



By 2030 eThekweni will be Africa's most caring and liveable city



Energy Efficient and Environmentally Friendly Desalination Technology, "Remix Water", Demonstration Project



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Sydney Masha
EWS: Civil Engineer - Commercial and Business

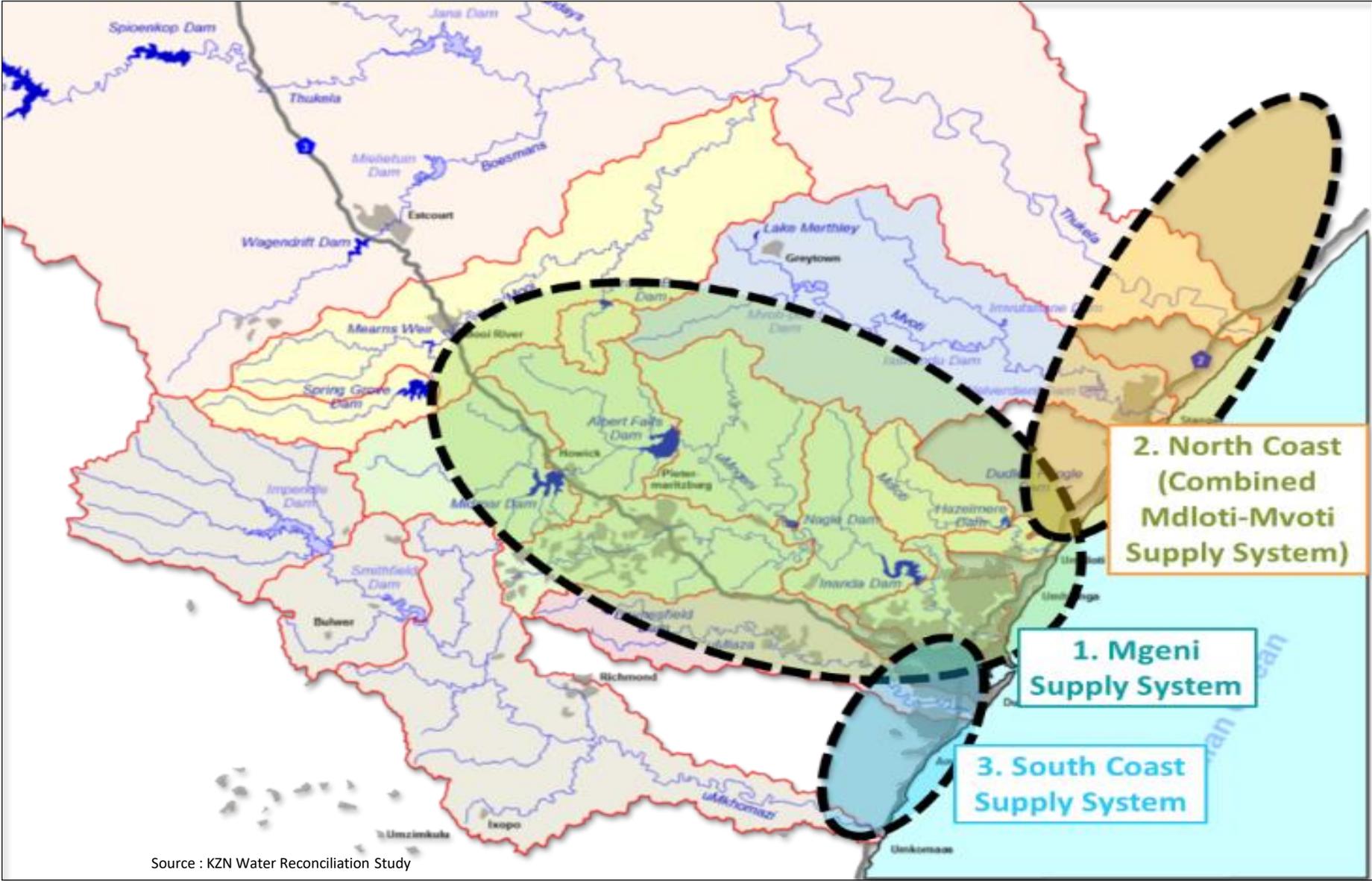
28 May 2019

ETHEKWINI WATER AND SANITATION

- Supply 910 MI/day of water from 9 Treatment Works
- 14 000km of water mains
- 263 Water Reservoirs
- 900 000 water connections
- Treat 500 MI/d of Waste Water
- 27 Waste Water Treatment Works
- 7 000 km of sewer mains

