TOOWOOMBA REGION

Rich traditions. Bold ambitions.

Our Reference: DM#7533483-v7
Your Reference: MAN19640
Contact Officer: Andrew Murray
Telephone: 0491494940

28 September2018

Compliance Delivery Manager
Department of Environment and Science
P.O. Box 731
TOOWOOMBA QLD 4350
Attn: Sarah Horton

Dear Ms Horton

Re: TEP Progress Report #6 Clifton WWTP for Period to 28 September 2018 (MAN19640)

The following progress report has been prepared and submitted in accordance with the reporting requirements of the approved Transitional Environmental Program MAN19640 that came into effect on the 12 April 2017 and remains in force for the period 12 April 2017 to 30 October 2019.
In agreement with Department of Environment and Science (DES), this reporting period is for 1 July 2018 to 30 September 2018.

Actions Undertaken to from 1 July 2018 to 30 September 2018

1. **De-sludge lagoon 3 (Not a TEP action) Status: Commenced 1 Aug 2018** **Progress:** On Track
2. **Licence Monitoring:** **Status:** In Progress **Target Date:** 30/11/2018 **Progress:** On Track

Comments:

1. **Aeration system**
   Aeration commenced on 24 June 2018, and has continued operation throughout the reporting period. Oxygen levels have averaged 7.8mg/L compared to 6.3mg/L the previous three months, prior to aeration. Trials with positioning of aerators and timers continuing. Due to the delayed installation of the aerators, the process monitoring period is also behind schedule.

2. **Baffle curtain**
   The baffle curtain was installed on 01 May 2018. Due to the aforementioned duck event, it is not yet possible to assess the effectiveness of the baffle curtain in settling of Suspended Solids. Monitoring continues to determine effectiveness. Aerator 2 distance from baffle curtain will be increased.

3. **Floating Wetlands**
   The restocked floating wetlands were growing well until the unprecedented influx of large numbers of ducks. Large numbers of ducks still remain, but have decreased from original numbers. The ducks have destroyed all visible plant matter above the surface, including grass on the banks. Investigations have shown that along with the loss of above ground vegetion there is a loss of root material below the waterline and it is not expected that the plants will recover after the migrating ducks have departed. New plantings have been budgeted and will be sourced from Council's Nursery. BOD and SS have remained within TEP licence limits, but at this stage it is too early to determine the effectiveness of the new wetlands and aeration system due to the ducks. Refer Photos 4-5.

4. **De-sludging of Lagoon 3**
   Following the sludge removal from lagoon 4 as identified in the TEP information request submission on 27 Feb 2017 (DM#7328359), Council is in the process of removing the sludge in lagoon 3 in an attempt to increase detention time and improving final effluent quality to meet licence conditions.
   The Department of Environment and Science (Catherine Hughes) was advised on 1 August, prior to taking lagoon 3 off line. This large lagoon is almost full of sludge, and it is anticipated that the additional detention time in this oxidation pond will be beneficial in reduction of BOD and SS when the full volume of the lagoon is reinstated. Depending on the seasonal conditions it was anticipated that the timeframe for de-sludging would be 6-12 months, but efforts are made to progress this action much faster. Refer Photos 1-3. The sludge will be stockpiled on site following the same approved process as for lagoon 4, and then removed by the contractor Arkwood for beneficial reuse near Pittsworth.

5. **Unprecedented Migrating Duck Event**
   Migrating Whistling Ducks has anually chosen to stop over at the Clifton WWTP lagoons. Possibly due to the drought conditions and due to the closure of Wyreema and Westbrooks sewage treatment plants, the ducks have arrived in much greater numbers than before – estimated in the thousands. The damage caused and the impact on licence parameters has been described in this report. As it became apparent that the problem was causing licence issues, the DES (Catherine Hughes) was contacted by phone and by letter (DM# 8185396 and DM#8193633) providing a report. Council is unsure if any actions to discourage the protected migrating bird species from landing are advisable from a wildlife protection perspective. At this stage consideration is given to protect only the floating wetlands with suitable netting, before the next duck migration.

6. **Licence Monitoring**
   Licence monitoring in accordance with the requirements of the TEP commenced on 9 March 2017. The results of monitoring can be found in Attachment 2. Up-stream and down-stream monitoring was not possible because Kings Creek had ceased to flow since 1 February 2018.

   Licence monitoring results for this reporting period (1 July – 30 September 2018) has indicated a set-back in discharge water quality to Kings Creek for BOD_5, Suspended Solids concentrations, and faecal coliform counts, all of these mainly contributable to the aforementioned duck event.

   Sample results at the discharge point were within the TEP licence limit (200mg/L) for BOD_5 for the reporting period. As there has been no flow in Kings Creek since 1 February 2018, there are no upstream and downstream results reported for this reporting period (1 July 2018 to 30 September 2018). BOD_5 results, were compliant in the previous period, but have climbed above the Environmental Authority (EA) licence limit in this period. The 85^{th} percentile increased from 19 to 26 mg/L.

   All Suspended Solids sample results were within the TEP licence limit (400mg/L) for the reporting period. During the previous reporting period Suspended solids concentrations had reduced to approach the EA licence limit of 30 mg/L 85th percentile, but in this reporting period the licence conditions were exceeded. The 85th percentile result for suspended solids from 1 April to 30 June 2018 was 41 mg/L, while the 85th percentile result for suspended solids for this reporting period was 64 mg/L. The maximum EA licence limit for suspended solids of 90 mg/L was exceeded twice during the reporting period.

   No results for dissolved oxygen were reported below 2.0 mg/L during this reporting. As there has been no flow in Kings Creek since 1 February 2018, there are no upstream and downstream results reported for this reporting period (1 July 2018 to 30 September 2018). There has been a small increase in DO.

   All pH values were reported within EA licence limit for this reporting period.

   Faecal coliforms results were reported within EA licence limit, with the exception of four sampling days between 9 August and 20 September 2018, where all values exceeded licence conditions due to the aforementioned duck event. Faecal coliform counts have generally remained within compliance since desludging of Lagoon 4. Discharge to Kings Creek was operationally interrupted during the period of the E.Coli Exceedances. Stream flow has ceased from 1 February 2018.

   All exceedances have been reported to DES within 28 days of receipt of analysis as required by the EA.

7. Milestones Achieved

1.	Investigate Floating Wetland removal options with SPEL:	Status: Completed	17-05-17
2.	Determine temporary storage options for sludge:	Status: Completed	21-04-17
3.	Isolation of lagoon 4 and new temporary discharge point:	Status: Completed	17-05-17
4.	Identify risks to effluent quality:	Status: Completed	01-03-17
5.	Assess risk of desludging to lagoon integrity:	Status: Completed	30-07-17
6.	Undertake Desludging Works:	Status: Completed	08-08-17
7.	Refilling and reinstate floating wetland:	Status: Completed	26-09-17
Power to Site			
8.	Scope additional power requirements:	Status: Completed	09-11-17
9.	Location of infrastructure:	Status: Not required	N/A
10.	Ergon/contractor timelines:	Status: Not required	N/A
11.	Installation of Infrastructure:	Status: Not required	N/A
Aeration System			
12.	Design an aeration system:	Status: Completed	24-11-17
13.	Investigate preferred models and supply times:	Status: Completed	24-11-17
14.	Investigate fixing method and location:	Status: Completed	24-11-17
15.	Assessment of need to reinforce embankments:	Status: Completed	26-03-18
16.	Establish site access for installation:	Status: Completed	24-11-17
17.	Undertake works:	Status: Completed	14-06-18
Baffle Curtain			
18.	Scope baffle curtain requirements length/depth/materials:	Status: Completed	16-11-17
19.	Source providers:	Status: Not required	
20.	Engage contractor:	Status: Not required	
21.	Undertake works:	Status: Completed	01-05-18

8. Actions to be under-taken in the next three (3) months.

1.	Licence Monitoring (post Aeration) and analysis : Ongoing for period	Target Date:

If you require further clarification on the content of this report, please contact Helen Warner (Acting Principal Management Systems) on 07 4688 6318.

