

Case Study: Beneficial Use of Sediments

Project	<i>Use in Civil and Environmental Applications</i>
Classification	<i>R1A_2017_IT</i>
Major Function	<i>Raw Material</i>
Other Function	<i>Remediation</i>
Location	<i>Palermo, Italy</i>
Volume	<i>76,000 m³</i>
Technique	<i>Multiple phase cleaning and sorting process</i>
Contaminants	<i>Mainly contaminated by hydrocarbons C>12</i>
Granulometry	<i>Sand/gravel with 15% silt and clay, mixed with waste and organic matter</i>
Scale	<i>Full scale</i>
Client	<i>Palermo Port Authority</i>
Executor	<i>Trevi Spa</i>
Research programme	<i>N/A</i>
Contact	<i>Giovanni Preda, Trevi Spa gpreda@trevispa.com, ☎ +39 0547319579</i>
Year start–end	<i>2015–2017</i>

Description of the project

At the end of the 1980s, the Palermo Port Authority started a dry dock construction, however, works were stopped due to a dispute with the subcontractor. When, at the beginning of the 2000s, the Port started to plan the completion of the work, it was necessary to dredge approximately 76,000 m³ of sediment (mainly sand contaminated by hydrocarbons C>12, heavy metals, and mixed waste, mostly conveyed by two sewage pipes).

Trevi Spa designed a waste washing treatment known as “Sediment Washing”. The Trevi plant had five technological treatment units, which in simple terms, function as follows:

- Unit A: receives and sorts the waste and conveys it to the plant;
- Unit B: washes the sediment in a drum washing barrel and sorts by wet sieving;
- Unit C: applies a chemical-physical treatment to coagulate and flocculate suspended solids and separate the water borne contaminants;

- Unit D: collects, compacts, and dehydrates the contaminated fine sediment to minimise the costs for final disposal;
- Unit E: conditions the waste slurry with acid to adjust the pH value and also removes dissolved pollutants.

This technology, if properly applied, reduces the amount of waste to be recycled/disposed of in external plants; for that reason, it can be considered environmentally sustainable and in compliance with waste management regulations.

The plant has a variable output, mainly according to the granulometry of the waste, however, once the works were finished, approximately 111,000 tons of waste were treated, recovering 41,400 tons of sand and 15,200 tons of gravel, while 25,400 tons of contaminated fine fraction was disposed of in an external plant.

Graphical information

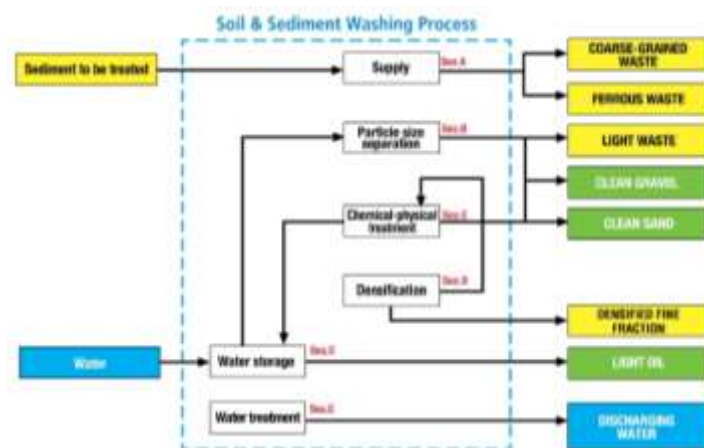


Figure 1. Soil & sediment washing process



Figure 2. Treatment of contaminated sediment—main output



Figure 3. The plant during the night shift

References/Web links

1. Envisan.com. (2019). *Dragage environnemental et traitement des sédiments | Envisan.* [online] Available at: <http://www.envisan.com/fr/activites/travaux-environnementaux/traitement-des-sediments-et-dragage-environnemental> [Accessed 30 May 2019].