

NOTICE OF MEETING



WATER, WASTE AND SEWER ADVISORY COMMITTEE MEETING

A Water, Waste and Sewer Advisory Committee Meeting of Byron Shire Council will be held as follows:

Venue	Conference Room, Station Street, Mullumbimby
Date	Thursday, 2 June 2016
Time	9.00am

A handwritten signature in black ink, appearing to read 'Phillip Holloway', is located in the lower left area of the page.

Phillip Holloway
Director Infrastructure Services

CONFLICT OF INTERESTS

What is a “Conflict of Interests” - A conflict of interests can be of two types:

Pecuniary - an interest that a person has in a matter because of a reasonable likelihood or expectation of appreciable financial gain or loss to the person or another person with whom the person is associated.

Non-pecuniary – a private or personal interest that a Council official has that does not amount to a pecuniary interest as defined in the Local Government Act (eg. A friendship, membership of an association, society or trade union or involvement or interest in an activity and may include an interest of a financial nature).

Remoteness – a person does not have a pecuniary interest in a matter if the interest is so remote or insignificant that it could not reasonably be regarded as likely to influence any decision the person might make in relation to a matter or if the interest is of a kind specified in Section 448 of the Local Government Act.

Who has a Pecuniary Interest? - a person has a pecuniary interest in a matter if the pecuniary interest is the interest of the person, or another person with whom the person is associated (see below).

Relatives, Partners - a person is taken to have a pecuniary interest in a matter if:

- The person's spouse or de facto partner or a relative of the person has a pecuniary interest in the matter, or
- The person, or a nominee, partners or employer of the person, is a member of a company or other body that has a pecuniary interest in the matter.

N.B. “Relative”, in relation to a person means any of the following:

- (a) the parent, grandparent, brother, sister, uncle, aunt, nephew, niece, lineal descends or adopted child of the person or of the person's spouse;
- (b) the spouse or de facto partners of the person or of a person referred to in paragraph (a)

No Interest in the Matter - however, a person is not taken to have a pecuniary interest in a matter:

- If the person is unaware of the relevant pecuniary interest of the spouse, de facto partner, relative or company or other body, or
- Just because the person is a member of, or is employed by, the Council.
- Just because the person is a member of, or a delegate of the Council to, a company or other body that has a pecuniary interest in the matter provided that the person has no beneficial interest in any shares of the company or body.

Disclosure and participation in meetings

- A Councillor or a member of a Council Committee who has a pecuniary interest in any matter with which the Council is concerned and who is present at a meeting of the Council or Committee at which the matter is being considered must disclose the nature of the interest to the meeting as soon as practicable.
- The Councillor or member must not be present at, or in sight of, the meeting of the Council or Committee:
 - (a) at any time during which the matter is being considered or discussed by the Council or Committee, or
 - (b) at any time during which the Council or Committee is voting on any question in relation to the matter.

No Knowledge - a person does not breach this Clause if the person did not know and could not reasonably be expected to have known that the matter under consideration at the meeting was a matter in which he or she had a pecuniary interest.

Participation in Meetings Despite Pecuniary Interest (S 452 Act)

A Councillor is not prevented from taking part in the consideration or discussion of, or from voting on, any of the matters/questions detailed in Section 452 of the Local Government Act.

Non-pecuniary Interests - Must be disclosed in meetings.

There are a broad range of options available for managing conflicts & the option chosen will depend on an assessment of the circumstances of the matter, the nature of the interest and the significance of the issue being dealt with. Non-pecuniary conflicts of interests must be dealt with in at least one of the following ways:

- It may be appropriate that no action be taken where the potential for conflict is minimal. However, Councillors should consider providing an explanation of why they consider a conflict does not exist.
- Limit involvement if practical (eg. Participate in discussion but not in decision making or vice-versa). Care needs to be taken when exercising this option.
- Remove the source of the conflict (eg. Relinquishing or divesting the personal interest that creates the conflict)
- Have no involvement by absenting yourself from and not taking part in any debate or voting on the issue as if the provisions in S451 of the Local Government Act apply (particularly if you have a significant non-pecuniary interest)

RECORDING OF VOTING ON PLANNING MATTERS

Clause 375A of the Local Government Act 1993 – Recording of voting on planning matters

- (1) In this section, **planning decision** means a decision made in the exercise of a function of a council under the Environmental Planning and Assessment Act 1979:
 - (a) including a decision relating to a development application, an environmental planning instrument, a development control plan or a development contribution plan under that Act, but
 - (b) not including the making of an order under Division 2A of Part 6 of that Act.
- (2) The general manager is required to keep a register containing, for each planning decision made at a meeting of the council or a council committee, the names of the councillors who supported the decision and the names of any councillors who opposed (or are taken to have opposed) the decision.
- (3) For the purpose of maintaining the register, a division is required to be called whenever a motion for a planning decision is put at a meeting of the council or a council committee.
- (4) Each decision recorded in the register is to be described in the register or identified in a manner that enables the description to be obtained from another publicly available document, and is to include the information required by the regulations.
- (5) This section extends to a meeting that is closed to the public.

BYRON SHIRE COUNCIL
WATER, WASTE AND SEWER ADVISORY COMMITTEE MEETING

BUSINESS OF MEETING

1. APOLOGIES

2. DECLARATIONS OF INTEREST – PECUNIARY AND NON-PECUNIARY

3. ADOPTION OF MINUTES FROM PREVIOUS MEETINGS

3.1 Water, Waste and Sewer Advisory Committee Meeting held on 3 March 2016

4. BUSINESS ARISING FROM PREVIOUS MINUTES

5. STAFF REPORTS

Infrastructure Services

5.1	STP Flow Data Report	4
5.2	History and Future of Inflow and Infiltration in Byron Shire Council's Sewer Systems....	8
5.3	Main Arm Reuse Options	80
5.4	Container Deposit Scheme (CDS) Information Session.....	86
5.5	Scope of the Water, Waste and Sewer and Related Committees	88

STAFF REPORTS - INFRASTRUCTURE SERVICES

Report No. 5.1 **STP Flow Data Report**
Directorate: Infrastructure Services
Report Author: Peter Rees, Manager Utilities
File No: I2016/542
Theme: Community Infrastructure
 Sewerage Services

Summary:

The data presented in Tables 1-3 is for the period May 2014 to April 2016.

It is the monthly inflows to each STP; the highest daily flow for each month and a calculated ratio of the highest monthly daily flow to as assumed average dry weather flow.

RECOMMENDATION:

That the Committee note the report.

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.1

Report

The data presented in Table 1 below contains all inflows to each Sewage Treatment Plant (STP) collated by month as requested by the Committee. The flows are for the period from May 2014 to April 2016. Included in the Table is the highest daily flow received at the plant for each month. The flows are not warranted as audited.

Table 2 contains a calculated ratio of the highest flow received for each month to an assumed average dry weather flow (ADWF). The ADWF is not a current calculated value and is based on historical assessments of each system.

Table 3 contains all recycled water monthly flows from each STP. The flows are not warranted as audited.

Table 1 – STP Flows and Highest Daily Flow for the Month

	Total Monthly Flows (kL)				TOTAL STP FLOW	Highest Daily Flow for Month (kL)			
	BASTP	BBSTP	BVSTP	OSSTP		BASTP	BBSTP	BVSTP	OSSTP
May-14	9,824	161,920	38,922	41421	252087	366	5865	1617	1787
Jun-14	9,297	130,578	35,074	36864	211813	340	5573	1461	1804
Jul-14	9,645	141,782	33,465	40497	225388	410	4890	1170	2097
Aug-14	15,353	178,730	76,823	54527	325433	1899	11791	8459	3786
Sep-14	9,411	148,768	52,400	43527	254106	417	6139	2775	1847
Oct-14	9,393	144,868	34,137	40689	229087	618	5334	1309	2484
Nov-14	8,619	132,092	35,320	38089	214120	601	4791	1611	2213
Dec-14	11,118	154,976	52,810	46256	265160	648	7600	5576	3417
Jan-15	11,397	177,643	110,628	57935	357603	626	7380	9339	3479
Feb-15	16,054	174,031	121,452	69952	381489	3862	13278	19599	12636
Mar-15	10,614	163,309	67,063	48778	289763	461	6780	8686	2896
Apr-15	10,930	171,481	84,414	48060	314885	575	7154	10676	2902
May-15	16,025	171,186	78,472	55750	321432	2732	12371	15812	4199
Jun-15	10,936	146,013	61,815	54928	273692	855	11101	7900	8092
Jul-15	10,266	151,286	55,841	49723	267116	371	6127	2816	2532
Aug-15	9,721	127,397	42,120	42918	222156	349	4430	1644	1912
Sep-15	9,571	125,259	35,123	41516	211469	508	4778	1624	1956
Oct-15	9,533	138,474	40,480	41014	229501	329	4908	2497	2047
Nov-15	9,985	155,571	60,487	45040	271083	476	8329	4536	3562
Dec-15	9,951	169,819	54,273	47875	281918	382	9201	3358	3078
Jan-16	10,762	171,169	56,902	46960	285792	746	6933	3516	3344
Feb-16	8,322	160,291	43,265	39143	251022	367	15951	3030	1897
Mar-16	12,633	190,703	100,204	56002	359542	1063	13822	12357	6112
Apr-16	9,781	193,405	46,091	41000	290277	352	30283	2761	1787

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.1

Table 2 – Peak Wet Weather Flow: ADWF Ratio

		ADWF RATIO				
		BASTP	BBSTP	BVSTP	OSSTP	Byron Rainfall
	ADWF	350.0	5000.0	1500.0	1200.0	
May-14		1.0	1.2	1.1	1.5	32
Jun-14		1.0	1.1	1.0	1.5	62
Jul-14		1.2	1.0	0.8	1.7	18
Aug-14		5.4	2.4	5.6	3.2	313
Sep-14		1.2	1.2	1.8	1.5	29
Oct-14		1.8	1.1	0.9	2.1	16
Nov-14		1.7	1.0	1.1	1.8	85
Dec-14		1.9	1.5	3.7	2.8	120
Jan-15		1.8	1.5	6.2	2.9	234
Feb-15		11.0	2.7	13.1	10.5	307
Mar-15		1.3	1.4	5.8	2.4	171
Apr-15		1.6	1.4	7.1	2.4	131
May-15		7.8	2.5	10.5	3.5	223
Jun-15		2.4	2.2	5.3	6.7	137
Jul-15		1.1	1.2	1.9	2.1	49
Aug-15		1.0	0.9	1.1	1.6	46
Sep-15		1.5	1.0	1.1	1.6	104
Oct-15		0.9	1.0	1.7	1.7	43
Nov-15		1.4	1.7	3.0	3.0	151
Dec-15		1.1	1.8	2.2	2.6	145
Jan-16		2.1	1.4	2.3	2.8	82
Feb-16		1.0	3.2	2.0	1.6	48
Mar-16		3.0	2.8	8.2	5.1	386
Apr-16		1.0	6.1	1.8	1.5	50

5 Table 3 – Recycled Water Flows

		RECYCLED WATER			
	Byron Rainfall	BASTP REUSE	BBSTP Reuse	BVSTP Reuse	Total Reuse
	Mm	kL	kL	kL	kL
May-14	32	944	27099	5219	33262
Jun-14	62	786	26839	910	28535
Jul-14	18	1247	29184	16379	46810
Aug-14	313	792	31095	2578	34465
Sep-14	29	1318	29237	2	30557
Oct-14	16	1359	30301	13344	45004
Nov-14	85	502	33455	11757	45714
Dec-14	120	341	39177	4480	43998
Jan-15	234	0	51018	0	51018
Feb-15	307	0	34053	0	34053
Mar-15	171	498	40427	0	40925
Apr-15	131	483	57263	0	57745
May-15	223	243	30178	0	30421
Jun-15	137	264	23369	3363	26995
Jul-15	49	384	25886	2603	28873
Aug-15	46	405	26182	4414	31000
Sep-15	104	375	50654	1237	52266

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.1

		RECYCLED WATER			
	Byron Rainfall	BASTP REUSE	BBSTP Reuse	BVSTP Reuse	Total Reuse
	Mm	kL	kL	kL	kL
Oct-15	43	1778	47741	2810	52329
Nov-15	151	1821	47105	2242	51168
Dec-15	145	0	12604	0	12604
Jan-16	82	162	17072	4096	21331
Feb-16	48	3	16384	0	16387
Mar-16	386	0	36822	0	36822
Apr-16	50	0	29015	754	29769

Financial Implications

Nil

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Statutory and Policy Compliance Implications

Nil

**Report No. 5.2 History and Future of Inflow and Infiltration in Byron Shire Council's
Sewer Systems**

Directorate: Infrastructure Services
Report Author: Peter Rees, Manager Utilities
File No: I2016/543
Theme: Community Infrastructure
Sewerage Services

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10 **Summary:**

The final report on the Mullumbimby Inflow and Infiltration programme has been attached for discussion.

15

RECOMMENDATION:

That the Committee note the report.

Attachments:

- 1 Mullumbimby Inflow & Infiltration Integrated Strategy Final Annual Report June 2010, DM990881 ,
page 10

20

Report

5 There have been comments regarding the level of stormwater ingress into the Mullumbimby sewerage system despite there being no sewer overflows into the river as a result of this ingress. It has been suggested Council needs to revisit its Mullumbimby stormwater inflow mitigation measures and more broadly review stormwater ingress into all the Shire's catchments.

10 As a starting point, the final Council considered report on the Mullumbimby Inflow and Infiltration programme has been attached for consideration.

Financial Implications

Nil

15 **Statutory and Policy Compliance Implications**

Nil



BYRON
3 - INFRASTRUCTURE

**Byron Shire Council
MULLUMBIMBY SEWERAGE SYSTEM
INFLOW AND INFILTRATION
PROGRAMME PRP 1 INTEGRATED
STRATEGY
Final Project Review June 2010**

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BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

MULLUMBIMBY SEWERAGE SYSTEM INFLOW AND INFILTRATION PROGRAM INTEGRATED STRATEGY FINAL PROJECT REVIEW

TABLE OF CONTENTS

5	1.0 SUMMARY AND RECOMMENDATIONS	3
	2.0 INTRODUCTION	6
	3.0 SECTION 1: Project Element Review	8
	3.1 Overall Project Coordination	8
10	3.2 Data Collection and Analysis	8
	3.3 Public Sewerage Infrastructure Repairs	9
	3.4 Private Sewerage Infrastructure Repairs	14
	3.5 Stormwater	16
	3.6 Community Education	17
15	3.7 Pump Station Review and Upgrade	17
	4.0 SECTION 2: Project Evaluation	19
	4.1 Key Performance Indicators Overview	19
	4.2 Maximum Ratio Wet Weather Flow (Daily) / Dry Weather flow (Daily)	20
	4.3 Overflow Events to the Brunswick River	20
20	5.0 SECTION 3: Project Alternatives and Recommendations	22
	5.1 Low Pressure Pump System	22
	5.2 Gravity Sewerage System Maintenance	23
	5.3 Recommendations	24
25	APPENDIX 1	26

1.0 SUMMARY AND RECOMMENDATIONS

5 The Mullumbimby sewerage system has historically suffered significant stormwater inflow and infiltration problems with flows well in excess of 14 x average dry weather flow being received in large rainfall events. This has resulted in sewage overflows to the Brunswick River. In 2007 Council developed and adopted the Mullumbimby Sewerage System Inflow and Integration program PRP 1 Integrated Strategy.

10 The Integrated Strategy focused effort on the following areas:

- Data Collection and Analysis
- Public Sewerage Infrastructure Rehabilitation
- Private Sewerage Infrastructure Repairs
- Stormwater Maintenance
- 15 • Public Education
- Pump Station Analysis and Upgrade

20 The strategy outlined a program of work for three years costing \$0.5 million per annum and required a report to be prepared annually to analyse the effectiveness of the program.

The strategy was also endorsed by the Department of Environment, Climate Change and Water (DECCW) and incorporated in PRP 2 on Licence #830.

25 Annual reports on progress have been reported to Council in 2008 and 2009. This report is the final annual report considering the outcomes of the implementation of the three year Strategy. The Final Report includes:

- a review of each project element defined in the original Strategy
- 30 • an evaluation of the project against both the original KPIs identified in the Strategy and all the relevant data collected.
- analysis of alternatives and makes recommendations on the direction the project should take to ensure there are no overflows into the Brunswick River due to stormwater ingress.
- 35

40 The Final Report documents the extensive work completed in rectifying defects in the stormwater system and public and private sewers but concludes that the project has not achieved the KPI targets for reducing overflow occasions to zero and reducing the ratio of Peak Weather Flow to Average Dry Weather flow to only 7 times. The project has however had the following positive impacts

- A reduction in overflow occasions by 15%.
- 45 ▪ A reduction in overflow volume by 39%.

50 The project has also demonstrated the mains of the sewerage system are not the cause of the stormwater ingress – there has been only four defects identified in the past three years in the sewer mains. The significant defects in the system are in the sideline connections to the properties and the property's drainage infrastructure. To date 543 of 703 property connections have been inspected with 61% found to have a defect. Of the properties, 704 of 766 have been inspected with 46% found to have defects.

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

The augmented sewerage system is now at a level which has adequate capacity to transfer all flows received to the new treatment facility. Considering the largest storm event of 2009/10 as an example, Mullumbimby generated 12.373 ML of effluent and Brunswick Heads 2.172 ML – with total effluent delivered to the STP's of 14.545 ML.

- 5 This is significantly below the 22.04 ML per day of flow that can be fully treated at the new Brunswick Valley STP and only eight times the combined average dry weather flow of Brunswick Heads and Mullumbimby.

- 10 High levels of stormwater ingress will always be undesirable because it leads to higher energy costs associated with pumping and treatment, but the ratio of peak wet weather flow to average dry weather flow cannot be used as the measure of system capacity provided:

- 15 1. The system has sufficient pumping capacity to transfer flows to the treatment facility;
2. The system has sufficient treatment (and storage) capacity to adequately treat the transferred flows; and
3. The system is adequately monitored and maintained to prevent peak wet weather flows from increasing.

- 20 Completion of the Brunswick Area Sewage Augmentation Scheme (BASAS) and ongoing maintenance work will ensure the Brunswick valley (Mullumbimby and Brunswick Heads) sewerage system satisfies these three criteria. This is supported by the computer model developed using both the data collected in this project and
25 Council's asset management system.

- 30 The existing gravity sewerage systems complete with the newly constructed transfer pump stations (SPS 4000 Mullumbimby and SPS 2000 Brunswick Heads) and the new Brunswick Valley sewage treatment plant, will be capable of collecting, transferring and treating sewage flows for all rainfall events up to the 1 in 20 year Average Recurrence Interval (ARI) event and possibly above.

- 35 In accordance with the resolution of Council, this report considers the option of addressing the problem of stormwater ingress through the retrofitting of a Low Pressure Pumping System (LPPS) to the Mullumbimby sewerage reticulation system. This option would have a high capital cost (estimated at \$19,000 per property) and will not eliminate stormwater inflow and infiltration because defects in the upstream private sewers will continue to be a problem and source of stormwater ingress. This conclusion has been demonstrated in the recent installation of a LPPS unit at one
40 property in the catchment and subsequent flow monitoring indicates wet weather flows are up to 20 times the dry weather flow due to stormwater ingress through defects in the upstream private sewers on the property. The reasons a LPPS is not recommended as a preferred project alternative are further discussed in Section 3 of this report.

- 45 The condition of the public and private sewerage system is dynamic and defects that result in stormwater ingress can emerge due to deterioration and private works. For this reason it will be necessary to complete residual corrective works in the worst effected sub catchments and also ongoing maintenance work so that the level of
50 stormwater ingress is progressively decreased.

- 55 The BASAS incorporates wet weather storage capacity that assists with pumping capacity and eliminating sewage overflows that occur when the sewerage system is overwhelmed. The level of wet weather storage capacity could be further increased by the implementation of a bulk effluent storage dam and constructed wetlands at the

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

- 5 Brunswick Valley STP (Vallances Road) site. These facilities were part of the concept for the BASAS and have been assessed in the EIS process but were deferred due to financial constraints. Implementation of a bulk effluent storage dam and constructed wetlands would also improve integrated effluent management outcomes that will provide sustainable benefits to the community and the environment.

The recommended future works to be undertaken on the Mullumbimby sewerage system are:

- 10 1. complete the work on the gravity system in catchments 4001 and 4003b;
 2. continue with inspection of private assets;
 3. implement routine investigation and repairs for both public and private infrastructure in our operational and maintenance activities; and
15 4. investigate further the use of the original BASAS project effluent storage dam and the constructed wetlands for supplementary storm flow storages and/or treatment.

