



MBD[™] Modular Brine Crystallization System

HPD[®] Evaporation and Crystallization

WATER TECHNOLOGIES

Thermal, Modular Wastewater Treatment System

Evaporation is an effective and reliable method to treat wastewaters that contain relatively high concentrations of total dissolved solids (TDS).

Veolia Water Technologies offers the **MBD™ (Modular Bulldozer Design) System** as an ideal solution that not only effectively treats high TDS wastewater, but also manages the subsequent mixed salts. Utilizing Veolia's HPD® thermal evaporation technology, it is a proven and cost-effective solution to the high cost and long-term liabilities associated with multiple ponds or deepwell injection.

System Description

The system is based on HPD® Forced Circulation Crystallization technology to treat a variety of waste streams followed by management of waste brines for disposal (as a concentrated or solid waste brine).

This “Bulldozer” system is supplied as a modular, skidded system and designed to treat feed from RO reject, ponds, or untreated brines without complex pretreatment:

- Capacity: 13.5 m³/h (70 gpm)
- High-efficiency, Mechanical Vapor Recompression (MVR) driven
- Process designed to resist scaling
- Materials of construction minimizes corrosion
- Used for volume reduction or Zero Liquid Discharge (ZLD)

Benefits & Features

Environmental Performance

- Water recovery up to 99%
- High-purity recovered water suitable for reuse, discharge, or aquifer reinjection
- Produces solid salt cake suitable for landfill disposal (ZLD option)
- Minimal chemical consumption

Modular Design

- Rapid deployment to site
- Supplied as (3) skids; can be redeployed
- Shippable by standard, over-the-road transport
- Small footprint

Mixed Salt Management (ZLD option)

- Centrifuge or filter press
- Supplied as skidded package

Applications



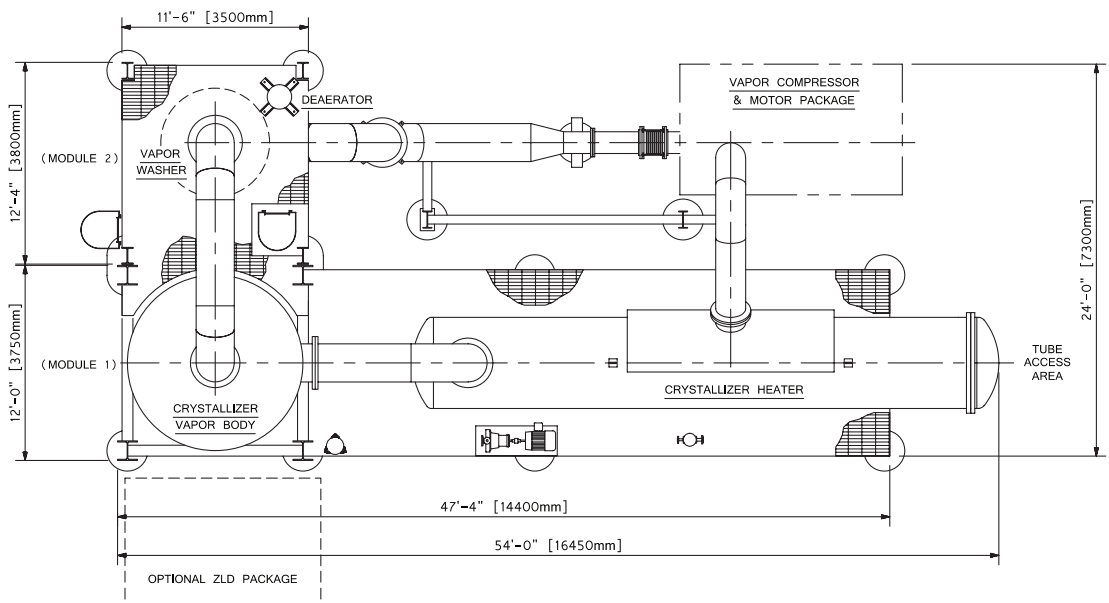
Pond volume reduction

Evaporator blowdown treatment

Pilot well testing

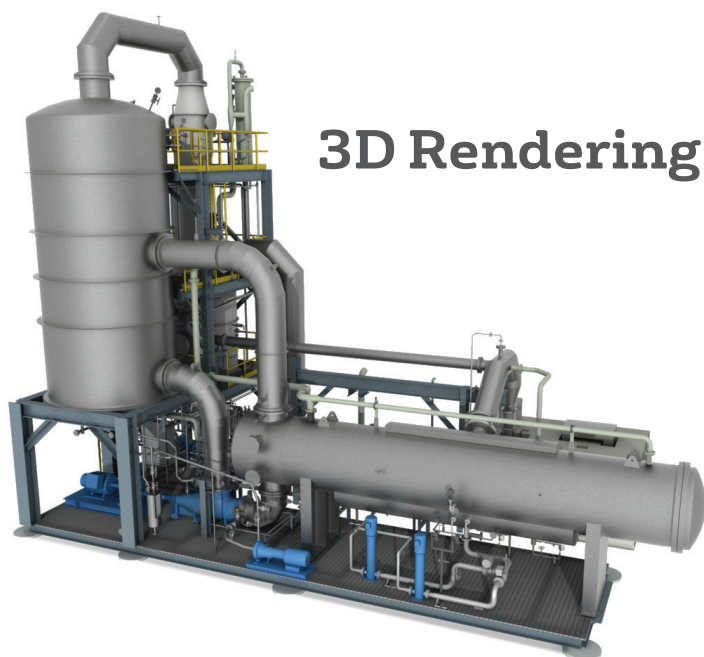
Zero Liquid Waste (ZLW) requirements

General Arrangement



A red Mack truck is shown from the front, pulling a large, horizontal, cylindrical industrial tank. The tank is metallic and has several circular access points. The truck is a Mack model, with the name 'Mack' visible on the side of the hood. The background is a clear blue sky.

Ancillary Equipment Included
Pumps • Platforms and decking
Instrumentation, control panels • Insulation
Valving • Electrical, wiring
Piping • Motor starters (option)



Simplified Flow Diagram

This diagram illustrates the process flow for a crystallization system. The main components and their functions are as follows:

- DEAERATOR:** Removes air from the feed stream.
- STRAINER:** Filters the feed to remove any solids.
- ANTISCALE PUMP:** Adds antiscalant to the feed to prevent scaling.
- PREHEATER:** Preheats the feed before it enters the crystallizer.
- COMPRESSOR:** Compresses the vapor from the vapor washer.
- VAPOR WASHER:** Removes entrained liquid from the vapor stream.
- VAPOR WASHER PUMP:** Pumps the liquid from the vapor washer to the crystallizer.
- SLURRY PUMP:** Pumps the slurry from the crystallizer to the recirculation pump.
- RECIRCULATION PUMP:** Circulates the slurry back to the crystallizer.
- CRYSTALLIZER VAPOR BODY:** The main vessel where crystallization occurs.
- CRYSTALLIZER HEATER:** Heats the crystallizer to maintain the desired temperature.
- DISTILLATE PUMP:** Pumps the distillate from the crystallizer to the distillate tank.
- ANTIFOAM PUMP:** Adds antifoam to the distillate stream.
- VENT:** Releases the vapor from the crystallizer.

The flow is color-coded to show different streams:

- Red:** Feed stream, including antiscalant and preheated feed.
- Blue:** Vapor stream, including vapor from the washer and the crystallizer.
- Green:** Slurry stream, including the slurry from the crystallizer and the recirculation loop.
- Grey:** Distillate stream, including the distillate from the crystallizer and the antifoam addition.

Resourcing the world

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