
November 18, 2010

Martha Anslow
Environmental Assessment Office
836 Yates Street
Victoria, BC
V8W 9V1

Dear Martha Anslow: **Kokish River Hydroelectric Project**

This submission is the result of a joint effort by Perry Wilson of the BC Fly Fishers Federation, Shayne Vollmers of the Vancouver Island Whitewater Paddling Society, and Ray Pillman of the Outdoor Recreation Council of BC.

Note that Shayne Vollmers is submitting further comments on the Kwagis Application on behalf of the Vancouver Island White Water Paddling Society. Perry Wilson's comments are fully included in this submission.

**Background of the Team Members**

Perry Wilson is based in Port McNeill, B.C. and was born and raised there. He is Vice President of the BC Fly Fishers Federation and its Regional Representative. He has been a sport fishing guide on Vancouver Island since 1982. He has long experience and knowledge of the fish and aquatic species issues of the Kokish and of many other rivers in the region.

Shayne Vollmers teaches school in Parksville . He is the River Impacts coordinator of the Vancouver Island Whitewater Paddlers Society and is especially familiar with the opportunities, joys and challenges of paddling the Kokish River.

Ray Pillman is a professional engineer retired from a long career in hydroelectric planning, design and management. He is a past president, now a senior advisor, of the Outdoor Recreation Council of BC. For the past 20 years he has represented the Outdoor Recreation sector in the province's land and water use planning initiatives. He now resides in West Vancouver. In his early years he lived in Beaver Cove and adjacent areas within a few kilometers of the Project site, and worked mainly in the fishing industry. He has fished in, and sailed and kayaked much of the BC coast.

**Our Key Issues and Concerns:**

In concept the Kokish Project looks attractive in that its energy production is based largely on late fall and winter rainfall, when the province can make best use of additional supply, in that it requires only a very short transmission line connection to the Vancouver Island grid, and in that it is located in an area that is already industrially developed to some degree.

The massive Kwagis Power Application for Environmental Certification document and the work that went into it is very impressive. However, and nevertheless, as it is presented in the Application the Project faces some serious challenges in avoiding, mitigating and compensating for the adverse impacts that its construction and operation would create.

The following Comments and Questions are submitted to record our opinions and objections and to seek answers to questions on whether and how the impacts could be avoided or adequately mitigated and/or compensated:

**1. Fisheries Concerns:**

Our main fisheries concern is for the health and the very survival of the summer steelhead, which have become rare on the East Coast of Vancouver Island. The conservation of salmon populations is also important, but their health cannot and should not be considered as a substitute for nor sought at the expense of the steelhead.

We have selected the Water Temperatures and Migration Sections in the Application as the primary issues on which to offer detailed comments and to pose questions. We will comment more briefly on some of the other Sections. To a very considerable extent our observations, comments, questions and criticisms on other Fishery Sections would be similar to those on the primary ones.

Our major criticism is that while the presentations on Potential Effects are generally rigorous these are followed by presentations on Mitigation, Compensation, Characterization of Residual Effects, Determination of Significance and Conclusions that are not well supported by evidence and that almost invariably pronounce adverse effects of the Project to be insignificant, neutral, short term, temporary, low magnitude, etc. which pronouncements we consider to not have been justified by the Proponent's assessment process.

**1.1 Water Temperatures**: As stated in Section 8.5.9 of the Application water temperatures are naturally higher in the low-flow, warm summer months. With diversion for power production the low-flow period in the diversion reach would be extended

considerably, with the result that the temperatures in the reach would be higher than they would be naturally and the period of high temperatures would be longer. The adverse effect on the survival of fish species, e.g. steelhead would, therefore, be greater.

Table 25.2 in Section 25.2, under Water Quality, Changes in Water Temperature it is recognized that reduced flow in the diversion reach would lead to increased heating and cooling. The mitigation measure proposed is: *"A long-term Monitoring Plan will be developed and implemented"*. Comment: A long-term monitoring Plan should be implemented but this would not prevent creating mortalities initially and for many years to come. Under Residual Effects, table 25.2, the likelihood of adverse effects is stated to be high, but amazingly the residual effects are expected to be neutral, low magnitude, local, long term, continuous, and reversible, and to be not significant.
Question: How can long term monitoring which would kill a significant number of rare summer steelhead be considered not significant?

