



Diamond Harbour Wastewater Treatment Plant Annual Monitoring Report July 2015 – June 2016

Prepared by: City Care Ltd
Kris Kaser

On behalf of

Christchurch City Council, City Water & Waste Unit

25 August 2016



Resource Consent Number: CRC101835
File Number: CO6C/14460
Client Name: Christchurch City Council
To: Discharge Contaminants Into Water.
Consent Location: Pauahinekotou Head, LYTTELTON HARBOUR
Status: Active

07/08/2012 Consent Commenced
 07/08/2017 Lapse Date
 03/09/2012 Given Effect to Date
 31/12/2021 Expiry Date

Subject to the Following Conditions:

1	The discharge shall be only treated sewage from the Diamond Harbour Wastewater Treatment Plant, located at the based of Pauahinekotou Head, Diamond Harbour.
Compliance	
2	a. Treated sewage effluent shall only be discharged to Lyttelton Harbour/Whakaraupo via an existing outfall approximately 60 metres seaward from Pauahinekotou Head, at or about map reference NZMS 260 M36: 8729-3141. b. The discharge at this location shall cease on 31 December 2021.
Compliance	
3	The volume of effluent discharged shall not exceed 2500 cubic metres per day at a maximum rate of 34 litres per second.
Unable to confirm compliance; the instantaneous inflow flowrate exceeded the consented limit of 34l/s 319 times during the twelve month period, primarily due to 2 major events and the pumped nature of the incoming flows. The peak flows through the treatment plant will be buffered through the large treatment tanks in the treatment plant prior to UV disinfection and discharge into the harbour. At present there is no flow meter on the discharge pipework. The maximum discharge of 2500 m³ per day was not exceeded (Attachment 1.1).	
4	The consent holder shall measure flows from the Diamond Harbour Sewage Treatment Plant, on a continuous basis, to a degree of accuracy of plus or minus ten percent, and shall maintain a record of total daily flows. This record shall be made available to the Canterbury Regional Council on request.
Compliance	
5	The median concentration of the five-day biological oxygen demand in the effluent discharged shall not exceed 30 grams per cubic metre from the date of commencement of this consent.
Compliance	
6	The median concentration of the suspended solids in the effluent discharged shall not exceed 30 grams per cubic metre from the date of commencement of this consent.
Non-Compliance; exceeded maximum TSS = 30 mg/L on 11 occasions	
7	a. The median concentration of faecal coliforms shall not exceed 700 colony forming units (CFU) per 100 millilitres of effluent. b. The median concentration of enterococci shall not exceed 1,750 MPN per 100 millilitres of effluent.
Complies	
8	For the purposes of determining whether the consent holder is complying with Conditions (5), (6) and (7): a. The effluent shall be sampled at any point after treatment and prior to discharge, and analysed for the concentration of the five-day biological oxygen demand, suspended solids, faecal coliforms and enterococci. b. The effluent shall be sampled at the following frequency: i. At least monthly samples shall be taken from 1 March to 30 November; and ii. At least weekly samples, on separate days selected at random, shall be taken during December, January and February. c. For the purposes of Conditions (5), (6) and (7), whenever a new sample result is available for each determinand, it shall be grouped with the previous four results obtained under Conditions (8)(a) and (b) or Condition (9), and the median result recorded. d. The time of day samples are taken shall be recorded.
Compliance	
9	If any sample measured has a faecal coliform count greater than 700 faecal coliforms per 100 millilitres of effluent or an

	enterococci count or more than 1,750 MPN per 100 millilitres of effluent, the consent holder shall take a further sample of treated effluent within two days of obtaining that result and shall test for faecal coliform and enterococci concentrations.
	Unable to confirm Compliance
10	If the median concentration of faecal coliforms or enterococci, as calculated in accordance with Condition 8(c), exceeds 700 faecal coliforms per 100 millilitres or 1,750 enterococci per 100 millilitres of effluent, the consent holder shall within ten working days of the exceedance, write to the Canterbury Regional Council outlining the measures the consent holder proposes to undertake to address the concentration exceedances, and the timeframe within which this will occur.
	Compliance; no exceedances occurred for either parameter
11	Prior to discharge, the effluent shall be sampled and analysed not less than once per month for the following: <ul style="list-style-type: none"> a. Dissolved reactive phosphorous (grams per cubic metre); b. Ammoniacal nitrogen (grams per cubic metre); c. Total oxidized nitrogen (grams per cubic metre); and d. Total nitrogen (grams per cubic metre).
	Compliance
12	Prior to discharge, the effluent shall be sampled at least annually during January and analysed for the following: <ul style="list-style-type: none"> a. Arsenic (milligrams per cubic metre); b. Cadmium (milligrams per cubic metre); c. Chromium (milligrams per cubic metre); d. Copper (milligrams per cubic metre); e. Lead (milligrams per cubic metre); f. Nickel (milligrams per cubic metre); and g. Zinc (milligrams per cubic metre).
	Compliance
13	<ul style="list-style-type: none"> a. The water of the receiving environment shall be sampled in January, March, May, June, September, November and December, at each of the following locations: <ul style="list-style-type: none"> i. 50 metres due north of the outfall; ii. 50 metres due south of the outfall; iii. 50 metres due east of the outfall; iv. 50 metres due west of the outfall; and v. surface water quality monitoring site SQ35187 (which is located at or about NZMS 260: M36:8636-3190, east of Quail Island/Otamahua). vi. surface water quality monitoring site at Church Bay, which is located at or about NZMS 260 M36:872-305. b. Each sample shall be analysed for the concentration of faecal coliforms, enterococci, total suspended solids, chlorophyll-a, ammoniacal nitrogen, total oxidized nitrogen total nitrogen and dissolved reactive phosphorus. The time the samples are taken shall be recorded. c. Samples shall be taken at approximately 0.5 metres below the surface of the water. d. Samples shall not be taken on consecutive days. e. Samples shall be taken within one hour of low water.
	Compliance
14	If any of the samples collected from around the mixing zone in accordance with Condition (13) contain concentrations of total nitrogen greater than 1.0 mgN/l or ammoniacal nitrogen greater than 0.91 mgN/l, the consent holder shall undertake an investigation of the operation of the Wastewater Treatment Plant and shall re-sample the discharge for ammoniacal nitrogen, total oxidized nitrogen, total nitrogen and dissolved reactive phosphorus, within 48 hours of receiving the results of the initial survey. The consent holder shall report the findings of the investigation to Canterbury Regional Council within one week of receipt of the results of the re-sample.
	Compliance
15	The monitoring required under Condition (13) shall be undertaken on the same day as the monitoring required under Condition (8). In the event that the monitoring required under Conditions (13) and (8) cannot be undertaken on the same days, the reason shall be recorded and submitted to the Canterbury Regional Council.
	Compliance
16	The sediment survey as carried out by Golders Associates (Report Number: 0978205527 – January 2010) for the application shall be repeated in 2015 in the month of November. The samples shall be analysed for total organic carbon, copper, lead and zinc and shall be collected from the following locations: <ul style="list-style-type: none"> a. At distances 25 metres perpendicular to the outfall; and b. At 50 metres and 150 metres along a transect in the same trajectory as the outfall pipe. These locations are illustrated on Plan CRC101835A which forms part of this consent.
	CCC to follow up
17	The laboratory carrying out the analyses for the purposes of Conditions (5), (6), (7), (9), (11), (12) and (13) of this consent shall be accredited for the analyses to ISO Guide 25, either by International Accreditation New Zealand (IANZ), or by an organisation with a mutual agreement with IANZ.
	Compliance

