Wastewater Recovery

City West Water - Altona Treatment Plant

Annmarie Tracey & Emily Rahles-Rahbula

September 2014

City West Water ™

Overview

∧ Altona Wastewater Treatment Plant

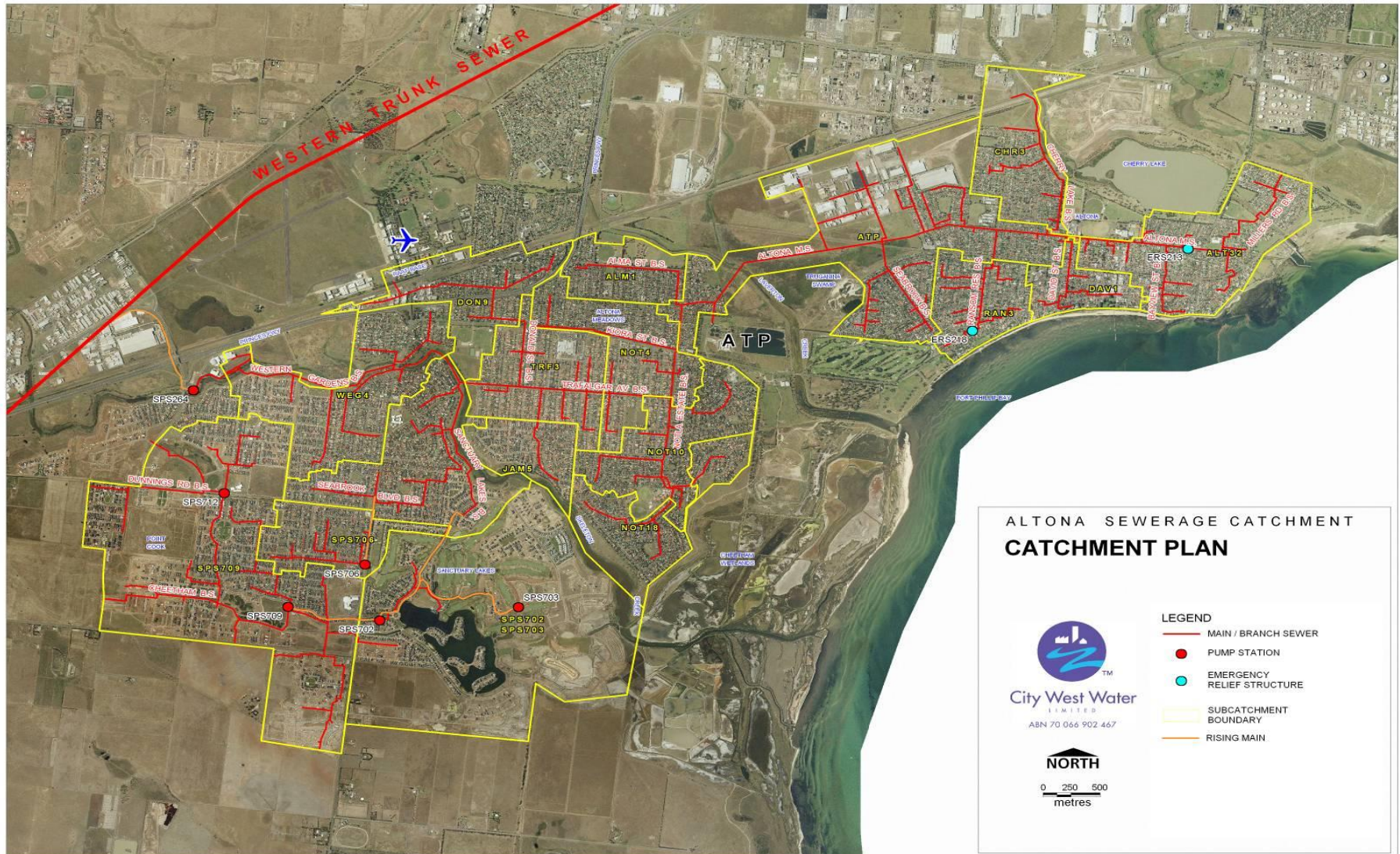∧ Altona Salt Reduction Plant

∧ Plant Tour

City West Water™

Altona Wastewater Treatment Plant

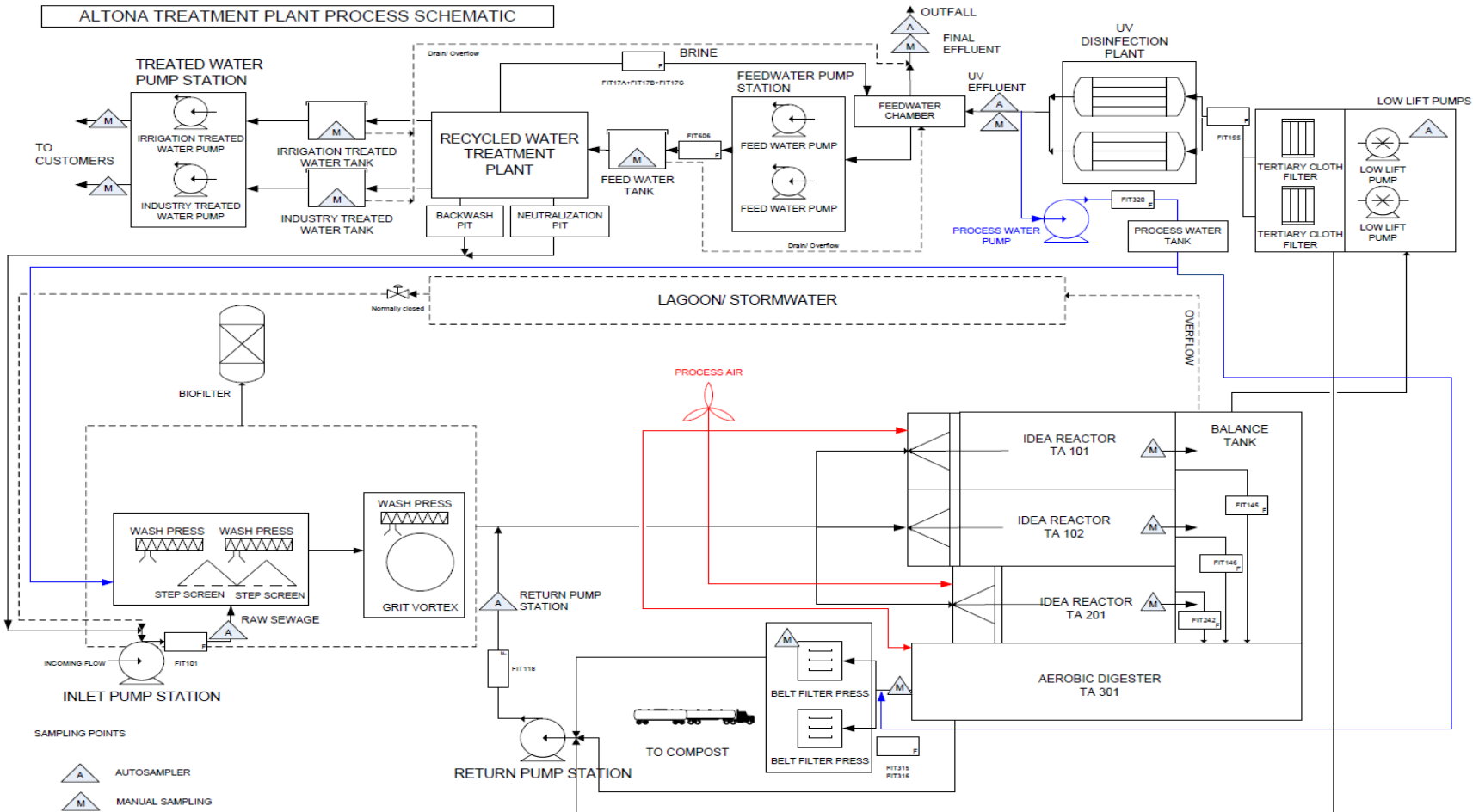Annmarie Tracey– Manager Alternative Water Operations

City West Water™

Altona Catchment Area

Process Overview

ALTONA TREATMENT PLANT PROCESS SCHEMATIC

Plant Information

- ∧ Built in 1968 and upgraded in 2007
- ∧ Site covers 71 acres
- ∧ 16ML/d ADWF – annually treats 4600 ML
- ∧ Treats sewage from 50,000 people
- ∧ Utilises Biological IDEA – Intermittent, Decanted, Extended Aeration Process
- ∧ Tertiary cloth filters and UV disinfection provide treatment to a Tertiary level
- ∧ Treated effluent serves as feedwater for the SRP rest is discharged to a submerged ocean outfall
- ∧ Produces annually 900+ dry tonnes of biosolids