2.0 INTRODUCTION

5 The purpose of this report is to provide a review of the Mullumbimby Inflow and Infiltration project in accordance with the Integrated Strategy developed in 2007 and endorsed by Council (Resolution 07-208) and the Department of Environment Climate Change and Water (DECCW PRP1 and PRP2).

This report follows on from

- 10 ▪ the annual Mullumbimby Inflow and Infiltration Integrated Strategy review report prepared in June 2008 and received and noted by Council (Resolution 08-490); and submitted to the DECCW who issued PRP3 in response;
- 15 ▪ a review of the project by a "consultant conversant with sewerage design and repair" in response to Council resolution 08-748; and
- 15 ▪ Council resolution 09-854 in response to the Consultant's report.

20 The review assesses actual data against the nominated Key Performance Indicators and makes an assessment of the success or otherwise of the strategy. The report also makes recommendations for future work required to mitigate the stormwater inflow and infiltration into the Mullumbimby sewerage system. The report will be presented to Council in accordance with the resolution of Council.

25 In addition to reviewing the project, this report also addresses specific issues raised in Council Resolution 09-854.

09-854 *Resolved:*

- 30 1. *That Council notes the Consultant's report titled 'Final Report Mullumbimby Inflow Infiltration Review Byron Shire Council'.*
- 35 2. *That shortfalls in the company Aurecon's report entitled 'Final Report Mullumbimby Inflow Infiltration Review Byron Shire Council' (#889165) be noted, including:*
 - 40 a. *the report does not answer the question posed by Council in its Resolution 08-748 namely to establish whether replacement or continued repair (or a combination of the two) would be the best option to resolve the Mullumbimby Inflow and Infiltration problem. It advises putting the issue off for some years, thus setting the scene for a panic at that time.*
 - 45 b. *it estimates a cost of \$2.9million for the low pressure pump (LPPS) option. It states that costing the other (repair) option is extremely difficult, and that such an approach is difficult to maintain (see Annexure 12, Page 3 of 49). Council has past expenditures and could forecast future ones. A comparison is however not made in the report. A brief comparison would however indicate that replacement at \$2.9million is a far more cost effective option than repair. The report dismisses the option however, simply saying it 'is very expensive'.*
 - 50 c. *the report makes no assessment of the success rate of the extensive repair programme carried out by Council to date. Aurecon may have been influenced in this by the Project Brief (Contract No: BSC/2009/00003; Pp 5-6) stating 'In response to Item 7, in April 2005 a report was prepared and presented to the Brunswick Wastewater Steering*

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

Committee quantitatively evaluating the work done. The data at the time indicated there had been measurable improvements and that overflows to the Brunswick River had been reduced by 60% and total flows in the system by 15%. That data was re-examined by the Committee and extreme doubts raised. In addition, there are now several years of data since 2005. These do not back up the claimed reduction.

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d. the report ignores years of overflow data collected by Council, as presented in its I/I Programme for PRP1, Annual Project Review of June 2008. Those data indicate system flows of about 14 times ADWF in 2005, 2006 and 2008. Measurement failed in May 2009, an event sure to have exceeded all others. April 2009 had already reached 12.4 times ADWF. Overflow occurs regularly from the Mullumbimby system. Sewer total flows exceed 10 Ml/day (11 times ADWF) on about 3 days a year (many more in 2009).

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e. the report argues on the flimsiest of grounds that Mullumbimby should accept as normal its current rate of overflows (assessed as a 1-in-3-month event).

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f. the report argues that extreme conditions in Mullumbimby drag its performance down from NSW's 1-in-20-year norm. It fails to examine what happens on the top half of Australia's east coast.

25

g. the report claims that the Sewerage Augmentation Scheme currently being built will eliminate sewer overflows. It fails to mention however that flows greater than 7 times ADWF will go untreated at the new STP, presumably overflowing there instead of in town (this ratio needs checking but the issue is presented in the Augmentation design).

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3. That key performance indicators of the Mullumbimby Inflow and Infiltration situation be reviewed six months before the opening of the new Brunswick Valley STP.

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4. That a decision on the level of leakage of the system, acceptable on a cost/benefit basis against a new sewerage system, be redetermined at that time. (Tabart/Staples)

40

Section 1 of the report provides a review of each project element defined in the original Strategy.

Section 2 provides an evaluation of the project against both the original KPIs identified in the Strategy and all the relevant data collected.

45

Section 3 analyses alternatives and makes a recommendation on the direction the project should take to ensure there are no overflows into the Brunswick River due to stormwater ingress.

3.0 SECTION 1: Project Element Review**3.1 Overall Project Coordination**

5 The majority of works incorporated in the Integrated Strategy have been completed but some work remains outstanding. For the public infrastructure, all mains and 77 % of the sidelines have been CCTV'd with only areas in catchment 4001 yet to be completed. An iterative process has been necessary because it is not possible to identify all defects with CCTV technology through one inspection.

10

Defect generation is a dynamic occurrence with development; tree root ingress and age deterioration all contributing to the generation of new defects. One area of concern is the sewer relining applied to some mains and manholes in 2000/01 is now failing. A programme has therefore been developed to re inspect areas previously done. This should be considered normal sewerage operations and maintenance for Mullumbimby.

15

The remaining CCTV work and repairs are being completed in the 2010/11 year as part of the budget allocation in the current Management Plan. The private asset inspections will also need to be continued for the foreseeable future. This can be completed with the budget allocation and in association with routine maintenance and operational work. The age, state and ground conditions of the private sewers mean this is a recommended function for the Mullumbimby sewerage system.

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25 The total funds approved for the Mullumbimby Inflow and Infiltration Integrated Strategy were \$500,000 per year for three years. In total \$1,408,870 was spent over the three years. Part of this expenditure has included the procurement of CCTV technology; data collection technology; switchboard technology and the training of operational staff in its use.

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3.2 Data Collection and Analysis

In March 2008 the new telemetry SCX Data monitors were installed into Sewer Pumps Stations 4001, 4002, 4003, 4004 and 4005. These monitors provide inflow; outflow; well heights and rainfall data. They are incorporated within Council's overall telemetry system. In addition, flow monitors were installed at the Palm Park and Mill Street overflow points.

35

Unfortunately, the Palm Park monitor was vandalised and the radio unit and antenna were stolen. Prior to this the respective pump station collection wells were calibrated so that the level at which the pump stations overflow was verified on the telemetry.

40

In 2009, using data gained from the SCADA system and the asset management data, a H2O Map Computerised Sewer Model for the Mullumbimby sewerage system was established. This model can be used to provide a measure of the system response to various rainfall events with the current sewerage system and again with the upgraded sewerage system. The results of this modelling are shown in Table 1 below.

45

50 The following points need to be stressed when using this data

- The model is an estimation based on an assumed unit Hydrograph. The results cannot be considered definitive but can be used to compare scenarios and provide a qualitative indication of system response.

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- The figures in Table 1 are flows over a three day period (to derive average daily flow, divide the figures in Table 1 by three)

Table 1

H2O Map Model of Mullumbimby Sewerage System Before and After Upgrade for Several Rainfall Events

Scenario / Parameter	DWF (No Storm)		1 in 2 year storm of 1 hour duration		1 in 2 year storm of 24 hours duration		1 in 5 year storm of 1 hour duration		1 in 5 year storm of 24 hours duration		1 in 20 year storm of 1 hour duration		1 in 20 year storm of 24 hours duration	
Rain Fall (mm)	0		50		178		64		246		83		344	
YEAR	2010	2015*	2010	2015*	2010	2015*	2010	2015*	2010	2015*	2010	2015*	2010	2015*
3 Day System Inflow (ML)	3	3	9	8	19	19	9	9	25	26	11	11	34	34
3 Day STP Inflow (ML)	3	3	8	8	18	19	9	9	21	24	10	11	25	29
3 Day Reticulation Overflow (ML)	0	0	0	0	1	0	0	0	4	1	0	0	9	5

Notes:

- 2015* is the Mullumbimby Sewerage System with an allowance for development in accordance with current plans
- The rainfall events modelled are:
No rainfall
1 in 2 year rainfall event of 1 hour duration (50mm)
1 in 2 year rainfall event of 24 hours duration (178mm)
1 in 5 year rainfall event of 1 hour duration (64mm)
1 in 5 year rainfall event of 24 hours duration (246mm)
1 in 20 year rainfall event of 1 hour duration (83mm)
1 in 20 year rainfall event of 24 hours duration (344mm)

Observations from the modelling

- The existing sewerage system overflows for all rainfall events over the 1 in 2 year event (50mm in 1 hour).
- The upgraded system will overflow in the 1 in 20 year event of 24 hours duration with only a nominal overflow in the 1 in 5 year event of 24 hours duration.
- The model indicates that there will be no overflows at the Mill Street and Palm Park overflow points but rather will occur through manholes due to the hydraulic grade line at these locations. There will therefore be no direct wet weather overflow into the Brunswick River.
- The quantum of flow to the new STP is significantly below the design wet weather maximum for all events (the maximum 3 day flow predicted is 29 ML which gives a daily flow average of 9.7 ML. The design wet weather maximum flow the STP can fully treat in one day is 22.04 ML)
- The transfer pump station 4000 is not required to operate at its capacity during these peak flow days.

Based on the modelling it could therefore be concluded that once the upgraded sewerage system is commissioned, there will be no wet weather overflows into the Brunswick River and the new STP will have the capacity to fully treat all wet weather flows received at the plant.

3.3 Public Sewerage Infrastructure Repairs

Work on the public sewerage system has been an iterative approach with work being undertaken on the entire reticulation system in catchments 4001; 4002 and 4003a

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and b. The camera and repair of sidelines (sewer lines from the sewer mains to the property boundary shafts) was targeted.

5 CCTV footage prepared under a contract undertaken in 2001 was initially used to identify repairs to the sewer mains. An in house capability to undertake pipeline inspections with Council's own personnel and CCTV equipment has been developed during the course of this project. These reinspections have been necessary as new defects were identified mainly due to tree root ingress.

10 There has been no evidence found that the sewer mains and pipe joints are a systemic cause of stormwater inflow. Only four instances have been identified over the 3 years of this strategy that required a sewer mains repair. Refer Photographs 1 - 4 below of some of the deep mains CCTV'd that highlight the generally good state of Council's sewer mains.

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Photograph 1

AP7 to AP6-tree root bung inside a 300mm gravity main



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Photograph 2

AP7 to AP6- Good General condition of the 300mm gravity main



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Photograph 3

AP14 to AP13-Good General condition of the 300mm gravity main in 3A catchment



5 Photograph 4

AT1 to AP13 - 150mm Gravity Main General Condition



- 10 Apart from the four isolated single source defects located in the mains, the defects in the public infrastructure have been located in the sideline connections to the properties. An area of particular weakness has been found to be the connections of these sidelines to the mains.
- 15 There are 703 property connections. Inspections have been done on 543 and of these, there have been defects in 332 connections – 61% of the assets have had some form of defect to permit stormwater ingress. The repairs have varied from full sideline replacements to replacement of the boundary shaft. Refer to Photographs 5 to 10 below for some typical defects encountered.

20

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Photograph 5
Stuart Street cracked pipe



5 Photograph 6
AP14 to AP13-Dislodged joint + Infiltration & tree roots in a 150mm house connection



10 Photograph 7
New City Road crack where BS Connects to Main



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Photograph 8
150mm house connection with tree root infiltration



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Photograph 9
Jubilee Avenue leak at joint on riser



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Photograph 10
Cedar Road broken bend at bottom of shaft



Repair work in catchments 4003a and b is ongoing and both CCTV and repair work in catchment 4001.

3.4 Private Sewerage Infrastructure Repairs

5

Overflow Relief Gully "Pop Tops" were installed throughout catchment 4002 during November and December 2007.

Inspections of the private sewerage infrastructure commenced in February 2008.

10 The process has been as follows:

- enter the property;
- undertake a physical above ground inspection of the plumbing system;
- undertake a CCTV inspection of the underground pipes and fittings;
- 15 ▪ identify defects (note it cannot be guaranteed that all defects will be identified as in some cases a defect is not noticeable unless it is raining at the time);
- send the property owner a letter advising of defects found and requesting repairs to be undertaken;
- if repairs not done, a follow up letter advising repairs must be done within 28
- 20 days;
- if repairs not done a follow up letter with a quote for Council to effect the repairs;
- once repairs done, a follow up inspection undertaken by Council.

In total, there are 766 properties in catchments 4001, 4002 and 4003a and b. Since

25 February 2008, 704 properties have been inspected. The results are:

Week Ending 30/07/10		
Total Inspections	704	
Defective	321	46%
Repaired	239	74%
Repairs in progress	34	11%
No response	48	15%

A critical point from this data is that 46% of the properties have defects that permit the ingress of stormwater. This statistic gives credibility to the statement that private

30

Another key point to arise from this part of the project is that it has not been possible to fully identify all defects in a plumbing system with one inspection. This has

35

necessarily become an iterative process whereby ongoing inspections are required, preferably under wet conditions although not too wet to prevent CCTV work.

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Photograph 11

Stormwater Collection System Feeding directly to Sewer System Stuart St



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Photograph 12

Stormwater pipe Discharging to Sewer System Dalley St (1)



10

Photograph 13

Stormwater pipe Discharging to Sewer System Dalley St (2)



5

Photograph 14

Broken Fitting Private Infrastructure



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3.5 Stormwater

15 The Stormwater crew commenced work in November 2007. The crew consists of two men, a contract excavator and a 3 tonne tipper truck. In total the following work has been done on the stormwater system.

- Removal of in excess of 50 tonnes of rubbish from the open drains.
 - Rehabilitation of 19,800 metres of stormwater drains across catchments 4001; 4002 and 4003a and b.
- 20

- Re established 2.2 kilometres of open drains to the Brunswick River and Kings Creek.
- Refurbishment of culvert crossings.
- Flushing of 500 metres of stormwater pipes.

5

This work has been very successful in getting the Mullumbimby stormwater system operational again. The extent of localised flooding during large rainfall events has been all but removed. This prevents the stormwater finding an alternative path into the sewerage system.

10

There have been several letters of commendation received from the residents of Mullumbimby for this work in particular noting how the stormwater no longer ponds around their homes.

15

3.6 Community Education

The focus of the communication strategy has been on direct contact with individual householders. This was possible because the large majority of houses (and associated private sewers) were individually inspected allowing direct communication on the project objectives and issues with the residents of Mullumbimby. In addition, there was follow up with many of the owners of properties with defects allowing further information to be provided on the problem of stormwater ingress into the Mullumbimby sewers. Through the process of letters, inspections and direct dialogue there has been a high awareness in the community of the project and also a high level of cooperation.

25

In addition to the inspections on the sewer system, considerable work has been completed in maintaining and upgrading the stormwater system. This work has brought the crews into direct contact with many residents and allowed further communication and promotion of the integrated strategy aims. For many residents it was an opportunity to understand first hand the relationship between ineffective stormwater drains that increase the level of the water table and ultimately increase the amount of stormwater ingress into the sewerage system.

30

To complement the process of direct communication, an information brochure was produced and circulated to residents.

35

During the implementation of the strategy several articles and advertorials were produced on the Brunswick Area Sewerage Augmentation Scheme and this information also included discussion on the associated Mullumbimby Integrated Inflow and Infiltration reduction strategy. This information has also been made available on the web.

40

Formal reporting on the progress and outcomes of the implementation of the strategy has occurred via annual reports to Council and this information has also been available to the community.

45

3.7 Pump Station Review and Upgrade

The review was completed in October 2007. The recommendations in part were:

50

- Connect 4001 rising main into the delivery main to bypass PS4003.
- Upgrade the switchboard at PS4003 to allow parallel pumping during high flows.

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Both of these recommendations are consistent with the Brunswick Area Sewage Augmentation Scheme and were completed in 2008. In addition, a bypass pipeline was installed at the Mullumbimby STP from the sedimentation tanks to the tertiary pond. This allows controlled overflow of the increased flow delivered to the STP during high flows. This ensures that the diluted sewage storm flows receive primary treatment during storm events.

Constraints in the 4003 rising main prevented pumping station 4001 pumping directly to the STP concurrently with 4003 due to excessive head loss in the pipeline. The final pump station configuration will therefore be implemented with completion of construction of the Brunswick Area Sewerage Augmentation Scheme. This is currently expected to occur in of October 2010. This is when the flows will be diverted from the existing Mullumbimby and Brunswick Heads STPs to the new Brunswick Valley STP at Vallances Road and pump station 4000 will become operational.

The new pumping configuration will then become:

- PS4001 will pump direct to PS4000 (and not through PS4003)
- PS4002 will pump direct to PS4000 (and not through catchment 4003a)
- The emergency overflow storage of 350 kilolitres will be operational

The advantages of this configuration are:

- PS4000 will have a single pump capacity of 167 litres/second, and the ability to have two pumps pumping in parallel. This provides a pumping capacity well in excess of four times the existing 4003 pump station capacity.
- Magnetic flow meters have been installed to measure the flow from PS4000 and the total flow being received at the STP. This will provide more accurate flow data than the current monitoring system which uses ultrasonic technology.
- Once the changeover occurs, work will commence to convert PS4003 from a dry well to a wet well configuration. This will provide an estimated additional 150 kilolitres of wet weather storage.

As a practical example of what will happen in the future, it is useful to consider the largest flow event of the past 12 months in both Brunswick Heads and Mullumbimby. It is necessary to look at both areas as it is the combined flows that will be received at the new treatment facility.

The largest flow event occurred on the 7/2/2010. The Mullumbimby system, including overflows, recorded 12.373 ML and Brunswick Heads recorded 2.172 ML – giving a combined total flow of 14.545 ML. This is comfortably below the design treatment capacity of 22 ML/day. The actual combined flow also equates to eight times the current combined average dry weather flow.

Therefore on the largest storm event during the past 12 months which was close to a 1 in 20 year event, there would have been no overflows and all flows would have been fully treated in the upgraded sewerage system.

4.0 SECTION 2: Project Evaluation

4.1 Key Performance Indicators Overview

5 The adopted Performance Indicators for the project are detailed in Table 1 :

Table 1
PRP 1 Project Key Performance Indicators

Key Performance Indicator	2007	2008	2009
Maximum Ratio Wet Weather Flow (Daily) / Dry Weather flow (Daily)	12	9	7
Number of Collection System Overflow Events to the Brunswick per year (for a 60 mm rainfall event)	0	0	0
Number of Collection System Overflow Events to the Brunswick per year (for a 85 mm event)		0	0

10

The Average Dry Weather Flow is taken as 953 kL/day; and the years referred to in Table 1 are DECC licence years commencing 27 April and finishing 26 April. Therefore:

15 2007 refers to 27 April 2007 to 26 April 2008
 2008 refers to 27 April 2008 to 26 April 2009
 2009 refers to 27 April 2009 to 26 April 2010

20 The raw flow data is contained in Appendix 1. For 2005 to 2007 the data listed is for days with rainfall above 3 mm commencing April 2005. Days with no rain are included when there was an overflow occurring due to ongoing stormwater infiltration following the rainfall event. Years 2008 to 2010 has all days. The data recorded is:

- 25 ■ Date
 ■ Flow received at STP
 ■ Rainfall
 ■ Overflow Mill St
 ■ Overflow Palm Park (Estimated)
 ■ Ratio Peak Wet Weather Flow / Average Dry Weather Flow

30

The actual Key Performance Indicators calculated for each of the three years are:

Table 2
Actual Key Performance Indicators
(Derived from Data in Appendix 1)

35

	Max PWWF/ADWF	No of Overflows for <60mm Rainfall	No of Overflows for <85mm Rainfall
2007/08	14.0	7	8
2008/09	12.4	4	9
2009/10	12.4	3	4

Other significant data that can be taken from Appendix 1 is shown in Table 3

Table 3
Other Significant Data

40

Indicator	2007/08	2008/09	2009/10
Total Rainfall Recorded (mm)	2,198	2,035	1,795
No of Days of Rainfall	168	159	141
Total Yearly System Flow	637,984	635,064	545,076
Total No of Overflow Events	8	11	7
Total Overflow Volume (kL)	39,476	22,128	28,056
Maximum Ratio Peak Wet Weather Flow / Average Dry Weather Flow	14.0	12.4	12.4

The project has not achieved any of the stated KPI targets. A discussion of each KPI is provided below.

4.2 Maximum Ratio Wet Weather Flow (Daily) / Dry Weather flow (Daily)

This ratio has decreased over the life of the project from 14.0 to 12.4. This is a modest decrease and it is doubtful that the ratio can ever be reduced to the currently discussed 5 and 7 times. The report undertaken by Aurecon last year demonstrates that for the Mullumbimby system characteristics, higher peak wet weather ratios are to be expected (refer Aurecon report *Mullumbimby Inflow Infiltration Review* dated 11 September 2009 Section 3.3).

