

# This presentation premiered at WaterSmart Innovations

[watersmartinnovations.com](http://watersmartinnovations.com)





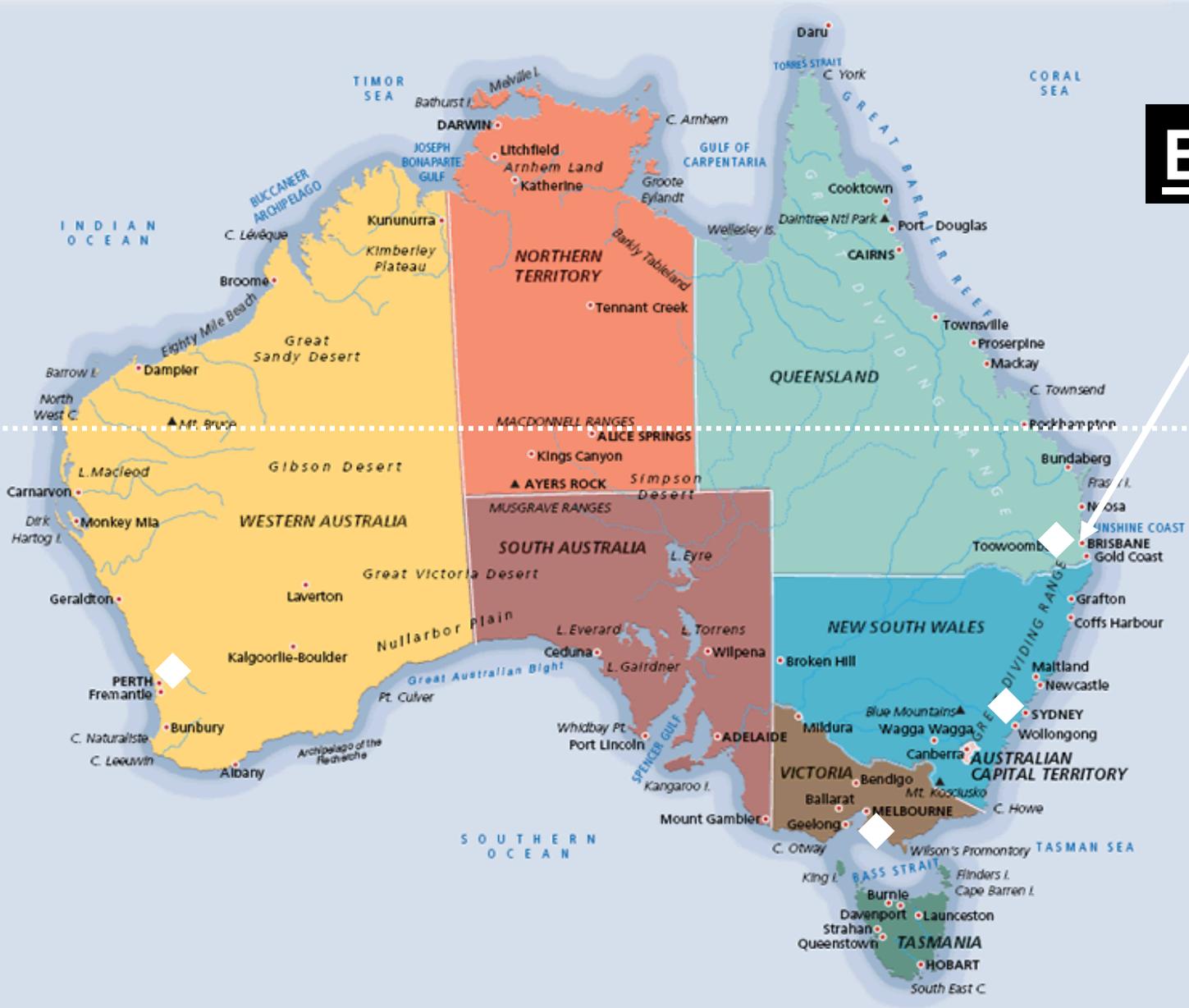
# Fast Tracked AWT Provides Drought Relief for Queensland

