



# Produced Water Management

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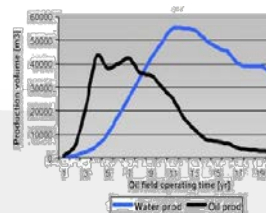
### What Is Produced Water?

Extraction of oil and gas from underground reservoirs often is accompanied by water or brine, which is referred to as Produced Water.

Over the past years, the growth of oil and gas production has resulted in the emergence of a new challenge in water management – namely, the disposal / treatment of Produced Water.

### The Big Challenge :

Produced water is the largest waste stream from oil and natural gas production. The amount of produced water, and the contaminants and their concentrations present in produced water usually vary significantly over the lifetime of a field. Early on, the water generation rate can be a very small fraction of the oil production rate, but it can increase with time to tens of times the rate of oil produced.



Large volume generated annually with high salinity of produced water could pose severe environmental impacts upon inadequate disposal. As a result, stringent environmental regulations require extensive treatment of produced water from oil and gas productions before discharge.

The quantity of water climbs and often exceeds the volume of the hydrocarbons in which safe disposal of such large amounts considered a big challenge for oil and gas decision makers.

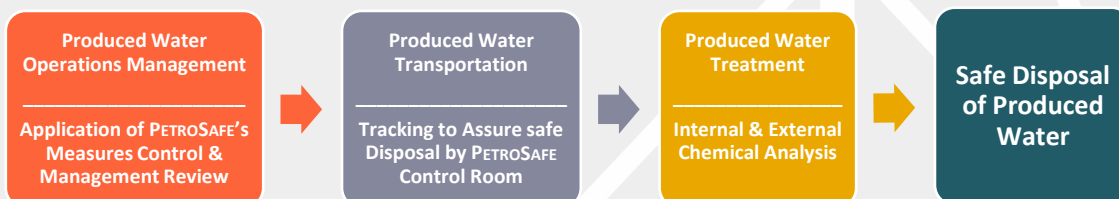
### Why PETROSAFE ?

If you are uncertain about how to deal with Produced Water in your industry or working in an oil and gas sector company and need technical support, PETROSAFE is there for you – ready to serve.

PETROSAFE as a unique company in the Egyptian Oil Sector specialized in Occupational Health, Safety and Environmental Protection services since it was established in 1996.

PETROSAFE is currently managing / handling in average more than 27,000 trip per year, transporting about 1,350,000 M3/year of produced wastewater through currently running projects.

### Steps of Safe Disposal of Produced Water :



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## Key Projects

- Mansoura Petroleum Company.
- Disouq Petroleum Company.
- Wastani Petroleum Company.
- Burullus Gas Company.

## PETROSAFE services include the following:



### 1. Produced Water Operations Management

PETROSAFE adopted a strategy for handling produced water to assure environmentally safe disposal and implementing the required services in a safely manner accordingly with the regulations and laws.

PETROSAFE applied its QHSE policy and procedures and enforced several control measures for transportation operations and treatment process.

PETROSAFE supervisors periodically conducted safety awareness and a pre job safety meeting for drivers to improvement their performance.

### 2. Produced Water Transportation

The assigned fleet for transportation produced water from oil & gas fields to final safe disposal treatment plants is subjected to several measures of control such as trucks safety & technical inspection procedures, journey management plan, installing volume level indicators to all trucks, installing static charge for all trucks, Preventive Planned Maintenance (PPM) and emergency transportation plan.

Safety and technical inspection for operational trucks is one of most significant rule to PETROSAFE supervisor in which implemented each time before entrance and loading allowance.



#### • Tracking of Transportation Fleet:

PETROSAFE tracks and monitors all transportation trucks through a specialized control room inside PETROSAFE building using GPS technique to track and emphasize the safe disposal of produced water.



### 3. Produced Water Treatment Process

Produced water resulting from oil and gas production operations, and various industrial activities contain a high amount of pollutants that cannot be discharged directly to the water body (fresh or marine) and public sewage systems so it's mandatory to treatment produced water according to Environmental standards & regulations and laws before final disposal .

