8.0 MONITORING AND FOLLOW-UP PROGRAMS

The Executive Committee is required to consider the need for any monitoring and follow-up of environmental or socio-economic effects of any project or activity conducted under Section 42(2)(a). Environmental and socio-economic monitoring and follow-up can be undertaken for the following reasons:

- To ensure the implementation and success of any mitigation measures identified as required or preferred during the assessment process.
- To confirm the accuracy of baseline information or any assumptions made with regard to the Project during the assessment process.
- To test the accuracy of predictions made during the assessment process and ensure that effects are consistent with the conclusions in the assessment and any conditions of the approvals provided by the regulator. In the event that a monitoring program identifies concerns in this regard, adaptive management practices can be applied to ensure effects are consistent with the findings of the assessment and the conditions of the regulator's approvals.
- To detect any unanticipated Project effects and implement mitigative or corrective measures as necessary to ensure that no significant adverse effects result from the construction or operation of the Project.

This chapter outlines monitoring and follow-up recommended with respect to the proposed Project. Generally, monitoring and follow-up are recommended in the following circumstances:

- Where the success of the proposed mitigation measures is determinative in the assessment finding that potential residual adverse effects are not likely to be significant. In these cases monitoring and follow-up are recommended to confirm the findings of the assessment.
- Where there is uncertainty with respect to the assessment findings such that monitoring is required to ensure that there are no residual significant adverse effects of the construction or operation of the Project.

In all cases, it is the intent of YEC to ensure, in consultation with regulators, that monitoring is undertaken in a focused manner and is aligned with the potential for specific corrective actions ("adaptive management"). Corrective actions may include further detailed investigation and implementation of mitigation options. In all cases, YEC will seek to ensure necessary mitigation measures are undertaken such that there remain no residual significant adverse effects related to the Project.

8.1 MONITORING PROGRAMS

During the course of the assessment (summarised in Chapter 7), several recommendations for monitoring were identified. Recommendations for specific monitoring programs are set out in further detail below. Monitoring programs recommended below are required to ensure the effectiveness of mitigation options that were important in the consideration of the effects assessment.

8.1.1 Chinook Salmon Rearing Channel

Monitoring is recommended to evaluate the success of the Chinook Salmon Rearing Channel in relation to identified requirements for this habitat developed in conjunction with regulators. YEC commits to undertake a periodic survey of the number of juvenile fish observed. In the event that monitoring identifies that use of the channel is sub-optimal, corrective measures will be investigated and implemented as appropriate.

8.1.2 Chinook Spawning and Juvenile Rearing in Zone 2

Monitoring is recommended once the new water flow regime has been established, to include a spawning and rearing survey to count the redds, map habitat and trap juvenile fish to determine distribution and abundance. If spawning and rearing does not appear to be as successful as desired, remedial action could be undertaken focused around in-stream habitat enhancement.

8.1.3 Lake Trout Age Class/Spawning Monitoring

The conclusions reached in Chapter 7 in respect of the Project's effects on lake trout require a program of monitoring for two variables:

(a) The specific year-class recruitment

(b) The overall health of the population, in light of overall characteristics of Mayo Lake.

A program of monitoring of lake trout (and to a lesser degree Lake Whitefish) age class patterns in Mayo Lake is required at appropriate intervals.

While Chapter 7 identifies several important variables related to lake trout spawning on Mayo Lake, which suggests that given the location of the spawning grounds and the history of the population in Mayo Lake, the Lake Trout population may be better suited to responding to the revised water regime than may be the case on other systems. In the event, however, that the monitoring work identifies concerns with respect to age class distribution, and key measures regarding the stock health are determined to be below a reasonably expected range in relation to the observed potential for Mayo Lake, a series of sequenced mitigation measures will be required.

First and foremost, mitigation is expected to focus on habitat enhancement particularly related to the quality and quantity of spawning habitat[1] at suitable depths commensurate with the managed regime of the lake.

Concurrently, other options would require discussions with regulators and governments at appropriate intervals, including coordination with governments with respect to other forms of enhancement that could be pursued (for example, YG and Yukon Energy presently cooperate with respect to the operation of a fish hatchery.)

[1] Given the current lake operates with a range of elevations above the historic (pre-1950) elevation of the lake, there is solid reason to expect that the spawning beds historically used by lake trout pre-1950 continue to exist, but may be used only to a limited extent or not at all including possibly due to siltation. Efforts to restore some portion of these spawning beds to a clean and optimal state would be a first priority for mitigation and enhancement options.

Ultimately, staged amendments to the operating regime for the lake could be considered, focused on either (a) incremental decreases to the absolute operating range used by Yukon Energy (i.e., increases to the LSL), or (b) changes to the frequency with which the larger drawdowns are permitted to occur (i.e., ensuring the use of more than 2.59 metres of winter drawdown is not permitted to occur for the 2 years in a row that is permitted under the operating regime for the proposed Project as set out in Chapter 6).

8.1.4 Compliance Monitoring

An environmental compliance monitoring program will ensure that commitments made to regulatory authorities and others are implemented through all phases of Project development. Activities in each phase are subject to relevant legislation, regulations and guidelines, the Project authorizations, as well as to commitments made in the Project Proposal.

