Addition to submission by K Lippiatt

I'm Power systems Engineer, Bushcraft Instructor & Conservationist

My additional submission:

ENG – R5

Renewable Electricity Generation

Activity Status Permitted

1. The construction, operation, maintenance, repair and upgrading of small and community scale renewable electricity generation shall comply with the following standards.

   Add:
   Hydro generation is only permitted on rivers already modified by generation, mining, or other human modifications.
   Where there is a proposal in install hydro generation on a Wild river with no existing structures, **this must be notified.**

   Reason
   Even "run of river" generation modifies the environment. Water flow is removed from the river and piped to the generator. Thus the environment is significantly modified for the local flora and fauna.

Additional Information:

- Diverting large amounts of river water reduces river flows, affecting water velocity and depth, reducing habitat quality for fish and aquatic organisms; reduced flows can lead to excessively warm water for salmon and other fish in summer.[3]
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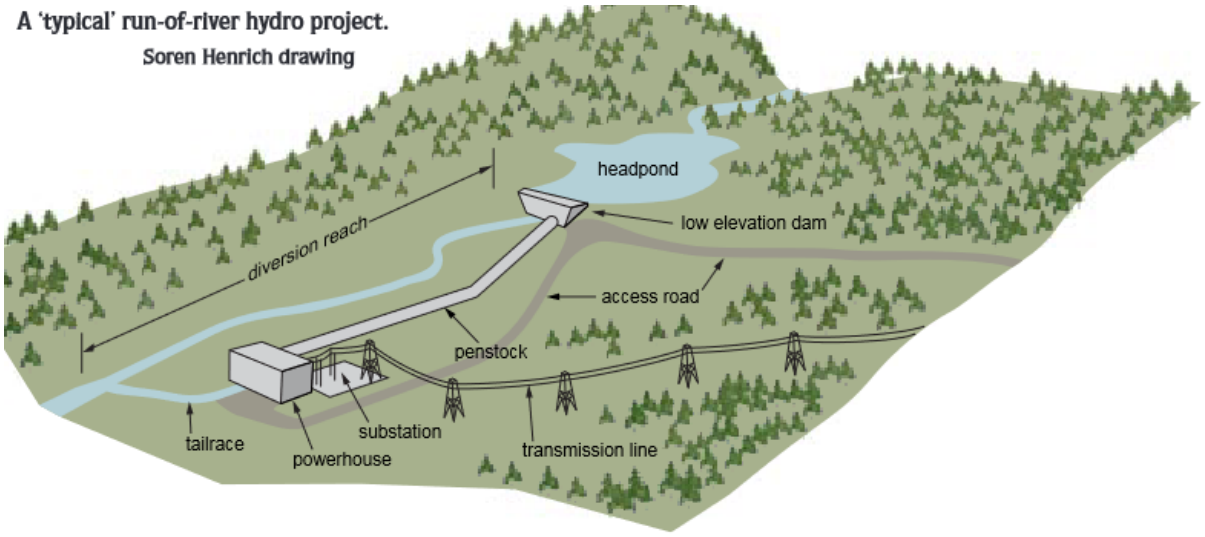
- In undeveloped areas, new access roads and transmission lines can cause habitat fragmentation, allowing the introduction of invasive species.[3]



What is run-of-river hydropower?

Run-of-river hydropower diverts some of a river's flow to power electricity-producing turbines, returning the water downstream of the turbines. Turbines are not installed in the river itself. Each project requires significant infrastructure, and always includes the following (as shown in Figure 1):

- A small dam to create a 'headpond.' This headpond does not store water; it merely floods a sufficient area to ensure that the intake to the penstock is under water.
- Pipes, known as 'penstocks,' deliver water from the headpond to the lower-elevation turbines. Penstocks are often three or four kilometres long.
- A powerhouse building that contains one or more turbines.
- A 'tailrace' channel through which the diverted water is returned to its river of origin.
- Access roads to the headpond and powerhouse.
- Transmission lines from the powerhouse to the nearest Distribution or Transmission line

The construction costs of run-of-river projects are significant—as are their terrestrial and aquatic 'footprints.' The section of river between the dam and the powerhouse (see Figure 1) is sometimes called the 'diversion reach,' because significant quantities of water are diverted from this section of river. When done properly, with care given to footprint size and location, these projects can create sustainable green energy that minimizes impacts to the surrounding environment and nearby communities.

Construction of the penstock at Furry Creek. IPPBC photo.

Run of River can be significant, in size and construction:

From Wikipedia, the free encyclopedia:

Chief Joseph Dam near Bridgeport, Washington, USA, is a major run-of-the-river station without a sizeable reservoir

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A small and floating run-of-the-river power plant in Austria.

A small dam is usually built to create a headpond ensuring that there is enough water entering the penstock pipes that lead to the turbines, which are at a lower elevation.[3] In general, projects divert some or most of a river's flow (up to 95% of mean annual discharge)[4] through a pipe and/or tunnel leading to electricity-generating turbines, then return the water back to the river downstream.[3]

The use of the term "run-of-the-river" for power projects varies around the world. Some may consider a project run-of-the-river if power is produced with no water storage, but limited storage is considered run-of-the-river by others. Developers may mislabel a project run-of-the-river to soothe public perception about its environmental or social effects. The European Network of Transmission System Operators for Electricity distinguishes *run-of-the-river and pondage hydropower* plants, which can hold enough water to allow generation for up to 24 hours (reservoir capacity / generating capacity ≤ 24 hours), from *reservoir hydropower* plants, which hold far more than 24 hours of generation without pumps.[6]

Many of the larger run-of-the-river projects have been designed to a scale and generating capacity rivaling some traditional hydroelectric dams.[8] For example, the Beauharnois Hydroelectric Generating Station in Quebec is rated at 1,853 MW.[9]

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[3]Douglas T, Broomhall P, Orr C. (2007). Run-of-the-River Hydropower in BC: A Citizen's Guide to Understanding Approvals, Impacts and Sustainability of Independent Power Projects