18	The consent holder shall submit to the Canterbury Regional Council: <ul style="list-style-type: none"> a. The results of any monitoring required each month under the conditions of this consent, by the 10th working day of the following month. b. The results of any sampling undertaken under Condition (9) that have a faecal coliform count greater than 700 faecal coliforms per 100 millilitres of effluent, or an enterococci count greater than 1,750 enterococci MPN per 100 millilitres of effluent, within three working days of receipt of any results.
Compliance	
19	The consent holder shall submit to the Canterbury Regional Council within three months of the commencement of this consent, a Management Plan. This shall include: <ul style="list-style-type: none"> a. An Operation and Maintenance Manual, which contains the key operation and maintenance tasks of the operator, normal operations, emergency operations and safety precautions. The emergency operations and safety precautions shall set out: <ul style="list-style-type: none"> i. The contingency measures to be taken at the pumping stations in the Diamond Harbour Wastewater Treatment Plant catchment and at the Treatment Plant in order to avoid the release of effluent to the environment during periods of any mechanical or electrical failure or power cut; and ii. the measures to be taken at the pumping stations in the Diamond Harbour catchment and at the Treatment Plant in the event of an emergency discharge or overflow. b. The Management Practices to ensure compliance with conditions of the Resource Consent. c. The Maintenance Contractor's monitoring programme and reporting provisions, including a specific requirement that monitoring is undertaken in accordance with Conditions (8), (9), (10), (11), (12), (13) (14), (15) and (16) of this consent.
Compliance; Management Plan submitted on 05/11/2012	
20	<ul style="list-style-type: none"> a. The consent holder shall submit a report to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, and upload the report on the consent holder's website by 31 August of each year summarizing the monitoring data collected and providing an interpretation of the results of the monitoring. b. The consent holder shall supply a copy of the report referred to in condition 20(a) to all the following organisations/groups/people: <ul style="list-style-type: none"> a. Cass Bay Residents Association b. Church Bay Neighborhood Association c. Diamond Harbour Community Association Incorporated d. Paula Smith C/o 1 Purau Avenue, RD 2, Diamond Harbour e. Te Hapu o Ngati Wheke (Rapaki) Runanga f. Te Runanga o Koukourarata g. Te Runanga o Ngai Tahu h. Governors Bay Community Association. c. The consent holder shall display all effluent and receiving environment monitoring data collected on the consent holder's website. This data shall be updated on a monthly basis.
Compliance via this report; CCC to distribute	
21	<ul style="list-style-type: none"> a. Within 60 days of the commencement date of this resource consent, the consent holder shall prepare an implementation plan which includes, but is not limited to the following matters: <ul style="list-style-type: none"> a. No later than 30 June 2015 all preliminary design details have been completed; b. No later than 30 September 2015, all necessary resource consents have been applied for c. No later than 30 June 2017 detailed design work completed; d. No later than 31 December 2021 all works have been commissioned, and after a period of testing the treatment plant is decommissioned. b. The consent holder shall provide an annual report to the Canterbury Regional Council in July each year, outlining progress on the Implementation Plan for the removal of the sewage discharge from Lyttelton Harbour/Whakaraupo. A copy of this annual report will also be forwarded to all organisations/groups represented on the Lyttelton Harbour/Whakaraupo Wastewater Working Party and also all parties listed in condition 20(b). c. The consent holder shall hold a public meeting once a year to discuss the monitoring data collected in the previous year and also to provide an update on progress relating to the cessation of the discharge at map reference NZMS 260 M36:838-815 on 31 December 2018, and the removal of the sewage discharge from Lyttelton Harbour/Whakaraupo.
CCC to follow up	
22	The Canterbury Regional Council may, once per year, on any of the last five working days of June or November each year, serve notice of its intention to review the conditions of this consent for the purposes of: <ul style="list-style-type: none"> a. Dealing with any adverse effects which may arise from the exercise of this consent and which it is appropriate to deal with later; or b. Requiring adoption of the best practicable option to remove or reduce any adverse effect on the environment; or c. Complying with the requirements of a relevant rule in an operative regional plan; or d. Amending the frequency of monitoring and the parameters monitored.
ECAN to request	
23	The consent holder shall surrender resource consent CRC031546 within 60 working days of the commencement of this consent.
Compliance	

Treatment Plant Effluent Monitoring

Daily flows for the Diamond Harbour Wastewater Treatment Plant (WwTP) were generally well under the 2,500 m³/d limit with 95% of all flows <600 m³/d (Attachment 1.3). Highest flows recorded were 1,313 m³/d on 20 Sept 2015 with the next highest of 1,092 m³/d on 7 January 2016, well within the consented limit (N.B. flows are measured on the inlet).

