

Remediation

of polluted site

SPOLANA - CHEMICAL WASTE DISPOSAL WALL

NERATOVICE - CZECH REPUBLIC



Ecosol containment wall and dynamic compaction

Nowadays, new and original geotechnical applications are required to clear polluted sites in the Czech Republic. The Spolana toxic chemical waste disposal landfill, at Neratovice, is an example of a site requiring remediation by the privatised Spolana company. Pollution was mainly due to PAH, cyanides, organochlorines, mercury and pesticides. The following method was used:

- isolating the existing landfill, by building an ECOSOL containment wall,
- increasing landfill capacity by creating a new ground-level landfill after compaction of existing underlying waste and construction of new dykes.

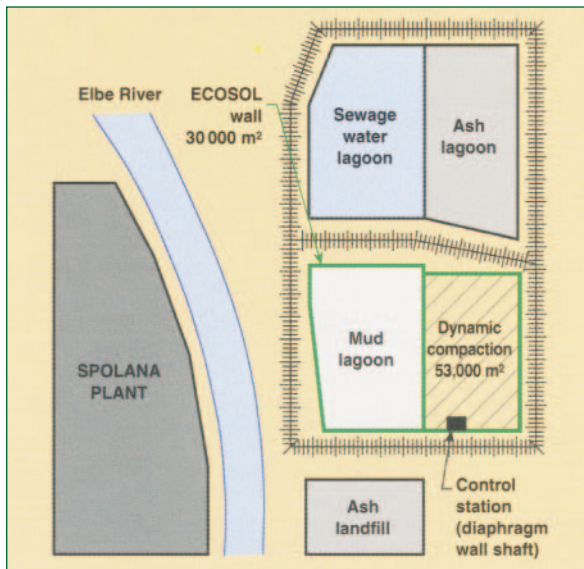
ECOSOL containment wall

Built using a KS 3000 hydraulic grab, between 11 and 20m in depth, and keyed 1 m-deep into the underlying marl. Required permeability was lower than 10^{-10} m/sec. This higher-than average requirement was reached thanks to the use of

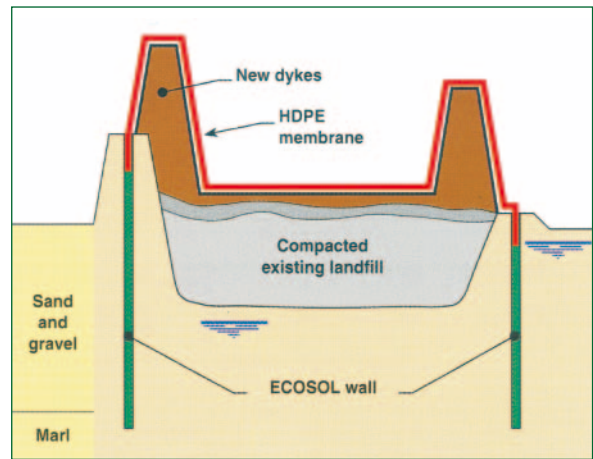


Overview of waste disposal site

CLIENT:	SPOLANA - FOND NATIONAL
ENGINEER:	VODNISTAVBY
MAIN CONTRACTOR:	SOLETANCHE BACHY
WORKS CARRIED OUT:	FROM 1993 TO 1996



Layout of waste disposal site



Cross-section of confined area

Soletanche Bachy patented Ecosol slurry. Checked non stop during operation, average permeability of site samples reached about 3×10^{-11} m/sec, with a maximum of 9×10^{-11} m/sec and a minimum of 2×10^{-12} m/sec. Water tests on core samples confirmed these excellent values.

Wall area: 30,000m²

Permeability rate $K < 10^{-10}$ m/sec

Dynamic compaction

Specifications required acceptable differential settlements lower than 1/400, for total settling lower than 100mm, and new landfill loading capacity exceeding 0.2 MPa. In order to meet this target, after penetrometer survey, waste quality needed to be improved on at least a 10m thickness. Consolidation was obtained by dropping a 15-t hammer, on a 10-m mesh, from a height of 20m.

Two penetrometer tests, and the construction of a loading dyke, proved that targets had been met.

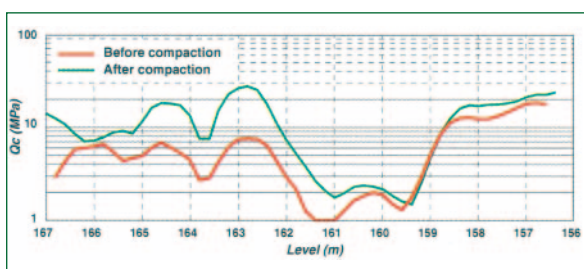
The whole works were controlled by chemical engineers. They checked that compaction did not cause toxic gas fumes. Luckily, it did not happen. Later, the use of a Glötzl horizontal «inclinometer» enabled to validate all chosen hypothesis and helped to optimise new landfill capacity.



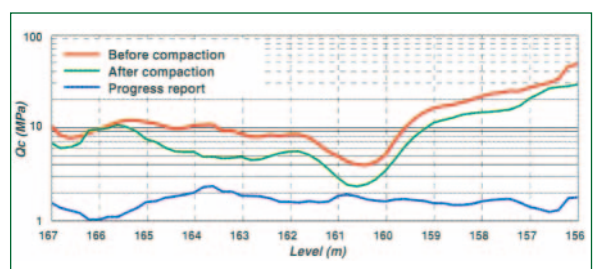
Diaphragm wall under construction from perimeter dyke



Dynamic compaction



Static penetrometer test results before and after compaction



Global progress report after compaction