

APPENDIX G:

DETAILED PROJECT SUPPORT COSTING OF RECYCLED WATER SCHEMES (PREFERRED SCENARIO BASED ON MCA)



Preliminary Capital and Operating Cost Estimates

Catchment: Caboolture (North East Business Park, Narangba East LAP, Burpengary East LAP, Morayfield Burpengary LAP)

Scenario: 2

Item	Capacity	Units	Qty	Capital Cost	
				Rate	Amount
Sewerage Collection System					
The collection system has not been included because it is required infrastructure independent of water recycling options					
Sewage Treatment Plant (Caboolture South)					
The sewage treatment plant has not been included because it is required infrastructure independent of water recycling options. The STP would include secondary treatment processes for removal of BOD and nutrients, with basic disinfection, producing effluent suitable for agricultural or restricted access irrigation, i.e. Class B recycled water. The capacity of the recently upgraded Caboolture South STP is not known but it is expected to be significantly greater than required to service the recycled water system.	12ML/day (Average Day)	Item	1	Required infrastructure	
Recycled Water Treatment Plant					
The function of the RWTP is to produce Class A+ recycled water suitable for dual reticulation for residential reuse, including toilet flushing, cold water laundry, garden watering and other outside uses. For the irrigation of high access public open space Class A recycled water would be adequate, however, as these areas will be supplied from the dual reticulation they will receive Class A+ water.					
Upgrade of the existing RWTP from 6ML/day (estimated available capacity) to 10ML/day i.e. an additional 4 ML/day.	+ 4 ML/day (MDMM)	Item	1	\$12,000,000	\$12,000,000
Above ground covered reinforced concrete treated water storage reservoir	4ML (Nominal)	Item	1	\$2,809,000	\$2,809,000
Distribution Pumping Station with duty / standby pumps, including electrical switchboards, control panels, telemetry, suction and discharge pipework and valving	120 L/s @ 60m (approx 130 kW)	Item	1	\$812,000	\$812,000
Pumping station building	30	m2	1	\$94,000	\$94,000
Ancillary works (earthworks, access roads, drainage, fencing, power supply)		Item	1	\$845,000	\$845,000
Recycled Water Trunk Distribution Mains					
Trenching, bedding, supply, lay, backfill including thrust blocks, valves, bends and fittings etc					
- 450mm DN DICL (20% Urban Road Reserve)		m	10,650	\$994	\$10,582,000
- 375mm DN DICL		m	20,000	\$751	\$15,015,000
- 300mm DN DICL (20% Urban Road Reserve)		m	54,650	\$686	\$37,474,000
Recycled Water Reservoir A					
Above ground reinforced concrete service reservoir	3ML	Item	1	\$2,443,912	\$2,444,000
Distribution Pumping Station with duty / standby pumps, including electrical switchboards, control panels, telemetry, suction and discharge pipework and valving	150 L/s @ 40m (approx 110 kW each)	Item	1	\$808,000	\$808,000
Pumping station building	30	m2	1	\$93,340	\$94,000
Ancillary works (earthworks, access roads, drainage, fencing, power supply)		Item	1	\$731,430	\$732,000
Recycled Water Reservoir B					
Above ground reinforced concrete service reservoir	3ML	Item	1	\$2,443,912	\$2,444,000
Distribution Pumping Station with duty / standby pumps, including electrical switchboards, control panels, telemetry, suction and discharge pipework and valving	120 L/s @ 40m (approx 90 kW each)	Item	1	\$784,000	\$784,000
Pumping station building	30	m2	1	\$93,340	\$94,000
Ancillary works (earthworks, access roads, drainage, fencing, power supply)		Item	1	\$731,430	\$732,000
Recycled Water Reservoir C					
Above ground reinforced concrete service reservoir	1ML	Item	1	\$1,560,180	\$1,561,000
Distribution Pumping Station with duty / standby pumps, including electrical switchboards, control panels, telemetry, suction and discharge pipework and valving	20 L/s @ 40m (approx 20 kW each)	Item	1	\$426,000	\$426,000
Pumping station building	30	m2	1	\$84,740	\$85,000
Ancillary works (earthworks, access roads, drainage, fencing, power supply)		Item	1	\$587,002	\$588,000

