SA Water Innovation (SAWI)
SORR Gyroid™ Oil Recovery System

Technical Briefing Document

This document provides an overview of the SORR Gyroid™ oil recovery boom technology and its application for marine, estuarine and inland water remediation. The system is designed to selectively capture hydrocarbons while repelling water, enabling recovery of pollutants and supporting a circular economy approach to environmental management.

1. Technology Overview

The SORR Gyroid™ boom contains engineered gyroid filtration media housed within a protective sleeve. When deployed in contaminated water, the gyroid material attracts hydrocarbons (oleophilic) while repelling water (hydrophobic). Oil is rapidly drawn into the internal lattice structure where it is retained until recovery.

Due to the high internal surface area of the gyroid structure, hydrocarbons are adsorbed efficiently while water is allowed to pass through the system.

2. Operational Process

1. The boom is placed into contaminated water.
2. Hydrocarbons migrate into the gyroid lattice structure.
3. Water is repelled and passes away from the filtration media.
4. The captured oil is retained within the structure.
5. Pressure can be applied to recover the hydrocarbons.
6. The boom can be redeployed multiple times.

3. Environmental and Circular Economy Benefits

The SORR Gyroid™ system is designed as a reusable oil recovery technology. Captured hydrocarbons can be recovered and reused rather than disposed of.

At the end of operational life, the gyroid material can be thermally processed into carbon black and combined with recycled plastics through Circular Seed processing systems. The resulting composite materials can be used in construction products, marine infrastructure and other durable applications.

This approach eliminates landfill and incineration pathways and supports a true circular economy model.

4. Laboratory Testing and Validation

Water and material analysis has been conducted by Sadekar Enviro Engineers Pvt Ltd, Goa, India.

Laboratory Certifications:

- Recognised under the Environment (Protection) Act, 1986 – Ministry of Environment, Forest and Climate Change (MoEFCC), Government of India
- ISO 9001:2015 – Quality Management Systems
- ISO 45001:2018 – Occupational Health and Safety Management Systems

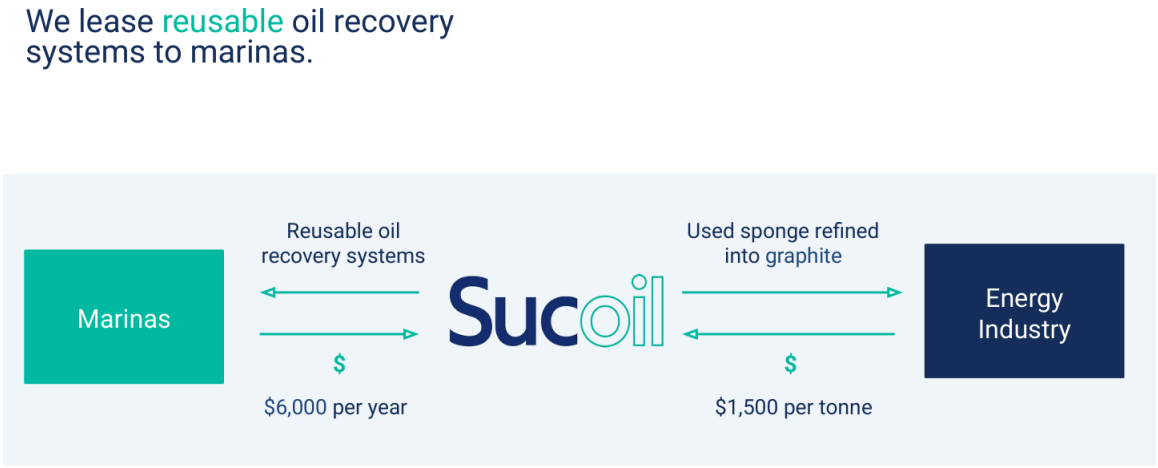
Report dates: 15–17 October 2024

Testing included chemical and microbiological analysis of impacted surface waters and comparative heavy metal analysis of unused and used gyroid sponge material.

