



Water Solutions for Downstream Oil & Gas

WATER TECHNOLOGIES

Solutions that ensure your productivity

Veolia Water Technologies is dedicated to serving the oil and gas industry globally. With a wide array of processes, the hydrocarbon processing industry is facing major challenges for economies of scale, constant productivity optimization, and safety and environmental constraints.

Water is a major component in all phases of the hydrocarbon processing industry

Refining activities require the best guarantees and experience for their water needs. Refineries require safety of plant operations, productive installations, and proper environmental compliance.

Veolia Water Technologies' capabilities cover all types of activities to fulfill the uppermost requirements of your water cycle

Oil refineries, the petrochemical industry, and chemical processing industry have extensive water and wastewater needs. Operators seek cost and operational efficiency, while providing better environmental stewardship. Veolia also works with other downstream customers for their water cycle requirements.

- Natural gas processing plants
- Liquefied Natural Gas (LNG)
- Gas-To-Liquids (GTL)
- Coal (PetCoke)- To-Liquids (CTL)
- Biomass-To-Liquids (BTL)



Secure, safe and reliable water supply

The hydrocarbon processing industry is particularly water demanding. Nearly all process steps require water in various forms, and processes require a reliable water supply. This can provide desalter washwater, boiler feed water for steam production, cooling tower makeup, process water, or utility water for domestic needs.



Wastewater Treatment

Most processes generate wastewater that must be treated prior to discharge and/or reuse

- Desalter wastewater
- Sour water from stripper
- Oily wastewater from tank draws
- Spent caustics
- Boiler and cooling tower blowdown
- Condensates
- Site run-off

Many pollutants must be removed to ensure full compliance and appropriate quality. These pollutants are mostly oils and hydrocarbons, hydrogen sulfide, ammonia, phenols, COD, BOD, mercury, selenium, cyanides and chlorides.



Demineralized water

- Membranes: ultra-filtration (UF), microfiltration (MF), nano-filtration (NF), Reverse Osmosis (RO), Electrodeionization (EDI)
- Ion exchange
- Deaerators
- Condensate polishing
- Water treatment chemicals