Recycled Water Reservoir D						
	Above ground reinforced concrete service reservoir	2ML	Item	1	\$1,959,492	\$1,960,000
	Distribution Pumping Station with duty / standby pumps, including electrical switchboards, control panels, telemetry, suction and discharge pipework and valving	50 L/s @ 40m (approx 40 kW each)	Item	1	\$434,368	\$435,000
	Pumping station building	30	m2	1	\$84,740	\$85,000
	Ancillary works (earthworks, access roads, drainage, fencing, power supply)		Item	1	\$696,355	\$697,000
Recycled Water Reticulation						
	Per Lot costs including reticulation mains (trenching, bedding, supply, lay, test, backfill, valves and fittings), house connections and water meters (assumes a total of 12 m per house on average)		Lot	20,493		
	- 200mm DN uPVC (reticulation main)	20%	m	49,183	\$314	\$15,420,000
	- 150mm DN uPVC (reticulation main)	30%	m	73,775	\$245	\$18,055,000
	- 100mm DN uPVC (reticulation main)	50%	m	122,958	\$178	\$21,879,000
	- 25mm DN PE (house connection) - 20 m per house		m	409,860	\$66	\$26,849,000
	- recycled water meter with non-return valve		Item	20,493	\$344	\$7,050,000

Total scheme cost
Recycled Cost per Lot

\$182,853,000

\$8,923

Assumptions		
1	Reported costs are total out turn costs	
2	Prices are current as at November 2011	
3	Delivery is based on a "Tier 2" contractor to construct	
4	Land acquisition costs are excluded	
5	DERM waste levy to come into force 1/12/11 not included on the basis that all material would be contained within the study area	
6	All DICL pipes are PN20	
7	Pipes with a diameter <=200mm have been priced on construction productivities commensurate with a subdivision	
8	Pipes with a diameter >200mm have been priced on construction productivities commensurate with rural and urban infrastructure or mixture of each	
9	Reported Costs include Design, Construction Supervision, Owners Costs & Contingency calculated as an uplift factor applied to the direct construction costs	
	Estimate Element	Basis
	Contractor OH & Margin	% of Direct Cost 25%
	Design & supervision	% of Direct Cost 12%
	Owners Costs	% of Direct Cost 5%
	Contingency	% of Direct Cost 30%
	Uplift Factor on DC	172%

Preliminary Capital and Operating Cost Estimates

Catchment: CIGA

Scenario: 2

Item	Capacity	Units	Qty	Capital Cost	
				Rate	Amount
Sewerage Collection System					
The collection system has not been included because it is required infrastructure independent of water recycling options					
Sewage Treatment Plant					
The sewage treatment plant has not been included because it is required infrastructure independent of water recycling options. The STP would include secondary treatment processes for removal of BOD and nutrients, with basic disinfection, producing effluent suitable for agricultural or restricted access irrigation, i.e. Class B recycled water.	12ML/day (Average Day - 55,000 EP)	Item	1	Required infrastructure	
Recycled Water Treatment Plant					
The function of the RWTP is to produce Class A+ recycled water suitable for dual reticulation for residential reuse, including toilet flushing, cold water laundry, garden watering and other outside uses. For the irrigation of high access public open space Class A recycled water would be adequate, however, as these areas will be supplied from the dual reticulation they will receive Class A+ water.					
The RWTP will include at least advanced filtration (likely to be membrane ultrafiltration), high intensity disinfection (likely to be UV irradiation) and residual chlorination.	12ML/day (MDMM)	Item	1	\$36,000,000	\$36,000,000
Above ground covered reinforced concrete treated water storage reservoir	4ML (Nominal)	Item	1	\$2,809,000	\$2,809,000
Distribution Pumping Station with duty / standby pumps, including electrical switchboards, control panels, telemetry, suction and discharge pipework and valving	140 L/s @ 80m (approx. 200 kW)	Item	1	\$872,000	\$872,000
Pumping station building	30	m2	1	\$105,000	\$105,000
Ancillary works (earthworks, access roads, drainage, fencing, power supply)		Item	1	\$845,000	\$845,000
Recycled Water Trunk Distribution Mains					
Trenching, bedding, supply, lay, backfill including thrust blocks, valves, bends and fittings etc					
- 450mm DN DICL		m	21,500	\$878	\$18,885,000
- 375mm DN DICL		m	28,500	\$751	\$21,396,000
- 300mm DN DICL		m	10,500	\$600	\$6,299,000
Recycled Water Reservoirs					
Above ground reinforced concrete service reservoir	4ML	Item	3	\$2,809,000	\$8,427,000
Distribution Pumping Station with duty / standby pumps, including electrical switchboards, control panels, telemetry, suction and discharge pipework and valving	160 L/s @ 50m (approx. 140 kW each)	Item	3	\$820,000	\$2,460,000
Pumping station building	30	m2	3	\$94,000	\$282,000
Ancillary works (earthworks, access roads, drainage, fencing, power supply)		Item	3	\$845,000	\$2,535,000
Recycled Water Reticulation					
Per Lot costs including reticulation mains (trenching, bedding, supply, lay, test, backfill, valves and fittings), house connections and water meters (assumes a total of 12 m per house on average)		Lot	21,286		
- 200mm DN uPVC (reticulation main)	20%	m	51,086	\$314	\$16,017,000
- 150mm DN uPVC (reticulation main)	30%	m	76,630	\$245	\$18,753,000
- 100mm DN uPVC (reticulation main)	50%	m	127,716	\$178	\$22,725,000
- 25mm DN PE (house connection) - 20 m per house		m	425,720	\$66	\$27,888,000
- recycled water meter with non-return valve		Item	21,286	\$344	\$7,323,000