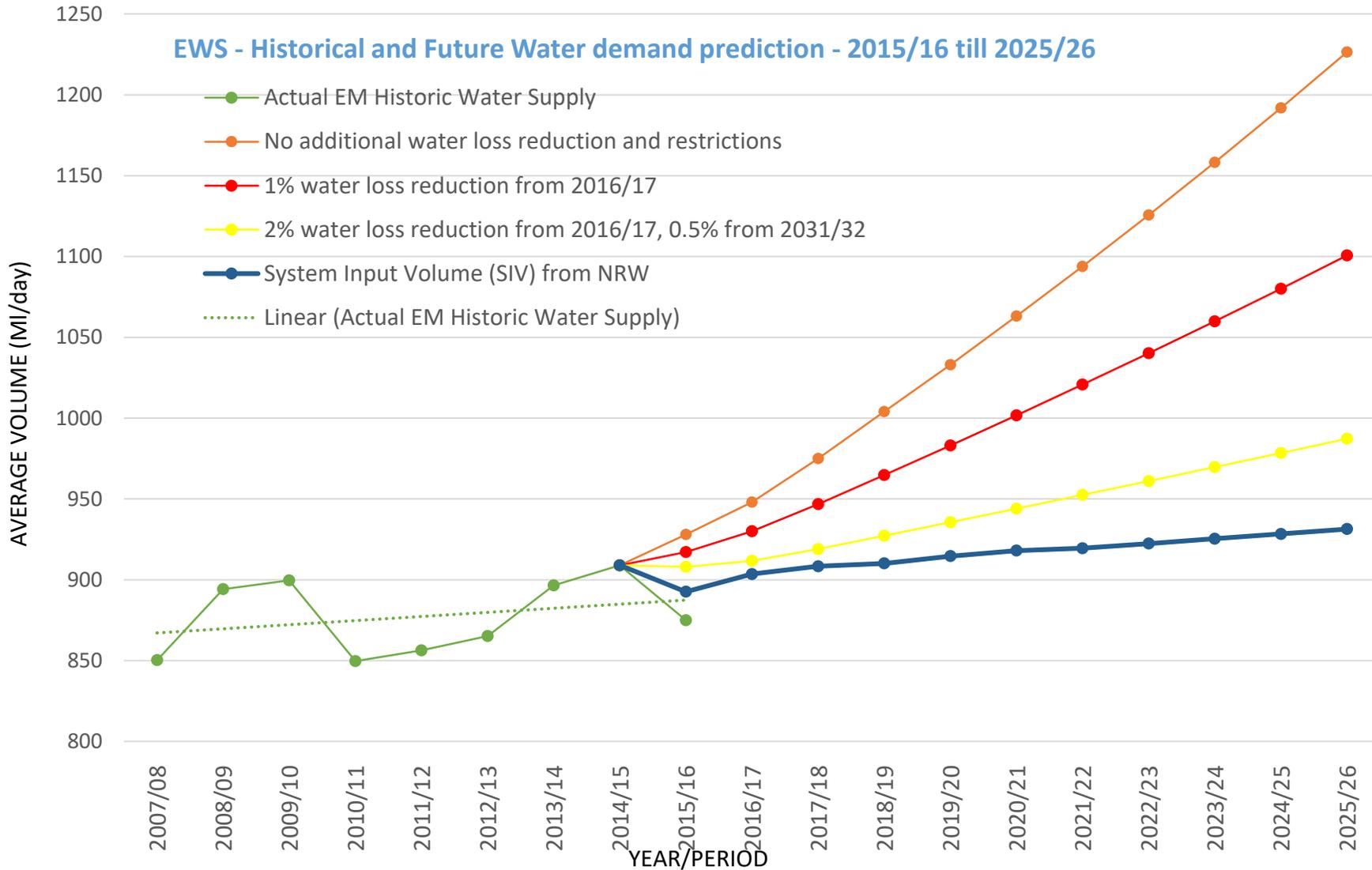


EWS WATER SOURCES



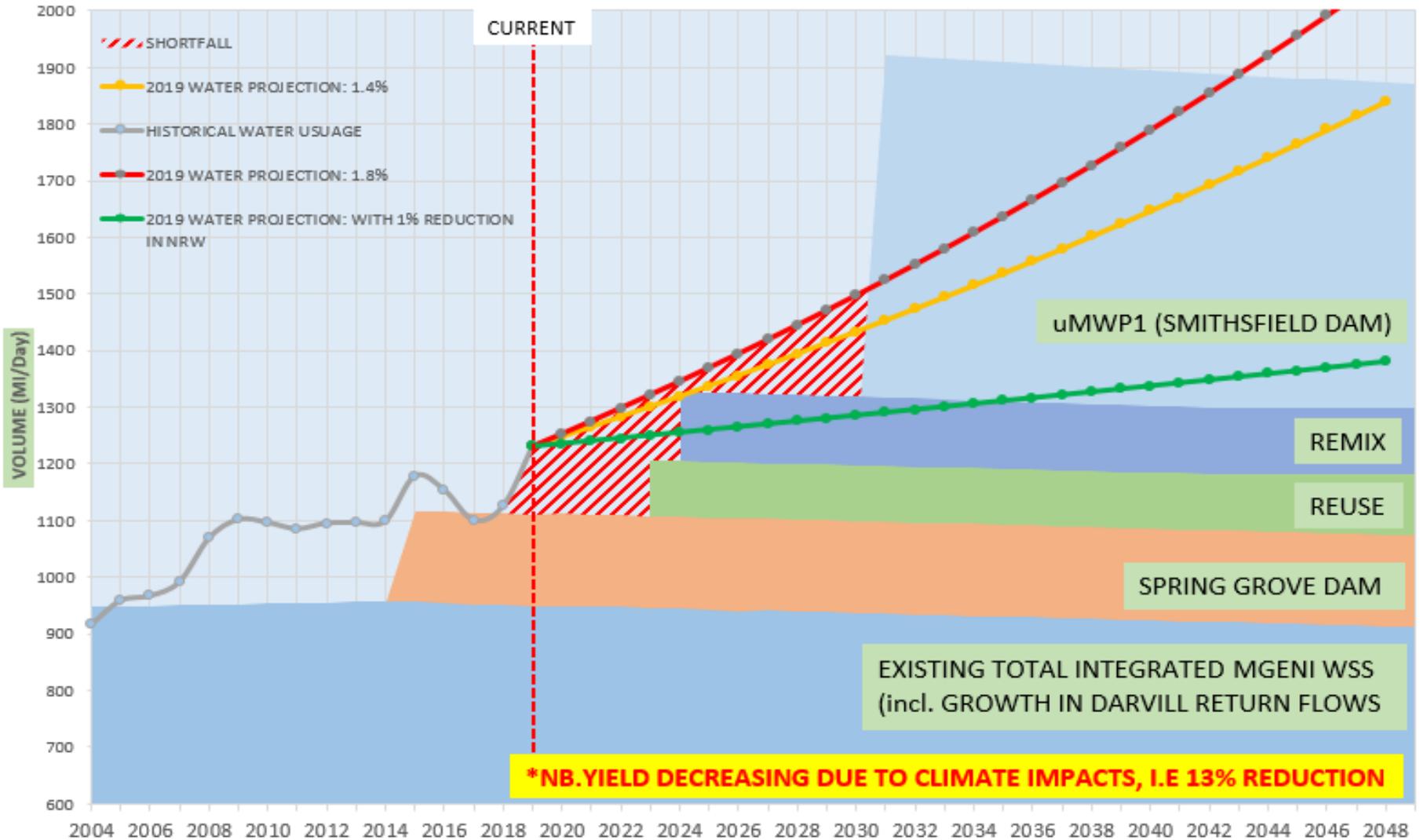
Source : KZN Water Reconciliation Study

EWS WATER DEMANDS

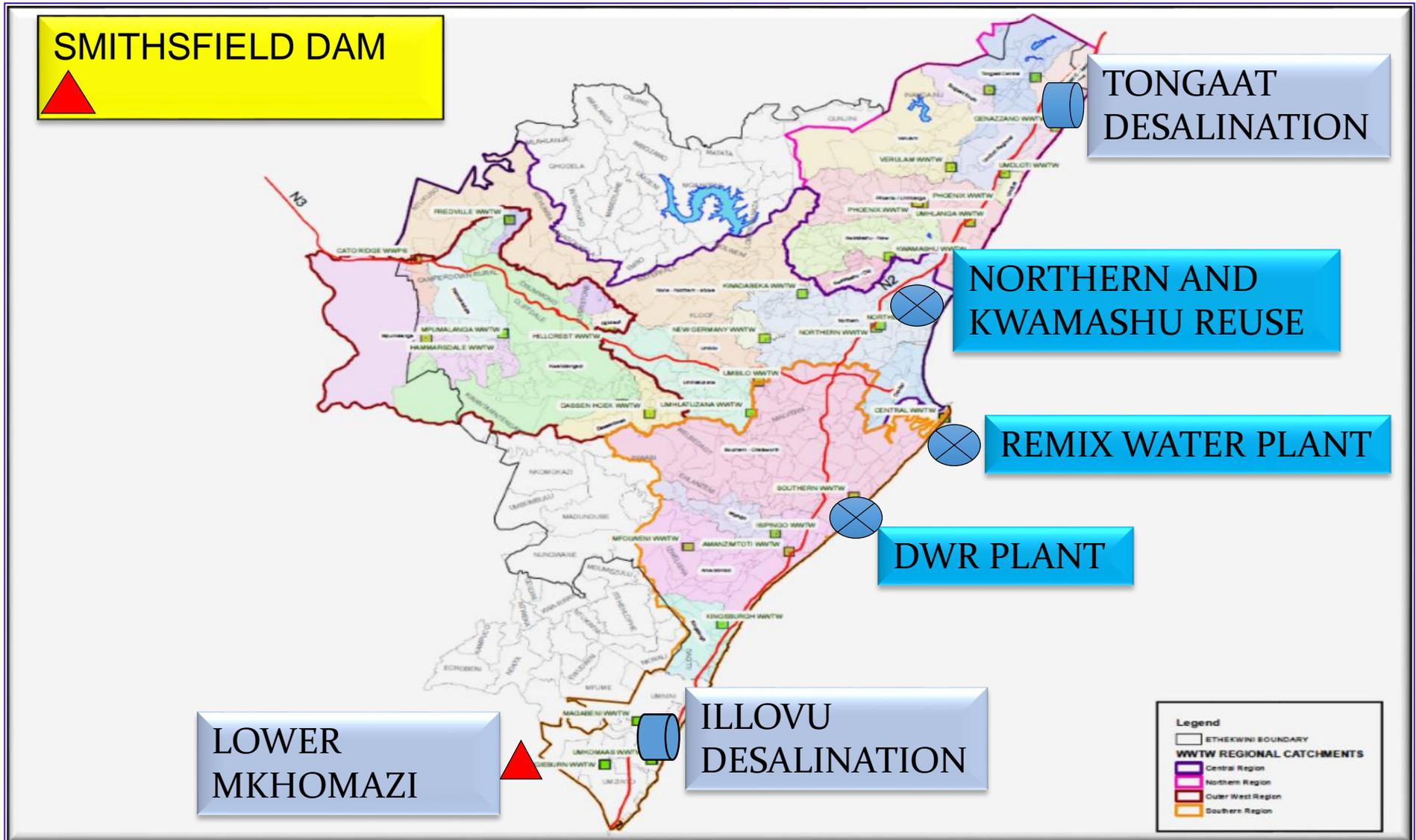


EWS WATER SOURCES

MGENI BALANCE WITH REMIX, REUSE AND SMITHSFIELD AT 2030



PROPOSED WATER SOURCES



BACKGROUND

eThekweni and NEDO/Hitachi event

World event

2013

- ◆ Site visit by EWS in Japan
- ◆ General MOU between eThekweni and Hitachi
- ◆ Launch Pre-FS in December

2014

- ◆ Pre-FS presentation in October

2015

- ◆ Approval of NEDO scheme for FS in February
- ◆ eThekweni council approved NEDO demo project in November
- ◆ eThekweni councilors visited Singapore NEWater and Hitachi-Aquatech in December