Kind regards

A Jones

sgd John Mills
Manager Water Operations

Attachment #1

Compliance Evaluation

(All Action Items)

TABLE 1

Actions	Start date	Compliance and End date
1. Desludge Lagoon 4: • Investigate Floating Wetland removal options with SPEL • Determine temporary storage options for sludge, • Options for isolation of lagoon 4 and new temporary discharge point. • Identify risks to effluent quality. • Assess risk of desludging to lagoon integrity. (Monitor desludging closely) • Undertake works. • Reinstate floating wetland.	12 April 2017	• **Completed** • **Completed** • **Completed** • **Completed** • **Completed** • **Completed** • **Completed**
2. Power augmentation to site: • Scope additional power requirements. (See action Item 3 and 7) • Total power requirement. (Aerators + contingency filtration depending on performance of aerators.) • Location of infrastructure. • Ergon/contractor timelines. • Installation of Infrastructure.	30 June 2017	• **Completed** • **Completed** • **Not required** • **Not required** • **Not required**
3. Installation of Aeration System Lagoon 4: • Design and implement an aeration system to treat wastewater on site and to release effluent compliant with Condition (C9) to waters at location W1. • Investigate preferred models and supply times. • Investigate fixing method and location. • Assessment of need to reinforce embankments. • Establish site access for installation. • Undertake works.	30 June 2017	• **Completed** • **Completed** • **Completed** • **Completed** • **Completed** • **Completed**
4. Install baffle curtain wall • Scope requirements length/depth/materials • Source providers • Engage contractor • Undertake works	30 June 2017	• **Completed** • **Not required** • **Not required** • **Completed**
5. Licence Performance Monitoring (4 Seasons) • Frequency Weekly (review as program proceeds) • Analysis (As required by licence)	Post Aeration 14 June 2018	Post-Aeration **Future-Target** 30 March 2019
6. Assess seasonal process performance and need for contingency plan to meet licence discharge limits. • Review effluent data and compliance performance • Assess need for contingency plan activation (eg filter system) • Advise EHP of outcome. • If required activate contingency plan.	1 April 2019	**Future**- Target 1 May 2019
7. Contingency Plan (Filtration System) • Installation • Monitor for 3 months	Installation 1 May 2019 Monitor 1 August 2019	**Not Required to Date** Installation 31 July 2019 **Not Required to Date** Monitor 30 October 2019
8. TEP Progress reports against Action plan • Evaluate Performance against licence. (EHP Report) • TEP Annual Return • Final Report to EHP (Includes Contingency Timeframe)	Ongoing Ongoing End of program	**In Progress**-Target 3 monthly **Future**-12 monthly **Future**-28 February 2020

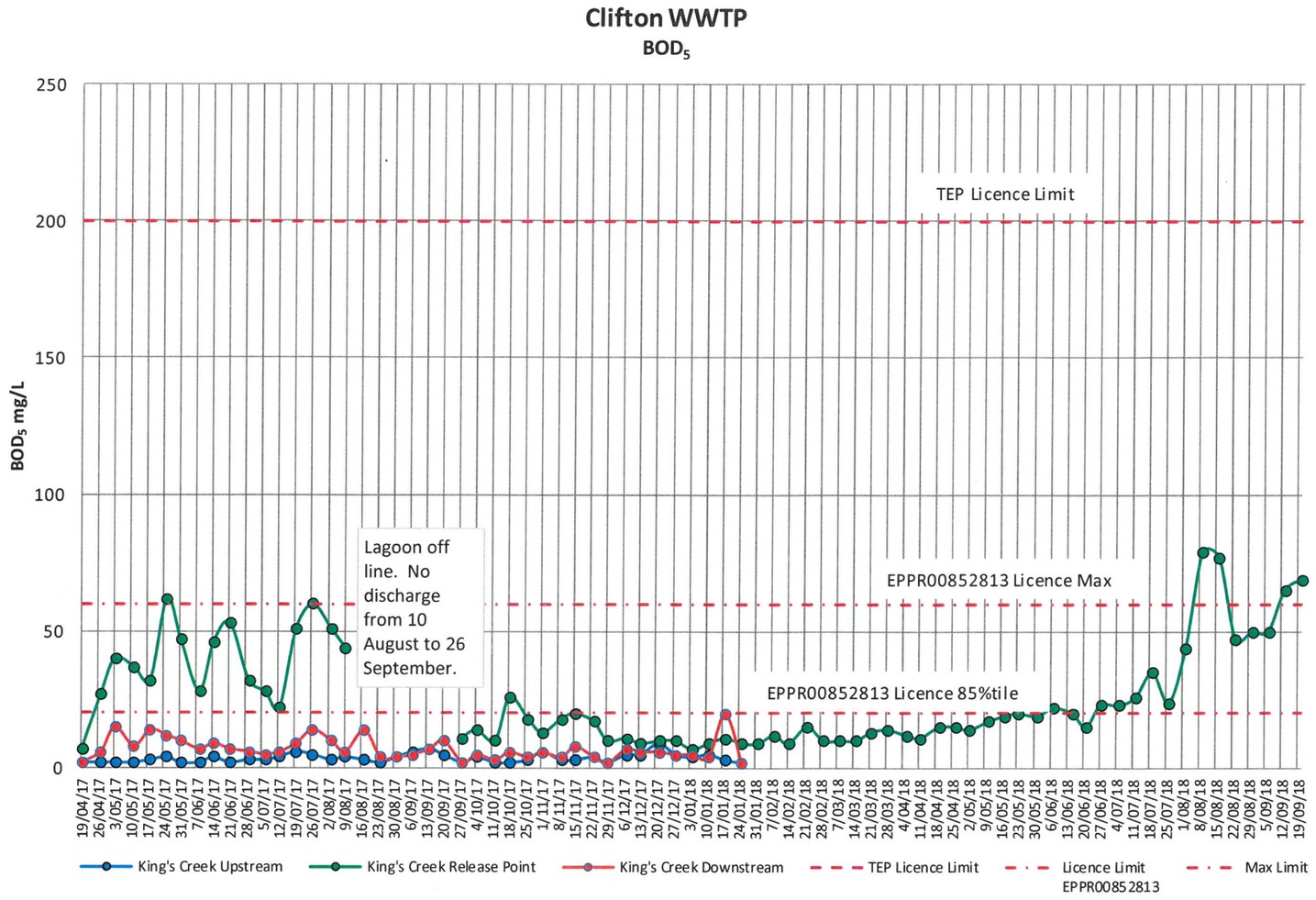
Performance indicators	Start date	End date
1. A Registered Professional Engineer supervises the design and installation of treatment system infrastructure.	3 January 2017	**Compliant**-Target 31 January 2020
2. Regular performance reviews which include a statement of achievement against the Action Plan to be submitted to EHP.	3 Monthly	**Compliant-** Target 31 January 2020
3. Each performance review will include Table(s) and Graph(s) of all water quality in-situ monitoring results and laboratory results.	3 Monthly	**Compliant**-Target 31 January 2020
4. Each performance review will include a compliance statement for Condition (C9).The release of contaminants to waters, at the sampling and in situ measurement point specified In Schedule H, with each of the limits specified in schedule C Table 1 for each quality characteristic in Environmental Authority EPPR00852813 of WT0076 Amendment 2.	3 Monthly	**Compliant**-Target 31 January 2020
Monitoring	**Start date**	**End date**
1. Suitably qualified Water Operations staff will undertake all monitoring and water quality samples are to be analysed by TRC's NATA accredited laboratory.	1 January 2017	**Compliant**-Target 31 December 2019
2. All water quality sampling will be undertaken by Water Operations staff under the guidance of TRC's NATA certified Laboratory and with reference to the Queensland's Government Monitoring and Sampling Manual.	1 January 2017	**Compliant**-Target 31 December 2019
3. Monitor the release of contaminants to waters which is to comply, at the sampling and in situ measurement point W1 specified in Schedule H, with each of the limits specified in Schedule C Table 1 for each quality characteristic in Environmental Authority EPPR00852813. (See Attach 2 and Attach 5 - Table 1 and 2)	Frequency Weekly	**Commenced-**Target 31 December 2019
4. Monitor Kings Creek 50m upstream and 50m downstream of Release Point W1 for each quality characteristic specified in schedule C Table 1 Environmental Authority EPPR00852813. (See Attachment 5)	Frequency Weekly	**Commenced-**Target 31 December 2019
Reporting	**Start date**	**End date**
1. A three (3) monthly progress report will be prepared and submitted to EHP by the Principal Management Systems detailing the actions taken, milestones achieved and the forecasted actions to be undertaken for the following three (3) months. Three (3) monthly progress reports will also include tables and graphs of water quality monitoring results taken at the sampling and in situ measurement point W1 and 50m upstream and 50m downstream of W1.	Ongoing	31 March 2017-**Not required** 30 June 2017-**Completed** 30 Sept 2017-**Completed** 31 Dec 2017- **Completed** 31 March 2018- **Completed** 30 June 2018- **Completed** 30 Sept 2018- **Complete** 31 Dec 2018- **Future** 31 March 2019- **Future** 30 June 2019- **Future** 30 Sept 2019- **Future**
2. A final report describing how the objectives of the TEP have been achieved will be provided to EHP within one (1) month after completion of the actions of the TEP and prior to the end date of the TEP.	31 Jan 2020	28 February 2020- **Future**

