

Yukon Water Board
Office des eaux du Yukon



TYPE A AND B

MUNICIPAL UNDERTAKINGS

INFORMATION PACKAGE FOR APPLICANTS

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1 INTRODUCTION

The purpose of this information package is to assist applicants in developing and submitting water use licence applications for type A and type B municipal undertakings and to understand the deliberation process that will be undertaken by the Yukon Water Board ("the Board") in rendering a decision on the application.

The specific information requirements and licensing principles presented in this package are not intended to serve as fixed standards for licensing. Rather, they are intended to set out a framework of information expectations for applications and of principles and position statements that the Board will apply in its licensing deliberations. The Board may deviate from or supplement the criteria or general information requirements identified in this package.

The information contained in this document provides guidance for licence applications which include large scale municipal undertakings (i.e. a wastewater treatment facility) assuming that the development, operation and decommissioning poses a significant potential for environmental effects which may arise from a wide variety of performance issues. The information in this document and its appendices also provides guidance for potential lower impact project applications, such as for septic systems, amendments or renewals of existing type A or B water licences for existing municipal undertakings. It is understood that for these types of projects not all information requirements will necessary apply.

The definition of municipal undertaking under the *Waters Regulation* applies to camps and lodges serving over 50 occupants per day, as well as cities, towns, villages, and settlements. A municipal water use licence is also triggered for camps and lodges serving 50 or fewer people where waste is deposited directly or indirectly to surface waters. For additional information for the requirement of a water licence for sewage disposal systems refer to Schedule 8 of the *Waters Regulations*, or the information bulletin for sewage disposal systems¹ produced by the Government of Yukon.

Projects can range from:

- a) withdrawal and distribution of water for municipal purposes²,
- b) collection, treatment, storage and disposal of municipal wastewater and associated sludge,
- c) collection, storage and distribution of water for other municipal services, such as the storage of water for use of fire suppression.

It is important for the applicant to understand that proposed activities will be licensed and regulated according to both the quantity and quality of what they will produce or discharge along with the receiving environment, and the specific processes that they will use within their overall systems. For example, a licence for a wastewater treatment system may include:

- a) effluent discharge criteria, and
- b) limits of the quantity and timing of treated water discharge.

¹ *Information Bulletin: Approvals required for a camp or lodge sewage disposal system*; Government of Yukon, Department of Environment, March 2012

² Drinking water quality is regulated under the *Public Health and Safety Act – O.I.C 2007/139 – Drinking Water Regulation* by the Government of Yukon, Environmental Health Branch; however, water withdrawal is regulated under the *Waters Act*.

Applicant's Information Package for Municipal Undertakings

As the application is tied to the water use licence, the project activities are expected to be carried out as described in the application. For example, an application for a wastewater treatment facility may include:

- a) the overall treatment plant design and technologies used for the undertaking,
- b) its routine operations and maintenance management programs,
- c) its routine monitoring programs, and
- d) adaptive management contingencies.

All of the relevant aspects affecting the design, operation, maintenance and performance of a municipal undertaking need to be fully described and supported in an applicant's package before the Board can consider the submission.

The Board anticipates proposed municipal undertakings to be unique and to vary in scope, design, operational complexity and potential environmental effects. The Board also understands there to be engineering and environmental factors common to most municipal undertakings. This guidance document and appendices are meant to provide the applicant with a base listing of information required for a licence application submission along with guidance for submission of additional information needed to address specific elements of the proposed project. Once an application for a water use licence is submitted with this required information to the Water Board Secretariat, a Licensing Officer will then work with the applicant to assure that the submission best describes the proposed undertaking for the Board and public.

If successful, a licence will be issued for the project, as described in the application and subject to conditions imposed by the Board. Therefore, it is in the best interest of the applicant to submit a clearly designed program that they can most readily and economically construct, operate, maintain, monitor, and decommission.

This guidance document contains the following sections:

- Section 1: Introduction** – an outline of this information package.
- Section 2: Statutory Requirements** – an overview of relevant statutory requirements related to applications for water use licences for municipal undertakings.
- Section 3: Guidance Documents** – information on the use of third party guidance documents in applications and identification of guidance documents considered relevant for municipal undertakings in Yukon.
- Section 4: Yukon Water Board and the Licensing Process** – a description of the Yukon Water Board and its licensing process.
- Section 5: Licensing Principles and Position Statements** – presentation of the principles and position statements considered by the Board in deliberating and rendering decisions on municipal undertaking applications.
- Section 6: Information Requirements for Applications** – an outline of the expected information required to support a water use licence application for a municipal undertaking.
- Section 7: Application Contents and Format** – the required contents and format of applications.
- Section 8: Licensing Conditions** – typical conditions that may be associated with issued licences.

