/m^3)	≤ 10	2.40	6.30	4.90	2.20	5.40	4.10	1.30	0.47	0.55	0.86	0.40	0.4	1.75	
Bacteriological															
Monthly median															
Enterococci (cfu/100mL)	≤ 100	1.6	1.6	2.4	1.6	7.4	13	13	15	34.5	21	2.4	2.4	5	
Faecal Coliforms (cfu/100mL)	≤ 1,000	3.3	1.6	1.6	1.6	73	110	83	59	92	70	8	3.3	34	
Pollutant load	**95th Percentile**													**Annual 95th Percentile**	
Monthly 95 Percentile															
NFR (g/m^3)	≤ 75	9.8	9.8	11.1	7.3	14.9	14.8	23.9	61.6	10.3	22.0	19.7	15.4	40.9	
Bacteriological															
Monthly 95 Percentile															
Enterococci (cfu/100mL)	≤ 1,000	37	36.9	9.9	139.6	30	307	25.5	33.3	211	364	372.5	50	368	
Faecal Coliforms (cfu/100mL)	≤ 10,000	55.1	43.2	6.6	976	139	1330	217	254.5	338.5	480	1955	311	1611	
Resolved WTP source incidents and complaints														**YTD**	**Target**
Reportable odour incidents		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints		0	0	3	3	0	0	2	0	0	0	0	0	8	0
Noise complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)		0	0	0	0	0	0	0	0	0	0	0	0	0	8
Total		0	0	2	0	0	0	0	0	8		0	0	0	0
Volumes	**Standard**													**Annual Maximum**	
Total month (m^3)		2,035,645	1,827,210	2,449,695	1,680,939	1,534,321	1,670,994	1,247,530	1,228,920	1,439,991	1,408,130	1,845,936	1,834,037		
Maximum daily discharge flow rate (m^3/s)	6	1.66	1.39	1.53	1.38	0.92	1.44	0.90	0.98	1.35	0.94	1.88	1.52	1.88	

Army Bay Wastewater Treatment Plant

The Army Bay WWTP is located at the end of Whangaparaoa Road on the Whangaparaoa Peninsula.

It is an activated sludge plant that utilises the following treatment devices and processes for treatment of wastewater and management of biosolids:

- Screening and grit removal
- Sequencing batch reactors
- Balancing ponds (to control the rate of effluent discharge)
- UV disinfection, and
- Sludge dewatering (gravity belt thickener and centrifuge).

Treated effluent is discharged into the Whangaparaoa Passage. All dewatered biosolids are taken to a permitted solid waste landfill for disposal.

The Army Bay WWTP has been operating in a stable and satisfactory state during this reporting year.

An upgrade of the biofilter is expected to begin in October 2015.

Assessment of Plant Performance

Effluent Discharge Volumes

The results indicate that effluent volume discharge limits were met for the reporting year.

Total effluent discharge volumes recorded for the reporting year were 3,437,273 m^3, indicating an approximately 5% increase in discharge compared to 2014 (3,284,701 m^3). Peaks in flow generally corresponded to periods of heavy or prolonged rainfall

Effluent Quality Monitoring

Compliance with all discharge standards was achieved during each quarter. Results indicate that compliance with discharge standards was achieved for all parameters.

Air Discharge Monitoring

Compliance with the air discharge consent was achieved during this reporting year.

Complaints and Incidents

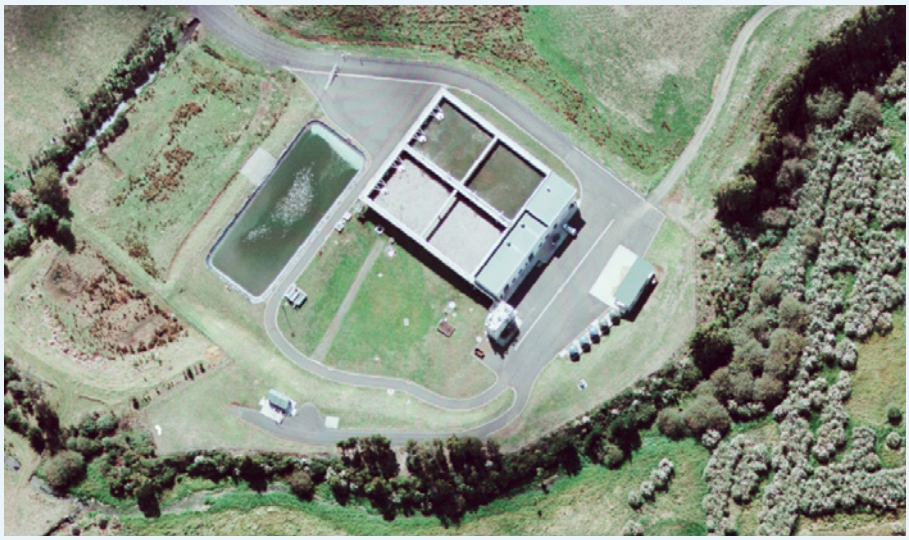
No complaints have been received in regards to the operation and maintenance of the WWTP for this reporting year. No notable incidents have been recorded in regards to the operation and maintenance of the WWTP for this reporting year.

Summary of Plant Performance

Army Bay WWTP continues to operate effectively to provide effluent that routinely complies with all discharge standards. No breaches were recorded in 2014-2015 and the plant performed well.

Wastewater Treatment Plant Performance – Army Bay

	Standard	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Annual Median	
Pollutant load	**Median**														
Monthly median															
BOD (g/m³)	≤ 20	1.4	1.1	1.9	2.1	3.0	3.7	2.9	1.3	1.3	1.7	1.9	0.9	1.8	
NFR (g/m³)	≤ 35	3.0	4.4	5.2	5.1	8.9	14.0	8.8	3.8	4.8	4.6	1.3	4.0	4.7	
Nutrients															
Monthly median															
Ammonia (g/m³)	≤ 15	0.93	1.1	1.1	3.2	1.8	1.4	1.1	0.8	0.7	1.4	1.3	0.7	1.1	
Bacteriological															
Monthly 95 Percentile															
Enterococci (cfu/100mL)	≤ 100	1.6	1.6	1.6	1.6	1.6	1.6	2.4	1.6	1.6	1.6	2.4	1.6	1.6	
Faecal Coliforms (cfu/100mL)	≤ 1,000	1.6	1.6	8.2	2.4	9.6	16.0	12.4	9.0	3.3	4.9	4.1	4.9	4.9	
Pollutant load	**92nd Percentile**													**Annual 92nd Percentile**	
Monthly 95 Percentile															
BOD (g/m³)	≤ 35	2.2	1.2	2.8	2.4	3.7	4.5	3.5	1.8	2.1	4.9	3.8	1.6	4.5	
NFR (g/m³)	≤ 75	7.1	4.8	6.5	6.5	10.0	17.0	10.5	6.9	14.7	19.0	10.3	6.2	17.2	
Bacteriological															
Monthly 95 Percentile															
Enterococci (cfu/100mL)	≤ 100	151.8	1.6	1.6	1.6	1.6	1.6	4.5	52.1	19.6	10.3	4.5	14.1	64.1	
Faecal Coliforms (cfu/100mL)	≤ 10,000	557	4.1	24.2	14.5	133	35.5	34.8	35.8	178.0	77.6	9.5	65.5	223	
Resolved WTP source incidents and complaints														**YTD**	**Target**
Reportable odour incidents		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0	0	0	0	
Volumes	**Standard**													**Annual Maximum**	
Total month (m³)		340,554	303,301	368,595	289,137	265,696	296,557	246,442	233,058	256,164	242,227	304,170	291,372		
Maximum daily discharge (m³/day)	32,147	19,451	16,572	20,615	14,436	11,550	18,976	9,268	10,944	10,379	9,726	19,322	13,776	20,615	



Pukekohe Wastewater Treatment Plant

The Pukekohe WWTP is located at Parker Lane, Tuakau. The wastewater treatment system consists of the following unit processes:

- Septage recipient tank
- Inlet step screen and grit removal
- Sequencing batch reactors (SBRs)
- Decant pond
- UV disinfection
- Polishing wetland
- Sludge oxidation pond

There are no sludge processing facilities as waste sludge is discharged to an old oxidation pond and supernatant is recycled back to the treatment plant influent.

Treated effluent is discharged into Parker Lane Stream via a seepage bed.

Assessment of Plant Performance

Effluent Discharge Volumes

Flow monitoring indicates that the maximum dry weather daily discharge limit was met during this reporting year. Peaks in flow occurred during high rainfall events and/or following consecutive days of rainfall, therefore not considered as breaches.

Effluent Quality Monitoring

The solids exceedance (NFR and BOD) was due to algae in pond supernatant, valve failure and individual SBR isolation during maintenance. The 90% Ammoniacal Nitrogen non-compliance related to a one-off blower aeration control instability. The Maximum Faecal Coliform non-compliance related to a one-off incident of sample bottle contamination.

No further planned SBR isolations will happen until the major upgrade of the plant, in order to limit exceedance in solids. Former DO probes have been replaced with improved optical probes. Temporary alkalinity dosing facilities have been installed. We are investigating hypochlorite dosing to control filamentous bulking and minimise risk of SBR solids carryover.

There is a major upgrade planned with conversion of SBRs to MBRs and building of a sludge processing facility. This upgrade is to facilitate projected growth requirements.

An aerated selector basin is being constructed prior to the screens and SBRs to balance the trade waste flows and loads from Yashilli dairy processing plant in Pukekohe (basin upgrade increases BOD treatment capacity by 20%). Yashilli commenced initial production tests on 29 March 2015.

Complaints and Incidents

One odour complaint was reported during this year at Pukekohe WWTP. No incidents were recorded for this reporting year.

Summary of Plant Performance

The Pukekohe WWTP generally operates effectively and predominantly complies with the consent conditions, apart from infrequent breaches. A new consent application has been lodged.