The instantaneous inflow rate was greater than 34 l/s 319 times. The majority of the exceedances were during the two large rainfall events in Sept15 & May/June 2016. Other smaller rain events were usually short-lived and uncharacteristic of the normal flow regime. Overall, flowrate compliance was much improved compared to 737 exceedances in the 2014-2015 period. The discharge rate would be buffered and therefore the inflow rate is a conservative guide only of the discharge rate.

The plant operated with full compliance for effluent water quality relating to BOD₅, faecal coliforms (FC), and Enterococci (ENT) (Table 1), however TSS levels were exceeded on 11 occasions. Maximum medians of 13 mg/L BOD₅ were below the 30-mg/L limits, TSS max of 47 mg/l compared to allowable 30 mg/l and FC of 40 CFU/100 mL and ENT of 74 MPN/100 mL were excellent compared to 700 CFU/100 mL and 1,750 MPN/100 mL consented.

Receiving Environment Monitoring

The receiving environment was monitored around the outfall and at two control sites (Quail Island and Church Bay) (Attachment 2.2). Human health related parameters of FC and ENT were usually at or below the respective detection limits. Trigger levels of 1 mg/L for TN and 0.91 mg/L for NH₃ were not exceeded at any of the sites with maximum values of 0.580mg/L TN at 50 m due South of the outfall and 0.024 mg/L NH₃ at Church Bay. Monitoring results did not appear to be significantly different between the outfall sites and the control sites.

Table 1. Summary of Exceedances and Non-Compliances from July 2015-June 2016.

Parameter	Exceedances of Trigger Value
Flow >2,500 m ³ /d	0
Discharge Flowrate >34 L/s	Unable to confirm compliance
BOD ₅ median >30 mg/L	0
TSS median >30 mg/L	11
FC >700 CFU/100 mL	0
ENT >1,750 MPN/100 mL	0
Receiving TN >1 mg/L	0
Receiving NH ₃ >0.91 mg/L	0

Table 2. Incoming instantaneous flowrates from July 2015-June 2016.

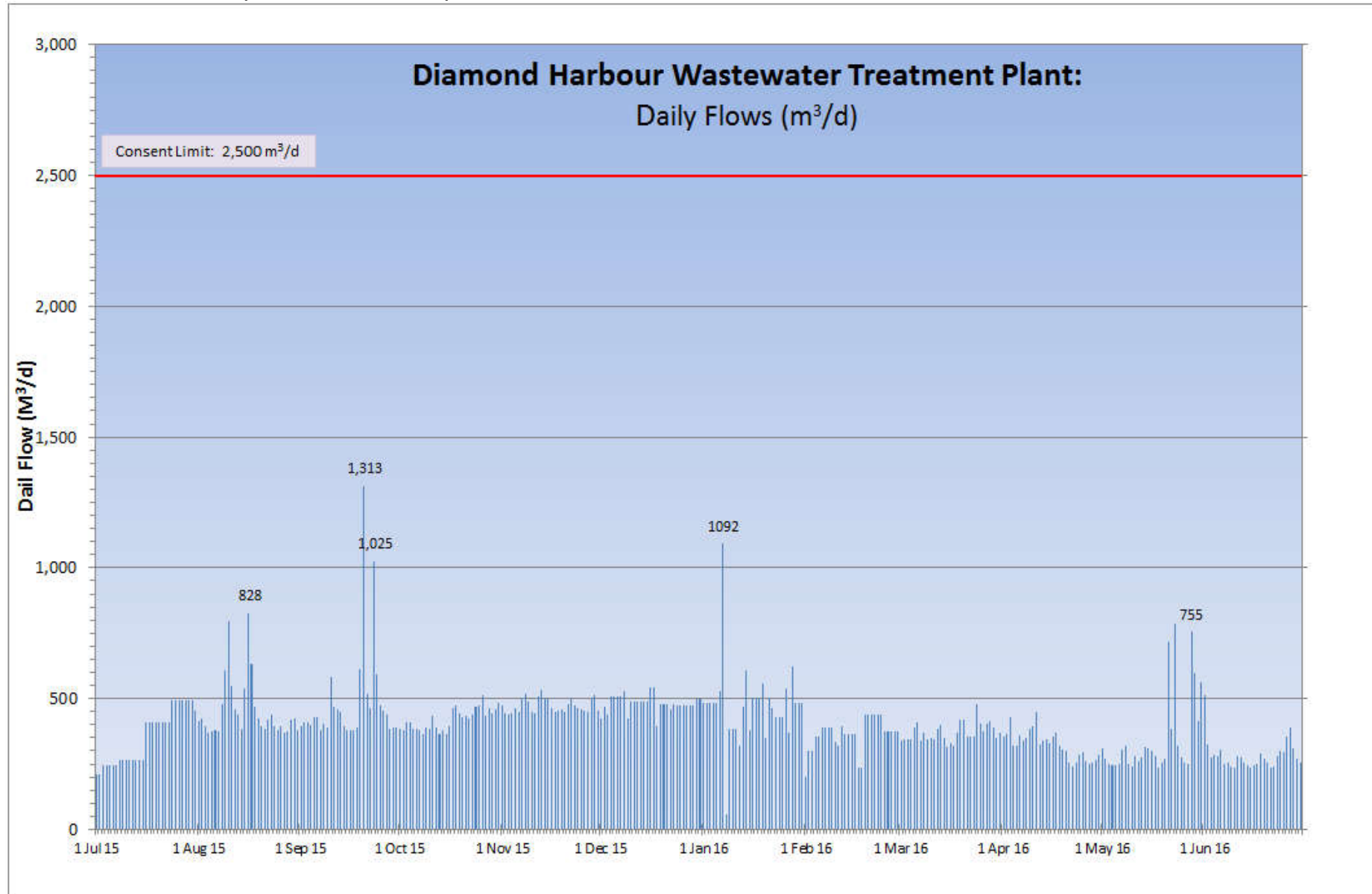
Month	Values > 34 L/s [#]
Jul-15	
Aug-15	25
Sep-15	160
Oct-15	
Nov-15	1
Dec-15	
Jan-16	
Feb-16	2
Mar-16	
Apr-16	4
May-16	123
Jun-16	4
Total	319