Attachment #2
Data and Graphs

Data File: DM#7506820

Table and Graph 1 - BOD5

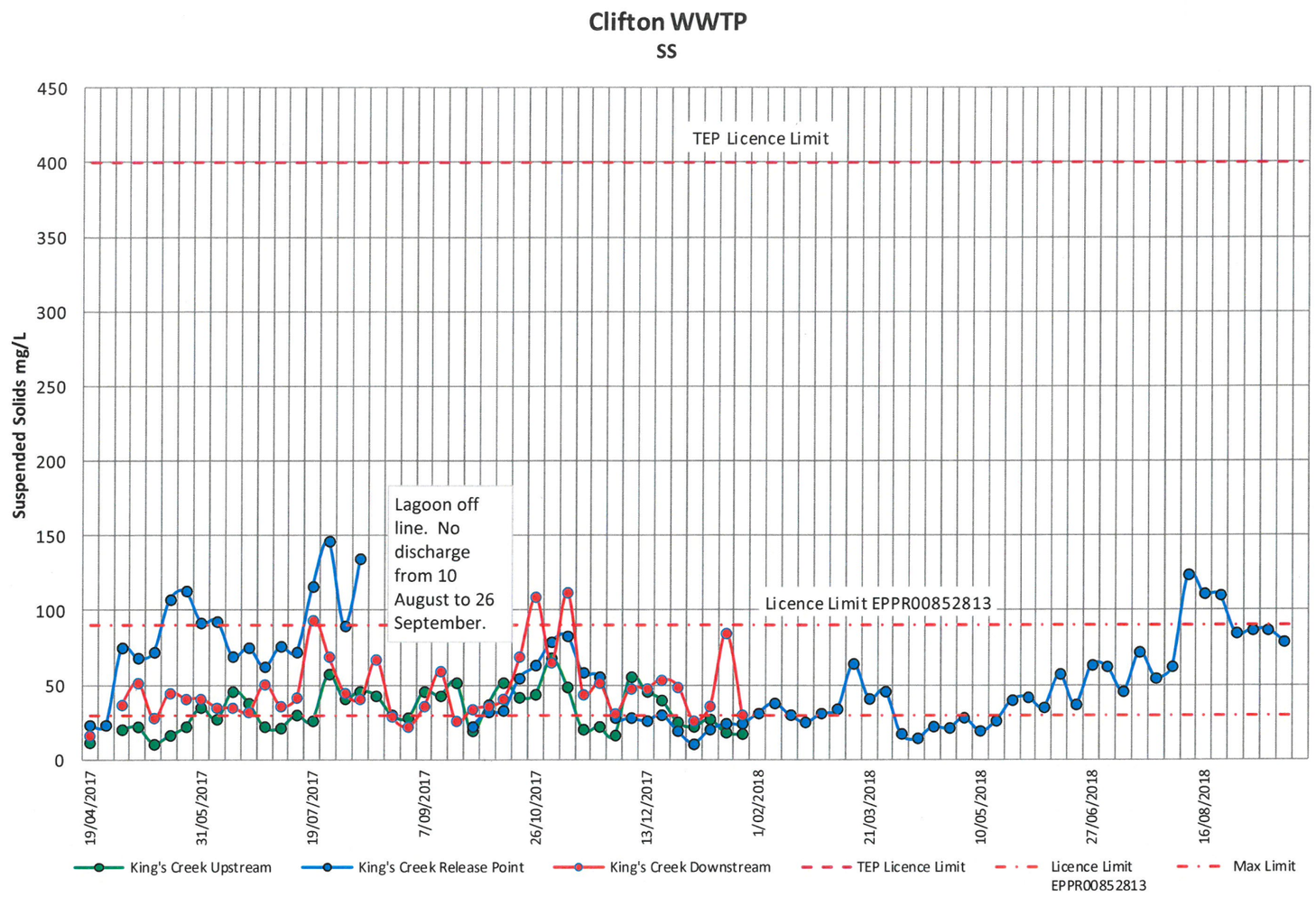
Clifton WWTP		King's Creek Upstream	King's Creek Release Point	King's Creek Downstream	Result	Licence Limits		
Reg. Date	Test	Result-<	Result	Result	Units	TEP Licence Limit	Licence Limit EPPR00852813	Max Limit
19/04/2017	BOD5	2	7	2	mg/L	200	20	60
27/04/2017	BOD5	2	27	6	mg/L	200	20	60
3/05/2017	BOD5	2	40	15	mg/L	200	20	60
11/05/2017	BOD5	2	37	8	mg/L	200	20	60
18/05/2017	BOD5	3	32	14	mg/L	200	20	60
25/05/2017	BOD5	4	62	12	mg/L	200	20	60
31/05/2017	BOD5	2	47	10	mg/L	200	20	60
8/06/2017	BOD5	2	28	7	mg/L	200	20	60
14/06/2017	BOD5	4	46	9	mg/L	200	20	60
21/06/2017	BOD5	2	53	7	mg/L	200	20	60
29/06/2017	BOD5	3	32	6	mg/L	200	20	60
6/07/2017	BOD5	3	28	5	mg/L	200	20	60
12/07/2017	BOD5	4	22	6	mg/L	200	20	60
19/07/2017	BOD5	6	51	9	mg/L	200	20	60
26/07/2017	BOD5	5	60	14	mg/L	200	20	60
3/08/2017	BOD5	3	51	10	mg/L	200	20	60
9/08/2017	BOD5	4	44	6	mg/L	200	20	60
17/08/2017	BOD5	3	Lagoon off line. No discharge from 10 August to 26 September.	14	mg/L	200	20	60
24/08/2017	BOD5	2		4	mg/L	200	20	60
31/08/2017	BOD5	4		4	mg/L	200	20	60
7/09/2017	BOD5	6		5	mg/L	200	20	60
14/09/2017	BOD5	7		7	mg/L	200	20	60
20/09/2017	BOD5	5		10	mg/L	200	20	60
28/09/2017	BOD5	2	11	2	mg/L	200	20	60
4/10/2017	BOD5	4	14	5	mg/L	200	20	60
12/10/2017	BOD5	2	10	3	mg/L	200	20	60
18/10/2017	BOD5	2	26	6	mg/L	200	20	60
26/10/2017	BOD5	3	18	4	mg/L	200	20	60
1/11/2017	BOD5	6	13	6	mg/L	200	20	60
9/11/2017	BOD5	3	18	4	mg/L	200	20	60
15/11/2017	BOD5	3	20	8	mg/L	200	20	60
23/11/2017	BOD5	4	17	4	mg/L	200	20	60
29/11/2017	BOD5	2	10	2	mg/L	200	20	60
7/12/2017	BOD5	5	11	7	mg/L	200	20	60
13/12/2017	BOD5	5	9	6	mg/L	200	20	60
21/12/2017	BOD5	9	10	6	mg/L	200	20	60
28/12/2017	BOD5	5	10	5	mg/L	200	20	60
4/01/2018	BOD5	4	7	5	mg/L	200	20	60
11/01/2018	BOD5	5	9	4	mg/L	200	20	60
18/01/2018	BOD5	3	11	20	mg/L	200	20	60
25/01/2018	BOD5	2	9	2	mg/L	200	20	60
1/02/2018	BOD5		9		mg/L	200	20	60
8/02/2018	BOD5		12		mg/L	200	20	60
14/02/2018	BOD5		9		mg/L	200	20	60
22/02/2018	BOD5		15		mg/L	200	20	60
1/03/2018	BOD5		10		mg/L	200	20	60
8/03/2018	BOD5		10		mg/L	200	20	60
15/03/2018	BOD5		10		mg/L	200	20	60
21/03/2018	BOD5		13		mg/L	200	20	60
28/03/2018	BOD5		14		mg/L	200	20	60
5/04/2018	BOD5		12		mg/L	200	20	60
11/04/2018	BOD5		11		mg/L	200	20	60
19/04/2018	BOD5		15		mg/L	200	20	60
26/04/2018	BOD5		15		mg/L	200	20	60
2/05/2018	BOD5		14		mg/L	200	20	60
10/05/2018	BOD5		17		mg/L	200	20	60
17/05/2018	BOD5		19		mg/L	200	20	60
23/05/2018	BOD5		20		mg/L	200	20	60
31/05/2018	BOD5		19		mg/L	200	20	60
7/06/2018	BOD5		22		mg/L	200	20	60
15/06/2018	BOD5		20		mg/L	200	20	60
21/06/2018	BOD5		15		mg/L	200	20	60
27/06/2018	BOD5		23		mg/L	200	20	60
5/07/2018	BOD5		23		mg/L	200	20	60
12/07/2018	BOD5		26		mg/L	200	20	60
19/07/2018	BOD5		35		mg/L	200	20	60
26/07/2018	BOD5		24		mg/L	200	20	60
2/08/2018	BOD5		44		mg/L	200	20	60
9/08/2018	BOD5		79		mg/L	200	20	60
16/08/2018	BOD5		77		mg/L	200	20	60
23/08/2018	BOD5		47		mg/L	200	20	60
30/08/2018	BOD5		50		mg/L	200	20	60
6/09/2018	BOD5		50		mg/L	200	20	60
13/09/2018	BOD5		65		mg/L	200	20	60
20/09/2018	BOD5		69		mg/L	200	20	60