Wastewater Treatment Plant Performance – Pukekohe

	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	No 940331 Consent Limits	
Plant load														
90% of 26 fortnightly samples tested to current month														
BOD (% of samples)	100%	100%	100%	96%	96%	96%	96%	96%	96%	96%	96%	96%	≤ 12 g/m³	
NFR (% of samples)	96%	96%	100%	96%	96%	96%	96%	96%	96%	96%	96%	96%	≤ 18 g/m³	
Maximum of 26 fortnightly samples tested to current month														
BOD (g/m³)	12.0	12.0	10.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	≤ 15 g/m³	
NFR (g/m³)	20.0	20.0	18.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	56.0	≤ 20 g/m³	
Nutrients														
90% of 26 fortnightly samples tested to current month														
Total phosphorus (% of samples)	96%	96%	100%	100%	100%	96%	96%	96%	96%	96%	96%	96%	≤ 8 g/m³	
Nitrogen in ammoniacal form (% of samples)	88%	85%	85%	85%	88%	88%	88%	88%	88%	88%	88%	85%	≤ 10 g/m³	
Maximum of 26 fortnightly samples tested to current month														
Total phosphorus (g/m³)	8.7	8.7	7.2	7.2	7.2	8.6	8.6	8.6	8.6	8.6	8.6	8.6	≤ 10 g/m³	
Nitrogen in ammoniacal form (g/m³)	13.0	14.0	15.0	15.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	14.0	≤ 15 g/m³	
Pathogens														
90% of 26 fortnightly samples tested to current month														
Faecal Coliform (% of samples)	96%	96%	96%	96%	100%	100%	100%	100%	100%	100%	100%	96%	≤ 1000 cfu/ 100mL	
Maximum of 26 fortnightly samples tested to current month														
Faecal Coliform (cfu/100mL)	26000	26000	26000	26000	530	530	530	530	530	530	530	3000	≤ 10000 cfu/100mL	
Breaches of resource consents													YTD	
Breaches of consent conditions	2	2	2	4	3	3	3	3	3	3	3	3	34	
Resolved WTP source incidents and complaints													YTD	Target
Reportable odour incidents	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints	0	0	0	0	0	0	1	0	0	0	0	0	1	0
Insect complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	1	0	0	0	0	0	1	
Maximum Daily Discharge Volume													Consent limit	
(Dry Weather Flow)"														
Peak day (m³/day)	13,459	14,072	16,845	9,524	9,928	11,188	6,324	6,657	7,954	10,184	15,953	16,846	‹ 8450	

Waiuku Wastewater Treatment Plant

The Waiuku WWTP is located opposite property 131 Mission Bush Road, Waiuku. The unit processes applied in this plant include the following:

- Aeration ponds
- Gravel beds
- UV disinfection
- Effluent storage pond

Treated effluent is discharged into the Waiuku Estuary.

Assessment of Plant Performance

Effluent Discharge Volumes

There was one exceedance of daily discharge volume, in May. This was a one off event.

Effluent Quality Monitoring

The non-compliance in 92%-tile NFR relates to a one-off NFR exceedance in December caused by high pond algae concentrations due to warm sunny weather. The plant has always been compliant since then.

Complaints and Incidents

No complaints were reported during this year at Waiuku WWTP. No incidents were recorded for this reporting year.

Summary of Plant Performance

The WWTP has provided adequate treatment of wastewater throughout the reporting year.

A new consent (24130) was granted in September 2014. The new consent has generally more appropriate consent limits for an oxidation pond based WWTP but requires improved Management Plans for Air Quality and Receiving Environment Monitoring (AQMP and REMP). It is anticipated that flow will no longer be non-compliant, and ammonia should also be compliant with new summer and winter ammonia limits. NFR could potentially be non-compliant on an infrequent basis.

Wastewater Treatment Plant Performance – Waiuku

	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	No 24130 Consent Limits	
Plant load														
92 Percentile of 12 consecutive monthly samples														
BOD (g/m^3)	8.9	8.9	8.9	8.9	8.5	8.5	8.5	8.5	8.1	7.5	6.7	5.9	≤ 20 g/m^3	
NFR (g/m^3)	42.8	42.8	42.8	42.8	42.8	66.0	66.0	66.0	56.0	34.4	33.6	37.0	≤ 45 g/m^3	
Nutrients														
92 Percentile of 12 consecutive monthly samples														
Total phosphorus (g/m^3)	5.7	5.7	5.7	5.7	6.3	7.4	7.4	7.4	6.8	6.7	6.7	6.6	≤ 8 g/m^3	
Nitrogen in ammoniacal form (g/m^3) Summer (Dec-Mar)	N.A.	N.A.	N.A.	N.A.	N.A.	0.4	0.4	0.4	0.4	N.A.	N.A.	N.A.	≤ 5 g/m^3	
Nitrogen in ammoniacal form (g/m^3) Winter (Apr-Nov)	11.0	11.0	11.2	11.2	11.2	N.A.	N.A.	N.A.	N.A.	11.0	11.0	9.4	≤ 12 g/m^3	
Total Inorganic Nitrogen (g/m^3)	17.2	16.4	19.1	19.1	19.1	19.1	19.1	19.1	18.8	18.4	18.3	18.1	≤ 20 g/m^3	
Pathogens														
92 Percentile of 12 consecutive monthly samples														
Enterococci (cfu/100mL)	9.1	9.1	9.1	9.1	9.1	9.1	8.8	8.1	7.5	6.9	1.6	1.6	≤ 150 cfu/ 100mL	
Faecal Coliform (cfu/100mL)	N.A.	N.A.	N.A.	N.A.	1.6	1.6	14.8	16.0	13.2	10.5	8.8	7.5	≤ 430 cfu/ 100mL	
92 Percentile of 12 consecutive monthly samples														
Dissolved oxygen (g/m^3)	5.4	6.0	5.4	5.4	6.2	6.5	6.3	6.4	6.5	6.5	7.4	6.9	› 2 g/m^3	
Breaches of resource consents													YTD	
Breaches of consent conditions	0	0	0	0	0	1	1	1	1	0	0	0	4	
Resolved WTP source incidents and complaints													YTD	Target
Reportable odour incidents	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Maximum Daily Discharge Volume													Consent limit	
Peak day (m^3/day)	3,639	2,881	3,842	2,884	2,927	3,103	1,626	1,805	3,189	1,901	6,554	4,118	‹ 5500m^3/ day + 33m^3/ day/1mm rainfall @ rainfall › 40mm/ week	

Beachlands Wastewater Treatment Plant

The Beachlands-Maraetai (Beachlands) WWTP is located at 100 Okaroro Drive, Beachlands; approximately 20 km east of Howick.

It is an activated sludge plant with biological nutrient removal (BNR) capacity (a 4-stage Bardenpho process). The following main unit processes are constructed at this WWTP for wastewater treatment and biosolids management:

- Screen and grit removal
- 4 stage Bardenpho lagoon
- Clarifier
- Disc filtration
- UV disinfection
- 2 stage sludge digestion lagoons, and
- Sludge drying bed

The treated effluent is discharged into the Te Puru Stream (known as Te Puru Pond) via ground soakage. All dewatered biosolids are taken to a permitted solid waste landfill for disposal.

Assessment of Plant Performance

Effluent Discharge Volumes

Effluent volume discharge limits were met for the reporting year.

Effluent Quality Monitoring

Results of monitoring indicate that compliance with all discharge standards was achieved during this reporting year.

Complaints and Incidents

No complaints were reported during this year at Beachlands WWTP. No incidents were recorded for this reporting year.

Summary of Plant Performance

Beachlands WWTP has performed well during this reporting year. All discharge volume limits were met and effluent quality standards consistently complied with.

Wastewater Treatment Plant Performance – Beachlands

	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	No 26875 Consent Limits	
Plant load														
90 percentile on 10 consecutive samples tested to current month														
BOD (g/m^3)	2.9	3.4	4.8	4.5	1.2	1.2	1.4	1.2	4.7	2.4	10.3	10.3	< 15	
NFR (g/m^3)	8.8	7.3	7.3	9.7	9.7	10.1	11.2	13.1	14.5	15.4	12.3	11.1	< 15	
Nutrients (g/m^3)														
95 percentile on 20 consecutive samples tested to current month														
Nitrogen in ammoniacal form (g/m^3) Summer (Nov-Apr)	N.A.	N.A.	N.A.	N.A.	0.4	0.4	0.7	0.7	0.4	0.7	N.A.	N.A.	< 4	
Nitrogen in ammoniacal form (g/m^3) Winter (May-Oct)	0.4	0.4	0.4	0.4	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	0.4	0.4	< 5	
90 percentile on 10 consecutive samples tested to current														
Nitrogen in nitrate form (g/m^3)	14.0	11.1	12.3	15.3	12.6	12.2	12.2	6.8	5.7	3.1	5.8	5.1	< 15	
Reactive phosphorus (g/m^3)	3.5	2.5	2.5	3.1	3.9	4.2	4.7	4.7	4.0	3.3	2.9	3.3	< 5	
Pathogens														
Median on 10 consecutive samples tested to current month														
Faecal Coliform (cfu/100mL)	1.6	1.6	1.6	1.6	1.6	1.6	1.8	2.0	1.6	1.6	1.6	1.6	< 14	
Breaches of resource consents													YTD	
Breaches of consent conditions	0	0	0	1	0	0	0	0	0	1	0	0	2	
Resolved WTP source incidents and complaints													YTD	Target
Reportable odour incidents	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Maximum Daily Discharge Volume													Consent limit	
Peak Day (m^3/day)	2,787	2,699	2,787	2,468	1,990	1,990	691	821	1,318	1,674	2,522	2,485	< 2800	

Helensville Wastewater Treatment Plant

Description of Treatment Processes

The Helensville WWTP is located at Mount Rex in Helensville on the Kaipara Coast Highway.

The system consists of an inlet screen followed by two oxidation ponds operated in series. There are a total of five floating aerators that assist in the treatment process. Treated effluent is discharged to the Kaipara River, approximately 5 km upstream from the South Kaipara Harbour.

The plant had a major upgrade in September 2015 with installation of a purpose built ultrafiltration unit. This advanced plant reuses membranes from Watercare's water treatment plants, helping to further improve performance as well as recycle used membranes. This has dramatically improved effluent quality from September 2015 onwards, which is outside of this reporting period.

Assessment of Plant Performance

Effluent Discharge Volumes

Flow monitoring indicates that the maximum daily discharge limit was met for most of this reporting year except on 01 September 2014 when the daily discharge volume was 6,521m^3/day. This was following a torrential rainfall event on the same day. Peaks in flow generally corresponded to periods of heavy or prolonged rainfall.

The annual average daily discharge limit of 1,500m^3/day has been met for this reporting year.

Effluent Quality Monitoring

Results indicate that 92nd percentile and median for E. coli and Total Suspended Solids exceeded the consented limits. Median value of BOD was compliant for this reporting year, although 92nd percentile value exceeded the consented limit value.

Microbial quality and the associated public health risks have now improved since the Ultrafiltration unit (U/F) was installed in September 2015.

Dissolved oxygen (DO) concentrations in the effluent continue to comply with consent limits (average DO level 7.5 mg/L).

Air Discharge Monitoring

Compliance with the air discharge consent was achieved during this reporting year.

Complaints and Incidents

No complaints have been received in regards to the operation and maintenance of the WWTP for this reporting year. No incidents have been reported for this reporting year.

Summary of Plant Performance

One breach in total effluent discharge volume was recorded this reporting year which correlated with heavy rainfall. Apart from general compliance with the discharge volume limit, Helensville WWTP continues to exceed effluent quality standards for biochemical oxygen demand, total suspended solids, and E. coli. This is due to the limitations of the treatment system that was in place for the reporting year. The commissioning of the ultrafiltration system has enabled the plant to be compliant on all measured parameters from September 2015 onwards.