Attachment 1.1: Flows, Diamond Harbour, Data

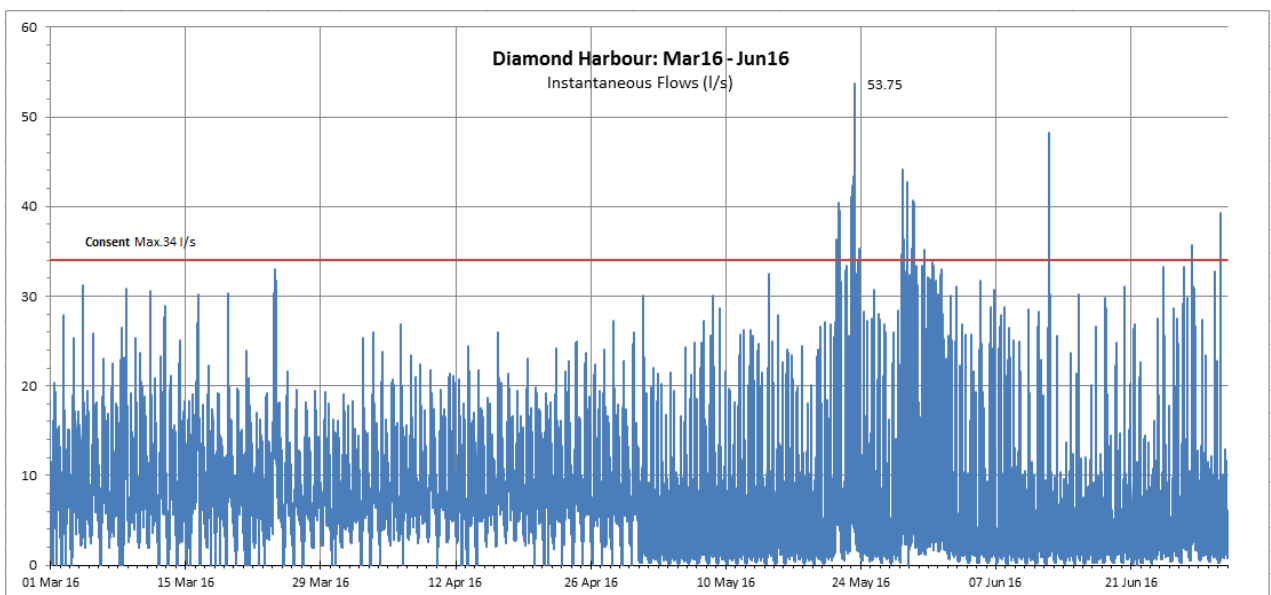
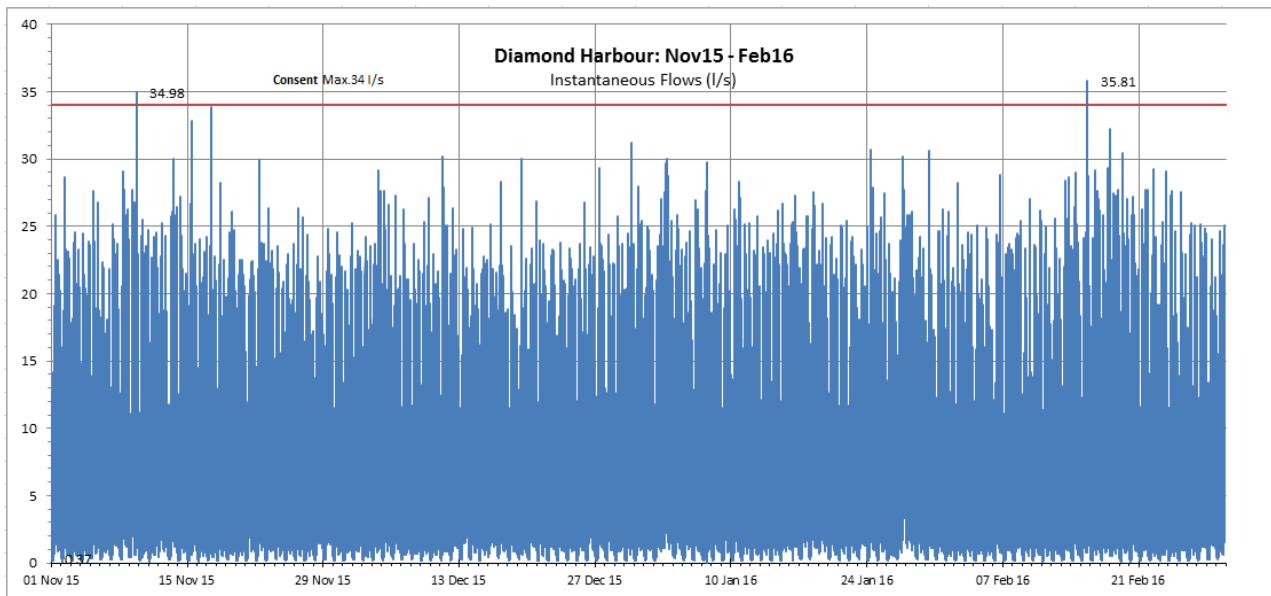
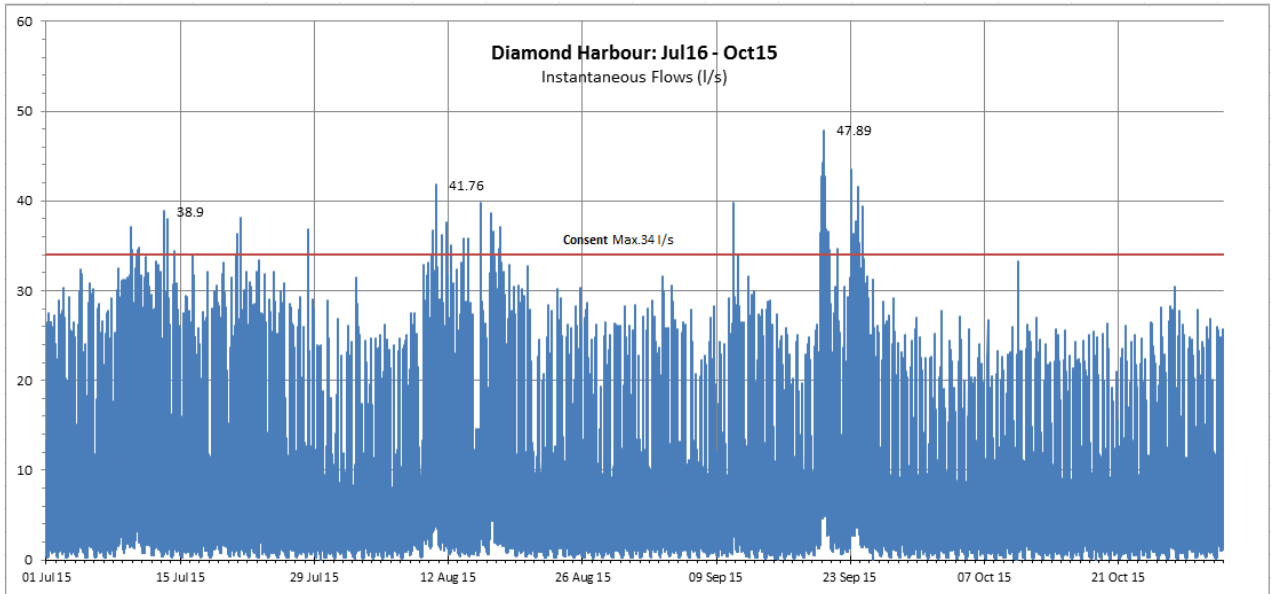
Plant : Diamond Harbour Wastewater Treatment, Banks Peninsula: Daily Flows - July 2015 - June 2016							
Date	Flow (m ³ /d)	Date	Flow (m ³ /d)	Date	Flow (m ³ /d)	Date	Flow (m ³ /d)
1 Jul 15	209	1 Oct 15	382	1 Jan 16	484	1 Apr 16	356
2 Jul 15	209	2 Oct 15	379	2 Jan 16	484	2 Apr 16	365
3 Jul 15	248	3 Oct 15	409	3 Jan 16	484	3 Apr 16	431
4 Jul 15	248	4 Oct 15	408	4 Jan 16	484	4 Apr 16	319
5 Jul 15	248	5 Oct 15	383	5 Jan 16	484	5 Apr 16	322
6 Jul 15	248	6 Oct 15	382	6 Jan 16	528	6 Apr 16	360
7 Jul 15	248	7 Oct 15	381	7 Jan 16	1,092	7 Apr 16	339
8 Jul 15	264	8 Oct 15	364	8 Jan 16	59	8 Apr 16	352
9 Jul 15	264	9 Oct 15	388	9 Jan 16	384	9 Apr 16	382
10 Jul 15	264	10 Oct 15	386	10 Jan 16	384	10 Apr 16	392
11 Jul 15	264	11 Oct 15	435	11 Jan 16	384	11 Apr 16	447
12 Jul 15	264	12 Oct 15	388	12 Jan 16	319	12 Apr 16	324
13 Jul 15	264	13 Oct 15	366	13 Jan 16	471	13 Apr 16	340
14 Jul 15	264	14 Oct 15	378	14 Jan 16	607	14 Apr 16	343
15 Jul 15	264	15 Oct 15	363	15 Jan 16	379	15 Apr 16	331
16 Jul 15	408	16 Oct 15	393	16 Jan 16	505	16 Apr 16	355
17 Jul 15	408	17 Oct 15	465	17 Jan 16	505	17 Apr 16	371
18 Jul 15	408	18 Oct 15	475	18 Jan 16	505	18 Apr 16	321
19 Jul 15	408	19 Oct 15	442	19 Jan 16	556	19 Apr 16	303
20 Jul 15	408	20 Oct 15	431	20 Jan 16	351	20 Apr 16	299
21 Jul 15	408	21 Oct 15	435	21 Jan 16	504	21 Apr 16	255
22 Jul 15	408	22 Oct 15	423	22 Jan 16	465	22 Apr 16	239