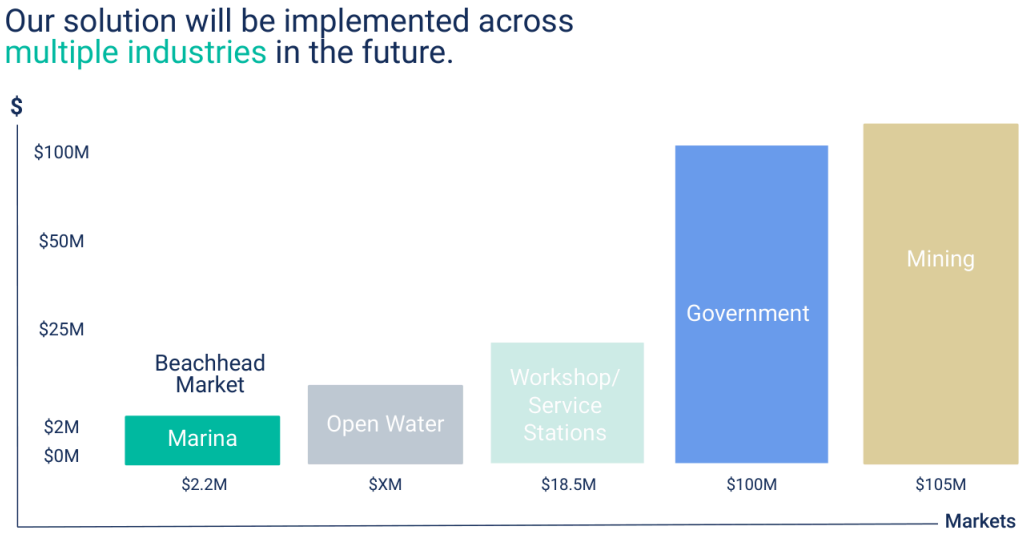
5. Visual Demonstration References

Reference Image – Demonstration Concept (Page 1)

Reference Image – Demonstration Concept (Page 2)

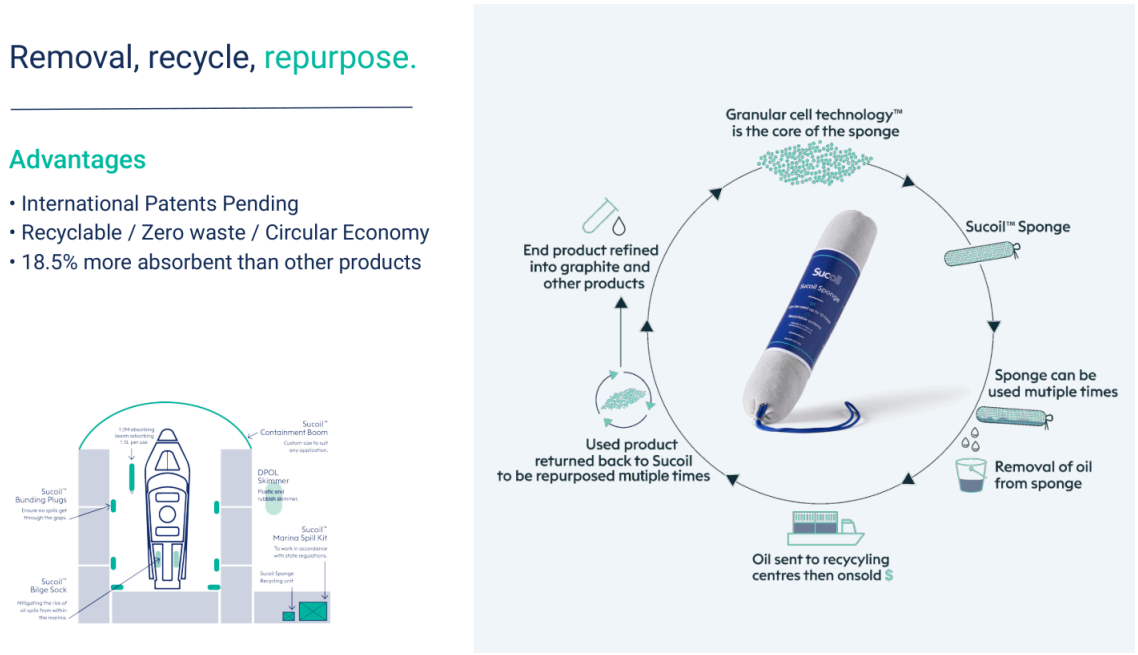


Reference Image – Demonstration Concept (Page 3)



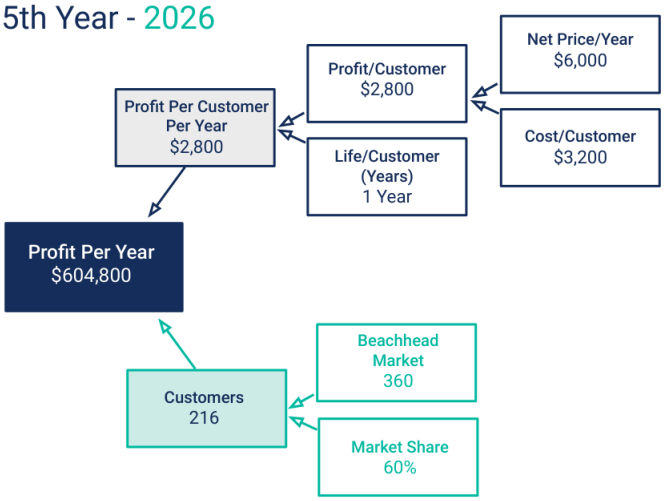
Reference Image – Demonstration Concept (Page 4)

Reference Image – Demonstration Concept (Page 5)



Reference Image – Demonstration Concept (Page 6)

Service Financials
5th Year - 2026



Key Drivers

- Material costs reduce after each use
- Limited customer base
- Unpredictability of oil spills