#### • Produced Water Analysis:

The wastewater treatment plant was provided with a high technical lab. for testing the chemical and physical analysis for raw water and treated water to help in processing and make more controlling for reaching high quality treatment of raw water after removing all the pollutants.

Analysis produced water after treatment to assure compliance with regulations and laws.



### 4. Safe Disposal of Produced Water

After treatment process , the final product of treated water will be complying with EEAA requirements & environmental laws/regulations and could be safely disposal.



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# PETROSAFE

Petroleum Safety & Environmental Services Co.



# DLS

Dry Location System

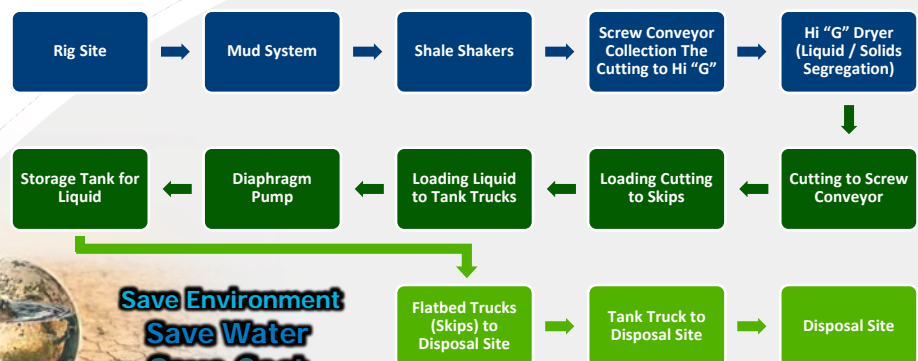
## DLS

### Dry Location System



One of the major operations in oil and gas industry that can potentially impact the environment is drilling. The process of drilling oil and gas wells generates a variety of different types of wastes. A major component of the wastes generated are solid cuttings and liquid drilling mud. The separation of solid cuttings from liquid drilling mud is known as "Drilling Waste Management". Once solid and liquid drilling wastes have been separated, can then implement wide range of practices and technologies to manage the waste. If you are looking for a solution that decreases the disposal volumes, allows increased recovery and reuses drilling fluids with respect to reducing the environmental impact of the drilling process ... PETROSAFE is the right place. PETROSAFE will provide the Dry Location Service (DLS) which eliminates the waste pit and reduces the drilling fluid in cuttings by 30%. The Dry Location is divided into Solid and Liquid Stream.

### Dry Location System Flow Chart



**Save Environment**  
**Save Water**  
**Save Cost**  
**Save Earth**

### Environmental Services

#### Waste Management

PETROSAFE offers a full range drilling waste management equipment for:

1. Strong and effective Solids control system.
2. Cuttings containment handling, recycling and recovery as much as possible of waste for re-use.
3. Treatment and disposal of contaminated drill cutting and drilling fluid.
4. Engineering services for drilling waste management designs for mud tank systems and liquid mud plant design.







### Dry Location System (DLS) :

- Reduction in Waste handling, Transporting & Logistics Cost.
- Reduction in Storage Space Cost.
- Reduction in Mud Cost.
- Reduction in Treatment Cost.

### Same time

- Saving of shallow water aquifer.
- Saving of natural resources due to re-use of material.
- Managing the various types of waste generated.
- Guaranty for Healthy Work Environment.

### Project target and achievement:

1. Zero discharge of drilling waste at Rig site. (drill cuttings OBM & WBM, drilling fluids, test fluids, mud tank cleaning, cements, cellars,.....etc.).
2. Zero environmental impact on the drilling site.
3. Zero downtime to the dry location system.
4. Zero Lost-Time Incidents (LTI).
5. Eliminate the use of waste pit which reflects cut on the footprint of the rig site up to 20%.
6. Minimize the volume of the generated waste. (by segregating the waste into Liquid and solids).
7. Mud recovery 30-50% of received active mud to the active mud system which reflects cost reduction of the mud bill.
8. Safe transfer and disposal of dry cuttings to the waste area using skips.
9. Safe transfer and disposal of waste fluid to the treatment area using tank truck.



before

after



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