



*Location of future Chuntoh Ghuna
renewable biofuel facility*

Chuntoh Ghuna Biomass to Renewable Biofuel Facility in Prince George

PROJECT AND AIR DISCHARGE PERMIT OVERVIEW

May 2023



The World Needs to Transition to a Low-Carbon Economy

The way we use carbon is unsustainable, and the world needs renewable alternatives to fossil fuels to support our transition to a low carbon future. While many industries and transportation sectors are adopting new low-carbon technologies, some sectors, such as aviation and marine

transportation, need “drop-in” low-carbon solutions as it may be several decades before they replace their fleets.

Arbios Biotech can contribute to our collective need to reduce the impact of carbon on the environment.

Arbios Biotech is a joint venture between industry leaders Licella & Canfor, with a vision to provide **low-carbon, circular economy** solutions around the world. Arbios will create high-value, renewable biofuels from locally sourced biomass, like forestry residues, providing a sustainable alternative to fossil-based fuels.



The Arbios Chuntoh Ghuna facility in Prince George was given its name by the Lheidli T'enneh First Nation on whose unceded territory the facility will be located.

Working in Partnership

Arbios and the Lheidli T'enneh First Nation have been working in partnership on this project since its inception. It is important for both Arbios Biotech and the Lheidli T'enneh First Nation to ensure that the project is aligned on environmental and cultural values and we jointly experience working on a project that will contribute to reducing global CO₂e emissions. We are proud of our facility name, which means “the forest lives”.

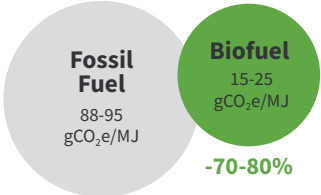
The Arbios Chuntoh Ghuna Facility is Demonstrating *First of a Kind* Technology in Prince George to Reduce Global Carbon Emissions

Arbios is excited to be pursuing a commercial-scale facility to develop and demonstrate the Cat-HTR™ technology. Taking a phased approach allows Arbios to integrate any learnings for lowering carbon footprint into future expansions.

The Arbios Biotech facility consists of 3 main areas:

- 1. biomass handling**, storage and preparation, and utilities
- 2. process area** which includes the Cat-HTR™ Hydrothermal Liquefaction process and supporting utilities
- 3. Bio-oil separation and storage**

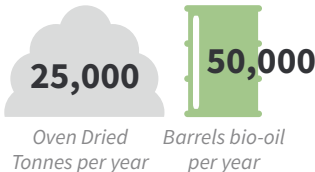
The bio-oil produced will be taken offsite and refined into high value renewable biofuels. This will initially take place in existing refineries.



Biofuels like those produced from Arbios' bio-oil can be up to 80% less carbon intensive than fossil fuels with similar properties.

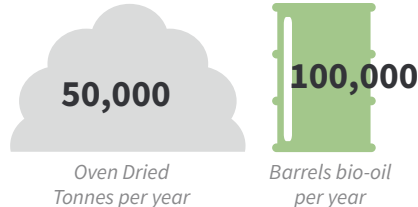
Source: <https://www.nrcan.gc.ca/energy-efficiency/transportationalternative-fuels/alternative-fuels/biofuels/biodiesel/3509>