2 STATUTORY REQUIREMENTS

2.1 Waters Act

Under the terms of the *Waters Act* (the Act or “WA”), the Yukon Government has delegated to the Board the authority to adjudicate applications for the use of, and deposit of waste in, water in the Yukon. As the adjudicating body, the Board can deny an application or approve an application with conditions. For type A or type B water use applications that are adjudicated on the basis of a public hearing, the water use licence also requires the approval of the Yukon Government Minister responsible for the administration of the WA (the Minister) before it can be issued by the Chair of the Board.

In exercising its powers, the Board recognizes and respects its objects that are described in Section 10 of the WA, as follows:

The objects of the Board are to provide for the conservation, development and utilization of waters in a manner that will provide the optimum benefit therefrom for all Canadians and for the residents of the Yukon Territory in particular.

2.2 Waters Regulations

Schedule 8 of the *Waters Regulation* sets out the triggers for water use licensing and thresholds to inform the type (type A or type B) water use licence. Section 5 of the *Waters Regulation* sets out the legislated requirements for a water use application (including amendments).

2.3 Umbrella Final Agreement -Chapter 14

The Board also has statutory obligations under Chapter 14 of the *Umbrella Final Agreement* (“UFA”) between the Governments of Canada, Government of Yukon and Yukon First Nations. Section 14.8.0 of the UFA provides that the Board shall not authorize any substantial alteration of the quantity, quality or rate of flow of water on or adjacent to settlement land, unless it is satisfied that:

- a) there is no alternative which could reasonably satisfy the requirements of the applicant; and
- b) there are no reasonable measures by which the applicant could avoid causing the alteration.

Section 14.9.0 imposes similar obligations upon the Board where a traditional use of water by a First Nation person in their traditional territory may be adversely affected by a licensed use.

2.4 Yukon Environmental and Socio-economic Assessment Act (YESAA)

Under the *Yukon Environmental and Socio-economic Assessment Act* (“YESAA”) the Board’s actions in enabling a project (i.e. issuance of a licence), cannot occur until all Decision Bodies for the project have issued decision documents allowing for the project to proceed to the regulatory stage. Where such decision documents include conditions, the Board may not issue a water use licence with conditions that conflict with those of the decision document. It is important to note, however, that interaction with the Yukon Water Board Secretariat

("Secretariat") in preparing a water use licence application for public comments can occur concurrently with the YESAA process.

2.5 Other Legislation

Municipal projects must, at a minimum, also meet all requirements specified within applicable federal and other territorial regulatory legislation. In addition to the legislation listed in section 2.1 through 2.4, other relevant legislation includes, but may not be limited to:

- a) Yukon Public Health and Safety Act
- b) Yukon Environment Act
- c) The pollution prevention provisions (Section 34) of the federal Fisheries Act
- d) Canadian Wastewater Systems Effluent Regulations under the federal Fisheries Act

The Board cannot issue a licence with terms or conditions that do not at least meet the combined requirements of these acts and regulations. For clarity, the Board can and often does require more stringent requirements than those specified within the governing legislation.

3 GUIDANCE DOCUMENTS

Within and outside of Canada there are numerous guidance documents that have been developed to assist owners and operators of municipal water and wastewater treatment facilities with responsible planning, design, and operation.

The Board recognizes the following documents, or their most recent revisions, as being reference material for municipal undertakings in Yukon:

3.1 Government of Yukon

- 3.1.1 Design Specifications for Sewage Disposal Systems, A guide to their design and maintenance, 2010

3.2 Canadian Council of Ministers of the Environment (CCME)

- 3.2.1 Canada-wide Strategy for the Management of Municipal Wastewater Effluent, 2009
- 3.2.2 Canadian Environmental Quality Guidelines and Summary Table, 2011

3.3 Health Canada

- 3.3.1 Canadian Guidance Document for Managing Drinking Water Systems, Prepared for Health Canada by Canadian Water and Wastewater Association, 2005

3.4 Aboriginal Affairs and Northern Development Canada

- 3.4.1 Design Guidelines for First Nations Water Works, 2006
- 3.4.2 Protocol for Centralised Wastewater Systems in First Nations Communities, 2010
- 3.4.3 Protocol for Decentralised Water and Wastewater Systems in First Nations Communities, 2010

