

### SCOPE

Substrates: sand, stones  
Pollution: moderate to very heavy  
Pollutant: all types  
Sea: with or without tides



### EQUIPMENT NEEDED

#### Basic equipment:

- Washing plant
- Feed hopper and conveyor belt, crane
- Boiler (1 t/h, heat exchanger)
- Generator (150 kVA)
- Agents (solvents, flocculants)
- Settling tanks

#### Extra equipment:

- Loader, tractor + trailers
- Skimming equipment
- Land-based logistical equipment: deployment of materials /sediment and waste management

### DESCRIPTION/PRINCIPLE

This datasheet is based on the plant at the Polmar stockpile in Brest.  
 The sediments are supplied to the plant using a hopper and a conveyor belt. They are washed in hot water inside a sludge trap (after impregnation with solvent and blending inside the trap) for 12 to 18 minutes for sand and 3 minutes for stones. When the sediments are removed from the sludge trap, they are then rinsed on a rotary screen, which sorts them: oversized elements (> 5mm) are removed. The rest is pumped into a hydrocyclone, where separation is carried out (water/hydrocarbons/solids) by centrifugation and gravity, so that sediments >200µm can be removed. The remaining mixture (water/oil/fine solid particles) is sent to settling tanks where the floating oil is skimmed off.

### CONDITIONS OF USE

Pollution: all types of, preferably fresh or little weathered, oil; polluted up to approximately 100g/kg.  
Substrate: stones and sand.  
Site: on the back beach, can imply quite a vast open area due to the amount of space the system requires.

### IMPACT ON THE ENVIRONMENT

Physical: (due to removal of sediments) slight temporary risk of erosion (during washing operations) in the event of a storm: assess this risk.  
Biological: possible risk connected to the residual presence of pollutant and products (rapid recolonisation after operations if sediment is well rinsed and returned to its original location) or the destruction of vegetation on stones at the top of the shingle bar.

### PERFORMANCE

Yield: sand 15m<sup>3</sup>/h; stones 20m<sup>3</sup>/h with variable pollutant content from 20 to 100 g/kg.  
Efficiency of washing: oil content > 1g/kg  
Waste: skimmed oil, soiled fine sediment, washing effluents.

### OBSERVATIONS

- Dosage of cleaning agent: sand: 500l/h; stones 60 to 100 l/h (agent to pollutant ration between 20 and 50% in weight).
- Extremely heavily polluted sediments should be washed beforehand in a wire mesh tank for instance.
- Operate a tight flow (to reduce the risk of erosion in the event of a storm due to excessive sedimentary deficit).
- Washed sediments should be returned to their original location as quickly as possible.
- Implementation of this technique implies a large volume of polluted stones on the one site; otherwise, another solution is preferable.
- Do not wash stones from very crumbly shale rocks.
- Provide anti-noise helmets.
- Requires a relatively large open space.