It may be possible through simulation studies to approximate the extent and timing of flow releases to the diversion reach that would be required to keep temperatures within an acceptable range, but these determinations would need to be tested in practice after the Project is built. To be rigorous the testing would involve reducing the flow to the extent of causing mortalities. A way to avoid this would be to set the lower limit at a conservatively safe level. This would result in considerable reduction of summer energy output.
Question: Is Kwagis willing to reduce power production sufficiently to safeguard the steelhead year after year, and how could relevant authorities and public watch dogs be assured that future managers and possible new owners of the Project would continue to adhere to such a policy?

**1.2 Migration:** Section 11.5.5.1 Potential Effects states that:
"*The construction of the intake has the potential to affect upstream migration of fish by delaying, impairing, or blocking upstream migration of adult fish, and by impairing, downstream migration of juvenile fish.*

*Project operation has the potential to affect migration through the use of project infrastructure and the diversion of flow. During operation, it is possible that upstream adult migration may be interrupted or delayed due to the influence of attractant flows and odours released into the lower river via the tailrace. Reduced flows in the diversion may alter width, depth, and velocity of the river, which may create additional obstacles and/or barriers to upstream and downstream migration of adult and juvenile fish. Reduced flows in the diversion section may also cause a blockage of passage into tributary streams. During operation, the intake weir creates an obstacle to upstream migration by adult and juvenile fish and the diversion of water into the penstock causes the potential for entrainment of fish during downstream migration."*

Section 11.5.5.2 Mitigation states:

*" All work in and about a stream will be scheduled to coincide with approved fisheries timing windows".*
Question: Does this mean that the approval authorities will largely be responsible for any adverse results? Comment : Construction of the intake and weir, even at an optimum time, would have an adverse effect on fish, which are continually present in some form in this area. Question: How can approved timing windows be considered a significant mitigation?

*" Fish and amphibians will be salvaged prior to the temporary diversion of flows at the intake site and at the penstock/tributary crossings."* Questions: How is the success of salvaging measured? What has been the success rate on similar projects elsewhere? How would the salvage be carried out? What success is expected in terms of steelhead and other species? How significant is this in terms of numbers of steelhead that will survive compared to pre-Project survival?

Section 11.5.5.3 Characterization of Residual Effects states:

*"The potential residual effects of the construction of the intake will be a neutral, low magnitude, local, short-term, will occur once, are reversible and will occur in an undisturbed context. The efficiency and success of the mitigation measure proposed to prevent or minimize the potential effects are proven. With the implementation of these mitigation measures, residual effects are expected to be non-existent or minimal."*
Question: How can the residual effect of interrupting, delaying, altering stream widths and creating obstacles and barriers be considered neutral and reversible in the context of the limited effectiveness of the mitigation proposed?

*"During Project operation residual effects from diversion of flow on upstream migration (including both attraction to tailrace flows and reduced flows in the diversion) will be neutral, low magnitude , local, long-term, will occur occasionally, are reversible and will occur in an undisturbed context. The Adaptive Resource Management Plan* ***(Appendix 11-C****) includes a commitment to release flows to ensure there are no unauthorized residual effects from flow alteration on upstream migration."* Comment: ["There is no working solution at the moment to reduce tailrace confusion and it was suggested that agencies accept the risk by engaging in an Adaptive Management Experiment" – Ptolemy- Oct 6, 2010] Comment: Attacking this uncertainty with Adaptive Management would risk destroying the summer-run steelhead and damaging populations of other species!

Similar statements are made and conclusions are reached in the Application for residual effects on downstream migration, on diversion of flow on migration into tributary habitat within the diversion, and on residual effects from the intake weir and entrainment on fish

migration. However, for the latter it is pointed out that *" Although tests of the Coanda screen have shown that it successfully passes juvenile salmonids with high rates of survival, tests have not been made in the exact conditions that will be present on the Kokish River. Site specific design is required to ensure the screen functions effectively at this site."* Comment: Coanda screens, as well as other types of screens, can clog up from debris, of which large amounts will continue to arrive in flows from Ida Lake; and so, flushing and cleaning would be required frequently and possibly for extended periods. Even if this were attended to 24/7, which is unlikely, preventing and controlling fish entrainment from reducing losses to pre-Project levels is not assured.