3.5 Environment Canada

- 3.5.1 Review of Municipal Effluent Chlorination / De-chlorination Principles, Technologies and Practices, 2003
- 3.5.2 The Ultraviolet Disinfection Guidance Manual for Municipal Wastewater Treatment Plants in Canada, 2003
- 3.5.3 The Treatment Processes for the Removal of Ammonia from Municipal Wastewater, 2003
- 3.5.4 The Guidance Manual for Sewage Treatment Plant Process Audits, 2003

3.6 Canadian Standards Association

- 3.6.1 B65-12 – Installation code for decentralized wastewater systems, 2012

3.7 Transport Canada

- 3.7.1 Transportation of Dangerous Goods Act, 1992

3.8 Canadian Ground Water Association

- 3.8.1 Guidelines for Water Well Construction, 1995

Some of these documents present guidelines and not standards and therefore constitute a less stringent form of support for the application. If used to support a method or technology, guidance criteria should then be reinforced by other forms of evidence in the application.

In addition to the above list of guidance documents, the Board acknowledges that other guidance documents exist or may be created after the date this guiding document comes into use that may be relevant to municipal undertakings. Where the Applicant or Interveners believe it is appropriate they may identify and submit such documents as evidence to support either the application or interventions and the Board will give due consideration to the value of the guidance document in deliberating upon the application. If the guidance document is not submitted as part of the application or intervention and is not a public document as defined in the Board's Rules of Procedure, it may not be considered.

4 YUKON WATER BOARD AND THE LICENSING PROCESS

4.1 Role of the Board

The Yukon Water Board is an independent quasi-judicial board with members nominated by the Government of Canada, the Government of Yukon, and the Council of Yukon First Nations and then appointed by the Yukon Government Minister responsible for administration of the WA.

Board members are independent of their nominating governments. As a quasi-judicial body, the Board's adjudication of applications must be conducted according to the principles of natural justice and procedural fairness. The decisions of the Board are final and conclusive, and are only subject to appeal to the Supreme Court of the Yukon Territory on questions of jurisdiction or law.

It is a fundamental principle of natural justice that, other than during a public hearing, the Board members not interact with the Applicant or other parties with an interest in the application. Such interactions include those required to determine the adequacy of an application. Therefore, all communications with the Board, except for questioning and representations during a public hearing, must be directed to the Board's Secretariat staff.

4.2 Review for Adequacy

To ensure adherence to natural justice, the Board has directed the Secretariat to review licence applications to ensure that they satisfy all mandatory requirements, are of acceptable scope and clarity to allow for the effective participation of other parties who may wish to intervene ("Interveners") and will facilitate the efficient adjudication of the application by the Board. This process termed "adequacy review" must be completed to the Secretariat's satisfaction prior to the application being made public by the Secretariat and accepted for adjudication by the Board. Staff of the Secretariat will work with the Applicant to ensure that the application is adequate and provide direction as necessary to address deficiencies in the application prior to the progressing to the public notice and comment phase.

4.3 Public Comment and Notification

Once deemed adequate, the Secretariat will post the application on the Board's online registry, *WATERLINE*, and will publicly advertise through local newspapers that the application has been accepted for adjudication by the Board. The advertisement will identify an intent date for interested parties to provide comments on the application and to identify whether they wish to have and/or wish to participate in a public hearing. Notifications are managed through the notification profile by the users signed up to *WATERLINE*, and can be based on a combination of undertaking type, watershed, traditional territory, nearest community, or project specific.

4.4 Board Review and Public Hearings

The adjudication of a type A municipal undertaking application, amendment or renewal will include a public hearing, except under certain circumstances. For type B applications or for applications to amend or renew type B licences, a public hearing is not required unless the Board determines it to be in the public interest. In the absence of a public hearing, the Board will deliberate upon an application during a scheduled Board meeting. Such Board meetings are typically held on a monthly schedule.

In its deliberations, the Board will assess and evaluate the evidence submitted to the Board by the Applicant and any Interveners, and will apply the licensing principles and position statements of the Board. The current licensing principles and position statements of the Board are presented in Section 4 of this information package.

4.5 Board Review and Technical Edits

Prior to finalizing a new licence, an amendment, or renewal of a licence, particularly for a very complex project, the Board may elect to distribute a draft of the water use licence to the Applicant and Interveners to seek technical comments on the contents. The distribution of a draft licence by the Board is not to re-hear or reconsider its decision but only to seek feedback on the clarity and/or correctness of specific parameters, names, and terminology presented in the licence. For example, an error in the units of a given parameter may be identified and

subsequently corrected as a result of technical comments received based on distribution of a draft licence.

