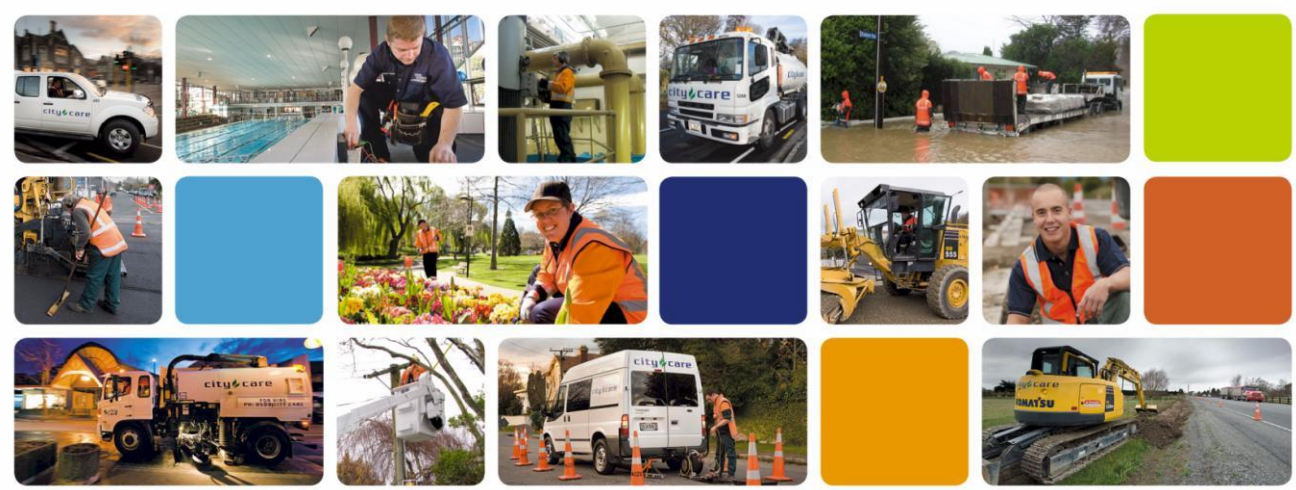


Diamond Harbour
Wastewater Treatment Plant
Annual Monitoring Report
July 2019 – June 2020

Prepared by: Citycare Water
Kris Kaser

On behalf of

Christchurch City Council, City Water & Waste Unit

28 August 2020

Resource Consent Number: CRC101835
File Number: CO6C/14460
Client Name: Christchurch City Council
To: Discharge Contaminants Into Water.
Consent Location: Pauaohinekotou 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 Pauaohinekotou 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 Pauaohinekotou 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.
	The instantaneous inflow flowrate exceeded the consented limit of 34l/s 1,311 times during the twelve-month period, primarily due to 6 major events. 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. There has never been a flow meter on the discharge pipework. The maximum discharge never exceeded 2,500 m³ per day. (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.
	Compliance
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 determinands, 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 that 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.
	Complies
11	Prior to discharge, the effluent shall be sampled and analysed not less than once per month for the following: 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: 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	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: 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: 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: 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 that 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: 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: 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	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: a. Cass Bay Residents Association b. Church Bay Neighbourhood 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	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: 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 Lyttleton 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: 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 m^3/d daily limit with 95% of all flows <515 m^3/d (Attachment 1.3). Highest flows recorded were 1,688 m^3/d on 1 August 2019 with the next highest of 1,247 m^3/d on 20 June 2019, within the consented limit (N.B. flows are measured on the inlet).

The instantaneous inflow rate was greater than 34 l/s 1,311 times. The majority of the exceedances were during six rainfall events. Other smaller rain events were usually short-lived and uncharacteristic of the normal flow regime. This is only 80 % of the previous year's events when flows were exceeded 1,576 occasions (the SCADA logging rate exacerbates this ie. if SCADA records every second for a minute and the flow exceeds 34 then there are 60 exceedances – whereas if it records only once per minute then there is only one exceedance logged). The discharge rate is measured on the inlet to the treatment station and the outfall flowrate is 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 BOD_5, TSS, faecal coliforms (FC), and Enterococci (ENT) (Table 1). Maximum medians of 4.1 mg/L BOD_5 were below the 30-mg/L limits, TSS max of 23 mg/l compared to allowable 30 mg/l and FC of 40 CFU/100 mL and ENT of 10 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 well 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 0.340mg/L TN at 50 m due West of the outfall and 0.018mg/L NH3 at 50m due East of Outfall (same locations as previous year). 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 2019-June 2020.

Parameter	Exceedances of Trigger Value
Flow >2,500 m^3/d	0
Discharge Flowrate >34 L/s	1311
BOD_5 median >30 mg/L	0
TSS median >30 mg/L	0
FC >700 CFU/100 mL	0
ENT >1,750 MPN/100 mL	0
Receiving TN >1 mg/L	0
Receiving NH3 >0.91 mg/L	0