## Cindy Wallis-Lage

**Scott Freeman, Mark Steichen, Jonathan Bates – B&V**

**Ivor Peries - Theiss Construction**

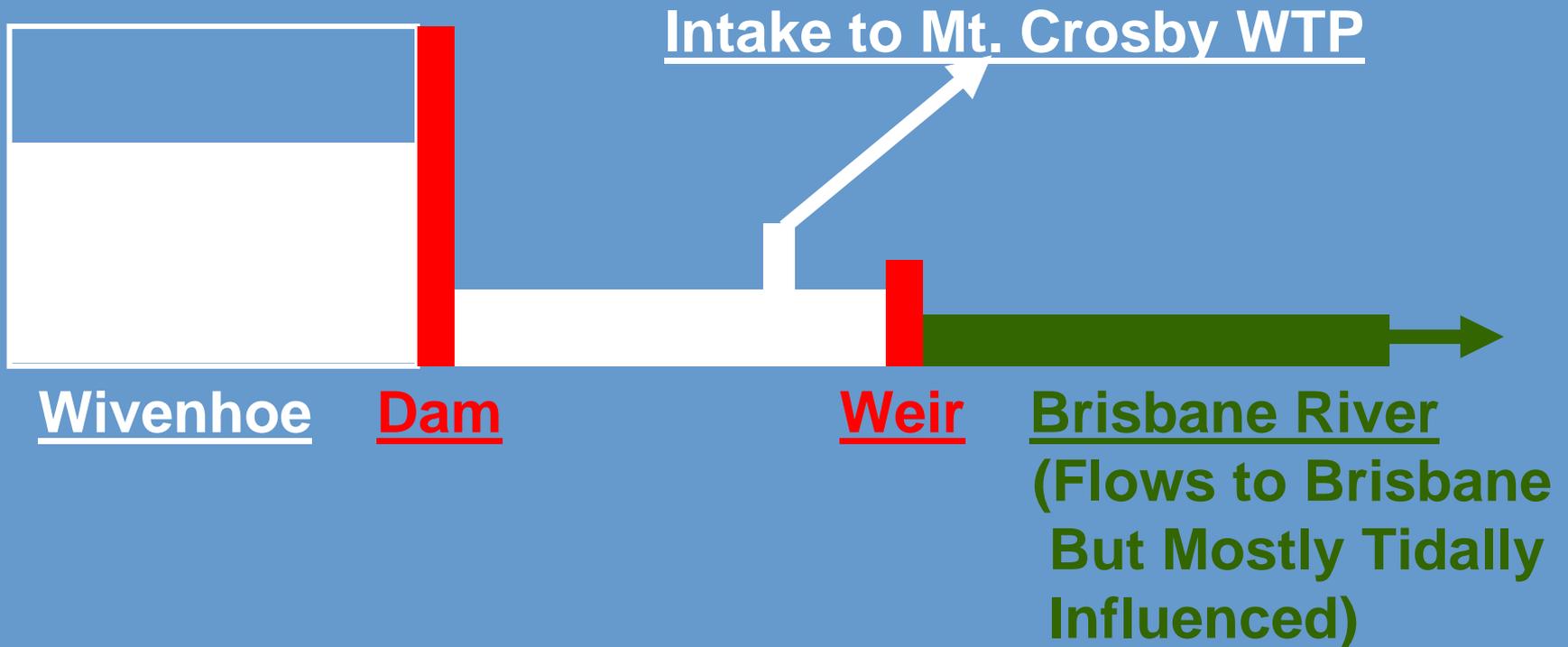
**John McEvoy – Western Corridor Recycled Water Project**