4.6 Water Use Licence

If the Board agrees to issue a licence or renew a licence, it will develop a licence document complete with conditions acceptable to the Board and consistent with any statutory requirements associated with YESAA, or any other applicable legislation. If the Board agrees to amend an existing licence, it will modify the existing licence document to that effect and include or modify any relevant conditions related to the amendment. An amended licence must still be consistent with any statutory requirements associated with YESAA, or other applicable legislation. Licences issued by the Board are based on the proposals and commitments made in the application by the Applicant and the submissions of Interveners to the process. The Board cannot change the nature of the work proposed by the Applicant other than to establish conditions for that work in a licence under the WA.

Type A water use licences, including amendments and renewals, approved by the Board are submitted to the Minister for approval and do not become effective until the Minister's and the Chairperson's signatures are applied. Type B water use licences approved by the Board become effective upon the signature of the Chairperson, unless the type B application requires a public hearing and in that case would require the Minister's approval.

4.7 Reasons for Decision

Irrespective of whether the Board agrees to issue (or amend or renew) a licence or not, the written reasons for its decision will be issued and made available publicly. The written reasons for decisions issued by the Board present the rationale applied by the Board in reaching its decision and in developing the conditions of an issued licence. Reasons for decision provide context to licences if a licence is issued, and identifies how the Board has adjudicated any disputed evidence or disputed interpretations of evidence arising during the licensing processes.

4.8 Timelines

There is currently no timeline to complete the licensing adequacy process, but the Secretariat is drafting guidelines intended to provide more process and timeline certainty.

4.9 Process Summary

The licensing process is summarized graphically in Figure 1.

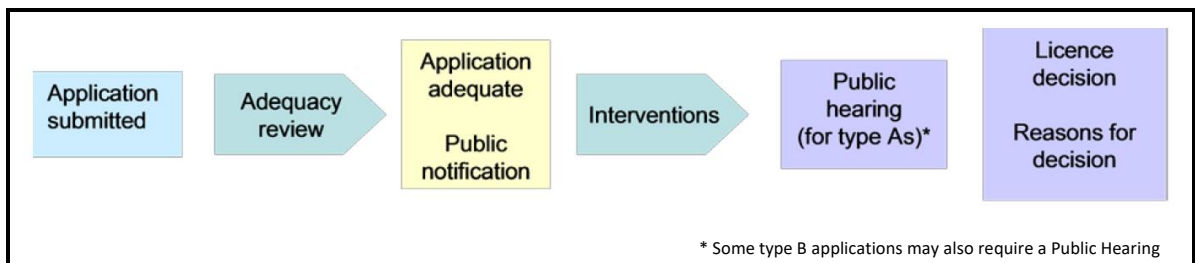


Figure 1: Yukon Water Board Licensing Process

5 LICENSING PRINCIPLES AND POSITION STATEMENTS

5.1 Licensing Principles

In deliberations and rendering decisions on municipal undertakings, the Board will apply the following principles:

- 5.1.1 avoid, minimize and/or mitigate significant adverse environmental effects from the potential uses of waters authorized under the WA,
- 5.1.2 only issue licences where doing so is consistent with the objects of the Board and supported, on the balance of probabilities, by the evidence presented,
- 5.1.3 only issue licences that, on the balance of probabilities are expected to at least achieve the objectives set out in the relevant mitigations included in the YESAA decision document, subject to the Board's authority and responsibility under the WA and the UFA,
- 5.1.4 issue licences that do not grant or renew rights in respect to water contrary to a YESAA recommendation and government decision document,
- 5.1.5 issue licences with conditions that address the specific aspects of the project being authorized and the site under development,
- 5.1.6 consider effects on other applicants and authorized water users, consistent with its other obligations to the public,
- 5.1.7 act openly, pursuant to the principles of procedural fairness and natural justice,
- 5.1.8 protect public health and safety and, in particular, minimize risk to human life,
- 5.1.9 issue licences that are clear and enforceable and administratively consistent, and
- 5.1.10 issue licences only when there is a reasonable certainty that an acceptable level of public health & safety and protection of the environment can be maintained during the municipal undertaking and acceptable reclamation can be achieved upon cessation of undertaking.

The Board encourages the use of robust, proven technologies, but allows for the use of innovative technologies where significant advantages can be shown. In the case of innovative yet unproven technologies, the Board will take a cautious approach, expecting Applicants to provide detailed rationales and contingency plans to manage the performance risk the innovative approach may entail.

