



# **Project Example: Wellington Water Works – Production Water Reuse**

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*by*

**Bill Wallace**

***Chair, FIDIC Sustainable Development Task Force***



# Project Background

- The town of Wellington, Colorado, USA and the surrounding area is experiencing exceptional growth
  - 62% in the next 30 years
- Projected growth in Colorado from 2005 to 2030 is from 4.2 million to 7.5 million
- Water is a critical resource

**“Nothing in the future will have a greater impact on our ability to sustain our way of life and preserve our environment for future generations than water.”**

***The Statewide Water Supply Initiative, Colorado Department of Natural Resources***



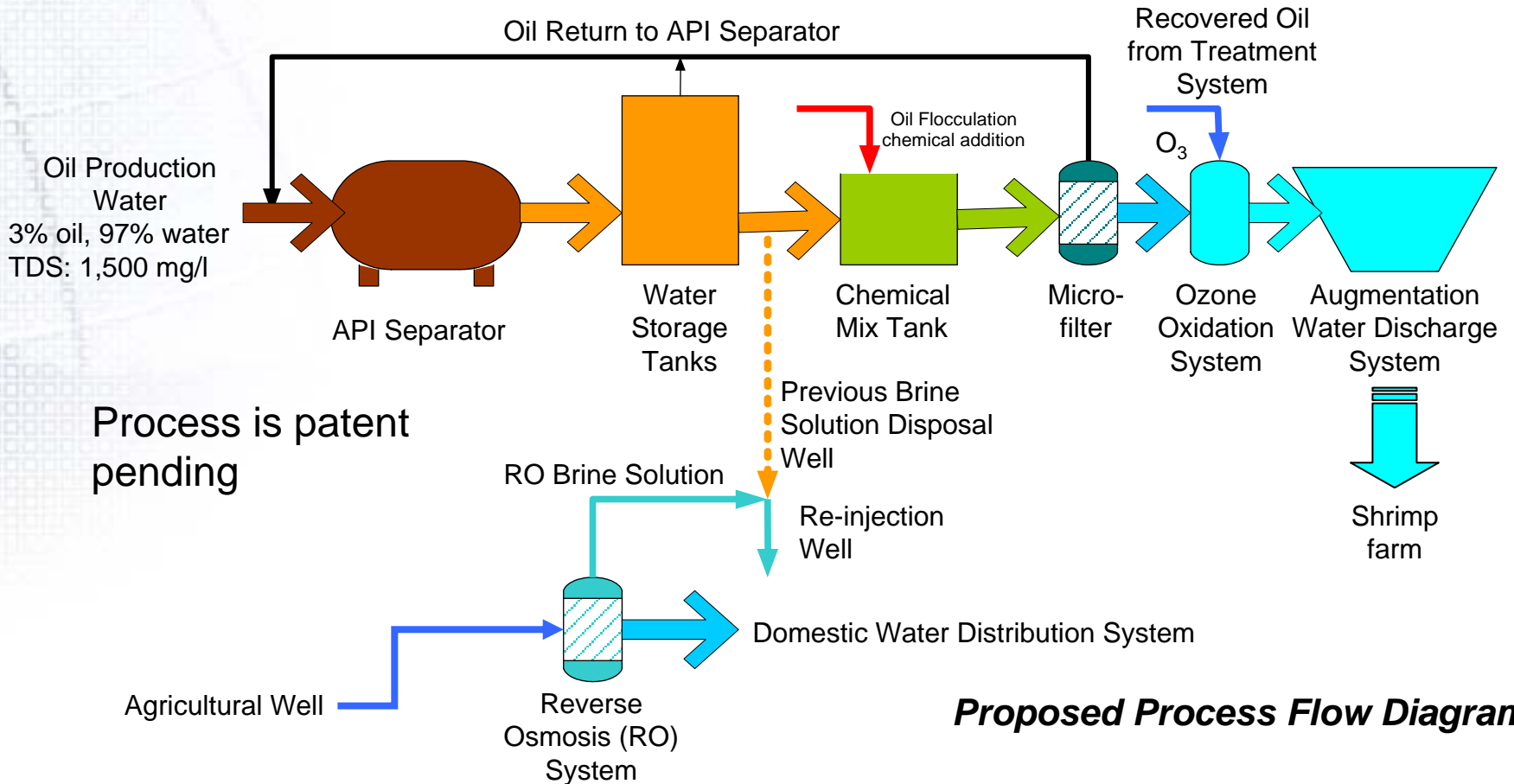
# Project Description

- A local oil extraction process brings up a solution that is 3% oil and 97% water
  - Process water has 1500 mg/l of total dissolved solids (TDS)
  - Mostly a salt solution of sulfates and chlorides
- The reservoir that we are currently pulling this water from has a capacity of at least 300 years
- The water is treated to recover all of the oil and then discharged to be used by a shrimp farm.
  - The shrimp operation needs water at a temperature of 85 degrees F. (30 degrees C.).
  - This discharged water needs to be cooled to bring it down to that temperature.
- The water used for domestic water (with production water added) is being treated utilizing a reverse osmosis (RO) system.
- The brine from the RO provides salt water for a shrimp farm



