



**Alternative Mitigation  
Strategies for off flavor  
compounds**



- ❖ AquaCon
- ❖ Off-flavor in Land-based aquaculture
- ❖ Traditional removal strategies and alternative Mitigation Strategies



**Choptank River**

# AquaCon at a glance

**AquaCon AS is a Norwegian holding company which have secured three US properties in order to develop several land-based salmon RAS facilities in direct proximity to key US salmon seafood markets**

- ❖ The team behind AquaCon comprises professionals with in-depth experience from the salmon farming industry, with focus on land-based facilities and RAS technology
- ❖ Will utilise proven RAS technology, specifically tailored to optimise production sustainability and mitigate risks
- ❖ Initial production volume target of 42,000 tonnes<sup>1</sup>, which will be built over three phases. Clear roadmap, with land plots secured, to scale production to 100,000 tonnes<sup>1</sup>
- ❖ Aims to be listed on the Oslo Stock Exchange



**AKVAgrouP will be the RAS technology supplier and has selected AquaCon as the preferred project in the USA**

# Off-flavor in Land-based aquaculture



# OFF FLAVOR

## Geosmin and MiB

- ❖ The most common preharvest off-flavors in aquaculture products are caused by geosmin and 2-methylisoborneol (MiB), two highly odorous, earthy-musty metabolites of aquatic microorganisms.
- ❖ Geosmin and MiB are produced as secondary metabolites by a variety of bacteria, such as actinomycetes, cyanobacteria, proteobacteria and fungi
- ❖ The compounds are rapidly absorbed by fish and stored in lipid-rich tissues. Elimination of geosmin and MiB is slower than uptake, and the rate of elimination is reduced as water temperature decreases and tissue lipid content increases
- ❖ The detectable level of the off-flavor compounds are at very low concentrations and are more predominant in fatty parts of the filet. According to different sources threshold for human geosmin detection limit is around 200- 400 ng/kg in the flesh/ filet (can subjective and in some cases, persons are immune to the off-flavor)
- ❖ The quick absorption and slow elimination from the flesh put a strong emphasis on the need for total control on the geosmin and MiB level in the production water, especially the last 2-3 months before harvest.
- ❖ Efficient removal from the fish and to avoid accumulation in the flesh requires a low concentration in the production water. Target concentration is as low as possible and less than 5-10 ng geosmin /L water
- ❖ Other off flavor compounds might be relevant, but the focus will initially be on geosmin and MiB



# **Traditional removal and alternative Mitigation Strategies**



# Traditional mitigation method

## Purging/ depuration

- ❖ Purging/ depuration is basically keeping the fish in clean water for up to one week to eliminate geosmin and MiB from the flesh
- ❖ Purging efficiency is dependent upon exchange rate water (HRT), temperature and the gradient in geosmin and MiB between water and fish.
- ❖ Effect of purging goes down over time and with lowered temperature, due reduced metabolic activity and less effective excretion over the gills
- ❖ Initial geosmin and MiB level in fish before purging will effect the duration of purging and the success in getting the level down to avoid off-flavor





# Alternative Mitigation Strategies – our approach

## Geosmin and MiB reduction in production and purging water by improved particles removal and the use alternative methods for geosmin and MiB elimination

- ❖ Profiling across production systems 10-12 locations in active operations/ sites.
  - ❖ Geosmin and MiB level
  - ❖ Particle distribution
- ❖ Sampling production water with known Geosmin and MiB concentration
- ❖ Spiking production water with geosmin to simulate different concentration
- ❖ Testing and benchmarking different technologies (alone or combined) for partial and full flow treatment
- ❖ Due to agreement with RAS technology provider the methods under testing can't be disclosed until further documentation is ready
- ❖ Evaluation of cost benefit of various methods
- ❖ Develop full scale application together with RAS technology provider







## CONTACT

Henrik Tangen  
Executive Chair, President and founder  
Phone: + 47 982 28 511  
[ht@aquacon.as](mailto:ht@aquacon.as)

Pål Haldorsen  
CEO  
Phone: + 47 911 62 610  
[ph@aquacon.as](mailto:ph@aquacon.as)

Ole Enggaard Pedersen  
CTO  
Phone: +45 22 10 02 10  
[oep@aquacon.as](mailto:oep@aquacon.as)

Ole Christian Norvik  
COO  
Phone: + 47 976 56 695  
[ocn@aquacon.as](mailto:ocn@aquacon.as)

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