Wastewater Treatment Plant Performance – Helensville

	Standard	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Annual Median
Pollutant load	**Median**													
Monthly median														
BOD (g/m^3)	≤ 20	17.0	14.5	18.0	11.4	15.0	25.0	34.5	29.0	26.0	25.0	30.5	12.0	21.5
NFR (g/m^3)	≤ 20	36.0	25.5	38.5	17.5	40.5	85.0	110.0	130.0	135.0	106.5	89.0	29.0	62.8
Nutrients														
Monthly median														
Ammonia (g/m^3)	≤ 20	9.10	24.5	20.5	23.0	20.0	18.0	0.69	0.46	0.53	0.51	2.3	22.0	13.6
Bacteriological														
Monthly median														
Enterococci (cfu/100mL)	≤ 50	25,000	2,470	2,005	3,700	4,650	8,000	1,195	19,650	5,350	9,450	51,500	11,000	6,675
Pollutant load	**92nd Percentile**													**Annual 92nd Percentile**
Monthly 92nd Percentile														
BOD (g/m^3)	≤ 30	34.6	17.4	18.8	12.7	16.7	32.6	38.3	31.5	31.9	30.9	30.9	13.7	35.0
NFR (g/m^3)	≤ 35	63.7	27.6	42.3	21.3	48.5	86.7	110.0	130.0	139.2	126.2	106.6	33.2	131.1
Nutrients														
Monthly 92nd Percentile														
Ammonia (g/m^3)	≤ 30	16.6	24.9	20.9	26.4	20.0	19.7	0.81	0.51	0.57	0.59	3.9	25.4	25.5
Bacteriological														
Monthly 92nd Percentile														
E. coli (cfu/100mL)	≤ 100	53,560	4,007	2,925	3,952	5,112	19,760	1,367	33,384	8,752	14,112	55,280	18,560	53,766

Resolved WTP source incidents and complaints													**YTD**	**Target**
Reportable odour incidents	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	

Volumes	**Standard**												**Annual Maximum**
Total month (m^3)		47,396	43,143	50,722	37,957	30,709	35,061	25,406	24,387	27,589	32,472	45,691	46,599	
Maximum daily discharge (m^3/day)	5,500m^3	2,500	3,654	6,521	3,515	1,480	3,766	1,059	1,051	1,515	1,726	4,721	4,259	6,521
Average (m^3/day)		1,529	1,392	1,691	1,224	1,024	1,131	820	871	890	1,082	1,474	1,553	
Annual Average (over any consecutive 12 month period)	1,500m^3	1,119	1,120	1,107	1,125	1,132	1,142	1,137	1,146	1,155	1,171	1,220	1,225	

Warkworth Wastewater Treatment Plant

The Warkworth WWTP is located at the end of Alnwick Street in Warkworth.

It is an activated sludge plant with the following processes and equipment utilised for the treatment of wastewater:

- Screen
- Oxidation ditch
- Two clarifiers
- Pebble filter
- Effluent balancing tank
- UV disinfection
- Peak flow plant (Actiflo)
- Sludge dewatering (centrifuge)
- Biofilter for treatment of air discharges from screening and biosolids processing areas.

Treated effluent is discharged to the Mahurangi River. Dewatered biosolids are taken to a permitted solid waste landfill.

Assessment of Plant Performance

Effluent Discharge Volumes

Review of results of daily discharge monitoring indicate that effluent volume discharge limits were met for the reporting year during both wet and dry weather conditions.

Effluent Quality Monitoring

Results of monitoring indicate that effluent discharge standards were consistently met for all parameters during this reporting year.

Air Discharge Monitoring

All monitoring as required by consent has been completed and all consent conditions complied with.

Complaints and Incidents

There were no complaints during this reporting year. No incidents were recorded for this reporting year.

Summary of Plant Performance

Warkworth WWTP achieved full compliance with both flow and discharge standards during this reporting year.

The “Actiflo” peak flow treatment (PFT) installed in 2012 continues to be effective in preventing any wet weather overflow issues.

Wastewater Treatment Plant Performance – Warkworth

	Standard	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Annual Median	
Pollutant load	92nd Percentile														
Monthly 92 Percentile															
BOD (g/m³)	≤ 20	1.4	1.45	1.44	2.7	1.68	1.4	0.85	1.38	1.54	1.21	1.38	1.14	1.8	
NFR (g/m³)	≤ 30	7.5	2.5	12.0	9.4	24.7	7.1	3.2	6.2	8.4	10.2	4.0	6.3	13.5	
Bacteriological															
Monthly 92 Percentile															
Faecal Coliforms (cfu/100mL)	≤ 200	2.8	3.3	75.3	30.8	21.3	36.1	9	7.8	4.9	93.6	6.2	3.3	77.5	
Nutrients															
Monthly 92 Percentile															
Ammonia (g N/m³)	≤ 10	2.9	0.4	0.61	3.4	3.2	0.4	0.52	0.59	2.2	2.9	4.5	0.4	3.5	
Resolved WTP source incidents and complaints														**YTD**	**Target**
Reportable odour incidents		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints		1	1	0	0	0	0	0	0	0	0	0	0	2	0
Other complaints (dust)		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		1	1	0	0	0	0	0	0	0	0	0	0	2	
Volumes	**Standard**													**Annual Maximum**	
Total month (m³)		45,697	33,941	41,061	28,484	25,993	32,959	24,543	23,242	25,930	25,897	33,105	31,389		
Maximum daily discharge (m³/day)	8,100	4,356	3,331	5,123	1,634	1,080	3,918	926	1,035	1,192	1,262	2,023	2,030	5,123	

Snells-Algies Wastewater Treatment Plant

The Snells-Algies WWTP is located on Hamatana Road in Snells Beach.

The treatment system consists of the following treatment devices and processes for treatment of wastewater:

- Influent splitter chamber
- Biofilter (air discharges from splitter are passed through biofilter)
- Two aerated lagoons
- Two oxidation ponds

Treated effluent is discharged to the CMA via an outfall pipe that extends 600 m into the marine environment south of Martins Bay.

Summary of Changes to the WWTP during 2014-2015

The Snells-Algies WWTP continues operating in a stable and satisfactory state. No upgrade work was needed in this reporting year. Options for replacing the outfall are being investigated.

Assessment of Plant Performance

Effluent Discharge Volumes

Results indicate that daily discharge volumes were in compliance with the discharge limits for the reporting year. Total discharge volumes for the year were approximately 302,438 m^3, slightly higher than the previous year 2014 (283,623 m^3) and slightly lower than 2013 (307,246 m^3).

Effluent Quality Monitoring

Results of monitoring as specified by the consents were assessed for compliance on a quarterly basis. This review indicates that compliance with all discharge standards were achieved during each quarter during this reporting year.

Odour Monitoring

Routine walk-over and odour inspection are conducted by Watercare's operations team at the WWTP. The WWTP has been well operated and maintained with no odour complaints received for the whole reporting year.

Complaints and Incidents

No complaints have been received in regards to the operation and maintenance of the WWTP for this reporting year. No incidents have been reported during this reporting year.

Summary of Plant Performance

The Snells-Algies WWTP performed well during this reporting year. Compliance with discharge standards was achieved at all times.

Wastewater Treatment Plant Performance – Snells/Algies

	Standard	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Annual Median	
Bacteriological															
Monthly median															
Enterococci (cfu/100mL)	≤ 50	25,000	2,470	2,005	3,700	4,650	8,000	1,195	19,650	5,350	9,450	51,500	11,000	6,675	
Pollutant load	**Monthly 92 Percentile**														
Monthly 92 Percentile															
BOD (g/m³)	≤ 80	18.7	13.6	16.1	17.5	27.2	37.6	25.3	21.3	20.4	12.5	9.9	12.9	28	
NFR (g/m³)	≤ 100	34.0	30.1	30.1	25.5	39.4	100.0	82.4	75.9	57.1	30.0	27.3	49.4	85	
Dissolved Oxygen (g/m³)	≥ 2	13.9	20.8	19.7	18.7	21.4	22.5	18.9	19.8	18.1	17.8	8.0	8.9	22	
Bacteriological															
Monthly 92 Percentile															
Faecal Coliforms (cfu/100mL)	≤ 50,000	2,624	5,484	984	4,208	3,492	2,860	1,366	1,176	2,016	3,792	2,356	697	4,361	
E. coli (cfy/100mL)	≤ 10,000	1,844	3,035	984	2,484	4,028	2,256	1,100	949	1,408	4,412	2,332	522	4,074	
Resolved WTP source incidents and complaints														**YTD**	**Target**
Reportable odour incidents		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0	0	0	0	
Volumes	**Standard**													**Annual Maximum**	
Total month (m³)		35,957	31,991	36,222	24,663	19,936	27,782	21,222	17,425	18,711	20,403	24,166	23,960		
Maximum daily discharge (m³/day)	4,680	2,000	1,905	2,038	1,297	1,295	1,988	920	1,257	1,229	1,194	1,278	1,816	2,038	

Wellsford Wastewater Treatment Plant

The Wellsford WWTP is located off State Highway one 1.8 km south of Wellsford.

The WWTP utilises the following processes and equipment for the treatment of wastewater:

- Oxidation pond equipped with aerators (with curtain installed to provide primary, secondary and tertiary areas of treatment)
- Wetland (four cells with total area of 0.63 ha)
- Aeration cascade

Treated effluent is discharged to an unnamed tributary of the Hoteo River.

Assessment of Plant Performance

Effluent Discharge Volumes

For the reporting year there was one discharge volume figure (2,842 m^3) higher than daily maximum volume discharge limits.

The consent also requires that discharge volumes shall not exceed 1,260 m^3/day for 95% of the time when calculated over a one year period. The daily discharge volume of 1,260 m^3/day was met for 90% of the time during this reporting year, indicating exceedance of this consent limit.

No overflows from the oxidation ponds occurred during this reporting year.

Effluent Quality Monitoring

Results of monitoring indicate that discharge standards for faecal coliforms, total inorganic nitrogen, and total suspended solids were exceeded during this reporting year. No seasonal trends or correlation to rainfall events were identified for these exceedances. This is consistent with the observation in previous years' records indicating that the WWTP is having difficulty meeting discharge standards. Installation of an Ultrafiltration plant is planned for later this year; this will improve the quality significantly.

Complaints and Incidents

No complaints have been received in regards to the operation and maintenance of the WWTP for this reporting year. No incidents were recorded for this reporting year.

Summary of Plant Performance

Wellsford WWTP continues to exceed total inorganic nitrogen, faecal coliforms and total suspended solids standards.

Daily discharge volumes exceeded the consented limit for 95% of the year. Maximum effluent discharge volumes also exceeded the consented limits on the 9th of July 2014. Watercare is investigating alternatives to improve effluent quality.

During last year, Watercare has installed and commissioned a new inlet screen to improve plant performance.

Watercare is upgrading the plant with a view to have an ultrafiltration unit commissioned in the 2015/16 financial year. This will improve the overall plant performance.

