COMMUNITY INFORMATION:
Location: British Columbia, 300 km northwest of Victoria
2008 Population: 330 on reserve, 618 off reserve
Area (hectares): 321,000

PROJECT INFORMATION:
Projected Cost: $14 million
Power Capacity: 5.5 MW
Projected GHG Reductions: 9,000 tonnes of CO_2 annually

CONTACT INFORMATION:
Phone Number: (250) 725-3233
Website: www.tla-o-qui-aht.org

Tla-o-qui-aht First Nation
Run of River Hydro

"The more information you have, the better your end result will be, and the fewer costly surprises you'll encounter." Jamie Bassett, Director of Economic Development, Tla-o-qui-aht First Nation

Canoe Creek Hydro is a corporation with a conscience. Formed as a partnership between Tla-o-qui-aht First Nation (75%) and Swift Water Power Corporation (25%), the company's first development was a 5.5 MW hydroelectric project on Canoe Creek. This project generates enough energy to power about 3,000 Vancouver Island homes. The First Nation is now looking at developing two more sites: Winchie Creek (4.4 MW) and Haa-ak-suuk Creek (7.5 MW). These sites were chosen after a rigorous process that began with a preliminary investigation of the 8 to 10 creeks that had potential for hydroelectric development within Tla-o-qui-aht First Nation's traditional territory. These locations have been chosen for minimal fish interference, proximity to existing power lines, and short pipe requirements. The selection process took approximately 6 months and $30,000, which was provided by INAC's Aboriginal and Northern Community Action Program (ANCAP) of 2003-2007.

The Process

Once the decision was made as to which site to focus on, Tla-o-qui-aht First Nation began the permitting and energy purchase agreement process for the Canoe Creek hydro project. They applied to ecoENERGY and Aboriginal Business Canada for approximately $1 million in funding for the development of a business plan, as well as all the elements that negotiation of an energy purchase agreement entailed, including the interconnection study. According to Jamie Bassett, Tla-o-qui-aht First Nation's Economic Development Director, the First Nation wisely spent 15-20% on preliminary engineering studies, such as Lidar surveying (a surveying technique using laser digital technology), penstock layout, road design, geo-technical work and terrain stability analysis. These studies formed the basis of the business plan, and made future steps more fluid and reliable. Partially as a result of this up-front spending, the Canoe Creek hydro project is within 1% of the projected budget, and ahead of its completion schedule.

Solid Partnerships

According to Bassett, other elements that have been key to the success of the Canoe Creek hydro project have been the support from Indian and Northern Affairs Canada, and the solid partnership with Swift Water Power Corporation. The only hindrance to the process has been access to financing, which took almost a year due to the poor credit climate during the project's search for financing.

Bassett remembers that the initial idea for the Canoe Creek hydro project came from one Councillor, Ray Martin, who in the early 2000's said, "I think we should be looking at this". "That kernel of an idea to start the process is often all you need to get things moving, along with a Chief and Council who are prepared to stand behind the project from beginning to end," Bassett says. This includes financial commitment; Tla-o-qui-aht First Nation contributed significant bridge financing to the project before long-term financing was found.

Smart Investments

The Canoe Creek hydro project is not only a step towards energy and financial self-sufficiency for Tla-o-qui-aht First Nation. It is also a very deliberate investment in an opportunity to develop an energy project that does not deplete natural resources. In this way, the First Nation hopes to stay true to its vision of sustainability while fostering economic development within its community. In order to maintain consistency with its sustainable development ideals, significant environmental planning and research was conducted to ensure that the First Nation traditional territory is protected, including the Kennedy River watershed (within which the Canoe Creek project is located) and surrounding wildlife. For example, small roads, buried penstock, and strict creek level control will minimize environmental degradation. Tla-o-qui-aht First Nation's ultimate goal is to reinvest the profits from the Canoe Creek hydro project into other economic and social development programs. It wants to rebuild dwindling salmon stocks in the area and rehabilitate the local fish habitats, as well as explore other ways to generate clean energy. An example currently being explored is the development of a wind farm on a high plateau within the First Nation's traditional territory. Over time, the increasing demand for clean energy will provide the opportunity and the mechanism by which the First Nation will move towards self-sufficiency.

Canoe Creek
Photo by: Tla-o-qui-aht First Nation

Construction of Canoe Creek Hydro Project
Photo by: Tla-o-qui-aht First Nation

"Develop a relationship with a joint venture partner that you trust, and stick with it. If you want to move quickly, you'll need their expertise. But make sure they're experienced, as well as committed to the project."

Jamie Bassett, Director of Economic Development

WHAT IS RUN OF RIVER HYDRO?

Two types of hydroelectric projects are common: those created by storing reservoirs of water behind a dam and "run of river" hydro projects. Run of river hydro does not store large quantities of water behind a dam. It is dependent on the flow of water in a river for generating power. Hydro projects generate power by passing water that is under pressure through turbines. Run of river hydro develops this pressure by using drops in elevation.

In run of river hydro systems, a small dam or weir (about 1 to 3 meters high) is typically built across a waterway which directs the water in the river toward the "intake" point. After the water has come through the intake, it is channeled along canals, tunnels or pipelines that run both parallel to, and above the river, to a point downstream. At this point, the water is allowed to fall through a pipe or penstock down to the powerhouse where it spins turbines to create electricity. The water is then channeled out of the powerhouse so that it can rejoin the river.

Run of river projects are most cost effective when the water does not have to be channeled far from the intake before it can be used. In other words, the faster a river descends after the intake point, the better. An ideal situation would be to have a waterfall just downstream of the intake. Sometimes, in more mountainous regions, the project can dispense with the canal and simply send water down the penstock directly from the intake. In less mountainous regions, however, a canal may be built up to one kilometer before enough elevation is achieved to allow the water to drop into the powerhouse. A three to five meter drop is generally the minimum required for the smallest run of river hydro projects.

RUN OF RIVER HYDRO POWER SUMMARY

Description:	Diversion of part of a river's natural water flow through pipes and turbines to generate power and returning the unaltered water to the river downstream
Minimum Flows Required:	• 0.5-12 m^3/s (off-grid) • 12 m^3/s (on-grid)
Electricity Costs:	~5-20cents/kWh
Positive Features:	• 30-50+ year lifespan • Stabilizes long-term electricity costs • Grid connected sites can often be cost-competitive even without subsidies
Challenges:	• Reliability of year-round flows • Possible impacts on fish habitat • In northern regions, freezing and blockages may be a problem, especially at intakes and along slow flowing canals.

Source: *Aboriginal Energy Alternatives, Pembina Institute*