Micro-Hydro in the Context of Community Forestry

Common characteristics: Both Micro-Hydro and Community Forestry are long term and sustainable, have low environmental impact, create value, and displace or replace less desirable activities or resource uses. Both utilize a commonly-owned and controlled resource and both can be made to benefit the whole community.

Synergies: Micro-Hydro generated electricity can be used to facilitate other uses of a Community Forest, by powering a facility such as an eco-lodge, interpretive or educational centre, or even a small value-added mill or manufacturing facility.

Educational value: Micro-Hydro can demonstrate the value of watersheds and the effects of seasonal flow variation which can in turn be impacted by forestry activities. The design and construction involve aspects of engineering, environmental assessment and contracting.

Environmental awareness: Micro-Hydro planning and construction must reflect an understanding of aquatic life and its needs.

Sustainable engineering: Designing for mitigation and avoidance of permanent impact on fish, amphibian and invertebrate populations and habitat is a necessary part of Micro-Hydro design and construction.

Micro-Hydro Development Steps

Determine if there is a cost-effective potential to generate power: This requires surveying the creek with altimeter and hip-chain and estimating water flow (and its seasonal variability), followed by simple calculations for power and more complex calculations for cost. Non-grid-connected multi-kilowatt projects can often be justified up to $4000 per kW; grid-connected projects ordinarily should remain below $2500 per kW. Labour and heavy equipment are factors that can easily push the cost over these thresholds. Often the project owner's "sweat equity" can keep a project economically viable.

Evaluate access to the site: This depends on property ownership and existing roads and trails, or suitable ground to build them on.

Determine environmental values and risks: These are influenced by size and steepness of the creek, natural barriers to fish and understanding of fish habitat and seasonal use by fish species. Input from a fish biologist may be required. Does the creek present hazards to the Micro-Hydro facility? Could the creek change in course or flow with time?

Determine disposition of generated power: Should the plant be grid-connected? How large are present and future loads, and how do they vary throughout the day and the year? Can daily or seasonal power surpluses be used beneficially? Can the power be used to serve more than a single load?

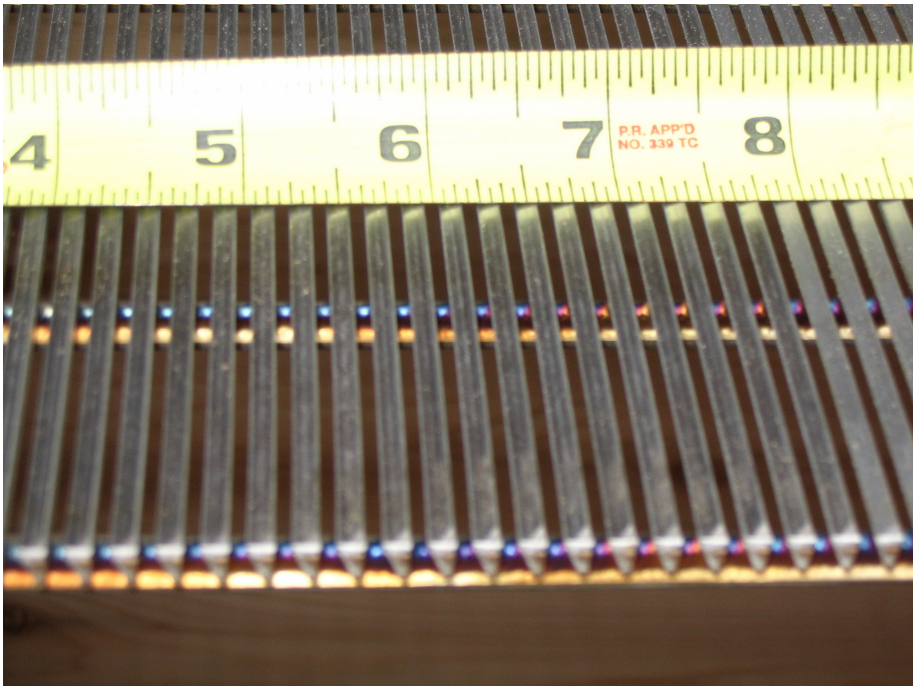
Water license application: Does the proposed project meet the BC Government-required criteria?

