

Municipal Planning Strategy Amendment Under Consideration: Broader Land-Based Aquaculture Activities Prepared by: C + D Community Design

MUNICIPAL POLICY AND REGULATION

What does open flow aquaculture mean?

Open flow aquaculture refers to a system where water flows from a water source through open or closed containment pens, and back into the water source. Land based open flow aquaculture facilities have the pens contained on land with the water flowing into the pens and back to the source.

Why are you considering amending the Municipal Planning Strategy to allow “open” and “closed” Land based aquaculture?

Council recognizes that the topographical layout of the Municipality provides significant opportunity to industrial uses that require access to fresh and saltwater systems. In addition, Council understands that the regulations for Aquaculture Uses are spread across three government jurisdictions, with regulations and industry practices being researched and improved upon constantly. To prevent missed opportunity, Council will consider aquaculture operations on an individual basis within the rural areas of the Municipality. By allowing the potential for this type of development to occur, Council is opening economic development opportunities, new jobs, and infrastructure investments into new areas.

The existing planning policies were written to accommodate closed contained aquaculture. The proposed amendment is to remove the “closed containment” terminology and to permit the consideration of all types of aquaculture operations through Development Agreement in the Rural Industrial Zone.

Policy 8.4.7

To establish a requirement in the Land Use By-law to permit bulk petroleum storage, asphalt paving plants, recycling depots, salvage and/or scrap yards, sawmills and planer mills and land based ~~closed containment~~ aquaculture operations in the Rural Industrial zone by development agreement in accordance with the policies in Section 15.1.9 of this Strategy.

A Development Agreement is a legal agreement between the municipality and a property owner used to ensure a property is developed in a particular way. A development Agreement gives the municipality the ability to create and enforce additional conditions. Additional conditions may include, but are not limited to, preserving vegetation, buffers around sensitive areas, visual screening, noise reduction

Q & A

measures, and more. We believe the additional controls and enforcement provided by a Development Agreement are sufficient to warrant considering broader aquaculture uses on a case-by-case basis.

Who creates, monitors and enforces the development agreement.

Creates

The Municipal Planning staff is responsible for the creation of Development Agreements. This process is a collaboration between the Planning team, the applicant and the municipality's Development Officer. Development Agreements under consideration must go through a Public Hearing prior to Council making a final decision. Until the agreement is finalized all the policies within the agreement are proposed and can be amended, added to, or removed as the process moves forward.

Monitors

The Development Agreement acts as its own Land Use By-Law for the property and would be enforced in the same way. The Municipality's Development Officer would be responsible to monitor the development, as well as accept and investigate and complaints.

When the planning staff makes recommendations, what is their role? Is it in their scope to not recommend a project due to environmental impact?

When a planner makes a recommendation, they primarily use the existing planning documents adopted by Council to inform the decision. It is the planner's job to make sure that a proposed application fits within the goals and vision of Council, and if changes need to be made, write policy pieces that reflect what they have heard from the public, staff and elected officials.

Existing planning policy is often sufficient to allow staff to mitigate the environmental impact of more common developments. However, it is not generally within the planning staff scope to determine the environmental impact of more complex projects like aquaculture facilities. In these cases the responsibility falls on other regulatory bodies including but not limited to the Department of Fisheries and Oceans. Furthermore, development agreements can require additional environmental studies be performed to help determine, and minimize, the impact of the development.

Did Planning Advisory Committee have any questions before recommending this or did they just recommend it to Council for action?

This has NOT been recommended to Council. We are still in the preliminary phase of this process. The Planning Advisory Committee is collecting information to inform their recommendation and ensure Council has access to everything they need when it comes time for them to decide.

Is there a way to register to receive mail outs related to this project?

Q & A

Yes, if you would like to receive updates in the mail please contact Jenny by email at jenny@district.yarmouth.ns.ca or by phone at 902-742-9691.

What does a land-based aquaculture use look like? What are the different ways that water can circulate through these systems? Are there any examples of different land-based systems in the Atlantic provinces?

