



# Corrosion and Odour Control in Gold Coast's Sewers

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# Corrosion and Odour Control in Gold Coast's Sewers

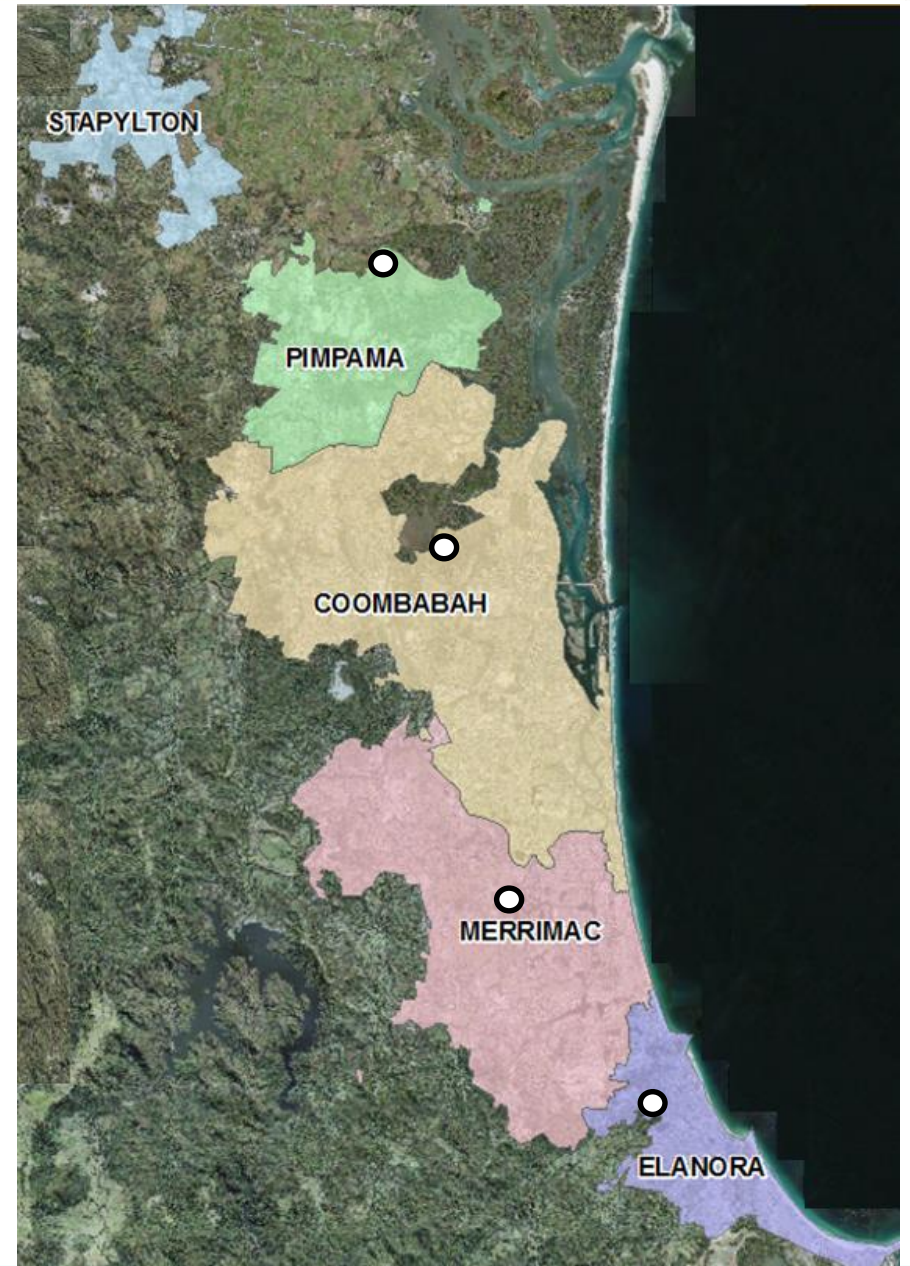
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**Presentation to:** Urban Water Forum 2016  
Advanced Water Management Centre  
The University of Queensland