High levels of stormwater ingress will always be undesirable because it leads to higher energy costs associated with pumping and treatment, but the ratio of peak wet weather flow to average dry weather flow cannot be used as the measure of system capacity provided:

- The system has sufficient pumping capacity to transfer flows to the treatment facility;
- The system has sufficient treatment (and storage) capacity to adequately treat the transferred flows; and
- The system is adequately monitored and maintained to prevent peak wet weather flows from increasing.

Completion of the Brunswick Area Sewage Augmentation Scheme (BASAS) and ongoing maintenance work will ensure the Brunswick valley (Mullumbimby and Brunswick Heads) sewerage system satisfies these three criteria.

Completion of the work in catchment 4001 and continuing with the private asset defect identification and repair program is recommended to continue the process of decreasing the volume of stormwater ingress.

4.3 Overflow Events to the Brunswick River

This KPI was split into two – one for 60 mm rainfall events and one for 85 mm rainfall events. The project failed to reach the nominated targets. It should be noted however that overflows into the Brunswick River have decreased over the life of the project. This is a positive result.

If this fact is also viewed with the other data of reduced total flows in the system by 15% (albeit on reduced rainfall); and total overflow volume reduction of 39%, then it can be argued the work done to date is having a measurable and positive effect.

It should also be noted that of the seven overflow events in the past year,

- Event 22/5/2009 – there was a power failure in Mullumbimby that increased the overflow volume.
- Event 9/11/2009 – there was only one pump operating at pump station 4003 due to a pump failure. This increased the overflow volume.
- Event 7/2/2010 – there was 305mm of rain recorded at the PS4003 rain gauge in a 12 hour period. This would put the event close to the 1 in 20 year ARI category.

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.The model projects a three day system flow of approximately 30 ML – which is what was received.

5 If the power blackouts and pump failures did not occur, the overflow volume reduction would have been greater. This also highlights the importance of completing the project element of pump station reconfiguration. This will be finalised under the Brunswick Sewage Augmentation Scheme in October 2010 when PS4000 becomes operational and the system flows are transferred to the new treatment facility.

10 When the BASAS is completed and the new pumping arrangements are in place, the overflows into the Brunswick River will cease under normal operating conditions and for all rainfall events up to the 1 in 20 ARI event and possibly even above.

15 It is expected that dry weather flows will increase with growth and additional development in the catchment. This growth in combination with wet weather flows could cause the treatment capacity to be compromised sooner than the 20 year design life. This risk can be mitigated and is discussed further in Section 3 below.

20

5.0 SECTION 3: Project Alternatives and Recommendations

Following on from the June 2008 Annual Review and the September 2009 Aurecon reports, there are only two practical project configurations to reduce the Mullumbimby inflow and infiltration with the objective of having no overflows into the Brunswick River. These are:

- Low Pressure Pump System – retrofitting low pressure pump units and associated pipework in place of the current gravity sewer system.
- Gravity Sewerage System Maintenance – continue with the identification and repair of defects in the existing gravity system and provide adequate storage for peak wet weather flows.

These configurations are discussed separately below.

5.1 Low Pressure Pump System

The concept that a Low Pressure Pump System (LPPS) will remove inflow and infiltration of stormwater into the sewerage system needs to be discussed further as there is now additional data on the performance of this system. The Mullumbimby Public School installed a private pump station earlier this year which essentially acts as a LPPS. The effluent from the site collects in the pump well and is pumped off site.

In June of this year a magnetic flow meter was installed on the discharge line to monitor the flows being discharged from the site. The data from this monitoring is shown in Table 4 below.

Table 4
Flow Data Mullumbimby Public School

DATE	TIME	SEWER METER (kL)	SEWER DISCHARGED	RAINFALL (mm)	WATER METER #742029 (kL)	WATER METER #799736 (kL)	WATER USED (kL) (Daily Average from Rates 1.0313 kL/day)
12-Jun-10	15:15	5.1					
13/06/2010	16:00	6.452	1.352	0.4			
14/06/2010	8:00	7.658	1.206	3.4			
14/06/2010	16:00	7.658	0	0.2			
15/06/2010	9:00	8.745	1.087	2.2			
15/06/2010	17:00	10.465	1.72	0			
16/06/2010	16:30	12.245	1.78	0			
17/06/2010	16:00	14.6	2.355	0			
18/06/2010	16:30	16.41	1.81	0			
21/06/2010	8:00	18.145	1.735	0.4			
22/06/2010	8:00	20.515	2.37	0			
22/06/2010	16:30	21.645	1.13	0			
23/06/2010	8:00	22.781	1.136	10.2	7420.29	7997.36	
23/06/2010	16:00	24.603	1.822	12.2	7420.49	7997.92	0.76
24/06/2010	8:15	29.504	4.901	10.4	7420.51	7997.96	0.06
24/06/2010	16:30	33.127	3.623	0	7420.7	7998.64	0.87
25/06/2010	15:00	39.735	6.608	0	7421.14	7999.26	1.06
26/06/2010	16:00	44.573	4.838	0	7421.21	7999.45	0.26
27/06/2010	14:00	47.546	2.973	0.6	7421.21	7999.46	0.01
11/07/2010	pm	95.103	47.557	43	7423.18	8006.88	9.39
17/07/2010	pm	111.778	16.675	0	7423.54	8008.22	1.7
23/07/2010	16:00	127.468	15.69	0	7433.1	8019.63	20.97
24/07/2010	14:00	128.622	1.154	6.2	7433.11	8019.74	0.12
27/07/2010	15:30	134.635	6.013	6	7434.7	8023.7	5.55
28/07/2010	14:00	147.173	12.538	85.2			
29/07/2010	16:00	166.863	19.69	0	7435.05	8024.75	1.4
31/07/2010	14:30	188.501	21.638	0	7436.27	8026.12	2.59

This data provides a clear example of the risks associated with implementing a LPPS. The Mullumbimby Public School, during the rainfall event on 28/7/2010, discharged in excess of 20 times its average dry weather flow. The school has

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significant amounts of rainfall entering its drainage system both as inflow and as infiltration.

- 5 The pump system is more efficient than the gravity sewer system at removing the stormwater inflow off the site and into the public sewerage system. Therefore, unless all the house drainage systems up stream of the pump unit are free of defects, installation of LPPS units on a large scale in Mullumbimby could increase the amount of stormwater entering the system in the short to medium term. With any LPPS project it would be necessary to continue with the identification and repair of private property drainage defects and this would need to continue for years to keep the system under control. It is important that the implementation of a LPPS be considered in the context of the need to also ensure the integrity of the upstream private sewers.
- 10
- 15 Another aspect of the LPPS that requires discussion is the cost. In the June 2008 report the costs to fit LPPS to catchments 4002 and 4003a only, and alternatively, retrofit to catchments 4002, 4003a, 4003b and 4001 were broadly estimated to be:

Project Element	Cost 4002 & 4003a	Cost 4002; 4003a; 4003b; 4001
Supply and Install Low Pressure System	\$2,900,000	\$12,750,000
Project Initiation and Planning Costs	\$200,000	\$200,000
Project Management	\$250,000	\$400,000
NPV Saving on Pump Station Operation	\$300,000	\$300,000
Contingency	\$500,000	\$500,000
Current Work on 4001 and 4003b gravity system	\$200,000	
Total Project Costs Low Pressure Pump System	\$4,350,000	\$14,150,000

- 20 Implementation of an expanded LPPS will also involve unquantified costs such as installing LPPS units in the confined central business district; redesigning pump station 4006 to allow discharge into pump station 4001/4000 and not into the extremity of 4001 gravity system as it currently does.
- 25 The retrofitting of a Low Pressure Pumping System (LPPS) to the Mullumbimby sewerage reticulation system would have a high capital cost and will not eliminate stormwater inflow and infiltration because defects in the upstream private sewers will continue to be a problem and source of stormwater ingress. For these reasons and given the capacity of the BASAS, implementation of a LPPS is not recommended.

30

5.2 Gravity Sewerage System Maintenance

- 35 The current project has decreased inflows into the system to a level that, once pump station 4000 is operational, there will be no direct overflows into the Brunswick River for any storm event less than a 1 in 20 year ARI and probably even greater. The current gravity system repair work is continuing and is expected to be largely completed by 2010. It is expected this work will reduce storm water inflow into the sewerage system even further. Thereafter it will be necessary to continue with maintenance of the system in conjunction with normal operational activities. This will
- 40 keep stormwater ingress into the sewerage system to a manageable level.

- 45 Once pump station 4000 is operational the system will have sufficient capacity to pump all flows to the treatment plant for the design life of the plant. Once the treatment facility is commissioned, the facility will have capacity to treat up to 22.04 ML per day.

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5.2 - ATTACHMENT 1

As stated in Section 2 above, the Mullumbimby sewer system will therefore be in a manageable state with no overflows occurring.

5 There is some conjecture that the treatment capacity will be compromised at some future date. The June 2008 annual review projected this date would be 2017 if flows could not be reduced below 14 times ADWF in Mullumbimby. The flows currently are at 12.4 times and falling, therefore this projection could be extended to 2020 or beyond.

10 There is significant capacity in the BASAS but it is also possible to provide further contingency and ensure all flows to the STP are treated to licence quality by constructing additional emergency storage at the new Vallances road treatment facility. This could be achieved by constructing the already scoped BASAS project elements of constructed wetlands and the effluent storage dam. These elements
15 have a combined storage capacity of 135 ML and would provide enormous flexibility to the system including enhancement of reuse capacity; and capture and treatment of storm flows.

20 The effluent storage dam could be used to store treated effluent in the dry months for use in reuse schemes; and lowered/ emptied in the wet months for the contingency use of capturing excess storm flows which could then be recycled through the plant for treatment. The effluent storage dam capacity is 55 ML.

25 The wetlands were designed as three cells covering 10 hectares with an operating depth up to 800mm. This gives a maximum storage capacity of 80 ML. The major storm events and the associated flows that would need to be bypassed would be highly diluted with stormwater. It is possible the wetlands could further treat these flows without using the STP biological processes.

30 The effluent storage dam and the wetlands were part of the original approved project scope and are already partially designed. They were excluded from the project scope due to financial constraints. The total cost is estimated to be \$4.5 million – similar to the limited Low Pressure Pump System (catchments 4002 and 4003b) and less than half the cost of the full Low Pressure Pump System (catchments 4001;
35 4002; 4003a and b).

40 This configuration would have very little risk in performing to operating licence requirements and providing sufficient contingency to capture any future unforeseen excess flows for subsequent treatment. Further investigation of this option is recommended.

5.3 Recommendations

45 The most practical approach to the project is to complete the work in 4001 and 4003b; continue with inspection of private assets; implement routine investigation and repairs for both public and private infrastructure in normal operational and maintenance activities; and investigate further the implementation of the effluent storage dam and the constructed wetlands at the Vallances road site as storm flow storages and/or treatment. This configuration will:

- 50
- Cost less than a full LPPS system
 - Have no untreated overflows to the Brunswick River for the design life of the BASAS for any event less than a 1 in 20 year ARI and possibly more under normal operating conditions
- 55

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This configuration with additional storage capacity has the following advantages:

- It is already part of the approved BASAS scheme
 - Provides increased reuse capacity
 - 5 ▪ Provides increased environmental outcomes in wetland operation
 - Provides increased effluent polishing with the wetlands
 - Design documents already exist and the project could be considered “shovel ready”.
- 10 Ongoing maintenance of the existing gravity sewerage system with the potential implementation of the effluent storage dam and constructed wetlands at the Vallances road site would further increase system storage capacity and improve integrated effluent management outcomes. It would also provide sustainable benefits to the community and the environment and will further enhance the award winning
- 15 Brunswick Area Sewage Augmentation Scheme.

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APPENDIX 1

Flow Data

DATE	STP INFLOW (KL)	RAINFALL (mm)	MILL ST OVERFLOW (KL)	PALM PARK OVERFLOW (KL)	Total Flow (KL)	RATIO PWWF / ADWF	Ratio>12	Ratio>9	Ratio>7	KPI 60mm	KPI 85mm
27/04/2005	1005	17			1005	1.1	0	0	0	0	0
28/04/2005	1960	18.5			1960	2.1	0	0	0	0	0
5/05/2005	1751	26			1751	1.8	0	0	0	0	0
6/05/2005	2854	10			2854	3.0	0	0	0	0	0
7/05/2005	1586	6.5			1586	1.7	0	0	0	0	0
8/05/2005	2016	18			2016	2.1	0	0	0	0	0
9/05/2005	5393	30.5			5393	5.7	0	0	0	0	0
13/05/2005	2830	7.5			2830	3.0	0	0	0	0	0
21/05/2005	1423	16			1423	1.5	0	0	0	0	0
7/06/2005	980	5			980	1.0	0	0	0	0	0
8/06/2005	962	6.5			962	1.0	0	0	0	0	0
9/06/2005	1233	3			1233	1.3	0	0	0	0	0
15/06/2005	635	8			635	0.7	0	0	0	0	0
27/06/2005	1303	15.5			1303	1.4	0	0	0	0	0
28/06/2005	4121	52			4121	4.3	0	0	0	0	0
29/06/2005	7898	137.5	3000		10898	11.4	0	1	1	0	0
30/06/2005	9843	268.5	3000		12843	13.5	1	1	1		
1/07/2005	8119	133.5	3000		11119	11.7	0	1	1		
2/07/2005	6566	2	3000		9566	10.0	0	1	1		
20/07/2005	1440	18.5			1440	1.5	0	0	0	0	0
21/07/2005	1923	9.5			1923	2.0	0	0	0	0	0
22/07/2005	1950	3			1950	2.0	0	0	0	0	0
13/08/2005	858	3			858	0.9	0	0	0	0	0
14/08/2005	1101	10			1101	1.2	0	0	0	0	0
28/08/2005	844	4			844	0.9	0	0	0	0	0
29/08/2005	747	7			747	0.8	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

30/08/2005	930	8.5			930	1.0	0	0	0	0	0
5/09/2005	880	5			880	0.9	0	0	0	0	0
17/09/2005	989	9.5			989	1.0	0	0	0	0	0
28/09/2005	791	5			791	0.8	0	0	0	0	0
16/10/2005	727	7.5			727	0.8	0	0	0	0	0
20/10/2005	602	3			602	0.6	0	0	0	0	0
21/10/2005	633	8			633	0.7	0	0	0	0	0
22/10/2005	1123	20			1123	1.2	0	0	0	0	0
25/10/2005	1334	27			1334	1.4	0	0	0	0	0
28/10/2005	1641	27			1641	1.7	0	0	0	0	0
2/11/2005	814	3			814	0.9	0	0	0	0	0
6/11/2005	823	5			823	0.9	0	0	0	0	0
7/11/2005	870	5			870	0.9	0	0	0	0	0
18/11/2005	768	7			768	0.8	0	0	0	0	0
24/11/2005	1520	23			1520	1.6	0	0	0	0	0
25/11/2005	2471	52			2471	2.6	0	0	0	0	0
26/11/2005	5193	11			5193	5.4	0	0	0	0	0
28/11/2005	3926	22			3926	4.1	0	0	0	0	0
29/11/2005	3926	22			3926	4.1	0	0	0	0	0
2/12/2005	1709	10			1709	1.8	0	0	0	0	0
3/12/2005	1763	5			1763	1.8	0	0	0	0	0
4/12/2005	4114	31			4114	4.3	0	0	0	0	0
9/12/2005	2446	20			2446	2.6	0	0	0	0	0
14/12/2005	1044	4			1044	1.1	0	0	0	0	0
17/12/2005	1909	31			1909	2.0	0	0	0	0	0
4/01/2006	877	14			877	0.9	0	0	0	0	0
6/01/2006	2040	45			2040	2.1	0	0	0	0	0
7/01/2006	2287	9			2287	2.4	0	0	0	0	0
8/01/2006	2024	14			2024	2.1	0	0	0	0	0
9/01/2006	4448	39.5			4448	4.7	0	0	0	0	0
10/01/2006	5938	33			5938	6.2	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

11/01/2006	6059	10			6059	6.4	0	0	0	0	0
19/01/2006	3778	220	393		4171	4.4	0	0	0		
20/01/2006	9253	115	3557	1196	14006	14.7	1	1	1		
21/01/2006	8777	78	3024	442	12243	12.8	1	1	1		
22/01/2006	7024	0	2390		9414	9.9	0	1	1	0	1
5/02/2006	1386	23.5			1386	1.5	0	0	0	0	0
13/02/2006	2818	33			2818	3.0	0	0	0	0	0
16/02/2006	4222	36	20		4242	4.5	0	0	0	1	1
23/02/2006	1226	12			1226	1.3	0	0	0	0	0
25/02/2006	1481	12			1481	1.6	0	0	0	0	0
26/02/2006	1260	4			1260	1.3	0	0	0	0	0
28/02/2006	3416	38			3416	3.6	0	0	0	0	0
1/03/2006	2951	3			2951	3.1	0	0	0	0	0
3/03/2006	2985	18			2985	3.1	0	0	0	0	0
4/03/2006	6928	107			6928	7.3	0	0	1	0	0
5/03/2006	7986	38			7986	8.4	0	0	1	0	0
6/03/2006	10059	75			10059	10.6	0	1	1	0	0
23/03/2006	1283	15			1283	1.3	0	0	0	0	0
24/03/2006	3569	39			3569	3.7	0	0	0	0	0
25/03/2006	4439	22			4439	4.7	0	0	0	0	0
26/03/2006	3120	5			3120	3.3	0	0	0	0	0
1/04/2006	1788	13			1788	1.9	0	0	0	0	0
5/04/2006	1696	25			1696	1.8	0	0	0	0	0
6/04/2006	4049	20			4049	4.2	0	0	0	0	0
16/04/2006	2361	78	832		3193	3.4	0	0	0	0	1
17/04/2006	7964	31			7964	8.4	0	0	1	0	0
23/03/1900		2433	22216	1638	Total 2006		3	8	11	1	4
1/05/2006	1355	10			1355	1.4	0	0	0	0	0
16/05/2006	2930	33			2930	3.1	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

17/05/2006	1277	3.5			1277	1.3	0	0	0	0	0
11/06/2006	1090	13.5			1090	1.1	0	0	0	0	0
14/06/2006	934	4			934	1.0	0	0	0	0	0
18/06/2006	1092	16			1092	1.1	0	0	0	0	0
19/06/2006	1074	4			1074	1.1	0	0	0	0	0
20/06/2006	1093	5			1093	1.1	0	0	0	0	0
21/06/2006	4796	46			4796	5.0	0	0	0	0	0
22/06/2006	5585	15			5585	5.9	0	0	0	0	0
23/06/2006	4595	24			4595	4.8	0	0	0	0	0
24/06/2006	6496	15			6496	6.8	0	0	0	0	0
25/06/2006	6369	17			6369	6.7	0	0	0	0	0
30/06/2006	1504	4			1504	1.6	0	0	0	0	0
5/07/2006	1399	7			1399	1.5	0	0	0	0	0
15/07/2006	999	4			999	1.0	0	0	0	0	0
16/07/2006	1105	8			1105	1.2	0	0	0	0	0
22/07/2006	942	13			942	1.0	0	0	0	0	0
25/07/2006	1188	8			1188	1.2	0	0	0	0	0
26/07/2006	2750	16			2750	2.9	0	0	0	0	0
28/07/2006	1755	9			1755	1.8	0	0	0	0	0
29/07/2006	4894	25			4894	5.1	0	0	0	0	0
6/08/2006	1233	5.5			1233	1.3	0	0	0	0	0
28/08/2006	925	7			925	1.0	0	0	0	0	0
29/08/2006	1395	19			1395	1.5	0	0	0	0	0
30/08/2006	5219	67			5219	5.5	0	0	0	0	0
31/08/2006	6729	38			6729	7.1	0	0	1	0	0
1/09/2006	6276	14			6276	6.6	0	0	0	0	0
2/09/2006	4389	7.5			4389	4.6	0	0	0	0	0
5/09/2006	1951	10.5			1951	2.0	0	0	0	0	0
11/09/2006	2543	25			2543	2.7	0	0	0	0	0
12/09/2006	2666	11			2666	2.8	0	0	0	0	0
13/09/2006	3304	10			3304	3.5	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