Wastewater Treatment Plant Performance – Wellsford

	Standard	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Annual Median	
Pollutant load	95th Percentile														
Monthly 95 Percentile															
BOD (g/m^3)	≤ 20	3.7	2.6	3.3	2.5	6.3	8.0	3.9	3.9	6.5	6.9	8.0	6.6	8.0	
NFR (g/m^3)	≤ 30	9.6	9.0	8.8	5.6	20.0	73.0	19.0	20.0	110.0	13.0	18.0	11.0	89.7	
Dissolved Oxygen (g/m^3)	≥ 3	7.3	7.5	6.7	7.0	7.0	6.8	5.3	6.3	5.7	7.1	6.4	7.4	7.4	
Bacteriological															
Monthly 95 Percentile															
Faecal Coliforms (cfu/100mL)	≤ 1,000	150	500	570	2,400	2,200	1,900	2,000	650	550	1,000	1,300	1,100	2,290	
Nutrients															
Monthly 95 Percentile															
Inorganic Nitrogen ($g N/m^3$)	≤ 10	17.0	16.0	22.0	23.0	17.0	14.0	13.0	9.5	10.0	9.2	4.8	7.6	22.5	
Resolved WTP source incidents and complaints														YTD	Target
Reportable odour incidents		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0	0	0	0	
Volumes	Standard													Annual Maximum	
Total month (m^3)			47,849	25,780	34,101	21,113	18,425	21,375	5,343	6,927	9,075	11,773	22,304	31,718	
95 Percentile Flow (m^3/day)		1,260	1,946	1,032	1,321	1,161	1,032	1,569	321	296	445	909	1,093	1,344	1,946
Maximum daily discharge (m^3/day)		2,500	2,842	1,059	1,352	1,311	1,142	1,733	378	376	570	955	1,135	1,434	2,842

Clarks Beach Wastewater Treatment Plant

The Clarks Beach WWTP is located on designated land adjacent to the Clarks Beach Golf Club, opposite property number 97, Stella Drive, Clarks Beach. The treatment plant consists of the following devices and processes:

- An oxidation pond
- Two subsurface-flow rock filters in parallel
- Three sand filter beds in parallel, and
- A 16-lamp UV plant.

Treated effluent enters a manhole located at the Clarks Beach Golf Course and following that a holding pond prior to discharge to a stormwater drain on the golf course. The drain flows adjacent to the boundary with the recreational reserve, through a series of irrigation reservoirs and wetland and into Waiuku River.

Assessment of Plant Performance

Effluent Discharge Volumes

There was occasional non-compliance of peak day discharge flow relating to the ground water infiltration following an extended period of wet weather.

Effluent Quality Monitoring

Suspended solids can also exceed discharge consent levels when plant under stress during high flows. The non-compliance in Median NFR, 95% NFR and 95% Dissolved Oxygen relates to performance limitation in oxidation pond system.

An Inflow and Infiltration (I&I) investigation has been completed to understand where the high flows come from. Some residential issues have been referred to the Council building compliance section. A new oxidation pond inlet screen has been installed. Additional sand will be added to the sand filter to increase filtration depth.

Complaints and Incidents

No complaints were reported during this year at Clarks Beach WWTP. No incidents were recorded for this reporting year.

Summary of Plant Performance

Clarks Beach WWTP continues to provide effective treatment of wastewater for the townships of Waiau Beach, Glenbrook and Clarks Beach.

However, the wet weather flows received at the plant place significant stress on the plant and lead to occasional breaching of the maximum daily discharge volume, resulting in poor solids removal. A significant upgrade of the plant is proposed in the Asset Management Plan.

Wastewater Treatment Plant Performance – Clarks Beach

	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	No 12998 Consent Limits"	
Plant load														
Median on 20 consecutive samples tested to current month														
BOD (g/m^3)	6.1	5.7	6.1	5.7	5.7	5.0	5.0	4.0	2.9	2.5	2.3	2.3	≤ 10 g/m^3	
NFR (g/m^3)	20.0	19.0	19.5	18.5	18.5	18.5	18.5	18.0	18.0	15.0	12.5	10.5	≤ 15 g/m^3	
95% on 20 consecutive samples tested to current month														
BOD (% of samples)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	≤ 20 g/m^3	
NFR (% of samples)	55%	60%	60%	65%	65%	65%	65%	70%	70%	80%	85%	81%	≤ 20 g/m^3	
Nutrients														
Median on 20 consecutive samples tested to current month														
Nitrogen in ammoniacal form (g/m^3)	0.8	0.8	0.5	0.7	0.8	0.7	0.7	0.8	0.8	0.9	1.0	1.0	≤ 10 g/m^3	
Total Inorganic Nitrogen (g/m^3)	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	10.3	10.3	≤ 15 g/m^3	
95% on 20 samples tested to current month														
Nitrogen in ammoniacal form (% of samples)	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	≤ 20 g/m^3	
Pathogens														
Median on 20 consecutive samples tested to current month														
Faecal Coliform (cfu/100mL)	1.6	1.6	2.4	2.4	2.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6	≤ 14 cfu/ 100mL	
90% on 20 consecutive samples tested to current month														
Faecal Coliform (% of samples)	95%	95%	90%	90%	90%	90%	90%	90%	90%	95%	90%	90%	≤ 43 cfu/ 100mL	
95% on 20 consecutive samples tested to current month														
Dissolved Oxygen (% of samples)	40%	30%	25%	15%	20%	21%	25%	25%	45%	45%	80%	90%	≥ 5 g/m^3	
Breaches of resource consents													YTD	
Breaches of consent conditions	3	3	3	3	2	2	2	2	2	2	2	2	28	
Resolved WTP source incidents and complaints													YTD	Target
Reportable odour incidents	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Maximum Daily Discharge Volume													Consent limit	
Peak day (m^3/day)	986	686	1,259	622	734	1,052	575	742	895	1,306	1,638	1,770	<600 + incidental rain m^3/day	

Omaha Wastewater Treatment Plant

The Omaha WWTP located at 64 Jones Road Omaha.

It is a land treatment system that consists of the following treatment devices and processes for treatment of wastewater:

- Inlet screen
- Aerated lagoon
- Oxidation pond
- Storage basin
- Low rate sand filters
- UV disinfection
- Drip irrigation

Treated effluent is applied on two irrigation areas referred to as Jones Road (17.4 hectares) and the Omaha South Golf Course (8.9 hectares). Each area is subdivided into smaller blocks to allow loading and resting of each irrigation area.

Assessment of Plant Performance

Effluent Discharge Volumes

The Jones road irrigation area has a daily discharge limit of 1,200 m^3/day, while the Golf Course has seasonal limits of 860 m^3/day from 1 October to 30 April and 570 m^3/day from 1 May to 30 September. The daily discharge limits were met for the reporting year on both sites.

Total irrigation volumes for this reporting year were 84,811 m^3 and 66,191 m^3 for Jones Road and Golf Course respectively, both below their respective annual limits. The records indicated that the application rates were still significantly lower than the maximum allowed for the year. This is consistent with the records for the previous years.

In addition to the total and daily discharge limits, the Golf Course irrigation area has weekly limits for irrigation of 6,000 m^3/week from 1 October to 30 April and 4,000 m^3/week from 1 May to 30 September. Review of effluent irrigation data (daily monitoring results reviewed) indicates that these limits were also met for the reporting year.

Effluent Quality Monitoring

Results indicate that compliance with consent limits was achieved for the year for all parameters.

Complaints and Incidents

No complaints have been received in regards to the operation and maintenance of the WWTP for this reporting year. No incidents have been reported for this reporting year.

Summary of Plant Performance

Omaha WWTP performed well during this reporting year, meeting all standards of effluent volume and quality discharge and recording no complaints or incidents.

Omaha WWTP continues to receive influent from Matakana.

Monitoring results show that the plant is operating effectively with effluent discharge limits being met for all seasons and both sites (Jones Road and Golf Course). The daily discharge volumes for both irrigation sites were well below the discharge limits.

Wastewater Treatment Plant Performance – Omaha

	Standard	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Annual 95th Percentile	
Pollutant load	95th Percentile														
Monthly 95 Percentile															
BOD (g/m³)	≤ 30	7.3	2.8	4.6	5.7	4.50	5.3	4.0	0.5	1.5	0.6	0.8	2.1	6.4	
NFR (g/m³)	≤ 20	25.5	10.0	13.9	10.8	7.2	10.6	8.5	14.4	13.4	6.7	1.6	2.5	19.4	
Bacteriological															
Monthly 95 Percentile															
Faecal Coliforms (cfu/100mL)	≤ 500	1.6	1.6	1.6	1.6	1.6	3.2	1.6	1.6	1.6	93.8	1.6	1.6	44.0	
Resolved WTP source incidents and complaints														YTD	Target
Reportable odour incidents		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints		0	0	0	1	0	0	0	0	0	0	0	0	1	0
Noise complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	1	0	0	0	0	0	0	0	0	1	0
Volumes – Jones Road Irrigation Site														Annual	
Total month (m³)		11,757	10,027	8,570	8,512	6,654	4,603	8,669	4,569	3,339	7,852	6,379	6,880		
Maximum daily (m³/day)	1,200	456	445	423	425	471	450	450	157	371	480	394	414	480	
Volumes (m³) –Omaha Golf Course Irrigation Site															
Total month (m³)			1,333	250	4,065	6,108	8,196	6,170	11,651	11,912	7,140	4,729	4,509	128	
Maximum daily (1 October to 30 April)		860				319	447	337	460	529	501	371			529
Maximum daily (1 May to 30 September)		570	77	59	325								281	73	325

Waiwera Wastewater Treatment Plant

The Waiwera WWTP is located on Weranui Road near Waiwera.

The WWTP utilises the following equipment and processes for the treatment of wastewater:

- One primary aerated oxidation pond
- One secondary oxidation pond (both equipped with aerators)
- Effluent diffusers

Treated effluent is discharged to the Waiwera River via twin outfall pipes.

Assessment of Plant Performance

Effluent Discharge Volumes

No discharges are authorised for the period from 15 December to 1 February each year. The daily discharge limit was met during this reporting year, and the no discharge period was complied with.

Effluent Quality Monitoring

Results of monitoring indicate that compliance with all discharge standards was achieved during this reporting year.

Complaints and Incidents

No complaints were reported during this year at Waiwera WWTP. No incidents were recorded for this reporting year.

Summary of Plant Performance

Waiwera WWTP has performed well during this reporting year. All discharge volume limits, including the no-discharge period, were met and effluent quality standards consistently complied with.

Wastewater Treatment Plant Performance – Waiwera

	Standard	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Annual 95th Percentile	
Plant load															
Monthly 95 Percentile															
BOD (g/m³) –	≤ 45	19.0	22.0	3.3	3.4	4.8	2.7	9.9	27.0	14.0	36.8	38.0	18.0	37.3	
Bacteriological															
Monthly 95 Percentile															
Faecal Coliforms (cfu/100mL)	≤ 3500	430	38.0	13.0	9.8	470	150	270	510.0	370.0	333.5	210.0	790.0	636	
Resolved WTP source incidents and complaints														YTD	Target
Reportable odour incidents		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0	0	0	0	
Volumes														Annual	
Total month (m³)		9,544	9,090	15,918	14,857	14,373	8,319	0	6,592	6,535	6,894	10,954	6,895		
Maximum daily (m³/day)	595	595	595	595	595	595	595	0	595	595	595	595	595	595	

Kawakawa Bay Wastewater Treatment Plant

The Kawakawa Bay WWTP is a Membrane Bio Reactor (MBR) based wastewater treatment plant that consists of the following major treatment devices and processes:

- Inlet screens and grit removal
- Two balancing tanks
- One membrane bioreactor
- Effluent storage lagoons (one operational, one seasonal)
- Irrigation fields

The treated effluent is preferentially discharged to the effluent irrigation field at the Glen Forest. However the Rautawa Stream is allowed to be utilised for effluent discharge as a last resort between May and October (inclusive) should discharge to the irrigation field not be possible.