Sludge and by-products

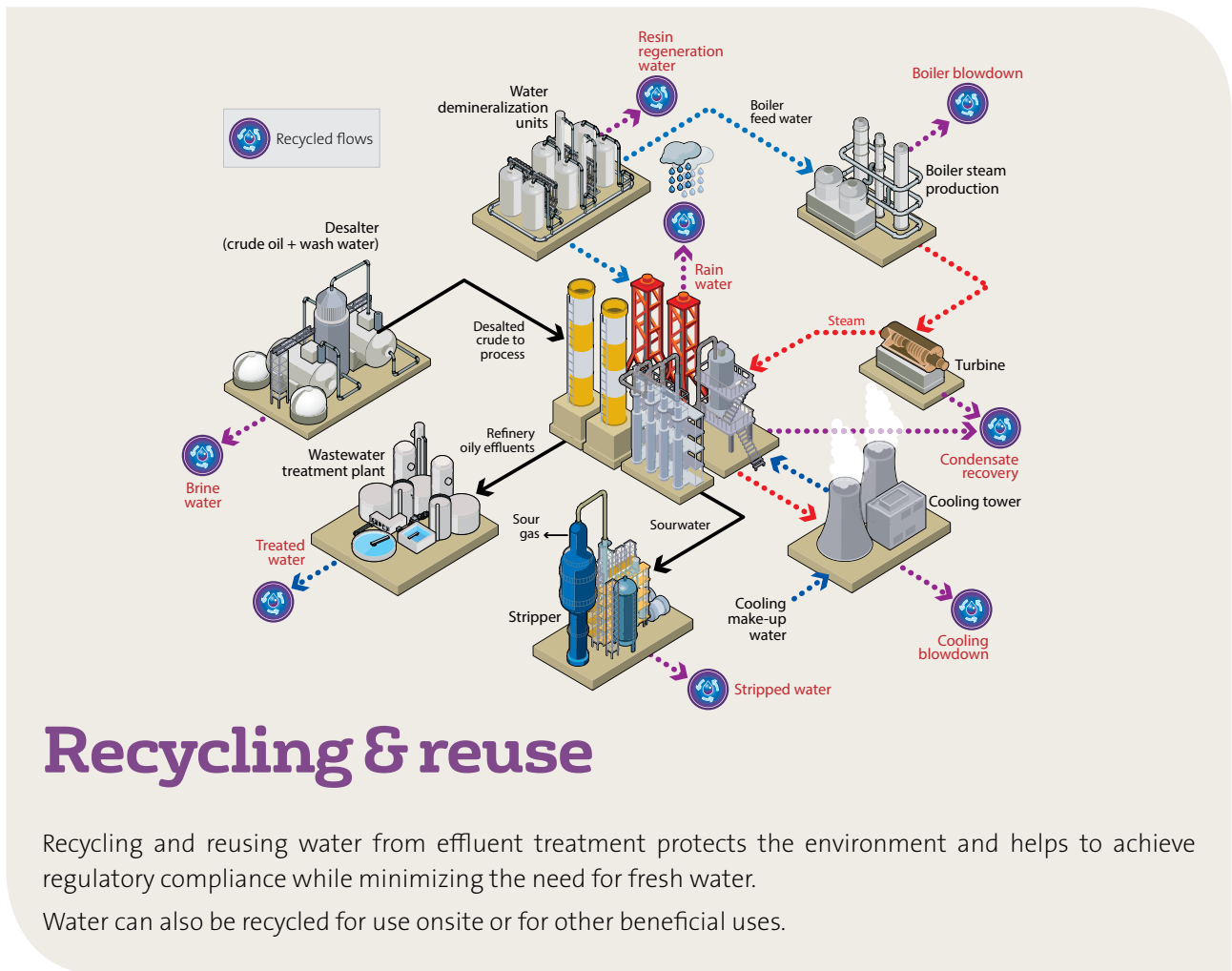


Veolia Water Technologies' approach to sludge and oily sludge treatment – from slop oil tanks, flotators, and biological treatment – focuses on opportunities for energy and product recovery:

- Sludge dewatering
- Triphasic centrifugation for oil recovery
- Thermal desorption to declassify
- Thermal drying before solids injection to coker
- Incineration allowing heat recovery and ash recovery
- Fluidized bed incinerator
- Produces stable and recyclable by-products
- Compliance with stricter emission standards
- Allows energy and by-products recovery

Proven solutions for sustainable water management

Veolia's unique portfolio of oil and gas technologies provides solutions to specific problems, as well as complete wastewater treatment plants for the global industrial water cycle. Solutions include primary or secondary oil/water separation, biological treatment, clarification, Zero liquid discharge, and Recycling and Reuse for Cooling Towers/Boiler Feed.



Dedicated experts at your service

Our experts will be at your plant, observe, and consult with you on your wastewater needs. Veolia will test effluent, and perform expert studies on your specific plant. We can also do pilots or lab testing and find a standard turnkey solution to meet your requirements. Our experts perform comprehensive audits and analysis to determine water treatment needs. We have dedicated local teams all over North America to provide service.

Specialized expertise

- Effluent characterization
- Engineering, procurement, start-up, commissioning, training
- Boiler and cooling water treatment programs
- System and component upgrades

A full range of industrial services and solutions

Operation of industrial wastewater plants

Veolia offers many services and solutions. Our services help reduce costs, provide better environmental compliance, and improve operational efficiency.

Water treatment chemicals: Hydrex™

Improve the performance and safety of your facilities with the Hydrex range of water treatment chemicals. The Hydrex water treatment chemical line includes both organic and inorganic chemicals formulated to meet the individual specifications of wastewater treatment plants.

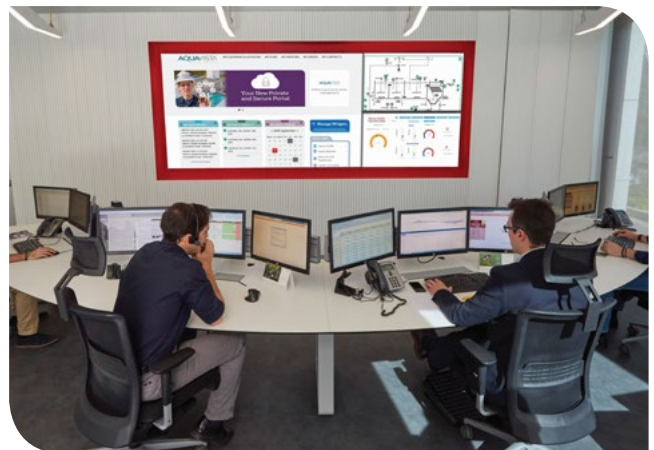
Veolia offers a full-suite of production chemicals. Our service includes technical support, on-site monitoring, plus our customers see user benefits such as performance improvement, corrosion prevention, and rapid response mobile units which can respond to production issues.