Table 2. Incoming instantaneous flowrates from July 2019-June 2020

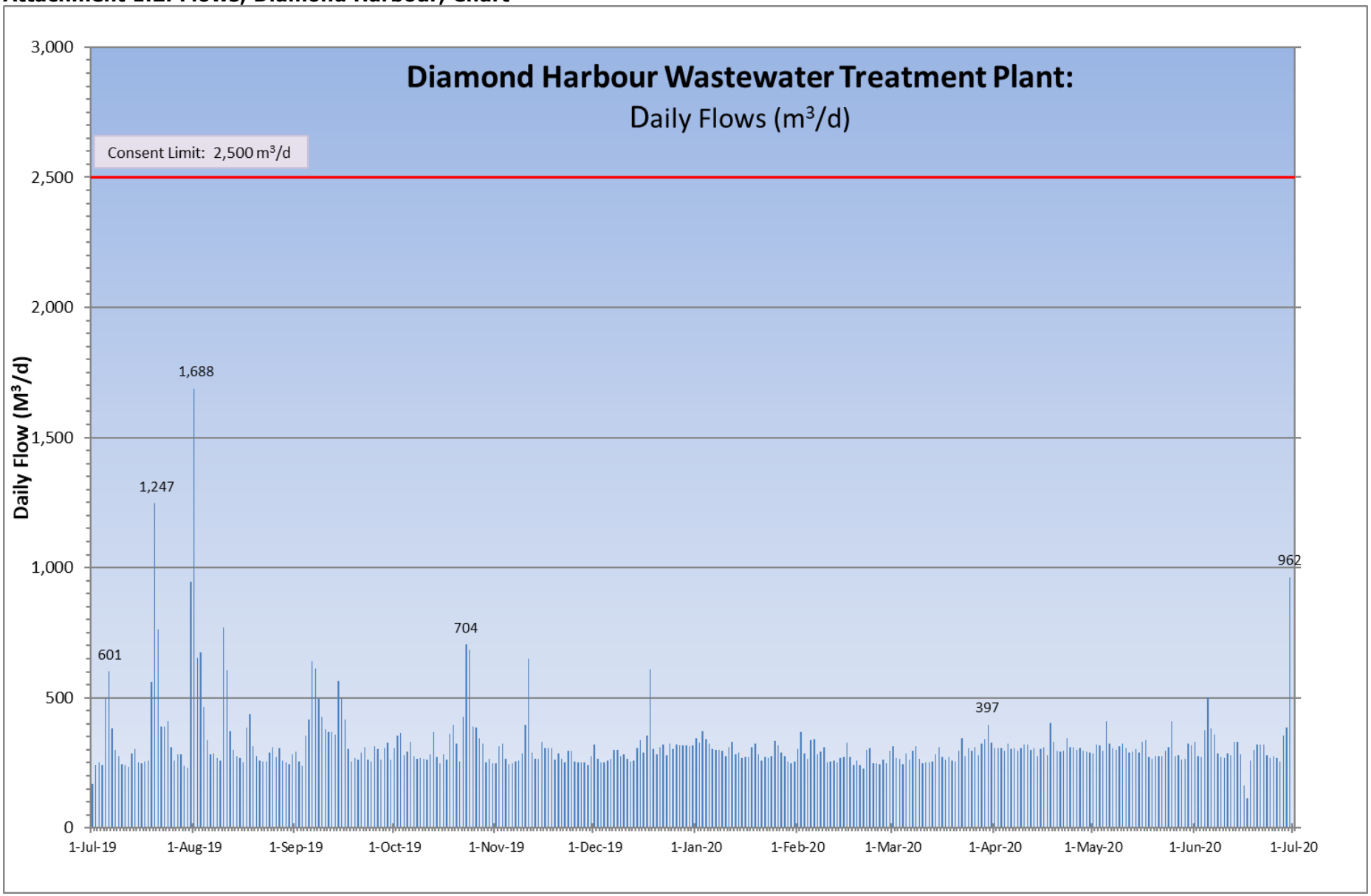
Month	Values > 34 L/s [#]
Jul-19	369
Aug-19	525
Sep-19	43
Oct-19	111
Nov-19	15
Dec-19	46
Jan-20	24
Feb-20	19
Mar-20	21
Apr-20	17
May-20	12
Jun-20	109
Total	**1311**