Line 1



Line 1 + Expansion

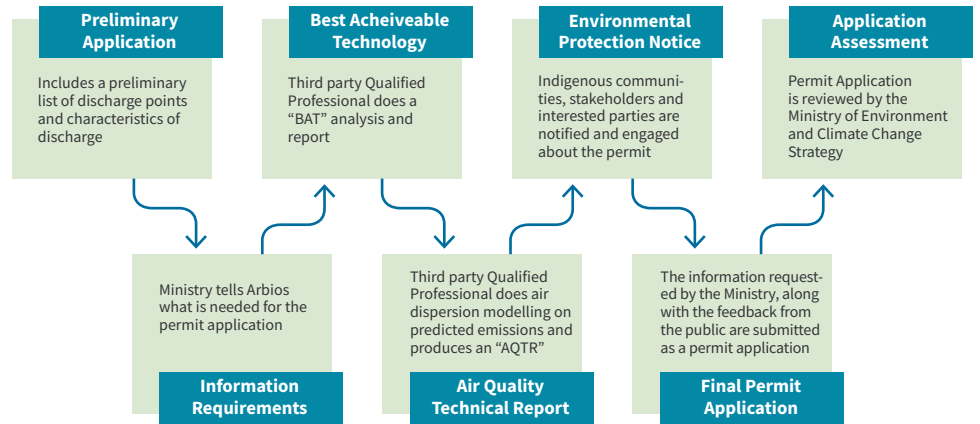
Air Discharge Permit is based on this volume



Arbios is Applying for an Air Discharge Permit

The Chuntoh Ghuna facility requires a new authorization to discharge waste under the Environmental Management Act (British Columbia). The Permit application will be reviewed by the Ministry of Environment & Climate Change Strategy, Environmental Protection Division.

While the modelling shows that when combined with the high background concentrations in the Prince George region maximum cumulative concentrations of Particulate Matter and NO₂ may exceed relevant Ambient Air Quality Objectives (AAQOs), with adherence to an environmental



“With adherence to an environmental management plan, the facility is not expected to adversely affect air quality in Prince George.”

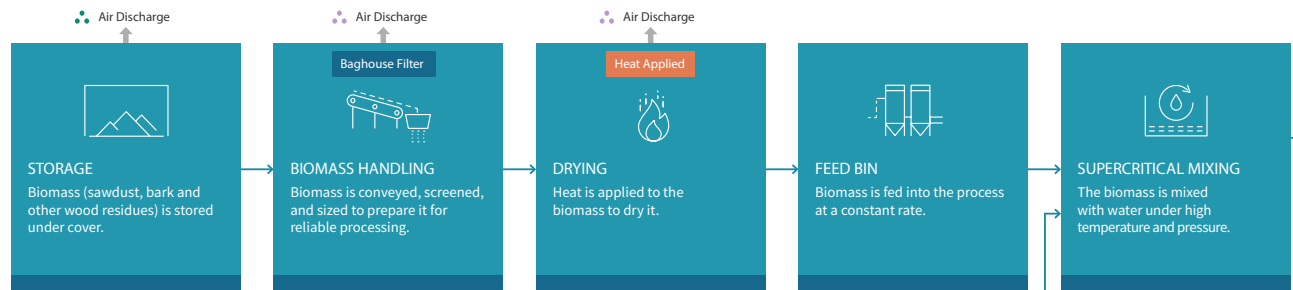
management plan, the facility is not expected to adversely affect air quality in Prince George.

For Particulate Matter, maximum potential discharges from the Chuntoh Ghuna facility may result in exceedances of the AAQO only within 200 m of the Facility.

