



# CASE STUDY

## Rapid solution for Petrochemical Utilities to meet RCER Oil & Benzene requirements



**Customer:** SABIC Affiliate  
**Location:** Jubail Industrial City, KSA  
**Process:** Utilities Section ETP

### APPLICATION: Oil and Benzene Removal from Wastewater Stream at Combined Effluent Treatment Plant

#### OBJECTIVES OF THE TREATMENT

- Removal of oil and benzene from all wastewater streams coming to effluent treatment plant
- Enable the customer to meet the RCER 2010 specifications for final discharge of wastewater

#### KEY METRICS

Inlet conc.	Oil & Grease	Benzene
System Design	450ppm (avg) 2000ppm (peak)	50ppm (avg) 250ppm (peak)
Actual	137ppm (avg) 620ppm (peak)	368ppm (avg) 2018ppm (peak)

- Target effluent concentrations:
  - Oil & Grease: <120 ppm
  - Benzene: 0.056 ppm

**FLOW RATE:** 65 m<sup>3</sup>/hr

**CONTACT / REFERENCE:** Upon request

### MYCELX DELIVERED:

- Rapid deployment**
- Consistently met RCER standards for >3yrs**
- Robust system able to deal with upset conditions (7x Benzene loading)**
- 75% cost savings vs. haul off**
- Achieved without any additional capex**



## CHALLENGE

A petrochemical facility in Saudi Arabia produced dozens of specialty chemicals such as ethylene, propylene, polyethylene, polypropylene, and ethylene glycol. Each of these processes generates heavily contaminated waste water streams which are all sent to a single processing facility. This effluent treatment plant relied primarily on chemical treatment to remove contamination from the combined waste streams. Due to the constantly changing composition and unpredictable loading of the wastewater, the designed treatment process was unable to reliably discharge wastewater at the required Royal Commission Environmental Regulations (RCER) 2010 specifications or meet company wastewater discharge objectives.

The customer sought an immediate solution with the primary focus of removing oil and benzene which were known to periodically present extreme loading challenges. The solution needed to ensure there would not be any benzene vapor present and that benzene dissolved in the wastewater would be removed. After startup, MYCELX's robust system managed to continue to meet outlet specifications despite extreme benzene loading conditions far beyond the original design. This led to the customer integrating the MYCELX system as a key component of their water management system in order to meet the final discharge requirements and achieve company discharge goals.

## SOLUTION

MYCELX designed, engineered and delivered a multi-stage treatment solution using our patented technologies for an optimized solution. MYCELX was **able to rapidly deploy** this system within 2 months by incorporating our Mobile Treatment Plants.

The primary **MYCELX Advanced Coalescer** system removed bulk oil and recovered high purity slop oil and settled out large solids.

The **MYCELX Polisher system** removed any remaining free oils as well as dispersed oil, emulsified oil and fine solids. The Polisher also extended the life of the final stage of the treatment process – a non-regenerable media bed.

The **MYCELX media depth bed** acted as the tertiary stage, reducing levels of BTEX and soluble oils to critically low discharge requirements.

Daily analysis of outlet water samples by a third party lab was used to generate regular reports for the client. **Water characterization and engineering expertise** allowed MYCELX to troubleshoot unique upset conditions such as heavy benzene loading.

The customer consistently met RCER discharge specifications despite inlet benzene loading concentrations that were 7 times higher than design specifications. MYCELX's solution **required no additional capex**, was able to easily fit into the existing infrastructure and **eliminated costly vacuum trucks**.

## IMPACT

The MYCELX oil and benzene removal system ran continuously to significantly reduce contamination and manage intermittent upset conditions.

- **Continuous Operation for over 3 years** despite periodic upstream upset and 2 turnarounds
  - >1,000,000m<sup>3</sup> of wastewater treated
- **RCER 2010 requirements met:**  
MYCELX's consistent performance enabled the customer to meet RCER discharge requirements despite high and variable contamination
  - **Average inlet concentrations:**  
Oil and Grease: 137ppm  
Benzene: 368ppm
  - **Upset conditions:**  
Oil & Grease: 620ppm  
Benzene: 2,018ppm
- **Significant cost savings:**
  - Up to 75% cost savings vs traditional haul-off disposal
  - >\$20m cost savings per year
- **Eliminated the need for vacuum trucks**
  - Safety, Health and Environmental benefits of eliminating the need for vacuum trucks and providing an on-site solution
  - 300 vacuum trucks removed from site