Note: Results marked red are results obtained without full QC compliance (refer to Progress Report #2)
Note: "<" have been removed from the data for graphing purposes.
No flow in Kings Creek from 1 February 2018

Table and Graph 2 - Suspended Solids

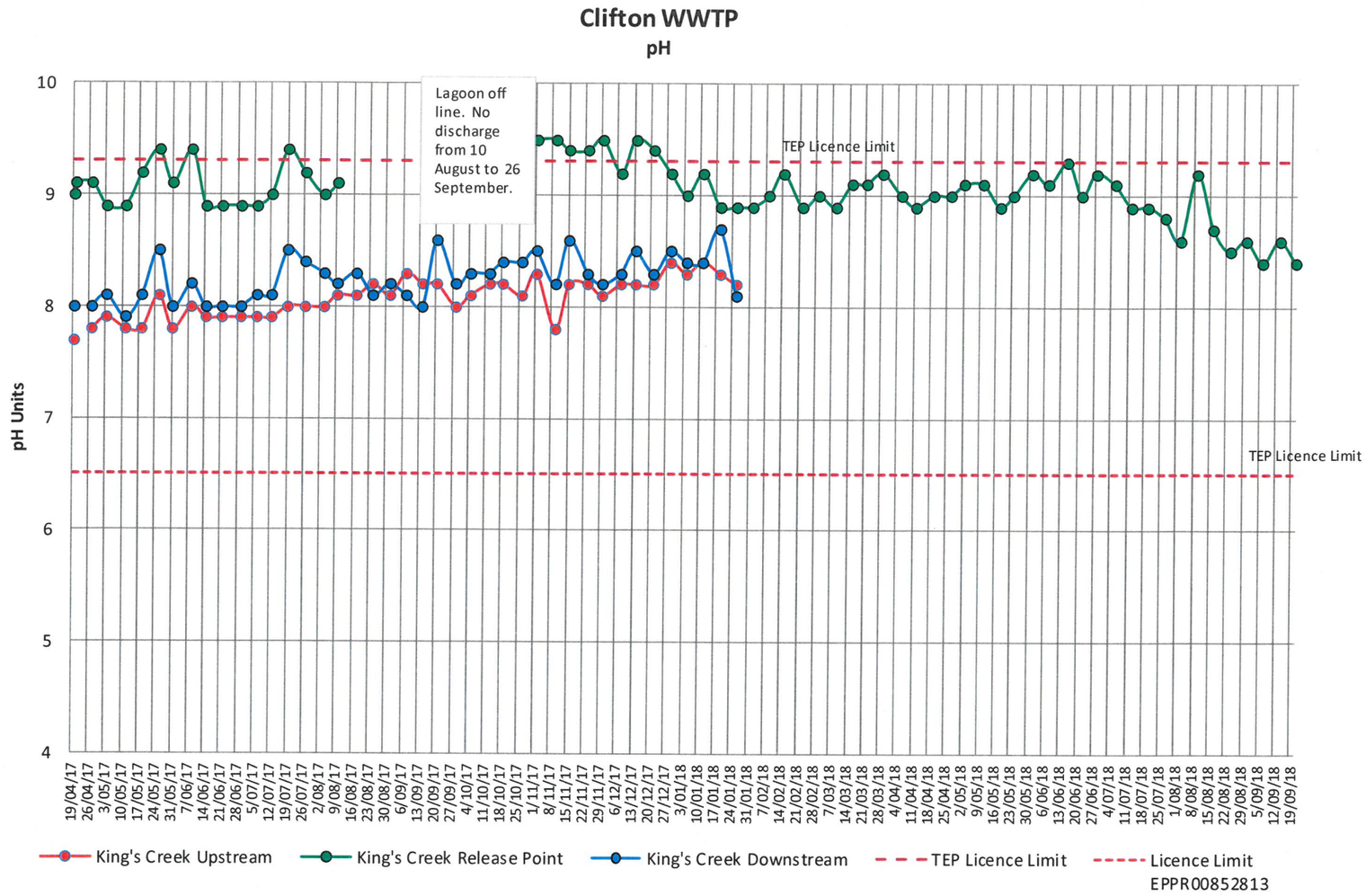
Clifton WWTP		King's Creek Upstream	King's Creek Release Point	King's Creek Downstream	Result	Licence Limits		
Reg. Date	Test	Result-<	Result	Result	Units	TEP Licence Limit	Licence Limit EPPR00852813	Max Limit
19/04/2017	SS	12	23	16	mg/L	400	30	90
20/04/2017	SS		23		mg/L	400	30	90
27/04/2017	SS	20	75	37	mg/L	400	30	90
3/05/2017	SS	22	68	52	mg/L	400	30	90
11/05/2017	SS	11	72	28	mg/L	400	30	90
18/05/2017	SS	16	107	45	mg/L	400	30	90
25/05/2017	SS	22	113	41	mg/L	400	30	90
31/05/2017	SS	35	92	41	mg/L	400	30	90
8/06/2017	SS	27	93	35	mg/L	400	30	90
14/06/2017	SS	46	69	35	mg/L	400	30	90
21/06/2017	SS	38	75	32	mg/L	400	30	90
29/06/2017	SS	22	62	51	mg/L	400	30	90
6/07/2017	SS	21	76	36	mg/L	400	30	90
12/07/2017	SS	30	72	42	mg/L	400	30	90
19/07/2017	SS	26	116	94	mg/L	400	30	90
26/07/2017	SS	57	146	69	mg/L	400	30	90
3/08/2017	SS	41	90	45	mg/L	400	30	90
9/08/2017	SS	46	135	41	mg/L	400	30	90
17/08/2017	SS	43	Lagoon off line. No discharge from 10 August to 26 September.	67	mg/L	400	30	90
24/08/2017	SS	30		29	mg/L	400	30	90
31/08/2017	SS	28		22	mg/L	400	30	90
7/09/2017	SS	46		36	mg/L	400	30	90
14/09/2017	SS	43		59	mg/L	400	30	90
20/09/2017	SS	52		26	mg/L	400	30	90
28/09/2017	SS	19	22	34	mg/L	400	30	90
4/10/2017	SS	37	32	36	mg/L	400	30	90
12/10/2017	SS	52	33	41	mg/L	400	30	90
18/10/2017	SS	42	55	69	mg/L	400	30	90
26/10/2017	SS	44	63	109	mg/L	400	30	90
1/11/2017	SS	68	79	65	mg/L	400	30	90
9/11/2017	SS	49	83	112	mg/L	400	30	90
15/11/2017	SS	20	58	44	mg/L	400	30	90
23/11/2017	SS	22	56	52	mg/L	400	30	90
29/11/2017	SS	16	28	31	mg/L	400	30	90
7/12/2017	SS	56	28	48	mg/L	400	30	90
13/12/2017	SS	46	26	48	mg/L	400	30	90
21/12/2017	SS	40	30	54	mg/L	400	30	90
28/12/2017	SS	25	19	49	mg/L	400	30	90
4/01/2018	SS	22	11	26	mg/L	400	30	90
11/01/2018	SS	27	20	36	mg/L	400	30	90
18/01/2018	SS	18	24	85	mg/L	400	30	90
25/01/2018	SS	17	24	30	mg/L	400	30	90
1/02/2018	SS		31		mg/L	400	30	90
8/02/2018	SS		38		mg/L	400	30	90
14/02/2018	SS		30		mg/L	400	30	90
22/02/2018	SS		25		mg/L	400	30	90
1/03/2018	SS		31		mg/L	400	30	90
8/03/2018	SS		34		mg/L	400	30	90
15/03/2018	SS		64		mg/L	400	30	90
21/03/2018	SS		41		mg/L	400	30	90
28/03/2018	SS		46		mg/L	400	30	90
5/04/2018	SS		17		mg/L	400	30	90
11/04/2018	SS		14		mg/L	400	30	90
19/04/2018	SS		22		mg/L	400	30	90
26/04/2018	SS		21		mg/L	400	30	90
2/05/2018	SS		28		mg/L	400	30	90
10/05/2018	SS		19		mg/L	400	30	90
17/05/2018	SS		26		mg/L	400	30	90
23/05/2018	SS		40		mg/L	400	30	90
31/05/2018	SS		42		mg/L	400	30	90
7/06/2018	SS		35		mg/L	400	30	90
15/06/2018	SS		57		mg/L	400	30	90
21/06/2018	SS		37		mg/L	400	30	90
27/06/2018	SS		63		mg/L	400	30	90
5/07/2018	SS		62		mg/L	400	30	90
12/07/2018	SS		46		mg/L	400	30	90
19/07/2018	SS		72		mg/L	400	30	90
26/07/2018	SS		55		mg/L	400	30	90
2/08/2018	SS		62		mg/L	400	30	90
9/08/2018	SS		124		mg/L	400	30	90
16/08/2018	SS		111		mg/L	400	30	90
23/08/2018	SS		110		mg/L	400	30	90
30/08/2018	SS		85		mg/L	400	30	90
6/09/2018	SS		87		mg/L	400	30	90
13/09/180	SS		87		mg/L	400	30	90
20/09/2018	SS		79		mg/L	400	30	90