City West Water™

Inlet pump station

City West Water™
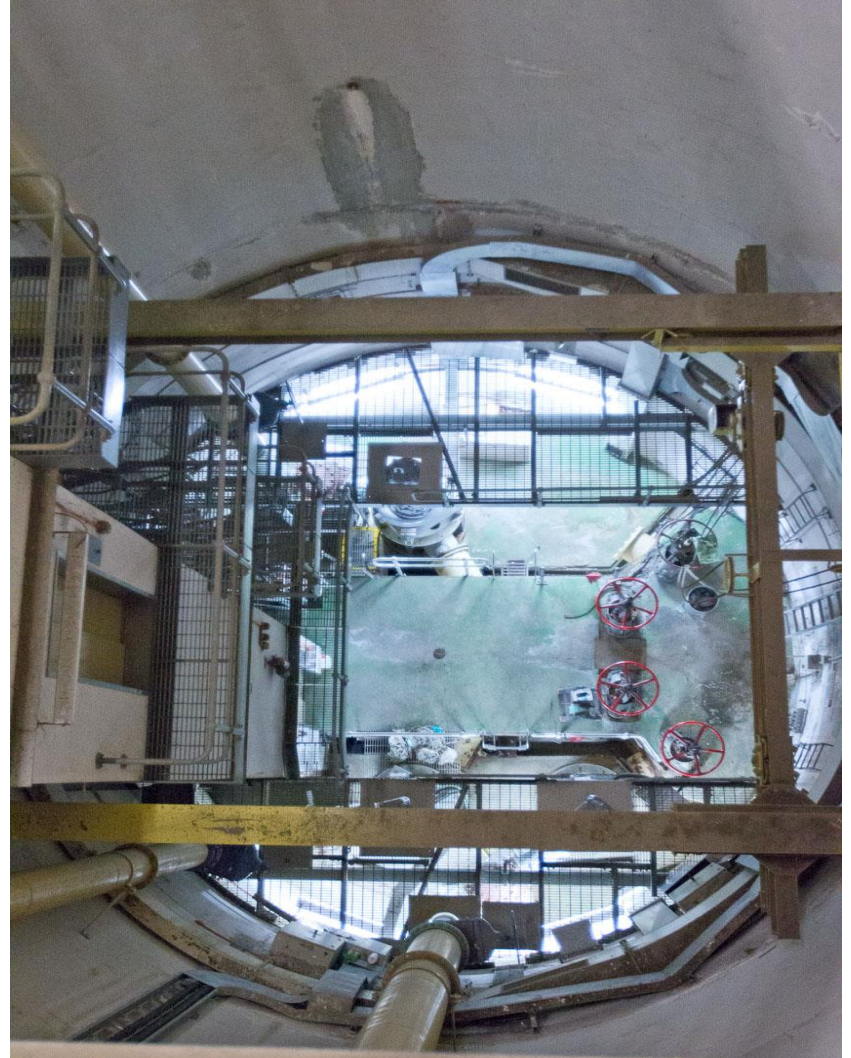
Raw Sewage Data

	BOD	Suspended Solids	Ammonia as N	Total Nitrogen	Total Phosphorus	Total Dissolved Solids
Median	160	130	37	47	6	4500
90th percentile	198	250	43	62	7.3	4900