Observation: The effectiveness of the proposed mitigation measures to reduce substantially the possible and probable adverse effects of the Project on migration have not been proven and is not evident from the information provided in the Application and its Appendices. The Characterization of Residual Effects and Determination of Significance sections appear to be excessively optimistic big jumps of faith from the more the credible Potential Effects sections.

**1.2.1 Adaptive Management** can, if properly used, be an effective tool for dealing with situations of uncertainty and limited knowledge . This usually requires long-term commitment by management and considerable investment of time by highly-qualified staff that would otherwise not be required for operational management.

In the simplest terms Adaptive Management means Learning From Your Mistakes. It does not prevent the making of mistakes, nor can it retroactively correct past mistakes. It encourages keeping track methodically of operational decisions and how they pan out and the making of better decisions in future on the basis of what has been learned. It is not nearly as effective for protecting the environment as abiding by the Precautionary Principle, which requires that high risk irreversible actions be avoided. It means that potentially, and even likely, damaging or sub-optimum solutions could be tried for a time. This could be justified in situations where the damage to the resource could be tolerated for a given period without serious irreversible damage.

In the Kokish situation it could and almost certainly would result in irreversible damage to rare steelhead and other fish species and aquatic resources, especially to summer steelhead. Trial and error programs to determine diversion rates to control low-flow, warm-season temperatures, to try to determine solutions to tailrace confusion effects, to determine acceptable flow ramping rates for the diversion reach all fall into this category. In our opinion Adaptive Management cannot be considered an effective mitigation for the adverse effects that these trials are intended to generate.

Adaptive Management has been used in some industries to weaken environmental protection where adhering to the Precautionary Principle is considered too limiting and inflexible by those who see environmental protection as too much of a burden for the

industry. In such situations it has been used as a loop hole for avoiding or softening regulations rather than as a management tool.

## 1.3 Other Fishery Issues/ Concerns:

### 1.3.1 Compensation:

The Application relies on Compensation as well as Mitigation to reduce the adverse effects of the Project.

Our Comments and Questions on the Compensation Plan described in Fisheries Appendix 11-C are based largely on the submission of October 6, 2010 by Ronald A. Ptolemy R.P. Bio. of M.O.E. and further detailed discussion with him:

1. Creating six off-channel spawning channels off the lower reach of the Kokish River downstream of the Powerhouse site might be used by some salmon species but would not be used by summer- run steelhead (which spawn in the upper reaches) and would not contribute to their preservation.

2. Modification of the barrier at km. 11.3 would increase access of salmon species and winter steelhead to the upper reaches of the Kokish River and beyond. This would result in the displacement of the summer steelhead. Retaining the natural barrier is considered essential for their survival. Note also that fish ladders are not always effective. There have been some significant failures. A fish ladder at the km. 11.3 barrier would be subject to frequent high energy peak flows and to severe impacts by large pieces of woody debris (logs). It would also be subject to sediment deposits that would render it ineffective.

3. Removal of logs and woody debris from the Bonanza River between Bonanza Lake and Ida Lake would not have appreciable positive effect.

4. Placing spawning gravel to create spawning areas: This has been tried on the Kokish. The gravel beds would be difficult to keep from being silted over and being flushed out by high flows. These cannot be counted on to compensate much for the Project's adverse effects.

5. Restoration of Riparian Vegetation would be effective but would not be very significant because the area involved would be quite small.

Regrettably the compensation measures proposed cannot be considered to provide significant compensation for the adverse effects of the Project.

### 1.3.2 Ramping of Diversion Reach Flows:

Controlled Ramping: Testing of controlled ramping, which would include survey of fish stranding, is proposed during the Commissioning of the Project. This would result in summer steelhead mortalities, which could threaten the survival of this rare species in the Kokish watershed.

