

Metro Vancouver
SUSTAINABLE REGION SCHOLARS
UBC Sustainability Scholars Program
Summer 2018

Title of Research Project:

Identify potentially appropriate source controls to address toxic contaminants found in surfactants

1. How will this project make a contribution to regional sustainability?

The Lions Gate Primary Wastewater Treatment Plant (North Vancouver) has historically (circa. 2000s) experienced toxicity issues for which anionic surfactants were the most frequent cause of toxicity in the samples examined. Nonylphenol and its ethoxylates are on the current Canadian Environmental Protection Act (CEPA) Toxic Substances List: schedule 1. The Source Control Program wishes to understand the potential quantity of these substances currently available through consumer products such as laundry detergents, dish soap and personal care products.

The project links to both the Board Strategic Plan and the provincially approved Integrated Liquid Waste and Resource Management Plan:

- The Board Strategic Plan requires Metro Vancouver to reduce contaminant loadings through stronger and expanded monitoring and source controls and to identify effective means to reduce previously identified contaminants and work with regulatory agencies and other experts to address the health and environmental effects associated with pharmaceuticals and personal care products.
- The Integrated Liquid Waste and Resource Management Plan (ILWRMP) requires Metro Vancouver to review and enhance sewer use bylaws to reduce liquid waste at source, including contaminants identified by the Canadian Environmental Protection Act.
- In approving the ILWRMP, the Minister of Environment encouraged Metro Vancouver (Ministerial Condition #5) to “continue to build upon previous studies associated with studying endocrine-disrupting chemicals, persistent organic pollutants and other micro-contaminants found in wastewater by developing source control initiatives (for example, target outreach), regulation and inspection programs.”

The project will assist Metro Vancouver in determining the appropriate source control initiatives to address “toxic” contaminants (as defined in CEPA) found in surfactants; including anionic surfactants and non-ionic surfactants (e.g. nonylphenol and its ethoxylates). Previous research by Metro Vancouver staff (2002) indicates that 75% of surfactants found in customer products are in detergents and cleaners, and the remaining 25% are in personal care products.

2. The purpose of the project is:

Determine the use of surfactants in consumer products (e.g. laundry detergent, dish soap, personal care products), quantify any potential issue and recommend appropriate source control initiatives. This will be achieved by:

- Investigate and categorize the ingredients in commercially available (e.g. in local supermarkets) consumer products by reviewing Safety Data Sheets (or other available sources)
- Using market research (or other available data), determine the quantity of products containing surfactants sold in the Metro Vancouver region each year
- Prioritize those products with potentially toxic ingredients that are consumed in large quantities

Submit applications here: <http://bit.ly/2DC2jpP>

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- Note if each product allows the consumer to control the quantity of product consumed per use (e.g. tablets or 'pods' versus liquid or powder detergent)
- Recommend what source control initiatives would be most suited to reducing these products in the wastewater system (e.g. education and outreach) and/or recommend what other research/analysis is required to inform source control initiatives

3. Outline the scope of project and how the scholar's work will be used by Metro Vancouver:

- Conduct a (short) literature review on surfactant use, types of surfactants and their fate in the wastewater system, potential environmental impacts, and wastewater treatment removal efficiencies of surfactants
- Conduct research at local supermarket (or equivalent) into the most common consumer products containing surfactants and inventory the ingredients. Safety Data Sheets can be used to determine the ingredients found in each product. Products should be broken into broad categories and sub categories; e.g. Detergents and Cleaners (fabric softeners, bleach, surface cleaners) and Personal Care Products (hand soap, hair care, toothpaste)
- For each product, the student should note the use of surfactants, the labelling on the products and if the consumer has the ability to alter the quantity of product consumed per use (e.g. tablets or 'pods' versus liquid detergent)
- Determine the relative quantities of each product used annually in the Metro Vancouver region by using market research data on sales or determining sales quantities using a proxy of shelf space in local supermarket(s) (or equivalent method)
- Develop a prioritized list of substances that pose the greatest risk to the wastewater system's receiving environment
- Recommend appropriate source control initiatives to reduce/eliminate prioritized substances

4. Project Deliverables:

- Literature review
- Database (excel file or similar) of products and their ingredients, which should have the ability to be filtered by product, use, ingredients, or other relevant categories, as determined through consultation with the Metro Vancouver project lead.
- Written report summarizing results with prioritized products/substances to target and recommended source control initiatives
- Final report or executive summary for the UBC Sustainability Scholars Program online project library.

5. Time Commitment

- This project will take **250** hours to complete.
- This project must be completed between **01 May 2018** and **10 August 2018**
- The scholar is to complete approximately 15 to 20 hours of work per week.
- Scholar to be available, either in person or by telephone as agreed, for project start-up meeting, periodic status updates and draft and final report presentations.

6. Describe the required/preferred skill set and knowledge base for a Scholar

- Excellent research and writing skills.

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- Strong analytical skills
- Ability to work independently
- Demonstrated time management skills
- Deadline oriented
- Detail oriented
- Strong technical writing skills
- Background in Chemistry / Environmental Science / Environmental Health Science
Chemical Engineering or Environmental Engineering

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