

CBJ Utility Fat Oils and Grease (FOG) Summary Briefing
City and Borough of Juneau Utility Advisory Board (UAB)

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In reference to the proposed FOG abatement wastewater treatment project, the CBJ UAB requested summary information and recommendations by CBJ Utility SMEs.

FOG impacts and control approach for CBJ's wastewater treatment network.

FOG's effects upon the CBJ waste treatment network include clogging of the collection systems and disruption and/or overloading of the waste treatment processes.

While the negative effects of FOG on CBJ's waste treatment operations is generally well known and accepted, the specific costs are more difficult to relate to the estimated range FOG loadings or concentrations for a variety of reasons common to all POTWs (e.g. cost of sampling and analysis, waste treatment process variability, community-specific food preparation and consumption patterns, etc.)

Given this circumstance, the CBJ and its regulatory authority, ADEC are seeking to reduce/eliminate FOG discharges to the degree possible using a combination of social incentives (for domestic discharges), direct source-control regulation (for industrial discharges) and the additional of primary treatment technologies for FOG removal at the treatment facility.

FOG sources and the magnitude of the CBJ waste management issue.

The CBJ is a relatively small community with 7940 total wastewater service connections (as of 9/23) feeding into three POTWs.

A 2021 industrial user survey for CBJ's primary POTW network, the Mendenhall Treatment Plant and sewer shed (MTP; ~62% of total CBJ service connections) identified only three significant industrial users (SIUs) and no major or significant food processing industries. Within the MTP service area, ~138 food vendors/retailers were identified, with approximately 1/3 currently operating grease traps and disposing of relatively small quantities of mixed FOG waste products to the CBJ hazardous materials center.

Other sources of FOG include domestic (residential) and tourism sectors. The loadings of FOG from these sectors have not been directly quantified. But, estimates from proxy indicators of FOG (total BOD and TSS) suggest that CBJ residential loadings are nominal for this type of community and contributions from the tourist sector, via accumulated cruise ship discharges and variable and periodically very high.

The goal of the CBJ is to trap and divert as much FOG as possible away from wastewater collections and treatment and into a separate waste stream for processing and management. Various approaches are in progress or planned to attain this goal. Of the primary FOG source categories, the CBJ Utility assesses the following:

- 1.) **Industry** – FOG discharges to the CBJ wastewater network are expected to drop substantially and then gradually as source control and building code conditions become more uniformly applied and enforced. Provided that this is accompanied by a systematic FOG waste collections and inventory system, the total production of semi-solid, mix-waste FOG is also expected to increase.
- 2.) **Domestic-residential** – domestic FOG source control/social awareness programs are expected to reduce FOG loading into the collections system. However, since the reduction of household FOG is a dispersed activity, it is not expected that this will result in the production of semi-solid, mixed-waste FOG streams that can be readily quantified or centrally processed.

- 3.) **Tourism and cruise ships** – FOG contributions to POTWs from tourism will likely be captured through improving source control in item 1.

Direct cruise ship discharges are currently managed at the JD POTW and excepting periodic foaming issues at that plant, FOG in those waste streams do not appear to cause significant or unmanageable damages to the JD facility. FOG control for cruise ship discharges will remain an option, but it is not expected that the CBJ will need to harvest mixed-waste FOG streams from that source in the near future.

- 4.) **POTW captured FOG** – the future installation of FOG collection and or bioaugmentation technologies at the MTP is expected to enhance secondary waste treatment efficiency and reduce real and regulatory risk from discharge exceedances. Depending upon the process selected (capture or bioaugmentation), this process enhancement may produce an additional waste stream of semi solid, mix-waste FOG. The amount of FOG removed may be significant at first but is expected to decline as source control measures take effect.

Recovered semi-solid, mixed waste FOG recycling/disposal options.

Current industry source control efforts for FOG within the CBJ have resulted in a nominal amount of consolidated waste by-products that are disposed via export through the CBJ hazardous waste program. And while it is expected that this consolidated waste stream may triple through implementation of various source control and treatment programs, the total amount of mixed-waste material projected will likely be too small and too heterogeneous to be cost-effectively reprocessed, recycled and reused either for bio-fuels and/or dedicated heating sources.

Direct land disposal and off-site export are the two current options for FOG products with a future mix-waste thermal combustion system (MTP pyrolysis) potentially being able to supplement the disposal options depending upon processing conditions.

Conclusions and Recommendations.

- Mitigation and collection of FOG from concentrated sources within the CBJ is expected to significantly benefit the Utility wastewater collections and treatment works through decreased system maintenance, enhanced system performance and increased system resilience.
- **It will not be cost-effective to locally refine and reprocesses the relatively small amount and mixed-waste types of FOG collected through industrial source control programming and at the POTW(s) into biodiesel or other fuel stocks.**

Disposal of the recovered mixed-waste streams of FOG will be managed through local landfilling, CBJ HHW-facilitated export to recyclers in the Pacific Northwest or through local future reprocessing into biochar via pyrolysis.

CBJ Utility staff recommends to the UAB that:

- FOG source control be pursued systematically through implementation of a CBJ source control program and the formal establishment of a control and enforcement program conducted in concert with CBJ CDD and the State, and
- Installation of pretreatment removal technologies of FOG at the MTP be funded and executed asap to reduce treatment upsets and extend facility capacity and resilience.