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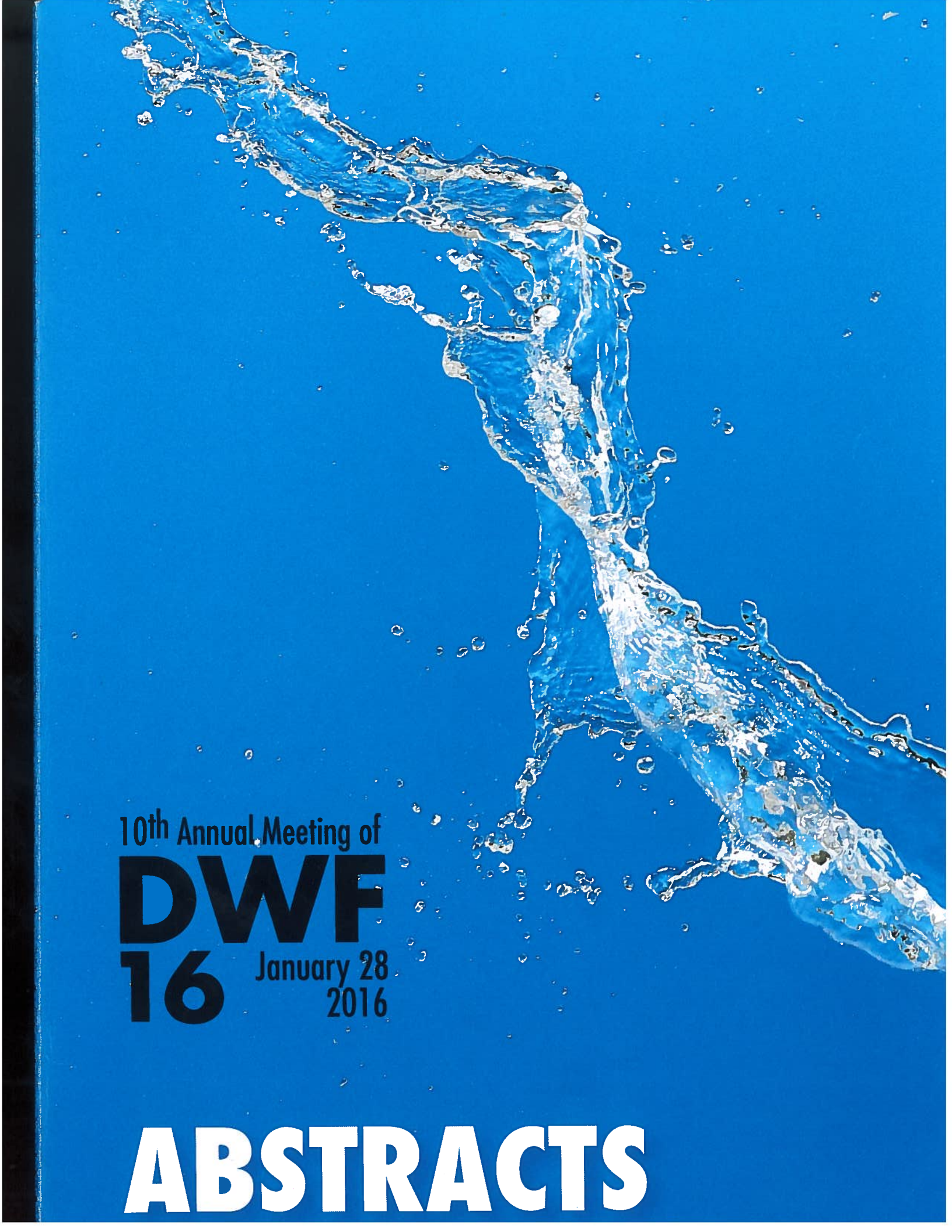

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ABSTRACTS

Use of Life-cycle assessment for including the environmental dimension in the decision making process in the water utility

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Abstract

Life-cycle assessment (LCA) is internationally acknowledged as the most comprehensive tool for assessing the environmental impacts of a product or system. LCA is being used more and more on water systems for evaluation of environmental impacts especially when it comes to comparing impacts from changes in the water cycle. Also in water utilities in Denmark LCA is used for identifying environmental hot spots and choosing technologies having lowest possible environmental impact. Research projects are started up on LCA of climate change adaption technologies (green or concrete) and impacts of freshwater withdrawal (used in well field operation) in 3VAND which is a cooperation of research projects within the three largest cities of Denmark.

At HOFOR LCA is today being used for assessing environmental impacts and incorporating the results in the decision making and communication of our drinking water or waste water management. This presentation will focus on three cases where LCA-results are used for strengthening the environmental part of decision making and communication of e.g. effects of changes in the drinking water production to our customers. The cases are LCA of 1) Central softening of drinking water; 2) Transport of excavated soil; and 3) Steps to improve water safety and quality of drinking water processes.

The first case is an LCA of central softening of drinking water for Copenhagen including processes at the waterworks such as building of the pellet reactor, energy and chemicals for the softening process – these are all processes that lead to higher environmental impact. In the households, effects of the softened water are identified such as lower electricity consumption for heating water, reductions in laundry detergent, prolonged service life of domestic household appliances, etc. The result of the LCA including both effects at waterworks and in the households in the LCA showed that the net environmental impact was negative, meaning that central softening is preferable from an environmental point of view.

The second case was used for choosing which soil depot to deposit soil from excavations done in the city where networks are established or pipes are replaced frequently. The LCA-results gave us new knowledge on the different routes and their environmental impacts. The results are now being used for negotiations with entrepreneurs on where to deposit soil from the utility's excavations. A map of most environmentally routes to soil deposit from excavations in HOFOR area was drawn based on the LCA-results, **Fig**. 1.

Last, the third case evaluates the impacts of introducing UV disinfection and activated carbon filtration to improve safety and water quality. The results show that the additional treatment steps increase the environmental burden from the production and delivery of drinking water. However, the question is whether reduced risk and added security can make up for an extra CO_2-emission?

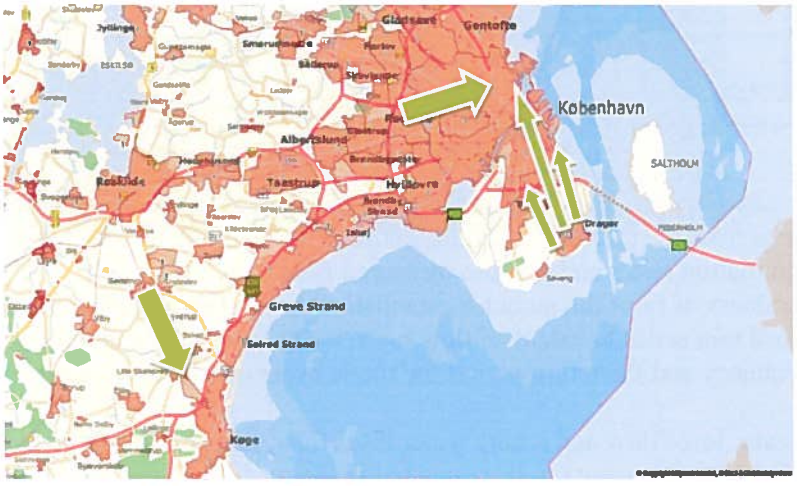

Figure 1 Map of HOFOR area showing the environmentally preferable routes for transport of excavated soils.

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