No flow in Kings Creek from 1 February 2018

Table and Graph 3 - pH

Clifton WWTP		King's Creek Upstream	King's Creek Release Point	King's Creek Downstream	Result	Licence Limits		
Reg. Date	Test	Result-<	Result	Result	Units	TEP Licence Limit	Licence Limit EPPR00852813	Max Limit
19/04/2017	PH	7.7	9.0	8.0	UNITS	9.3	6.5	9.3
20/04/2017	PH		9.1		UNITS	9.3	6.5	9.3
27/04/2017	PH	7.8	9.1	8.0	UNITS	9.3	6.5	9.3
3/05/2017	PH	7.9	8.9	8.1	UNITS	9.3	6.5	9.3
11/05/2017	PH	7.8	8.9	7.9	UNITS	9.3	6.5	9.3
18/05/2017	PH	7.8	9.2	8.1	UNITS	9.3	6.5	9.3
25/05/2017	PH	8.1	9.4	8.5	UNITS	9.3	6.5	9.3
31/05/2017	PH	7.8	9.1	8.0	UNITS	9.3	6.5	9.3
8/06/2017	PH	8.0	9.4	8.2	UNITS	9.3	6.5	9.3
14/06/2017	PH	7.9	8.9	8.0	UNITS	9.3	6.5	9.3
21/06/2017	PH	7.9	8.9	8.0	UNITS	9.3	6.5	9.3
29/06/2017	PH	7.9	8.9	8.0	UNITS	9.3	6.5	9.3
6/07/2017	PH	7.9	8.9	8.1	UNITS	9.3	6.5	9.3
12/07/2017	PH	7.9	9.0	8.1	UNITS	9.3	6.5	9.3
19/07/2017	PH	8.0	9.4	8.5	UNITS	9.3	6.5	9.3
26/07/2017	PH	8.0	9.2	8.4	UNITS	9.3	6.5	9.3
3/08/2017	PH	8.0	9.0	8.3	UNITS	9.3	6.5	9.3
9/08/2017	PH	8.1	9.1	8.2	UNITS	9.3	6.5	9.3
17/08/2017	PH	8.1	Lagoon off line. No discharge from 10 August to 26 September.	8.3	UNITS	9.3	6.5	9.3
24/08/2017	PH	8.2		8.1	UNITS	9.3	6.5	9.3
31/08/2017	PH	8.1		8.2	UNITS	9.3	6.5	9.3
7/09/2017	PH	8.3		8.1	UNITS	9.3	6.5	9.3
14/09/2017	PH	8.2		8.0	UNITS	9.3	6.5	9.3
20/09/2017	PH	8.2		8.6	UNITS	9.3	6.5	9.3
28/09/2017	PH	8.0	9.3	8.2	UNITS	9.3	6.5	9.3
4/10/2017	PH	8.1	9.2	8.3	UNITS	9.3	6.5	9.3
12/10/2017	PH	8.2	9	8.3	UNITS	9.3	6.5	9.3
18/10/2017	PH	8.2	9.1	8.4	UNITS	9.3	6.5	9.3
26/10/2017	PH	8.1	9.5	8.4	UNITS	9.3	6.5	9.3
1/11/2017	PH	8.3	9.5	8.5	UNITS	9.3	6.5	9.3
9/11/2017	PH	7.8	9.5	8.2	UNITS	9.3	6.5	9.3
15/11/2017	PH	8.2	9.4	8.6	UNITS	9.3	6.5	9.3
23/11/2017	PH	8.2	9.4	8.3	UNITS	9.3	6.5	9.3
29/11/2017	PH	8.1	9.5	8.2	UNITS	9.3	6.5	9.3
7/12/2017	PH	8.2	9.2	8.3	UNITS	9.3	6.5	9.3
13/12/2017	PH	8.2	9.5	8.5	UNITS	9.3	6.5	9.3
21/12/2017	PH	8.2	9.4	8.3	UNITS	9.3	6.5	9.3
28/12/2017	PH	8.4	9.2	8.5	UNITS	9.3	6.5	9.3
4/01/2018	PH	8.3	9	8.4	UNITS	9.3	6.5	9.3
11/01/2018	PH	8.4	9.2	8.4	UNITS	9.3	6.5	9.3
18/01/2018	PH	8.3	8.9	8.7	UNITS	9.3	6.5	9.3
25/01/2018	PH	8.2	8.9	8.1	UNITS	9.3	6.5	9.3
1/02/2018	PH		8.9		UNITS	9.3	6.5	9.3
8/02/2018	PH		9		UNITS	9.3	6.5	9.3
14/02/2018	PH		9.2		UNITS	9.3	6.5	9.3
22/02/2018	PH		8.9		UNITS	9.3	6.5	9.3
1/03/2018	PH		9		UNITS	9.3	6.5	9.3
8/03/2018	PH		8.9		UNITS	9.3	6.5	9.3
15/03/2018	PH		9.1		UNITS	9.3	6.5	9.3
21/03/2018	PH		9.1		UNITS	9.3	6.5	9.3
28/03/2018	PH		9.2		UNITS	9.3	6.5	9.3
5/04/2018	PH		9		UNITS	9.3	6.5	9.3
11/04/2018	PH		8.9		UNITS	9.3	6.5	9.3
19/04/2018	PH		9		UNITS	9.3	6.5	9.3
26/04/2018	PH		9		UNITS	9.3	6.5	9.3
2/05/2018	PH		9.1		UNITS	9.3	6.5	9.3
10/05/2018	PH		9.1		UNITS	9.3	6.5	9.3
17/05/2018	PH		8.9		UNITS	9.3	6.5	9.3
23/05/2018	PH		9		UNITS	9.3	6.5	9.3
31/05/2018	PH		9.2		UNITS	9.3	6.5	9.3
7/06/2018	PH		9.1		UNITS	9.3	6.5	9.3
15/06/2018	PH		9.3		UNITS	9.3	6.5	9.3
21/06/2018	PH		9		UNITS	9.3	6.5	9.3
27/06/2018	PH		9.2		UNITS	9.3	6.5	9.3
5/07/2018	PH		9.1		UNITS	9.3	6.5	9.3
12/07/2018	PH		8.9		UNITS	9.3	6.5	9.3
19/07/2018	PH		8.9		UNITS	9.3	6.5	9.3
26/07/2018	PH		8.8		UNITS	9.3	6.5	9.3
2/08/2018	PH		8.6		UNITS	9.3	6.5	9.3
9/08/2018	PH		9.2		UNITS	9.3	6.5	9.3
16/08/2018	PH		8.7		UNITS	9.3	6.5	9.3
23/08/2018	PH		8.5		UNITS	9.3	6.5	9.3
30/08/2018	PH		8.6		UNITS	9.3	6.5	9.3
6/09/2018	PH		8.4		UNITS	9.3	6.5	9.3
13/09/2018	PH		8.6		UNITS	9.3	6.5	9.3
20/09/2018	PH		8.4		UNITS	9.3	6.5	9.3