28/09/2006	2256	24			2256	2.4	0	0	0	0	0
17/10/2006	766	11			766	0.8	0	0	0	0	0
22/10/2006	724	4.5			724	0.8	0	0	0	0	0
30/10/2006	932	4			932	1.0	0	0	0	0	0
5/11/2006	1381	23.5			1381	1.4	0	0	0	0	0
9/11/2006	1455	27.5			1455	1.5	0	0	0	0	0
10/11/2006	3394	25.5			3394	3.6	0	0	0	0	0
28/11/2006	610	3.5			610	0.6	0	0	0	0	0
30/11/2006	935	10			935	1.0	0	0	0	0	0
4/12/2006	1125	17.5			1125	1.2	0	0	0	0	0
16/12/2006	849	6			849	0.9	0	0	0	0	0
17/12/2006	1145	21.5			1145	1.2	0	0	0	0	0
22/12/2006	1061	10			1061	1.1	0	0	0	0	0
27/12/2006	814	4			814	0.9	0	0	0	0	0
3/01/2007	1029	15			1029	1.1	0	0	0	0	0
4/01/2007	1105	9.5			1105	1.2	0	0	0	0	0
5/01/2007	1594	19			1594	1.7	0	0	0	0	0
6/01/2007	1879	17			1879	2.0	0	0	0	0	0
9/01/2007	1416	17.5			1416	1.5	0	0	0	0	0
26/01/2007	875	16			875	0.9	0	0	0	0	0
27/01/2007	828	4			828	0.9	0	0	0	0	0
12/02/2007	871	9.5			871	0.9	0	0	0	0	0
13/02/2007	2758	58			2758	2.9	0	0	0	0	0
14/02/2007	2663	10			2663	2.8	0	0	0	0	0
15/02/2007	1339	5			1339	1.4	0	0	0	0	0
18/02/2007	892	4			892	0.9	0	0	0	0	0
19/02/2007	887	3			887	0.9	0	0	0	0	0
21/02/2007	824	6			824	0.9	0	0	0	0	0
22/02/2007	903	3			903	0.9	0	0	0	0	0
23/02/2007	860	10			860	0.9	0	0	0	0	0
24/02/2007	957	3			957	1.0	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

1/03/2007	829	3.5			829	0.9	0	0	0	0	0
2/03/2007	779	4			779	0.8	0	0	0	0	0
6/03/2007	744	4			744	0.8	0	0	0	0	0
7/03/2007	1335	18.5			1335	1.4	0	0	0	0	0
8/03/2007	1005	7			1005	1.1	0	0	0	0	0
9/03/2007	2205	25			2205	2.3	0	0	0	0	0
10/03/2007	1238	4			1238	1.3	0	0	0	0	0
14/03/2007	926	8			926	1.0	0	0	0	0	0
26/03/2007	944	8			944	1.0	0	0	0	0	0
5/04/2007	860	4			860	0.9	0	0	0	0	0
6/04/2007	887	8			887	0.9	0	0	0	0	0
7/04/2007	814	11			814	0.9	0	0	0	0	0
8/04/2007	1013	5.5			1013	1.1	0	0	0	0	0
9/04/2007	1391	20			1391	1.5	0	0	0	0	0
10/04/2007	1639	18			1639	1.7	0	0	0	0	0
19/03/1900		1065	0		Total 2006/2007		0	0	1	0	0
12/05/2007	655	7.5			655	0.7	0	0	0	0	0
14/05/2007	967	12			967	1.0	0	0	0	0	0
30/05/2007	685	4.5			685	0.7	0	0	0	0	0
6/06/2007	885	10			885	0.9	0	0	0	0	0
7/06/2007	1133	14			1133	1.2	0	0	0	0	0
24/06/2007	702	4			702	0.7	0	0	0	0	0
26/06/2007	1780	38			1780	1.9	0	0	0	0	0
27/06/2007	2856	16			2856	3.0	0	0	0	0	0
16/08/2007	598	4			598	0.6	0	0	0	0	0
20/08/2007	2299	75	2517		4816	5.1	0	0	0	0	1
21/08/2007	6087	60	3123		9210	9.7	0	1	1		
22/08/2007	6391	45	1429		7820	8.2	0	0	1		

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

23/08/2007	4628	4			4628	4.9	0	0	0	0	0
25/08/2007	1956	12			1956	2.1	0	0	0	0	0
26/08/2007	2671	5			2671	2.8	0	0	0	0	0
5/09/2007	1962	23			1962	2.1	0	0	0	0	0
6/09/2007	1483	9			1483	1.6	0	0	0	0	0
7/09/2007	1947	10			1947	2.0	0	0	0	0	0
8/09/2007	1710	4			1710	1.8	0	0	0	0	0
23/09/2007	1334	18			1334	1.4	0	0	0	0	0
9/10/2007	1783	37			1783	1.9	0	0	0	0	0
11/10/2007	1331	9			1331	1.4	0	0	0	0	0
13/10/2007	1260	5.5			1260	1.3	0	0	0	0	0
26/10/2007	1087	20			1087	1.1	0	0	0	0	0
27/10/2007	1718	18			1718	1.8	0	0	0	0	0
29/10/2007	2646	36			2646	2.8	0	0	0	0	0
1/11/2007	1418	10			1418	1.5	0	0	0	0	0
3/11/2007	2973	25			2973	3.1	0	0	0	0	0
9/11/2007	4743	45.4	2066		6809	7.1	0	0	1		
10/11/2007	5884	24.4	293		6177	6.5	0	0	0		
11/11/2007	7034	71.4	6267		13301	14.0	1	1	1		
12/11/2007	6316	11.6	1824		8140	8.5	0	0	1	1	1
24/11/2007	1218	6.5			1218	1.3	0	0	0	0	0
26/11/2007	946	5			946	1.0	0	0	0	0	0
27/11/2007	1069	5			1069	1.1	0	0	0	0	0
29/11/2007	998	4			998	1.0	0	0	0	0	0
6/12/2007	1240	17			1240	1.3	0	0	0	0	0
7/12/2007	912	2			912	1.0	0	0	0	0	0
8/12/2007	904	3			904	0.9	0	0	0	0	0
9/12/2007	1063	0			1063	1.1	0	0	0	0	0
10/12/2007	2262	39			2262	2.4	0	0	0	0	0
11/12/2007	1534	5	0		1534	1.6	0	0	0	0	0
12/12/2007	4888	52	793		5681	6.0	0	0	0	1	1

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

13/12/2007	4497	2.5	48		4545	4.8	0	0	0		
18/12/2007	1641	9			1641	1.7	0	0	0	0	0
26/12/2007	925	11			925	1.0	0	0	0	0	0
27/12/2007	1413	10			1413	1.5	0	0	0	0	0
28/12/2007	1157	13.5			1157	1.2	0	0	0	0	0
30/12/2007	1180	4	0		1180	1.2	0	0	0	0	0
31/12/2007	1640	22	0		1640	1.7	0	0	0	0	0
1/01/2008	5720	37	1002		6722	7.1	0	0	1		
2/01/2008	6870	15	0		6870	7.2	0	0	1		
3/01/2008	4880	15	2690		7570	7.9	0	0	1		
4/01/2008	8940	153	3800		12740	13.4	1	1	1		
5/01/2008	9220	58	3950		13170	13.8	1	1	1		
6/01/2008	7190	18	750		7940	8.3	0	0	1	1	1
7/01/2008	5805	3			5805	6.1	0	0	0	0	0
9/01/2008	3373	9			3373	3.5	0	0	0	0	0
11/01/2008	2910	19	60		2970	3.1	0	0	0	1	1
12/01/2008	4980	4	0		4980	5.2	0	0	0	0	0
13/01/2008	2456	4.5			2456	2.6	0	0	0	0	0
14/01/2008	3510	7			3510	3.7	0	0	0	0	0
15/01/2008	2638	14			2638	2.8	0	0	0	0	0
16/01/2008	3680	4.5			3680	3.9	0	0	0	0	0
19/01/2008	2111	8			2111	2.2	0	0	0	0	0
21/01/2008	1795	3			1795	1.9	0	0	0	0	0
22/01/2008	1881	10			1881	2.0	0	0	0	0	0
23/01/2008	1709	1			1709	1.8	0	0	0	0	0
24/01/2008	1449	3			1449	1.5	0	0	0	0	0
25/01/2008	1631	2			1631	1.7	0	0	0	0	0
26/01/2008	1420	11.5			1420	1.5	0	0	0	0	0
30/01/2008	1250	5.5			1250	1.3	0	0	0	0	0
31/01/2008	1286	3			1286	1.3	0	0	0	0	0
3/02/2008	4720	195	1000		5720	6.0	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

4/02/2008	7360	83	4000		11360	11.9	0	1	1	0	1
5/02/2008	7270	14			7270	7.6	0	0	1	0	0
6/02/2008	6110	8			6110	6.4	0	0	0	0	0
7/02/2008	5100	14			5100	5.4	0	0	0	0	0
12/02/2008	1629	8			1629	1.7	0	0	0	0	0
13/02/2008	4464	30			4464	4.7	0	0	0	0	0
14/02/2008	4223	4			4223	4.4	0	0	0	0	0
15/02/2008	3157	4			3157	3.3	0	0	0	0	0
16/02/2008	2618	6			2618	2.7	0	0	0	0	0
17/02/2008	2524	6.5			2524	2.6	0	0	0	0	0
18/02/2008	1937	9			1937	2.0	0	0	0	0	0
19/02/2008	3187	12			3187	3.3	0	0	0	0	0
20/02/2008	3071	4			3071	3.2	0	0	0	0	0
21/02/2008	2467	3			2467	2.6	0	0	0	0	0
27/02/2008	1966	16			1966	2.1	0	0	0	0	0
29/02/2008	1645	9			1645	1.7	0	0	0	0	0
1/03/2008	1564	3			1564	1.6	0	0	0	0	0
3/03/2008	1357	5			1357	1.4	0	0	0	0	0
4/03/2008	1505	4			1505	1.6	0	0	0	0	0
6/03/2008	1177	4			1177	1.2	0	0	0	0	0
7/03/2008	1388	6.5			1388	1.5	0	0	0	0	0
17/03/2008	817	5			817	0.9	0	0	0	0	0
18/03/2008	968	7			968	1.0	0	0	0	0	0
21/03/2008	1036	3			1036	1.1	0	0	0	0	0
23/03/2008	927	3			927	1.0	0	0	0	0	0
28/03/2008	2112	26			2112	2.2	0	0	0	0	0
29/03/2008	1156	45			1156	1.2	0	0	0	0	0
6/04/2008	950	20			950	1.0	0	0	0	0	0
7/04/2008	1500	20			1500	1.6	0	0	0	0	0
8/04/2008	2060	15			2060	2.2	0	0	0	0	0
9/04/2008	4160	28			4160	4.4	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

10/04/2008	5810	22			5810	6.1	0	0	0	0	0
11/04/2008	6050	28	191.4		6240	6.5	0	0	0	1	1
18/04/2008	3740	48	363		4103	4.3	0	0	0		
19/04/2008	6663	37.5	1449		8112	8.5	0	0	1		
20/04/2008	7423	24.5	138		7561	7.9	0	0	1	1	1
21/04/2008	6762	7			6762	7.1	0	0	1	0	0
20/04/1900		2093.8	37753.4	0	Total 2007/2008		3	5	16	6	8

Reading Date	Rainfall mm	Inflow kL/day	MILL ST OVERFLOW (KL)	PALM PARK OVERFLOW (KL)	Total Flow (kL)	RATIO PWWF / ADWF	Ratio>12	Ratio>9	Ratio>7	KPI 60mm	KPI 85mm
27/04/2007	1	750			750	0.8	0	0	0	0	0
28/04/2007	1	764			764	0.8	0	0	0	0	0
29/04/2007	0	755			755	0.8	0	0	0	0	0
30/04/2007	0	724			724	0.8	0	0	0	0	0
01/05/2007	0	700			700	0.7	0	0	0	0	0
02/05/2007	0	709			709	0.7	0	0	0	0	0
03/05/2007	0	722			722	0.8	0	0	0	0	0
04/05/2007	0	678			678	0.7	0	0	0	0	0
05/05/2007	0	716			716	0.8	0	0	0	0	0
06/05/2007	0	710			710	0.7	0	0	0	0	0
07/05/2007	0	711			711	0.7	0	0	0	0	0
08/05/2007	6	687			687	0.7	0	0	0	0	0
09/05/2007	1.5	750			750	0.8	0	0	0	0	0
10/05/2007	0	753			753	0.8	0	0	0	0	0
11/05/2007	1.5	816			816	0.9	0	0	0	0	0
12/05/2007	7.5	655			655	0.7	0	0	0	0	0
13/05/2007	2	744			744	0.8	0	0	0	0	0
14/05/2007	12	967			967	1.0	0	0	0	0	0
15/05/2007	0	851			851	0.9	0	0	0	0	0
16/05/2007	0	774			774	0.8	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

17/05/2007	0	731			731	0.8	0	0	0	0	0
18/05/2007	0	723			723	0.8	0	0	0	0	0
19/05/2007	5	722			722	0.8	0	0	0	0	0
20/05/2007	0	788			788	0.8	0	0	0	0	0
21/05/2007	1	709			709	0.7	0	0	0	0	0
22/05/2007	0	888			888	0.9	0	0	0	0	0
23/05/2007	0	668			668	0.7	0	0	0	0	0
24/05/2007	0	713			713	0.7	0	0	0	0	0
25/05/2007	0	742			742	0.8	0	0	0	0	0
26/05/2007	0	635			635	0.7	0	0	0	0	0
27/05/2007	1.5	718			718	0.8	0	0	0	0	0
28/05/2007	0	900			900	0.9	0	0	0	0	0
29/05/2007	2	645			645	0.7	0	0	0	0	0
30/05/2007	4.5	685			685	0.7	0	0	0	0	0
31/05/2007	0	696			696	0.7	0	0	0	0	0
01/06/2007	0	683			683	0.7	0	0	0	0	0
02/06/2007	0	720			720	0.8	0	0	0	0	0
03/06/2007	0	849			849	0.9	0	0	0	0	0
04/06/2007	0	721			721	0.8	0	0	0	0	0
05/06/2007	0	613			613	0.6	0	0	0	0	0
06/06/2007	10	885			885	0.9	0	0	0	0	0
07/06/2007	14	1133			1133	1.2	0	0	0	0	0
08/06/2007	2.5	982			982	1.0	0	0	0	0	0
09/06/2007	0	771			771	0.8	0	0	0	0	0
10/06/2007	0	774			774	0.8	0	0	0	0	0
11/06/2007	0	709			709	0.7	0	0	0	0	0
12/06/2007	0	861			861	0.9	0	0	0	0	0
13/06/2007	0	755			755	0.8	0	0	0	0	0
14/06/2007	0	607			607	0.6	0	0	0	0	0
15/06/2007	2	709			709	0.7	0	0	0	0	0
16/06/2007	0	822			822	0.9	0	0	0	0	0
17/06/2007	0	700			700	0.7	0	0	0	0	0
18/06/2007	0	678			678	0.7	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

19/06/2007	0	674			674	0.7	0	0	0	0	0
20/06/2007	0	661			661	0.7	0	0	0	0	0
21/06/2007	0	673			673	0.7	0	0	0	0	0
22/06/2007	0	678			678	0.7	0	0	0	0	0
23/06/2007	0	677			677	0.7	0	0	0	0	0
24/06/2007	4	702			702	0.7	0	0	0	0	0
25/06/2007	2.5	955			955	1.0	0	0	0	0	0
26/06/2007	38	1780			1780	1.9	0	0	0	0	0
27/06/2007	16	2856			2856	3.0	0	0	0	0	0
28/06/2007	0	1506			1506	1.6	0	0	0	0	0
29/06/2007	0	935			935	1.0	0	0	0	0	0
30/06/2007	0	967			967	1.0	0	0	0	0	0
01/07/2007	0	870			870	0.9	0	0	0	0	0
02/07/2007	0	804			804	0.8	0	0	0	0	0
03/07/2007	0	813			813	0.9	0	0	0	0	0
04/07/2007	0	723			723	0.8	0	0	0	0	0
05/07/2007	0	742			742	0.8	0	0	0	0	0
06/07/2007	0	689			689	0.7	0	0	0	0	0
07/07/2007	0	691			691	0.7	0	0	0	0	0
08/07/2007	0	717			717	0.8	0	0	0	0	0
09/07/2007	0	861			861	0.9	0	0	0	0	0
10/07/2007	0	577			577	0.6	0	0	0	0	0
11/07/2007	0	776			776	0.8	0	0	0	0	0
12/07/2007	0	720			720	0.8	0	0	0	0	0
13/07/2007	0	720			720	0.8	0	0	0	0	0
14/07/2007	0	628			628	0.7	0	0	0	0	0
15/07/2007	0	711			711	0.7	0	0	0	0	0
16/07/2007	0	860			860	0.9	0	0	0	0	0
17/07/2007	0	607			607	0.6	0	0	0	0	0
18/07/2007	0	685			685	0.7	0	0	0	0	0
19/07/2007	0	734			734	0.8	0	0	0	0	0
20/07/2007	0	679			679	0.7	0	0	0	0	0
21/07/2007	0	596			596	0.6	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

22/07/2007	0.5	641			641	0.7	0	0	0	0	0
23/07/2007	2	820			820	0.9	0	0	0	0	0
24/07/2007	1.5	575			575	0.6	0	0	0	0	0
25/07/2007	0	789			789	0.8	0	0	0	0	0
26/07/2007	0	621			621	0.7	0	0	0	0	0
27/07/2007	0	591			591	0.6	0	0	0	0	0
28/07/2007	0	690			690	0.7	0	0	0	0	0
29/07/2007	0	719			719	0.8	0	0	0	0	0
30/07/2007	0	697			697	0.7	0	0	0	0	0
31/07/2007	0	544			544	0.6	0	0	0	0	0
01/08/2007	0	702			702	0.7	0	0	0	0	0
02/08/2007	0	722			722	0.8	0	0	0	0	0
03/08/2007	0	813			813	0.9	0	0	0	0	0
04/08/2007	0	460			460	0.5	0	0	0	0	0
05/08/2007	0	712			712	0.7	0	0	0	0	0
06/08/2007	0	783			783	0.8	0	0	0	0	0
07/08/2007	0	605			605	0.6	0	0	0	0	0
08/08/2007	0	635			635	0.7	0	0	0	0	0
09/08/2007	0	687			687	0.7	0	0	0	0	0
10/08/2007	0	651			651	0.7	0	0	0	0	0
11/08/2007	0	697			697	0.7	0	0	0	0	0
12/08/2007	0	597			597	0.6	0	0	0	0	0
13/08/2007	0	673			673	0.7	0	0	0	0	0
14/08/2007	0	625			625	0.7	0	0	0	0	0
15/08/2007	0	627			627	0.7	0	0	0	0	0
16/08/2007	4	598			598	0.6	0	0	0	0	0
17/08/2007	0.5	681			681	0.7	0	0	0	0	0
18/08/2007	0	589			589	0.6	0	0	0	0	0
19/08/2007	2	657			657	0.7	0	0	0	0	0
20/08/2007	75	2299			2299	2.4	0	0	0	0	0
21/08/2007	60	6087			6087	6.4	0	0	0	0	0
22/08/2007	45	6391			6391	6.7	0	0	0	0	0
23/08/2007	4	4628			4628	4.9	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

24/08/2007	2	3081			3081	3.2	0	0	0	0	0
25/08/2007	12	1956			1956	2.1	0	0	0	0	0
26/08/2007	5	2671			2671	2.8	0	0	0	0	0
27/08/2007	2	1930			1930	2.0	0	0	0	0	0
28/08/2007	0	1572	2517		4089	4.3	0	0	0	0	1
29/08/2007	0	1341	3123		4464	4.7	0	0	0		
30/08/2007	0	1296	1429		2725	2.9	0	0	0		
31/08/2007	0	1167			1167	1.2	0	0	0	0	0
01/09/2007	0	924			924	1.0	0	0	0	0	0
02/09/2007	0	1043			1043	1.1	0	0	0	0	0
03/09/2007	0	1199			1199	1.3	0	0	0	0	0
04/09/2007	0	843			843	0.9	0	0	0	0	0
05/09/2007	23	1962			1962	2.1	0	0	0	0	0
06/09/2007	9	1483			1483	1.6	0	0	0	0	0
07/09/2007	10	1947			1947	2.0	0	0	0	0	0
08/09/2007	4	1710			1710	1.8	0	0	0	0	0
09/09/2007	0	1528			1528	1.6	0	0	0	0	0
10/09/2007	4	1485			1485	1.6	0	0	0	0	0
11/09/2007	0	1333			1333	1.4	0	0	0	0	0
12/09/2007	0	1184			1184	1.2	0	0	0	0	0
13/09/2007	0	1129			1129	1.2	0	0	0	0	0
14/09/2007	0	991			991	1.0	0	0	0	0	0
15/09/2007	0	1021			1021	1.1	0	0	0	0	0
16/09/2007	0	970			970	1.0	0	0	0	0	0
17/09/2007	0	1147			1147	1.2	0	0	0	0	0
18/09/2007	0	989			989	1.0	0	0	0	0	0
19/09/2007	0	711			711	0.7	0	0	0	0	0
20/09/2007	0	864			864	0.9	0	0	0	0	0
21/09/2007	0	747			747	0.8	0	0	0	0	0
22/09/2007	0	817			817	0.9	0	0	0	0	0
23/09/2007	18	1334			1334	1.4	0	0	0	0	0
24/09/2007	0	1300			1300	1.4	0	0	0	0	0
25/09/2007	0	947			947	1.0	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