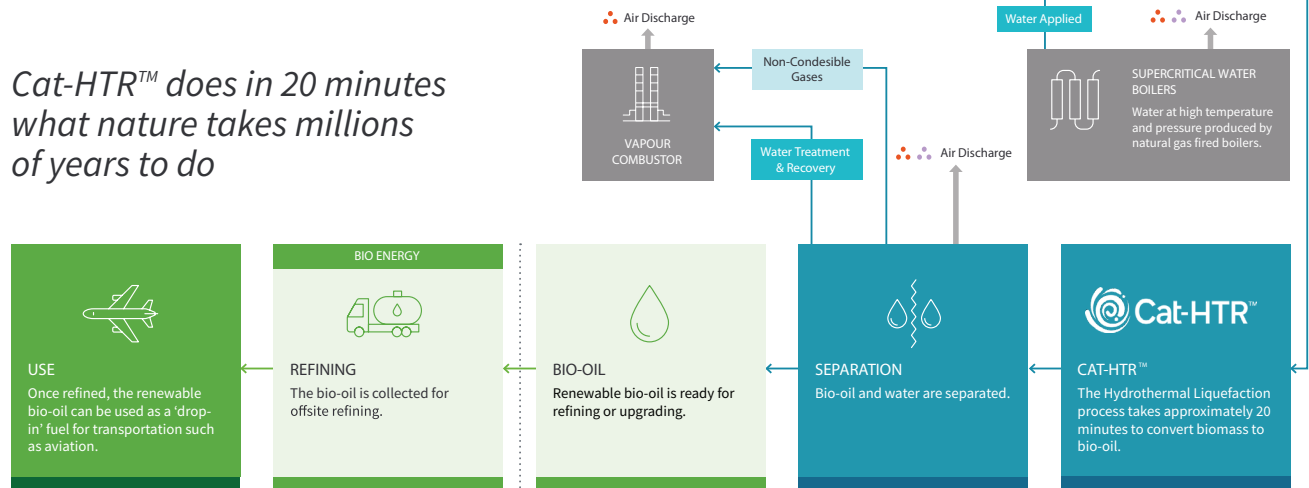
For NO₂, exceedances of the 1-hour AAQO are predicted in an area within 3 km of the facility, however exceedances are expected to be very infrequent.

Maximum modelled concentrations for SO₂ are expected to remain well below the AAQOs.

It should be noted, the air dispersion model is based on the Chuntoh Ghuna facility emission rates at their maximum permitted levels throughout the year. As stated in the Air Quality Technical Report, *“In reality, the average emission rates during facility operations are expected to be considerably lower”*



Cat-HTR™ does in 20 minutes what nature takes millions of years to do



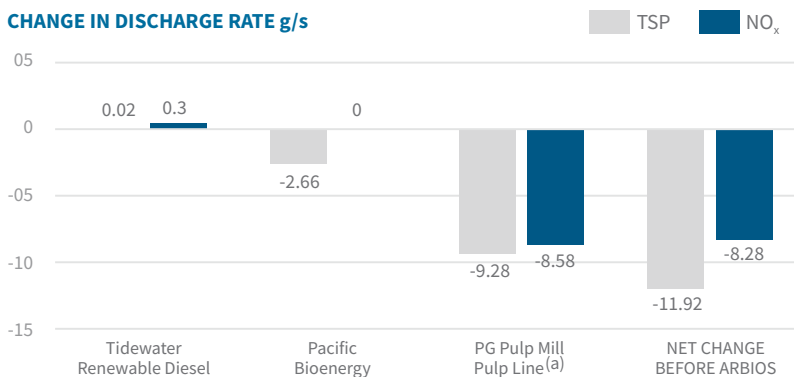
AIR DISCHARGE TYPE: ●●● Particulate Matter (non point source and/or miscellaneous) ●●● Particulate Matter ●●● NOx, SO2, CO

The Industrial Impact on the Airshed in Prince George is Changing

The Chuntoh Ghuna facility's air dispersion modelling is based on a recent micro emissions inventory conducted in Prince George. Since the emissions inventory was last updated, **three key changes in industrial sources have or will occur before the Chuntoh Ghuna facility is commissioned:**

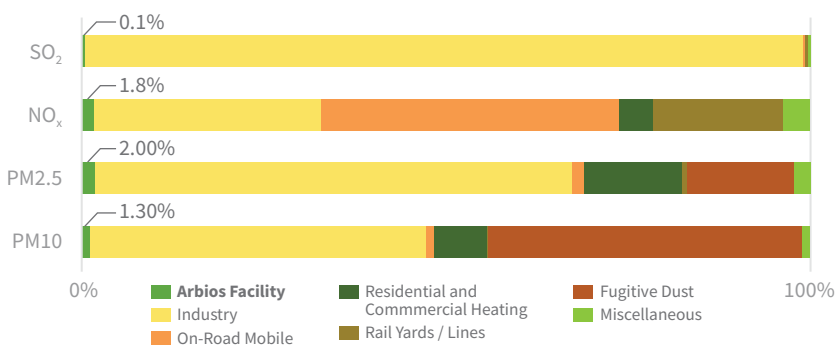
- the closure of the Pacific Bioenergy Pellet facility,
- the future addition of the Tidewater Renewables facility, and
- the closure of the pulp line at PG Pulp Mill.

