Al Karaana Lagoon, situated 60 km southwest of Doha (Qatar), has been in use since 2006 to accept fluid mechanical waste released by tankers. In 2016, the tidal pond also began accepting treated sewage water from Al Karaana treatment station.

Thanks to ASHGHAL, who promoted the reclamation and rehabilitation of this area, with the aim being to recover nature and transform it into a lavish landscape inhabited by lots of birds, fish and local wildlife. Recently it has become beautiful tourist attraction place worth visiting in Qatar.

French firm, SUEZ, which is one of the pioneers in the field of soil treatment, was granted the recovery and restoration contract for Al Karaana Lagoon in December 2017. Incorporating expulsion fills, the territory is assessed at 4.5 km2.

The fundamental difficulties in confronting this undertaking are in overseeing and treating liquid waste on one hand, but also ensuring a wonderful regular habitat for Qatari wildlife.

Two permanent modern profluent treatment dissipation tidal ponds have been incorporated as a feature of the design. The tidal ponds are constructed using by a very thick 3mm polyethylene (360,000 sqm of ALVATECH Geomembrane HDPE) with a dissipation area of 370,000sqm or 1.2 mn cu m (million cubic meter) of fluid waste capacity. The two tidal ponds are now in use.

Three tidal ponds have been developed with an aggregate zone of 730,000 sqm, which are waterproofed with 800,000 sqm ALVATECH Geomembrane HDPE 1.5 mm, intended to dissipate over 2 mn cu m of treated wastewater from the neighbouring Al Karaana treatment plant.

A 60,000 sqm landfill using a very thick polyethylene (ALVATECH Geomembrane HDPE 3 mm) is at present under development. The landfill was intended to get and contain strong debased buildup.

After purification, aesthetic and finishing work will be done to replicate an indigenous habitat for wildlife.
Below are some details of this project and some site photos taken during the works:

Promoter: ASHGHAL  
Owner Engineer: EGIS  
EPC Contractor: SUEZ  
Sub-Contractor: KEO  
Geosynthetics Installer: MGES  
Geomembranes Manufacturer: SOTRAFA

KEO International Consultants, had been appointed by SUEZ to undertake the detailed design works for the Landfill, Industrial Effluent Evaporation Ponds and TSE lagoons associated with the Al Karaana Lagoons remediation project in Qatar.
Liner System Design:
1) Compacted fill/ existing ground
2) Geosynthetic Clay Liner (GCL)
3) 3.0 mm thick Smooth HDPE ALVATECH Geomembrane in a 7.5 m width manufactured by SOTRAFA, supplied as the main waterproofing barrier.

Landfill, base liner system from bottom to top:
1) Compacted fill/existing ground
2) Geosynthetic Clay Liner (GCL)
3) 1.5 mm thickness smooth HDPE Geomembrane ALVATECH 7.5 m width manufactured by SOTRAFA, supplied as the main waterproofing barrier.
4) Drainage Geocomposite CBR 10.5 KN on base
5) Protection Geotextile CBR 10.5 KN on slopes
6) 500 mm uncompacted stone drainage/protection layer on base only.

Landfill, capping liner system from bottom to top:
1) 300 mm waste regulation layer
2) Gas drainage geocomposite CBR 5.5 KN
3) 1.5 mm thick smooth HDPE ALVATECH Geomembrane in a 7.5 m width manufactured by SOTRAFA, supplied as the main waterproofing barrier.
4) Protection geotextile CBR 10.5 KN
5) 500 mm cover material (Dmax < 63 mm)
6) 500 mm erosion protection layer (crushed stone 63 – 250 mm)

In searching the best waterproofing barrier available, SOTRAFA was appointed to manufacture the high-thickness polyethylene liner, ALVATECH Geomembrane HDPE.

ALVATECH Geomembrane HDPE is manufactured by SOTRAFA whose facilities have a cutting-edge technology using a flat-die system.

A special formula provides an outstanding weldability and high chemical resistance. Additionally, the 7.5 m width improves the installation performance.
SOTRAFA manufactures ALVATECH Geomembrane with latest technology using flat-die system, 7.5 m width. Our quality meets the GRI GM-13 Standard.

Fig. 3 Fully-equipped Laboratory to test all the mechanical and durability properties that are reflected within Technical Data Sheet.

Fig. 4 Rolls of ALVATECH geomembrane in storage, ready to be installed.
Fig. 5 SOTRAFA facilities. Actual Production Capacity 36,000 tons of Geomembrane

Fig. 6 Details of connection between polyethylene pipes and ALVATECH HDPE

Fig. 7 Thermal welding process to join ALVATECH, with an automatic machine welding a double track to ensure a watertight seal.
Please click on these links to watch the videos of the installation process, an amazing job!!

1) [https://www.youtube.com/watch?v=2ahJYJXFc8Q](https://www.youtube.com/watch?v=2ahJYJXFc8Q)

2) [https://www.youtube.com/watch?v=Z4XrVdtgRkc](https://www.youtube.com/watch?v=Z4XrVdtgRkc)

Fig. 8. ALVATECH Geomembrane has an outstanding and uniform flatness even in extremely high temperatures in an arid and desert climate.

Fig. 9 Deploying the waterproofing barrier, achieving a high installation performance.
Click on this link to watch this challenging and successful environmental project:

https://www.youtube.com/watch?v=g89nJkV1cYU