

Wollongong Water Recycling Plant technical data

Primary treatment		Wollongong/Bellambi	Port Kembla
Equipment	Design criteria	Stream 1	Stream 2
Automated screens	Number	3	1
	Type	Step screen	Step screen
	Aperture	3 mm	3 mm
	Capacity	1040 L/s/screen	590 L/s/screen
	Average capture	3-5 kg/ML	3-5 kg/ML
Grit tanks	Number	2	2 (1 standby)
	Type	Aerated grit chamber	Aerated grit chamber
	Dimensions (w x l x d)	2.7 x 14.4 x 3 m	
	Capacity	510 L/s/tank	590 L/s
	Average capture	3-6 kg/ML	3-6 kg/ML
Sedimentation tanks	Number	3	2
	Type	Conventional	Multifo™ Lamella
	Depth	3 m	5.6 m
	Volume	910 m ³ /tank	-
	Detention time	1.7 h	1.1 h
	Scraper type	Chain and launder	Chain

Secondary treatment

Equipment	Design criteria	Stream 1	Stream 2
Bioreactor	Number	4	1
	Type	CONVAS	5 Stage Biotenipho BNR
	Dimensions (w x l x d)	11 x 48 x 3 m	5 m
	Capacity	19 ML/d	43 ML/d
	Zones	aerobic, aerobic	Pre-fermentation, anaerobic, anoxic, aerobic, re-aerobic
Secondary clarifiers (small)	Number	3	-
	Type	Circular	-
	Dimensions (ø x depth)	28 m x 3.7 m	-
	Capacity	9 ML/day/unit	-
Secondary clarifiers (large)	Number	1	4
	Type	Circular	Circular
	Dimensions (ø x depth)	34 m x 4 m	34 m x 4.6 m
	Capacity	18 ML/day	40 ML/day/unit

Tertiary treatment

Equipment	Design criteria	CONVAS	BNR
Chemical mixing tank	Number	0	1
	Mixer type	N/A	Paddle
	Chemical added	N/A	Ferrous chloride
Filters	Number	5	5
	Type	Rapid gravity, deep bed	Rapid gravity, deep bed
	Media	Sand	Sand
	Media Depth	1.2 m	1.2 m
	Surface Area	72 m ² /filter	72 m ² /filter
	Filtration rate	5.5 m/h	5.5 m/h
	Backwash frequency	20-25 h	20-25 h
UV disinfection	Number of channels	2	
	Number of banks	4	
	Number of modules	6	
	Lamps per module	18	
	Lamps	432	
	UV dose rate	40 mJ/cm ²	
	Faecal Coliform	86 cfu/100 mL	
Microfiltration	Type	Continuous Microfiltration	
	Number of units	9	
	Modules per unit	112	
	Membrane type	Hollow fiber outside-in	
	Pore size	0.2 µm	
	Daily Volume	26 ML/d	
	Filtrate turbidity	0.04 NTU	
Reverse Osmosis	Number of units	4 duty / 1 standby	
	Unit configuration	3 stage 28:12:6	
	Membranes per unit	322	
	Membrane active surface	37 m ²	
	Flow per unit	5 ML/d	
Disinfection	Chemical added	Sodium Hypochlorite	
	Volume	40 kL	
	Dose concentration	3.6 mg/L	

Solids handling

Equipment	Design criteria	Details
Gravity thickeners	Number	2
	Dimensions (Ø x depth)	12 m x 4 m
	Combined thickening capacity	200 m ³ /d
Anaerobic digesters	Number	6
	Type	Mesophilic anaerobic digesters
	Volume (V)	1200 m ³ each digester
	Temperature	37 degrees
	Retention time target	30 days
Centrifuge	Number	5
	Input	330 m ³ /d
	Biosolids produced	38 T/d wet
	Solids recovery	91%

Energy recovery

Equipment	Design criteria	Details
Cogeneration	Number	1
	Type	Jenbacher 615 kW
	Output	300 MWh/month

Water recycling

Equipment	Design criteria	Details
Microfiltration	Type	Outside-in
	Number of filters	1008
	Pore size	0.2µm
Reverse Osmosis	Membrane surface area	37 m ²
	Number of vessels	46
	Number of stages	3
	Configuration	28:12:6
	Particle size removed	>0.001µm
	Output	20 ML/d

Chemical additions

Equipment	Design criteria	Details
Phosphorus removal	Chemical added	Ferrous Chloride
	Storage Capacity	90 kL
	Dosage rate	350 L/d
Sludge thickening	Chemical added	Anionic polymer
	Storage Capacity	2.4 T
	Dosage rate	100 kg/d
Sludge dewatering	Chemical added	Anionic polymer
	Storage Capacity	2.4 T
	Dosage rate	100 kg/d
Recycled water disinfection	Chemical used	Sodium Hypochlorite
	Storage Capacity	40 kL
	Dosage rate	13.6 mg/L
pH balance	Chemical used	Sodium Hydroxide
	Storage Capacity	20 kL
	Dosage rate	2.3 mg/L
Chlorine removal	Chemical used	Sodium Metabisulphite
	Storage Capacity	5 kL
	Dosage rate	3.5 mg/L