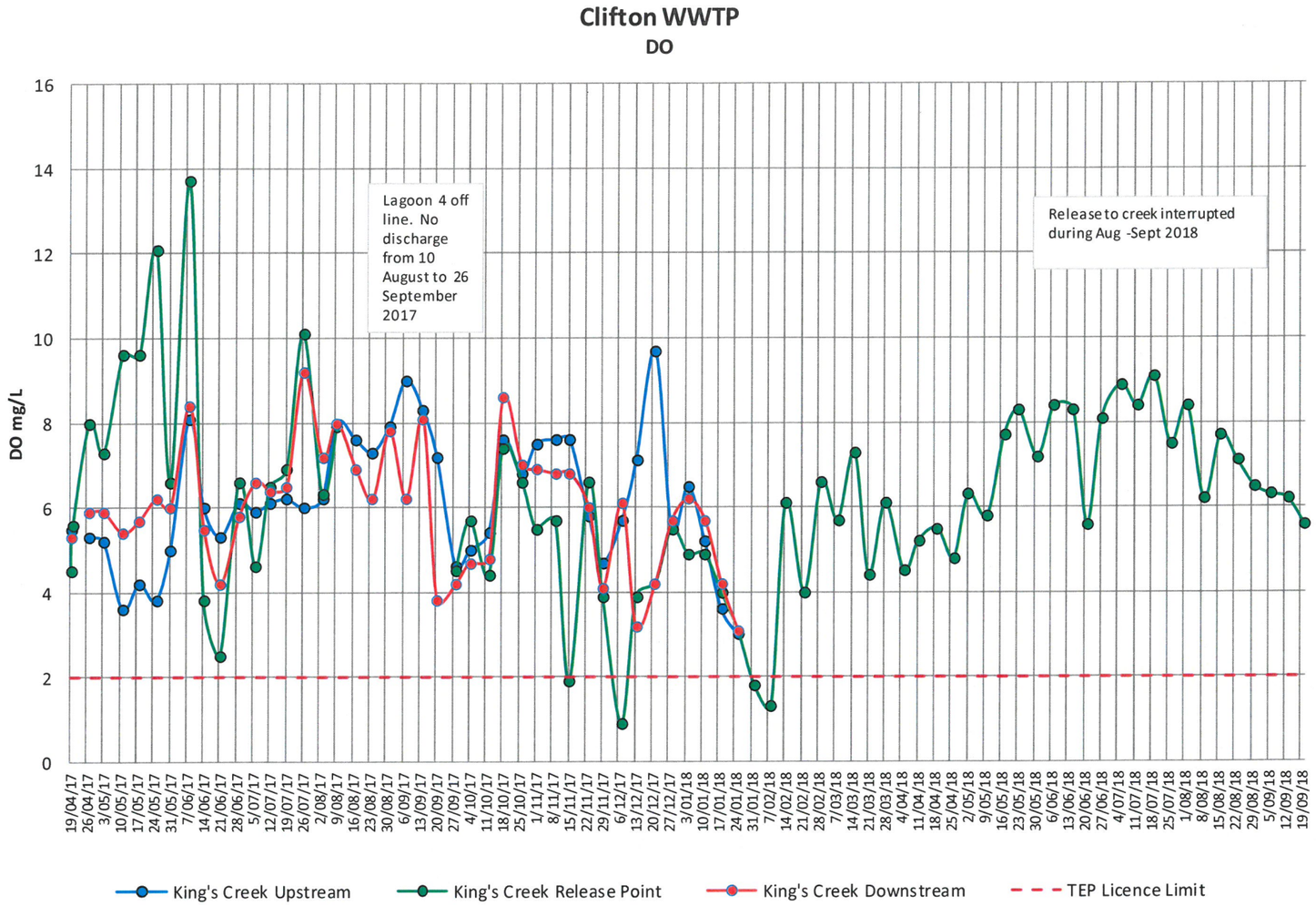


Note: There are no TEP or licence limits for upstream and downstream pH values (data collected for information purposes only)

No flow in Kings Creek from 1 February 2018

Table and Graph 4 - Dissolved Oxygen

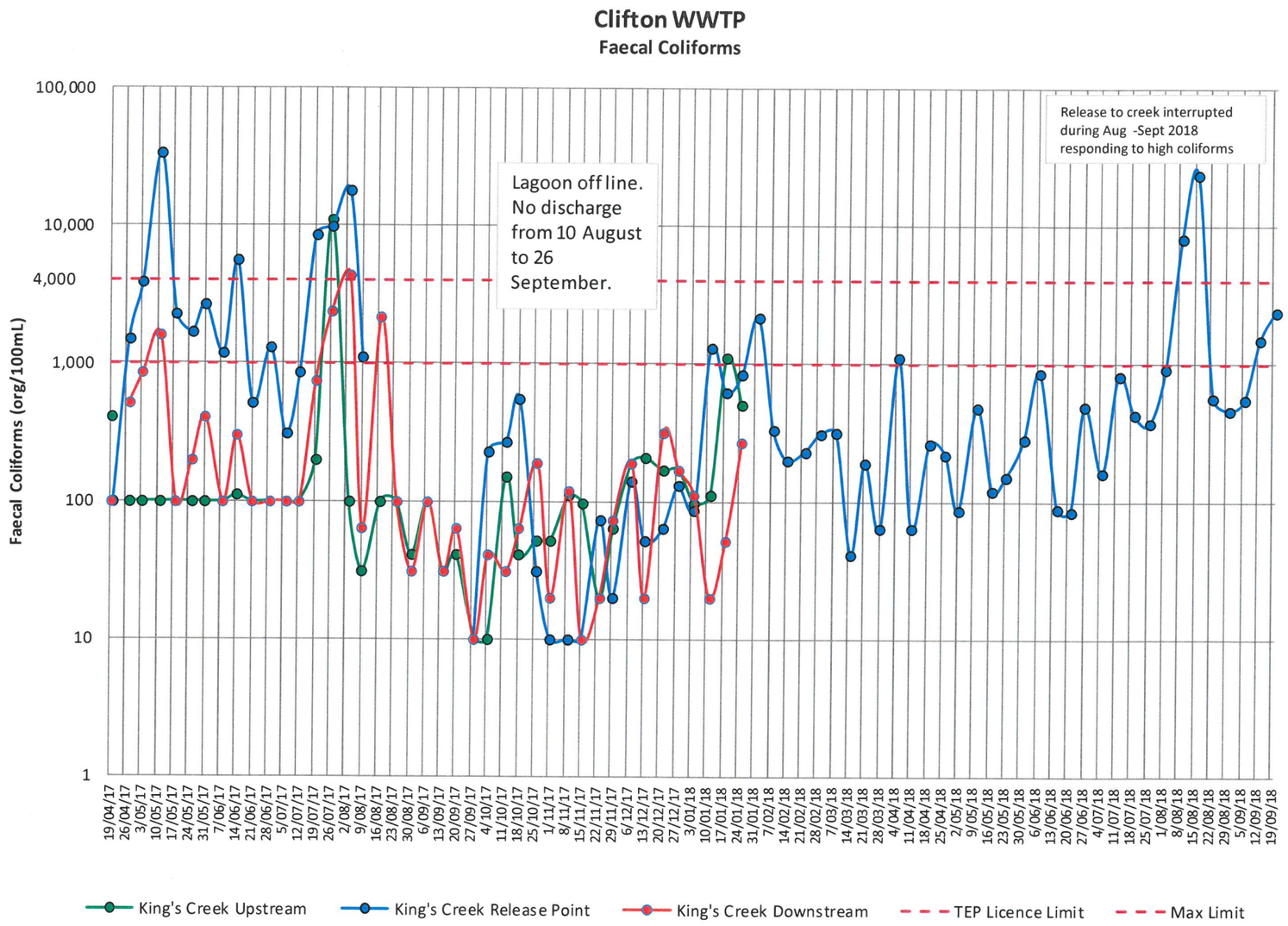
Clifton WWTP		King's Creek Upstream	King's Creek Release Point	King's Creek Downstream	Result	Licence Limits		
Reg. Date	Test	Result-<	Result	Result	Units	TEP Licence Limit	Licence Limit EPPR00852813	Max Limit
19/04/2017	DO	5.5	4.5	5.3	mg/L	2.0	2.0	
20/04/2017	DO		5.6		mg/L	2.0	2.0	
27/04/2017	DO	5.3	8.0	5.9	mg/L	2.0	2.0	
3/05/2017	DO	5.2	7.3	5.9	mg/L	2.0	2.0	
11/05/2017	DO	3.6	9.6	5.4	mg/L	2.0	2.0	
18/05/2017	DO	4.2	9.6	5.7	mg/L	2.0	2.0	
25/05/2017	DO	3.8	12.1	6.2	mg/L	2.0	2.0	
31/05/2017	DO	5.0	6.6	6.0	mg/L	2.0	2.0	
8/06/2017	DO	8.1	13.7	8.4	mg/L	2.0	2.0	
14/06/2017	DO	6.0	3.8	5.5	mg/L	2.0	2.0	
21/06/2017	DO	5.3	2.5	4.2	mg/L	2.0	2.0	
29/06/2017	DO	6.1	6.6	5.8	mg/L	2.0	2.0	
6/07/2017	DO	5.9	4.6	6.6	mg/L	2.0	2.0	
12/07/2017	DO	6.1	6.5	6.4	mg/L	2.0	2.0	
19/07/2017	DO	6.2	6.9	6.5	mg/L	2.0	2.0	
26/07/2017	DO	6.0	10.1	9.2	mg/L	2.0	2.0	
3/08/2017	DO	6.2	6.3	7.2	mg/L	2.0	2.0	
9/08/2017	DO	8.0	7.9	8.0	mg/L	2.0	2.0	
17/08/2017	DO	7.6	Lagoon off line. No discharge from 10 August to 26 September.	6.9	mg/L	2.0	2.0	
24/08/2017	DO	7.3		6.2	mg/L	2.0	2.0	
31/08/2017	DO	7.9		7.8	mg/L	2.0	2.0	
7/09/2017	DO	9.0		6.2	mg/L	2.0	2.0	
14/09/2017	DO	8.3		8.1	mg/L	2.0	2.0	
20/09/2017	DO	7.2		3.8	mg/L	2.0	2.0	
28/09/2017	DO	4.6	4.5	4.2	mg/L	2.0	2.0	
4/10/2017	DO	5	5.7	4.7	mg/L	2.0	2.0	
12/10/2017	DO	5.4	4.4	4.8	mg/L	2.0	2.0	
18/10/2017	DO	7.6	7.4	8.6	mg/L	2.0	2.0	
26/10/2017	DO	6.8	6.6	7	mg/L	2.0	2.0	
1/11/2017	DO	7.5	5.5	6.9	mg/L	2.0	2.0	
9/11/2017	DO	7.6	5.7	6.8	mg/L	2.0	2.0	
15/11/2017	DO	7.6	1.9	6.8	mg/L	2.0	2.0	
23/11/2017	DO	5.8	6.6	6	mg/L	2.0	2.0	
29/11/2017	DO	4.7	3.9	4.1	mg/L	2.0	2.0	
7/12/2017	DO	5.7	0.9	6.1	mg/L	2.0	2.0	
13/12/2017	DO	7.1	3.9	3.2	mg/L	2.0	2.0	
21/12/2017	DO	9.7	4.2	4.2	mg/L	2.0	2.0	
28/12/2017	DO	5.5	5.5	5.7	mg/L	2.0	2.0	
4/01/2018	DO	6.5	4.9	6.2	mg/L	2.0	2.0	
11/01/2018	DO	5.2	4.9	5.7	mg/L	2.0	2.0	
18/01/2018	DO	3.6	4	4.2	mg/L	2.0	2.0	
25/01/2018	DO	3	3.1	3.1	mg/L	2.0	2.0	
1/02/2018	DO		1.8		mg/L	2.0	2.0	
8/02/2018	DO		1.3		mg/L	2.0	2.0	
14/02/2018	DO		6.1		mg/L	2.0	2.0	
22/02/2018	DO		4		mg/L	2.0	2.0	
1/03/2018	DO		6.6		mg/L	2.0	2.0	
8/03/2018	DO		5.7		mg/L	2.0	2.0	
15/03/2018	DO		7.3		mg/L	2.0	2.0	
21/03/2018	DO		4.4		mg/L	2.0	2.0	
28/03/2018	DO		6.1		mg/L	2.0	2.0	
5/04/2018	DO		4.5		mg/L	2.0	2.0	
11/04/2018	DO		5.2		mg/L	2.0	2.0	
19/04/2018	DO		5.5		mg/L	2.0	2.0	
26/04/2018	DO		4.8		mg/L	2.0	2.0	
2/05/2018	DO		6.3		mg/L	2.0	2.0	
10/05/2018	DO		5.8		mg/L	2.0	2.0	
17/05/2018	DO		7.7		mg/L	2.0	2.0	
23/05/2018	DO		8.3		mg/L	2.0	2.0	
31/05/2018	DO		7.2		mg/L	2.0	2.0	
7/06/2018	DO		8.4		mg/L	2.0	2.0	
15/06/2018	DO		8.3		mg/L	2.0	2.0	
21/06/2018	DO		5.6		mg/L	2.0	2.0	
27/06/2018	DO		8.1		mg/L	2.0	2.0	
5/07/2018	DO		8.9		mg/L	2.0	2.0	
12/07/2018	DO		8.4		mg/L	2.0	2.0	
19/07/2018	DO		9.1		mg/L	2.0	2.0	
26/07/2018	DO		7.5		mg/L	2.0	2.0	
2/08/2018	DO		8.4		mg/L	2.0	2.0	
9/08/2018	DO		6.2		mg/L	2.0	2.0	
16/08/2018	DO		7.7		mg/L	2.0	2.0	
23/08/2018	DO		7.1		mg/L	2.0	2.0	
30/08/2018	DO		6.5		mg/L	2.0	2.0	
6/09/2018	DO		Error		mg/L	2.0	2.0	
13/09/2018	DO		6.2		mg/L	2.0	2.0	
20/09/2018	DO		5.6		mg/L	2.0	2.0	



