



## Sunshine Coast Conservation Association

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The SCCA is pleased to submit the following comments and questions resulting from our review of the draft Application Information Requirements (dAIR) for the Burnco Aggregate Project. The SCCA was awarded participant funding from CEAA to review the project at each stage. Comments submitted during the January 2012 comment period on the original Project Description still apply to the project and are included as Attachment B.

The SCCA contracted Schick Consulting and Stamford Environmental (Schick-Stamford) to review the dAIR with respect to fisheries and aquatic habitat. Schick-Stamford's comments and questions are included as Attachment A. Questions and comments in the body of this letter and in both Attachments should be treated as SCCA comments to be responded to as part of the dAIR consultation process.

In addition to the Attachments, the SCCA submits the comments and questions on the dAIR, generally targeted at surface water and groundwater effects assessments, below. At this time the SCCA also requests that the public comment period for the Application/EIS be a minimum of 45 days due to the anticipated complexity of the application and time required for a thorough review.

1. The dAIR document repeatedly states that the regulatory and policy setting will be reviewed and summarized as part of the effects assessment.
  - a. How will the relevant standards, guidelines and policies be applied to the baseline data, effects assessment and prediction?

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2. Water quality is identified as a VC in Table 4 under surface water, groundwater and human health. Parameters such as TSS and TDS are specifically mentioned, but overall focus appears to be on drinking water quality guidelines under human health effects assessment.
  - a. How many water quality sampling events, distributed over how many months and years, in how many sampling locations, will contribute to the water quality baseline?
  - b. How will water quality be assessed against fish and aquatic habitat requirements? If so, which specific analytes will form part of the baseline data, effects assessment and long-term monitoring programme?
  - c. How will surface water discharge from the mining area (if any) be predicted in terms of quality and quantity?
  - d. How will effects of other mine water management on quantity and quality of surface water (specifically pit diversion, inflow and outflow water quality and quantity) be predicted?
  - e. Table 4 identifies that mining may alter contribution to base flows – how will impacts to base flows resulting from mining be assessed?
3. Section 5.4.4 – Surface Water Baseline
  - a. Will the LSA and RSA extents be presented on a map including a rationale for each?
  - b. How many actual streamflow monitoring events will be conducted? How will these be distributed in terms of months/seasons and years?
  - c. Will streamflow be measured during low flow events or will low flow events such as 7Q10 simply be predicted from statistical analysis?
4. Section 5.4.5 – Surface Water Effects
  - a. Will a geological model be used to evaluate long-term risk of McNab channel avulsion into the mined area, particularly post-closure, and its effect on surface water quality?
  - b. Will a risk assessment for catastrophic avulsion be completed, and will an associated bond value be calculated?
5. Section 5.5.3.2 – Groundwater Study Boundaries
  - a. Will the LSA and RSA extents be presented on a map including a rationale for each?
  - b. Will neighbouring groundwater users be included as VCs (Table 4)?

6. Section 5.5.3.3

- a. What is the number of wells being used to establish baseline, and the number of wells used to calibrate the numerical model?
- b. What parameters will groundwater samples be tested for?
- c. In the document there is no discussion of how the local and regional geology will be conceptualized. Will this be completed before the conceptual hydrogeologic model is developed?
- d. Will the conceptual hydrogeologic model include characterization and delineation of key stratigraphic and hydrogeologic units including a summary of the physical properties for each hydrostratigraphic unit (eg. Hydraulic conductivity, transmissivity, saturated thickness, storativity, porosity and specific yield).
- e. Will the hydrogeologic characterization include an evaluation of seasonal variations in groundwater levels, flow directions and water quality?
- f. Will the hydrogeologic evaluation include characterization of surface water/groundwater interaction at the site?
- g. A 'geochemistry evaluation' is mentioned twice in the document. Please provide details of the assessment and prediction methodology. Will the evaluation assess rock, sediment, surface water and/or groundwater?
- h. A numerical groundwater model is proposed to be calibrated to baseline conditions and then used to predict groundwater conditions during mining operations and post closure. Which modelling software will be used? Will the rationale for the selected modelling software be provided? Will model input parameters, boundary conditions and calibration statistics be clearly defined?