26/09/2007	0	840			840	0.9	0	0	0	0	0
27/09/2007	1	827			827	0.9	0	0	0	0	0
28/09/2007	0	1029			1029	1.1	0	0	0	0	0
29/09/2007	0	723			723	0.8	0	0	0	0	0
30/09/2007	0	832			832	0.9	0	0	0	0	0
01/10/2007	0	857			857	0.9	0	0	0	0	0
02/10/2007	0	679			679	0.7	0	0	0	0	0
03/10/2007	0	825			825	0.9	0	0	0	0	0
04/10/2007	0	710			710	0.7	0	0	0	0	0
05/10/2007	0	758			758	0.8	0	0	0	0	0
06/10/2007	0	662			662	0.7	0	0	0	0	0
07/10/2007	0	753			753	0.8	0	0	0	0	0
08/10/2007	2.5	768			768	0.8	0	0	0	0	0
09/10/2007	37	1783			1783	1.9	0	0	0	0	0
10/10/2007	2	1315			1315	1.4	0	0	0	0	0
11/10/2007	9	1331			1331	1.4	0	0	0	0	0
12/10/2007	0	1091			1091	1.1	0	0	0	0	0
13/10/2007	5.5	1260			1260	1.3	0	0	0	0	0
14/10/2007	0	1070			1070	1.1	0	0	0	0	0
15/10/2007	0	1021			1021	1.1	0	0	0	0	0
16/10/2007	0	778			778	0.8	0	0	0	0	0
17/10/2007	0	820			820	0.9	0	0	0	0	0
18/10/2007	2	939			939	1.0	0	0	0	0	0
19/10/2007	0	770			770	0.8	0	0	0	0	0
20/10/2007	0	785			785	0.8	0	0	0	0	0
21/10/2007	0	853			853	0.9	0	0	0	0	0
22/10/2007	0	925			925	1.0	0	0	0	0	0
23/10/2007	0	444			444	0.5	0	0	0	0	0
24/10/2007	0	837			837	0.9	0	0	0	0	0
25/10/2007	0	869			869	0.9	0	0	0	0	0
26/10/2007	20	1087			1087	1.1	0	0	0	0	0
27/10/2007	18	1718			1718	1.8	0	0	0	0	0
28/10/2007	0	1016			1016	1.1	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

29/10/2007	36	2646			2646	2.8	0	0	0	0	0
30/10/2007	0	2568			2568	2.7	0	0	0	0	0
31/10/2007	0	1484			1484	1.6	0	0	0	0	0
01/11/2007	10	1418			1418	1.5	0	0	0	0	0
02/11/2007	0	1166			1166	1.2	0	0	0	0	0
03/11/2007	25	2973			2973	3.1	0	0	0	0	0
04/11/2007	0	1620			1620	1.7	0	0	0	0	0
05/11/2007	0	1514			1514	1.6	0	0	0	0	0
06/11/2007	0	1211			1211	1.3	0	0	0	0	0
07/11/2007	5	1015			1015	1.1	0	0	0	0	0
08/11/2007	16	1852			1852	1.9	0	0	0	0	0
09/11/2007	38	2820	2066		4886	5.1	0	0	0	1	1
10/11/2007	11	5890	293		6183	6.5	0	0	0		
11/11/2007	70	7536	6267		13803	14.5	1	1	1		
12/11/2007	20	6046	1824		7870	8.3	0	0	1		
13/11/2007	2	6041			6041	6.3	0	0	0	0	0
14/11/2007	0	4086			4086	4.3	0	0	0	0	0
15/11/2007	0	2373			2373	2.5	0	0	0	0	0
16/11/2007	0	2122			2122	2.2	0	0	0	0	0
17/11/2007	0	1714			1714	1.8	0	0	0	0	0
18/11/2007	0	1608			1608	1.7	0	0	0	0	0
19/11/2007	0	1820			1820	1.9	0	0	0	0	0
20/11/2007	0	1392			1392	1.5	0	0	0	0	0
21/11/2007	0	1179			1179	1.2	0	0	0	0	0
22/11/2007	0	1059			1059	1.1	0	0	0	0	0
23/11/2007	0	1160			1160	1.2	0	0	0	0	0
24/11/2007	6.5	1218			1218	1.3	0	0	0	0	0
25/11/2007	1	1063			1063	1.1	0	0	0	0	0
26/11/2007	5	946			946	1.0	0	0	0	0	0
27/11/2007	5	1069			1069	1.1	0	0	0	0	0
28/11/2007	2	1017			1017	1.1	0	0	0	0	0
29/11/2007	4	998			998	1.0	0	0	0	0	0
30/11/2007	0	1129			1129	1.2	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

01/12/2007	0	803			803	0.8	0	0	0	0	0
02/12/2007	1.2	1036			1036	1.1	0	0	0	0	0
03/12/2007	0	1113			1113	1.2	0	0	0	0	0
04/12/2007	0	744			744	0.8	0	0	0	0	0
05/12/2007	0	957			957	1.0	0	0	0	0	0
06/12/2007	17	1240			1240	1.3	0	0	0	0	0
07/12/2007	2	912			912	1.0	0	0	0	0	0
08/12/2007	3	904			904	0.9	0	0	0	0	0
09/12/2007	0	1063			1063	1.1	0	0	0	0	0
10/12/2007	39	2262			2262	2.4	0	0	0	0	0
11/12/2007	1	1376			1376	1.4	0	0	0	0	0
12/12/2007	5	1534	793		2327	2.4	0	0	0	1	1
13/12/2007	52	4888	48		4936	5.2	0	0	0		
14/12/2007	2.5	4497			4497	4.7	0	0	0	0	0
15/12/2007	0	2638			2638	2.8	0	0	0	0	0
16/12/2007	0	1787			1787	1.9	0	0	0	0	0
17/12/2007	0	1418			1418	1.5	0	0	0	0	0
18/12/2007	9	1641			1641	1.7	0	0	0	0	0
19/12/2007	0	1472			1472	1.5	0	0	0	0	0
20/12/2007	0	1511			1511	1.6	0	0	0	0	0
21/12/2007	0	1089			1089	1.1	0	0	0	0	0
22/12/2007	0	1291			1291	1.4	0	0	0	0	0
23/12/2007	2	1032			1032	1.1	0	0	0	0	0
24/12/2007	0	1150			1150	1.2	0	0	0	0	0
25/12/2007	0	805			805	0.8	0	0	0	0	0
26/12/2007	11	925			925	1.0	0	0	0	0	0
27/12/2007	10	1413			1413	1.5	0	0	0	0	0
28/12/2007	13.5	1157			1157	1.2	0	0	0	0	0
29/12/2007	0.5	1231			1231	1.3	0	0	0	0	0
30/12/2007	4	1176			1176	1.2	0	0	0	0	0
31/12/2007	22	1638			1638	1.7	0	0	0	0	0
01/01/2008	37	5721	1002		6723	7.1	0	0	1	1	1
02/01/2008	15	6874			6874	7.2	0	0	1	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

03/01/2008	15	4879	2690		7569	7.9	0	0	1	1	1
04/01/2008	153	8939	3800		12739	13.4	1	1	1		
05/01/2008	58	9218	3950		13168	13.8	1	1	1		
06/01/2008	18	7187	750		7937	8.3	0	0	1		
07/01/2008	3	5805			5805	6.1	0	0	0	0	0
08/01/2008	1	3826			3826	4.0	0	0	0	0	0
09/01/2008	9	3373			3373	3.5	0	0	0	0	0
10/01/2008	2	2256			2256	2.4	0	0	0	0	0
11/01/2008	19	2908	60		2968	3.1	0	0	0	1	1
12/01/2008	4	4975			4975	5.2	0	0	0	0	0
13/01/2008	4.5	2456			2456	2.6	0	0	0	0	0
14/01/2008	7	3510			3510	3.7	0	0	0	0	0
15/01/2008	14	2638			2638	2.8	0	0	0	0	0
16/01/2008	4.5	3680			3680	3.9	0	0	0	0	0
17/01/2008	2	2797			2797	2.9	0	0	0	0	0
18/01/2008	2	2379			2379	2.5	0	0	0	0	0
19/01/2008	8	2111			2111	2.2	0	0	0	0	0
20/01/2008	1.5	1897			1897	2.0	0	0	0	0	0
21/01/2008	3	1795			1795	1.9	0	0	0	0	0
22/01/2008	10	1881			1881	2.0	0	0	0	0	0
23/01/2008	1	1709			1709	1.8	0	0	0	0	0
24/01/2008	3	1449			1449	1.5	0	0	0	0	0
25/01/2008	2	1631			1631	1.7	0	0	0	0	0
26/01/2008	11.5	1420			1420	1.5	0	0	0	0	0
27/01/2008	2	1374			1374	1.4	0	0	0	0	0
28/01/2008	1	1296			1296	1.4	0	0	0	0	0
29/01/2008	1	1244			1244	1.3	0	0	0	0	0
30/01/2008	5.5	1250			1250	1.3	0	0	0	0	0
31/01/2008	3	1286			1286	1.3	0	0	0	0	0
01/02/2008	0	1106			1106	1.2	0	0	0	0	0
02/02/2008	1	1191			1191	1.2	0	0	0	0	0
03/02/2008	195	4715	1000		5715	6.0	0	0	0	0	0
04/02/2008	83	7362	4000		11362	11.9	0	1	1		

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

05/02/2008	14	7267			7267	7.6	0	0	1	0	0
06/02/2008	8	6105			6105	6.4	0	0	0	0	0
07/02/2008	14	5102			5102	5.4	0	0	0	0	0
08/02/2008	1.5	3844			3844	4.0	0	0	0	0	0
09/02/2008	1	2950			2950	3.1	0	0	0	0	0
10/02/2008	0	1796			1796	1.9	0	0	0	0	0
11/02/2008	1	1503			1503	1.6	0	0	0	0	0
12/02/2008	8	1629			1629	1.7	0	0	0	0	0
13/02/2008	30	4464			4464	4.7	0	0	0	0	0
14/02/2008	4	4223			4223	4.4	0	0	0	0	0
15/02/2008	4	3157			3157	3.3	0	0	0	0	0
16/02/2008	6	2618			2618	2.7	0	0	0	0	0
17/02/2008	6.5	2524			2524	2.6	0	0	0	0	0
18/02/2008	9	1937			1937	2.0	0	0	0	0	0
19/02/2008	12	3187			3187	3.3	0	0	0	0	0
20/02/2008	4	3071			3071	3.2	0	0	0	0	0
21/02/2008	3	2467			2467	2.6	0	0	0	0	0
22/02/2008	0	2072			2072	2.2	0	0	0	0	0
23/02/2008	0	1758			1758	1.8	0	0	0	0	0
24/02/2008	0	1612			1612	1.7	0	0	0	0	0
25/02/2008	0	1543			1543	1.6	0	0	0	0	0
26/02/2008	2	1318			1318	1.4	0	0	0	0	0
27/02/2008	16	1966			1966	2.1	0	0	0	0	0
28/02/2008	0	1645			1645	1.7	0	0	0	0	0
29/02/2008	9	1645			1645	1.7	0	0	0	0	0
01/03/2008	3	1564			1564	1.6	0	0	0	0	0
02/03/2008	0	1470			1470	1.5	0	0	0	0	0
03/03/2008	5	1357			1357	1.4	0	0	0	0	0
04/03/2008	4	1505			1505	1.6	0	0	0	0	0
05/03/2008	0	1399			1399	1.5	0	0	0	0	0
06/03/2008	4	1177			1177	1.2	0	0	0	0	0
07/03/2008	6.5	1388			1388	1.5	0	0	0	0	0
08/03/2008	0	1239			1239	1.3	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

09/03/2008	1.5	992			992	1.0	0	0	0	0	0
10/03/2008	0	950			950	1.0	0	0	0	0	0
11/03/2008	1	1049			1049	1.1	0	0	0	0	0
12/03/2008	0	979			979	1.0	0	0	0	0	0
13/03/2008	0	931			931	1.0	0	0	0	0	0
14/03/2008	0	991			991	1.0	0	0	0	0	0
15/03/2008	0	1027			1027	1.1	0	0	0	0	0
16/03/2008	0	1026			1026	1.1	0	0	0	0	0
17/03/2008	5	817			817	0.9	0	0	0	0	0
18/03/2008	7	968			968	1.0	0	0	0	0	0
19/03/2008	1	975			975	1.0	0	0	0	0	0
20/03/2008	0	1207			1207	1.3	0	0	0	0	0
21/03/2008	3	1036			1036	1.1	0	0	0	0	0
22/03/2008	2	945			945	1.0	0	0	0	0	0
23/03/2008	3	927			927	1.0	0	0	0	0	0
24/03/2008	1	849			849	0.9	0	0	0	0	0
25/03/2008	0	842			842	0.9	0	0	0	0	0
26/03/2008	0	881			881	0.9	0	0	0	0	0
27/03/2008	2	836			836	0.9	0	0	0	0	0
28/03/2008	26	2112			2112	2.2	0	0	0	0	0
29/03/2008	45	1156			1156	1.2	0	0	0	0	0
30/03/2008	1	1056			1056	1.1	0	0	0	0	0
31/03/2008	0	874			874	0.9	0	0	0	0	0
01/04/2008	0	934			934	1.0	0	0	0	0	0
02/04/2008	0	884			884	0.9	0	0	0	0	0
03/04/2008	0	931			931	1.0	0	0	0	0	0
04/04/2008	0	885			885	0.9	0	0	0	0	0
05/04/2008	0	817			817	0.9	0	0	0	0	0
06/04/2008	20	945			945	1.0	0	0	0	0	0
07/04/2008	20	1503			1503	1.6	0	0	0	0	0
08/04/2008	15	2064			2064	2.2	0	0	0	0	0
09/04/2008	28	4160			4160	4.4	0	0	0	0	0
10/04/2008	22	5812			5812	6.1	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

11/04/2008	28	6049	191.4		6240.4	6.5	0	0	0	1	1
12/04/2008	1	5158			5158	5.4	0	0	0	0	0
13/04/2008	0	1703			1703	1.8	0	0	0	0	0
14/04/2008	0	1885			1885	2.0	0	0	0	0	0
15/04/2008	1	1650			1650	1.7	0	0	0	0	0
16/04/2008	3	1532			1532	1.6	0	0	0	0	0
17/04/2008	2	1436			1436	1.5	0	0	0	0	0
18/04/2008	48	3740	363		4103	4.3	0	0	0	1	1
19/04/2008	37.5	6663	1449		8112	8.5	0	0	1		
20/04/2008	24.5	7423	138		7561	7.9	0	0	1		
21/04/2008	7	6762			6762	7.1	0	0	1	0	0
22/04/2008	0	4078			4078	4.3	0	0	0	0	0
23/04/2008	0	2793			2793	2.9	0	0	0	0	0
24/04/2008	0	1281			1281	1.3	0	0	0	0	0
25/04/2008	0	1054			1054	1.1	0	0	0	0	0
26/04/2008	0	1226			1226	1.3	0	0	0	0	0
	2197.7	600231	37753.4	0	637984.4		3	4	13	7	8
27/04/2008	0	1445	0		1445	1.5	0	0	0	0	0
28/04/2008	0	1681	0		1681	1.8	0	0	0	0	0
29/04/2008	0	887	0		887	0.9	0	0	0	0	0
30/04/2008	0	1214	0		1214	1.3	0	0	0	0	0
01/05/2008	0	904	0		904	0.9	0	0	0	0	0
02/05/2008	0	949	0		949	1.0	0	0	0	0	0
03/05/2008	0	615	0		615	0.6	0	0	0	0	0
04/05/2008	0	825	0		825	0.9	0	0	0	0	0
05/05/2008	0	481	0		481	0.5	0	0	0	0	0
06/05/2008	0	682	0		682	0.7	0	0	0	0	0
07/05/2008	0	686	0		686	0.7	0	0	0	0	0
08/05/2008	0	707	0		707	0.7	0	0	0	0	0
09/05/2008	0	786	0		786	0.8	0	0	0	0	0
10/05/2008	0	752	0		752	0.8	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

11/05/2008	1	882	0		882	0.9	0	0	0	0	0
12/05/2008	0	813	0		813	0.9	0	0	0	0	0
13/05/2008	0.5	942	0		942	1.0	0	0	0	0	0
14/05/2008	1.5	952	0		952	1.0	0	0	0	0	0
15/05/2008	0	854	0		854	0.9	0	0	0	0	0
16/05/2008	0	896	0		896	0.9	0	0	0	0	0
17/05/2008	0	893	0		893	0.9	0	0	0	0	0
18/05/2008	7	959	0		959	1.0	0	0	0	0	0
19/05/2008	0	880	0		880	0.9	0	0	0	0	0
20/05/2008	0	825	0		825	0.9	0	0	0	0	0
21/05/2008	0	857	0		857	0.9	0	0	0	0	0
22/05/2008	0	809	0		809	0.8	0	0	0	0	0
23/05/2008	14	1135	0		1135	1.2	0	0	0	0	0
24/05/2008	0	928	0		928	1.0	0	0	0	0	0
25/05/2008	0	787	0		787	0.8	0	0	0	0	0
26/05/2008	0	763	0		763	0.8	0	0	0	0	0
27/05/2008	0	837	0		837	0.9	0	0	0	0	0
28/05/2008	0	820	0		820	0.9	0	0	0	0	0
29/05/2008	16	1043	0		1043	1.1	0	0	0	0	0
30/05/2008	22.5	2255	0		2255	2.4	0	0	0	0	0
31/05/2008	10	2199	0		2199	2.3	0	0	0	0	0
01/06/2008	0.5	1534	0		1534	1.6	0	0	0	0	0
02/06/2008	8	1346	170		1516	1.6	0	0	0	0	0
03/06/2008	96	6728	1818		8546	9.0	0	0	1		
04/06/2008	5	6372	2		6374	6.7	0	0	0		
05/06/2008	0	3758	0		3758	3.9	0	0	0	0	0
06/06/2008	0	2780	0		2780	2.9	0	0	0	0	0
07/06/2008	0	1809	0		1809	1.9	0	0	0	0	0
08/06/2008	2	1684	0		1684	1.8	0	0	0	0	0
09/06/2008	12	2063	0		2063	2.2	0	0	0	0	0
10/06/2008	17	3431	0		3431	3.6	0	0	0	0	0
11/06/2008	0	4163	0		4163	4.4	0	0	0	0	0
12/06/2008	0	2421	0		2421	2.5	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

13/06/2008	0	2450	0		2450	2.6	0	0	0	0	0
14/06/2008	0	1377	0		1377	1.4	0	0	0	0	0
15/06/2008	0	2009	0		2009	2.1	0	0	0	0	0
16/06/2008	0	1310	0		1310	1.4	0	0	0	0	0
17/06/2008	0	1553	0		1553	1.6	0	0	0	0	0
18/06/2008	2	1102	0		1102	1.2	0	0	0	0	0
19/06/2008	6	1686	0		1686	1.8	0	0	0	0	0
20/06/2008	0	1334	0		1334	1.4	0	0	0	0	0
21/06/2008	2	910	0		910	1.0	0	0	0	0	0
22/06/2008	0	1144	0		1144	1.2	0	0	0	0	0
23/06/2008	0	1292	0		1292	1.4	0	0	0	0	0
24/06/2008	0	887	0		887	0.9	0	0	0	0	0
25/06/2008	0	1074	0		1074	1.1	0	0	0	0	0
26/06/2008	0	988	0		988	1.0	0	0	0	0	0
27/06/2008	0	1301	0		1301	1.4	0	0	0	0	0
28/06/2008	0	953	0		953	1.0	0	0	0	0	0
29/06/2008	0	772	0		772	0.8	0	0	0	0	0
30/06/2008	0	927	0		927	1.0	0	0	0	0	0
01/07/2008	0	947	0		947	1.0	0	0	0	0	0
02/07/2008	0	982	0		982	1.0	0	0	0	0	0
03/07/2008	0	877	0		877	0.9	0	0	0	0	0
04/07/2008	0	944	0		944	1.0	0	0	0	0	0
05/07/2008	15	2281	15		2296	2.4	0	0	0	1	1
06/07/2008	2	4490	0		4490	4.7	0	0	0	0	0
07/07/2008	30	2404	0		2404	2.5	0	0	0	0	0
08/07/2008	7	2675	0		2675	2.8	0	0	0	0	0
09/07/2008	4	2868	0		2868	3.0	0	0	0	0	0
10/07/2008	0	1600	0		1600	1.7	0	0	0	0	0
11/07/2008	0	1621	0		1621	1.7	0	0	0	0	0
12/07/2008	0	1405	0		1405	1.5	0	0	0	0	0
13/07/2008	0	1368	0		1368	1.4	0	0	0	0	0
14/07/2008	0	1234	0		1234	1.3	0	0	0	0	0
15/07/2008	0	1205	0		1205	1.3	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