**Brisbane**

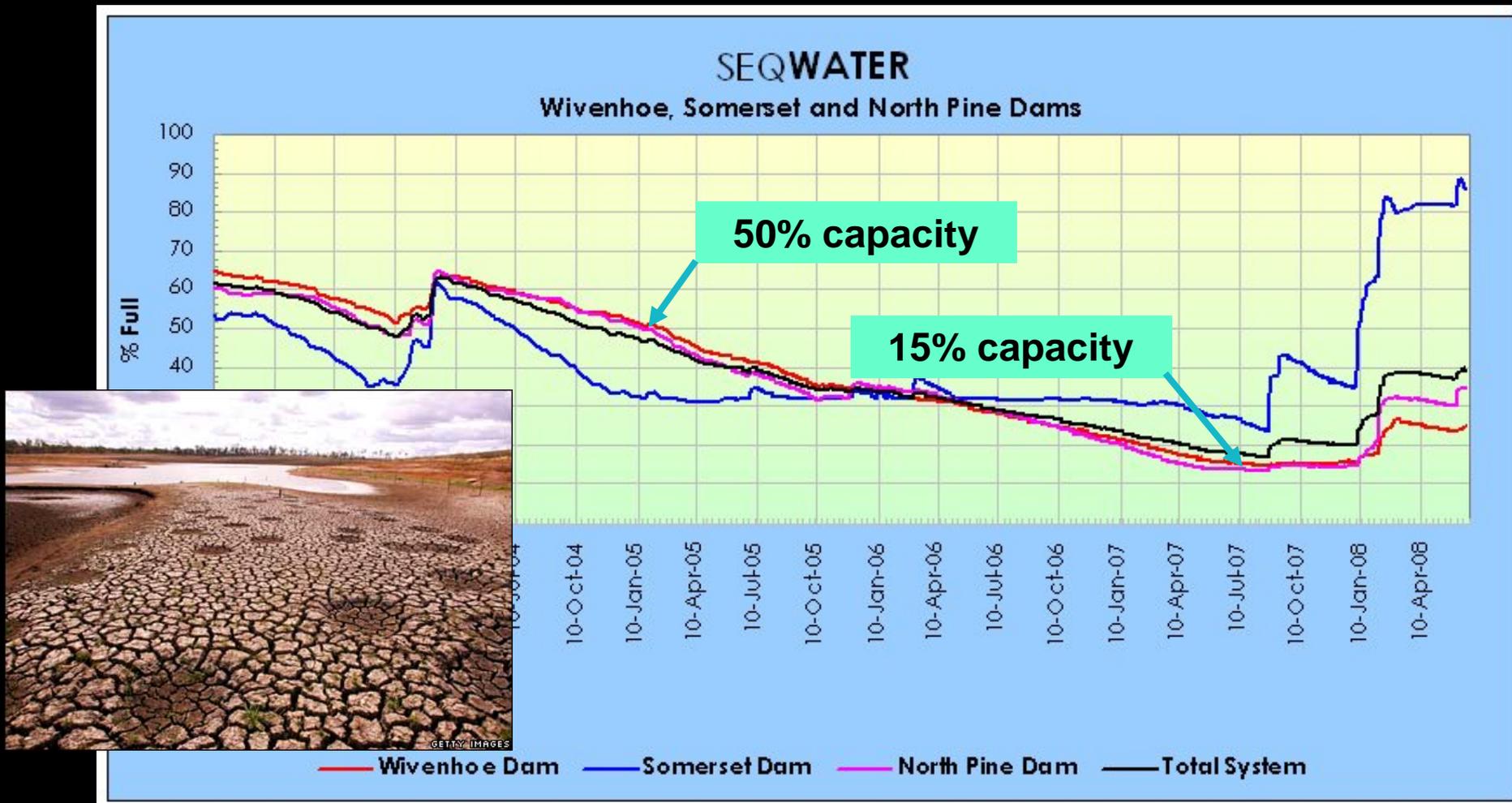
Tropic of Capricorn

# In Brisbane/SE Queensland ~ 70% of the Source Drinking Water is From Mt. Crosby WTP



# Causes of Pending Future Water Shortage

(1) Seven Year Drought Results in Water Level ~ 15%



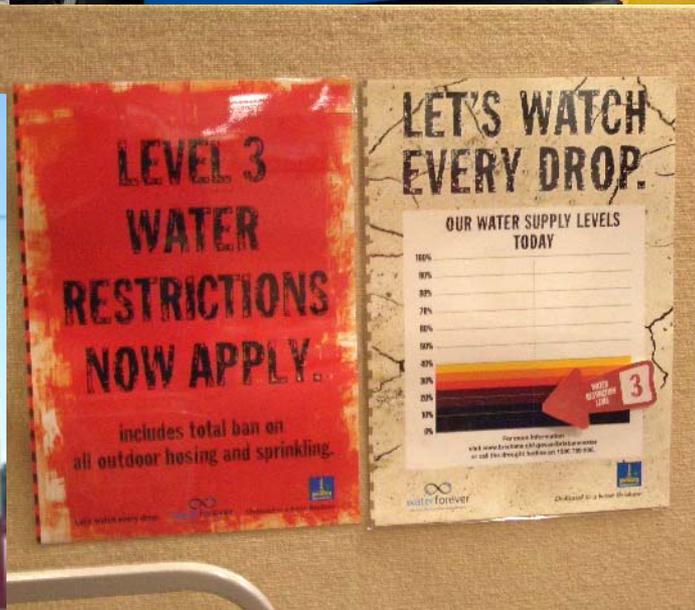
## (2) Population Increase

- Queensland, “The Sunshine State”
- Fastest Growing State in Australia
- Over 60% of population lives within 90 mi of Brisbane (~ South East Queensland)
- ~ 60% increase in SEQ population over last two decades
  - 1998: 1.7 million
  - 2006: 2.7 million
- Reasons: Mild Climate, Beautiful Beaches, Scenic, World-Heritage sites (Great Barrier Reef, Fraser island) and Queenslander Lifestyle.



# Multi-Faceted Solution to Water Shortage

- Public Education and Involvement
- Conservation
- Incentives
- Restrictions
- New Projects



# Water Restriction Levels

Level	Trigger	Measures taken
Level 1	at 40% Capacity in Source	Voluntary water saving
Level 2	35%	Ban on outdoor sprinklers & incentives (appliances, rain water tanks, etc)
Level 3	30%	Add ban on outdoor hosing (medical exclusions)
Level 4	25%	New limits for swimming pool owners, businesses, industry, etc.
Level 5	20%	140 L/d, additional household restrictions

REF: Reference: [www.qwc.qld.gov.au](http://www.qwc.qld.gov.au).