No flow in Kings Creek from 1 February 2018

Table and Graph 5 - Faecal Coliforms

Clifton WWTP		King's Creek Upstream	King's Creek Release Point	King's Creek Downstream	Result	Licence Limits		
Reg. Date	Test	Result-<	Result-<	Result-<	Units	TEP Licence Limit	Licence Limit EPPR00852813	Max Limit
19/04/2017	COLI-FAECAL-MPN	410	100	100	MPN/100 mL	1000	1000	4000
20/04/2017	COLI-FAECAL-MPN		100		MPN/100 mL	1000	1000	4000
27/04/2017	COLI-FAECAL-MPN	100	1500	520	MPN/100 mL	1000	1000	4000
3/05/2017	COLI-FAECAL-MPN	100	3900	850	MPN/100 mL	1000	1000	4000
11/05/2017	COLI-FAECAL-MPN	100	34000	1600	MPN/100 mL	1000	1000	4000
18/05/2017	COLI-FAECAL-MPN	100	2300	100	MPN/100 mL	1000	1000	4000
25/05/2017	COLI-FAECAL-MPN	100	1700	200	MPN/100 mL	1000	1000	4000
31/05/2017	COLI-FAECAL-MPN	100	2700	410	MPN/100 mL	1000	1000	4000
8/06/2017	COLI-FAECAL-MPN	100	1200	100	MPN/100 mL	1000	1000	4000
14/06/2017	COLI-FAECAL-MPN	110	5600	300	MPN/100 mL	1000	1000	4000
21/06/2017	COLI-FAECAL-MPN	100	520	100	MPN/100 mL	1000	1000	4000
29/06/2017	COLI-FAECAL-MPN	100	1300	100	MPN/100 mL	1000	1000	4000
6/07/2017	COLI-FAECAL-MPN	100	310	100	MPN/100 mL	1000	1000	4000
12/07/2017	COLI-FAECAL-MPN	100	850	100	MPN/100 mL	1000	1000	4000
19/07/2017	COLI-FAECAL-MPN	200	8600	750	MPN/100 mL	1000	1000	4000
26/07/2017	COLI-FAECAL-MPN	11000	9900	2400	MPN/100 mL	1000	1000	4000
3/08/2017	COLI-FAECAL-MPN	100	18000	4400	MPN/100 mL	1000	1000	4000
9/08/2017	COLI-FAECAL-MPN	31	1100	63	MPN/100 mL	1000	1000	4000
17/08/2017	COLI-FAECAL-MPN	100	Lagoon off line. No discharge from 10 August to 26 September.	2200	MPN/100 mL	1000	1000	4000
24/08/2017	COLI-FAECAL-MPN	100		100	MPN/100 mL	1000	1000	4000
31/08/2017	COLI-FAECAL-MPN	41		31	MPN/100 mL	1000	1000	4000
7/09/2017	COLI-FAECAL-MPN	100		100	MPN/100 mL	1000	1000	4000
14/09/2017	COLI-FAECAL-MPN	31		31	MPN/100 mL	1000	1000	4000
20/09/2017	COLI-FAECAL-MPN	41		63	MPN/100 mL	1000	1000	4000
28/09/2017	COLI-FAECAL-MPN	10	10	10	MPN/100 mL	1000	1000	4000
4/10/2017	COLI-FAECAL-MPN	10	230	41	MPN/100 mL	1000	1000	4000
12/10/2017	COLI-FAECAL-MPN	150	270	31	MPN/100 mL	1000	1000	4000
18/10/2017	COLI-FAECAL-MPN	41	550	63	MPN/100 mL	1000	1000	4000
26/10/2017	COLI-FAECAL-MPN	52	31	190	MPN/100 mL	1000	1000	4000
1/11/2017	COLI-FAECAL-MPN	52	10	20	MPN/100 mL	1000	1000	4000
9/11/2017	COLI-FAECAL-MPN	110	10	120	MPN/100 mL	1000	1000	4000
15/11/2017	COLI-FAECAL-MPN	97	10	10	MPN/100 mL	1000	1000	4000
23/11/2017	COLI-FAECAL-MPN	20	74	20	MPN/100 mL	1000	1000	4000
29/11/2017	COLI-FAECAL-MPN	63	20	73	MPN/100 mL	1000	1000	4000
7/12/2017	COLI-FAECAL-MPN	190	140	190	MPN/100 mL	1000	1000	4000
13/12/2017	COLI-FAECAL-MPN	210	52	20	MPN/100 mL	1000	1000	4000
21/12/2017	COLI-FAECAL-MPN	170	63	320	MPN/100 mL	1000	1000	4000
28/12/2017	COLI-FAECAL-MPN	170	130	170	MPN/100 mL	1000	1000	4000
4/01/2018	COLI-FAECAL-MPN	97	86	110	MPN/100 mL	1000	1000	4000
11/01/2018	COLI-FAECAL-MPN	110	1300	20	MPN/100 mL	1000	1000	4000
18/01/2018	COLI-FAECAL-MPN	1100	620	52	MPN/100 mL	1000	1000	4000
25/01/2018	COLI-FAECAL-MPN	500	840	270	MPN/100 mL	1000	1000	4000
1/02/2018	COLI-FAECAL-MPN		2200		MPN/100 mL	1000	1000	4000
8/02/2018	COLI-FAECAL-MPN		330		MPN/100 mL	1000	1000	4000
14/02/2018	COLI-FAECAL-MPN		200		MPN/100 mL	1000	1000	4000
22/02/2018	COLI-FAECAL-MPN		230		MPN/100 mL	1000	1000	4000
1/03/2018	COLI-FAECAL-MPN		310		MPN/100 mL	1000	1000	4000
8/03/2018	COLI-FAECAL-MPN		320		MPN/100 mL	1000	1000	4000
15/03/2018	COLI-FAECAL-MPN		41		MPN/100 mL	1000	1000	4000
21/03/2018	COLI-FAECAL-MPN		190		MPN/100 mL	1000	1000	4000
28/03/2018	COLI-FAECAL-MPN		63		MPN/100 mL	1000	1000	4000
5/04/2018	COLI-FAECAL-MPN		1100		MPN/100 mL	1000	1000	4000
11/04/2018	COLI-FAECAL-MPN		63		MPN/100 mL	1000	1000	4000
19/04/2018	COLI-FAECAL-MPN		260		MPN/100 mL	1000	1000	4000
26/04/2018	COLI-FAECAL-MPN		220		MPN/100 mL	1000	1000	4000
2/05/2018	COLI-FAECAL-MPN		86		MPN/100 mL	1000	1000	4000
10/05/2018	COLI-FAECAL-MPN		480		MPN/100 mL	1000	1000	4000
17/05/2018	COLI-FAECAL-MPN		120		MPN/100 mL	1000	1000	4000
23/05/2018	COLI-FAECAL-MPN		150		MPN/100 mL	1000	1000	4000
31/05/2018	COLI-FAECAL-MPN		280		MPN/100 mL	1000	1000	4000
7/06/2018	COLI-FAECAL-MPN		860		MPN/100 mL	1000	1000	4000
15/06/2018	COLI-FAECAL-MPN		88		MPN/100 mL	1000	1000	4000
21/06/2018	COLI-FAECAL-MPN		85		MPN/100 mL	1000	1000	4000
27/06/2018	COLI-FAECAL-MPN		490		MPN/100 mL	1000	1000	4000
5/07/2018	COLI-FAECAL-MPN		160		MPN/100 mL	1000	1000	4000
12/07/2018	COLI-FAECAL-MPN		830		MPN/100 mL	1000	1000	4000
19/07/2018	COLI-FAECAL-MPN		430		MPN/100 mL	1000	1000	4000
26/07/2018	COLI-FAECAL-MPN		370		MPN/100 mL	1000	1000	4000
2/08/2018	COLI-FAECAL-MPN		930		MPN/100 mL	1000	1000	4000
9/08/2018	COLI-FAECAL-MPN		8200		MPN/100 mL	1000	1000	4000
16/08/2018	COLI-FAECAL-MPN		24000		MPN/100 mL	1000	1000	4000
23/08/2018	COLI-FAECAL-MPN		570		MPN/100 mL	1000	1000	4000
30/08/2018	COLI-FAECAL-MPN		460		MPN/100 mL	1000	1000	4000
6/09/2018	COLI-FAECAL-MPN		550		MPN/100 mL	1000	1000	4000
13/09/2018	COLI-FAECAL-MPN		1500		MPN/100 mL	1000	1000	4000
20/09/2018	COLI-FAECAL-MPN		2400		MPN/100 mL	1000	1000	4000