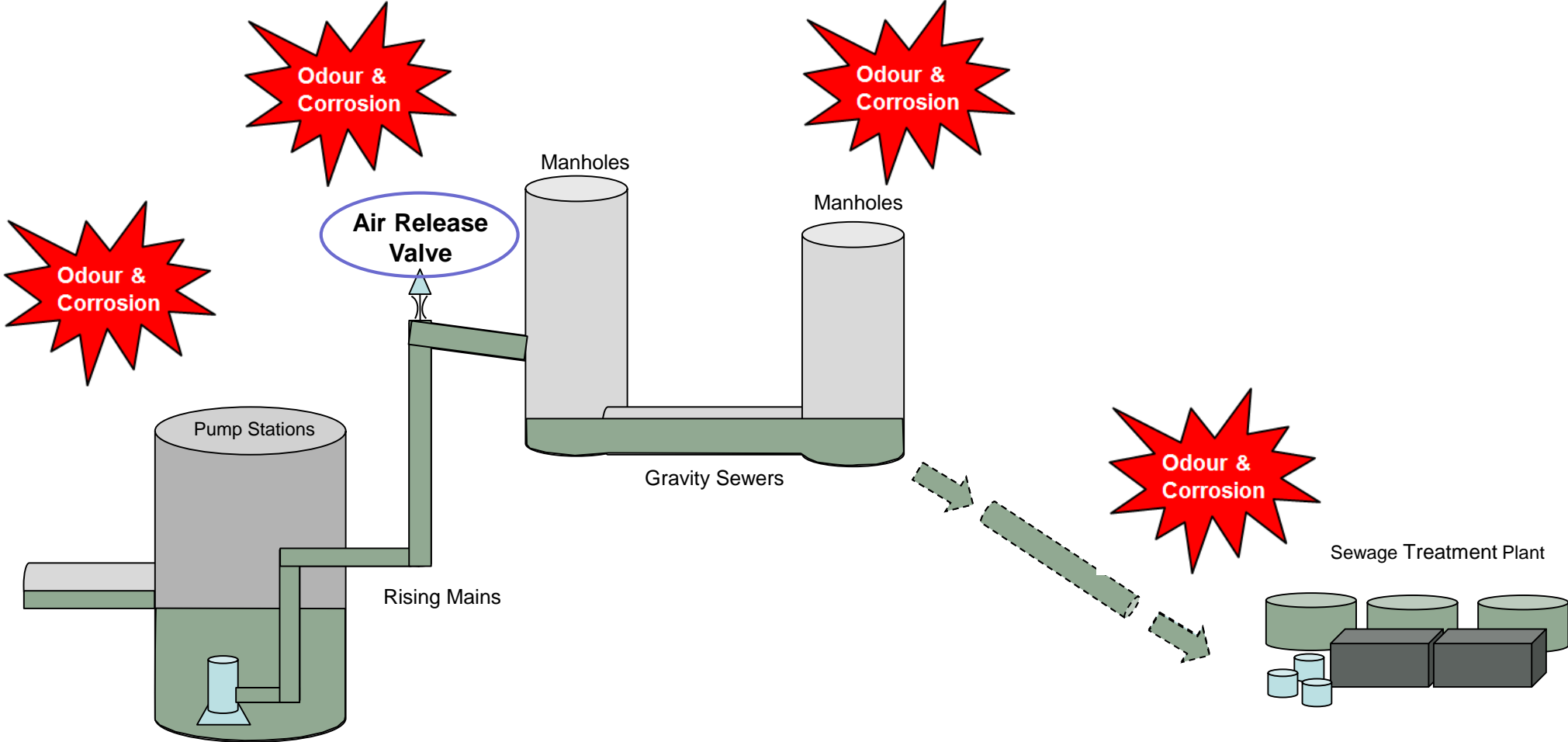
**Presenter:** Mark M. Hunting  
Executive Coordinator Sewerage Catchment Planning  
City of Gold Coast