Land Based Aquaculture Operations are defined by their separation from the ocean. These uses are typically large, contained tank systems placed on land. These systems have their own separate licensing process with the [Department of Fisheries and Aquaculture](#).

There are four types of land-based aquaculture operations, open flow, re-use, recirculation, and low-water exchange.

1. Open Flow/Single Pass/Flow Through (Water retention <2 hours)

Here water passes through the rearing tanks one time and is discharged.

2. Re-Use (Water retention can be several hours)

Here approximately 70% of the water is recycled. This allows control of the gasses, oxygen and carbon dioxide. New water is used to manage Total Ammonia Nitrogen (TAN). With temperature recovery, this system type also makes water temperature control feasible.

3. Recirculation (Water retention is measured in days)

Here more than 99% of the water is recycled. New water is added to control the mass of nitrate, which is produced by the bio-filters within the system nitrifying TAN.

4. Low-Water Exchange Recirculation (Water retention is weeks)

These are the most advanced systems. They are uncommon and there is not a lot of experienced operators. New water is added to offset that lost with the removal of waste and to ensure metals cannot accumulate. These systems include de-nitrification, which converts nitrate to nitrogen gas, and phosphorus capture.

All (4) of these system types are generally regulated under the same framework, the concentration of nitrogen and phosphorous at the end of a mixing zone. In New Brunswick, at 100m from the discharge point, the total nitrogen (TN) and Total Phosphorous (TP) are required to be less than 0.5mg/L and 0.035mg/L, respectively. This is to prevent facilities from changing the trophic status of the receiving environment. These universal requirements mean the system types and/or sizes are typically dictated by the receiving environment (water course or body).

There are several fresh water open flow systems in New Brunswick that operate with these requirements

Q & A

The most common land-based salt water open flow and re-use aquaculture systems in Atlantic Canada are likely those used in the lobster industry.

ENVIRONMENT

Regarding Environment, a Development Agreement gives the municipality the ability to create and enforce additional conditions. Additional conditions may include, but are not limited to, preserving vegetation, buffers around sensitive areas, visual screening and more.

We believe the additional controls and enforcement provided by a Development Agreement are sufficient to warrant considering broader aquaculture uses on a case-by-case basis.

Will an environmental assessment be required?

Provincial regulations allow Municipalities to request that an expert be engaged, or a study be undertaken as needed. Environmental Assessment will be requested depending on the project.

What materials, if any, would be released into the ocean by open flow aquaculture?

Over the past 30 years there has been significant advancement in the engineering of land-based aquaculture facilities, along with all other aspects of the aquaculture industry such as sea rearing and processing. The aquaculture industry has continually invested in research and development across its entire range of activities, which has resulted in the modern land-based facilities used primarily for juvenile production today.

Regarding the discharge from land-based facilities, following are the four areas for consideration.

Nutrients

Today it is common for 85% or more of solids generated within a land-based aquaculture facility to be retained and composted. This often results in the Total Suspended Solids (TSS) of the effluent being equivalent to, or sometimes less than that of, the receiving environment.

For this reason, the TSS of the effluent is generally monitored, but not used to regulate facilities. Instead, regulators have moved to ensuring the trophic status of the receiving environment is not impacted. This means land-based facilities are generally being regulated on their phosphorous and nitrogen discharges, specifically at the edge of a mixing zone from their discharge point. The most common mixing zone is 100m from the discharge point, however site-specific conditions can impact this.

The discharge point(s) generally are not allowed to impact the sea floor, for example scouring is not permitted, and they must encourage mixing.

Q & A

Fish

Generally, in land-based facilities, producers maintain three layers of screening between fish and the environment to mitigate the risk of escapes.

Therapeutants

The technological advancement of land-based aquaculture facilities has resulted in significant improvements in water quality and fish welfare. Together with the general reduction in overall water turn-over, therapeutants are generally contained within the facility until their efficacy poses unmeasurable impact to the receiving environment.

Disinfectants

It is good practise for the operators of land-based aquaculture facilities to plan for periodic disinfection of their rearing systems. This is typically done by adjusting the pH, for example increasing the pH of the systems to 14 and maintaining this for a period. The water is then neutralized prior to discharge.