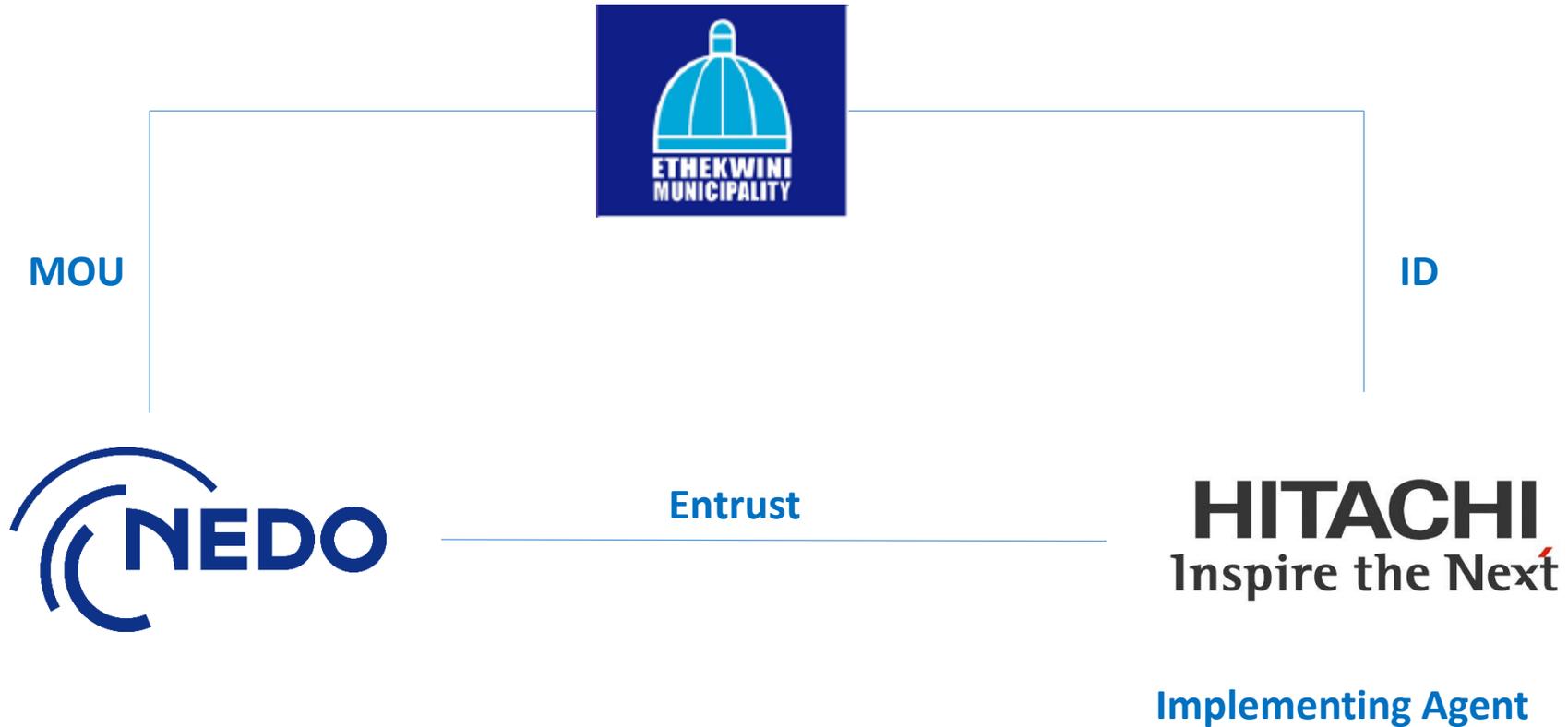
Rugby world cup
In UK

2016

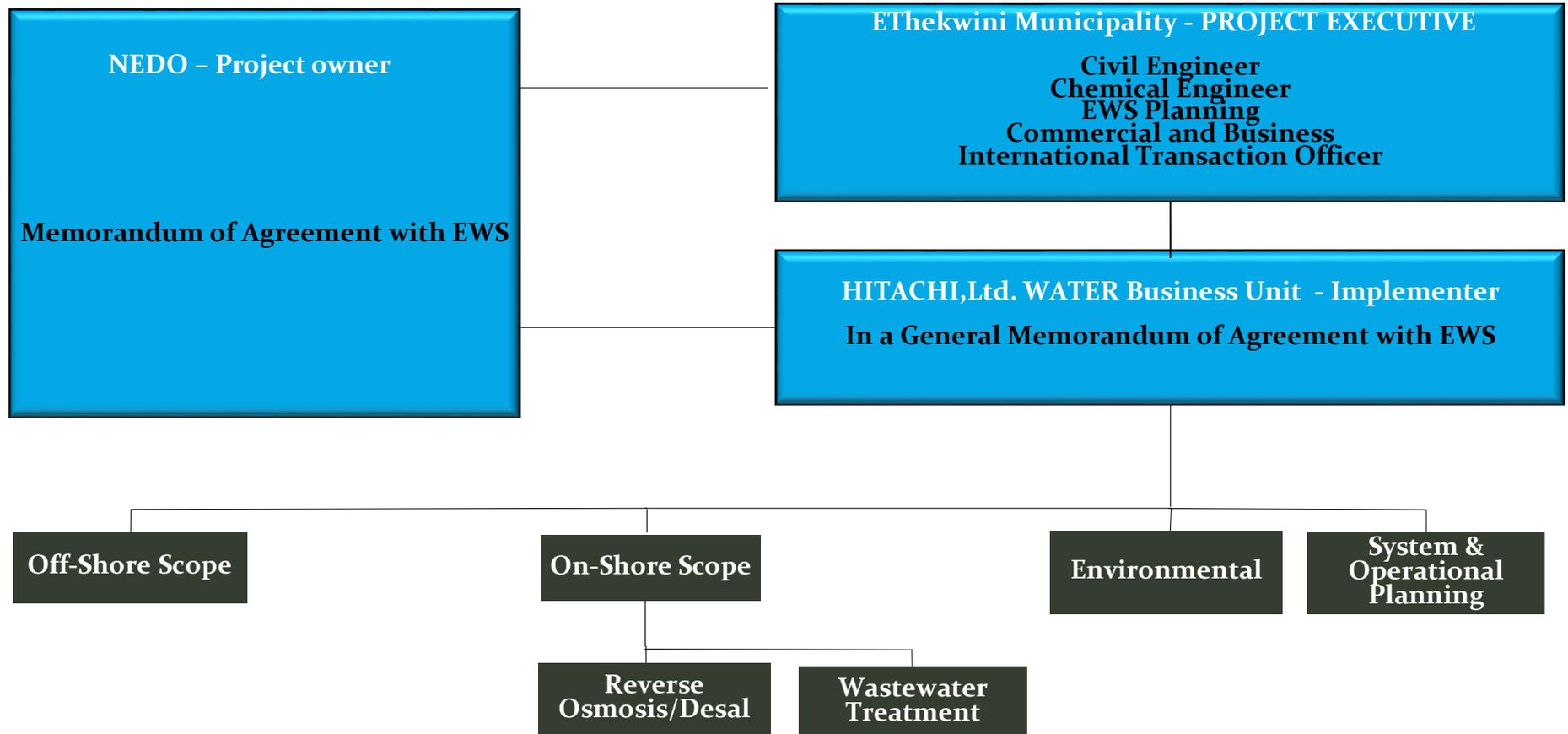
- ◆ Approval of NEDO scheme for 6.25MLD plant in August
- ◆ MOU / ID signing in November

Rio Olympic

CONTRACTUAL FRAMEWORK



PROJECT TEAM



PROJECT TEAMS

STEERING COMMITTEE

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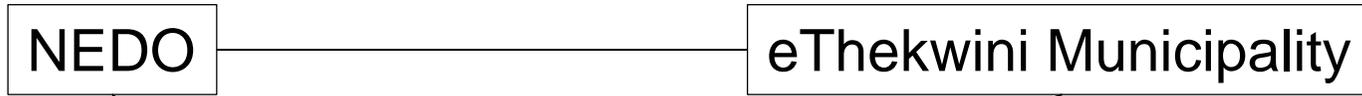
SUB - COMMITTEE

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Chairperson: Process Engineer
Civil Engineer/Project Manager
Works Area Manager
Mechanical and Electrical Engineers
Engineer: Sanitation Design
Engineer: Water Design and Non-Revenue Water