# The Gold Coast Sewer Network

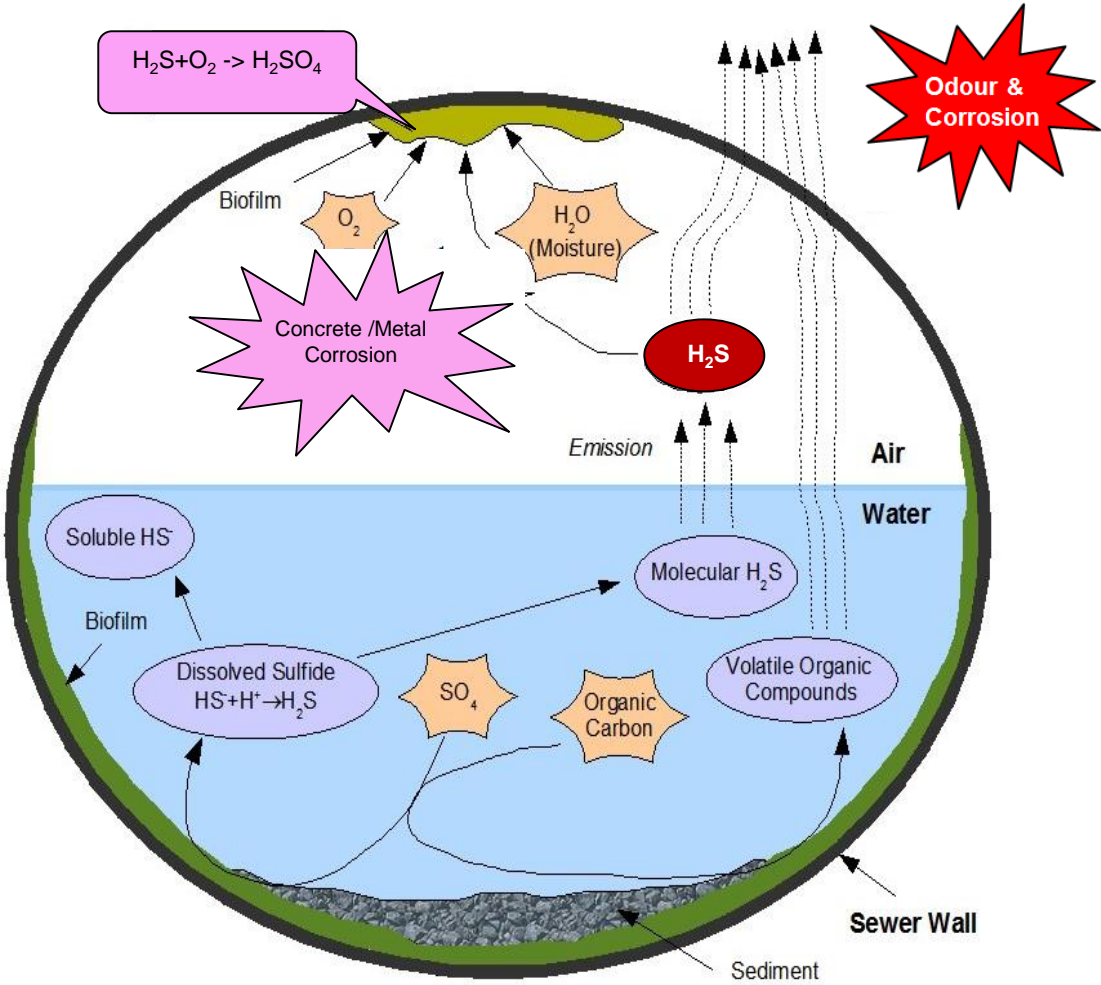
- **4 Sewage Treatment Plants – Pimpama, Coombabah, Merrimac, Elanora**
- **360 km of rising mains**
- **2,600 km of gravity sewers with 59,000 manholes**
- **530 pumping stations**



# Odour and Corrosion in the Sewerage System



# Odour and Corrosion in the Sewerage System



# Challenges and Drivers

- Long and flat terrain
- Premature asset failure
- Customer complaints
- Regulatory compliance
- Chemical costs