7. Sections 5.4.7 and 5.5.7 - Cumulative Effects

- a. Will the surface water and groundwater assessments, including models and predictions relied upon, incorporate cumulative effects of present and future industrial operations (as shown in Table 5 and particularly forestry operations) in combination with the Proposed Project?

Attachment A

**Review of the Assessment of Potential Effects Including Cumulative Effects  
of the Proposed Burnco Aggregate Project**

Prepared for the  
Sunshine Coast Conservation Association

By  
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Schick Consulting  
And  
Mike Stamford  
Stamford Environmental

October 11, 2013

## **Review Process and Approach**

The purpose of this review is to critique methods proposed by Golder and Associates (contracted by Burnco) to evaluate the base line condition and potential impacts imposed on fish and fish habitats resulting from a Proposed Burnco Aggregate Project in McNab Creek watershed. A Draft Application Information Requirements / Environmental Impact Statement Guidelines (Rev 2.1), which was submitted to BC Environmental Assessment Office on September 9, 2013 was evaluated here.

The Review follows a format of asking questions pertaining to each subsection of Section 5.1 Fisheries and Aquatic Habitat of the Draft AIR/EIS including:

- 1) Spatial and Temporal Boundaries
- 2) Assessment Methods
- 3) Baseline Conditions
- 4) Effects Assessment
- 5) Mitigation
- 6) Prediction and Assessment of Residual and Cumulative Effects

The questions we present focus on information outcomes rather than asking if particular study methods or sampling designs will be employed. Our intent is to ensure that sufficient and relevant information is gathered to address potential impacts resulting from 15 - 20 years of gravel extraction and traffic within the second largest salmon-bearing stream in Howe Sound. We also took the view that, for some species, any potential reduction of habitat or local population levels must be considered in light of region wide population concerns both in terms of number of fish and their demographic connections with surrounding watersheds. Current approaches to evaluate the conservation status of a species must consider not only population abundance but also their viability based on connections with adjacent areas to account for migration behaviour and dispersal among watersheds used for breeding and rearing areas (e.g. metapopulation structure).

## **Review of Section 5.1**

### **5.1.3.2 Spatial and Temporal Boundaries**

- 1) Will Figure 2 in the September 9, 2013 Draft Application showing the Proposed Conceptual Site Layout indicate the Property Boundary? It is currently unclear which “streams, groundwater channels and other waterbodies located adjacent to the mine footprint along the foreshore within the Property” are included in the LSA.
- 2) Since all streams, groundwater channels, and other waterbodies along the foreshore bounded on the north by McNab Creek and on the south by southwest corner of the existing log dump tenure, as shown in Figure 2, are likely reliant on surface and groundwater originating within the Project footprint, will they be included in the LSA?
- 3) The proposed marine LSA includes the intertidal and sub-tidal areas within the Proposed Project footprint. The McNab Creek estuary and associated intertidal and sub-tidal shallow water shelf extending into Howe Sound is relatively rare habitat within Howe Sound. Several of the fish species present in the McNab Creek watershed and streams entering foreshore depend heavily the estuarine and foreshore environments during the transition from the freshwater juvenile lifestage to juvenile marine lifestage (Healey 1982, Miller and Sadro 2003). Several aspects of the Project including marine transportation, barge loading, changes to freshwater discharge, accidental discharge of suspended sediments have the potential to impact survival and growth of anadromous VC. Will the Proposed Project include the entire McNab Creek estuary, intertidal and shallow subtidal areas in the LSA?
- 4) What is your proposed time period to establish a baseline condition? Will age structure and seasonal abundance estimates be established for each species prior to construction? Does your baseline condition consider the possibility that current conditions likely reflect recovery from previous disturbances unrelated to the Proposed Project?
- 5)

