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GEOTECHNICAL SOLUTIONS

Cleaning sedimentation ponds at the Og (Nabbi Mussa) WWTP

Case Study

- **Client** – Mekorot Development and Enterprise Ltd.
- **Execution** – Admir Environment Ltd., 2016

Background:

The Nabbi Mussa WWTP is operated by the Mekorot-Minrav partnership, and was built to receive wastewater from the eastern part of Jerusalem.

The biological processes in the facility create a sludge buildup on the bottom of the sedimentation ponds. Since the facility's launch in March of 2014, about 30,000m³ of sludge had built up in the WWTP's two sedimentation ponds. The average solid concentration tested for the sludge was ~7%.

It was decided to clean both ponds in two separate stages.

The solution:

The cleanup combined two technologies:

1. Pumping out the sludge using a dredger:

- Using a dredger enables to pump out sludge at high flowrates (150-200 m³/h), while protecting the ponds' waterproof lining.
- Sludge dredging is done during the facility's normal operations.
- The procedure doesn't cause any particle levitation.

2. Dewatering the sludge using Geotube® geotechnical sleeves:

- Using Geotubes allows for gravitational dewatering without the use of energy.
- Using several Geotubes simultaneously enables to dewater at the high flowrate delivered by the dredger.
- Significantly reducing the volume of sludge for removal.
- Removing over 99% of solids.
- Preventing noxious odors and environmental hazards.

Combining these technologies allows for effective reservoir cleanup in a short time, with significant cost savings.

Execution:

The pond was cleaned in several stages

- Deploying the system on site.
- Pumping out the sediment from the bottom of the pond with a dredger into the Geotube® system while dosing with polymers to achieve flocculation.
- Returning the filtered water through the Geotubes into the pond.
- Gravitational dewatering of the sludge in the Geotubes.

Results:

- As per requirements, the project was done without halting normal facility operations.
- About 30,000m³ of sludge were pumped from the bottom of the pond.
- The sludge volume was reduced in the Geotubes due to dewatering.
- The solid concentration received immediately after pumping out was over 25%.
- The quality of water leaving the WWTP was maintained throughout the project.
- The Geotube® sleeves were left in a spill containment system for further drying and refilling with sludge.

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