How much energy do land based aquaculture facilities consume?

The energy consumption of a land-based aquaculture facility is proportional to the production of the facility and to a lesser degree the intensity of the recirculation system.

For example, a recirculating aquaculture facility, which cleans and recycles water, will consume more energy than a single pass aquaculture facility with no temperature control. The low-water exchange recirculating aquaculture facility will use significantly less new water, compared even to a traditional recirculation aquaculture facility, but it will also require more energy.

The benefit of a recirculation aquaculture system is more and better control of water quality parameters. However, recirculating systems can have greater capital requirements than single pass systems.

Does land based aquaculture produce Bio-gasses?

The captured solids from land-based aquaculture facilities can be used to produce bio-gasses and are suitable for use in bio-gas plants and bio-gas plants existing in Nova Scotia. To date, it has not been economical for land-based aquaculture facilities to have their own dedicated bio-gas plant on-site.

Where would the waste be disposed of?

The Municipal Government Act gives Municipalities the ability to regulate the location of disposal sites for any waste material.

Specifics of waste disposal, treatment and even outflow into the ocean are all regulated by the Department of Aquaculture and Fisheries.

The Development Agreement tool provides Council with the ability for case specific assessment where we can take extra precautions in instances where land or species need to be protected.

Q & A

INDUSTRY AND ECONOMY

Will this affect the livelihood of other fisherman in the area, such as clambers, lobster trappers, and periwinkle scavengers?

Coastal aquaculture, when regulated and carried out responsibly as it is in Nova Scotia, will not negatively affect fisheries and marine life. In Nova Scotia, it has been shown that fish farming and wild fisheries can co-exist. In some cases, Aquaculture operators are also active fishermen. The Nova Scotia Department of Aquaculture and Fisheries is responsible for issuing licence for both industries.

Aquaculture is an industry that has had a positive impact through economic development in rural areas. Aquaculture is a positive contributor to the sustainability of the fisheries sector through contributions to shared infrastructure and diversified markets stemming from rural Nova Scotia.

Could it affect nearby existing farmland?

There is no reason to expect a land-based aquaculture facility to negatively impact an adjacent agriculture operation. Land-based aquaculture facilities are commonly located in agricultural areas. The solids produced by a land-based aquaculture facility are rich in nitrogen and phosphorous, are suitable for land application, and benefit green leafy production.

The water supplies for fresh-water land-based aquaculture facilities undergo established scientific testing methods to prove their sustainability prior to approval. Once operations commence, the water supplies are continually monitored (the chemistry, water level and flow) and reported.

For saltwater land-based aquaculture facilities, mitigation measures are taken to ensure there is no contamination of the ground water. Monitoring wells are constructed around the facility to monitor for saltwater intrusion. If saltwater intrusion is identified, additional mitigation measures are required prior to impact outside the facility's property.

What are some of the economic benefits of allowing broader aquaculture activities in the rural industrial zone?

The aquaculture industry is a raising contributor to the Nova Scotia economy. The industry itself creates jobs, generates tax dollars, and directly injects international money into the local economy. This industry is particularly valuable because it can be in rural communities where it is difficult to achieve economic stimulus. The aquaculture industry also has the added benefit of creating spin off industry through the supply and processing end of the food supply.

What do farmed fish taste like? Are they the same quality as fished product?

Many (mistakenly) believe that farm raised seafood is bad and wild caught fish is always the premium product. Many factors can influence the taste of fish. The feed and harvesting process all play an

Q & A

important role in taste. Farm fished can be a sustainable complement to wild fisheries, supplement and support fishing livelihoods, and provide great-tasting healthy seafood.

Are there Open Flow land-based fish farms in NS and NB?

Short answer, yes there are many. Planning staff have been working diligently to research Canadian examples of land-based systems through a case study report. This report will be made available to the public and shared with Council shortly.

Open Flow is a general term used to refer to land-based systems that return some portion of the water they use back into the watercourse.

The most common land-based salt water open flow and re-use aquaculture systems in Atlantic Canada are likely those used in the lobster industry.