### **5.1.3.3 Assessment Methods**

- 1) Will studies and surveys describing freshwater habitats in the LSA and RSA provide perspective relative to Howe Sound in general? For instance, how rare is low gradient stream and estuary habitat such as that provided by McNab Creek watershed?
- 2) Will studies to evaluate the genetic relationship of VC found in the LSA with adjacent populations residing in Howe Sound and other areas in the RSA. A recent status report indicated that, at the stock level, coastal cutthroat trout within the

Georgia Basin tentative designatable unit meet the requirement of “endangered” (Costello 2008). Will these studies evaluate the significance of the cutthroat trout population in the McNab watershed for the conservation status of the Georgia Basin tentative designatable unit?

- 3) Will the detailed descriptions and mapping of aquatic habitats, sensitive areas and critical seasonal habitats for each VC include:
  - a) Spawning grounds;
  - b) Freshwater juvenile overwintering habitats;
  - c) Freshwater summer low water refuges for adult residents VC;
  - d) Freshwater summer low water refuge for juvenile VC;
  - e) Marine nursery sites?
- 4) Will the identification of mitigation measures and environmental management strategies to avoid, limit or mitigate potential effects from the Proposed Project include empirical studies from comparable conditions to support the claims that the measures will produce the expected outcomes?

#### **5.1.4 Baseline Conditions**

- 1) Will the electronic raw data of all field sampling of VC and non VC species and all VC related mapping be available for public access;
- 2) Will fish sampling methodologies, sampling intensity and sampling frequency have a high likelihood of resulting in sufficiently precise age and season specific population estimates for each VC, particularly those of low abundance levels, to detect an ecologically significant change in population size (25%);
- 3) What is the effect size that would be detectable given the sample intensity, frequency and overall methods to determine baseline conditions of VC by age, season and species?
- 4) Will the timing of fish sampling and fish surveys be able to estimate:
  - a) VC spawning locations, timing, duration and abundance within the freshwater LSA,
  - b) Smolt production for all anadromous salmon originating in the freshwater LSA,
  - c) Fry and parr standing stock estimates for cutthroat trout, coho to evaluate summer and winter habitat productivity within the freshwater LSA,
- 5) Will the fish habitat assessment and mapping be carried out during low and high water conditions to identify, locate and quantify season specific habitats?

- 6) How much effort will the baseline assessment consider fish species outside the VC if they are encountered? For instance, the Dolly Varden (*Salvelinus malma*) is rare in Howe Sound but might occur in McNab Creek. How will your baseline condition account for the discovery of novel diversity in Howe Sound (e.g. anadromous dolly varden)?

### **5.1.5 Effects Assessment**

- 1) Will the assessment evaluate for potential impacts on juvenile fish growth, survival, residence time in the entire marine LSA and throughout the remaining intertidal and shallow water subtidal zone bounded on the north by McNab Creek and on the south by southwest corner of the existing log dump tenure from :
  - a) Marine transportation;
  - b) Barge loading;
  - c) Changes to water quality and chemistry;
  - d) Changes to surface and ground water discharge;
  - e) Accidental discharge of suspended sediments;
  - f) Changes to quantity of surface and groundwater entering the foreshore?
- 2) Will the assessment evaluate the potential impact on the growth and survival of the anadromous VC originating in other areas of RSA but using the marine LSA and remaining intertidal and shallow water subtidal zone;
- 3) Will the assessment evaluate the potential effects on each life stage of freshwater and anadromous fish include:
  - a) Direct and indirect effects of changes to the quantity of surface and groundwater supplying streams, wetlands and waterbodies both within the LSA or influenced by hydrology within the LSA?

