

# LIQUID EFFLUENTS



## OCP INDUSTRIAL LIQUID EFFLUENTS

Industrial liquid effluent is defined as any liquid discharge resulting from an industrial process (including the liquid leaving an effluent treatment station), which is then discharged into a natural receiving environment in the public domain. It is something that OCP is working very hard to mitigate.

Only OCP industrial sites located on the maritime coast (Safi, Jorf Lasfar and Laâyoune) which are concerned by this type of effluent discharged into the Atlantic Ocean. The other sites (Khouribga & Gantour) do not have industrial liquid effluents.

OCP's industrial liquid effluents mainly consist of:

- Cooling seawater
- Sea water for phosphogypsum removal
- Water from the phosphate laundromat (only in Laâyoune)

## WATER IS A RARE MATERIAL TO BE PRESERVED

As part of OCP's «WATER PROGRAM» a target has been set for 2030 to achieve a 100% utilization rate in water processed from unconventional sources (based mainly on the desalination of seawater and the reuse of water coming from WWTPs (Sewage Treatment Plant)). OCP has also set itself the goal of major recycling and optimization programs for freshwater consumption that are already systematically implemented ; here are some examples of the achievements so far :

- The muddy waters of the laundries in Khouribga and Gantour are stored in spreading dikes in order to recycle these waters after the decantation process, thus ensuring the recycling rate exceeds 80%
- Zero liquid effluent in the fertilizer production units
- Recycling of washing water from atmospheric emissions treatment when the washing operation is done with fresh water.

## PILOTAGE AND CONTROL OF THE ENVIRONMENTAL IMPACT OF LIQUID EFFLUENTS

- Systematic monitoring of effluent quality (by internal resources and a third party)
- All internal laboratories for measuring liquid effluents are accredited, according to the international standard ISO 17025
- All chemical stocks have retention basins for collection and recycling in the event of an accidental spill
- Observation and monitoring by third parties are periodically carried out to characterize the quality of the receiving environments (such as : sea - groundwater)



- Environmental assessment studies of the impact on flora and fauna are also periodically carried out by specialized, leading international organizations expert in this area.
- There is a continuous process of initiating and implementing actions to improve environmental performance, especially: EMS certified ISO14001, version 2015, as well as numerous environmental assessment studies that are regularly carried out.
- Another major improvement at the Jorf Lasfar site, is the development of submarine outfalls fitted with diffusers, at their downstream ends, which allows for a better dispersion of liquid effluents resulting in a very significant reduction of the impact plume.

These emissaries are a world first in terms of design in how the treated effluent is transported, prior to its release. A unique pipeline, comprising a hydrolic system that allows for a management of the levels of dilution; with a length of up to approximately 3 km, they were produced in partnership with leading international specialists in the marine field.

This project, which cost around 1.2 billion dirhams, made it possible to obtain seawater quality around the emissary in accordance with recognized standards.

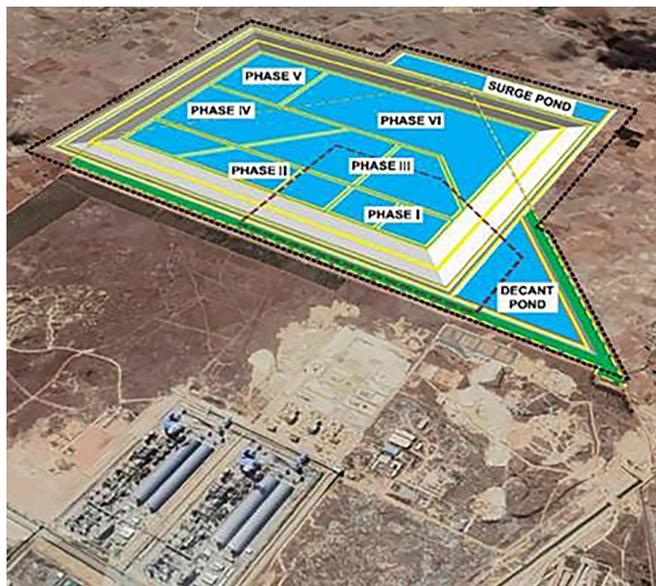


## VISION & OBJECTIVES OCP

OCP's vision for managing emissions and liquid effluents will be determined by "Best-in-Class" methods, adopting the most advanced and available environmental practices.

In terms of liquid effluent management, OCP has set itself the following objectives:

- **100%** compliance in its dispersion of liquid effluents as outlined by national and international regulations (IFC-WB for discharges and WHO for the quality of natural environments)
- The gradual withdrawal of any phosphogypsum (PG) spill into the marine environment towards heap disposal (storage), with a view to developing PG as a co-product. The first onshore storage will come into effect by **2023** for two integrated industrial units at the Jorf Lasfar site ; this will lead to the equivalent of around 15% of the site's production in PG (12.5% of OCP's global remit). The process of storage for 33% of the PG produced at Safi should also start in **2023**.



- Enhanced monitoring of the impact on the marine environment by setting up online measurement means, continuous dispersion supervision models, forecasting systems according to sea conditions and periodic studies of environmental assessment, based on a field diagnosis.
- The objective, by 2028, is to reach Zero effluents coming from any form of freshwater. This target has already been reached at mining sites due to the early adoption of water consumption optimization programs across all OCP locations.

## WAYS OF RECOVERING PHOSPHOGYPSUM (PG):

### EXAMPLES OF PROJECTS

#### 1- Reuse of the PG in road construction (underlayment of roads)

This is a very promising recovery way, especially for roads not far from PG production areas (because of the cost of transport). OCP is already at an advanced stage in testing process on sections of pilot roads.



#### 2- Valuation of PG in Agriculture (amendment and fertilizer)

This very promising recovery path also, in particular for saline soils, is being tested on different types of soils and crops in partnership with INRA (National Institute for Agronomic Research) and the UM6P University of Benguerir.



### 3- Promotion of PG in red bricks and agglos

A research and development mission for the recovery of PG in bricks and agglos is launched by OCP in partnership with the Public Laboratory for Tests and Studies (LPEE).



### 4- Thermal decomposition of PG and simultaneous production of sulfur and clinker

PG is only  $\text{CaSO}_4$  (Calcium Sulfates) hydrated. Its thermal decomposition into  $\text{CaO}$  and  $\text{SO}_2$  will produce Clinker and recyclable sulfuric acid in OCP's industrial activity.

### 5- Recovery of PG in Cement (by adding additives to delay the hardening in the cement)

PG can also be a raw material for the cement industry as a retarder for setting cement. Tests are on the pipe with industrialists in the field.