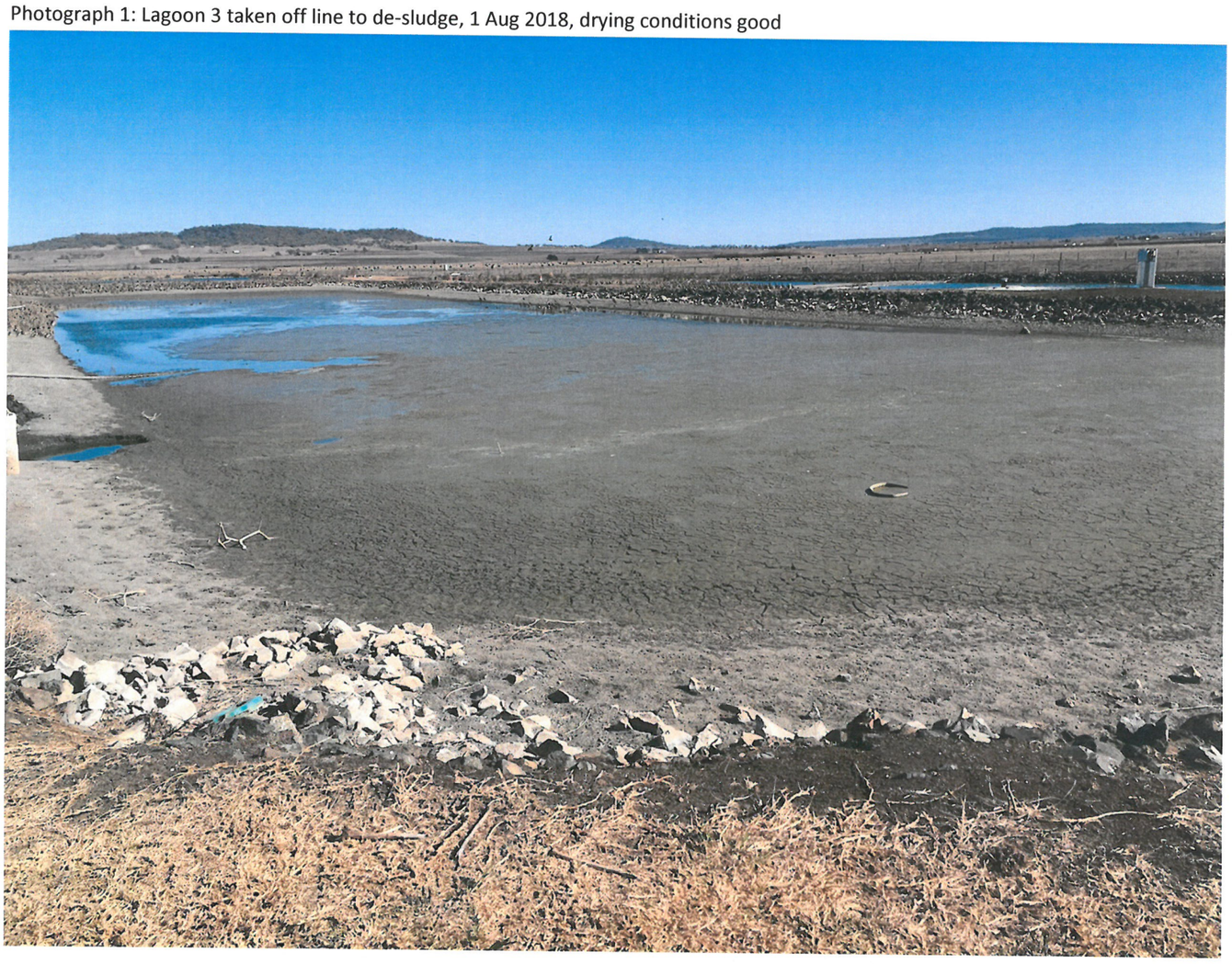


Note: There are no TEP licence limits for upstream and downstream Faecal Coliform results (Data collected for information only)

No flow in Kings Creek from 1 February 2018

Attachment #3
Photographs

Photograph 1: Lagoon 3 taken off line to de-sludge, 1 Aug 2018, drying conditions good



Photograph 2: Lagoon 3 de-sludge progress indicating original lagoon depth of 1.8m



Photograph 3: Lagoon 3 sludge drying out well and plans underway to remove sludge quickly with larger excavators



Photograph 4: Migrating Ducks in larger numbers than precious years



Photograph 5: Damage caused by Migrating Ducks to floating wetlands



Photograph 6: Plant root systems not viable, requiring re-planting



Photograph 7: Flocks of ducks removing vegetation and affecting licence compliance



Photograph 8: Water Quality (BOD, SS and E.Coli) affected by flocks of migrating ducks