Figures shown above are for year 2013-14

City West Water™

Inlet Works
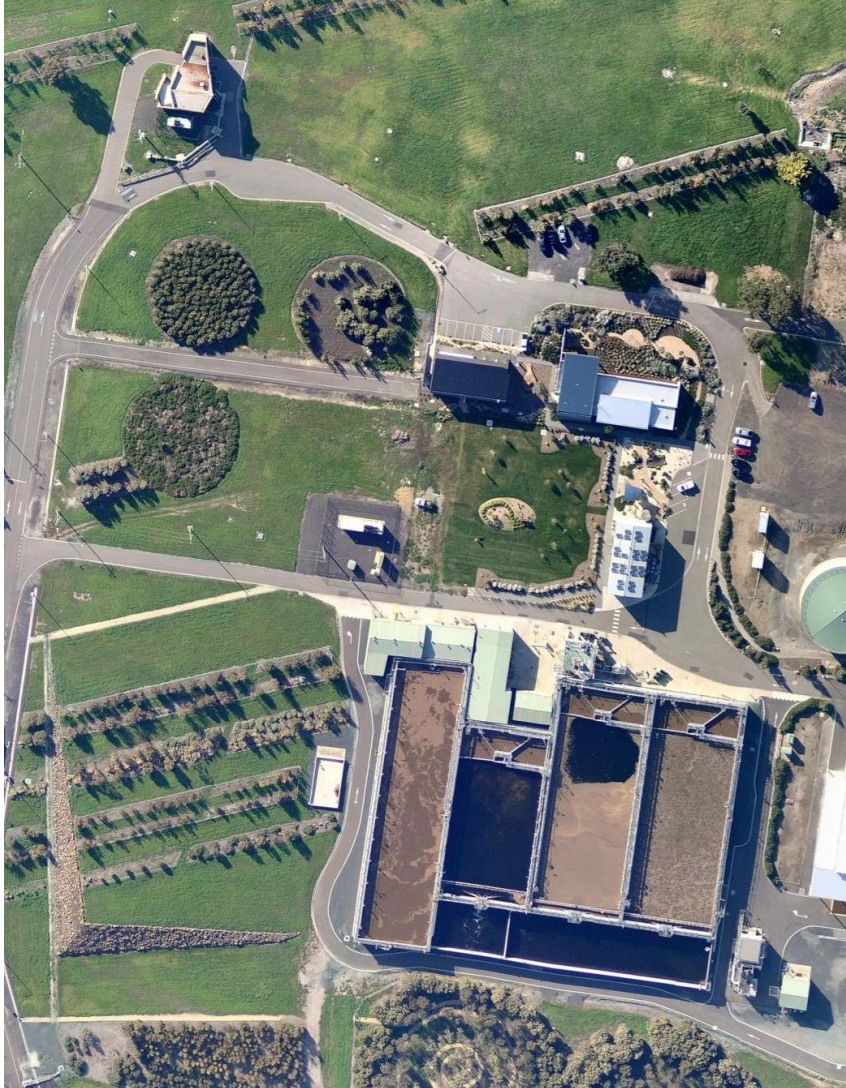
SCADA Screenshot