16/07/2008	13	1436	0		1436	1.5	0	0	0	0	0
17/07/2008	0	1302	0		1302	1.4	0	0	0	0	0
18/07/2008	0	1411	0		1411	1.5	0	0	0	0	0
19/07/2008	0	1115	0		1115	1.2	0	0	0	0	0
20/07/2008	0	1285	0		1285	1.3	0	0	0	0	0
21/07/2008	0	1071	0		1071	1.1	0	0	0	0	0
22/07/2008	0	864	0		864	0.9	0	0	0	0	0
23/07/2008	0	1057	0		1057	1.1	0	0	0	0	0
24/07/2008	26	1678	0		1678	1.8	0	0	0	0	0
25/07/2008	64	7820	1100		8920	9.4	0	1	1	0	1
26/07/2008	7	6970	0		6970	7.3	0	0	1	0	0
27/07/2008	0	3838	0		3838	4.0	0	0	0	0	0
28/07/2008	5	2538	0		2538	2.7	0	0	0	0	0
29/07/2008	2	2391	0		2391	2.5	0	0	0	0	0
30/07/2008	0	2014	0		2014	2.1	0	0	0	0	0
31/07/2008	0	1653	0		1653	1.7	0	0	0	0	0
01/08/2008	0	1613	0		1613	1.7	0	0	0	0	0
02/08/2008	0	1653	0		1653	1.7	0	0	0	0	0
03/08/2008	0	1268	0		1268	1.3	0	0	0	0	0
04/08/2008	0	1137	0		1137	1.2	0	0	0	0	0
05/08/2008	0	1147	0		1147	1.2	0	0	0	0	0
06/08/2008	0	1162	0		1162	1.2	0	0	0	0	0
07/08/2008	0	1227	0		1227	1.3	0	0	0	0	0
08/08/2008	0	919	0		919	1.0	0	0	0	0	0
09/08/2008	0	1125	0		1125	1.2	0	0	0	0	0
10/08/2008	0	978	0		978	1.0	0	0	0	0	0
11/08/2008	0	1154	0		1154	1.2	0	0	0	0	0
12/08/2008	0	773	0		773	0.8	0	0	0	0	0
13/08/2008	0	949	0		949	1.0	0	0	0	0	0
14/08/2008	0	987	0		987	1.0	0	0	0	0	0
15/08/2008	0	954	0		954	1.0	0	0	0	0	0
16/08/2008	0	1033	0		1033	1.1	0	0	0	0	0
17/08/2008	0	886	0		886	0.9	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

18/08/2008	0	879	0		879	0.9	0	0	0	0	0
19/08/2008	0	917	0		917	1.0	0	0	0	0	0
20/08/2008	0	943	0		943	1.0	0	0	0	0	0
21/08/2008	0	1024	0		1024	1.1	0	0	0	0	0
22/08/2008	0	786	0		786	0.8	0	0	0	0	0
23/08/2008	0	684	0		684	0.7	0	0	0	0	0
24/08/2008	0	838	0		838	0.9	0	0	0	0	0
25/08/2008	0	818	0		818	0.9	0	0	0	0	0
26/08/2008	0	926	0		926	1.0	0	0	0	0	0
27/08/2008	0	670	0		670	0.7	0	0	0	0	0
28/08/2008	3.5	1050	0		1050	1.1	0	0	0	0	0
29/08/2008	7	762	0		762	0.8	0	0	0	0	0
30/08/2008	0	738	0		738	0.8	0	0	0	0	0
31/08/2008	0	825	0		825	0.9	0	0	0	0	0
01/09/2008	12	1086	0		1086	1.1	0	0	0	0	0
02/09/2008	0	659	0		659	0.7	0	0	0	0	0
03/09/2008	0	861	0		861	0.9	0	0	0	0	0
04/09/2008	2	779	0		779	0.8	0	0	0	0	0
05/09/2008	60	3922	0		3922	4.1	0	0	0	0	0
06/09/2008	3	5061	0		5061	5.3	0	0	0	0	0
07/09/2008	0	2329	0		2329	2.4	0	0	0	0	0
08/09/2008	0	1609	0		1609	1.7	0	0	0	0	0
09/09/2008	0	1254	0		1254	1.3	0	0	0	0	0
10/09/2008	0	1194	0		1194	1.3	0	0	0	0	0
11/09/2008	0	1182	0		1182	1.2	0	0	0	0	0
12/09/2008	2	1296	0		1296	1.4	0	0	0	0	0
13/09/2008	0	1009	0		1009	1.1	0	0	0	0	0
14/09/2008	0	1197	0		1197	1.3	0	0	0	0	0
15/09/2008	7	1010	0		1010	1.1	0	0	0	0	0
16/09/2008	0	956	0		956	1.0	0	0	0	0	0
17/09/2008	0	983	0		983	1.0	0	0	0	0	0
18/09/2008	2	957	0		957	1.0	0	0	0	0	0
19/09/2008	0	1005	0		1005	1.1	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

20/09/2008	0	998	0		998	1.0	0	0	0	0	0
21/09/2008	0	902	0		902	0.9	0	0	0	0	0
22/09/2008	2	1048	0		1048	1.1	0	0	0	0	0
23/09/2008	0	767	0		767	0.8	0	0	0	0	0
24/09/2008	0	873	0		873	0.9	0	0	0	0	0
25/09/2008	5	878	0		878	0.9	0	0	0	0	0
26/09/2008	0	995	0		995	1.0	0	0	0	0	0
27/09/2008	0	755	0		755	0.8	0	0	0	0	0
28/09/2008	0	830	0		830	0.9	0	0	0	0	0
29/09/2008	0	752	0		752	0.8	0	0	0	0	0
30/09/2008	2	805	0		805	0.8	0	0	0	0	0
01/10/2008	2.5	789	0		789	0.8	0	0	0	0	0
02/10/2008	0	775	0		775	0.8	0	0	0	0	0
03/10/2008	0	817	0		817	0.9	0	0	0	0	0
04/10/2008	0	756	0		756	0.8	0	0	0	0	0
05/10/2008	0	754	0		754	0.8	0	0	0	0	0
06/10/2008	0	710	0		710	0.7	0	0	0	0	0
07/10/2008	0	602	0		602	0.6	0	0	0	0	0
08/10/2008	0	728	0		728	0.8	0	0	0	0	0
09/10/2008	0	738	0		738	0.8	0	0	0	0	0
10/10/2008	7	868	0		868	0.9	0	0	0	0	0
11/10/2008	1	609	0		609	0.6	0	0	0	0	0
12/10/2008	3.5	784	0		784	0.8	0	0	0	0	0
13/10/2008	2	727	0		727	0.8	0	0	0	0	0
14/10/2008	0	778	0		778	0.8	0	0	0	0	0
15/10/2008	13	849	0		849	0.9	0	0	0	0	0
16/10/2008	70	3161	164		3325	3.5	0	0	0	0	1
17/10/2008	1	2892	0		2892	3.0	0	0	0	0	0
18/10/2008	0	1672	0		1672	1.8	0	0	0	0	0
19/10/2008	4	1521	0		1521	1.6	0	0	0	0	0
20/10/2008	0	1071	0		1071	1.1	0	0	0	0	0
21/10/2008	0	1364	0		1364	1.4	0	0	0	0	0
22/10/2008	0	770	0		770	0.8	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

23/10/2008	15	1239	0		1239	1.3	0	0	0	0	0
24/10/2008	0	1121	0		1121	1.2	0	0	0	0	0
25/10/2008	0	1050	0		1050	1.1	0	0	0	0	0
26/10/2008	0	946	0		946	1.0	0	0	0	0	0
27/10/2008	0	993	0		993	1.0	0	0	0	0	0
28/10/2008	0	574	0		574	0.6	0	0	0	0	0
29/10/2008	3	889	0		889	0.9	0	0	0	0	0
30/10/2008	0	867	0		867	0.9	0	0	0	0	0
31/10/2008	0	926	0		926	1.0	0	0	0	0	0
01/11/2008	0	837	0		837	0.9	0	0	0	0	0
02/11/2008	3	775	0		775	0.8	0	0	0	0	0
03/11/2008	4	808	0		808	0.8	0	0	0	0	0
04/11/2008	5	920	0		920	1.0	0	0	0	0	0
05/11/2008	2	884	0		884	0.9	0	0	0	0	0
06/11/2008	7	939	0		939	1.0	0	0	0	0	0
07/11/2008	0	897	0		897	0.9	0	0	0	0	0
08/11/2008	0	923	0		923	1.0	0	0	0	0	0
09/11/2008	12	1030	0		1030	1.1	0	0	0	0	0
10/11/2008	1.5	829	0		829	0.9	0	0	0	0	0
11/11/2008	2.5	931	0		931	1.0	0	0	0	0	0
12/11/2008	4	536	0		536	0.6	0	0	0	0	0
13/11/2008	28	1171	0		1171	1.2	0	0	0	0	0
14/11/2008	24.5	2307	0		2307	2.4	0	0	0	0	0
15/11/2008	0	886	0		886	0.9	0	0	0	0	0
16/11/2008	0	1040	0		1040	1.1	0	0	0	0	0
17/11/2008	14	1146	0		1146	1.2	0	0	0	0	0
18/11/2008	32	3802	8		3810	4.0	0	0	0	1	1
19/11/2008	49	5563	502		6065	6.4	0	0	0	1	1
20/11/2008	37	7914	650		8564	9.0	0	0	1		
21/11/2008	8	3472	252		3724	3.9	0	0	0		
22/11/2008	5	4456	0		4456	4.7	0	0	0	0	0
23/11/2008	0	2403	0		2403	2.5	0	0	0	0	0
24/11/2008	0	2193	0		2193	2.3	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

25/11/2008	0	1195	0		1195	1.3	0	0	0	0	0
26/11/2008	2	1321	0		1321	1.4	0	0	0	0	0
27/11/2008	29	3142	0		3142	3.3	0	0	0	0	0
28/11/2008	2	2610	0		2610	2.7	0	0	0	0	0
29/11/2008	1	1412	0		1412	1.5	0	0	0	0	0
30/11/2008	1.5	1593	0		1593	1.7	0	0	0	0	0
01/12/2008	0	1428	0		1428	1.5	0	0	0	0	0
02/12/2008	0	1640	0		1640	1.7	0	0	0	0	0
03/12/2008	0	2206	0		2206	2.3	0	0	0	0	0
04/12/2008	0	1080	0		1080	1.1	0	0	0	0	0
05/12/2008	0	1115	0		1115	1.2	0	0	0	0	0
06/12/2008	0	951	0		951	1.0	0	0	0	0	0
07/12/2008	12	1091	0		1091	1.1	0	0	0	0	0
08/12/2008	5	1091	0		1091	1.1	0	0	0	0	0
09/12/2008	1.5	1077	0		1077	1.1	0	0	0	0	0
10/12/2008	0	1030	0		1030	1.1	0	0	0	0	0
11/12/2008	5	1022	0		1022	1.1	0	0	0	0	0
12/12/2008	6	1146	0		1146	1.2	0	0	0	0	0
13/12/2008	6	1040	0		1040	1.1	0	0	0	0	0
14/12/2008	1	1019	0		1019	1.1	0	0	0	0	0
15/12/2008	0	962	0		962	1.0	0	0	0	0	0
16/12/2008	0	878	0		878	0.9	0	0	0	0	0
17/12/2008	0	908	0		908	1.0	0	0	0	0	0
18/12/2008	0	806	0		806	0.8	0	0	0	0	0
19/12/2008	11	990	0		990	1.0	0	0	0	0	0
20/12/2008	1	951	0		951	1.0	0	0	0	0	0
21/12/2008	1	768	0		768	0.8	0	0	0	0	0
22/12/2008	0	746	0		746	0.8	0	0	0	0	0
23/12/2008	0	687	0		687	0.7	0	0	0	0	0
24/12/2008	0	747	0		747	0.8	0	0	0	0	0
25/12/2008	21.5	1303	0		1303	1.4	0	0	0	0	0
26/12/2008	2.5	835	0		835	0.9	0	0	0	0	0
27/12/2008	0.5	1017	0		1017	1.1	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

28/12/2008	11.5	1086	0		1086	1.1	0	0	0	0	0
29/12/2008	26	2002	0		2002	2.1	0	0	0	0	0
30/12/2008	7.5	2072	0		2072	2.2	0	0	0	0	0
31/12/2008	0	799	0		799	0.8	0	0	0	0	0
02/01/2009	3	839	0		839	0.9	0	0	0	0	0
03/01/2009	14	1440	0		1440	1.5	0	0	0	0	0
04/01/2009	3	1283	0		1283	1.3	0	0	0	0	0
05/01/2009	0	924	0		924	1.0	0	0	0	0	0
06/01/2009	0	1022	0		1022	1.1	0	0	0	0	0
07/01/2009	0	921	0		921	1.0	0	0	0	0	0
08/01/2009	0	1081	0		1081	1.1	0	0	0	0	0
09/01/2009	1	916	0		916	1.0	0	0	0	0	0
10/01/2009	0	773	0		773	0.8	0	0	0	0	0
11/01/2009	0	937	0		937	1.0	0	0	0	0	0
12/01/2009	1	705	0		705	0.7	0	0	0	0	0
13/01/2009	0	808	0		808	0.8	0	0	0	0	0
14/01/2009	0	841	0		841	0.9	0	0	0	0	0
15/01/2009	0	595	0		595	0.6	0	0	0	0	0
16/01/2009	0	966	0		966	1.0	0	0	0	0	0
17/01/2009	1	771	0		771	0.8	0	0	0	0	0
18/01/2009	7	827	0		827	0.9	0	0	0	0	0
19/01/2009	0	885	0		885	0.9	0	0	0	0	0
20/01/2009	0	672	0		672	0.7	0	0	0	0	0
21/01/2009	0	754	0		754	0.8	0	0	0	0	0
22/01/2009	0	992	0		992	1.0	0	0	0	0	0
23/01/2009	15	920	0		920	1.0	0	0	0	0	0
24/01/2009	1	695	0		695	0.7	0	0	0	0	0
25/01/2009	0	809	0		809	0.8	0	0	0	0	0
26/01/2009	30	1721	0		1721	1.8	0	0	0	0	0
27/01/2009	4.5	744	0		744	0.8	0	0	0	0	0
28/01/2009	15.5	1753	0		1753	1.8	0	0	0	0	0
29/01/2009	9.5	1445	0		1445	1.5	0	0	0	0	0
30/01/2009	7.5	1789	0		1789	1.9	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

31/01/2009	4	1415	0		1415	1.5	0	0	0	0	0
01/02/2009	15	2168	0		2168	2.3	0	0	0	0	0
02/02/2009	3.5	1327	0		1327	1.4	0	0	0	0	0
03/02/2009	35	2523	12		2535	2.7	0	0	0	1	1
04/02/2009	6	4048	0		4048	4.2	0	0	0	0	0
05/02/2009	3	1171	0		1171	1.2	0	0	0	0	0
06/02/2009	0.5	2468	0		2468	2.6	0	0	0	0	0
07/02/2009	0	1459	0		1459	1.5	0	0	0	0	0
08/02/2009	0	1034	0		1034	1.1	0	0	0	0	0
09/02/2009	0	1003	0		1003	1.1	0	0	0	0	0
10/02/2009	0	1074	0		1074	1.1	0	0	0	0	0
11/02/2009	3	1229	0		1229	1.3	0	0	0	0	0
12/02/2009	3	1003	0		1003	1.1	0	0	0	0	0
13/02/2009	58	2843	761		3604	3.8	0	0	0	0	1
14/02/2009	80	7948	2363		10311	10.8	0	1	1		
15/02/2009	35	6512	208		6720	7.1	0	0	1		
16/02/2009	2	5946	0		5946	6.2	0	0	0	0	0
17/02/2009	10	4012	0		4012	4.2	0	0	0	0	0
18/02/2009	12	3591	0		3591	3.8	0	0	0	0	0
19/02/2009	4	3339	0		3339	3.5	0	0	0	0	0
20/02/2009	1	3032	0		3032	3.2	0	0	0	0	0
21/02/2009	1	1661	0		1661	1.7	0	0	0	0	0
22/02/2009	2	1884	0		1884	2.0	0	0	0	0	0
23/02/2009	2	1773	0		1773	1.9	0	0	0	0	0
24/02/2009	0	1847	0		1847	1.9	0	0	0	0	0
25/02/2009	0	1351	0		1351	1.4	0	0	0	0	0
26/02/2009	0	1239	0		1239	1.3	0	0	0	0	0
27/02/2009	2	667	0		667	0.7	0	0	0	0	0
28/02/2009	0	1301	0		1301	1.4	0	0	0	0	0
01/03/2009	0	1046	0		1046	1.1	0	0	0	0	0
02/03/2009	0	953	0		953	1.0	0	0	0	0	0
03/03/2009	0.5	1033	0		1033	1.1	0	0	0	0	0
04/03/2009	0	995	0		995	1.0	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

05/03/2009	0.5	955	0		955	1.0	0	0	0	0	0
06/03/2009	0	982	0		982	1.0	0	0	0	0	0
07/03/2009	0	887	0		887	0.9	0	0	0	0	0
08/03/2009	0	776	0		776	0.8	0	0	0	0	0
09/03/2009	0	1010	0		1010	1.1	0	0	0	0	0
10/03/2009	1	833	0		833	0.9	0	0	0	0	0
11/03/2009	9.5	863	0		863	0.9	0	0	0	0	0
12/03/2009	11.5	1188	0		1188	1.2	0	0	0	0	0
13/03/2009	2	961	0		961	1.0	0	0	0	0	0
14/03/2009	2	902	0		902	0.9	0	0	0	0	0
15/03/2009	0	908	0		908	1.0	0	0	0	0	0
16/03/2009	0	729	0		729	0.8	0	0	0	0	0
17/03/2009	8.5	1110	0		1110	1.2	0	0	0	0	0
18/03/2009	0	954	0		954	1.0	0	0	0	0	0
19/03/2009	0	879	0		879	0.9	0	0	0	0	0
20/03/2009	0	798	0		798	0.8	0	0	0	0	0
21/03/2009	17	1115	0		1115	1.2	0	0	0	0	0
22/03/2009	6	1124	0		1124	1.2	0	0	0	0	0
23/03/2009	5	1262	0		1262	1.3	0	0	0	0	0
24/03/2009	0	708	0		708	0.7	0	0	0	0	0
25/03/2009	0	864	0		864	0.9	0	0	0	0	0
26/03/2009	0	708	0		708	0.7	0	0	0	0	0
27/03/2009	0	823	0		823	0.9	0	0	0	0	0
28/03/2009	15	1112	0		1112	1.2	0	0	0	0	0
29/03/2009	10	1423	0		1423	1.5	0	0	0	0	0
30/03/2009	30	2003	0		2003	2.1	0	0	0	0	0
31/03/2009	80	8152	1745.9		9897.9	10.4	0	1	1	0	1
01/04/2009	0.5	5550	430.7		5980.7	6.3	0	0	0		
02/04/2009	9.5	3232	0		3232	3.4	0	0	0		0
03/04/2009	104	8001	1181.4	1000	10182.4	10.7	0	1	1		
04/04/2009	38	8927	3494.9		12421.9	13.0	1	1	1		
05/04/2009	1	6984	1041.2		8025.2	8.4	0	0	1		
06/04/2009	15	8290	30.9		8320.9	8.7	0	0	1	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

