Long-term behaviour of mechanically-biologically pre-treated residual waste in landfills

Short Description
(State: End of Project)

In the framework of the overall project, “Mechanical-Biological Treatment of Wastes to be Deposited in Landfills,” the possibilities for biological stabilisation of residual wastes and their subsequent behaviour in the landfill were studied. At the centre of this sub-project were observations of material quality, waste-mechanics properties, as well as expected emissions of gas and water paths.

The results should provide information on the behaviour of mechanically-biologically treated wastes in landfills. For this, the soil’s physical and mechanical properties were specially studied with respect to

- emplacement behaviour
- stability
- settlement behaviour
- material transport (gas and water)

The assessment of the content materials in the pre-treated residual waste and its release mechanisms is performed using

- chemical-physical analyses (leaching)
- biological activity studies and
- various simulation tests.

Results:

Mechanical-biological pre-treatment has a very positive effect on most of the stability properties, such as respiration activity, gas build-up, as well as the emplacement density of the wastes.

The ignition loss and the TOC content in the solid also had significantly reduced content at the end of the tests. However, both values are above the currently required limits of TASi (Technical Procedures for Housing Waste) for class II landfills.

For the landfill post-care phase, the pollution of leachate is of special importance. The TOC contents attained (Total Organic Carbon) and TKN concentrations (Total Kjeldahl nitrogen) are significantly above the desired discharge values.
<table>
<thead>
<tr>
<th>Source Of Supply</th>
<th>The final report (call number F 99 B 1357) can be borrowed from Technische Informationsbibliothek (TIB) Hannover Welfengarten 1B 30167 Hannover</th>
</tr>
</thead>
</table>
| Promotion Index No. | 1490952/7 (subproject 3/1)  
1490987/6 (subproject 3/5)  
1490973/4 (subproject 4/1) |
| Duration | 01.07.1995 - 31.10.1998 (subproject 3/1)  
01.09.1995 - 31.08.1998 (subproject 4/1) |
| Funding Institution | Bundesministerium für Bildung und Forschung (BMBF)  
Postfach 30 02 35  
53182 Bonn  
fon: ++ 49 / 1888 / 57 - 0  
fax: ++ 49 / 1888 / 57 - 3601 |
| Executing Institution | Universität Gesamthochschule Essen  
Fachgebiet Abfallwirtschaft  
Fachbereich 10 - Bauwesen  
Postfach 10 37 64  
45037 Essen (subproject 3/1)  
AGR Abfallentsorgungs-Gesellschaft Ruhrgebiet mbH  
Abt. F31 - Chemische Untersuchung und Entwicklung  
Wiedehopfstr. 30  
45892 Gelsenkirchen (subproject 3/5)  
Fraunhofer-Institut für Umweltchemie und Ökotoxikologie (IUCT)  
Postfach 12 60  
57377 Schmallenberg (subproject 4/1) |
| Contact | Prof. Dr.-Ing. habil. Werner Bidlingmaier (subproject 3/1)  
Bauhaus-Universität-Weimar  
Fakultät Bauingenieurwesen, Professur Abfallwirtschaft  
Coudraystraße 7  
99423 Weimar  
fon: ++ 49 / 3643 / 584614  
fax: ++ 49 / 3643 / 584639 |
|          | Dr. U. Walter (subproject 3/5)  
fon: ++ 49 / 209 / 9705 - 752 |
|          | Dr. W. Kördel (subproject 4/1)  
fon: ++ 49 / 2972 / 302 – 217 |