PROJECT TEAM



Hitachi



Noise impact assessment



Heritage Impact Assessment

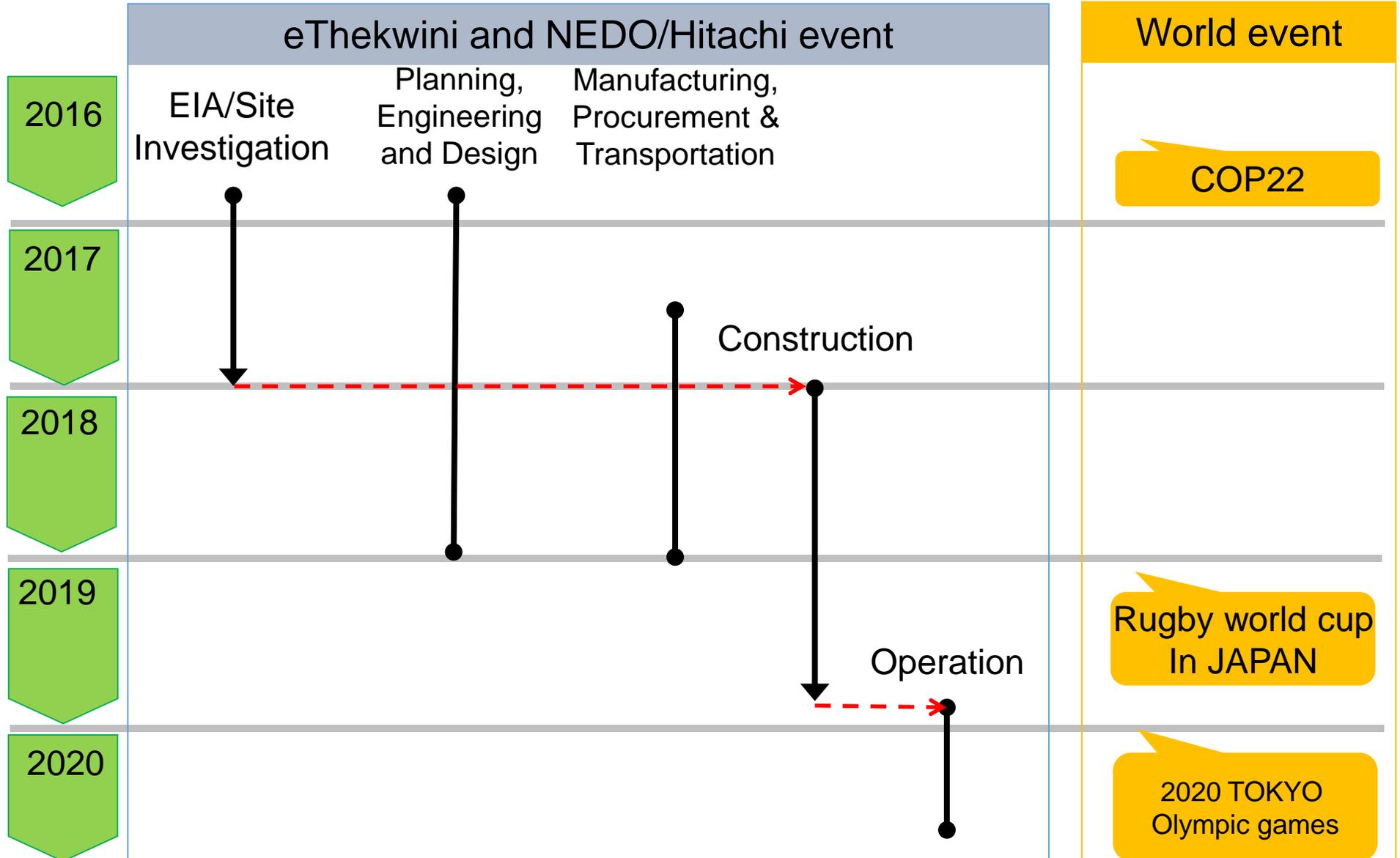


Wetland study



Marine Estuarine and Coastal Ecology

TIMELINES



REMIX WATER

Integrated system of Seawater desalination technology and Sewage reuse technology

Energy-saving

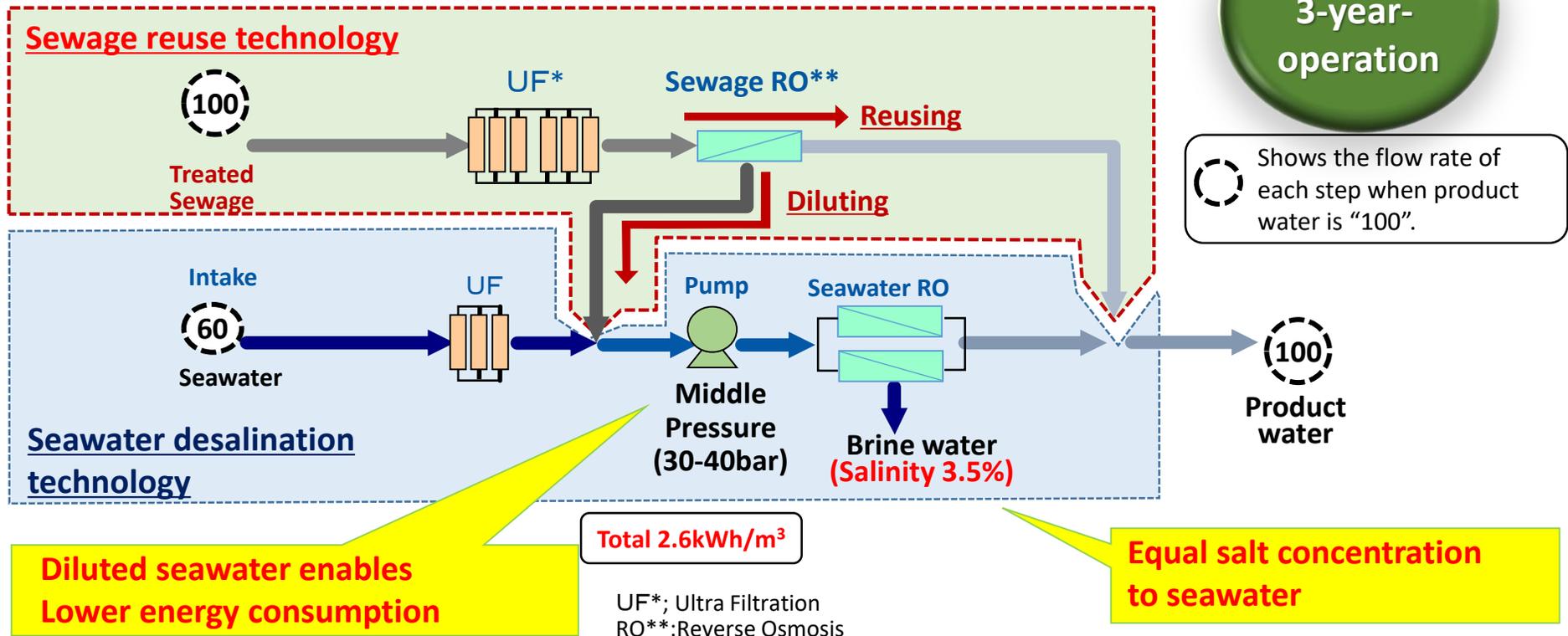
Lower environmental load

Lower cost



Verified for
3-year-
operation

System flow



CHALLENGES OF CONVENTIONAL SEAWATER DESALINATION

Challenges of seawater desalination

1. High electricity consumption
2. Brine Discharge

Properties	Remix Water		Conventional
Electricity consumption	2.6KW-hr per cubic meter of treated water	30%Less ←	3.8KW-hr per cubic meter of treated water
Brine salinity concentration	3.5% salinity and less volume of brine produced (37.5% of feed ends up as brine)	50%Less ←	7% salinity and large volume of brine produced.(60% of feed ends up as brine).

ADVANTAGES OF REMIX WATER

Remix Water is the key technology for water security and sustainable society

Lower environmental load

- Brine salinity can be decreased at the same level of the sea
- Water recycling technology

Energy-saving

- Electricity consumption can be decreased.

