What is FOG/scum?
The most commonly reported problems in sewers and pump stations are blockages caused by the presence of fats, oil and grease (FOG) (US EPA, 2004), followed by increased demand for line flushing with the most severe problems being experienced in the city centres (Mattson, 2014). FOG in wastewater forms a thick murky layer known as scum. The Figures 1, 2, 3 and 4 depict scum sampling in Durban.

What problems are due to FOG/Scum?

<table>
<thead>
<tr>
<th>Problems</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scum accumulation in tank</td>
<td>Debris not caught in the screens.</td>
</tr>
<tr>
<td>Floating fat, oil and grease</td>
<td>Blocked scum hopper outlet pipe.</td>
</tr>
<tr>
<td>FOG discharge with overflows</td>
<td>Scum baffle is too shallow.</td>
</tr>
<tr>
<td>Brown scum on reactor surface</td>
<td>Scum forming filaments.</td>
</tr>
<tr>
<td>White scum on reactor surface</td>
<td>Sludge age is too short.</td>
</tr>
</tbody>
</table>

What is hypothesis of the study?

- Fats, Oils and Grease (FOG) from daily activities
- Biodegradable carbohydrates from cooking
- Calcium from cemented sewer lines

Emulsion rises slowly
Bubbles attachment increases rise rate, light in weight like foam
Forms Precipitate with fatty acids links and hardens the scum

What methods were for the analysis of FOG/Scum samples?

Step 1 - Locating the problematic pump stations in the sub-catchment.
Step 2 - Determining socio-economic background of sub-catchments.
Step 3 - The samples were collected from influent tank of the pump stations between 27th Sep. to 7th Oct.2015.
Step 4 - Performing laboratory analysis of the samples.
Step 5 - We analysed moisture, total solids, volatile solids, ash and C:N:S.

What results were obtained from laboratory analysis?

- **Fig.6** Moisture content, total solids, volatile solids and ash in FOG/Scum samples from 14 Pump stations
- **Fig.7** C:N:S ratio of FOG/Scum in the 14 Pump stations

What we concluded from the results obtained?

1. Only 14 pump stations have significant amount of scum formation in sub-catchments of the eThekwini municipality.
2. The visual difference in the presence of the scum sample indicate the difference in formation.
3. The scum has a very high moisture content.
4. The FOG/scum samples contain mostly carbon, with small amounts of nitrogen and sulphur.

What would be our future work?

1. Experiments and investigations on scum needed to define the causes of scum formation.
2. We will measure calorific value of the scum, analyse COD and metals in the FOG/scum samples from other wastewater installations.

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