23 Jul 15	408	23 Oct 15	437	23 Jan 16	431	23 Apr 16	255
24 Jul 15	494	24 Oct 15	468	24 Jan 16	431	24 Apr 16	287
25 Jul 15	494	25 Oct 15	475	25 Jan 16	431	25 Apr 16	296
26 Jul 15	494	26 Oct 15	514	26 Jan 16	538	26 Apr 16	262
27 Jul 15	494	27 Oct 15	434	27 Jan 16	367	27 Apr 16	252
28 Jul 15	494	28 Oct 15	462	28 Jan 16	624	28 Apr 16	253
29 Jul 15	494	29 Oct 15	443	29 Jan 16	484	29 Apr 16	263
30 Jul 15	494	30 Oct 15	460	30 Jan 16	484	30 Apr 16	287
31 Jul 15	454	31 Oct 15	481	31 Jan 16	484	1 May 16	311
1 Aug 15	415	1 Nov 15	472	1 Feb 16	199	2 May 16	269
2 Aug 15	424	2 Nov 15	442	2 Feb 16	299	3 May 16	252
3 Aug 15	396	3 Nov 15	439	3 Feb 16	299	4 May 16	244
4 Aug 15	369	4 Nov 15	443	4 Feb 16	356	5 May 16	246
5 Aug 15	372	5 Nov 15	466	5 Feb 16	356	6 May 16	249
6 Aug 15	379	6 Nov 15	451	6 Feb 16	390	7 May 16	304
7 Aug 15	373	7 Nov 15	502	7 Feb 16	390	8 May 16	319
8 Aug 15	479	8 Nov 15	520	8 Feb 16	390	9 May 16	252
9 Aug 15	609	9 Nov 15	489	9 Feb 16	390	10 May 16	240
10 Aug 15	796	10 Nov 15	451	10 Feb 16	334	11 May 16	278
11 Aug 15	548	11 Nov 15	446	11 Feb 16	321	12 May 16	258
12 Aug 15	461	12 Nov 15	509	12 Feb 16	393	13 May 16	276
13 Aug 15	441	13 Nov 15	531	13 Feb 16	366	14 May 16	317
14 Aug 15	386	14 Nov 15	496	14 Feb 16	366	15 May 16	312
15 Aug 15	536	15 Nov 15	502	15 Feb 16	366	16 May 16	298
16 Aug 15	828	16 Nov 15	466	16 Feb 16	366	17 May 16	282
17 Aug 15	631	17 Nov 15	447	17 Feb 16	237	18 May 16	235
18 Aug 15	469	18 Nov 15	454	18 Feb 16	237	19 May 16	257
19 Aug 15	423	19 Nov 15	461	19 Feb 16	438	20 May 16	271

