

Understanding the mass balance of heavy metals in wastewater treatment plants (30 hp)

Prel. startdatum	2024-01-15
Projektbeskrivning	
<p>A relatively new concept in municipal wastewater treatment is “wastewater resource recovery facilities”. The objective of wastewater treatment is no longer to “only” protect freshwater resources, but also to achieve reuse of nutrients, organic matter, and water. Sludge, generated during municipal wastewater treatment, is rich in organic matter with typically high levels of nutrients (mainly phosphorus) that should be returned to the food chain. However, its direct application as soil fertilizer poses environmental and health risks in the sense that sewage sludge also contains heavy metals and other contaminants.</p> <p>To avoid soil and food contaminated with heavy metals, only certified sewage sludge can be used in agricultural lands. The certification process is carried out through REVAQ, that defines a set of threshold values for certain heavy metals in sewage sludge.</p> <p>The trend over the past decades is that heavy metal loads have decreased. However, our recent findings indicate that the <u>heavy metal mass balances over the treatment process are not fully understood</u>. As the recovery of the high nutrient content of sewage sludge is constrained by the heavy metal concentrations, increasing the knowledge of the metals mass balance within the wastewater treatment plants is crucial to improve the recovery and reuse of valuable nutrients.</p> <p><u>The goal of this thesis is to perform a mass balance of the heavy metals by looking at different streams in several Swedish wastewater treatment plants</u>. You will try to investigate the reasons for potential deviation in the mass balance (i.e. when the concentrations of the metals do not add up).</p> <p>Perform mass balance studies based on monthly data available for (i) Mälarenergi, (ii) Eskilstuna Strägnäs Energi och Miljö and (iii) Käppalaförbundet, for the most important heavy metals. Depending on the output from the mass balance, further investigations will be decided upon discussion with the supervisor. Further work may include (i) literature search (e.g., identification of likely source of specific metals) or (ii) make additional sampling and chemical analysis at specific points of the plants.</p>	

Kontaktperson

Namn	Lara Carvalho
Organisation	Mälardalen University
E-postadress	Lara.carvalho@mdu.se
Telefonnummer	021 10 73 39



Ev. samarbetspartners	<input type="checkbox"/> Enköping kommun <input checked="" type="checkbox"/> Eskilstuna energi & miljö <input type="checkbox"/> Falu energi & vatten <input checked="" type="checkbox"/> Käppalaförbundet <input checked="" type="checkbox"/> Mälarenergi <input type="checkbox"/> Nodra <input type="checkbox"/> Roslagsvatten	<input type="checkbox"/> Stockholm vatten <input type="checkbox"/> Syvab <input type="checkbox"/> Tekniska verken <input type="checkbox"/> Uppsala vatten <input type="checkbox"/> Växjö kommun <input type="checkbox"/> Örebro kommun	<input type="checkbox"/> KTH <input type="checkbox"/> Lunds universitet <input checked="" type="checkbox"/> Mälardalens universitet <input type="checkbox"/> SLU <input type="checkbox"/> Uppsala universitet <input type="checkbox"/> IVL <input type="checkbox"/> Rise
------------------------------	---	---	--