Total scheme cost

\$193,621,000

Recycled Cost per Lot

\$9,096

Assumptions		
1	Reported costs are total out turn costs	
2	Prices are current as at November 2011	
3	Delivery is based on a "Tier 2" contractor to construct	
4	Land acquisition costs are excluded	
5	DERM waste levy to come into force 1/12/11 not included on the basis that all material would be contained within the study area	
6	All DICL pipes are PN20	
7	Pipes with a diameter <=200mm have been priced on construction productivities commensurate with a subdivision	
8	Pipes with a diameter >200mm have been priced on construction productivities commensurate with rural and urban infrastructure or mixture of each	
9	Reported Costs include Design, Construction Supervision, Owners Costs & Contingency calculated as an uplift factor applied to the direct construction costs	
	Estimate Element	Basis
	Contractor OH & Margin	% of Direct Cost 25%
	Design & supervision	% of Direct Cost 12%
	Owners Costs	% of Direct Cost 5%
	Contingency	% of Direct Cost 30%
	Uplift Factor on DC	172%

Preliminary Capital and Operating Cost Estimates
Catchment: Lower Pine

Item	Capacity	Units	Capital Cost		
			Qty	Rate	Amount
Sewerage Collection System					
No additional sewerage collection system required					
Brendale Sewage Treatment Plant					
The capacity of the Brendale STP is not known but upgrade works are not expected.					
Brendale PRW Treatment Plant					
The function of the PRW Treatment Plant is to produce recycled water suitable for indirect potable use.					
The PRW Treatment Plant will include at least advanced filtration (likely to be membrane ultrafiltration), high intensity disinfection (likely to be UV irradiation) and residual chlorination.	11 ML/day (AD 2050)	Item	1	\$52,250,000	\$52,250,000
Distribution Pumping Station with duty / standby pumps, including electrical switchboards, control panels, telemetry, suction and discharge pipework and valving	105 L/s @ 55m (approx 100 kW)	Item	1	\$799,693	\$799,693
Pumping station building	30	m ²	1	\$93,340	\$93,340
Ancillary works (earthworks, access roads, drainage, fencing, power supply)		Item	1	\$155,875	\$155,875
Murrumba Downs Sewage Treatment Plant					
The capacity of the Murrumba Downs STP is not known but upgrade works are not expected.					
Murrumba Downs PRW Treatment Plant					
The function of the PRW Treatment Plant is to produce recycled water suitable for indirect potable use.					
The PRW Treatment Plant will include at least advanced filtration (likely to be membrane ultrafiltration), high intensity disinfection (likely to be UV irradiation) and residual chlorination.	42 ML/day (AD 2050)	Item	1	\$199,500,000	\$199,500,000
Distribution Pumping Station with duty / standby pumps, including electrical switchboards, control panels, telemetry, suction and discharge pipework and valving	400 L/s @ 65m (approx 440 kW)	Item	1	\$2,012,526	\$2,012,526
Pumping station building	30	m ²	1	\$121,915	\$121,915
Ancillary works (earthworks, access roads, drainage, fencing, power supply)		Item	1	\$155,875	\$155,875
PRW Trunk Mains					
Trenching, bedding, supply, lay, backfill including thrust blocks, valves, bends and fittings etc					
- 750mm DN DICL (40% Urban areas)		m	7,250	\$2,070	\$15,007,417
- 450mm DN DICL		m	8,450	\$878	\$7,422,141
Submerged Discharge Structure					
Likely to include discharge headwall, flow/energy dissipation,		Item	1	\$85,000	\$85,000