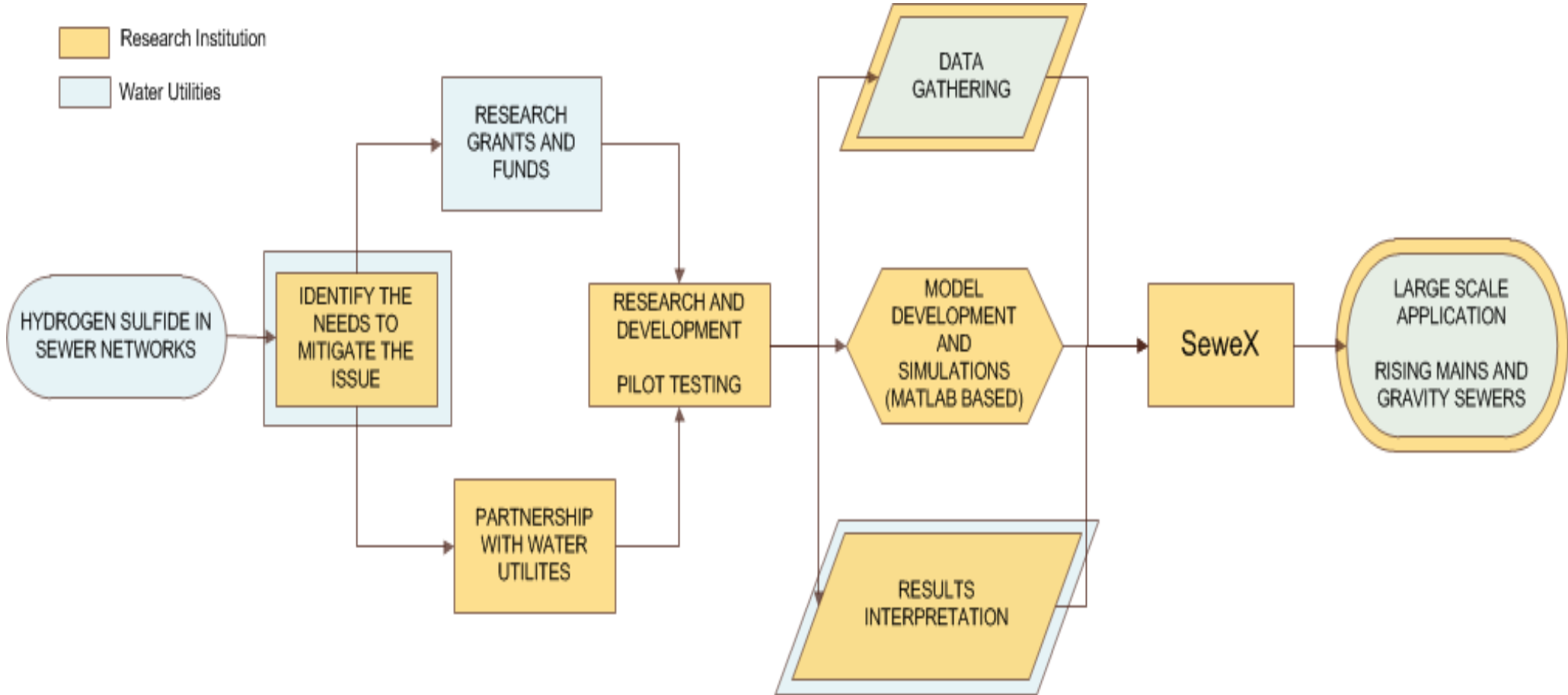


# Gold Coast Water's Aims

- **Control strategies for prevention of asset failures due to premature corrosion**
- **Manage and understand system behaviour for optimal process control**
- **Mitigation of odour**
- **Sewer Corrosion and Odour Management Plan**



# Research Integration in the Industry





# UQ Partnership with the City of Gold Coast

- **Sulfide Generation Model Development (UC09), 2003**
- **ARC Linkage Project 1 (Biotransformation project), 2004-2007**
- **ARC Linkage Project 2 (SCORE project), 2008-2013**
- **Odour Control at Elanora (Rising main) and STP, 2010**
- **Cloevis pilot study, 2012**
- **Coombah Wastewater Treatment Plant Odour Abatement Project, 2013**
- **ECG project - pilot study (ongoing in UC09)**