The implementation of water restrictions



Matt Golding - The Age, 2006

*Watersmart '08*

# Emergency Water Supply Projects (Partial List)

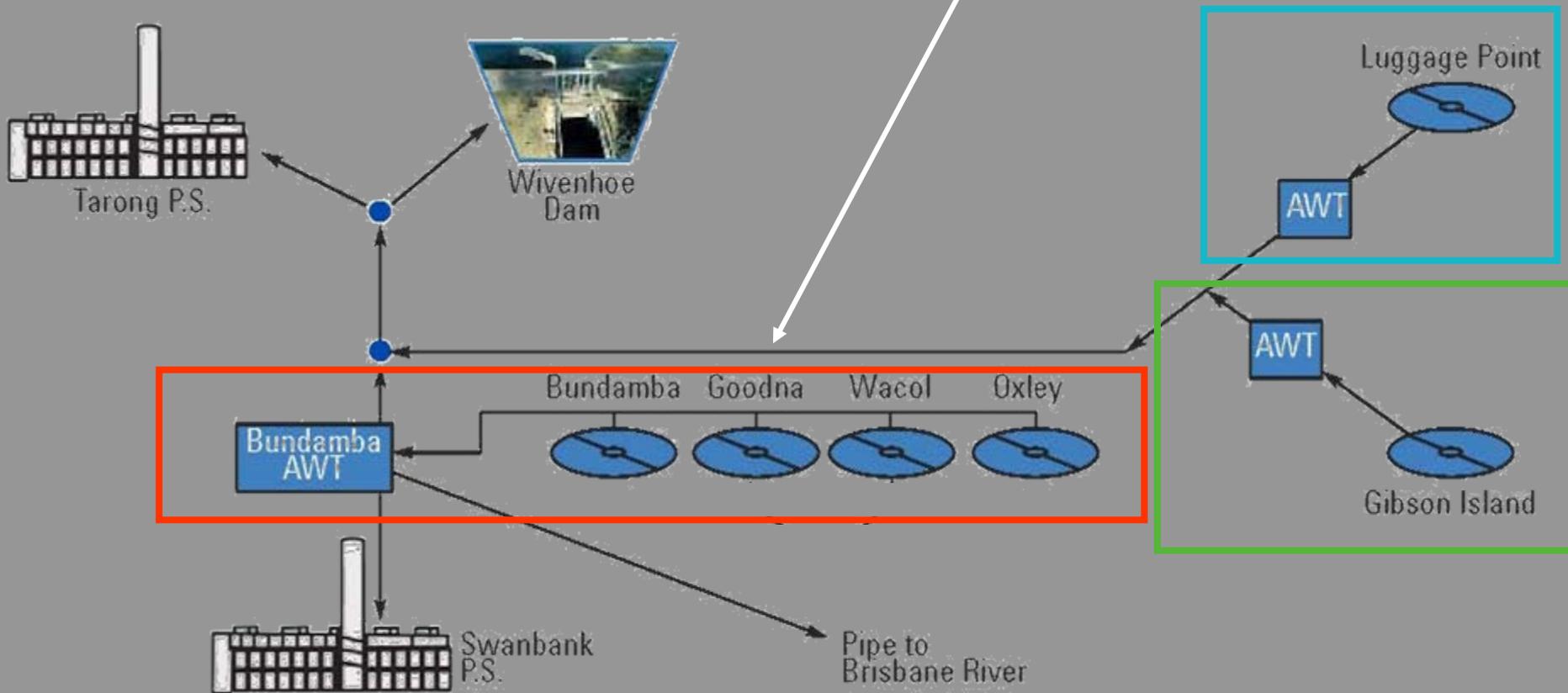
- Western Corridor Recycled Water Project (WCRWP) – 230 – 300 ML/d (61 – 79 mgd)
- Gold Coast Seawater Desal – 125 ML/d (33 mgd)
- New Groundwater (Bribie Island & Brisbane Caboolture Aquifers) – 10 & 20 ML/d
- Raise Mt. Crosby Weir – 15 ML/d
- Pipelines / Interconnectors – 130, 65, & 22 ML/d
- Distribution Pressure / Leakage Reduction – 60 ML/d
- Home & Business Usage Improvements – 20 ML/d
- New Dams – To be determined

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# Western Corridor Recycled Water Project (WCRWP)

AWTP Product Distributed via New 200-km Pipeline



WESTERN CORRIDOR  
RECYCLED WATER PROJECT



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LEGEND

- LUGGAGE PT - BUNDAMBA (REV G)
- OXLEY - BUNDAMBA (REV G)
- BUNDAMBA - CABOONBAH (REV G)
- BUNDAMBA - SWANBANK
- +
 WATER TREATMENT PLANT
- LOCALITY
- RIVER/CREEK
- WATERBODIES
- URBAN AREA

SOURCE: GIS Data supplied by NRM4QLD  
DATUM: GDA94 (MGA Zone 56)  
DATE PRINTED: 23 September 2008  
FILE: G:\411588\qgm\map\001\_community\_consultation\_4115909\_181\_en\_d.mxd

