

Success Story

ONE INTEGRATED PLATFORM. ZERO DISCHARGE. INDIA'S FIRST SEMICONDUCTOR FAB

Gradiant delivered end-to-end water and wastewater as one accountable platform, enabling India's first semiconductor fab in one of its most water-stressed region.

The Challenge

India's flagship semiconductor initiative is anchored by one of the world's largest U.S. chip manufacturers, whose first fab spans 1 million square feet in Gujarat, one of India's most water-stressed regions.

Semiconductor manufacturing demands massive ultrapure water volumes with zero tolerance for quality deviations or downtime, against a site with limited freshwater, aggressive sustainability targets, and a strict Zero Liquid Discharge mandate from day one.

Ultrapure water production, complex wastewater streams, and unforgiving uptime requirements made this a high-risk profile where one misstep could stall fab operations. Gradiant was selected to de-risk the infrastructure and enable India's semiconductor ambitions at scale.

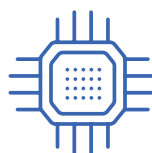
The Solution

One Accountable Water Platform for Semiconductors

Gradiant integrated ultrapure water (UPW) production, high-recovery wastewater recycling, and Zero Liquid Discharge (ZLD) under one accountable partner.

The UPW system combines solids removal, RO, IX, UV, EDI, and ultrafiltration with tightly controlled recirculation, delivering fab-grade water at scale.

For wastewater, Gradiant built a high-recovery treatment train for variable, silica-rich effluent — Selective Contaminant Extraction, UF, Semi-Batch RO,



Semiconductors



India

Fast Facts

Location	Gujarat, India
End-User	Leading U.S. Semiconductor Manufacturer
Solution	Zero Liquid Discharge, Wastewater Recycling, Ultrapure Water
Industry	Semiconductors
Feedwater Source	River Water
Technology	Semi-Batch RO, CFRO, Selective Contaminant Extraction, SmartOps
System Capacity	4,000 m ³ /day
System Recovery	96%
Online Date	March 2026
Delivery Model	Design-Build-Operate

4,000
m³/d
UPW
production



98%
Reduction
in Disposal
Volumes

96%
Water Recovery



ZERO
Liquid
Discharge

**Lower
CAPEX
& OPEX**



vs. Conventional Solutions

CFRO, and SmartOps AI — maximizing recovery through rapid ramp-up. CGE crystallization then delivers Zero Liquid Discharge, cutting disposal volumes by more than 98%, leaving only solid salts.

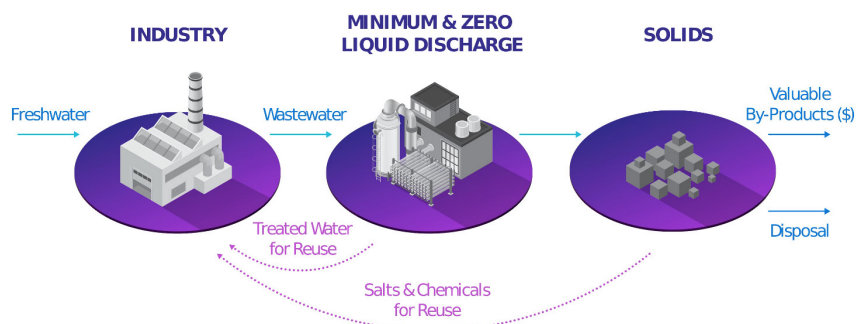
Built on proven semiconductor references across the U.S., Taiwan, Singapore, and Japan, and optimized for India's first fab.

The Benefits

Gradiant delivered 4,000 m³/day of ultrapure water, keeping fab production running in one of India's most water-stressed regions.

The integrated platform achieves Zero Liquid Discharge, 96% water recovery, and a 98% cut in disposal volume, reducing freshwater demand, CAPEX, OPEX, and energy intensity.

The project sets the blueprint for the next wave of semiconductor fabs across India and other water-constrained regions.



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