Attachment 1.1: Flows, Diamond Harbour, Data

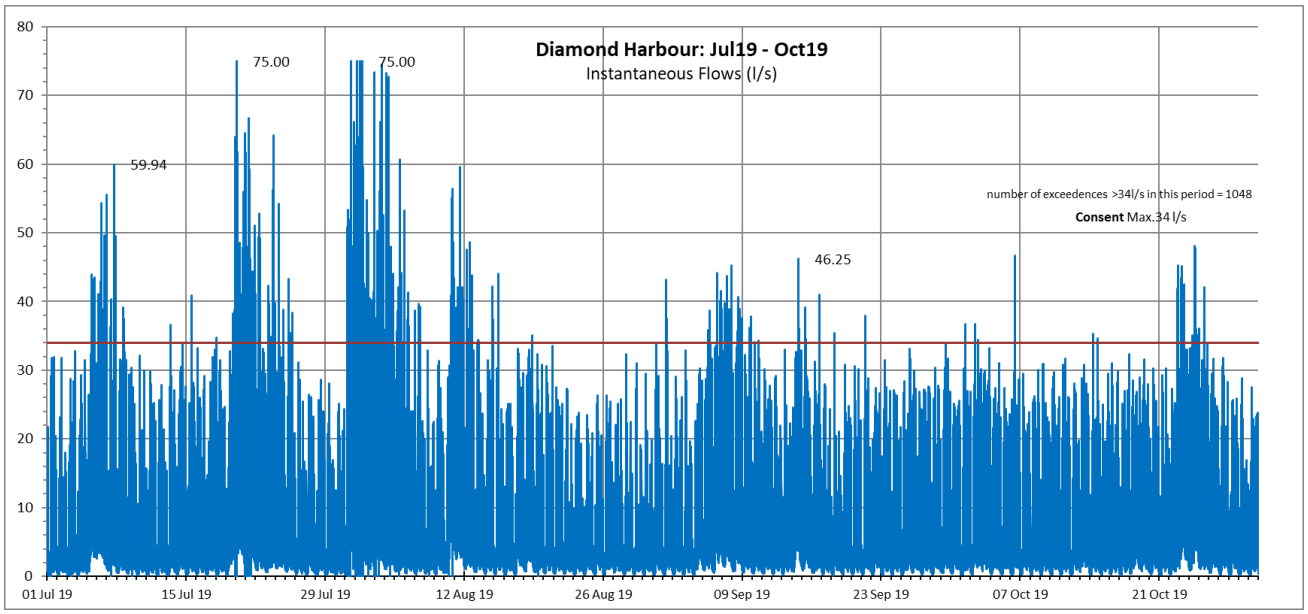
Plant :	Diamond Harbour Wastewater Treatment, Banks Peninsula: Daily Flows for July 2019 - June 2020						
Date	Flow (m^3/d)	Date	Flow (m^3/d)	Date	Flow (m^3/d)	Date	Flow (m^3/d)
1-Jul-19	169	1-Oct-19	306	1-Jan-20	344	1-Apr-20	308
2-Jul-19	242	2-Oct-19	353	2-Jan-20	326	2-Apr-20	308
3-Jul-19	250	3-Oct-19	365	3-Jan-20	372	3-Apr-20	307
4-Jul-19	243	4-Oct-19	280	4-Jan-20	341	4-Apr-20	297
5-Jul-19	499	5-Oct-19	292	5-Jan-20	325	5-Apr-20	324
6-Jul-19	601	6-Oct-19	332	6-Jan-20	302	6-Apr-20	304
7-Jul-19	383	7-Oct-19	274	7-Jan-20	299	7-Apr-20	307
8-Jul-19	301	8-Oct-19	264	8-Jan-20	299	8-Apr-20	295
9-Jul-19	277	9-Oct-19	269	9-Jan-20	296	9-Apr-20	305
10-Jul-19	244	10-Oct-19	265	10-Jan-20	276	10-Apr-20	320
11-Jul-19	240	11-Oct-19	261	11-Jan-20	309	11-Apr-20	322
12-Jul-19	235	12-Oct-19	284	12-Jan-20	329	12-Apr-20	301
13-Jul-19	285	13-Oct-19	369	13-Jan-20	282	13-Apr-20	306
14-Jul-19	302	14-Oct-19	273	14-Jan-20	290	14-Apr-20	276
15-Jul-19	250	15-Oct-19	248	15-Jan-20	268	15-Apr-20	302
16-Jul-19	247	16-Oct-19	284	16-Jan-20	273	16-Apr-20	311
17-Jul-19	256	17-Oct-19	262	17-Jan-20	271	17-Apr-20	280
18-Jul-19	260	18-Oct-19	361	18-Jan-20	310	18-Apr-20	404
19-Jul-19	560	19-Oct-19	397	19-Jan-20	324	19-Apr-20	330
20-Jul-19	1,247	20-Oct-19	323	20-Jan-20	282	20-Apr-20	296
21-Jul-19	765	21-Oct-19	256	21-Jan-20	260	21-Apr-20	293
22-Jul-19	388	22-Oct-19	427	22-Jan-20	273	22-Apr-20	297
23-Jul-19	389	23-Oct-19	704	23-Jan-20	268	23-Apr-20	345
24-Jul-19	410	24-Oct-19	684	24-Jan-20	277	24-Apr-20	311
25-Jul-19	310	25-Oct-19	389	25-Jan-20	334	25-Apr-20	310
26-Jul-19	257	26-Oct-19	384	26-Jan-20	317	26-Apr-20	298
27-Jul-19	281	27-Oct-19	344	27-Jan-20	288	27-Apr-20	305
28-Jul-19	284	28-Oct-19	324	28-Jan-20	275	28-Apr-20	297
29-Jul-19	237	29-Oct-19	251	29-Jan-20	256	29-Apr-20	293
30-Jul-19	232	30-Oct-19	265	30-Jan-20	247	30-Apr-20	289
31-Jul-19	944	31-Oct-19	248	31-Jan-20	256	1-May-20	286
1-Aug-19	1,688	1-Nov-19	247	1-Feb-20	304	2-May-20	322
2-Aug-19	653	2-Nov-19	315	2-Feb-20	367	3-May-20	316
3-Aug-19	673	3-Nov-19	324	3-Feb-20	285	4-May-20	295
4-Aug-19	465	4-Nov-19	266	4-Feb-20	265	5-May-20	408
5-Aug-19	339	5-Nov-19	246	5-Feb-20	337	6-May-20	325
6-Aug-19	281	6-Nov-19	248	6-Feb-20	341	7-May-20	305
7-Aug-19	287	7-Nov-19	255	7-Feb-20	282	8-May-20	300
8-Aug-19	269	8-Nov-19	258	8-Feb-20	292	9-May-20	313
9-Aug-19	258	9-Nov-19	287	9-Feb-20	311	10-May-20	325
10-Aug-19	771	10-Nov-19	395	10-Feb-20	250	11-May-20	308
11-Aug-19	606	11-Nov-19	650	11-Feb-20	255	12-May-20	288
12-Aug-19	372	12-Nov-19	290	12-Feb-20	257	13-May-20	294
13-Aug-19	298	13-Nov-19	265	13-Feb-20	253	14-May-20	303
14-Aug-19	274	14-Nov-19	267	14-Feb-20	268	15-May-20	289
15-Aug-19	270	15-Nov-19	331	15-Feb-20	273	16-May-20	331
16-Aug-19	253	16-Nov-19	306	16-Feb-20	327	17-May-20	339
17-Aug-19	384	17-Nov-19	307	17-Feb-20	273	18-May-20	272
18-Aug-19	438	18-Nov-19	305	18-Feb-20	240	19-May-20	267