CHANGE IN DISCHARGE RATE g/s



At maximum permit emissions, **the Chuntoh Ghuna facility would account for no more than 2% of emissions in the Prince George airshed.**

PERCENT CONTRIBUTION



(a) Based on data input for the most recent Micro Emissions Inventory (Nilson, B., Jackson, P., Ainslie, B., and Roth, G. 2010)

Find Out More

There's much more information about the air dispersion modelling, the Air Discharge Permit application, Arbios and the Chuntoh Ghuna facility on our website at www.arbiosbiotech.com

Frequently Asked Questions

Does the facility need an environmental review process like the Federal Impact Assessment process or the BC Environmental Assessment Process?

Our facility is too small to trigger these processes, but we are still required to have permits that are relevant to the facility's equipment and operations. Arbios and the Lheidli T'enneh First Nation have conducted a voluntary joint environmental due diligence process which examined areas of interest to the Nation that included environmental protection as well as Indigenous interests and traditional use. The results of this process are being used to inform our procedures and mitigations during construction and operations.

Will the facility increase road traffic in Prince George?

For the first processing line, we expect 4 trucks a day to call at the facility. In addition, there will of course be some additional deliveries to the facility for the provision of goods and services. We expect this volume to be a minor addition to the road traffic in Prince George.

Does the facility burn biomass?

No, the facility uses water at high temperatures and pressures to convert biomass into bio-oil in about 20 minutes - something that nature takes millions of years to do.

Is the air dispersion model based on the most recent data?

The model was run for a 3-year period from January 1, 2013, to December 31, 2015. This was the most recent 3-year period during which the most representative meteorological data were available.

What type of feedstock will you use and where will it come from?

The small and modular configuration of Arbios facilities means that they can be located close to feedstocks, which reduces the carbon intensity for transportation of the biomass. Prince George is a natural location for the supply of woody biomass, and the Chuntoh Ghuna facility will be able to process bark, shavings and sawdust - typical sawmill residues. Our biomass volumes are quite small in comparison to other industry usage in the region, and we have already secured our initial supplies for when we start operating the facility.

Why is this positive for Prince George?

The Chuntoh Ghuna facility will create between 15 and 50 skilled jobs in Prince George, ranging from Process Operators to Plant Manager. We are using mostly local companies to build the facility, and there will be ongoing contracts to support the facility in operation. Prince George is an ideal location to demonstrate this sustainable way of utilizing sustainable biomass to produce renewable biofuels, making a difference to global emissions, and growing the regional bio-economy.

How do I find out more about Particulate Matter and NO₂?

More information on Particulate Matter and NO₂ can be found here:

<https://www.healthlinkbc.ca/healthlinkbc-files/particulate-matter-and-outdoor-air-pollution>

<https://www.env.gov.bc.ca/soe/indicators/air/fine-pm.html>

<https://www.healthlinkbc.ca/healthlinkbc-files/indoor-air-quality-combustion-products>

<https://www.env.gov.bc.ca/soe/indicators/air/no2.html>

We are seeking your feedback on the Air Discharge Permit Application... and on the project in general.



For a faster response, you can contact us at any time at info@arbiosbiotech.com

Alternatively you can contact us by writing to: **Arbios Biotech, PO Box 21130, Prince George RPO Sprucedland, BC V2M 7A5**

www.arbiosbiotech.com