### **5.1.6 Mitigation**

- 1) Will compensation for loss of marine habitat productivity, quantity or quality consider the regional scarcity of shallow water estuaries in Howe Sound area;
- 2) Will compensation for loss of constructed habitats be based on the habitat loss that the constructed habitat was intended to compensate for and not on the present habitat values of these habitats;
- 3) Will the identification of mitigation measures and environmental management strategies to avoid, limit or mitigate potential effects from the Proposed Project include empirical studies from comparable conditions to support the claims that the measures will produce the expected outcomes?

### **5.1.7 Prediction and Assessment of Residual and Cumulative Effects**

- 1) Will the prediction of cumulative effects on cutthroat trout consider:
  - a) The general population trends within the Georgia Basin Ecoprovince;
  - b) The trend in quantity and quality of freshwater and marine habitats within the Georgia Basin Ecoprovince;

### **References**

Costello, A.B. 2008. The status of coastal cutthroat trout in British Columbia. Pp. 24-36 in PJ Connolly, TH Williams, and RE Gresswell (Eds.). The 2005 coastal cutthroat trout symposium: status, management, biology, and conservation. Oregon Chapter, American Fisheries Society. Portland.

Healey, M.C. 1982. Juvenile Pacific salmon in estuaries: the life support system. pp. 315-341. *In*: V.S. Kennedy (ed.) Estuarine Comparisons, Academic Press, New York, NY.

Miller, B., S. Sadro. 2003. Residence Time and Seasonal Movements of Juvenile Coho Salmon in the Ecotone and Lower Estuary of Winchester Creek, South Slough, Oregon. *Transactions of the American Fisheries Society* 132:546–559,

## Attachment B

As submitted by the SCCA for the original Terms of Reference.

January 2012

The following issues are of concern to the Sunshine Coast Conservation Association (SCCA). It is the expectation that the Terms of Reference for the Burnco Aggregate project would provide a comprehensive analysis and assessment of the following concerns.

- Noise pollution and impacts on area residents and wildlife (linkage to adverse effects on wildlife)
- Comprehensive visual impact analysis or assurance of reduced visibility impacts
- Effects of dust and other operational byproducts on surrounding riparian ecosystems.
- Light pollution risks with emphasis on species at risk and use of area. Emphasis to focus on migratory species and species using valley as flight corridors (MAMU)
- A comprehensive assessment of the area's wildlife resources with emphasis on species and risk or red and blue listed species that currently utilize the area. Comprehensive studies must include mitigation plans.
- Assessment of potential carrying capacity as it relates to wildlife resources of this watershed, and in particular within the proposed areas of impact, and the significance of those values within Howe Sound and Georgia Strait. Identify the level of risk presented to these potential values by this project.
- Comprehensive review of current and past fisheries values. Current mine location suggests no surface streams yet prior to deforestation area had documented salmon and trout bearing streams.
- Cumulative effects assessment
- Valued Ecosystem Component analysis and risk assessment for the planned mine area.
- Measures to ensure no degradation or loss of intertidal estuarine habitats. This must include complete protection of small streams entering Howe Sound along the estuary. All these waterways support chum salmon and searun coastal cutthroat trout.

- Comprehensive assessment of subtidal habitats at load out facility. It is assumed that there will be loss and therefore deposition of material during the conveying and loading process. Turbidity and deposition may impact cutthroat trout and other species normally occurring within or transiting this zone. This was an active log and booming area but recovery of the area has likely started. How will proponent mitigate and prevent adverse impacts?
- Comprehensive hydrologic and groundwater assessment and risk of mine excavation dewatering the McNab mainstem.
- Planned compensation plan for loss of identified fish habitat and estimated HADD.
- Comprehensive assessment and report on risks of McNab Creek avulsing and entering the excavated pit lake. Any assessment must report risk to environmental resources if this event occurred.
- Assessment must include any other proposed or projected industrial activities within the water shed. The proposed IP projects located on three upstream tributaries represents an accumulation of risks that must be considered as proceeding with either project could impact the level of risk presented by the other.
- Detailed reclamation plans for mine.
- Requirement for pre and post monitoring of critical area fish and wildlife populations and habitats that would potentially be affected by mine development.