Lower cost

- CAPEX ; around 15 %* decreased
- OPEX ; around 30 % *decreased

*Its depend on the condition (water quality, location and others)

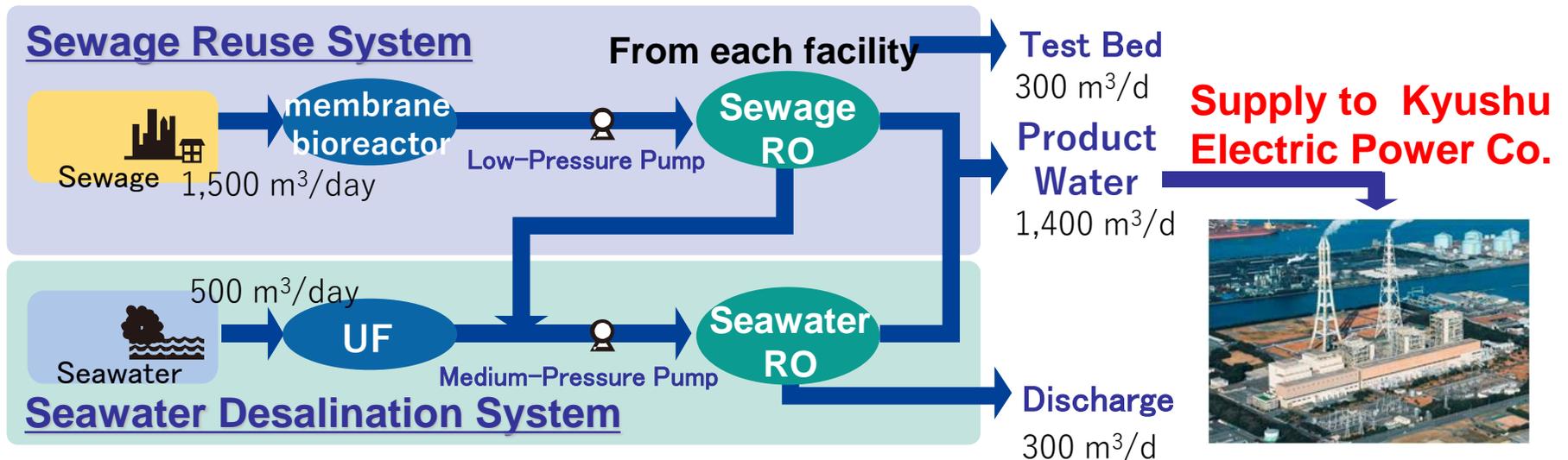
VERIFICATION PLANT

- Period: 2010.12~2013.11
- Location: Water Plaza Kitakyushu

3years operation
was completed



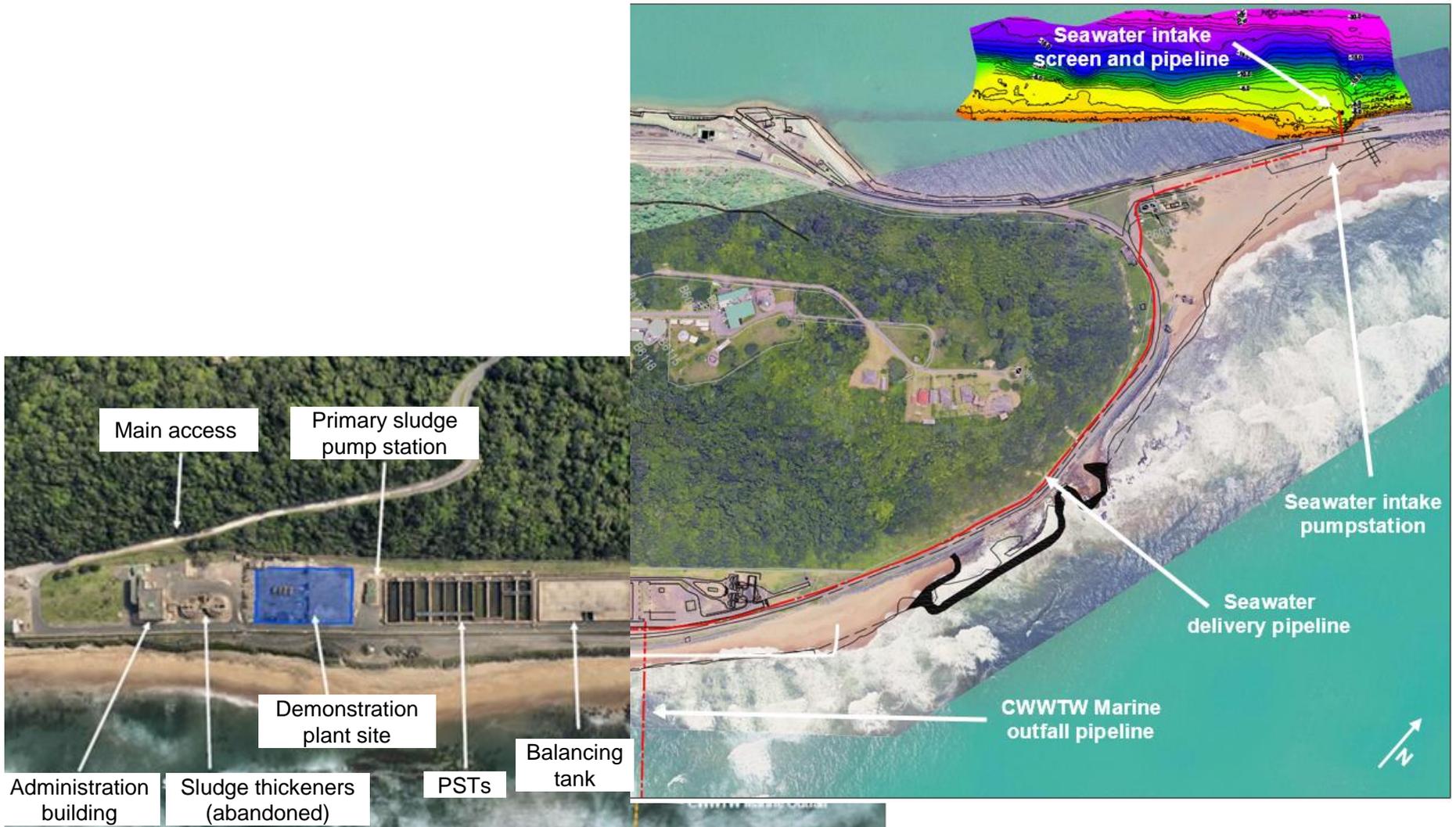
■ Process of Demo Plant



SA: DEMONSTRATION SITE



REMIX – 6.25 MLD



REMIX WATER



Project Timeline

- November 2016 – MOU Signed between eThekweni Municipality and NEDO
- August 2018 – EIA, WULA, CWDP and Design Drawings Completed