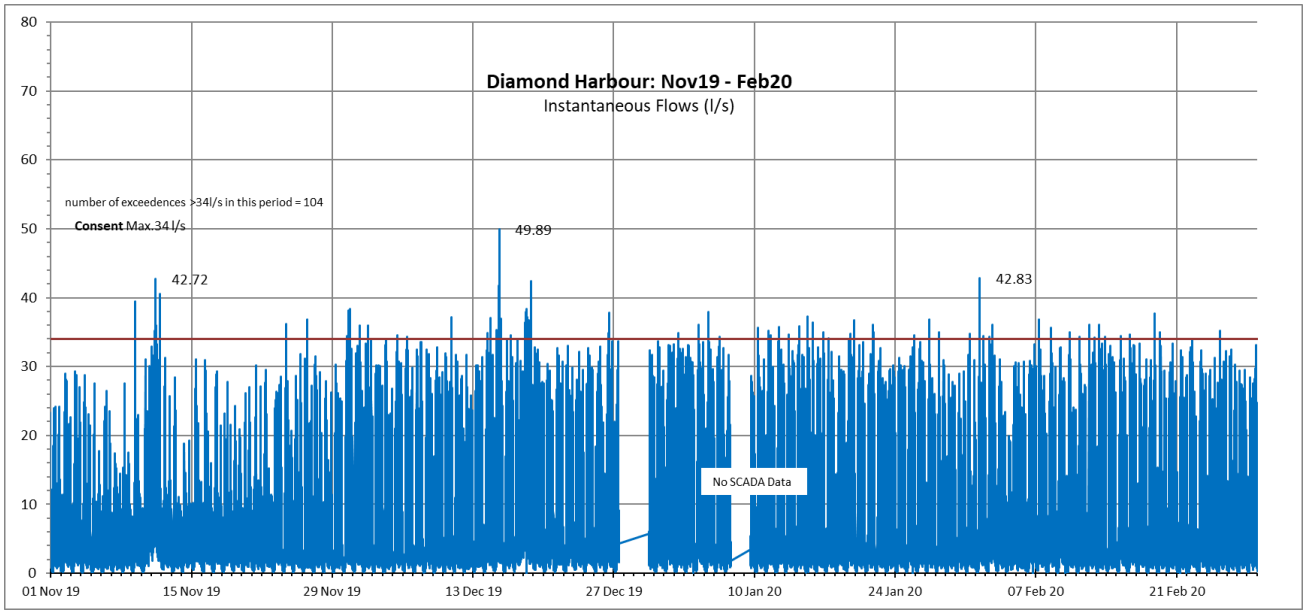
Date	Flow (m^3/d)	Date	Flow (m^3/d)	Date	Flow (m^3/d)	Date	Flow (m^3/d)
19-Aug-19	312	19-Nov-19	262	19-Feb-20	259	20-May-20	275
20-Aug-19	277	20-Nov-19	286	20-Feb-20	241	21-May-20	275
21-Aug-19	258	21-Nov-19	265	21-Feb-20	229	22-May-20	274
22-Aug-19	256	22-Nov-19	251	22-Feb-20	300	23-May-20	296
23-Aug-19	256	23-Nov-19	297	23-Feb-20	308	24-May-20	309
24-Aug-19	289	24-Nov-19	297	24-Feb-20	249	25-May-20	409
25-Aug-19	309	25-Nov-19	255	25-Feb-20	249	26-May-20	277
26-Aug-19	273	26-Nov-19	251	26-Feb-20	246	27-May-20	279
27-Aug-19	307	27-Nov-19	252	27-Feb-20	262	28-May-20	263
28-Aug-19	257	28-Nov-19	252	28-Feb-20	249	29-May-20	267
29-Aug-19	250	29-Nov-19	241	29-Feb-20	296	30-May-20	325
30-Aug-19	246	30-Nov-19	274	1-Mar-20	314	31-May-20	318
31-Aug-19	282	1-Dec-19	321	2-Mar-20	269	1-Jun-20	329
1-Sep-19	293	2-Dec-19	266	3-Mar-20	264	2-Jun-20	277
2-Sep-19	255	3-Dec-19	253	4-Mar-20	246	3-Jun-20	271
3-Sep-19	238	4-Dec-19	252	5-Mar-20	286	4-Jun-20	374
4-Sep-19	355	5-Dec-19	259	6-Mar-20	262	5-Jun-20	502
5-Sep-19	416	6-Dec-19	265	7-Mar-20	297	6-Jun-20	382
6-Sep-19	641	7-Dec-19	298	8-Mar-20	313	7-Jun-20	357
7-Sep-19	613	8-Dec-19	298	9-Mar-20	264	8-Jun-20	286
8-Sep-19	495	9-Dec-19	277	10-Mar-20	247	9-Jun-20	271
9-Sep-19	428	10-Dec-19	282	11-Mar-20	252	10-Jun-20	270
10-Sep-19	378	11-Dec-19	266	12-Mar-20	253	11-Jun-20	287
11-Sep-19	369	12-Dec-19	254	13-Mar-20	256	12-Jun-20	279
12-Sep-19	367	13-Dec-19	258	14-Mar-20	284	13-Jun-20	329
13-Sep-19	358	14-Dec-19	306	15-Mar-20	309	14-Jun-20	332
14-Sep-19	563	15-Dec-19	338	16-Mar-20	272	15-Jun-20	281
15-Sep-19	500	16-Dec-19	290	17-Mar-20	263	16-Jun-20	162
16-Sep-19	417	17-Dec-19	354	18-Mar-20	272	17-Jun-20	115
17-Sep-19	303	18-Dec-19	609	19-Mar-20	258	18-Jun-20	259
18-Sep-19	256	19-Dec-19	304	20-Mar-20	254	19-Jun-20	300
19-Sep-19	268	20-Dec-19	282	21-Mar-20	296	20-Jun-20	321
20-Sep-19	261	21-Dec-19	309	22-Mar-20	345	21-Jun-20	319
21-Sep-19	291	22-Dec-19	319	23-Mar-20	277	22-Jun-20	322
22-Sep-19	309	23-Dec-19	278	24-Mar-20	307	23-Jun-20	279
23-Sep-19	261	24-Dec-19	325	25-Mar-20	297	24-Jun-20	270
24-Sep-19	256	25-Dec-19	304	26-Mar-20	311	25-Jun-20	277
25-Sep-19	314	26-Dec-19	319	27-Mar-20	279	26-Jun-20	269
26-Sep-19	302	27-Dec-19	316	28-Mar-20	323	27-Jun-20	256
27-Sep-19	261	28-Dec-19	316	29-Mar-20	341	28-Jun-20	355
28-Sep-19	305	29-Dec-19	316	30-Mar-20	397	29-Jun-20	384
29-Sep-19	328	30-Dec-19	312	31-Mar-20	328	30-Jun-20	962
30-Sep-19	261	31-Dec-19	316				