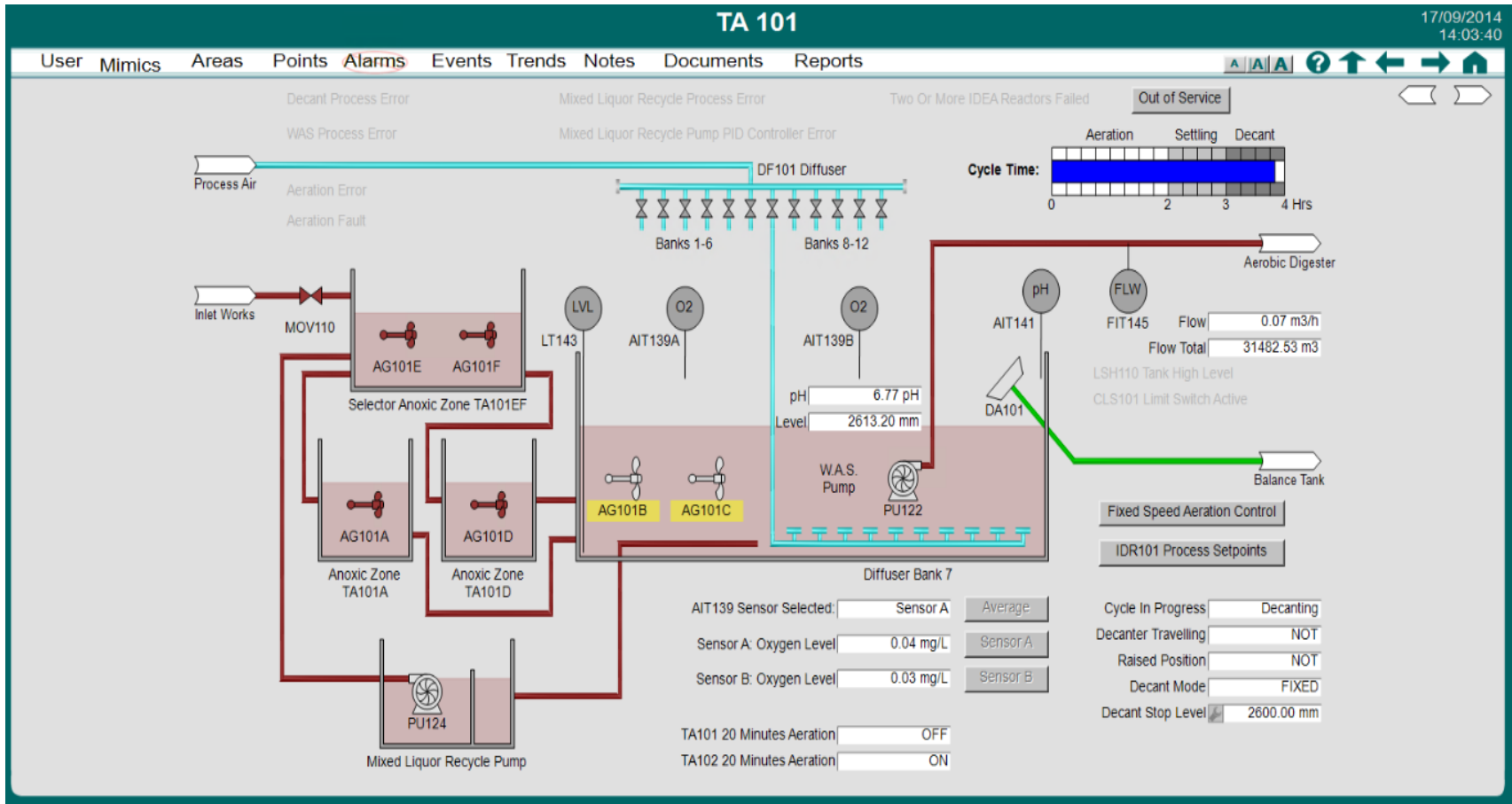
IDEA Reactors – Anoxic Zone
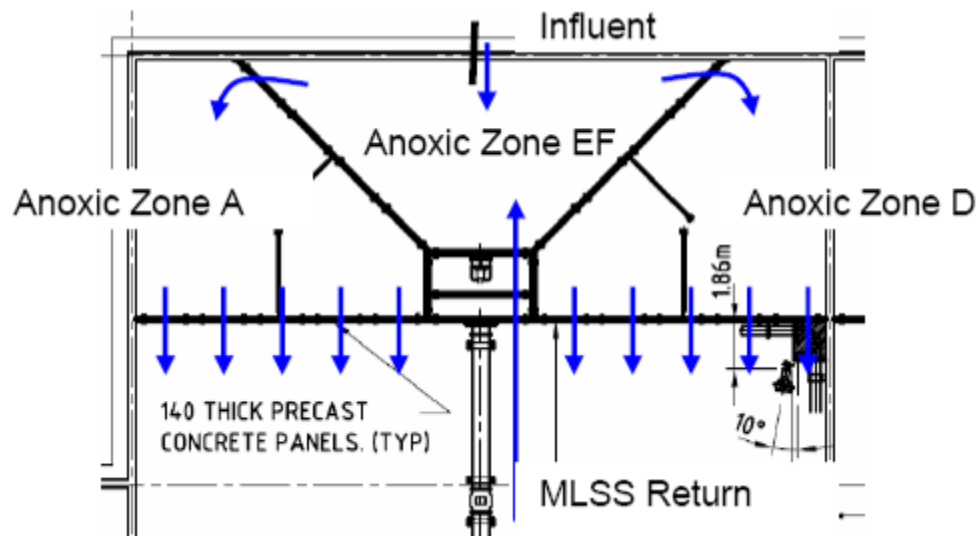
IDEA Reactors – Aeration Zone