- October 2018 – Construction Commenced
- November 2019 – Plant Commissioned
- December 2019 – December 2020 Demonstration Period



CAPACITY BUILDING

- **DST-HITACHI Scholarship program** 2009-2014: Power sector 2015-Water sector (two months water sector education/training program for five scholars)

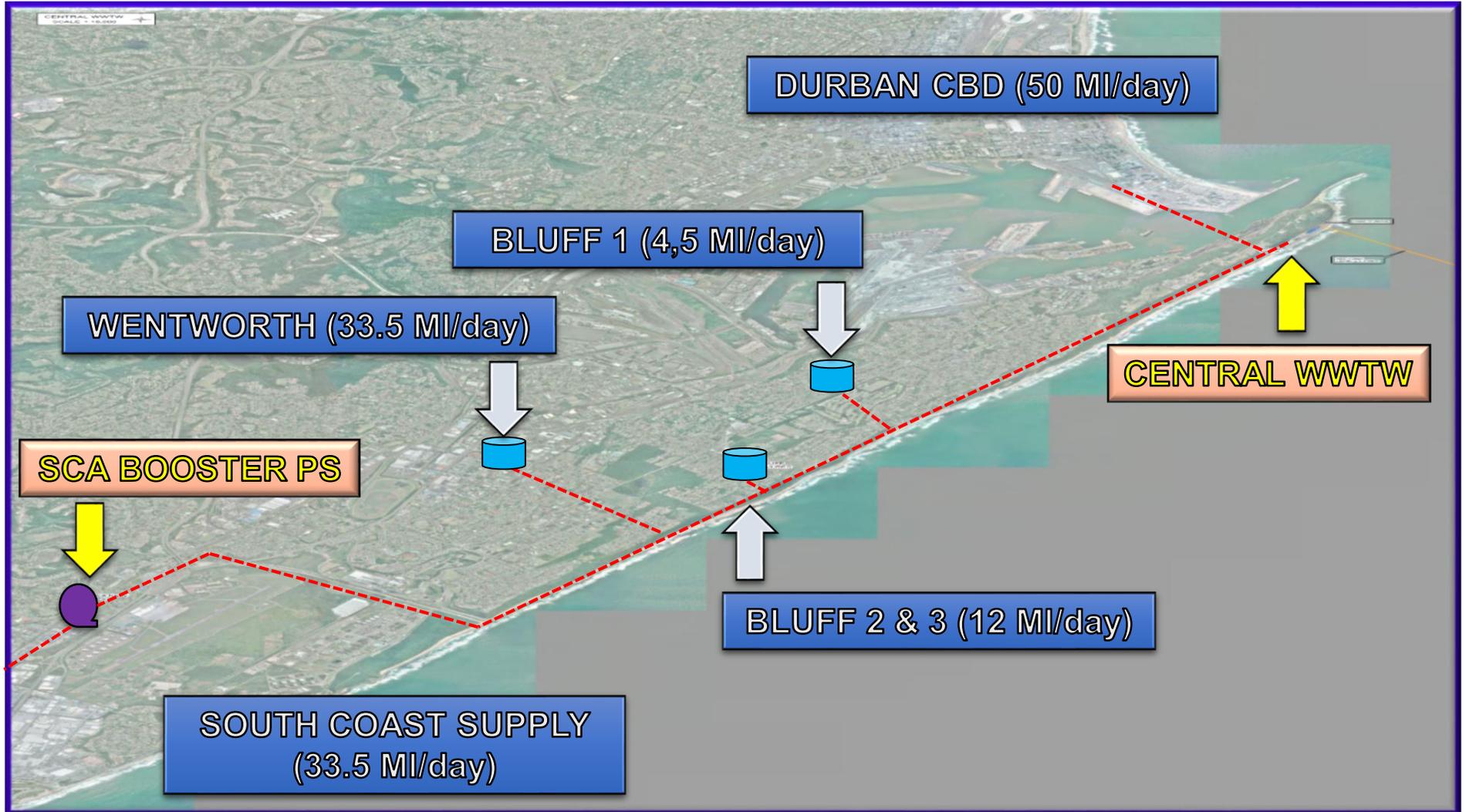


- **Technology training program** for eThekweni engineers during NEDO project

REMIX – 100 MLD PPP



WATER DISTRIBUTION OPTIONS





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THANK YOU

QUESTIONS?