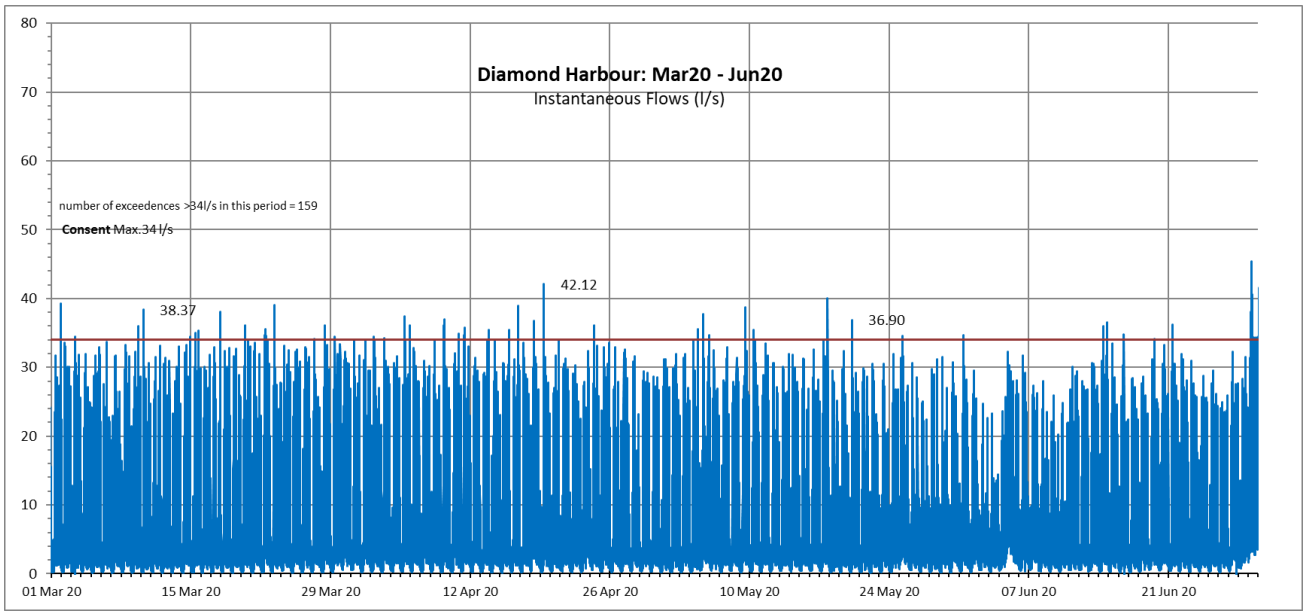
Attachment 1.2: Flows, Diamond Harbour, Chart



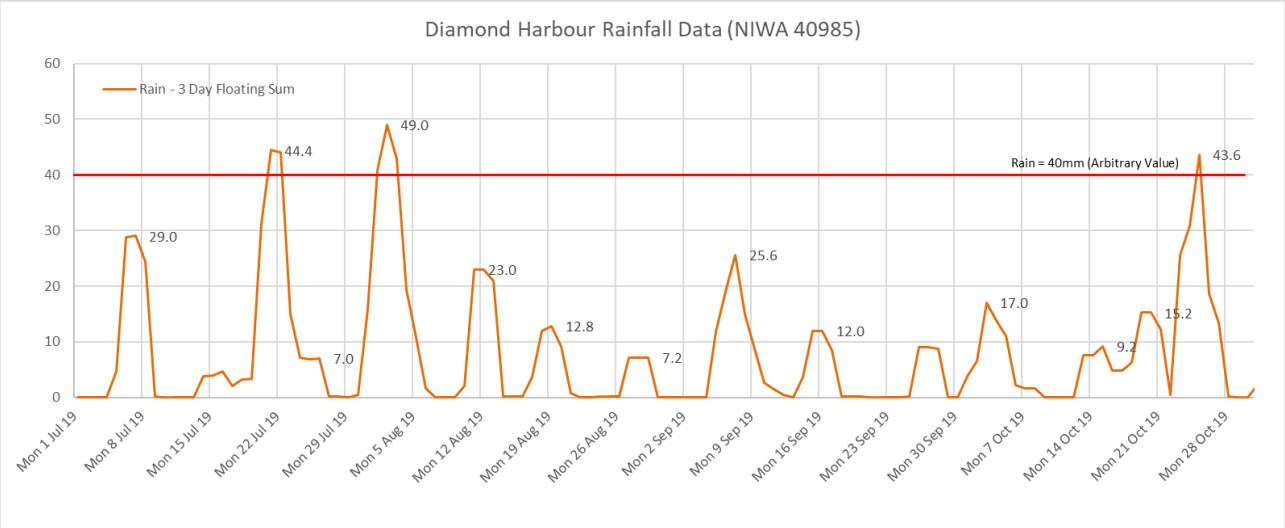
Attachment 1.3: Instantaneous Flows, Diamond Harbour

