A1 Preamble

This Wahleach Water Use Plan (WUP) Monitoring Program and Physical Work Terms of Reference (TOR) Addendum is the first program-wide addendum since original submission in 2005. This program wide addendum is preceded by two individual physical works program TOR addendums accepted by the Provincial Comptroller of Water Rights in July 2007 and November 2008. The TOR changes summarized here result from the Wahleach Monitoring Advisory Committee’s consideration of the first 5 years of monitoring data and associated adaptive responses to monitoring studies to ensure robust programs results and thorough consideration of study-specific management questions after the recommended 10 years of monitoring.

TOR Addendums are reviewed and approved by the Wahleach WUP Monitoring Advisory Committee prior to submission to the Comptroller of Water Rights (CWR) for formal integration into the Implementation Order for the Wahleach WUP.

The following changes are detailed in this addendum:

- **WAHMON#1 – Lower Jones Creek Fish Productivity Index**: schedule change to monitoring only during odd pink spawning years and additional of egg incubation component.
- **WAHMON#2 – Lower Jones Creek Stability Assessment**: Addition of single channel transect.
- **WAHMON#3 – Herrling Sidechannel Pink/Chum Spawning Success**: Schedule and method changes related to outcomes of 5 year interim review. A proposed scope change includes a channel re-contouring pilot program to be confirmed based on outcomes of Ministry of Environment white sturgeon spawning investigations in Herrling Sidechannel.
- **WAHWORKS#1 – Boulder Creek Flow Bypass**: Schedule adjustment with delay of the upgrade of the “temporary” Boulder Creek flow bypass facility to a more robust permanent structure until after completion of the 10 years of Jones Creek Fish Productivity Index monitoring.
- **WAHWORKS#2 – Wahleach Reservoir Fertilization**: Budget and schedule changes associated with confirmation of ongoing limnology and fish monitoring components.
A2 Addendum to WAHMON#3 – Herrling Island Sidechannel Chum/Spink Spawning Success Monitoring

A2.1 Addendum Rationale

Through completion of 5 years of Herrling Sidechannel chum and pink spawning monitoring the objectives of this study have been met with the support of the approved terms of reference. The five years of monitoring confirmed Wahleach Generating Station (WAH GS) outages: 1) did not prevent pink or chum from spawning in marginal habitat and 2) resulted in the stranding of spawning adult pink and chum during the fall spawning period (Smith, 2010). Further monitoring to address study specific management questions is unnecessary, however, pilot channel re-contouring and associated monitoring at confirmed high risk chum and pink stranding sites is proposed to assess suitability as a future mitigation strategy to prevent both adult and redd stranding.

Ministry of Environment’s (MOE) summer 2010 confirmation of white sturgeon spawning in Herrling Sidechannel has resulted in MOE resistance to a re-contouring strategy given associated uncertain risk to white sturgeon spawning habitat. Based on further MOE investigation into white sturgeon critical habitat requirements due for completion in the upcoming years there may be opportunities to reassess the pilot contouring initiative through a follow up TOR addendum.

A2.2 Objectives and Scope

The changes in this addendum apply to changes to both program schedule and methods as a result of a review of program results after 5 years of data collection. Given resolution of study specific management questions relating to assessing the effectiveness of fall WAH GS shutdowns in reducing marginal spawning no further adult spawning or redd field observations will occur. Field monitoring of Herrling Sidechannel water level fluctuation in response to both WAH GS and Fraser River discharge will continue through the end of the proposed WUP review period in 2015.

A2.3 Methods

Annual field monitoring of Herrling Sidechannel water level fluctuation will occur from mid September through the end of April at the previously established three hydrometric stations in the Herrling Island sidechannel (Ibid). The uppermost station (station 1) was located on the left bank approximately 2.5 m downstream from the inlet of the sidechannel and 50 m upstream from WAH GS tailrace. The middle station (station 3) was located on the right bank in site 5, approximately 1.2 km downstream from the WAG HS tailrace. The lowermost station (station 2) was located on the left bank approximately 2.5 km downstream from the WAH GS tailrace.

An additional component to the continuous monitoring of stage elevation at the three hydrometric stations, stage-discharge transects will be completed at both stations 2 and 3 four times during the annual monitoring period. The stage-discharge transects will be completed during safety wading conditions typically available during the low Fraser River levels during the September – April monitoring period. Flows transects should be done to cover the widest possible variety of stage elevations to allow establishment of a comprehensive stage-discharge relationship for each station.

Flow transect data be collected in accordance to the applicable portions of the procedures described in the RIC standard (2009) for hydrometric monitoring (with particular attention to p.77).

Specifics of stage-discharge transect establishment include measurement of: a) current velocity at 0.6 of depths <0.75m, and at 0.2 & 0.8 of total depth when >0.75m, b) water column depth, c) water surface elevation, d) distance from wetted edge. The four annual measures would be collected at intervals with a frequency that ensures that no more than 20% of the channel cross-sectional area is contained in the area between intervals. Permanent survey landmarks should be installed at Stations 2 and 3 to facilitate stage-discharge data collection.
Each of the four annual field visits to complete stage-discharge transects should also involve both download of water level data and photos be taken of transect locations.

A2.4 Reporting

Annual Herrling Sidechannel hydrometric data reports will be completed for program years 5 – 10. The report should include station specific figures including: 1) stage vs. discharge for a minimum of 4 data points, 2) wetted width vs. stage elevations, 3) secondary axis showing concurrent discharge by the Wahleach Generation station (data to be provided by BCH) and 4) stage elevation and discharge at the nearby WSC Fraser @ Hope gauge. A copy of raw and processed data will be provided in MS Excel format.

A2.5 Schedule

The original TOR approved annual adult and redd stranding observations will be discontinued for the remainder of the 5 year WUP review period with the proposed pilot channel re-contouring program schedule to be confirmed based on potential future agency support. Water level monitoring will take place from September through April annually for the remaining five implementation years.

A2.6 Budget

The costs for annual water level monitoring will remain per the original TOR at $15K per year. If the proposed channel re-contouring strategy receives agency support a further TOR addendum will confirm associated costs. Given the discontinuation of both the annual adult and redd observations the total ten year program cost has been reduced by $165K.