# The H<sub>2</sub>S Model (SeweX)

**ARC Linkage project in collaboration with UQ-AWMC, GCW, Sydney Water Corp, Brisbane Water, SA Water and UQ**

**A dynamic model that predicts corrosion rates, dissolved sulfide and sulfate, pH and COD**

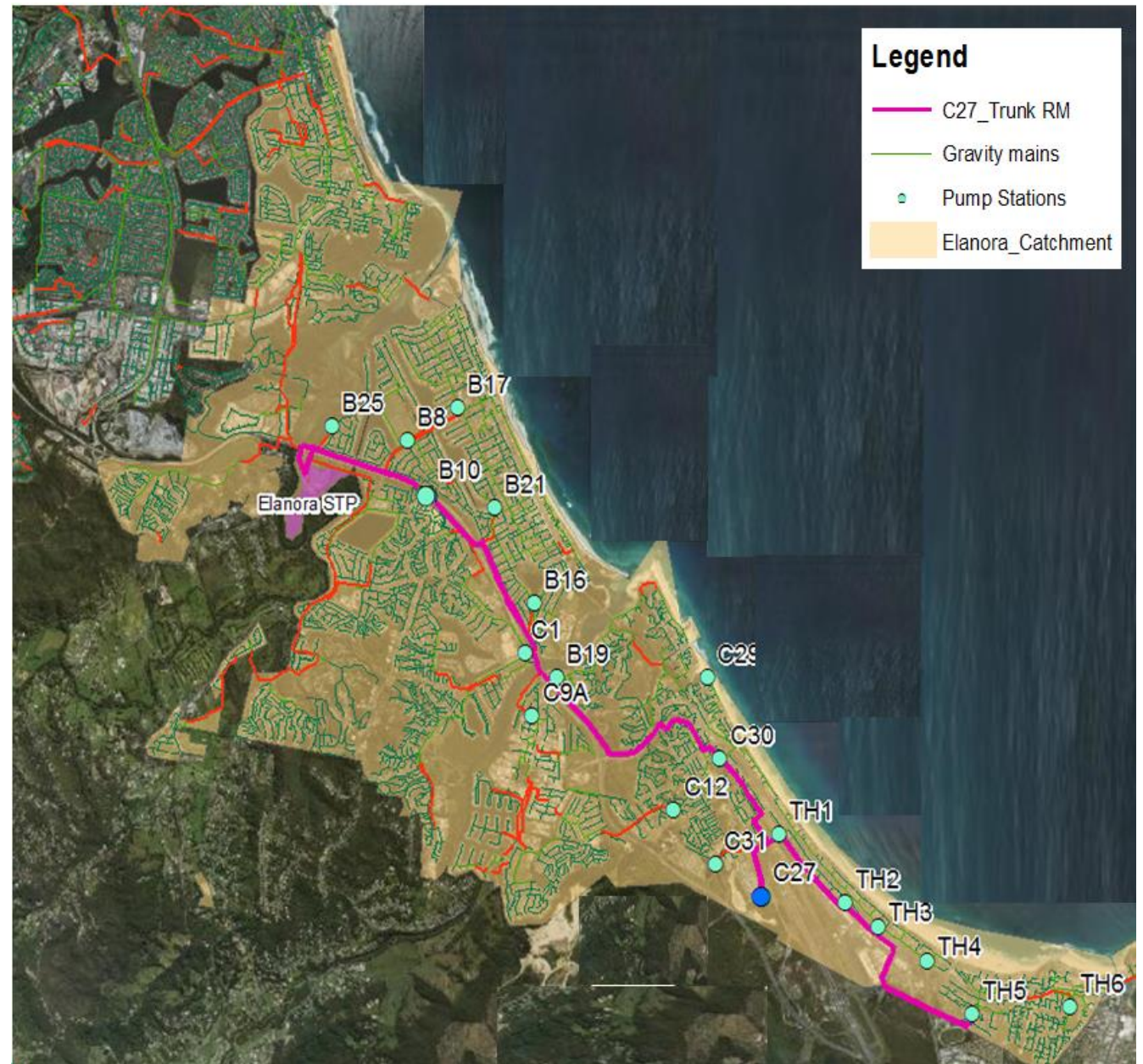
**Model built for SPS C27, B49 and B9 trunk rising main using**

- Sewer details from site inspections and GIS
- Online - monitoring checks (S::CAN)
- Measured online flow data from STP

**Calibrated using grab samples and online total dissolved sulfide**

## C27 Elanora Catchment

- Built in the 1980's
- 204 km total gravity sewers
- 36 km rising mains
- 9 km C27 trunk
- 57 Pump Stations
- 4900 Manholes
- 58,000 EP @ 12MLD ADWF