IDEA Reactors - Aeration

City West Water™

Flow Balance Tank

Tertiary Cloth Filters

UV Disinfection

EPA Licence Limits

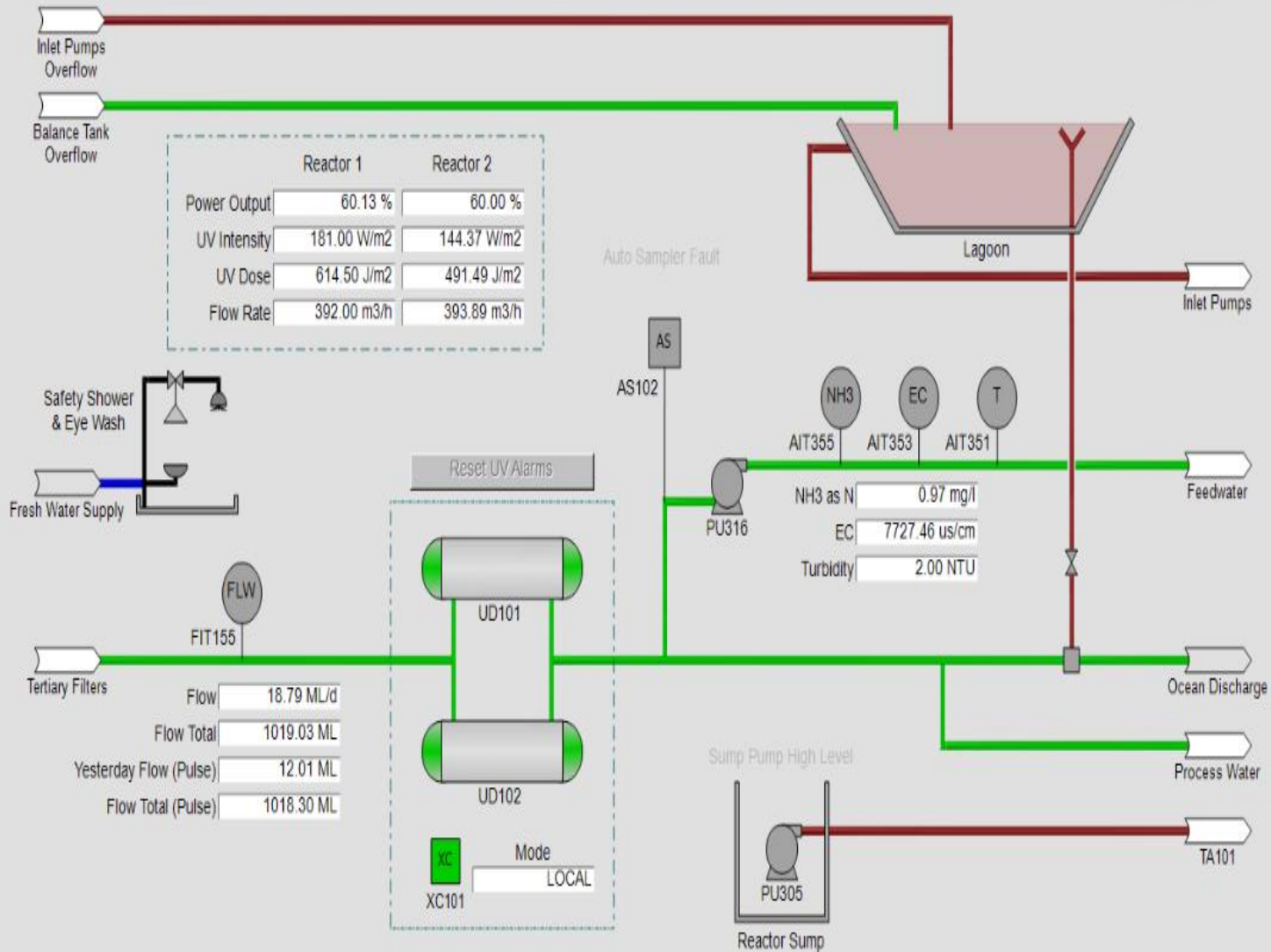| Indicator	Units	Limit Type	To Port Phillip Bay
Biochemical oxygen demand (5 day)	mg/L	Annual Median	8
Biochemical oxygen demand (5 day)	mg/L	90th Percentile	16
Suspended solids	mg/L	Annual Median	10
Suspended solids	mg/L	90th Percentile	15
Escherichia Coli	orgs /100ml	Annual Median	200
Escherichia Coli	orgs /100ml	90th Percentile	1000
Ammonia	mg/L	Annual Median	10
Ammonia	mg/L	90th Percentile	NS
Ammonia	mg/L	Maximum	24
Total nitrogen	mg/L	Annual Median	50
Total nitrogen	mg/L	90th Percentile	75
Total phosphorus	mg/L	Annual Median	50
Total phosphorus	mg/L	90th Percentile	75
pH	pH units	Range	6-9
Total residual chlorine	mg/L	Maximum	1
Flow rate	ML/day	Maximum	30

City West Water™

20

Treated Discharge Outfall

ATP Outfall

Compiled by :
Melway Reference : 209B2
Date : 3/7/2012

NCTFS

Scale: 1:7500

Assets labelled AC may contain asbestos material and therefore works on these assets must be undertaken in accordance with OHS Regulations 2007 (Part 4.3).
Warning : City West Water Limited does not guarantee and makes no representation or warranty as to the accuracy or scale of this plan. This company accepts no liability for any loss, damage or injury by any person as a result of any inaccuracy in this plan.

07/18/2012

Sludge Thickening & Dewatering

Pinegro

Composted biosolids windrows

Composted biosolids were used to establish the grass in the ATP garden area in 2013

City West Water™

Altona Recycled Water Scheme

Emily Rahles-Rahbula – Manager Altona Salt Reduction Plant

City West Water™

Altona Salt Reduction Plant

∧ Recycled Water Scheme

∧ Treatment Process Steps and their purpose

∧ Recycled Water Quality & Regulatory Requirements

City West Water™

Altona Recycled Water Scheme

The pipeline from the Altona Treatment Plant connects plastics manufacturer Qenos, Kooringal and Sanctuary Lakes Golf Course and Altona Green reserve.