Obtaining equipment and expertise: Type of penstock, turbine and generator; degree to which mechanized equipment (excavators, etc.) is used; siting and design of intake and powerhouse; screening at intake; dealing with ice and debris; transmission of power; governors, load and power controls; physical and electrical safety design and devices.

Intake Up

Intake Down

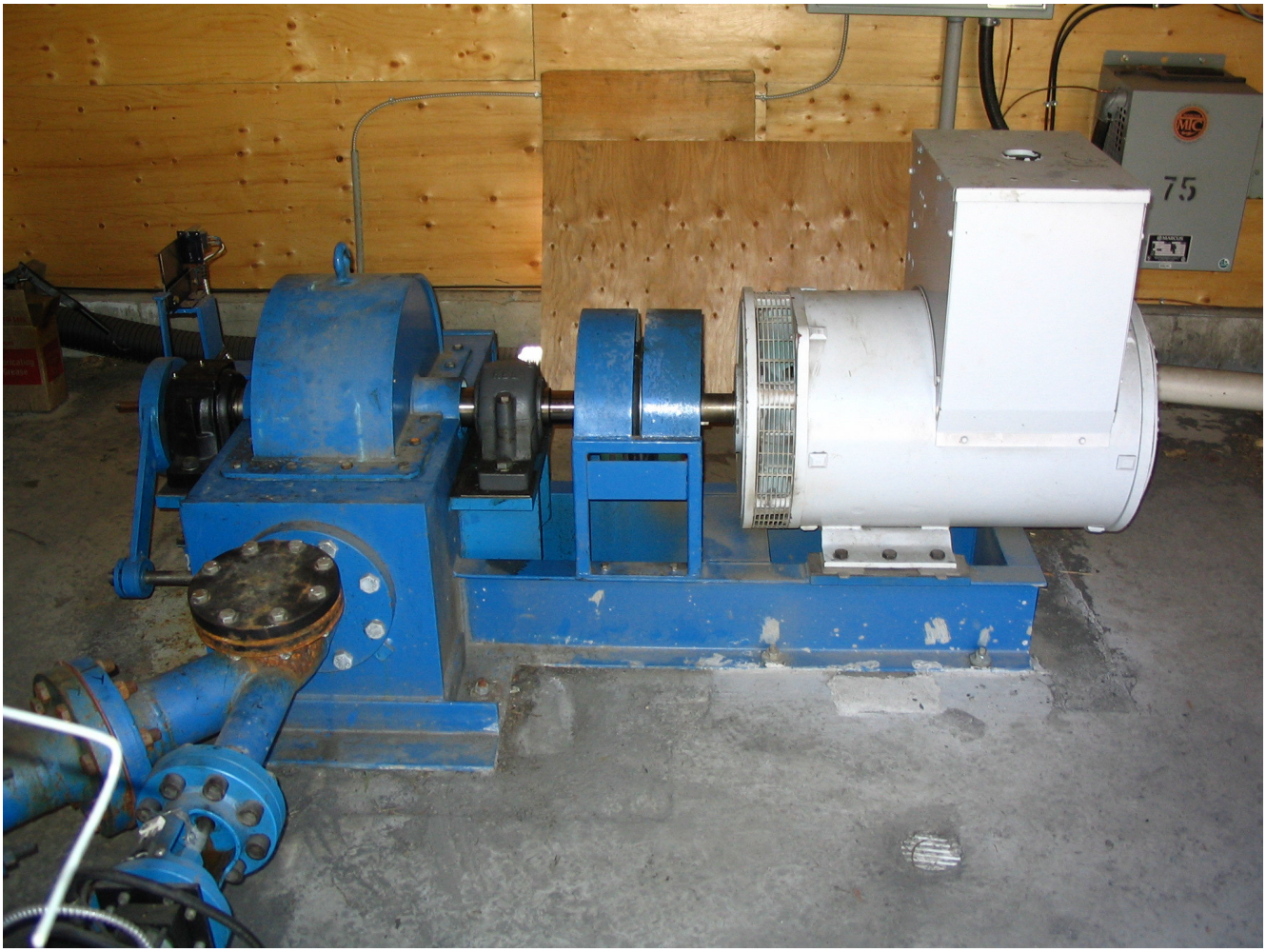
Mulvey intake



Salisbury intake screen

Pelton wheel

control box



Turbine Engine