07/04/2009	110	6193	0	1000	7193	7.5	0	0	1		
08/04/2009	6	8019	2109		10128	10.6	0	1	1		
09/04/2009	2	5277	79.2		5356.2	5.6	0	0	0		
10/04/2009	12	5841	0		5841	6.1	0	0	0	0	0
11/04/2009	0	3986	0		3986	4.2	0	0	0	0	0
12/04/2009	9	3916	0		3916	4.1	0	0	0	0	0
13/04/2009	10	4096	0		4096	4.3	0	0	0	0	0
14/04/2009	73	8582	229.6	500	9311.6	9.8	0	1	1	0	1
15/04/2009	7	7018	1197.8		8215.8	8.6	0	0	1		
16/04/2009	0	5154	62.2		5216.2	5.5	0	0	0		
17/04/2009	0	3092	0		3092	3.2	0	0	0	0	0
18/04/2009	2	3481	0		3481	3.7	0	0	0	0	0
19/04/2009	2	2780	0		2780	2.9	0	0	0	0	0
20/04/2009	0	2111	0		2111	2.2	0	0	0	0	0
21/04/2009	3	1688	0		1688	1.8	0	0	0	0	0
22/04/2009	6	1769	0		1769	1.9	0	0	0	0	0
23/04/2009	11	2210	0		2210	2.3	0	0	0	0	0
24/04/2009	0	1861	0		1861	2.0	0	0	0	0	0
25/04/2009	0	1627	0		1627	1.7	0	0	0	0	0
26/04/2009	0	1510	0		1510	1.6	0	0	0	0	0
	2035	612937	19627.8	2500	635064.8		1	7	15	4	9
27/04/2009	0	1371	0		1371	1.4	0	0	0	0	0
28/04/2009	0	1149	0		1149	1.2	0	0	0	0	0
29/04/2009	0	1235	0		1235	1.3	0	0	0	0	0
30/04/2009	0	1118	0		1118	1.2	0	0	0	0	0
01/05/2009	0	1172	0		1172	1.2	0	0	0	0	0
02/05/2009	0	946	0		946	1.0	0	0	0	0	0
03/05/2009	1	1050	0		1050	1.1	0	0	0	0	0
04/05/2009	0.5	1164	0		1164	1.2	0	0	0	0	0
05/05/2009	3	825	0		825	0.9	0	0	0	0	0
06/05/2009	6	1098	0		1098	1.2	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

07/05/2009	2.5	1094	0		1094	1.1	0	0	0	0	0
08/05/2009	0	1020	0		1020	1.1	0	0	0	0	0
09/05/2009	3	1164	0		1164	1.2	0	0	0	0	0
10/05/2009	0	765	0		765	0.8	0	0	0	0	0
11/05/2009	12.5	1253	0		1253	1.3	0	0	0	0	0
12/05/2009	1	1031	0		1031	1.1	0	0	0	0	0
13/05/2009	0	984	0		984	1.0	0	0	0	0	0
14/05/2009	0	1291	0		1291	1.4	0	0	0	0	0
15/05/2009	0	943	0		943	1.0	0	0	0	0	0
16/05/2009	0	715	0		715	0.8	0	0	0	0	0
17/05/2009	0	928	0		928	1.0	0	0	0	0	0
18/05/2009	0	937	17.1		954.1	1.0	0	0	0	1	1
19/05/2009	56	4904	0		4904	5.1	0	0	0	0	0
20/05/2009	26	5672	0		5672	6.0	0	0	0	0	0
21/05/2009	120	6812	1000		7812	8.2	0	0	1	0	0
22/05/2009	127	3835	2000	1000	6835	7.2	0	0	1		
23/05/2009	32	6170	2000		8170	8.6	0	0	1		
24/05/2009	21	9509	2000		11509	12.1	1	1	1		
25/05/2009	2	5370	0		5370	5.6	0	0	0	0	0
26/05/2009	4	3817	0		3817	4.0	0	0	0	0	0
27/05/2009	2	3654	0		3654	3.8	0	0	0	0	0
28/05/2009	0	2281	0		2281	2.4	0	0	0	0	0
29/05/2009	0	2259	0		2259	2.4	0	0	0	0	0
30/05/2009	0	1917	0		1917	2.0	0	0	0	0	0
31/05/2009	0	1830	0		1830	1.9	0	0	0	0	0
01/06/2009	7.5	2460	0		2460	2.6	0	0	0	0	0
02/06/2009	0	1852	0		1852	1.9	0	0	0	0	0
03/06/2009	3.5	1241	0		1241	1.3	0	0	0	0	0
04/06/2009	2.5	1399	0		1399	1.5	0	0	0	0	0
05/06/2009	2	2145	0		2145	2.3	0	0	0	0	0
06/06/2009	0	1059	0		1059	1.1	0	0	0	0	0
07/06/2009	4	1731	0		1731	1.8	0	0	0	0	0
08/06/2009	0	1005	0		1005	1.1	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

09/06/2009	0	1379	0		1379	1.4	0	0	0	0	0
10/06/2009	0	1321	0		1321	1.4	0	0	0	0	0
11/06/2009	0	1093	0		1093	1.1	0	0	0	0	0
12/06/2009	0	1200	0		1200	1.3	0	0	0	0	0
13/06/2009	0	883	0		883	0.9	0	0	0	0	0
14/06/2009	0	975	0		975	1.0	0	0	0	0	0
15/06/2009	0	1280	0		1280	1.3	0	0	0	0	0
16/06/2009	0	857	0		857	0.9	0	0	0	0	0
17/06/2009	0	1048	0		1048	1.1	0	0	0	0	0
18/06/2009	4	851	0		851	0.9	0	0	0	0	0
19/06/2009	3.5	991	0		991	1.0	0	0	0	0	0
20/06/2009	39	2602	0		2602	2.7	0	0	0	0	0
21/06/2009	25	4417	1000		5417	5.7	0	0	0	0	0
22/06/2009	103	8301	2000	1000	11301	11.9	0	1	1		
23/06/2009	47	8301	1000		9301	9.8	0	1	1		
24/06/2009	1.5	7694	0		7694	8.1	0	0	1	0	0
25/06/2009	0	4711	0		4711	4.9	0	0	0	0	0
26/06/2009	0.5	1047	0		1047	1.1	0	0	0	0	0
27/06/2009	0.5	2007	0		2007	2.1	0	0	0	0	0
28/06/2009	0	2250	0		2250	2.4	0	0	0	0	0
29/06/2009	0	2102	0		2102	2.2	0	0	0	0	0
30/06/2009		1640	0		1640	1.7	0	0	0	0	0
01/07/2009	0	1945	0		1945	2.0	0	0	0	0	0
02/07/2009	0	1294	0		1294	1.4	0	0	0	0	0
03/07/2009	0	1146	0		1146	1.2	0	0	0	0	0
04/07/2009	0	1071	0		1071	1.1	0	0	0	0	0
05/07/2009	0	1227	0		1227	1.3	0	0	0	0	0
06/07/2009	0	1183	0		1183	1.2	0	0	0	0	0
07/07/2009	0	1230	0		1230	1.3	0	0	0	0	0
08/07/2009	11	1361	0		1361	1.4	0	0	0	0	0
09/07/2009	2	1424	0		1424	1.5	0	0	0	0	0
10/07/2009	14	1767	0		1767	1.9	0	0	0	0	0
11/07/2009	2	2032	0		2032	2.1	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

12/07/2009	0	1476	0		1476	1.5	0	0	0	0	0
13/07/2009	0	1739	0		1739	1.8	0	0	0	0	0
14/07/2009	1	789	0		789	0.8	0	0	0	0	0
15/07/2009	0	1080	0		1080	1.1	0	0	0	0	0
16/07/2009	0	1097	0		1097	1.2	0	0	0	0	0
17/07/2009	0	1030	0		1030	1.1	0	0	0	0	0
18/07/2009	0	1022	0		1022	1.1	0	0	0	0	0
19/07/2009	0	1147	0		1147	1.2	0	0	0	0	0
20/07/2009	0	939	0		939	1.0	0	0	0	0	0
21/07/2009	0	987	0		987	1.0	0	0	0	0	0
22/07/2009	0	948	0		948	1.0	0	0	0	0	0
23/07/2009	0	788	0		788	0.8	0	0	0	0	0
24/07/2009	0	950	0		950	1.0	0	0	0	0	0
25/07/2009	3	1105	0		1105	1.2	0	0	0	0	0
26/07/2009	0	915	0		915	1.0	0	0	0	0	0
27/07/2009	0	1052	0		1052	1.1	0	0	0	0	0
28/07/2009	0	901	0		901	0.9	0	0	0	0	0
29/07/2009	0	1014	0		1014	1.1	0	0	0	0	0
30/07/2009	0	877	0		877	0.9	0	0	0	0	0
31/07/2009	0	633	0		633	0.7	0	0	0	0	0
01/08/2009	0	797	0		797	0.8	0	0	0	0	0
02/08/2009	0	827	0		827	0.9	0	0	0	0	0
03/08/2009	0	994	0		994	1.0	0	0	0	0	0
04/08/2009	0	666	0		666	0.7	0	0	0	0	0
05/08/2009	0	968	0		968	1.0	0	0	0	0	0
06/08/2009	0	1173	0		1173	1.2	0	0	0	0	0
07/08/2009	0	1227	0		1227	1.3	0	0	0	0	0
08/08/2009	0	788	0		788	0.8	0	0	0	0	0
09/08/2009	0	587	0		587	0.6	0	0	0	0	0
10/08/2009	0	969	0		969	1.0	0	0	0	0	0
11/08/2009	0	680	0		680	0.7	0	0	0	0	0
12/08/2009	0	678	0		678	0.7	0	0	0	0	0
13/08/2009	0	950	0		950	1.0	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

14/08/2009	0	676	0		676	0.7	0	0	0	0	0
15/08/2009	0	688	0		688	0.7	0	0	0	0	0
16/08/2009	0	657	0		657	0.7	0	0	0	0	0
17/08/2009	0	812	0		812	0.9	0	0	0	0	0
18/08/2009	0	722	0		722	0.8	0	0	0	0	0
19/08/2009	0	678	0		678	0.7	0	0	0	0	0
20/08/2009	0	551	0		551	0.6	0	0	0	0	0
21/08/2009	0	713	0		713	0.7	0	0	0	0	0
22/08/2009	0	665	0		665	0.7	0	0	0	0	0
23/08/2009	0	739	0		739	0.8	0	0	0	0	0
24/08/2009	0	811	0		811	0.9	0	0	0	0	0
25/08/2009	0	713	0		713	0.7	0	0	0	0	0
26/08/2009	0	634	0		634	0.7	0	0	0	0	0
27/08/2009	0	832	0		832	0.9	0	0	0	0	0
28/08/2009	0	590	0		590	0.6	0	0	0	0	0
29/08/2009	0	525	0		525	0.6	0	0	0	0	0
30/08/2009	0	646	0		646	0.7	0	0	0	0	0
31/08/2009	0	815	0		815	0.9	0	0	0	0	0
01/09/2009	0	624	0		624	0.7	0	0	0	0	0
02/09/2009	0	610	0		610	0.6	0	0	0	0	0
03/09/2009	0	926	0		926	1.0	0	0	0	0	0
04/09/2009	0	513	0		513	0.5	0	0	0	0	0
05/09/2009	8	675	0		675	0.7	0	0	0	0	0
06/09/2009	0	716	0		716	0.8	0	0	0	0	0
07/09/2009	0	843	0		843	0.9	0	0	0	0	0
08/09/2009	9	629	0		629	0.7	0	0	0	0	0
09/09/2009	0	697	0		697	0.7	0	0	0	0	0
10/09/2009	0	667	0		667	0.7	0	0	0	0	0
11/09/2009	0	797	0		797	0.8	0	0	0	0	0
12/09/2009	0	585	0		585	0.6	0	0	0	0	0
13/09/2009	0	861	0		861	0.9	0	0	0	0	0
14/09/2009	0	727	0		727	0.8	0	0	0	0	0
15/08/2009	0	688	0		688	0.7	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

16/09/2009	0	558	0		558	0.6	0	0	0	0	0
17/09/2009	0	626	0		626	0.7	0	0	0	0	0
18/09/2009	0	675	0		675	0.7	0	0	0	0	0
19/09/2009	0	355	0		355	0.4	0	0	0	0	0
20/09/2009	0	798	0		798	0.8	0	0	0	0	0
21/09/2009	0	820	0		820	0.9	0	0	0	0	0
22/09/2009	4	660	0		660	0.7	0	0	0	0	0
23/09/2009	0	406	0		406	0.4	0	0	0	0	0
24/09/2009	0	656	0		656	0.7	0	0	0	0	0
25/09/2009	0	632	0		632	0.7	0	0	0	0	0
26/09/2009	0	631	0		631	0.7	0	0	0	0	0
27/09/2009	0	932	0		932	1.0	0	0	0	0	0
28/09/2009	0	474	0		474	0.5	0	0	0	0	0
29/09/2009	0	744	0		744	0.8	0	0	0	0	0
30/09/2009	0	526	0		526	0.6	0	0	0	0	0
01/10/2009	0	652	0		652	0.7	0	0	0	0	0
02/10/2009	0	724	0		724	0.8	0	0	0	0	0
03/10/2009	0	474	0		474	0.5	0	0	0	0	0
04/10/2009	0	811	0		811	0.9	0	0	0	0	0
05/10/2009	1	457	0		457	0.5	0	0	0	0	0
06/10/2009	3	736	0		736	0.8	0	0	0	0	0
07/10/2009	0	654	0		654	0.7	0	0	0	0	0
08/10/2009	0	536	0		536	0.6	0	0	0	0	0
09/10/2009	0	521	0		521	0.5	0	0	0	0	0
10/10/2009	0	451	0		451	0.5	0	0	0	0	0
11/10/2009	1.5	736	0		736	0.8	0	0	0	0	0
12/10/2009	7	513	0		513	0.5	0	0	0	0	0
13/10/2009	4	615	0		615	0.6	0	0	0	0	0
14/10/2009	0	696	0		696	0.7	0	0	0	0	0
15/10/2009	0	528	0		528	0.6	0	0	0	0	0
16/10/2009	0	557	0		557	0.6	0	0	0	0	0
17/10/2009	0	618	0		618	0.6	0	0	0	0	0
18/10/2009	0	538	0		538	0.6	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

19/10/2009	0	722	0		722	0.8	0	0	0	0	0
20/10/2009	0	978	0		978	1.0	0	0	0	0	0
21/10/2009	0	378	0		378	0.4	0	0	0	0	0
22/10/2009	0	878	0		878	0.9	0	0	0	0	0
23/10/2009	0	385	0		385	0.4	0	0	0	0	0
24/10/2009	0	593	0		593	0.6	0	0	0	0	0
25/10/2009	0	651	0		651	0.7	0	0	0	0	0
26/10/2009	0	709	0		709	0.7	0	0	0	0	0
27/10/2009	9	452	0		452	0.5	0	0	0	0	0
28/10/2009	17	1606	0		1606	1.7	0	0	0	0	0
29/10/2009	12	937	0		937	1.0	0	0	0	0	0
30/10/2009	0	825	0		825	0.9	0	0	0	0	0
31/10/2009	0	668	0		668	0.7	0	0	0	0	0
01/11/2009	14	720	0		720	0.8	0	0	0	0	0
02/11/2009	0	788	0		788	0.8	0	0	0	0	0
03/11/2009	0	856	0		856	0.9	0	0	0	0	0
04/11/2009	0	930	0		930	1.0	0	0	0	0	0
05/11/2009	0	700	0		700	0.7	0	0	0	0	0
06/11/2009	1	535	0		535	0.6	0	0	0	0	0
07/11/2009	19	1324	0		1324	1.4	0	0	0	0	0
08/11/2009	0	757	0		757	0.8	0	0	0	0	0
09/11/2009	78	3435	1737		5172	5.4	0	0	0	0	1
10/11/2009	3	3677	0		3677	3.9	0	0	0	0	0
11/11/2009	0	1739	0		1739	1.8	0	0	0	0	0
12/11/2009	0	1296	0		1296	1.4	0	0	0	0	0
13/11/2009	0	820	0		820	0.9	0	0	0	0	0
14/11/2009	0	958	0		958	1.0	0	0	0	0	0
15/11/2009	2	797	0		797	0.8	0	0	0	0	0
16/11/2009	0	1020	0		1020	1.1	0	0	0	0	0
17/11/2009	0	835	0		835	0.9	0	0	0	0	0
18/11/2009	3	843	0		843	0.9	0	0	0	0	0
19/11/2009	0	925	0		925	1.0	0	0	0	0	0
20/11/2009	0	859	0		859	0.9	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

21/11/2009	0	557	0		557	0.6	0	0	0	0	0
22/11/2009	0	732	0		732	0.8	0	0	0	0	0
23/11/2009	0	856	0		856	0.9	0	0	0	0	0
24/11/2009	0.5	550	0		550	0.6	0	0	0	0	0
25/11/2009	1.5	871	0		871	0.9	0	0	0	0	0
26/11/2009	0	621	0		621	0.7	0	0	0	0	0
27/11/2009	0	797	0		797	0.8	0	0	0	0	0
28/11/2009	0	744	0		744	0.8	0	0	0	0	0
29/11/2009	3	833	0		833	0.9	0	0	0	0	0
30/11/2009	5	791	0		791	0.8	0	0	0	0	0
01/12/2009	0	780	0		780	0.8	0	0	0	0	0
02/12/2009	2	754	0		754	0.8	0	0	0	0	0
03/12/2009	0.5	757	0		757	0.8	0	0	0	0	0
04/12/2009	0	720	0		720	0.8	0	0	0	0	0
05/12/2009	0	875	0		875	0.9	0	0	0	0	0
06/12/2009	0.5	666	0		666	0.7	0	0	0	0	0
07/12/2009	0.5	741	0		741	0.8	0	0	0	0	0
08/12/2009	0	652	0		652	0.7	0	0	0	0	0
09/12/2009	0	734	0		734	0.8	0	0	0	0	0
10/12/2009	0	669	0		669	0.7	0	0	0	0	0
11/12/2009	0	716	0		716	0.8	0	0	0	0	0
12/12/2009	0	757	0		757	0.8	0	0	0	0	0
13/12/2009	0	692	0		692	0.7	0	0	0	0	0
14/12/2009	0	665	0		665	0.7	0	0	0	0	0
15/12/2009	0.5	799	0		799	0.8	0	0	0	0	0
16/12/2009	0.5	738	0		738	0.8	0	0	0	0	0
17/12/2009	0	735	0		735	0.8	0	0	0	0	0
18/12/2009	0	637	0		637	0.7	0	0	0	0	0
19/12/2009	0	683	0		683	0.7	0	0	0	0	0
20/12/2009	11	768	0		768	0.8	0	0	0	0	0
21/12/2009	46	1736	0		1736	1.8	0	0	0	0	0
22/12/2009	0.5	653	0		653	0.7	0	0	0	0	0
23/12/2009	0	811	0		811	0.9	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

24/12/2009	0.5	735	0		735	0.8	0	0	0	0	0
25/12/2009	0	767	0		767	0.8	0	0	0	0	0
26/12/2009	0	796	0		796	0.8	0	0	0	0	0
27/12/2009	1.5	757	0		757	0.8	0	0	0	0	0
28/12/2009	42.5	1414	0		1414	1.5	0	0	0	0	0
30/12/2009	46.5	4414	0		4414	4.6	0	0	0	0	0
31/12/2009	1.5	2293	0		2293	2.4	0	0	0	0	0
01/01/2010	2	1630	0		1630	1.7	0	0	0	0	0
02/01/2010	2	1007	0		1007	1.1	0	0	0	0	0
03/01/2010	0	971	0		971	1.0	0	0	0	0	0
04/01/2010	2	990	0		990	1.0	0	0	0	0	0
05/01/2010	1.5	1041	0		1041	1.1	0	0	0	0	0
06/01/2010	1.5	804	0		804	0.8	0	0	0	0	0
07/01/2010	3	912	0		912	1.0	0	0	0	0	0
08/01/2010	23	1313	0		1313	1.4	0	0	0	0	0
09/01/2010	2.5	1665	0		1665	1.7	0	0	0	0	0
10/01/2010	0	656	0		656	0.7	0	0	0	0	0
11/01/2010	0	866	0		866	0.9	0	0	0	0	0
12/01/2010	0	857	0		857	0.9	0	0	0	0	0
13/01/2010	0	783	0		783	0.8	0	0	0	0	0
14/01/2010	0	784	0		784	0.8	0	0	0	0	0
15/01/2010	0	781	0		781	0.8	0	0	0	0	0
16/01/2010	1.5	845	0		845	0.9	0	0	0	0	0
17/01/2010	0	729	0		729	0.8	0	0	0	0	0
18/01/2010	1.5	643	0		643	0.7	0	0	0	0	0
19/01/2010	0	697	0		697	0.7	0	0	0	0	0
20/01/2010	0	1221	0		1221	1.3	0	0	0	0	0
21/01/2010	0	171	0		171	0.2	0	0	0	0	0
22/01/2010	0	695	0		695	0.7	0	0	0	0	0
23/01/2010	0	764	0		764	0.8	0	0	0	0	0
24/01/2010	0	674	0		674	0.7	0	0	0	0	0
25/01/2010	0	527	0		527	0.6	0	0	0	0	0
26/01/2010	0	696	0		696	0.7	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