Waste activated sludge from the bioreactors is temporarily stored in a WAS tank onsite before being transferred to Mangere WWTP for digestion.

Assessment of Plant Performance

Effluent Discharge Volumes

The recorded actual daily plant influents have been 60m^3/day and lower and have not ever reached the consent level 800m^3/day. The discharge consent limits were fully met.

Effluent Quality Monitoring

Consent conditions were consistently met.

Complaints and Incidents

No complaint was reported during this year at Kawakawa WWTP. No incidents were recorded for this reporting year.

Summary of Plant Performance

Consistently satisfactory performance has been observed at Kawakawa WWTP regarding the discharge volume, land disposal rate, and effluent quality. As an example of the performance and remarkable design of the plant, the plant won the IPENZ Arthur Mead award in 2014.

Wastewater Treatment Plant Performance – Kawakawa Bay

	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	No 30833 Consent Limits
Plant load													
Monthly Median													
Faecal Coliforms, cfu/100mL	1.6	2.5	1.6	1.6	11.0	9.8	2.4	2.4	1.6	1.6	1.6	1.6	‹ 1000
E. coli, cfu/100mL	1.6	8.3	1.6	1.6	6.0	2.0	1.7	1.6	1.6	1.6	1.6	1.6	‹ 1000
Maximum Daily Discharge Volume													Consent limit
Peak day (m^3/day)	89	65	72	187	102	135	102	141	107	132	102	90	‹ 800

Kingseat Wastewater Treatment Plant

The Kingseat WWTP is located at 14 Buchanan Road, Kingseat. The plant operates an aerated wastewater treatment system comprising the following main devices and processes:

- Flow balancing tank
- Activated sludge aeration tank
- Clarifier
- UV disinfection
- Aerated WAS tank

The treated effluent is discharged via an outlet pipe into an unnamed intermittent stream, which drains to the Whatapaka Inlet.

Sludge from the WAS tank is transported to Pukekohe WWTP for further disposal.

Assessment of Plant Performance

Effluent Discharge Volumes

The two instances of non-compliance on peak day discharge volume were caused by ground water infiltration following an extended period of wet weather.

Effluent Quality Monitoring

NFR non-compliance relates to 4 occasions of exceedance. The exceedances in October and November were found to be over-aerating in the reactors causing re-suspension of solids. Exceedances in February and April were found to be a submerged pipe got disjointed and allowing solids to short-circuit. This was repaired in April and there have been no further effluent quality non-compliances since.

There was one instance of non-compliance related to E. coli – a result of equipment failure due to solids buildup on the UV lamp.

Complaints and Incidents

No complaints were reported during this year at Kingseat WWTP. No incidents were recorded for this reporting year.

Summary of Plant Performance

Occasional non-compliance of discharge flow, suspended solids and E. coli during high flow events due to the overloading of clarifier and carryover of solids. Some network Inflow and Infiltration causing high inflows, less than in previous years following improvements to the plant.

Wastewater Treatment Plant Performance – Kingseat

	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	No 24255 Consent Limits
Plant load													
92 percentile of samples tested in rolling 12 month period													
BOD	6.3	5.6	4.7	9.4	9.4	9.4	5.6	10.0	5.6	6.1	6.1	6.1	≤ 20 g/m³
NFR	24.2	27.7	27.7	64.4	64.4	64.4	45.0	43.3	43.3	43.3	43.3	43.3	≤ 30 g/m³
Pathogens													
92 percentile of samples tested in rolling 12 month period													
E. coli	158.0	117.0	130.0	130	130	130.0	57	57	57	24	24.0	24.0	≤ 200 cfu/ 100mL
Nutrients													
92 percentile of samples tested in rolling 12 month period													
Nitrogen in ammoniacal form (g/m³)	0.70	0.70	0.60	0.50	0.50	0.50	0.40	0.40	0.40	0.40	0.40	0.40	≤ 5 g/m³
92 percentile of samples tested in rolling 12 month period													
Dissolved oxygen	9.6	9.6	9.6	9.6	9.6	9.6	8.3	7.6	7.6	8.5	8.9	8.9	≥ 5 g/m³

Breaches of resource consents													YTD
Breaches of consent conditions	0	0	0	1	1	1	1	1	1	1	1	1	9

Resolved WTP source incidents and complaints													YTD	Target
Reportable odour incidents	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	

Maximum Daily Discharge Volume													Consent limit
Peak day (m³/day)	44.0	35.0	50.0	23.0	22.0	47.0	36.0	40.0	40.0	47.0	52.0	91.0	98% ‹38m³/ day

Waiheke Wastewater Treatment Plant (Owhanake)

The Owhanake WWTP is located at 61 Ocean View Road, Waiheke Island. The major treatment devices and processes applied in this plant include the following:

- Additional primary tank (APT) fitted with 4 Zoeller effluent filter (0.78mm)
- Two recirculation tanks
- Four sand filters
- UV disinfection
- Two slag filters
- Polishing wetland

The tertiary treated effluent is discharged into the natural Matiatia wetland before draining into Matiatia Bay.

Assessment of Plant Performance

Effluent Discharge Volumes

Discharge consent permits up to a maximum of 80 m^3/day. An activated sludge based treatment plant (called Plant B in the Consent) is required to be constructed for flows above 80 m^3/day and up to 250 m^3/day. Plant B is also required before average dry weather flows exceed 35 m^3/day. Average recent plant flows are 32 m^3/day and the peak holiday flow is a maximum of 41.5 m^3/day. Non-holiday period flows generally average 29 m^3/day.

A recent tally of connections totalled 38. Over the past few years there has been a change in the use of these connections as building consents have been granted for new facilities. For example, one previously small dwelling has been developed into a kindergarten and one previously empty section consists of four restaurants.

The results indicate that effluent volume discharge were well below the limit for the reporting year.

Effluent Quality Monitoring

This WWTP is generally non-compliant especially in the peak holiday seasons where the treatment plant is overloaded with organics. The sand filters turn anaerobic and result in high rate of failures in ammonia and E. coli. This affects downstream processes such as UV disinfection and results in occasionally elevated BOD, NFR, Total Nitrogen and Total Phosphorus concentrations in the effluent quality.

Two new sand filters were put into operation in May 2015, bringing the total of sand filters available to six. Since the operation of the new sand filters has complemented the old, the effluent quality has improved and returned within the consent limits.

Air Discharge Monitoring

Compliance with the air discharge consent was achieved during this reporting year.

Complaints and Incidents

No complaints have been received in regards to the operation and maintenance of the WWTP for this reporting year. No incidents have been recorded in regards to the operation and maintenance of the WWTP for this reporting year.

Summary of Plant Performance

The Owhanake WWTP performed poorly over the past years. The construction of two new sand filters at the end of the 2014/15 financial year has considerably improved the situation.

Wastewater Treatment Plant Performance – Waiheke

	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	No 37282 Consent Limits	
Plant load														
Maximum of monthly sample tested														
BOD (g/m³)	1.8	1.2	4.4	4.4	30.0	3.1	3.1	7.1	6.6	4.6	4.1	3.7	‹ 10	
NFR (g/m³)	2.0	1.3	32.0	8.0	33.0	2.0	11.0	5.5	2.8	2.6	4.2	1.3	‹ 10	
Nutrients														
Maximum of monthly sample tested														
Total phosphorus (g/m³)	5.0	6.5	5.9	2.7	4.2	2.1	16.0	10.0	7.5	12.0	6.4	5.7	‹ 7	
Nitrogen in ammoniacal form (g/m³)	3.30	34.00	19.00	28.0	30.00	11.00	30.0	32.0	33.00	37.00	32.0	6.8	‹ 2	
Total Oxidised Nitrogen (g/m³)	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	‹ -	
Total Nitrogen (g/m³)	5.3	14.8	19.1	29.4	32.3	23.0	36.8	36.2	49.0	41.50	35.73	27.70	‹ 30	
Pathogens														
Maximum of monthly sample tested														
E. coli (cfu/100mL)	30	76000	8400	170	540	590	710	80000	3	200	1500	1.6	≤ 50	
E. coli (cfu/100mL) Summer 01Dec to 31Mar						590	710	80000	3				≤ 126	
Breaches of resource consents													YTD	
Breaches of consent conditions	1	2	3	2	5	4	5	5	2	4	3	1	37	
Resolved WTP source incidents and complaints													YTD	Target
Reportable odour incidents	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Maximum Daily Discharge Volume													Consent limit	
Peak day (m³/day)	39	35	47	45	50	49	50	42	37	39	37	27	‹ 80	

Denehurst Wastewater Treatment Plant

The Denehurst WWTP is located at Denehurst Drive in Waimauku and services 19 properties.

It is a land treatment system that consists of the following treatment devices and processes for treatment of wastewater and management of septage:

- Interceptor tanks
- AdvanTex© recirculating packed bed reactor treatment technology
- Irrigation (drip irrigation) onto two areas with a total of approximately 2,500 m² (one area is 1,409 m² and the other 1,080 m²)
- 2 Flow balancing tanks (30m² each).

Treated effluent is discharged to the irrigation areas identified above. Interceptor tanks require periodic cleaning of the effluent filter and removal of septage. The interceptor tanks are inspected quarterly and maintained as necessary.

Assessment of Plant Performance

Effluent Discharge Volumes

The results indicate that effluent volume discharge limits were met for the reporting year.

Effluent Quality Monitoring

Results of monitoring as specified by the consent for treated effluent were submitted to Auckland Council quarterly and results indicate full compliance with discharge standards.

Complaints and Incidents

No complaints have been received in regards to the operation and maintenance of the WWTP for this reporting year. No incidents have occurred for this reporting year.

Summary of Plant Performance

The Denehurst WWTP continued to operate at capacity over this reporting year due to the high infiltration and inflows received by the plant. No exceedance of the discharge limit occurred; this is due to the successful performance of the flow balancing tanks installed in May 2011. Any additional inflow beyond the discharge limit is stored in the tanks and tankered offsite as required.

Wastewater Treatment Plant Performance – Denehurst

	Standard	Jul 2014	Aug 2014	Sept 2014	Oct 2014	Nov 2014	Dec 2014	Jan 2015	Feb 2015	Mar 2015	Apr 2015	May 2015	Jun 2015	Annual 95th Percentile	
Plant load	**Maximum**														
Monthly maximum															
BOD (g/m³) – 6 monthly sample only	≤ 15						5.5						6.1	6.1	
NFR (g/m³) – 6 monthly sample only	≤ 15						7.8						15.0	15.0	
Resolved WTP source incidents and complaints														**YTD**	**Target**
Reportable odour incidents		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odour complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Insect complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Noise complaints		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other complaints (dust)		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	0	0	0	0	0	0	0	0	0	0	0	
Volumes (m³) –Omaha Golf Course Irrigation Site														**Annual**	
Total month		446	450	435	427	410	369	287	273	305	323	416	368		
Maximum daily	14.8	14.8	14.5	14.5	14.5	14.5	14.5	11.9	11.9	14.5	14.5	14.5	14.6	14.8	

Biosolids – Mangere WWTP

Watercare's largest discharge to land is the biosolids generated as a byproduct of the wastewater treatment process. A significant proportion of metals and pathogens are removed with the solids. Approximately 115,000 tonnes of biosolids were produced at the Mangere Wastewater Treatment Plant in the 2014/15 year. The graphs show the metal levels in the biosolids at the Mangere Wastewater Treatment Plant.