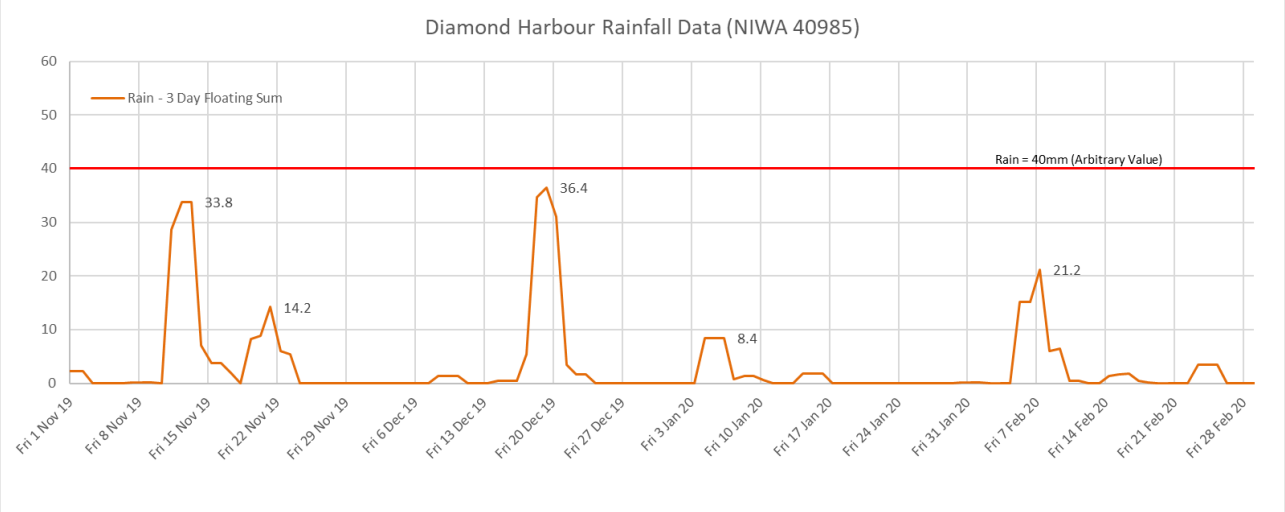


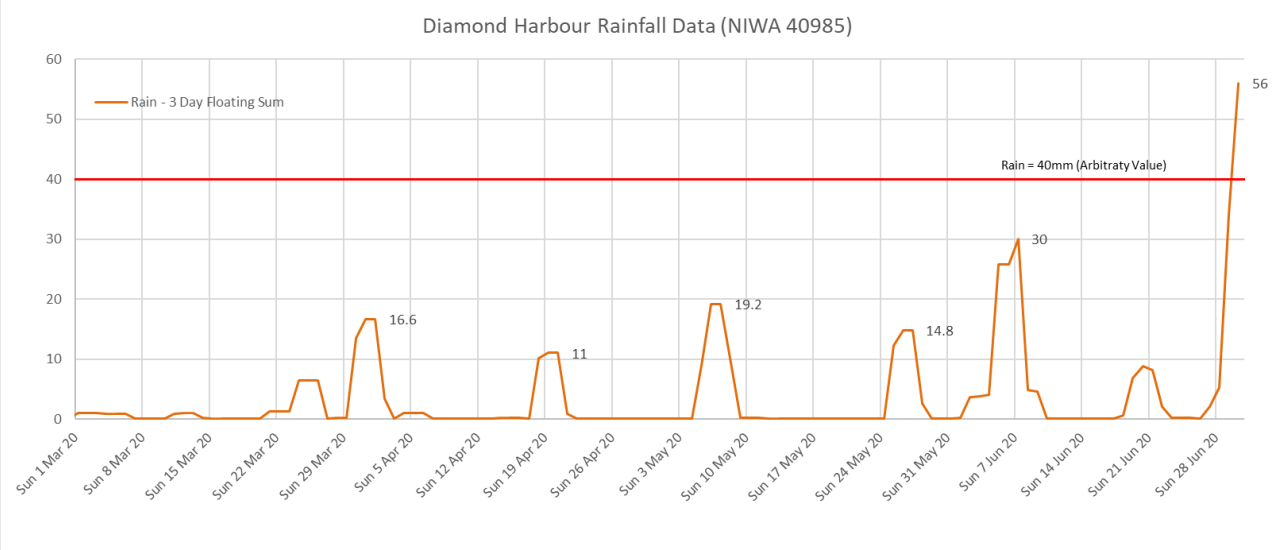




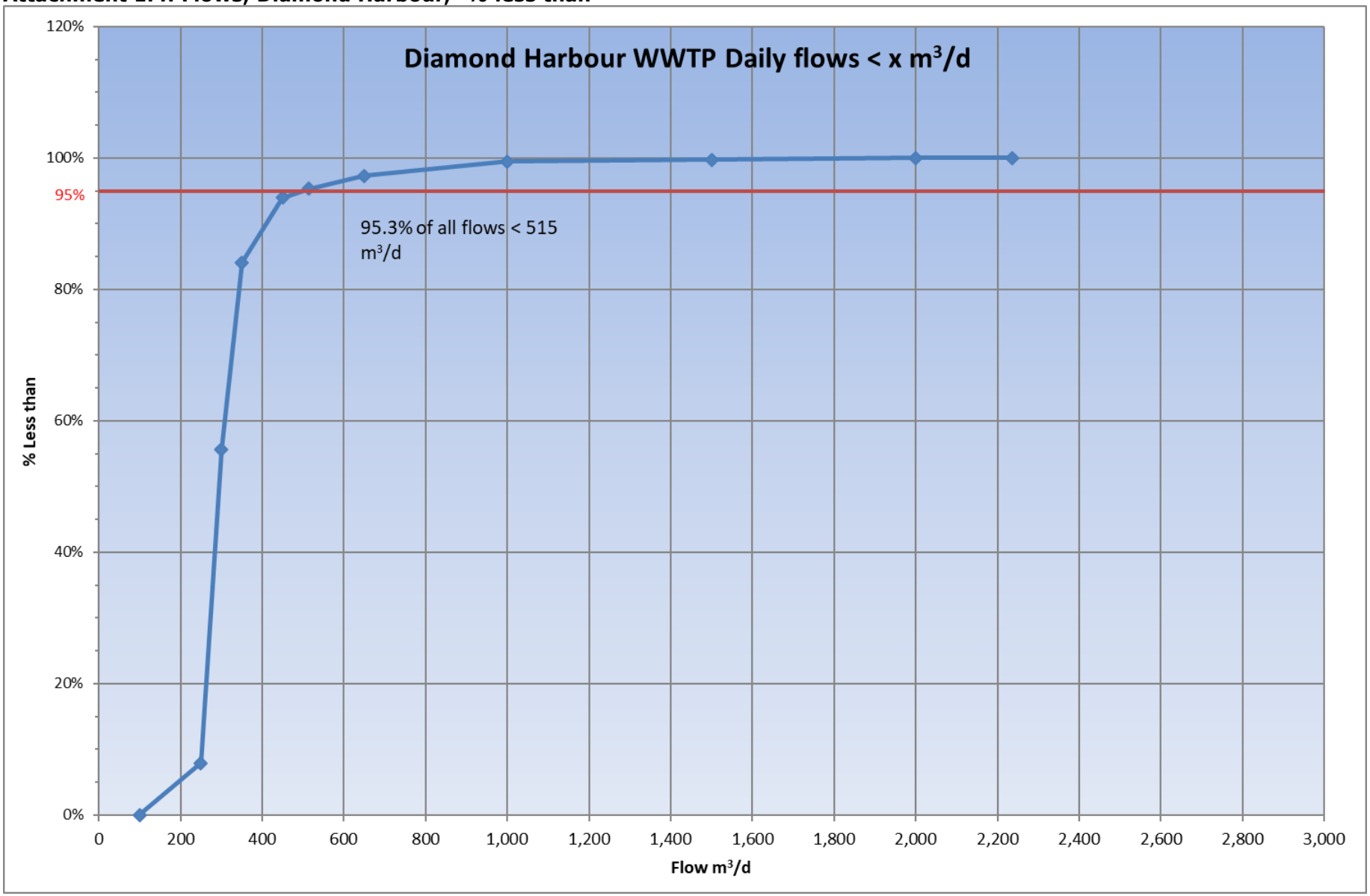
Attachment 1.3a: Rainfall Data







Attachment 1.4: 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	NOx	FC	ENT	**BOD_5**	**TSS**	**FC**	**ENT**
10-Jul-19	9.8	0.12	53	13	0.18	7.5	10	10	3.2	11.0	10.0	10
6-Aug-19	4.7	0.71	14	14	1.6	10	50	30	3.6	11.0	10.0	10
10-Sep-19	2.5	1.6	7.8	5.4	2.8	1.4	10	20	3.6	11.0	10.0	10
8-Oct-19	2.2	2	5.8	10	6.2	0.85	10	10	2.5	11.0	10.0	10
25-Nov-19	1.8	2.5	3	5.7	1.2	3.2	10	10	2.5	7.8	10.0	10
5-Dec-19	2	2.7	9.6	4.4	1.2	1.7	10	10	2.2	7.8	10.0	10
12-Dec-19	1.1		3.8				10	10	2.0	5.8	10.0	10
19-Dec-19	2.1		3.5				10	10	2.0	3.8	10.0	10
27-Dec-19	10		6.5				70	10	2.0	3.8	10.0	10
