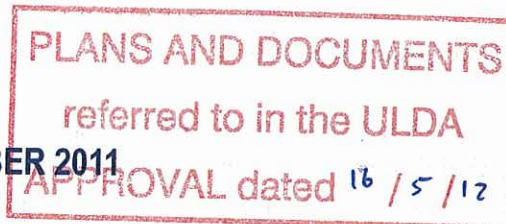


RIPLEY VALLEY – AMEX RIPLEY PROJECT

INTERIM WASTE WATER STRATEGY - SEPTEMBER 2011



Background

The topographic nature of Ripley Valley is that it is separated into only two primary sewer catchments; one on Bundamba Creek and the other on Deebing Creek. This report considers the Bundamba Creek Catchment with respect to the interim sewer servicing strategy for development on land owned by AMEX Corporation.

Interim servicing strategies and potential combinations have been considered in a number of previous reports including:

- Ripley Valley Sewerage Planning (RVSP) (Opus 2009 for Ipswich Water);
- Draft Ripley Valley Bundamba Sewerage Planning – Interim Stages Report (MWH, July 2010 for Ipswich Water);
- SUCE Water & Sewerage Report (Cardno 2009);
- UC Water & Sewerage Report (Cardno 2009); and
- Neighbourhood Master Plans & the SUCE NMP Water Supply & Sewerage Supplementary Report (Cardno, May 2010).

The Draft Ripley Valley Bundamba Sewerage Planning Report and the Cardno Strategies are broadly similar with relatively minor differences in pipe sizes depending on growth rates.

Forecast Demand

In January 2011, Urbis provided the following estimates of sales rates for Ripley Valley – including both the Deebing Creek and Bundamba Creek catchments over the next 10 Years as follows:

Ripley Valley – Take up forecasts:

Year	Per Year	Cumulative	Bundamba Catchment *
2011	0	0	0
2012	250	250	167
2013	375	625	417
2014	750	1,375	917
2015	1,000	2,375	1,583
2016	1,075	3,450	2,300
2017	1,200	4,650	3,100
2018	1,200	5,850	3,900
2019	1,125	6,975	4,650
2020	1,013	7,988	5,325
2021	1,013	9,000	6,000
2022	1,200	10,200	6,800

*Assumes Bundamba Catchment is 2/3rds of overall sales forecast

Bundamba Creek Catchment

Servicing for the Bundamba Creek Catchment will ultimately be via a 1,200 mm diameter main (depending on available grade) running down Bundamba Creek and connecting to the existing and ultimately augmented QUU Bundamba Creek Trunk Sewer. In the interim, servicing of this catchment will be via pump stations and rising mains. There a number of potential configurations which include:

- initial tankering;
- a rising main from the SUCE to the UC and then from the UC to Robertson Road;
- potential to reduce rising main length by connecting to the network at the existing Ripley village (i.e. at Fischer Road); and
- potential to reduce the rising main length by connecting to the network at the Cunningham Highway.

These options are considered further in the following options commentary.

Interim Servicing Arrangements

Stage 1 – To ensure sufficient flow is established to allow for a pump station and rising main to operate effectively, tankering of effluent will be undertaken from the development until such time that tankering becomes inefficient and uneconomic.

Stage 2 – Servicing will be through a new pump station south of the CHE and a 225mm diameter rising main connecting to a second pump station (or in-line booster station) near Aulds Road (north of the Urban Core) and then a further 250mm rising main to the Cunningham Highway, and ultimately to the existing deep sewer main at Robertson Road. The final design of the rising main and monitoring of sewage quality will determine if chemical dosing is required in the initial implementation.

Alternatively, the 225mm rising main may connect to a manhole on the gravity main adjacent to the Ripley township and utilise spare capacity in the 225mm gravity main that runs along the creek line from Fischer Road. This would be subject to further on site investigation (i.e. survey, condition assessment including CCTV survey and in the field flow monitoring in accordance with QUU design brief requirements) to determine the capacity of the main.

The attached plan shows indicative routes for the rising mains. Whilst alternative routes have been considered, the route from PS1 to PS2 along the Bundamba Creek corridor is considered the most economical. This is subject to securing easements across 3rd party land in a cost effective and timely manner.

The Draft Ripley Valley Bundamba Sewerage Planning – Interim Stages Report (MWH, July 2010) reported for the Fischer Road sewer that:

- Initial capacity checks indicate that the Fischer Road branch sewer can service an additional 700EP (10L/s) before the Desired Standards of Service (DSoS) is breached;
- If the additional flows (from the Ripley Valley developmental areas) are restricted (to 10L/s) during wet weather, approximately 3,000 EP could be serviced during dry weather conditions; and
- The Fischer Road sewer also has capacity to accept an additional 16L/s during ADWF conditions.

The above capacity of 700EP and 3,000EP is equivalent to approximately 255 lots and 1,095 lots respectively based on 2.74 EP/lot.

The above cannot yet be verified as the MWH report did not include detailed calculations. However, QUU in an email dated 20th September 2011 provided modelling results which broadly indicate similar Peak Wet Weather Flow (PWWF), capacity albeit the minimum spare capacity in the flattest section of the 225mm main is approximately 8.3 L/s (i.e. 624 EP based on an ADWF of 230 L/EP/d and 228 lots based on 2.74 EP/lot). Therefore, the existing gravity sewer is likely at most to have potential spare capacity to service 1 to 2 years of current forecast growth.

It should be noted that under the former Ipswich Water design standards a 225mm gravity sewer at minimum grade has a design capacity of 1,807 EP (i.e. 659 lots @ 2.74 EP/lot). However, there are some sections of the existing 225mm gravity sewer that are reported as being flatter than minimum grade.