Digital, smarter water solutions with AQUAVISTA™

This new digital services platform for water treatment systems provides your plant personnel with a tool to efficiently manage plants and water treatment equipment. Real-time data is customized, aggregated and always available through a suite of intelligent water process applications and algorithms.

This secure 24/7 cloud-based digital service reduces operating costs, improves performance, and simplifies plant management. It will decrease energy and chemical consumption, increase hydraulic and biological capacity, all while a network of Veolia's water experts stand ready to troubleshoot any problems.





Project management from a single partner

With more than 500 completed projects and decades of experience in the oil and gas industry, Veolia is your key partner for developing and implementing the most reliable water treatment systems. We provide an extensive range of technologies and services adapted to the oil and gas industry's requirements.

DB(O) Partnerships enable Veolia to provide for the design, construction and operation of a project and can dramatically save money, reduce time and provide stringer guarantees.

Your concerns are our concerns

Veolia is committed to offering advanced solutions through secure, cost-effective and lasting water treatment technologies to meet your expectations. We offer an intelligent combination of 350+ proven and safe technologies, providing quality water for all types of needs.

Proven Technologies for Downstream Oil & Gas



Deoiling CPI and IGF

- Oil and solids gravity separation of water from oily effluent treatment
- Standard designs for quick delivery
- Compact process for space saving



ANOXKALDNES™ MBBR

- Pretreatment of overloaded activated sludge
- Suitable for high BOD/COD wastewaters
- Nitrification, Denitrification
- Handles thermophilic conditions



Immersed Membrane Bioreactor - MBR

- Compact design and environmentally safe
- Reliable biological treatment
- High treated effluent quality



Actiflo™ / Multiflo™

High rate technology settlers to minimize space and optimize layout. Suitable for many types of raw water and wastewater treatment and reuse applications. Applicable to TSS separation, metals removal, softening and reuse.



Disc Filter

- High performing compact filters
- Low TSS value at outlet
 - Continuous operation minimizing water loss
 - Application for effluent reuse as process water



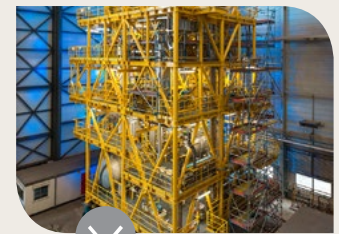
Flotation

- Removal of free oil through dissolved gas flotation, induced gas flotation or highly compact flotation design per O&G specifications
- Offered with high safety standards and features to treat VOC



Anaerobic Biothane Petrochemical PTA Plant

Suitable for high COD load, minimizing sludge production in pretreatment and saving energy. Application for numerous chemical effluents.



MPPE

Removal and recovery of dissolved and dispersed hydrocarbons from produced water (BTEX, PAH, etc.). Onshore, offshore, and FLNG. Containerized or skid-mounted.



Reverse Osmosis

- Treatment of any kind of process water from sea water, raw water, effluent for reuse, or cooling tower blowdown.
- High recovery ratio up to 90% (function of application)
 - From mobile units to full size plants



Demineralizer

Mixed bed, ion exchanges for facilities from mobile unit to full size plant. Applications range from cooling to HP boilers feed.



Zero Liquid Discharge (ZLD)

Evaporation and Crystallization solutions minimize waste and recycle effluent with no aqueous discharge to the environment.



Media Filtration

High performance filters using sand or nutshell medias for fine particles removal per O&G specifications. High quality filtrate offers great reuse opportunities.

Resourcing the world

Veolia Water Technologies
Tel +1-800-337-0777
water.info@veolia.com
www.veoliawatertech.com