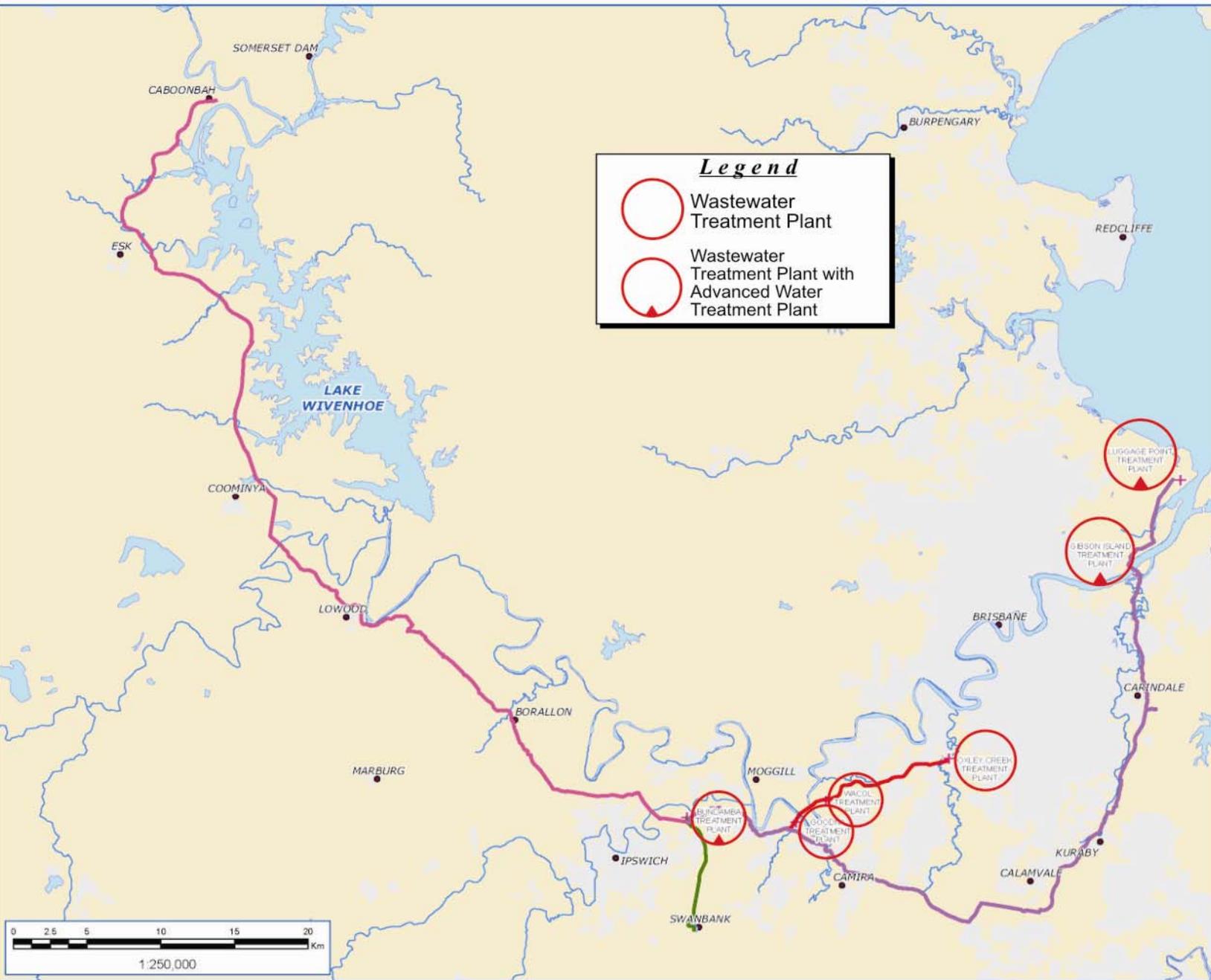
THE COORDINATOR GENERAL

WESTERN CORRIDOR  
RECYCLED WATER PROJECT

PROJECT OVERVIEW

A3  
ORIG

FIGURE 1



**Legend**

- Wastewater Treatment Plant
- Wastewater Treatment Plant with Advanced Water Treatment Plant



## Bundamba AWTP

Phase 1A ~ 20 ML/d

Phase 1B ~ 80 ML/d

### Treated RO Concentrate (Discharged) Quality

Parameter	Water Quality Standard (50th percentile values)
Nitrate as N, mg/L	1
Total Phosphorus as P, mg/L	4
Total Suspended Solids, TSS, mg/L	10

## Treated Water Quality

### Nutrients:

TN, mg/L	0.81, 21 day average
TIN, mg/L	0.04, 21 day average
TP, mg/L	0.13, 21 day average

### Disinfection by-products:

Total Trihalomethanes  
Total Haloacetic acids (HAA5)  
Bromate  
Chlorite

### Endocrine Disrupter Compounds (EDCs), nano-g/L:

Estrone (E1)  
17-beta estradiol (E2)  
Ethinylestradiol (EE2)  
Total PNEC7  
Nonlyphenol (NP)

### NDMA, nano-g/L:

**Bundamba AWTP**  
**Phase 1A ~ 30 ML/d**  
**Phase 1B ~ 36 ML/d**



## Treated Water Quality

**Nutrients:**

TN, mg/L	0.81, 21 day average
<del>TIN, mg/L</del>	<del>0.04, 21 day average</del>
TP, mg/L	0.13, 21 day average