All land-based system types are generally regulated under the same framework, the concentration of nitrogen and phosphorous at the end of a mixing zone.

NEIGHBOURS AND COMMUNITY

Regarding Neighbours and Community, a Development Agreement gives the municipality the ability to create and enforce additional conditions. Additional conditions may include visual screening, noise reduction measures, and more.

We believe the additional controls and enforcement provided by a Development Agreement are sufficient to warrant considering broader aquaculture uses on a case-by-case basis.

Do aquaculture facilities smell? What regulations can be used to mitigate any impact on the community?

The most common continuous odor from land-based aquaculture facilities is generally related to the offline storage of captured solids, manure and uneaten feed. This odor is commonly limited to within 15m [50ft] of the solid's storage. Additionally, there are periodic activities which will produce a temporarily elevated odour. These are primarily the removal of the captured solids and incineration of mortalities. The frequency of these activities will vary both with the facility and the production cycle.

There are methods to mitigating smells and research being done in this area. For example, feed is generally stored inside, in sealed bags, and does not generate odor.

The Municipal Planning Strategy recognized that Aquaculture and other industrial type developments may require additional site-specific controls as they have the potential to create dust, pollution and other nuisance factors including smell.

Q & A

The Rural Development Designation will only permit certain types of land uses by site plan approval or development agreement rather than as-of-right. The land uses regarded as requiring additional site-specific control are land uses that have the potential for causing conflict with existing uses because of the potential for noise, odour, dust, pollution and other nuisance factors associated with such uses. These uses include but are not limited to large scale wind farms, shooting ranges, motor vehicle racetracks, intensive livestock operations, fur farms, salvage yards and industrial uses with potential to generate noise, odour, dust or pollution.

Council will be able to regulate unwanted odours through policies within Development Agreements based on the specific site. Generally, the operations would be expected to minimize and prevent any negative impact on surrounding properties by sound, odor, dust, fumes, or smoke.

Are aquaculture facilities noisy? What regulations can be used to mitigate any impact on the community?

The Municipal Planning Strategy recognized that Aquaculture and other industrial type developments may require additional site-specific controls as they have the potential to create dust, pollution and other nuisance factors including excessive noise.

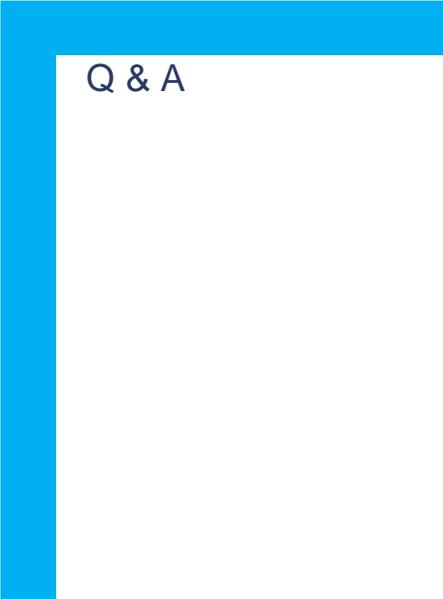
Council will be able to regulate unwanted odours through policies within Development Agreements based on the specific site. Generally, the operations would be expected to minimize and prevent any negative impact on surrounding properties by sound, odor, dust, fumes, or smoke.

Could land based aquaculture facilities produce significant light pollution?

The municipality can make use of the Development Agreements to ensure facilities would function within accordance to the Yarmouth dark skies tourism initiative. Lighting would feature horizontal cut offs to ensure light remains on the property. The facilities would not radiate light pollution.

Would the proposed changes affect residential zones in any way? Some residential zones already allow noisy, and potentially environmentally unsound uses, could this change open residential zones to even more industrial uses?

No. The proposed amendment to the Municipal Planning Strategy will only affect land zoned Rural Industrial. Furthermore, any future aquaculture facilities located in Rural Industrial zones adjacent residential zones will be required by development agreement to limit their impact on the residential zone through techniques like visual screening, and sound reduction measures.



Q & A