20 Aug 15	396	20 Nov 15	449	20 Feb 16	438	21 May 16	715
21 Aug 15	384	21 Nov 15	479	21 Feb 16	438	22 May 16	384
22 Aug 15	417	22 Nov 15	500	22 Feb 16	438	23 May 16	787
23 Aug 15	441	23 Nov 15	474	23 Feb 16	438	24 May 16	318
24 Aug 15	396	24 Nov 15	462	24 Feb 16	438	25 May 16	273
25 Aug 15	377	25 Nov 15	459	25 Feb 16	374	26 May 16	255
26 Aug 15	393	26 Nov 15	452	26 Feb 16	374	27 May 16	249
27 Aug 15	368	27 Nov 15	450	27 Feb 16	374	28 May 16	755
28 Aug 15	376	28 Nov 15	502	28 Feb 16	374	29 May 16	599
29 Aug 15	417	29 Nov 15	512	29 Feb 16	374	30 May 16	413
30 Aug 15	423	30 Nov 15	456	1 Mar 16	340	31 May 16	561
31 Aug 15	380	1 Dec 15	426	2 Mar 16	344	1 Jun 16	514
1 Sep 15	392	2 Dec 15	469	3 Mar 16	346	2 Jun 16	323
2 Sep 15	408	3 Dec 15	440	4 Mar 16	344	3 Jun 16	277
3 Sep 15	411	4 Dec 15	507	5 Mar 16	387	4 Jun 16	283
4 Sep 15	397	5 Dec 15	507	6 Mar 16	411	5 Jun 16	282
5 Sep 15	430	6 Dec 15	507	7 Mar 16	342	6 Jun 16	305
6 Sep 15	430	7 Dec 15	507	8 Mar 16	369	7 Jun 16	252
7 Sep 15	379	8 Dec 15	530	9 Mar 16	343	8 Jun 16	257
8 Sep 15	404	9 Dec 15	426	10 Mar 16	350	9 Jun 16	239
9 Sep 15	391	10 Dec 15	487	11 Mar 16	343	10 Jun 16	237
10 Sep 15	581	11 Dec 15	487	12 Mar 16	383	11 Jun 16	281
11 Sep 15	470	12 Dec 15	487	13 Mar 16	399	12 Jun 16	275
12 Sep 15	461	13 Dec 15	487	14 Mar 16	348	13 Jun 16	253
13 Sep 15	451	14 Dec 15	487	15 Mar 16	315	14 Jun 16	243
14 Sep 15	396	15 Dec 15	487	16 Mar 16	328	15 Jun 16	234
15 Sep 15	381	16 Dec 15	543	17 Mar 16	322	16 Jun 16	244
16 Sep 15	381	17 Dec 15	543	18 Mar 16	368	17 Jun 16	249
17 Sep 15	381	18 Dec 15	395	19 Mar 16	417	18 Jun 16	291
18 Sep 15	388	19 Dec 15	479	20 Mar 16	420	19 Jun 16	271
19 Sep 15	612	20 Dec 15	479	21 Mar 16	354	20 Jun 16	253
20 Sep 15	1,313	21 Dec 15	479	22 Mar 16	356	21 Jun 16	236
21 Sep 15	520	22 Dec 15	459	23 Mar 16	353	22 Jun 16	238
22 Sep 15	464	23 Dec 15	478	24 Mar 16	478	23 Jun 16	281
23 Sep 15	1,025	24 Dec 15	471	25 Mar 16	402	24 Jun 16	298
24 Sep 15	594	25 Dec 15	471	26 Mar 16	376	25 Jun 16	296
25 Sep 15	476	26 Dec 15	471	27 Mar 16	402	26 Jun 16	356
26 Sep 15	456	27 Dec 15	471	28 Mar 16	413	27 Jun 16	388
27 Sep 15	440	28 Dec 15	471	29 Mar 16	391	28 Jun 16	308
28 Sep 15	386	29 Dec 15	471	30 Mar 16	349	29 Jun 16	269
29 Sep 15	389	30 Dec 15	499	31 Mar 16	368	30 Jun 16	257
30 Sep 15	387	31 Dec 15	499				