Fast, Uncontrolled Ramping during operation, resulting from sudden changes in power generation by the Project, could cause rapid changes in the flow rate in the diversion reach, the magnitude depending on the generation output at the time. These changes could be rapid increases due to shutting down generation units because of sudden loss of load or of closing the intake gate, or they could be decreases due to unplanned isolation of a section of the transmission line from other generation sources and consequent automatic picking up of the load by the Kokish units.

The result of these fast, large flow changes in the diversion reach could be fatal to fish and to kayakers and fishers in and within the banks of the River. Means of mitigating such increases and decreases, whether caused by equipment malfunction or human error, are limited. Although not frequent power outage events such as these are not uncommon. They have occurred on the Vancouver Island system.

**1.3.3 Water Chemistry:** Please see Item **3.0** Engineering and Construction Concerns.

**1.3.4 In Stream Flow Requirements:** The IFRs proposed may be too low [ Ron Ptolemy – October 6, 2010].

**1.4 Conclusions on Fisheries Issues:**

The Application relies on the proposed mitigation and compensation measures to compensate for the adverse effects of the Project. Regrettably, based our assessment of these proposed measures we cannot conclude that these measures would be effective.

## 2.0 Navigation Concerns :

The Kokish River provides intermittent, seasonal challenging opportunities for high-intermediate and expert white water kayakers and canoeists to experience the joys of paddling in a spectacular mountain river setting.

Based on available geographic information and on extensive information provided by the whitewater paddling community the Application describes accurately the geographic, climatic and hydrological conditions which govern the Kokish River's usability for white water kayaking and canoeing.

Being dependent for its flows mostly on the rains that fall in the upper reaches of its drainage area, but which are moderated somewhat by the effect of two lakes and seasonally by melting snow, the Kokish is still a flashy river, although not as volatile as some other East Coast Vancouver Island rivers and streams.

The limits for safe paddling, established by the paddling community, are between a minimum of 10 cms and a maximum of 30 cms., although flows below 15 cms. are considered only marginally safe. The preferred hydrographic conditions mostly prevail when flow rates are descending after peak flows.

The Project as proposed would reduce the flows in the usable range for paddling almost to zero for the otherwise most feasible paddling months. This became obvious to VIWPS representatives in pre-Application discussions with the Proponent, which had been going on in some form since 2005.

In the spring and summer of 2009 two meetings took place between the Proponent and VIWPS. In the last of these meetings, organized by the Proponent, held on July 9, 2009, representatives of EAO, Transport Canada and other agencies and advisors were also involved. At this meeting the Proponent proposed windows, for which power production would be curtailed, to allow paddling opportunity and to provide improved access for paddlers to and off the River as mitigation for the otherwise severe reduction of diversion reach flows due to power generation during fixed specific short periods in the spring months when flows might be favourable for paddling. This proposal would not provide any assurance that the dates offered would coincide with favourable flow conditions but was taken positively as willingness by the Proponent to engage in further discussion with the aim to reach an agreement with the paddling community on this issue.

VIWPS representatives pointed out the short comings of this proposal and suggested improvements that they considered essential to make use of the River and reaching agreement possible. The Proponents representatives agreed to consider these suggestions and to call another meeting at which they would present revised proposals that might lead to agreement. Following that meeting VIWPS met further with Transport Canada at which the paddlers' requirements and possible solutions were discussed. But the anticipated meetings between the Proponent and VIWPS did not take place. The Proponent responded to VIWPS's request for further meetings that its proposals would be revealed and be available when the Application for an Environmental Certificate would be made public.

Our opinion, based on the proposals for Navigation contained in the Application, is that the Project as proposed would not provide any practical opportunity for Navigation of the Kokish river for recreational paddling, and would not meet the requirements of Transport Canada on this issue.

For firsthand information and views on Navigation concerns please see the additional submission on this subject by Shayne Vollmers.

**3.0 Engineering and Construction Concerns:**

1. Foundations of Major Structures: The conceptual drawings of the intake/weir and of the powerhouse show that these would rest on foundation materials other than solid rock, the depth to which has not been fully determined. Nor has the suitability of the foundations been fully investigated.