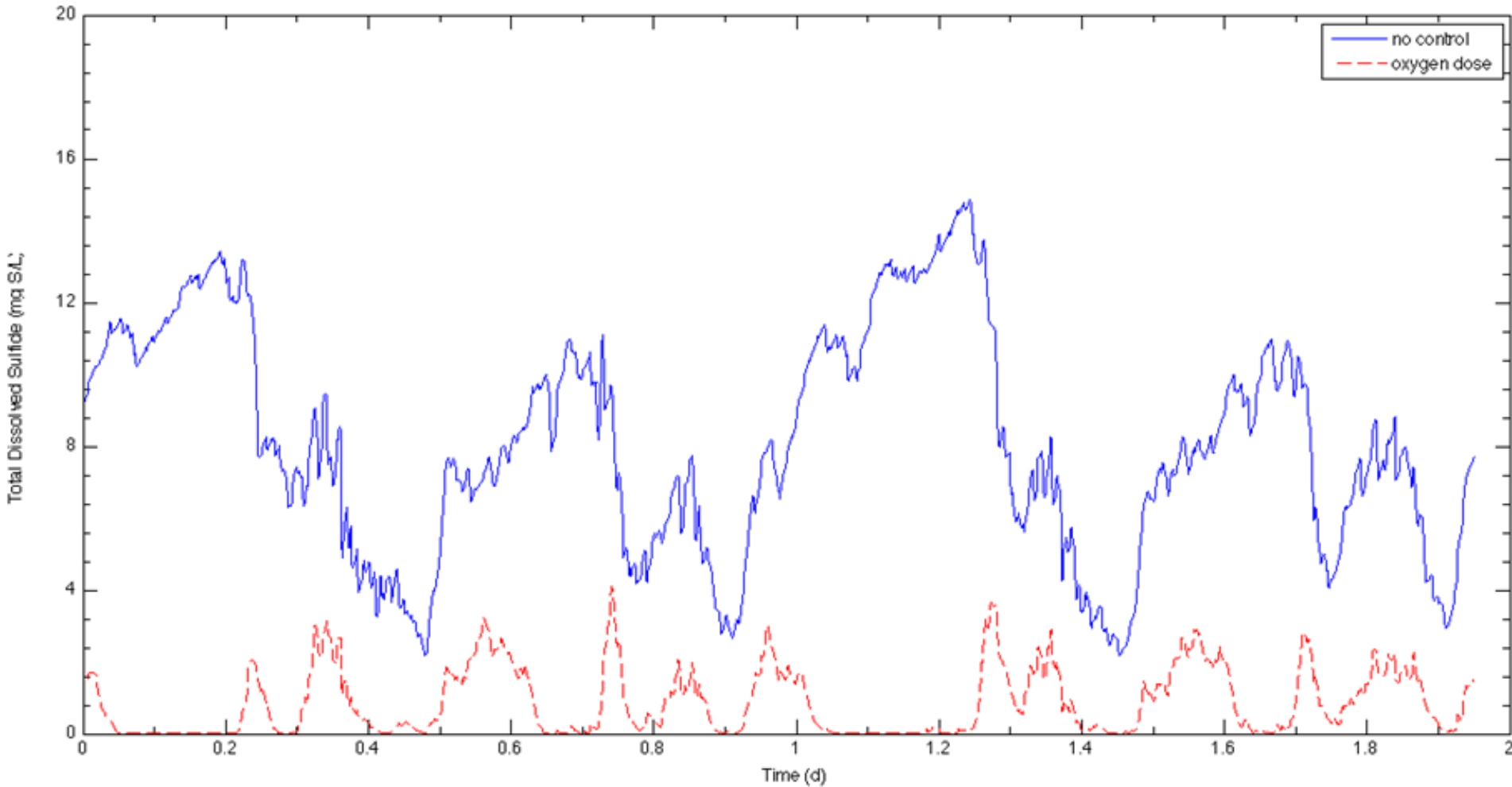
# Elanora Catchment Optimization

## •Sulfide modelling results

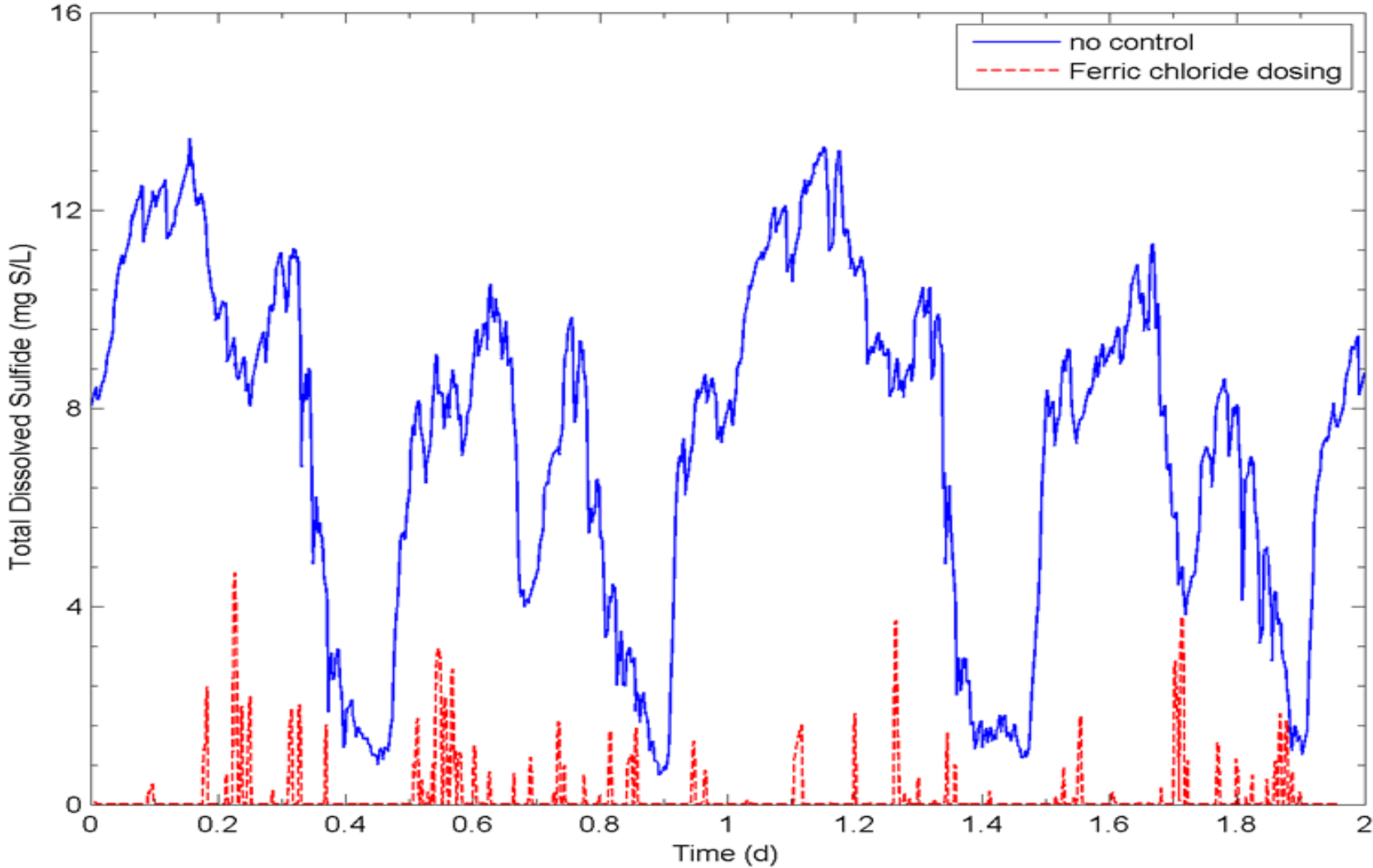
- Reduction of H<sub>2</sub>S using Oxygen Dosing
- Reduction of H<sub>2</sub>S using Ferric Chloride Dosing
- Reduction of H<sub>2</sub>S using Magnesium Hydroxide Dosing

Network	Chemical	Injection Location
C27	Oxygen	1770m upstream of STP
	Ferric chloride	544m upstream of STP
	Magnesium hydroxide	50m upstream of C27 PS