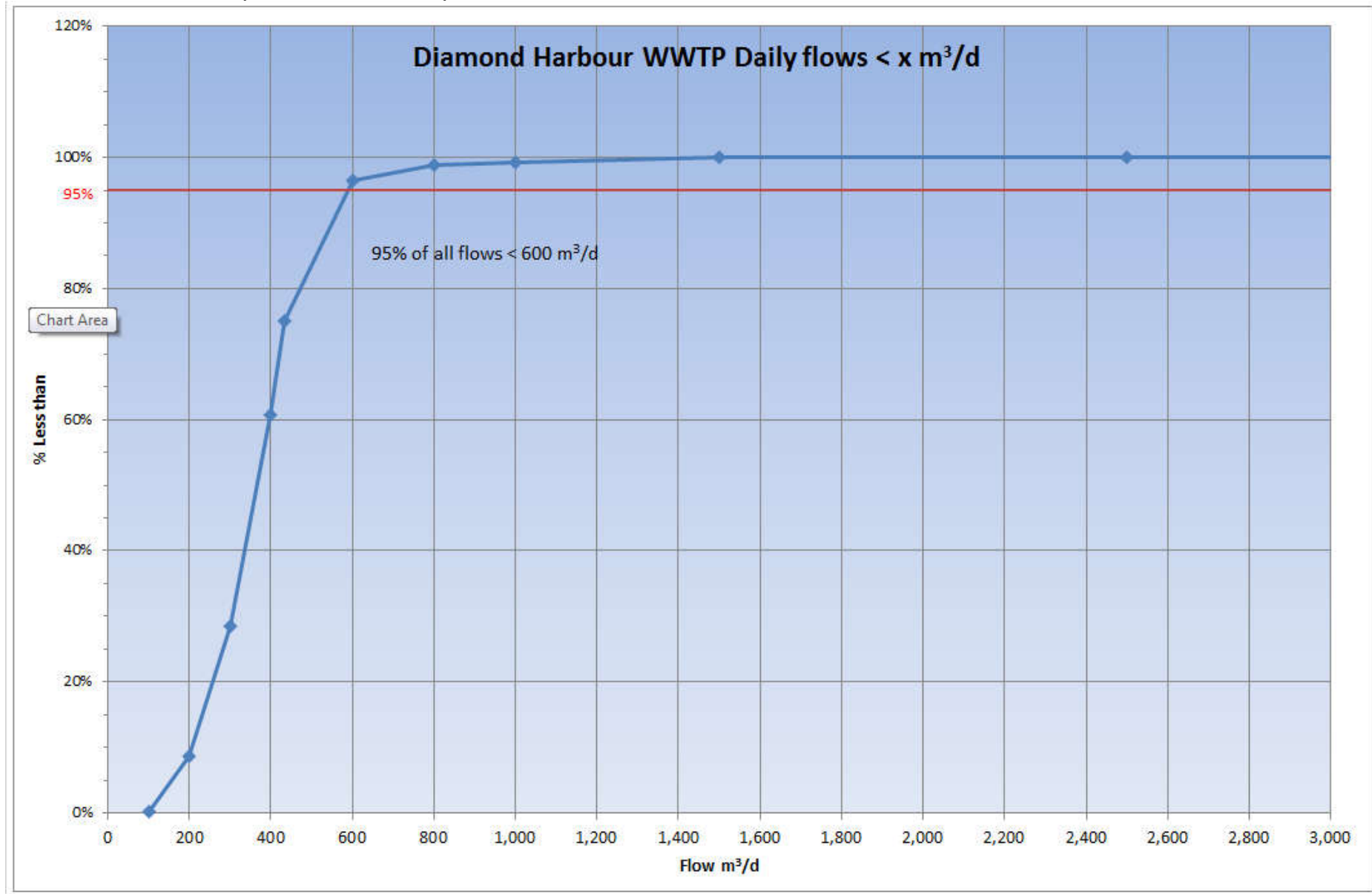
Attachment 1.2: Flows, Diamond Harbour, Chart



Attachment 1.3: Instantaneous Flows, Diamond Harbour



Attachment 1.3: Flows, Diamond Harbour, '% less than'



Attachment 2.1: Lab Data, Diamond Harbour Wastewater Treatment Plant

Plant:		Diamond Harbour Wastewater Treatment, Banks Peninsula										
Asset Owner:		Christchurch City Council										
Laboratory		Christchurch City Council Laboratory, City Water & Waste Unit										
									5-Sample Median			
Date	BOD ₅	DRP	TSS	TN	NH ₄ -N	NO _x	FC	ENT	BOD ₅	TSS	FC	ENT
	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	CFU/100ml	MPN/100ml	[mg/l]	[mg/l]	CFU/100ml	MPN/100ml
8 Jul 2015	2.4	0.8	5	3.8	0.83	2.3	10	10	2.4	5.0	10.0	10
31 Aug 2015	2.6	3.0	32	20.4	0.005	16	3200	1200	2.4	5.0	10.0	10
10 Sep 2015	21.0	1.9	19	26.8	21	0.75	40	100	2.6	6.0	10.0	10
21 Oct 2015	18.0	1.3	47	15	8.7	0.06	60	74	2.6	19.0	40.0	74
18 Nov 2015	2.1	0.18	8	18.2	0.96	17	10	31	2.6	19.0	40.0	74
1 Dec 2015	13.0		59				10	10	13.0	32.0	40.0	74
8 Dec 2015	6.8	0.36	30	11	0.45	10	10	10	13.0	30.0	10.0	31
15 Dec 2015	13.0		61				30	10	13.0	47.0	10.0	10
23 Dec 2015	7.0		38				10	10	7.0	38.0	10.0	10
30 Dec 2015	4.7		22				10	10	7.0	38.0	10.0	10
5 Jan 2016	60.0	5.9	44	35	25	1.3	1	10	7.0	38.0	10.0	10
12 Jan 2016	2.3		24				10	10	7.0	38.0	10.0	10
20 Jan 2016	5.0		48				10	10	5.0	38.0	10.0	10
27 Jan 2016	4.2		21				10	10	4.7	24.0	10.0	10
3 Feb 2016	3.7		12				10	10	4.2	24.0	10.0	10
10 Feb 2016	9.8	7.7	63	8.4	4.2	1.4	20	10	4.2	24.0	10.0	10
17 Feb 2016	6.6		44				30	41	5.0	44.0	10.0	10
24 Feb 2016	12.0		40				1600	470	6.6	40.0	20.0	10
15 Mar 2016	4.1	1.9	12	7.6	0.33	6.4	10	10	6.6	40.0	20.0	10
22 Apr 2016	2.8	3.4	23	4.7	0.55	0.94	10	10	6.6	40.0	20.0	10
10 May 2016	1.8	5.4	4	1.9	0.005	1.3	1	10	4.1	23.0	10.0	10
21 Jun 2016	1.6	0.5	29	2.1	0.55	1	20	10	2.8	23.0	10.0	10
								Limit	30	30	700	1750
								Exceedances	0	11	0	0
								Max	13.0	47.0	40.0	74.0
	As	Cd	Cr	Cu	Pb	Ni	Zn					
	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]					
6 Jan 2011	0.0015	0.0002	0.001	0.0020	0.0025	0.0021	0.025					
12 Jan 2016	<0.0015	<0.00020	<0.0010	0.0039	<0.0015	<0.0025	0.025					