National guidelines for the beneficial use of biosolids that grade biosolids for unrestricted use (grade 'a') or restricted use (grade 'b') depending on their contamination loads have been included. On 1 January 2013 new limits in the national guidelines came into effect and are also presented below.

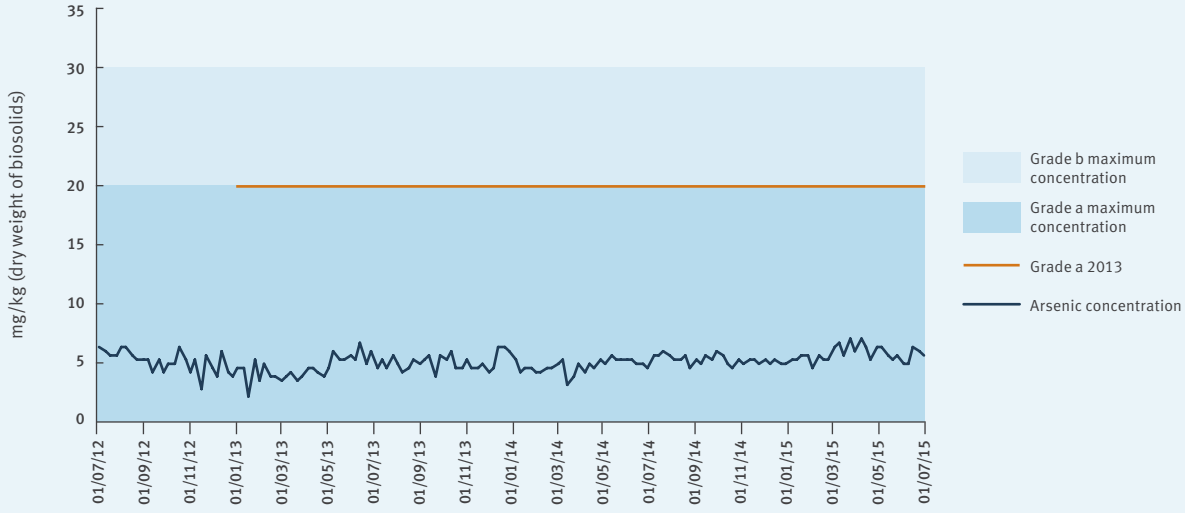
With the exception of zinc, metal levels have remained at relatively low levels over the past year. Elevated zinc levels are attributed to contamination in stormwater runoff that makes its way into the wastewater system.

How does the current year result compare to last year and/or recent trends in terms of performance? The levels of arsenic, copper and mercury continue to be relatively constant over the last few years. Chromium and nickel, on average, show a declining trend. Cadmium, lead, nickel and zinc are recognised as stormwater runoff contaminants, and show some seasonality.

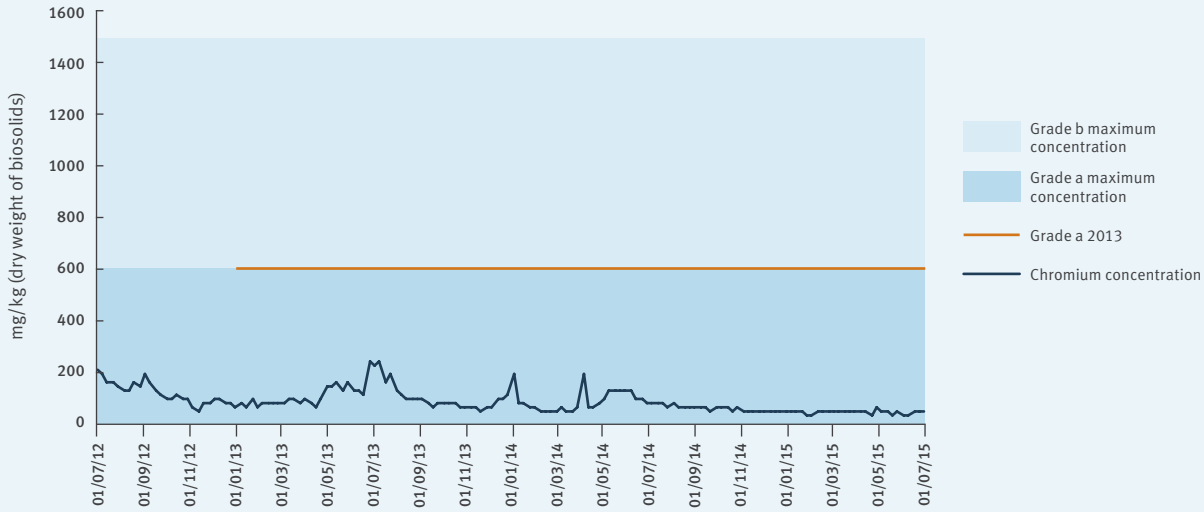
Any significant developments that have contributed to the current year result? Industrial metal treatment processes continue to be monitored closely for compliant performance. The result of this is evident in the stable or decreasing levels of metals in the biosolids apart from potential contamination from nonpoint sources.

Any initiatives underway or pending that will impact performance in this area over the next 12 months? The fluctuations in zinc, lead, nickel and cadmium levels will be investigated to determine if a point source can be identified as a contributor, and control it thereafter.