**Disinfection by-products:**  
 Total Trihalomethanes  
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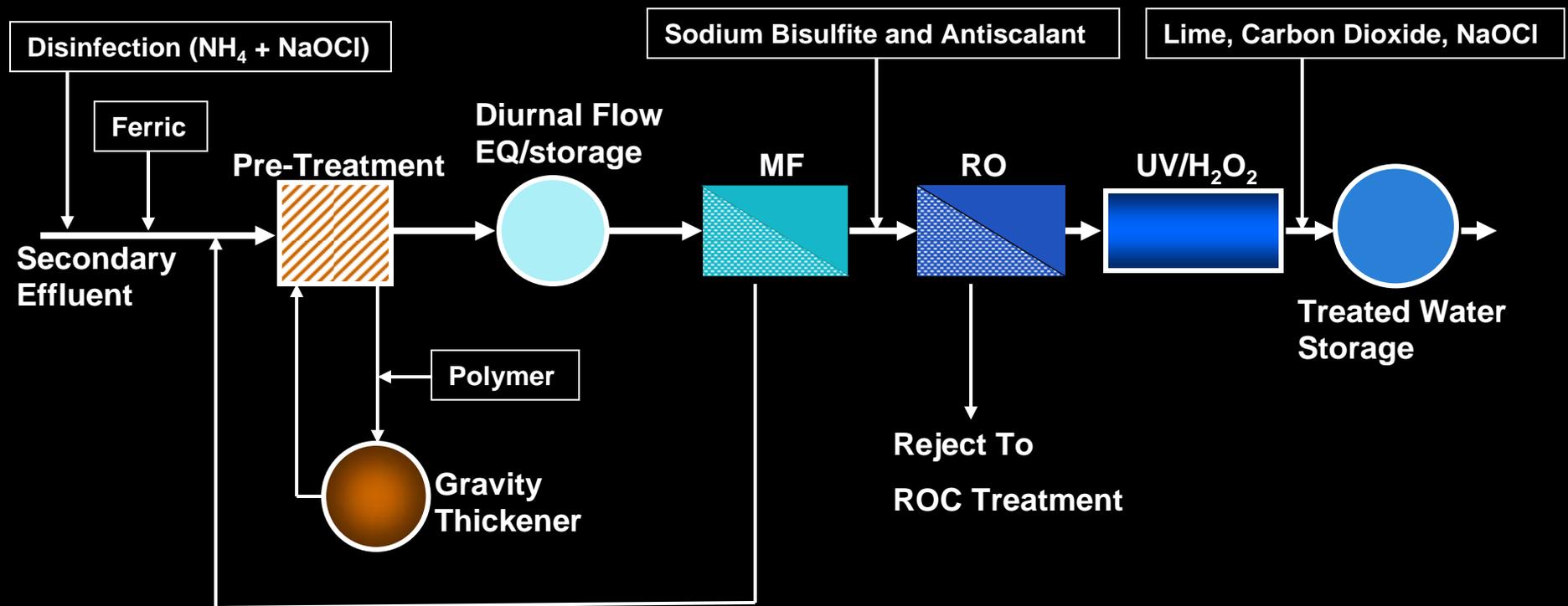
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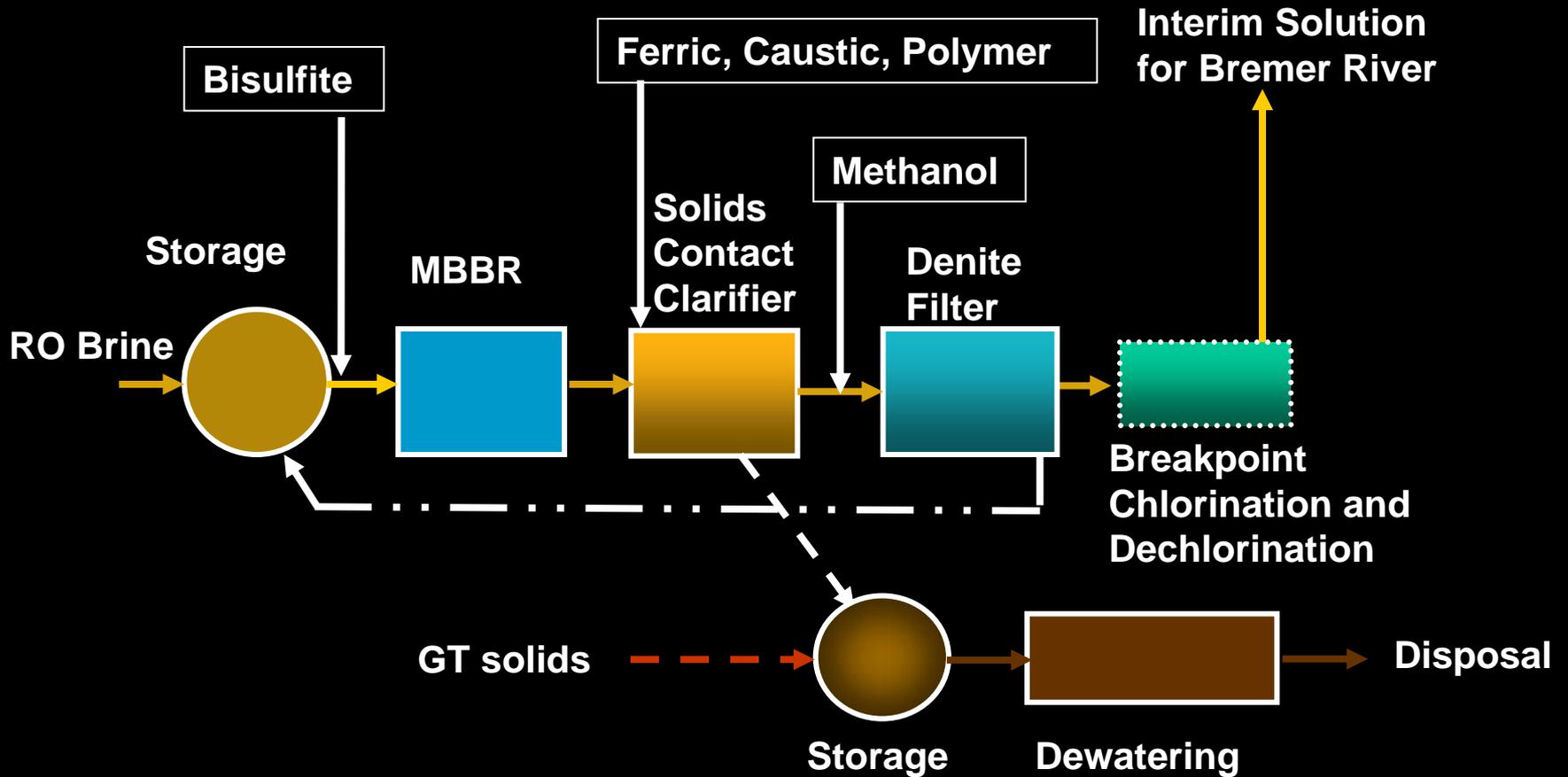
## Treated RO Concentrate (Discharged) Quality