Under this arrangement, pumping from the new pump station may also be synchronised to pump at off peak times to maximise the use of any capacity of the existing infrastructure.

It may also be possible to defer the section of rising main from the Cunningham Highway to Robertson Road. The modelling results given in the QUU email dated 20th September 2011 indicates there may be spare PWWF capacity in the flattest section of the 300/375mm gravity sewer between the Cunningham Highway and Robertson Road of approximately 28 L/s (i.e. 2,101 EP based on an ADWF of 230 L/EP/d and 767 lots based on 2.74 EP/lot). Therefore, it is possible the existing gravity sewer between the Cunningham Highway and Robertson Road has spare capacity to service up to 4 years of growth before the rising main would need to be extended. An indicative connection point (4) is shown on the attached plan; however, site investigations may determine a connection further south i.e. close to, or south of the highway.

The Draft Ripley Valley Bundamba Sewerage Planning – Interim Stages Report (MWH, July 2010) reported the PWWF design capacity of the two rising mains and pump stations as follows:

- From CHE to Aulds Road of 25L/s – Cardno calculate this is equivalent to approximately 1,878 EP based on an ADWF of 230 L/EP/d and 685 lots @ 2.74 EP/lot; and
- From Aulds Road to Robertson Road via new rising main of 40L/s – Cardno calculate this to be equivalent to approximately 3,005 EP based on an ADWF of 230 L/EP/d and 1,097 lots @ 2.74 EP/lot.

Stage 3 – This involves an upgrade of the pumps in the new pump stations at the CHE and at Aulds Road, and the duplication of the rising main from Aulds Road to Robertson Road with an additional 375mm rising main.

The Draft Ripley Valley Bundamba Sewerage Planning – Interim Stages Report (MWH, July 2010) reported PWWF design capacity of the two rising mains and pump stations as follows:

- From CHE to Aulds Road of 42L/s (i.e. Cardno calculate this to be equivalent to approximately 3,155 EP based on an ADWF of 230 L/EP/d and 1,152 lots @ 2.74 EP/lot) to 70L/s (i.e. Cardno calculate this to be equivalent to approximately 5,259 EP based on an ADWF of 230 L/EP/d and 1,919 lots @ 2.74 EP/lot); and
- From Aulds Road to Robertson Road via new rising main of 106L/s (i.e. Cardno calculate this to be equivalent to approximately 7,964 EP based on an ADWF of 230 L/EP and 2,907 lots @ 2.74 EP/lot) to 279L/s (i.e. Cardno calculate this to be equivalent to approximately 20,961 EP based on an ADWF of 230 L/EP/d and 7,650 lots @ 2.74 EP/lot).

Stage 4A – When the 1,919 lots capacity has been reached in the SUCE the system would require augmentation of the rising main between the CHE and Aulds Road with a 200-300mm rising main. At that time, other options to reduce the rising main length and pumping requirements, including a rising main into the proposed Urban Core gravity network, can also be considered.

Stage 4B – When the 7,650 lots capacity has been reached for pumping north of the UC from Aulds Road to Robertson Road then an interim pump station located part way between the UC and Robertson Road to boost capacity and delay the ultimate gravity main augmentation could be considered to increase capacity to approximately 11,000 lots. There may be a demand to introduce this earlier in any event in order to service the State owned development land north of the existing township. Detailed design may also conclude that increasing the pump capacity at Aulds Road may extend the operation of the rising main configuration.

Stage 4C – Further augmentation would lead to construction of the ultimate trunk gravity main on Bundamba Creek.

Staging Timing

Based on the above information, the potential timing for each stage of the works for the Bundamba Creek catchment is as follows:

Stage or Works	Timing
1	2012
2	2013
3	2015
4	2022+

Summary Bundamba Creek Catchment Augmentation Works

Stage	Works Description	Capacity	Map Reference
1	Tankering	Up to 150 lots per development area	
2	SUCE to UC 225mm RM & PS	685 lots (25 L/s)	PS1 & RM 1-2
	UC to Cunningham Highway 250mm RM & PS ^{(1)/(2)}	767 lots	PS2 & RM 2-4
	Cunningham Highway to Robertson Rd 250mm RM ⁽²⁾	1,097 lots (40 L/s)	RM 4-5
3	SUCE PS upgrade	1,919 lots (42 L/s – 72 L/s)	PS1
	UC PS upgrade & 375mm RM duplication	7,650 lots (106 L/s – 279 L/s)	PS2

4A	SUCE to UC capacity increase - via a 200-300mm RM duplication	Capacity between 5,500 lots (38% catchment south of CHE) and 12,000 lots (80% catchment south of CHE)	RM 1-2
4B	UC to Robertson Road capacity increase – consider a new Interim PS between UC and Robertson Road to boost RM design capacity otherwise proceed to Stage 4C. Exact location to be confirmed during detailed design	Capacity increase to be determined through preliminary design. Assume increase to 11,000 lots.	PS3
4C	UC to Robertson Road capacity increase - ultimate gravity sewer		RM 2-5

Notes:

1. Potential to utilise spare capacity of approximately 10 L/s (i.e. 700 EP, 255 lots) in the existing 225mm Fischer Road gravity sewer in the interim subject to further investigation.
2. Potential to utilise spare capacity of approximately 28 L/s (i.e. 2,101 EP, 767 lots) in the existing 300mm/375mm Cunningham Highway to Robertson Road gravity sewer in the interim subject to further investigation.

RM – Rising Main

PS – Pump Station

CHE - Centenary Highway Extension

SUCE – Secondary Urban Centre East

UC – Urban Core