Pre-construction monitoring will be undertaken in order to help mitigate any potentially avoidable environmental site-specific impacts during the construction phase of the Project. This will include ongoing management of potential heritage resource sites (consistent with the commitments in the Project Proposal) and will include construction on-site monitoring by an archaeologist at specific sites considered to be of high potential archaeological value. This would also include evaluation of potential lost wildlife habitat or rare plant habitat and re-vegetation where appropriate.

Following construction and clean-up activities, a report of post-construction inspection of the proposed facilities and infrastructure will be prepared. Both aerial and ground surveys will be used to conduct the inspection. If problem areas are noted, site-specific rehabilitation programs will be identified in the inspection report, implemented, and the problem areas will be monitored. Monitoring during the operations and maintenance phases of the Project will continue and will be conducted through routine aerial and ground patrols. General environmental conditions will continue to be monitored.

8.1.5 Worker Safety and Environmental Briefings

Yukon Energy Corporation recognizes the responsibilities for health and safety are shared and accepts the responsibility of leadership of the health and safety program, for its effectiveness and improvement and for providing the safeguards required to ensure safe operations. In fulfilling this commitment to protect both people and property, management will provide and maintain a safe and healthy work environment in accordance with industry standards and in compliance with legislative requirements. Yukon Energy will strive to eliminate any foreseeable hazards that may result in property damage, accidents, and/or personal injury/illness.

On every Project, all workers are given the necessary instruction and training to complete the tasks. Workers are adequately supervised while taking into account the nature of the work and the abilities of the workers. They will be provided with a list of emergency response plans and reporting protocols, and specific information on waste management practices to be utilized during the construction phase of the Project, including all liquid and solid wastes generated.

The Corporation's internal responsibility system for health and safety is naturally extended to contractors and consultants. Yukon Energy Corporation also expects contractors and consultants to accept their responsibility to ensure that Project work is performed in a safe manner, and that it is in compliance with

the Yukon's *Occupational Health and Safety Act*, the Yukon's Health and Safety Regulations and any other applicable territorial and/or federal laws or any other industry-specific requirements that may apply.

In regards to construction, operations, maintenance, and decommissioning activities, mitigation of environmental effects throughout the full life cycle of the Project will be facilitated by providing construction and maintenance personnel with clear instructions on mitigation measures to be implemented (based on commitments in the Project Proposal and requirements issuing from regulatory approvals and permits) and on the appropriate lines of communication and means of reporting to be followed. Upon modification of construction methods and schedules, reporting will take place which summarizes environmental sensitivities and mitigative actions taken.

8.2 FOLLOW-UP PROGRAMS

Follow-up programs are recommended in certain cases where there is a potential opportunity to reduce uncertainty identified in the effects assessment process. Specifically, in many cases conclusions can be reached that an effect is not significant (for example, effects that are clearly low in magnitude due to affecting very few individuals out of a population) but nonetheless uncertainty remains as to the precise magnitude of the effect and more specifically, any potential to reduce the adverse effects or enhance benefits. However, it is important to note that Follow-up programs are not integral to the determinations of significance made in Chapter 7. Rather, recommended follow-up programs can be undertaken:

- as ready opportunities arise within Yukon Energy's operations;
- in conjunction with programs or efforts of other agencies or undertaken by government departments; or,
- where there are potential benefits to be obtained.

8.2.1 Chinook Salmon Habitat Cross Sections

Obtaining 2-3 representative cross-sections in different types of habitat at low flow conditions (i.e. 5-6 cms) to translate the information and apply the Habitat Suitability model for future projections.

8.2.2 Mapping and Categorization of Lake Trout Spawning Habitat

Mapping and categorizing of lake trout spawning habitat would provide higher levels of confidence in mitigation measures identified above. Follow-up would include mapping the location, depth and variety of substrate material the lake trout are using to help determine if future additional mitigation is required.

8.2.3 Examining Changes in Channel Morphology

Consistent with YEC's on-going efforts to review physical environment changes in the water systems, a periodic review of aerial photography supplied by the YG or Government of Canada could be incorporated as part of a time-sequence review of the lower Mayo River. Planned higher flow events could be induced if determined appropriate.

8.2.4 Examination of Fish Stranding

To the extent necessary, monitoring of fish stranding as a result of more frequent dewatering in Zone 3 could be undertaken.

8.2.5 Nesting Surveys

Pre-construction and post-construction nesting surveys could be undertaken to determine or confirm the presence of nesting sites for Rusty Blackbird as well as waterfowl and waterbirds. Nesting surveys could also be undertaken to confirm Project effects on local nesting sites.

8.2.6 Aquatic Mammal Surveys

Pre-construction and post-construction surveys of food caches and lodges in areas potentially affected by the Project could help confirm local animal population responses and adaptations to changing water levels on Mayo Lake.

8.2.7 Notification and Project Liaison

Yukon Energy will designate liaison personnel to triage any concerns that may arise during construction, operation and maintenance phases. The scope of liaison will include regulatory and environmental affairs, as well as work to maintain close communications with Nacho Nyak Dun, the Village of Mayo, other local and territorial organizations, and citizens as concerns may arise.