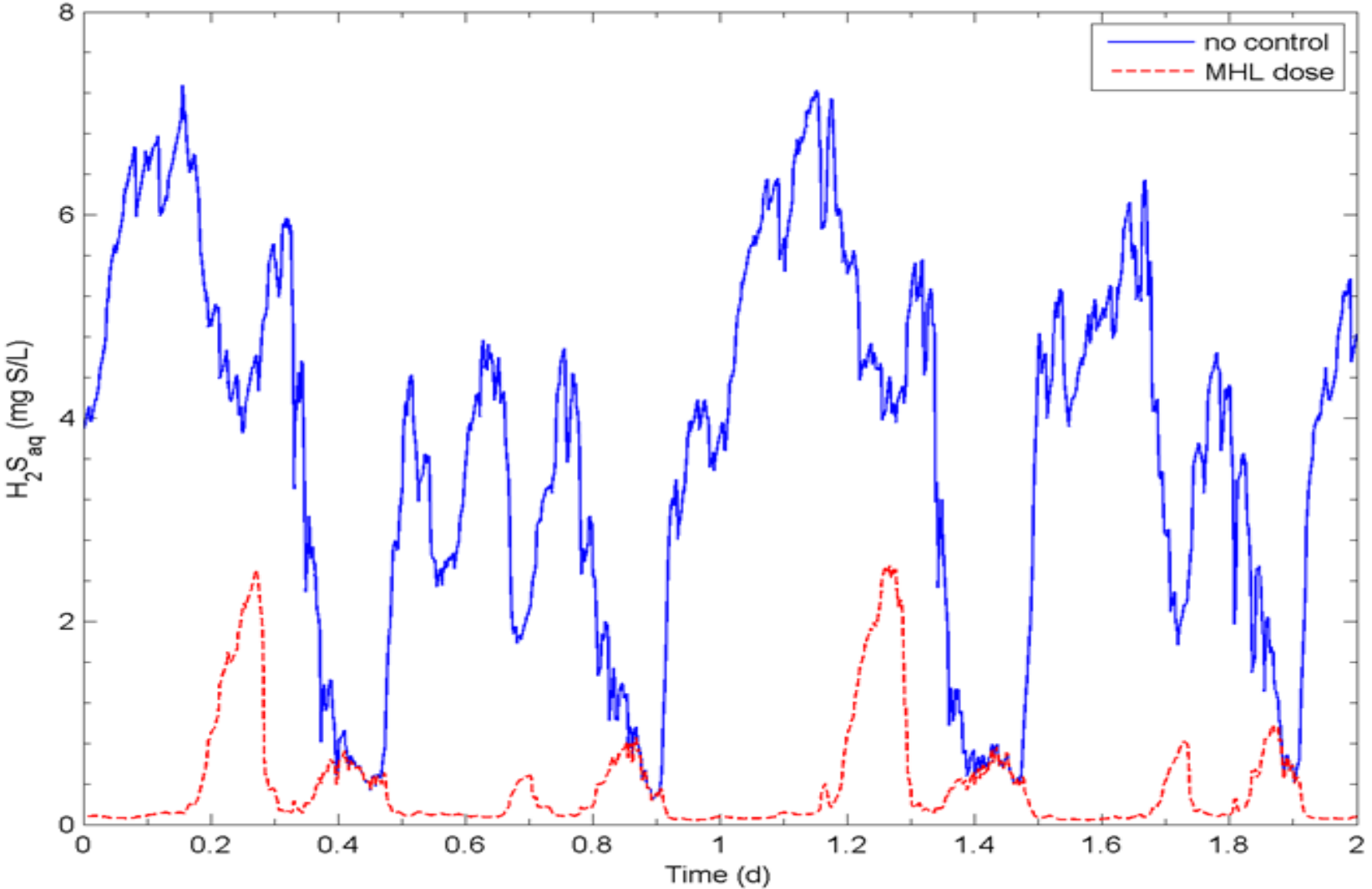
# Oxygen Injection Dosing Results



# Ferric Chloride Dosing Results



# Magnesium Hydroxide Dosing in C27



# Gold Coast Water Benefits

- **Obtain an optimal network-based sulfide control strategy for the Elanora rising main system.**
- **Implementation of the strategy removed the number of oxygen injection stations and saved \$0.5M/year of oxygen injection cost**
- **Added bonus of asset protection in the network (asset deterioration estimated at \$1.5M/year for the Elanora catchment, SKM 2007)**



# What are our Challenges?

- **Choice between emerging technologies which are applied to networks with knock-on benefits through STP's**
- **Justification of various options through cost benefit analysis**
- **Knowledge transfer to utilities for optimised control**

# Moving Forward

- **Application of the modelling process to both gravity and rising main networks**
  - Elanora Sewerage Catchment
    - Model Development/ Build-up - March 2016
    - Field Monitoring/ Model Calibration - July 2017
    - Project Completion - December 2017
- **Implementation in other Gold Coast sewerage catchments**
  - Coombabah Catchment: - January 2017
  - Stapylton Catchment: - July 2017
  - Merrimac East & West Catchment: - January 2018
  - Helensvale Catchment: - January 2019



**Thank You!**

## Contact details

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**Mark Hunting**

**Executive Coordinator Sewerage Catchment Planning**

**E** [mhunting@goldcoast.qld.gov.au](mailto:mhunting@goldcoast.qld.gov.au)

**W** [cityofgoldcoast.com.au](http://cityofgoldcoast.com.au)

**Enrico Olympia**

**Modelling/Planning Engineer**

**E** [eolympia@goldcoast.qld.gov.au](mailto:eolympia@goldcoast.qld.gov.au)

**W** [cityofgoldcoast.com.au](http://cityofgoldcoast.com.au)