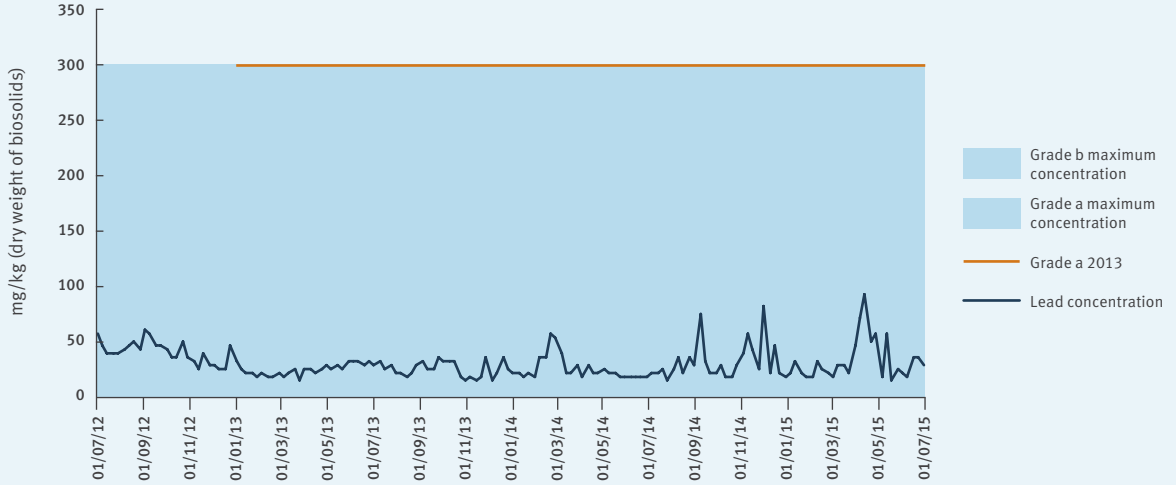
Mangere WWTP biosolids arsenic levels



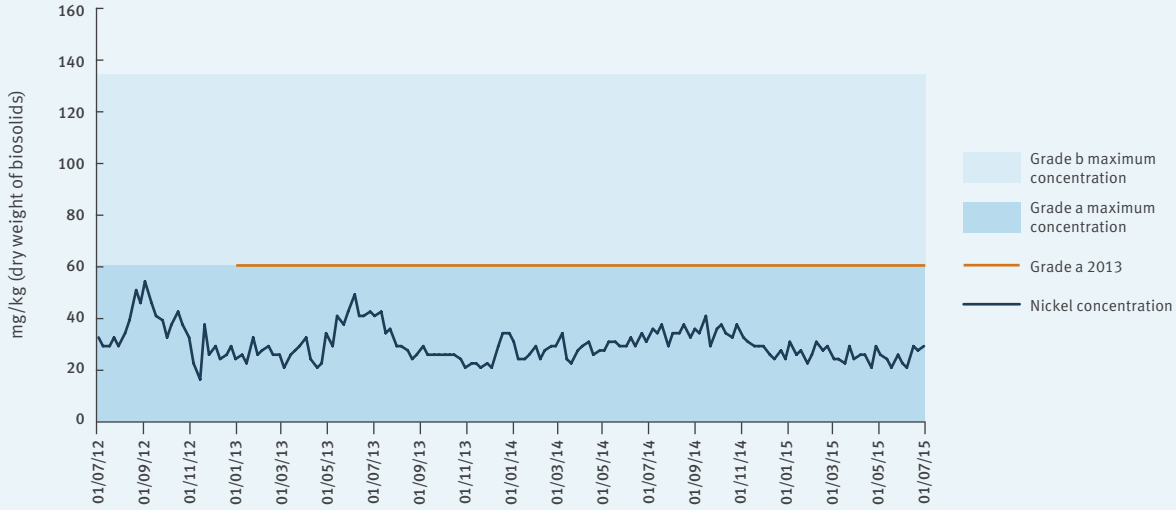
Mangere WWTP biosolids chromium levels



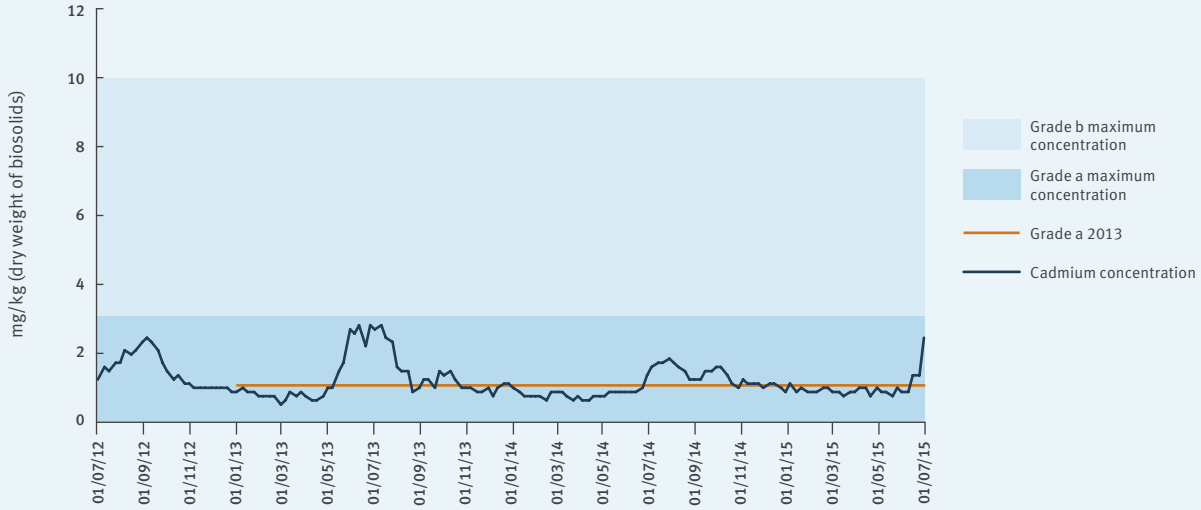
Mangere WWTP biosolids lead levels



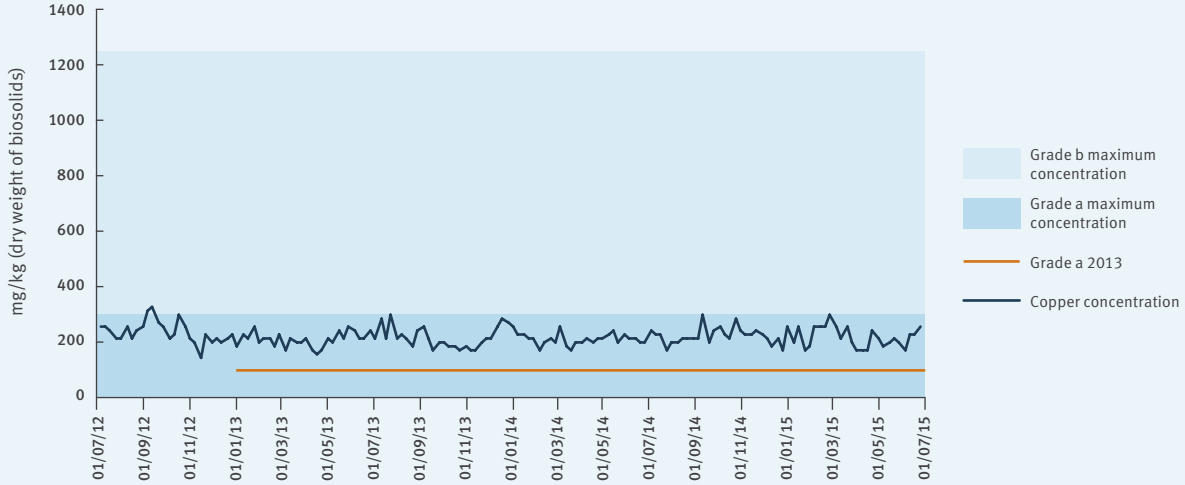
Mangere WWTP biosolids nickel levels



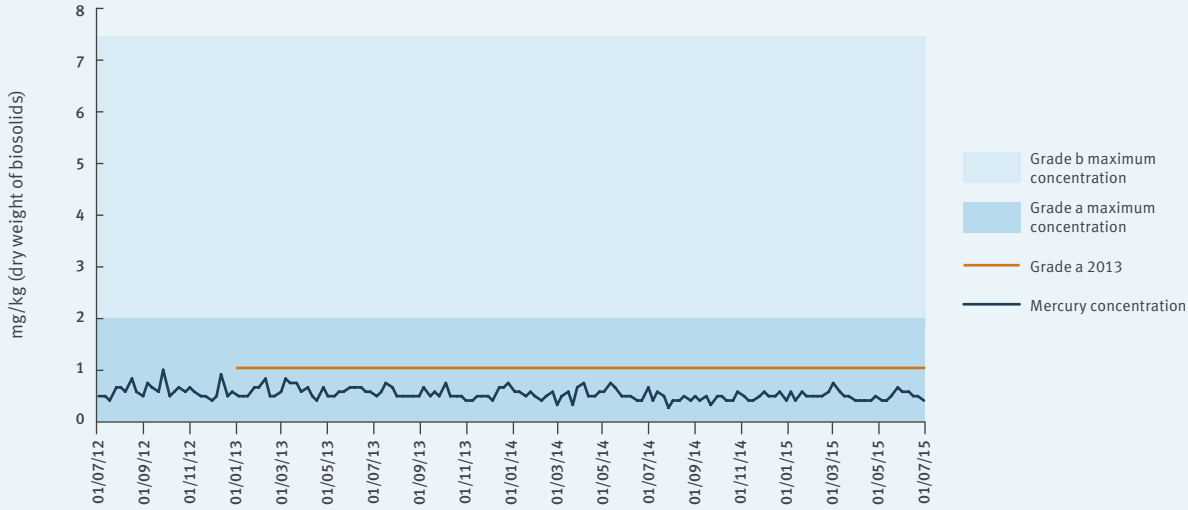
Mangere WWTP biosolids cadmium levels



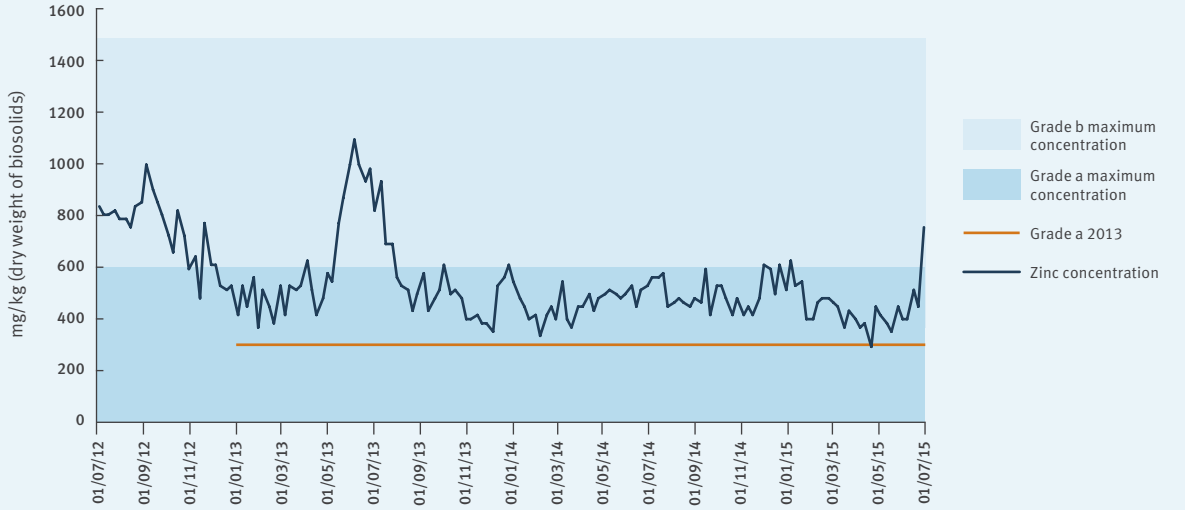
Mangere WWTP biosolids copper levels



Mangere WWTP biosolids mercury levels



Mangere WWTP biosolids zinc levels



Biosolids – Rosedale WWTP

Approximately 16,000 tonnes of dewatered sludge were produced at the Rosedale Wastewater Treatment Plant in the 2014/15 year. The graphs show the metal levels in the dewatered sludge at the Rosedale Wastewater Treatment Plant.

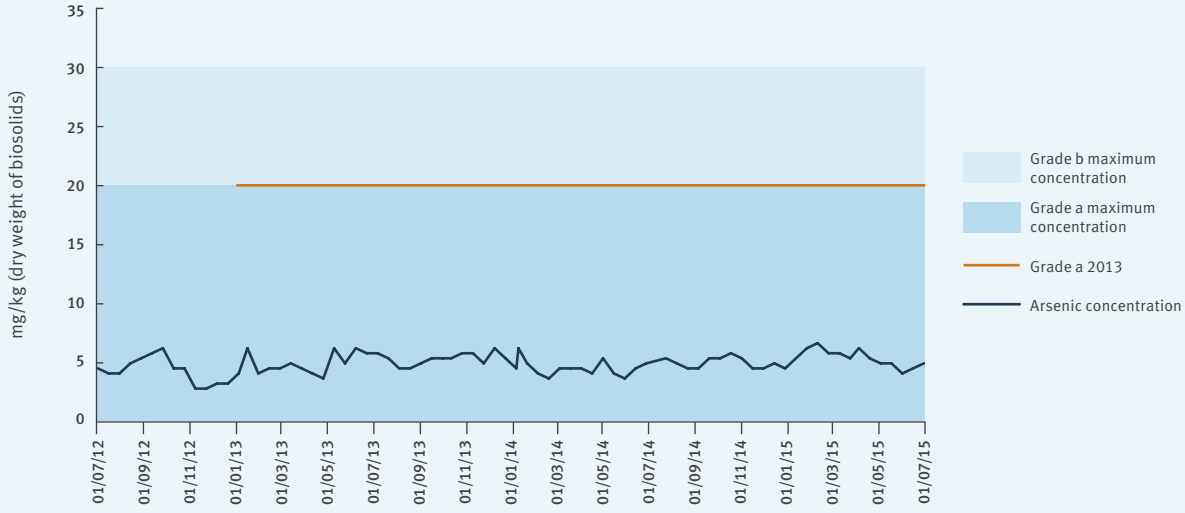
National guidelines for the beneficial use of biosolids that grade biosolids for unrestricted use (grade 'a') or restricted use (grade 'b') depending on their contamination loads have been included. On 1 January 2013 new limits in the national guidelines came into effect and are also presented below.

With the exception of copper and zinc, metal levels have remained at relatively low levels over the past year. Elevated levels of copper are attributed to the cuprosolvency of copper and copper alloys used in domestic plumbing while elevated zinc levels are attributed to contamination in stormwater runoff that makes its way into the wastewater system.

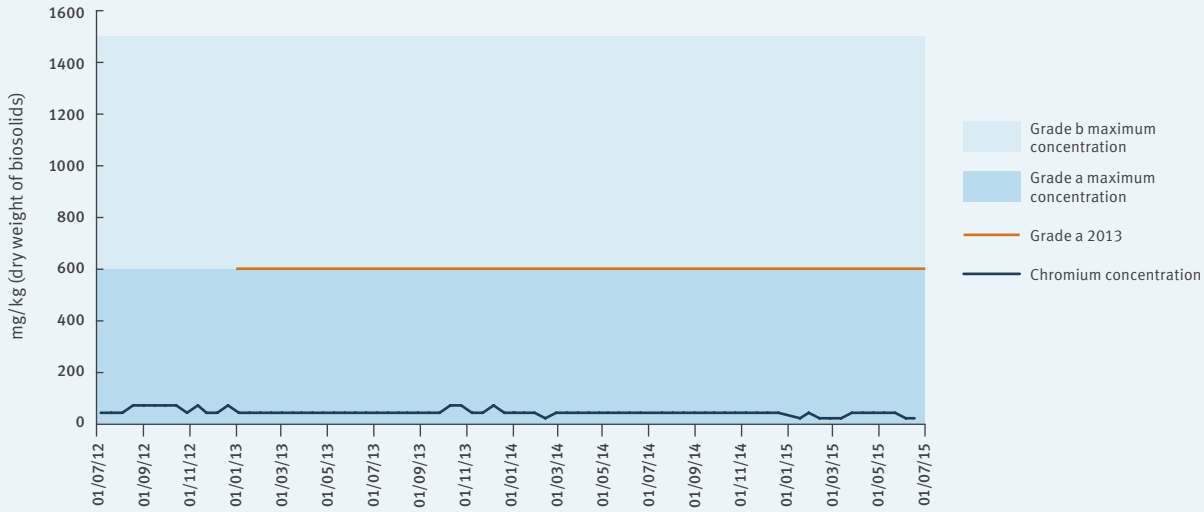
How does the current year result compare to last year and/or recent trends in terms of performance? The levels of arsenic, cadmium, chromium and lead have been relatively constant over the last few years. Mercury, nickel, copper and zinc, on average, show a declining trend.

