

14 RESULTS FROM CHARACTERISATION OF LANDFILL LEACHATES AND RELATED EFFLUENTS

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ABSTRACT

A number of landfill leachates and related effluents has been characterised in research projects from 1996 till today. Up to 400 parameters has been analysed in samples from 30 sites. A database based on the results will be available in the beginning of 2002 on www.ivl.se. The samples of runoff water from waste segregation areas shows higher concentrations of some compounds compared to landfill leachates.

INTRODUCTION

A number of landfill leachates and related effluents has been characterised in research projects from 1996 till today. Grab samples of both water and sediment has been analysed. The parameters analysed are general characteristics, such as COD, BOD and N-ammonium, organic sum parameters such as EGOM and EOX, organic compounds, metal-organic compounds, metals, other elements, toxicity and hormone disrupting effects.

BACKGROUND

Details about the investigated sites, sampling methods etc concerning the work until 1999 are described in previously published reports (Öman et al, 2000). Details concerning the work from 2000 until now will be published later.

RESULTS FROM CHARACTERISATION

Up to 400 parameters has been analysed in samples from 30 sites. Only a small fraction of the results is presented in this paper. In table 1 some results are presented.

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Parameters	Conc. in landfill leachates	Average conc., (number of sites in brackets)	Concentration in runoff water from waste segregation area 1	Concentration in runoff water from waste segregation area 2	Comments
Flow		Not available	Not available	20 000 m ³ /year	
TOC (mg/l)	49-490	150, (21)	1900	90	
COD (mg/l)	160-1300	640, (19)	8000	310	
Chloride (mg/l)	310-4900	1500, (21)	1300	90	
BOD (mg/l)	3-110	30, (18)	3400	90	
N-tot (mg/l)	15-870	270, (22)	120	10	
N-ammonia (mg/l)	0-110	60, (24)	0,2	0,3	
Nonylphenol (µg/l)	0-17	2, (14)	Not analysed	4,5	
Nonylphenol monoethoxylate (µg/l)	0-15	7, (8)	Not analysed	14	
Sum nonylphenol ethoxylate (µg/l)	Not available	Not available	33	Not available	
Diethyl phthalate (µg/l)	0-5	0,8, (30)	49	2,5	
Pentabromo diphenylether (µg/l)	0-0,07	0,03, (9)	0,66	0,01	Bromated flame retardant
2,4-DP, dichloroprop (µg/l)	0-8	1,2, (25)	7,3	1,7	Pesticide, one of the 8 fenoxi acid that is often found in landfill leachates
TBT, tributyl tin (µg/l)	0-0,02	0,003, (12)	0,41	0,27	
Methylmercury (ng/l)	0-0,9	0,5, (12)	0,7	Not analysed	

Table 1. Some results of characterisation of leachates and runoff waters from waste segregation areas. The number of sampled sites are indicated in brackets

DATABASE

The large number of data collected in these projects will be published in a database on the internet. The database will also contain data on storm water from air field, ground water and treated municipal waste water. The database will also contain data research organisations others than IVL. The database should be available in the beginning of 2002 on www.ivl.se.

DISCUSSION

The limitations of grab samples

It's important to understand the limitations of the grab samples. We don't know in what extent the character of the landfill leachates are changing over time. Probably the character of runoff water from waste segregation areas is changing more than the leachates. The purpose of our investigations has however mainly been to identify specific compounds.

Most of the landfill leachate sampling are however made in the leachate ponds. This makes the samples more representative compared to grab samples taken in tubes or ditches.

The samples are analysed as single samples, mostly without blank samples. Although the use of our sampling techniques reduce the contamination risks we still can get wrong analyse results from the laboratory. To get more reliable results it's necessary to analyse duplicates, blank samples and to run the same sample at different laboratories. This is however very expensive.

Runoff water from waste segregation area

The effluents of runoff water from waste segregation areas are of special interest. The results from the analysis of the two grab samples are not easy to interpret. However the samples shows higher concentrations of some compounds compared to landfill leachates. The volumes of runoff water are today generally smaller than the volumes of landfill leachates. However, the changes in the waste management sector could imply larger volumes of wastes at open segregation areas. These areas often have no collecting and treatment systems for the runoff water.

The leachates of tomorrow

Another interesting issue is tomorrows landfill leachates. How will the changes in the waste management sector affect the volumes and character of the leachates? The changes in the waste management sector could imply larger volumes of segregated wastes in cell deposits and less organic content on the landfills.

REFERENCES

1. Öman C et al. (2000). Handbok för lakvattenbedömning. Rapport B 1354. IVL Svenska Miljöinstitutet AB, Stockholm.