Further investigation may show that to achieve sound and impervious foundations much more of the overlying material may have to be excavated and be replaced by concrete and/or the material consolidated by pressure grouting, or other treatment. At the Intake/ Weir these treatments would almost certainly not seal off completely flows through the foundation materials to the River downstream. These processes could introduce significant amounts of fine particles, cement and other toxic substances into the Kokish . There is also the challenge of keeping water leaking through the cofferdams from flowing into the River.

Placing rip rap on the river banks could have similar effects, especially if cement mortar or concrete would be required. This would be difficult to contain, especially where the rip rap would be placed outside of the cofferdams. Using rock excavated on site is always a gamble as it may not break into suitable shapes and sizes for use as rip rap. Question: How would the release of cement and other toxic substances from these construction processes be avoided and controlled effectively?

2. Penstock and Intake Gate: Placing the penstock on the east side of the East Main Logging Road and burying it below road level would provide the penstock a considerable amount of protection. However, although it would not be especially vulnerable it would not be immune from being damaged. Use of heavy equipment to replace or repair culverts that carry flows of tributaries across, above or below, the penstock and slides and debris flows originating from the steep terrain to the east could rupture the penstock. [ I have seen vital power station facilities dug up and severely damaged by heavy equipment despite operating staff being stationed to ensure that that would not happen – RP].

If a breach of the Kokish penstock were to occur the Intake Gate would have to be closed very quickly. Question: Will the Intake Gate be designed and built to close and to shut off the large flow resulting from a major breach of the penstock? Comment: The conceptual design drawings show inadequate space for an effective intake gate. Question: Would the emergency closure of the intake gate be controlled locally or remotely from Powell River, manually by an operator or automatically? Comment: The concept drawings show only a

control desk at the powerhouse. These are important considerations because an uncontrolled breach could quickly cause extensive damage to the powerhouse, switchyard, the transmission line, roads and bridges and the environment, including sluicing large amounts of overburden and debris into the Kokish River.

On the other hand quick closer could suddenly release up to an additional 20 cms of water into the diversion reach, with attendant damage to fish and possibly endangering kayakers and fishers who happen to be in or within the confines of the river.

**4.0 Responsibilities of Kwagis and its Contractor(s):**

Section 28, Table 28-1 Table of Owner's Commitments and Assurances lists and assigns the responsibilities for the Commitment items for the Project either to Kwagis Power or to the Contractor or to both. We consider crucially important that Kwagis Power maintain overall responsibility for all aspects of the Project and that it does not disassociate itself, wholly or in part, from any of the responsibilities listed. Responsibilities should be clearly defined and be legally binding. These should be vetted and approved by the relevant provincial, federal and local authorities and made known to all concerned.

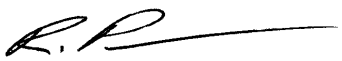
5.0 Final Concern: **Water License:**

Section 3.3 of the Application states: *"Historically, several design concepts have been contemplated for a hydroelectric facility on the Kokish River. An artefact of this history is the provision for water storage in the water license application currently used by Kwagis Power to obtain first in line water rights. Water storage is not being proposed by Kwagis Power for the Kokish River facility."*

Our concern is that at some time, sooner or later, the addition of upstream storage could become irresistible, as this could increase substantially the generation of firm energy and, therefore, the profitability of the project. Adding storage would, of course, also change significantly the impacts of the Project. This would no longer be the same project.

While we would expect that adding storage would require a new application process we are concerned that the above wording could be interpreted to allow the addition of storage in the lakes and head waters as a matter of course and as a right established by the present or by an earlier water rights application. We consider it essential that the present Project not be allowed to become the first stage of an eventual storage-based project. A way to prevent this would be to include in the terms of the water license that may be granted for the proposed Project, a clause prohibiting provision of storage irrevocable for the life of the Project, or at least for 40 years. If that cannot be done effectively we submit that a Water License and an Environmental Certificate should not be granted for the present Application.

Yours truly,



Ray Pillman, P. Eng. (Ret.)

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