Any significant developments that have contributed to the current year result? Industrial metal treatment processes and dentists continue to be monitored closely for compliant performance. The result of this is evident in the stable or decreasing levels of metals in the biosolids.

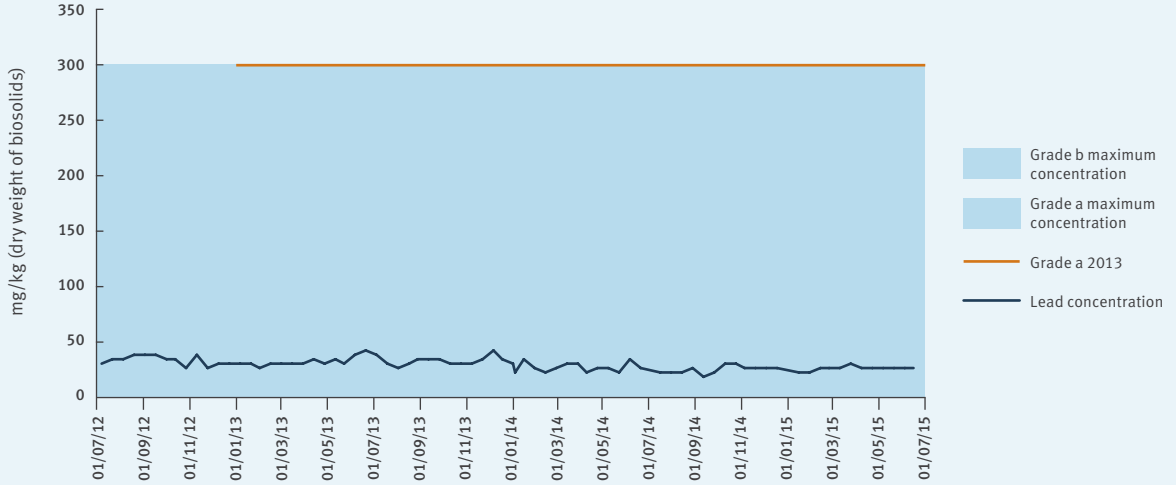
Rosedale WWTP biosolids arsenic levels



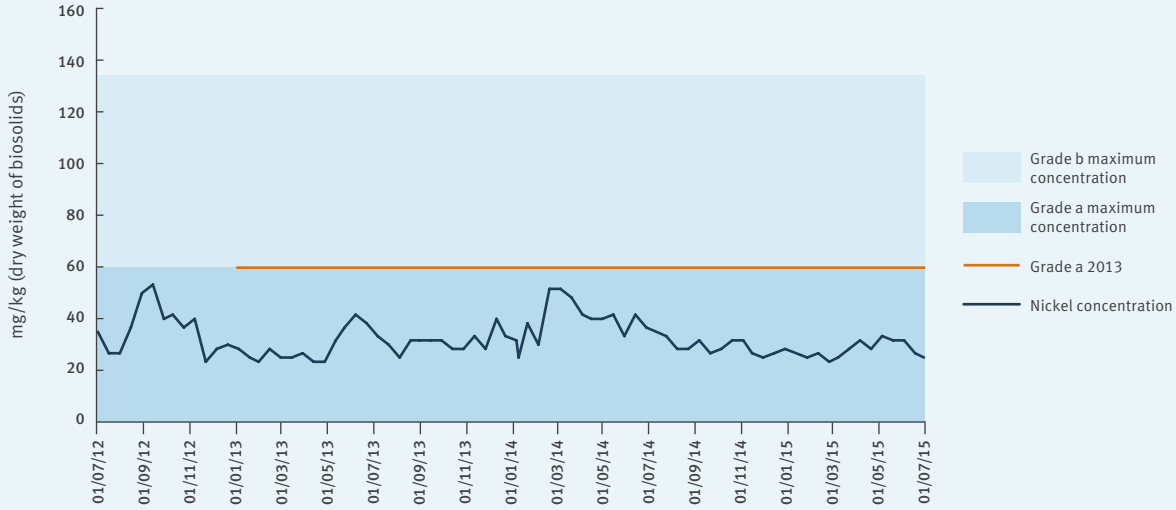
Rosedale WWTP biosolids chromium levels



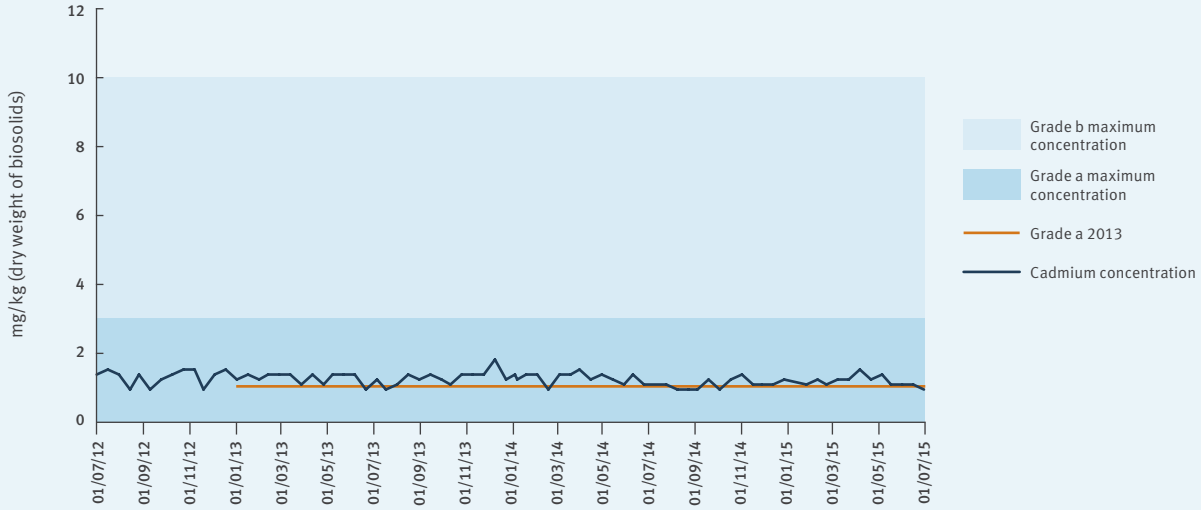
Rosedale WWTP biosolids lead levels



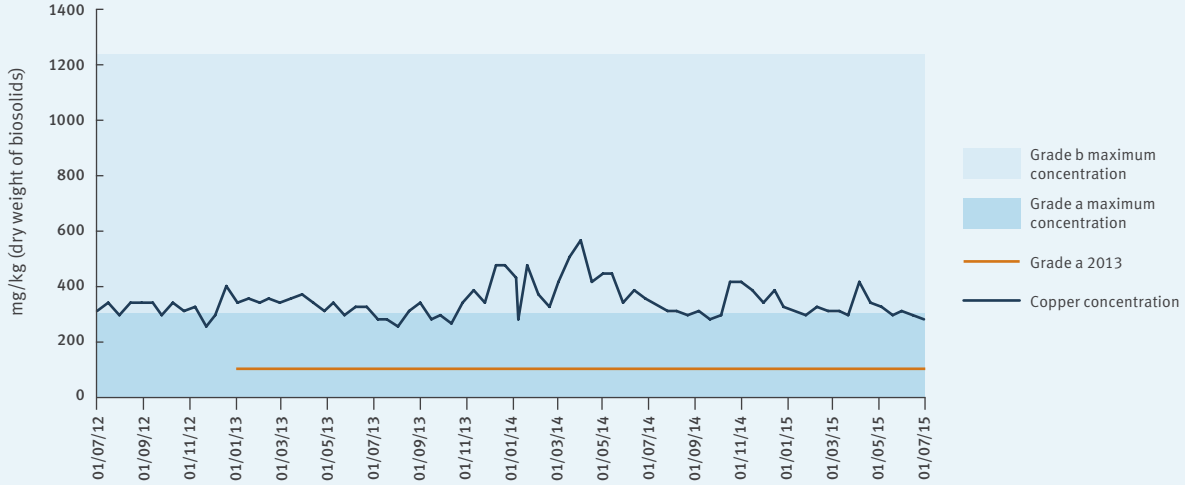
Rosedale WWTP biosolids nickel levels



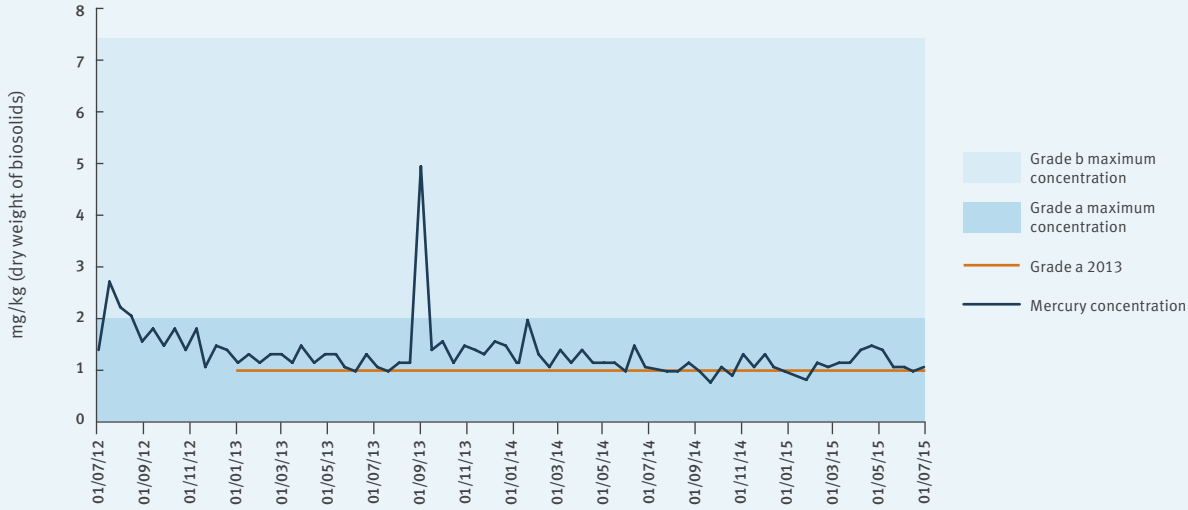
Rosedale WWTP biosolids cadmium levels



Rosedale WWTP biosolids copper levels



Rosedale WWTP biosolids mercury levels



Rosedale WWTP biosolids zinc levels