27/01/2010	0	607	0		607	0.6	0	0	0	0	0
28/01/2010	2.5	466	0		466	0.5	0	0	0	0	0
29/01/2010	13	736	0		736	0.8	0	0	0	0	0
30/01/2010	0.5	745	0		745	0.8	0	0	0	0	0
31/01/2010	37	1339	0		1339	1.4	0	0	0	0	0
01/02/2010	14	1778	0		1778	1.9	0	0	0	0	0
02/02/2010	2.5	728	0		728	0.8	0	0	0	0	0
03/02/2010	5.5	1038	0		1038	1.1	0	0	0	0	0
04/02/2010	3.5	1054	0		1054	1.1	0	0	0	0	0
05/02/2010	2	928	0		928	1.0	0	0	0	0	0
06/02/2010	1	1028	0		1028	1.1	0	0	0	0	0
07/02/2010	190	6373	4000	2000	12373	13.0	1	1	1	0	0
08/02/2010	29	7828	4682		12510	13.1	1	1	1		
09/02/2010	2	5852	0		5852	6.1	0	0	0	0	0
10/02/2010	11.5	4835	0		4835	5.1	0	0	0	0	0
11/02/2010	4.5	3622	0		3622	3.8	0	0	0	0	0
12/02/2010	0	2548	0		2548	2.7	0	0	0	0	0
13/02/2010	0	1966	0		1966	2.1	0	0	0	0	0
14/02/2010	0	1645	0		1645	1.7	0	0	0	0	0
16/02/2010	9.5	2010	0		2010	2.1	0	0	0	0	0
17/02/2010	23.5	2122	0		2122	2.2	0	0	0	0	0
18/02/2010	0.5	2252	0		2252	2.4	0	0	0	0	0
19/02/2010	6.5	1950	0		1950	2.0	0	0	0	0	0
20/02/2010	6	2041	0		2041	2.1	0	0	0	0	0
21/02/2010	1	1712	0		1712	1.8	0	0	0	0	0
22/02/2010	0	1522	0		1522	1.6	0	0	0	0	0
23/02/2010	0	1368	0		1368	1.4	0	0	0	0	0
24/02/2010	0	1295	0		1295	1.4	0	0	0	0	0
25/02/2010	13	1762	0		1762	1.8	0	0	0	0	0
26/02/2010	7	1660	0		1660	1.7	0	0	0	0	0
27/02/2010	11.5	2490	0		2490	2.6	0	0	0	0	0
28/02/2010	6.5	2464	0		2464	2.6	0	0	0	0	0
01/03/2010	14	2455	0		2455	2.6	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

02/03/2010	26	4616	220		4836	5.1	0	0	0	1	1
03/03/2010	21	7471	0		7471	7.8	0	0	1	0	0
04/03/2010	10	5874	0		5874	6.2	0	0	0	0	0
05/03/2010	0.5	3450	0		3450	3.6	0	0	0	0	0
06/03/2010	4	2588	0		2588	2.7	0	0	0	0	0
07/03/2010	5	2259	0		2259	2.4	0	0	0	0	0
08/03/2010	3.5	2136	0		2136	2.2	0	0	0	0	0
09/03/2010	0	1921	0		1921	2.0	0	0	0	0	0
10/03/2010	0	1673	0		1673	1.8	0	0	0	0	0
11/03/2010	0	1515	0		1515	1.6	0	0	0	0	0
12/03/2010	57	5151	2400		7551	7.9	0	0	1	1	1
13/03/2010	5	6341	0		6341	6.7	0	0	0	0	0
14/03/2010	7	3446	0		3446	3.6	0	0	0	0	0
15/03/2010	21	5002	0		5002	5.2	0	0	0	0	0
16/03/2010	14.5	5418	0		5418	5.7	0	0	0	0	0
17/03/2010	2.5	3263	0		3263	3.4	0	0	0	0	0
18/03/2010	1.5	2534	0		2534	2.7	0	0	0	0	0
19/03/2010	2	2159	0		2159	2.3	0	0	0	0	0
20/03/2010	0	1896	0		1896	2.0	0	0	0	0	0
21/03/2010	0	1732	0		1732	1.8	0	0	0	0	0
22/03/2010	0	1623	0		1623	1.7	0	0	0	0	0
23/03/2010	0	1339	0		1339	1.4	0	0	0	0	0
24/03/2010	0	1184	0		1184	1.2	0	0	0	0	0
25/03/2010	0	1223	0		1223	1.3	0	0	0	0	0
27/03/2010	0	1114	0		1114	1.2	0	0	0	0	0
28/03/2010	0.5	1108	0		1108	1.2	0	0	0	0	0
30/03/2010	0	885	0		885	0.9	0	0	0	0	0
31/03/2010	6	1106	0		1106	1.2	0	0	0	0	0
01/04/2010	14	2368	0		2368	2.5	0	0	0	0	0
02/04/2010	1	775	0		775	0.8	0	0	0	0	0
03/04/2010	5.5	1391	0		1391	1.5	0	0	0	0	0
04/04/2010	2	1206	0		1206	1.3	0	0	0	0	0
05/04/2010	1	871	0		871	0.9	0	0	0	0	0

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

06/04/2010	0	983	0		983	1.0	0	0	0	0	0
07/04/2010	0	1058	0		1058	1.1	0	0	0	0	0
09/04/2010	0	948	0		948	1.0	0	0	0	0	0
10/04/2010	0	967	0		967	1.0	0	0	0	0	0
11/04/2010	0	843	0		843	0.9	0	0	0	0	0
12/04/2010	0	1233	0		1233	1.3	0	0	0	0	0
13/04/2010	0	491	0		491	0.5	0	0	0	0	0
14/04/2010	6	920	0		920	1.0	0	0	0	0	0
15/04/2010	0.5	869	0		869	0.9	0	0	0	0	0
16/04/2010	1	938	0		938	1.0	0	0	0	0	0
17/04/2010	11	1100	0		1100	1.2	0	0	0	0	0
18/04/2010	6	1025	0		1025	1.1	0	0	0	0	0
19/04/2010	6.5	869	0		869	0.9	0	0	0	0	0
20/04/2010	2.5	1218	0		1218	1.3	0	0	0	0	0
21/04/2010	23	1969	0		1969	2.1	0	0	0	0	0
22/04/2010	11.5	2789	0		2789	2.9	0	0	0	0	0
23/04/2010	2.5	1666	0		1666	1.7	0	0	0	0	0
24/04/2010	0	1710	0		1710	1.8	0	0	0	0	0
25/04/2010	0	1056	0		1056	1.1	0	0	0	0	0
26/04/2010	0	994	0		994	1.0	0	0	0	0	0
	1795	517020	24056.1	4000	545076.1		3	5	11	3	4
27/04/2010	0	1384	0		1384	1.5	0	0	0	0	
28/04/2010	0	690	0		690	0.7	0	0	0	0	
29/04/2010	0	1017	0		1017	1.1	0	0	0	0	
30/04/2010	0	1017	0		1017	1.1	0	0	0	0	
01/05/2010	0	912	0		912	1.0	0	0	0	0	
02/05/2010	5	928	0		928	1.0	0	0	0	0	
03/05/2010	0	993	0		993	1.0	0	0	0	0	
04/05/2010	73	2350	0		2350	2.5	0	0	0	0	
05/05/2010	11.5	5013	5200		10213	10.7	0	1	1	0	
06/05/2010	0	3713	0		3713	3.9	0	0	0	0	

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

07/05/2010	0	2488	0		2488	2.6	0	0	0	0	
08/05/2010	0	1537	0		1537	1.6	0	0	0	0	
09/05/2010	0	1634	0		1634	1.7	0	0	0	0	
10/05/2010	1	1227	0		1227	1.3	0	0	0	0	
11/05/2010	0	1349	0		1349	1.4	0	0	0	0	
12/05/2010	0	1255	0		1255	1.3	0	0	0	0	
13/05/2010	0	1182	0		1182	1.2	0	0	0	0	
14/05/2010	0	1180	0		1180	1.2	0	0	0	0	
15/05/2010	0	1065	0		1065	1.1	0	0	0	0	
16/05/2010	0	994	0		994	1.0	0	0	0	0	
17/05/2010	0	923	0		923	1.0	0	0	0	0	
18/05/2010	0	936	0		936	1.0	0	0	0	0	
19/05/2010	0	988	0		988	1.0	0	0	0	0	
20/05/2010	0	963	0		963	1.0	0	0	0	0	
21/05/2010	0	1109	0		1109	1.2	0	0	0	0	
22/05/2010	3	878	0		878	0.9	0	0	0	0	
23/05/2010	0	756	0		756	0.8	0	0	0	0	
24/05/2010	3	864	0		864	0.9	0	0	0	0	
25/05/2010	2.5	960	0		960	1.0	0	0	0	0	
26/05/2010	0.5	913	0		913	1.0	0	0	0	0	
27/05/2010	0	896	0		896	0.9	0	0	0	0	
28/05/2010	3.5	951	0		951	1.0	0	0	0	0	
29/05/2010	5	932	0		932	1.0	0	0	0	0	
30/05/2010	12	1263	0		1263	1.3	0	0	0	0	
31/05/2010	0.5	946	0		946	1.0	0	0	0	0	
01/06/2010	0	963	0		963	1.0	0	0	0	0	
02/06/2010	4.5	1020	0		1020	1.1	0	0	0	0	
03/06/2010	78	3459	3081	1000	7540	7.9	0	0	1	0	
04/06/2010	1	7306	0		7306	7.7	0	0	1	0	
05/06/2010	0	1102	0		1102	1.2	0	0	0	0	
06/06/2010	0	3448	0		3448	3.6	0	0	0	0	
07/06/2010	0	1501	0		1501	1.6	0	0	0	0	
08/06/2010	0	1495	0		1495	1.6	0	0	0	0	

BYRON SHIRE COUNCIL

STAFF REPORTS - INFRASTRUCTURE SERVICES

5.2 - ATTACHMENT 1

09/06/2010	0	1317	0		1317	1.4	0	0	0	0	
10/06/2010	0	1341	0		1341	1.4	0	0	0	0	
11/06/2010	0	1379	0		1379	1.4	0	0	0	0	
12/06/2010	0	1130	0		1130	1.2	0	0	0	0	
13/06/2010	0	1159	0		1159	1.2	0	0	0	0	
14/06/2010	3.5	894	0		894	0.9	0	0	0	0	
15/06/2010	2.5	1075	0		1075	1.1	0	0	0	0	
16/06/2010	0	1171	0		1171	1.2	0	0	0	0	
17/06/2010	0	997	0		997	1.0	0	0	0	0	
18/06/2010	0.5	1218	0		1218	1.3	0	0	0	0	
19/06/2010	0	780	0		780	0.8	0	0	0	0	
20/06/2010	0	894	0		894	0.9	0	0	0	0	
21/06/2010	0	1088	0		1088	1.1	0	0	0	0	
22/06/2010	3	756	0		756	0.8	0	0	0	0	
23/06/2010	7	929	0		929	1.0	0	0	0	0	
24/06/2010	20.5	2161	0		2161	2.3	0	0	0	0	
25/06/2010	0.5	1771	0		1771	1.9	0	0	0	0	
26/06/2010	0	1652	0		1652	1.7	0	0	0	0	
27/06/2010	0.5	869	0		869	0.9	0	0	0	0	
28/06/2010	0.5	1050	0		1050	1.1	0	0	0	0	
29/06/2010	0	1133	0		1133	1.2	0	0	0	0	
30/06/2010	0	1148	0		1148	1.2	0	0	0	0	

Report No. 5.3
Directorate: Infrastructure Services
Report Author: Peter Rees, Manager Utilities
File No: I2016/544
Theme: Community Infrastructure
Sewerage Services

Summary:

The Water Waste and Sewer Committee tasked staff to undertake a review of potential recycled water use opportunities in Mullumbimby. The attached paper presents a desktop review of potential recycled water use.

RECOMMENDATION:

That the Committee note the report.

Attachments:

1 B2033_BSC_Mullumbimby Recycled Water Use_Rev1 (2), E2016/33997 , page 82

Report

5 The Water Waste and Sewer Committee tasked staff to undertake a review of potential recycled water use opportunities in Mullumbimby. The attached paper presents a desktop review of potential recycled water use.

Financial Implications

10 Nil

Statutory and Policy Compliance Implications

Nil



Water and Waste Advisory Committee

Mullumbimby Recycled Water Use

Overview

The Main Arm Recycled Water Scheme (MARWS) commenced in 2003 with the delivery of recycled water to two adjacent farming enterprises for irrigation purposes: the Leeson and Johnston properties, on Main Arm Road. The scheme was supplied with recycled water from the Mullumbimby STP until the commissioning of the Brunswick Valley STP (BVSTP) in 2010.

The BVSTP is a tertiary treatment plant with UV sterilisation. The BVSTP has a design capacity of 3.8ML/day, with a current average dry weather flow (ADWF) of 1.5 ML/day. Following treatment, the effluent is stored in a 1.9 ML storage tank and either transferred to the Mullumbimby Recycled Water Facility (MRWF) for further treatment prior to recycled water use or discharged on the ebb tide into the Brunswick River.

At the MRWF the treated effluent is stored in a 10 ML storage pond. The treated effluent undergoes disinfection by chlorination as the recycled water is pumped to the irrigation properties, where it is delivered to onsite dams for irrigation purposes.

The quality of the water is suitable for *Pasture and Fodder Irrigation* in accordance with the *Australian Guidelines for Water Recycling 2006* (AGWR). Council operates the scheme in-line with the Byron Shire Council Waste Water Management Systems, Recycled Water Management Plan. Johnston and Leeson both have a formalised recycled water use agreement with Council.

The MARWS was established through a community consultation process, with the following objectives, as documented in the Brunswick River Catchment Effluent Management Strategy and Byron Shire Sewerage Management Strategy for Byron Shire (1999):

- ❑ *To ensure maximum resource utilisation and maximise the beneficial use of sewage effluent*
- ❑ *To minimise discharge to water ways where there are other opportunities for resource utilisation*

The scheme was developed with the aspirational irrigation use of 165 ML/average year (REF 2002). Water balances were carried out when the scheme commenced to determine the amount of recycled water to be used by each site (REF 2002). Recycled water is allocated to each user as follows:

- ❑ Johnston is allocated 70% of recycled water flow with a min of 0.4 and max of 1.2 ML/day for the 29 ha irrigation area
- ❑ Leeson is allocated 30% of recycled water flow with a min of 0.2 and max of 0.6 ML/day for the 18.6 ha irrigation area

Neither property uses the minimum daily allocation volume. Recycled water requirements are dependent on a number of environmental factors such as soils and rainfall. The area can receive high rainfall which will impact on volume irrigated per year. Groundwater and soils have been monitored at the recycled water irrigation sites since the scheme commenced and show no adverse impacts from the irrigation scheme.

Recycled Water Quality

The AGWR specifies combinations of treatment processes, together with non-treatment barriers (on-site controls) to ensure water of acceptable quality is provided for specified uses. In accordance with the AGWR the quality of the recycled water from BVSTP is suitable for:

- ☐ Pasture and Fodder Irrigation (cattle grazing)
- ☐ Municipal Use with Restricted Access and Application (sporting fields)

The level of treatment requires '*restricted access and application*' in municipal areas for the protection of public health. This may limit the application use for the recycled water scheme. The AGWR recommend the following non-treatment barriers (on-site controls):

- ☐ No public access after irrigation, until dry
- ☐ Minimum 25 – 30 m buffer to nearest point of public access
- ☐ Spray drift control

Recycled Water Use

The BVSTP ADWF is currently 1.5 ML/day. This equates to an annual flow of approximately 550ML/year. Although in 2007, 205 ML of recycled water was applied to the two properties, there has been a steady decline in use with approximately 50 ML per year irrigated since 2010. During the 2014/2015 reporting year Johnson used 100% of the recycled water from BVSTP (equating to 9% of the BVSTP annual discharge). Since the commissioning of the BVSTP, 5 % to 10% of the treated effluent has been used for recycled water irrigation purposes.

Council are identifying future options to increase recycled water use from the BVSTP and minimise discharge into the Brunswick River. A number of potential sites and uses have been highlighted for further investigation. The table below provides an overview of these sites and estimates of water use. Estimated recycled water use is a preliminary desktop calculation derived from actual recycled water use from both the rural (MARWS) and urban (Byron Bay Urban Recycled Water Scheme) schemes operated by Council. It's a starting point for consideration, but further detailed analysis is required.

Table 1 Potential recycled water users, areas and estimation of potential water use

Potential Users	ha	ML/y r	Comments
Rural			
Identify further properties for Pasture and Fodder irrigation on Main Arm Rd	60	90	<ul style="list-style-type: none"> Low Risk (private farm) Recycled water main is already in place. No further treatment required Need to contact properties and assess potential. Uncertain if there are viable farming enterprises that will use substantial volume of water Est water use based on 1.5ML/ha/year (Johnston's 29 ha property)
Mullumbimby Show Ground	2	10	<ul style="list-style-type: none"> Low Risk Recycled water main is already in place No further treatment required Onsite-controls (incl. NO public access until dry which may limit irrigation opportunities)
Commercial food crops (Hydroponic tomato grower adjacent to showgrounds has expressed interest)	-	-	<ul style="list-style-type: none"> Medium - High Risk Would require treatment upgrade (eg Filtration) and rigorous monitoring and reporting
Municipal (Sporting Fields)			
Mullumbimby Rugby League Football Club (includes camping facilities, sporting fields and surrounding paddocks)	5	25	<ul style="list-style-type: none"> Involve an under bore across the Brunswick River Further treatment required (chlorine dosing with adequate contact time) and onsite recycled water storage tank
Mullumbimby Golf Course	15	40	<ul style="list-style-type: none"> No further treatment required Reticulation infrastructure required Onsite-controls (incl. NO public access until dry which may limit irrigation opportunities)
Mullumbimby High School	1	5	<ul style="list-style-type: none"> Medium Risk due to proximity to residential area and high accessibility No further treatment required Reticulation infrastructure required Onsite-controls (incl. NO public access until dry which may limit irrigation opportunities)
Mullumbimby sporting fields (Two small sporting fields are situated in the Mullumbimby township)	1	5	<ul style="list-style-type: none"> Reticulation infrastructure required Onsite-controls (incl. NO public access until dry which may limit irrigation opportunities)
Dual Reticulation (toilets)			
Toilet Flushing	-	2	<ul style="list-style-type: none"> High Risk Would require treatment upgrade and rigorous monitoring and reporting; cross connection controls / external audits / community education Est water use based on BBURWS extension design
Wetlands / Regeneration			
Wetlands regeneration	50	400	<ul style="list-style-type: none"> Low Risk Low maintenance High evapo-transpiration / seepage Est water use from Byron constructed wetlands and 24 ha

Summary Points

- ❑ **Wetland Regeneration** has the potential to utilise, through evapotranspiration and seepage, a high percentage of the BVSTP treated effluent
- ❑ **Pasture and fodder Irrigation** can potentially utilise a significant volume of the BVSTP treated effluent. It is important to ensure there is a strong commitment from potential users that they will utilise the resource (User Agreements).
- ❑ **Municipal Use (sporting fields)** Current recycled water treatment and quality dictates that restricted access is required to ensure the protection of public health if recycled water from BVSTP is used in public areas. This can limit the opportunities irrigation.
- ❑ **Toilet flushing and commercial food production** - recycled water treatment and quality is unsuitable for toilet flushing purposes or commercial food production (e.g. tomatoes). Further treatment would be required.

Report No. 5.4 Container Deposit Scheme (CDS) Information Session

Directorate: Infrastructure Services

Report Author: Helen Waldron, EA Infrastructure Services

File No: I2016/548

5 **Theme:** Community Infrastructure
Waste and Recycling Services

Summary:

10 Committee member Luke McConnell will talk to the Committee about an information session he attended on a container deposit scheme.

RECOMMENDATION:

That Council note that the Water Waste and Sewer Advisory Committee were presented information regarding a container deposit scheme.

15

Report

Committee member Luke McConnell will talk to the Committee about an information session he attended on a container deposit scheme.

5

Financial Implications

Nil

10

Statutory and Policy Compliance Implications

Nil

Report No. 5.5 **Scope of the Water, Waste and Sewer and Related Committees**
Directorate: Infrastructure Services
Report Author: Helen Waldron, EA Infrastructure Services
File No: I2016/549
5 **Theme:** Community Infrastructure
 Waste and Recycling Services

Summary:

Cr Dey will speak to the Committee about a recent report to Council regarding the scope of Council Committees.

RECOMMENDATION:

That Council note the Water, Waste and Sewer Advisory Committee were provided with information about the recent report to Council reviewing all Committees

Report

Cr Dey will speak to the Committee about a recent report to Council regarding the scope of Council Committees.

5

Financial Implications

Nil

10

Statutory and Policy Compliance Implications

Nil