Total scheme cost

\$277,603,783

Assumptions		
1	Reported costs are total out turn costs	
2	Prices are current as at November 2011	
3	Delivery is based on a "Tier 2" contractor to construct	
4	Land acquisition costs are excluded	
5	DERM waste levy to come into force 1/12/11 not included on the basis that all material would be contained within the study area	
6	All DICL pipes are PN20	
7	Pipes with a diameter <=200mm have been priced on construction productivities commensurate with a subdivision	
8	Pipes with a diameter >200mm have been priced on construction productivities commensurate with rural and urban infrastructure or mixture of each	
9	Reported Costs include Design, Construction Supervision, Owners Costs & Contingency calculated as an uplift factor applied to the direct construction costs	
	Estimate Element	Basis
	Contractor OH & Margin	% of Direct Cost 25%
	Design & supervision	% of Direct Cost 12%
	Owners Costs	% of Direct Cost 5%
	Contingency	% of Direct Cost 30%
	Uplift Factor on DC	172%

Preliminary Capital and Operating Cost Estimates

Catchment: Hays (Ray Frawley Fields Clontarf, Redcliffe Reuse Scheme Option 3)

Scenario: 2

Item	Capital Cost				
	Capacity	Units	Qty	Rate	Amount
Sewerage Collection System					
No additional sewerage collection system required					
Sewage Treatment Plant (Redcliffe)					
No additional sewage treatment plant works required. The capacity of the Redcliffe STP is not known but it is expected to be significantly greater than required to service the recycled water system.					
Recycled Water Treatment Plant					
The function of the RWTP is to produce Class A recycled water suitable for the irrigation of high access public open space.					
The RWTP will include at least advanced filtration (likely to be membrane ultrafiltration), high intensity disinfection (likely to be UV irradiation) and residual chlorination.	4 ML/day (PD)	Item	1	\$12,000,000	\$12,000,000
Above ground covered reinforced concrete treated water storage reservoir	4ML (Nominal)	Item	1	\$2,808,840	\$2,809,000
Distribution Pumping Station with duty / standby pumps, including electrical switchboards, control panels, telemetry, suction and discharge pipework and valving	250 L/s @ 60m (approx 250 kW)	Item	1	\$1,279,882	\$1,280,000
Pumping station building	30	m2	1	\$104,715	\$105,000
Ancillary works (earthworks, access roads, drainage, fencing, power supply	to reservoir	Item	1	\$844,821	\$845,000
Recycled Water Trunk Distribution Mains					
Trenching, bedding, supply, lay, backfill including thrust blocks, valves, bends and fittings etc					
- 450mm DN DICL (100% Urban Road Reserve)		m	2,050	\$1,516	\$3,108,000
- 375mm DN DICL (100% Urban Road Reserve)		m	2,350	\$1,331	\$3,129,000
- 300mm DN DICL (75% Urban Road Reserve)		m	2,750	\$985	\$2,709,000
Recycled Water Service Connections					
Per connection costs including (trenching, bedding, supply, lay, test, backfill, valves and fittings), service connections and water meters (assumes a total of 150 m per connection on average)		Connections	12		
- 150mm DN PE (service connection)	25%	m	450	\$245	\$111,000
- 100mm DN PE (service connection)	75%	m	1,350	\$178	\$241,000
- 100mm recycled water meter with non-return valve	25%	Item	3	\$7,740	\$24,000
- 150mm recycled water meter with non-return valve	75%	Item	9	\$8,514	\$77,000

Total scheme cost
Recycled Cost per Connection

\$26,438,000

\$2,203,167

Assumptions		
1	Reported costs are total out turn costs	
2	Prices are current as at November 2011	
3	Delivery is based on a "Tier 2" contractor to construct	
4	Land acquisition costs are excluded	
5	DERM waste levy to come into force 1/12/11 not included on the basis that all material would be contained within the study area	
6	All DICL pipes are PN20	
7	Pipes with a diameter <=200mm have been priced on construction productivities commensurate with a subdivision	
8	Pipes with a diameter >200mm have been priced on construction productivities commensurate with rural and urban infrastructure or mixture of each	
9	Reported Costs include Design, Construction Supervision, Owners Costs & Contingency calculated as an uplift factor applied to the direct construction costs	
	Estimate Element	Basis
	Contractor OH & Margin	% of Direct Cost 25%
	Design & supervision	% of Direct Cost 12%
	Owners Costs	% of Direct Cost 5%
	Contingency	% of Direct Cost 30%
	Uplift Factor on DC	172%