Altona Treatment Plant Recycled Water Project

City West Water™
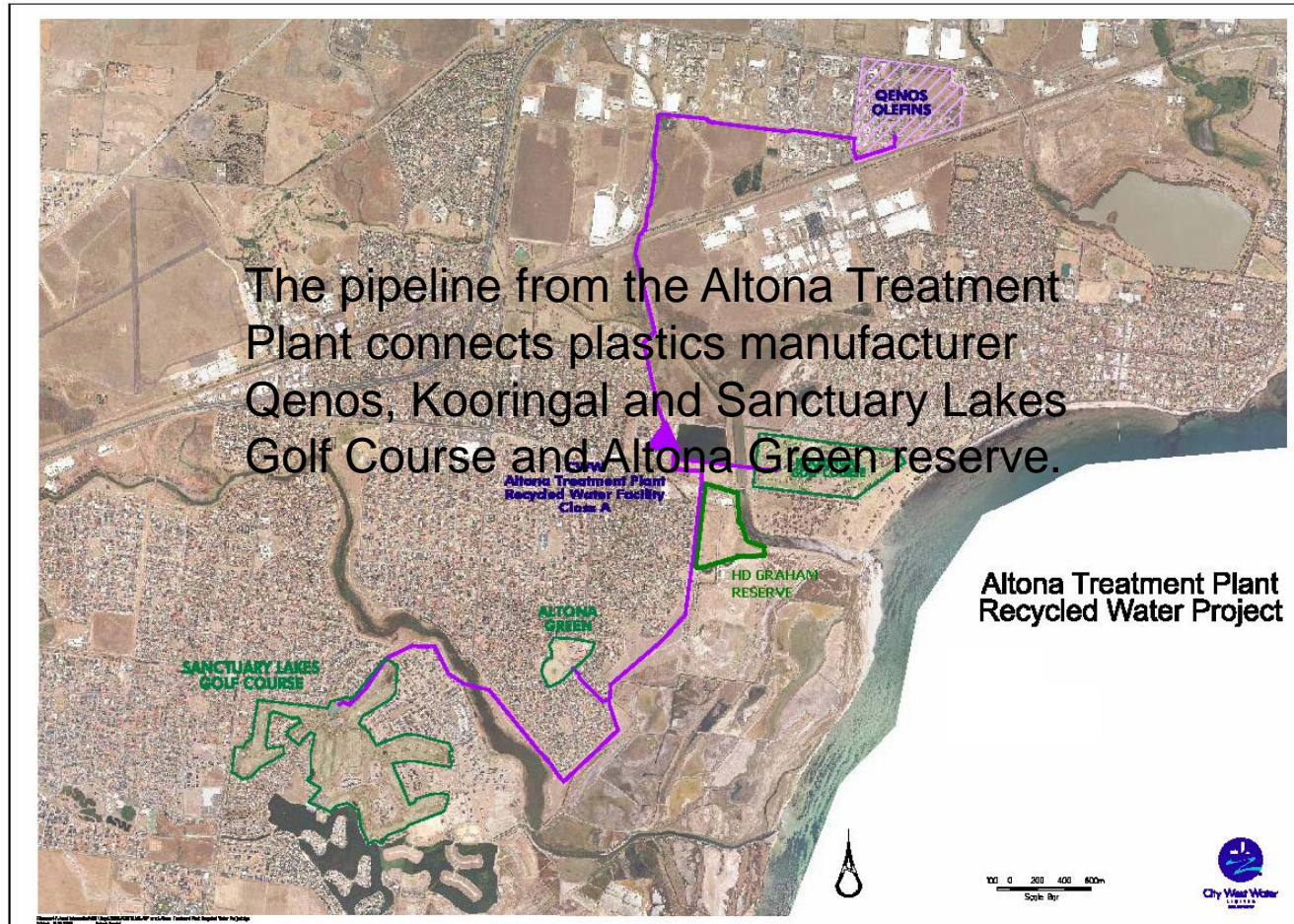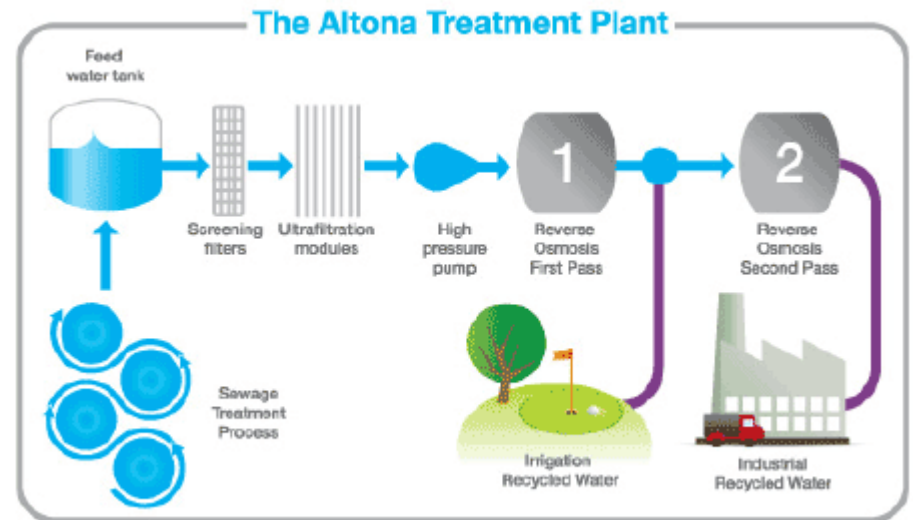
The Plant

∧ ASRP or the Altona Salt
Reduction Plant produces 2
grades of water for its customers:

- 5.9MLD of Industrial Water
- 3.1MLD of Irrigation Water

∧ The pipeline from the Altona
Treatment Plant connects plastics
manufacturer Qenos, Kooringal
and Sanctuary Lakes Golf Course
and Altona Green reserve.