3-Jan-20	3		4.9				10	10	2.1	4.9	10.0	10
10-Jan-20	13		64				1100	360	3.0	4.9	10.0	10
20-Jan-20	4.1	6.4	10	7.9	1.7	4.5	10	10	4.1	6.5	10.0	10
23-Jan-20	3.7		28				10	10	4.1	10.0	10.0	10
30-Jan-20	2.9		8.8				10	10	3.7	10.0	10.0	10
5-Feb-20	7.4		23				10	10	4.1	23.0	10.0	10
13-Feb-20	2	2.2	3	4.5	1.7	1.5	10	10	3.7	10.0	10.0	10
20-Feb-20	2.9		4.3				10	10	2.9	8.8	10.0	10
27-Feb-20	2.6		3				10	10	2.9	4.3	10.0	10
19-Mar-20	2.3	1.3	3	4.1	0.91	1.9	10	10	2.6	3.0	10.0	10
7-Apr-20	1.8	1.9	6.3	2.6	0.89	0.63	40	20	2.3	3.0	10.0	10
20-May-20	3.4	1.5	13	2.6	0.59	0.16	200	10	2.6	4.3	10.0	10
29-Jun-20	14	0.68	30	8.5	4.7	4.7	150	130	2.6	6.3	40.0	10
								Limit	30	30	700	1750
								Exceedances	0	0	0	0
								Max	4.1	23.0	40.0	10.0