Attachment 2.2: Lab Data, Receiving Environment

*See Governors Bay for Quail Control data.																				
Consent CRC101835																				
Date	OF - 50m due				Church Bay	OF - 50m due				Church Bay	OF - 50m due				Church Bay	OF - 50m due				Church Bay
	East	North	South	West		East	North	South	West		East	North	South	West		East	North	South	West	
	TN mg/L	TN mg/L	TN mg/L	TN mg/L	TN mg/L	NH3 mg/L	NH3 mg/L	NH3 mg/L	NH3 mg/L	NH3 mg/L	NOX mg/L	NOX mg/L	NOX mg/L	NOX mg/L	NOX mg/L	DRP mg/L	DRP mg/L	DRP mg/L	DRP mg/L	DRP mg/L
10 Sep 2015	0.086	0.1	0.012	0.093	0.11	0.007	0.005	0.007	0.005	0.02	0.01	0.01	0.01	0.011	0.01	0.0034	0.0051	0.0031	0.003	0.016
6 Nov 2015	0.16	0.16	0.17	0.016	0.17	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.01	0.01	0.01	0.0046	0.004	0.0033	0.0037	0.0055
8 Dec 2015	0.08	0.1	0.58	0.11	0.084	0.005	0.005	0.005	0.006	0.007	0.01	0.01	0.01	0.01	0.01	0.0092	0.0096	0.011	0.011	0.012
5 Jan 2016	0.18	0.16	0.2	0.23	0.16	0.005	0.005	0.008	0.009	0.018	0.01	0.01	0.01	0.01	0.01	0.012	0.01	0.01	0.012	0.022
11 Feb 2016	0.13	0.14	0.13	0.14	0.13	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.01	0.01	0.01	0.013	0.014	0.012	0.013	0.011
17 Mar 2016	0.26	0.15	0.15	0.16	0.18	0.021	0.013	0.014	0.014	0.024	0.01	0.01	0.01	0.01	0.01	0.022	0.019	0.019	0.019	0.022
10 May 2016	0.26	0.25	0.26	0.25	0.25	0.011	0.011	0.011	0.012	0.013	0.01	0.01	0.01	0.01	0.01	0.01	0.011	0.01	0.01	0.011
17 Jun 2016	0.12	0.17	0.17	0.12	0.12	0.005	0.005	0.011	0.006	0.005	0.062	0.062	0.066	0.058	0.052	0.02	0.02	0.022	0.021	0.019
average	0.160	0.154	0.209	0.140	0.151	0.008	0.007	0.008	0.008	0.012	0.017	0.017	0.017	0.016	0.015	0.012	0.012	0.011	0.012	0.015
maximum	0.260	0.250	0.580	0.250	0.250	0.021	0.013	0.014	0.014	0.024	0.062	0.062	0.066	0.058	0.052	0.022	0.020	0.022	0.021	0.022

Date	OF - 50m due				Church Bay	OF - 50m due				Church Bay	OF - 50m due				Church Bay	OF - 50m due				Church Bay
	East	North	South	West		East	North	South	West		East	North	South	West		East	North	South	West	
	TSS mg/L	TSS mg/L	TSS mg/L	TSS mg/L	TSS mg/L	Chla mg/L	Chla mg/L	Chla mg/L	Chla mg/L	Chla mg/L	ENT MPN/100mL	ENT MPN/100mL	ENT MPN/100mL	ENT MPN/100mL	ENT MPN/100mL	FC CFU/100mL	FC CFU/100mL	FC CFU/100mL	FC CFU/100mL	FC CFU/100mL
10 Sep 2015	14	17	16	15	62	1.7	2	1.5	1.3	3.2	10	10	10	10	10	1.0	1.0	1.0	1.0	1.0
6 Nov 2015	20	18	38	17	24	1.14	0.98	1.4	0.98	0.97	10	10	10	10	10	2.0	4.0	1.0	1.0	1.0
8 Dec 2015	65	63	74	74	65	0.08	0.81	0.83	0.41	0.58	41	52	10	10	10	1.0	1.0	1.0	1.0	1.0
5 Jan 2016	14	18	18	12	18	0.82	0.91	0.87	1	0.74	10	10	10	10	10	1.0	2.0	1.0	1.0	1.0
11 Feb 2016	no results from lab					3.4	3.8	3.1	2.8	2.2	10	10	10	10	10	1.0	1.0	1.0	1.0	1.0
17 Mar 2016	14	14	16	23	23	4.3	3.9	3.7	3.6	3.9	10	10	10	10	10	1.0	1.0	5.0	3.0	1.0
10 May 2016	12	15	39	14	13	3.4	3	2.9	2.8	2.9	10	10	10	10	10	1.0	2.0	1.0	1.0	1.0
17 Jun 2016	no results from lab					1.9	1.8	2.2	1.8	2.1	10	10	10	10	10	1.0	1.0	1.0	1.0	1.0
average	23.167	24.167	33.500	25.833	34.167	2.093	2.150	2.063	1.836	2.074	13.875	15.250	10.000	10.000	10.000	1.125	1.625	1.500	1.250	1.000
maximum	65	63.0	74.0	74.0	65.0	4.3	3.9	3.7	3.6	3.9	41.0	52.0	10.0	10.0	10.0	2.0	4.0	5.0	3.0	1.0

* TN should not be > 1
 * NH3 should not be > 0.91