The Altona Treatment Plant

City West Water™

Chemical Storage

∧ Chemical Storage Tanks
- Sulphuric Acid
- Hydrochloric Acid
- Sodium Hypochlorite
- Sodium Metabisulphite
- Antiscalant
- Caustic

City West Water™

Feedwater Storage

- 3 ML balancing storage tank to collect decanted treated effluent from the ATP.
- Flow is pumped from the feed water chamber after tertiary cloth filters and UV disinfection.

City West Water™

UF Feed Strainers

∧ UF Feed pumps

- 3 duty / 1 standby feed pumps

∧ Coarse Screens

- 1 duty / 1 standby
- 250 micron screen
- 24 individual cartridges / strainer
- Automatic Backwashing based on timer &/or differential pressure.

City West Water ™

Ultrafiltration

∧   4 Trains, each with 108 modules (with expansion capacity to 120 modules)

∧   Outside-In hollow fiber membranes

∧   LRV=3.5 for protozoa and LRV=2.2 for viruses

∧   Automatic Clean In Place (CIP) System

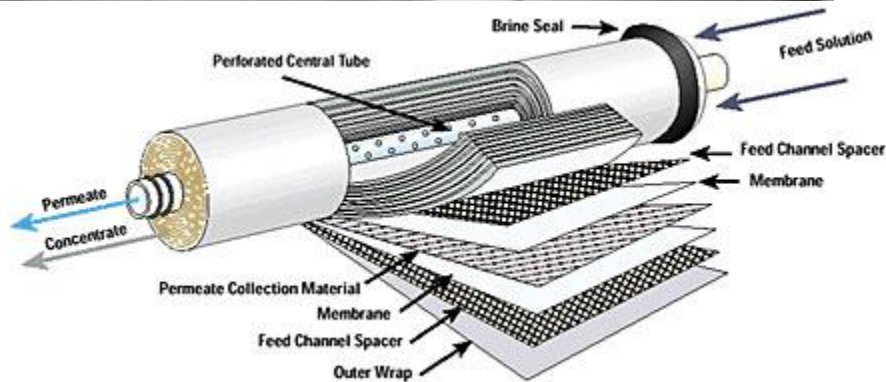∧   First of the Critical Control Points (TMP, Flux, Turbidity & PDT)

City West Water™

Cartridge Filters

∧ Coarse Screen Filters

- 5 micron cartridge filters
- 60 filter tubes per vessel
- 4 vessels in the system

∧ Protection for the RO membranes

∧ Situated between low pressure and high pressure RO Feed Pumps.

City West Water™

Reverse Osmosis

∧ Salt Reduction Step.

∧ Three 1st Pass RO Trains

∧ Two 2nd Pass RO Trains

∧ RO First Pass is Responsible for Pathogen Removal (i.e.. LRV=1.5)

∧ Second Critical Control Point (Log Reduction of EC; Recovery and Flux)

∧ Energy Recovery Unit on inter-stage line of the first pass membranes

City West Water™

Degasification

∧ Degasification – used to raise the pH of product water to neutral (i.e. pH = 7)

City West Water™

35

Chlorine Disinfection

∧ Final Step in Pathogen reduction uses Chlorine disinfection.

∧ Final Critical Control Point (i.e.. Chlorine Contact Time = Chlorine Residual, Temp, pH, Flow)

∧ pH adjustment (using caustic and lime dosing) is also conducted at this stage.

∧ Product Water Storage Tanks
  - 3ML Irrigation Water Storage
  - 3ML Industrial Water Storage

City West Water™

Product Water Quality

∧ Class A Recycled Water – as per Victorian Department of Health Standards

∧ Requires approximately 6 Log Reduction in Pathogens across the plant

∧ Supported by a Recycled Water Quality Management System

∧ Uses HACCP principles

∧ Critical Control Points are monitored and when deemed out of desired range the plant will automatically stop.

∧ Continuous Integrity and Operational Monitoring

∧ Daily Verification through internal laboratory testing

City West Water™

Product Water Delivery

- ∧ Qenos - 3.7 Km of 300mm HDPE transfer pipe
- ∧ Sanctuary Lakes (+ Altona Green) – 5km of 225mm + 400m of 100mm of HDPE transfer pipe
- ∧ Kooringal – 700m of 150mm HDPE transfer pipe.

City West Water™

38

Thank You