Parameter	Water Quality Standard (50th percentile values)
<del>Nitrate as N, mg/L</del>	<del>1</del>
Total Phosphorus as P, mg/L	4
Total Suspended Solids, TSS, mg/L	10
Total Nitrogen, mg/L	45
Ammonia as N, mg/L	0.9

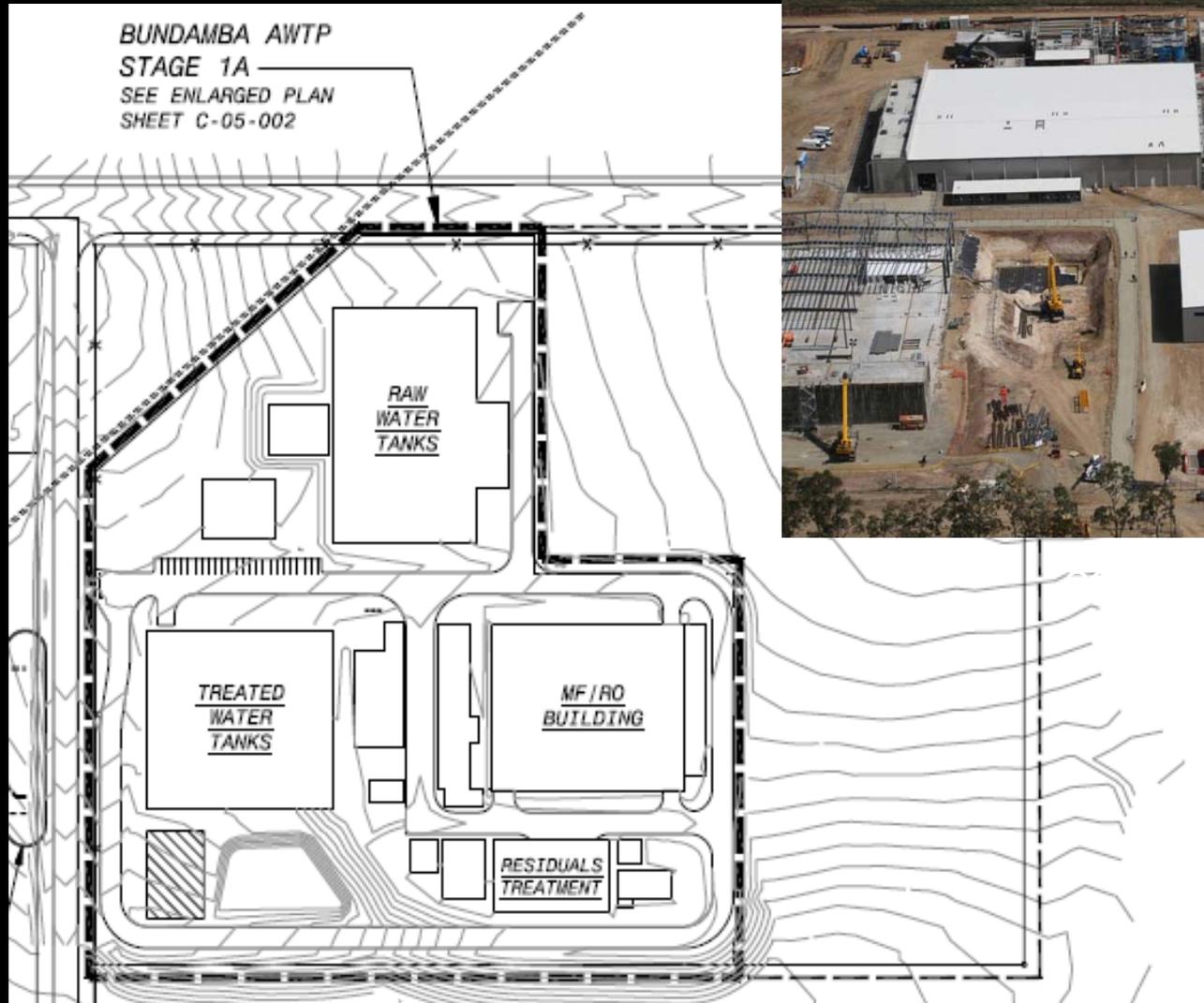
# Bundamba Advanced WTP – Flow Schematic