# Production Water Treatment System

Oil production water is treated to meet the standards required by the Colorado Department of Public Health and Environment



**Proposed Process Flow Diagram**



# Example of Production Water Process Skid

- Production water treatment skid
- This system is capable of treating 25 gpm
- Wellington Water Works skid would have 3 additional ceramic membrane modules



Ceramic membrane modules



# Pilot Plant Test Site

- Field testing the water treatment process for the oil production water
- Plant removes oil and oil byproducts to levels that can meet the requirements of the U.S. Environmental Protection Agency and the Colorado Department of Public Health & Environment

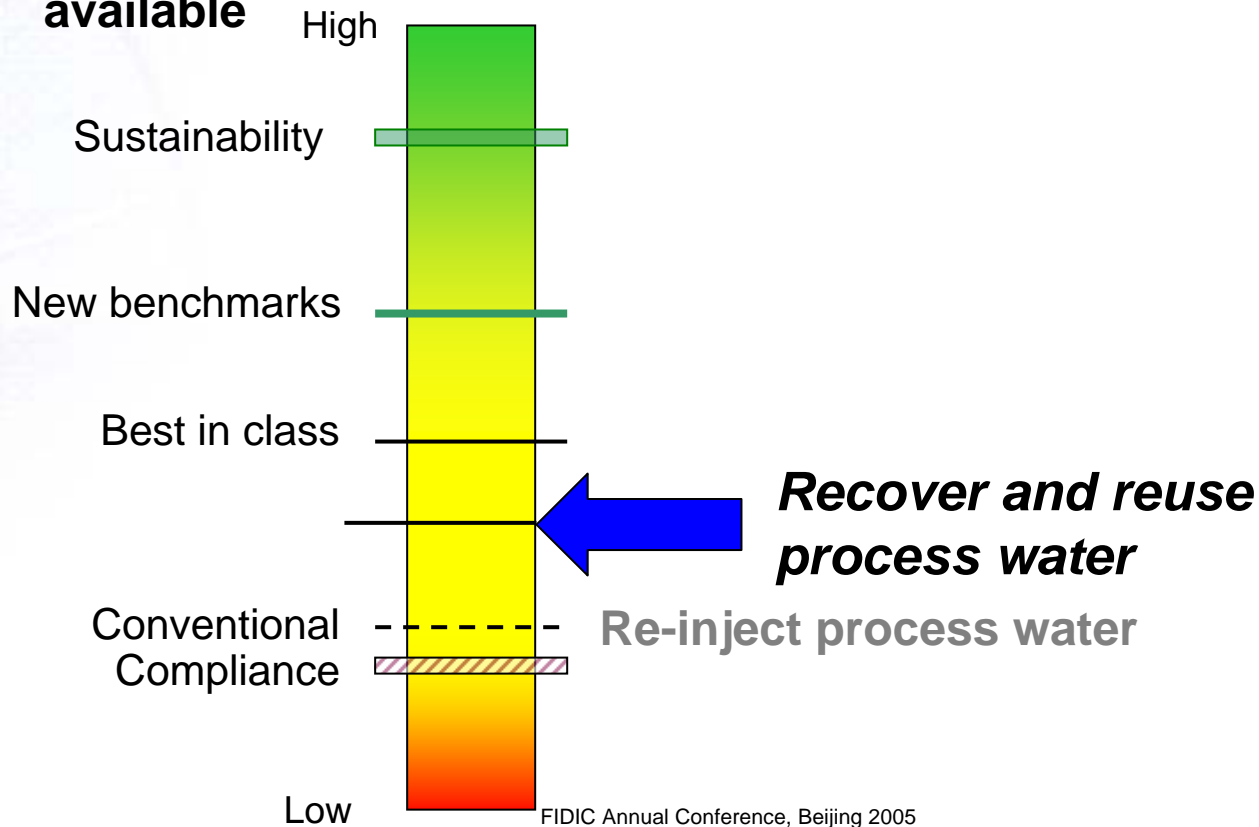




# Achievements: Water Quantity

**PSM Goal:** Design and construct facilities and infrastructure in a manner that minimizes the use of fresh water, taking into account the total amount of fresh water.

**PSM Indicator:** EN-13: Measurements of fresh water usage on project during all phases, as compared to the total amount of fresh water available





# Wellington Water Works – Production Water Reuse

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Project contact information:

*David R. Stewart, PhD, PE*

*President and CEO*

*Stewart Environmental Consultants, Inc.*

*3801 Automation Way, Suite 200*

*Fort Collins, CO 80525*

*Telephone: +1 970 226 5500 ext 204*

*Fax: +1 970 226 4946*

*Email: [dave.stewart@stewartenv.com](mailto:dave.stewart@stewartenv.com)*