	As	**Cd**	**Cr**	**Cu**	**Pb**	**Ni**	**Zn**
	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg/l]
12 Jan 2016	<0.0015	<0.00020	<0.0010	0.0039	<0.0015	<0.0025	0.025
18 Jan 2017	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.02
17 Jan 2018	0.0015	<0.0010	<0.0010	0.0026	<0.0010	0.0012	0.047
17 Jan 2019	0.0013	<0.0010	<0.0010	0.0016	<0.0010	<0.0010	0.025
10 Jan 2020	0.0012	<0.0010	0.0013	0.013	0.0014	0.0015	0.0.69

Attachment 2.2: Lab Data, Receiving Environment

Diamond Harbour	OF - 50m due				Church Bay	Quail island Control	OF - 50m due				Church Bay	Quail island Control	OF - 50m due				Church Bay	Quail island Control	OF - 50m due				Church Bay	Quail island Control
CRC101835	East	North	South	West			East	North	South	West			East	North	South	West			East	North	South	West		
Date	TN mg/L	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	NH3 mg/L	NOX 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	DRP mg/L
	not to exceed 1.0						not to exceed 0.91																	
10-Sep-19	0.15	0.13	0.23	0.14	0.18	0.25	0.018	0.0062	0.0077	0.015	0.0086	0.005	0.019	0.023	0.028	0.02	0.01	0.014	0.028	0.012	0.22	0.01	0.0096	0.012
25-Nov-19	0.13	0.13	0.13	0.14	0.13	0.16	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.01	0.01	0.01	0.01	0.016	0.011	0.12	0.012	0.011	0.0098
5-Dec-19	0.18	0.13	0.16	0.14	0.17	0.17	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.01	0.01	0.01	0.01	0.01	0.0088	0.0083	0.0093	0.0086	0.0093	0.0073
20-Jan-20	0.17	0.13	0.13	0.2	0.18	0.19	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.012	0.016	0.016	0.014	0.016	0.0063	0.0064	0.0073	0.0084	0.011	0.0099
19-Mar-20	0.15	0.13	0.16	0.099	0.13	0.21	0.011	0.0088	0.01	0.0051	0.0083	0.005	0.01	0.01	0.01	0.01	0.01	0.01	0.003	0.003	0.003	0.003	0.003	0.0056
20-May-20	0.15	0.17	0.19	0.34	0.23	0.22	0.0084	0.013	0.016	0.012	0.01	0.0063	0.01	0.01	0.11	0.011	0.01	0.01	0.01	0.017	0.02	0.015	0.013	0.013
26-Jun-20	0.15	0.13	0.15	0.13	0.13	0.14	0.0065	0.006	0.0065	0.007	0.0052	0.005	0.01	0.01	0.01	0.01	0.01	0.01	0.011	0.012	0.012	0.012	0.013	0.013
average	0.154	0.136	0.164	0.170	0.164	0.191	0.008	0.007	0.008	0.008	0.007	0.005	0.011	0.012	0.028	0.012	0.011	0.011	0.012	0.010	0.056	0.010	0.010	0.010
maximum	0.180	0.170	0.230	0.340	0.230	0.250	0.018	0.013	0.016	0.015	0.010	0.006	0.019	0.023	0.110	0.020	0.014	0.016	0.028	0.017	0.220	0.015	0.013	0.013

Diamond Harbour	OF - 50m due				Church Bay	Quail island Control	OF - 50m due				Church Bay	Quail island Control	OF - 50m due				Church Bay	Quail island Control	OF - 50m due				Church Bay	Quail island Control
CRC101835	East	North	South	West			East	North	South	West			East	North	South	West			East	North	South	West		
Date	TSS	TSS	TSS	TSS	TSS	TSS	Chla	Chla	Chla	Chla	Chla	Chla	ENT	ENT	ENT	ENT	ENT	ENT	FC	FC	FC	FC	FC	FC
10-Sep-19	12	22	11	9.1	21	17	2.6	2.1	2.7	2.9	1.5	1.9	10	10	10	10	10	10	2	4	5	1	1	3
25-Nov-19	16	17	16	16	22	21	1.9	1.9	2.1	2	1.6	3.1	10	10	10	10	10	10	1	1	1	1	1	1
5-Dec-19	18	15	13	16	18	10	2.2	2.7	2.8	3.3	2.3	2.1	10	10	10	10	10	10	1	1	1	1	1	1
20-Jan-20	11	9.6	11	11	27	14	2.0	2.0	1.0	2.0	3.0	3.0	10	10	10	10	10	10	1	1	2	2	1	11
19-Mar-20	20	15	15	17	19	10	3.5	1.3	1.3	1.4	1.8	2.2	10	10	10	10	10	10	1	1	1	1	1	3
20-May-20	18	20	19	25	32	21	2.8	3.1	2.7	2.6	3.8	3.0	10	10	10	10	10	10	1	1	1	1	1	1
26-Jun-20	11	11	14	13	15	12	1.5	1.4	1.6	1.5	1.0	2.0	10	10	10	10	10	10	1	1	2	1	1	7
average	15.143	15.657	14.143	15.300	22.000	15.000	2.357	2.071	2.029	2.243	2.143	2.471	10.000	10.000	10.000	10.000	10.000	10.000	1.143	1.429	1.857	1.143	1.000	3.857
maximum	20.0	22.0	19.0	25.0	32.0	21.0	3.5	3.1	2.8	3.3	3.8	3.1	10.0	10.0	10.0	10.0	10.0	10.0	2.0	4.0	5.0	2.0	1.0	11.0

*** TN should not be > 1**

*** NH3 should not be > 0.91**