# Innovative RO Reject Treatment



BUNDAMBA AWTP  
STAGE 1A  
SEE ENLARGED PLAN  
SHEET C-05-002



215 m

105 m



**18" Koch RO  
Elements**

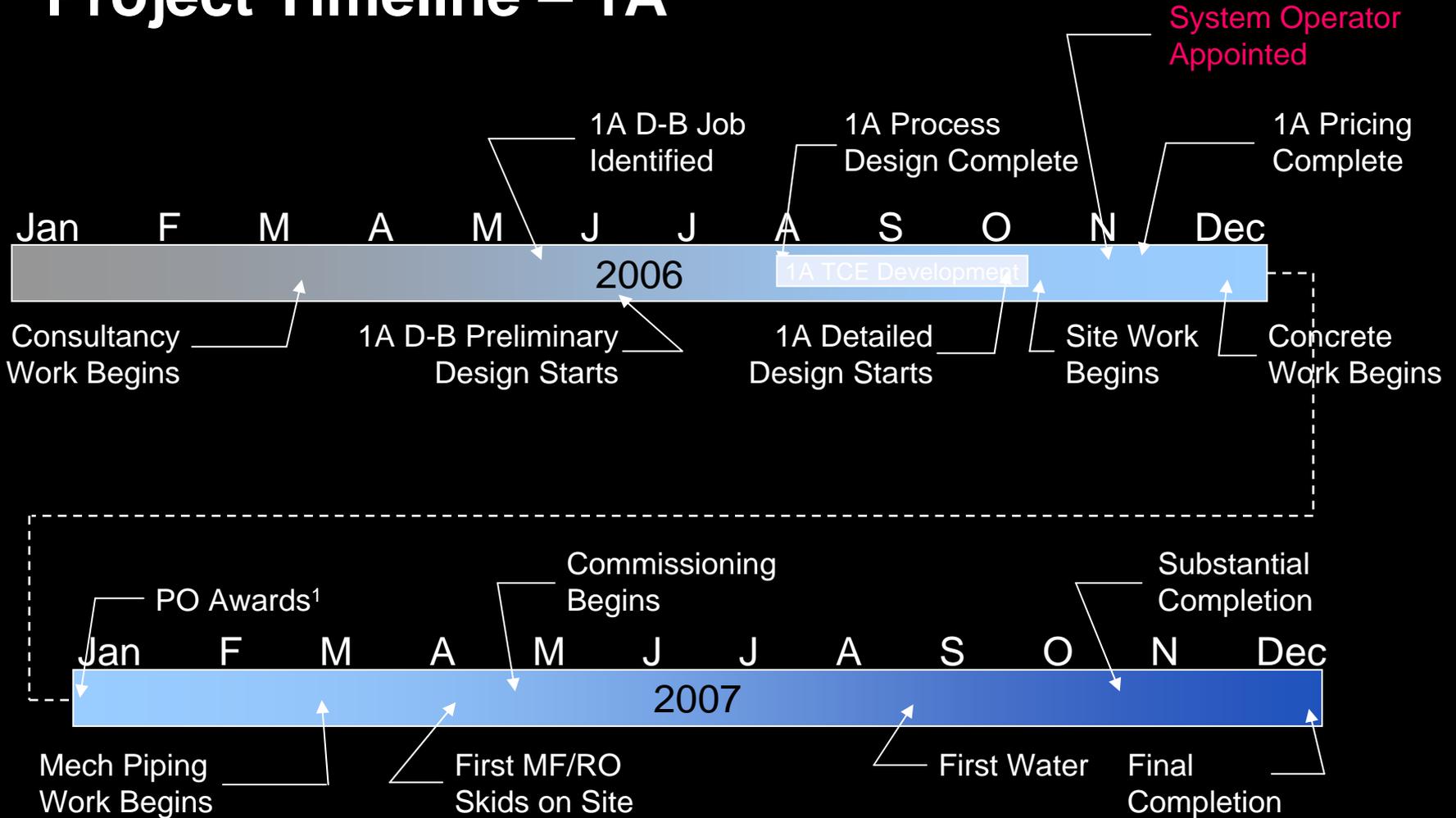


**Siemen's MF  
Skids**



**Trojan Lo/Hi  
UV with H<sub>2</sub>O<sub>2</sub>**

# Project Timeline – 1A



<sup>1</sup>MF, RO, UV Purchase Orders Issued in Fall 06

# Water Delivered to Swanbank on August 27, '07!



# Bundamba: Sunday, Sept. 2, 2007

"Ten months ago, this was a paddock. Now we have a high-tech plant producing some of the best-grade recycled water in the world, which easily meets Australian drinking water standards."

....." met a timetable that some said was impossible. It's a tremendous feat of engineering recognized around the world."

"It was like "drinking champagne."

Premier Peter Beattie,  
Queensland



# Treated water quality has been exceptional!

Parameter	Limit	Ave
pH	6 – 8.5	7.43
Total N	<0.81	0.46
TOC	</= 1	0.57
Total P	< 0.13	0.02
Turbidity	< 5	0.91
Alkalinity	40 - 100	78.03
Nanopollutants, ng/L		
NDMA	10	<5
Estrone (E1)	3	<5
17-Beta Estradiol (E2)	1	<5
Nonlyphenol (NP)	7	<13.5

## In Summary

- Water is “**Gold**” in Australia
- Multiple water strategies are required
- WCRWP augments water supply via recycled water
  - Power plants & other industrial users to substitute current consumption of source water with recycled water.
  - Excess water will discharge to Lake Wivenhoe
- Fast track projects can be achieved: at a penalty



Thank you!

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