5.2 Board Position Statements

The Board gives notice to potential Applicants that its deliberations will apply the following Board position statements:

- 5.2.1 that the treatment of water be designed to the extent practical to minimize the potential load of contaminants that may be released to the environment,
- 5.2.2 that the proposed technologies and systems be considered, explained and supported within the context of a changing northern climate,

- 5.2.3 that all effluents reporting to surface water are non-toxic according to Environment Canada criteria³,
- 5.2.4 that all effluent reporting to groundwater is within applicable standards and guidelines for site specific use,
- 5.2.5 that a risk based approach will be used to evaluate the effects to water and the environment,
- 5.2.6 given the uncertainty of the response of natural systems to disruption by water, wastewater and/or bio-solids treatment activities, development of an adaptive management plan is an essential element for management of municipal undertakings. The plan should describe the process(es) of decision making that will be undertaken to achieve the operational objectives set out in the additional plans required to form part of the application, as detailed in section 6. However, the adaptive management plan shall itself not be the basis for the management of the project.

6 INFORMATION REQUIREMENTS FOR APPLICATIONS

Applicants should be aware that licences, if issued, are based upon the information submitted in the application. This includes any additional submissions and/or revisions provided to the Board by the Applicant, up to the date of the Board's decision. Any significant change to the project following licensing will likely trigger a requirement for an amendment of the licence and may also prompt the need for an additional project assessment under YESAA. Therefore, it is imperative to ensure that the application accounts for all currently planned or foreseen activities within the municipal undertaking.

The Board expects that Applicants for water use licences for municipal undertakings will at a minimum:

6.1 Project Description

Submit a project description that details the project in sufficient detail to facilitate an understanding of the project, its purpose, life cycle, and to support more detailed sections of the application as described in the subsequent sub-sections:

- a) project location,
- b) land ownership for the project location;
- c) setting and history,
- d) major facility components, including but not limited to offsite transport and disposal of wastes resulting from the municipal undertaking,
- e) rationale for selected technology,
- f) development and commissioning schedules,
- g) expected facility lifecycle,
- h) monitoring, reporting and compliance assurance systems and protocols, and

³ Environment Canada single concentration procedure, reference method EPS1/RM/13; 96 hour rainbow trout mortality of 50% or less (LT50) is considered nontoxic. On a case by case basis, the Board may also require other toxicity criteria be met to conclude that an effluent is non-toxic.

- i) other relevant details to provide a full understanding of the proposed project.

6.2 Project Environment

Submit comprehensive information regarding the project environment. It is assumed that the majority of these data will have been generated for the YESAA process. Such information will normally be required to be based on measurements and/or observations from a period of at least two consecutive years, inclusive of all available monitoring programs conducted at the site by the Applicant and/or past parties managing the site and will include:

- a) surface water and groundwater quality and quantity, including seasonal variations in quality and quantity,
- b) surface water and groundwater flow patterns,
- c) climatic data (particularly precipitation),
- d) characterization of the presence and nature of permafrost at the site,
- e) descriptions of aquatic ecosystems,
- f) descriptions of terrestrial ecosystems, and
- g) descriptions of current human activities and uses of resources.

Investigations should be sufficiently specific and detailed that they provide an appropriate understanding of the variability of the site, including seasonal variability. Historical information, climate trends and future projections, if any, shall be summarized and limitations on its accuracy and precision identified. Current climate and hydrologic data shall be compared to historical data to determine deviations from normal patterns and conditions. To the extent that is practical and feasible, identification of project sensitivities to climate parameters and variability should be discussed and considered.

6.3 Influent and Effluent Characteristics

Predict or describe (if know) the chemical composition and quantities of the input and effluent. This may vary considerably by project type and complexity since the various types of municipal projects may accept or produce an array of liquid, sludge and solid waste streams. The composition and projected quantity of each waste stream must be understood and described in detail sufficient to predict and quantify their potential effects upon the receiving environment.

6.4 Proposed Effluent Discharge Standards and Compliance Point

Identify the contaminants of concern (i.e. nutrients, hydrocarbons, metals, microorganisms, etc.) and provide a list of effluent discharge standard that will be met at a proposed point of compliance. The rationale and basis for the proposed effluent discharge standards should be included in the application so that reviewers can understand the basis for the proposed standards and evaluate any potential risks to the receiving environment. The point of compliance is generally the last point of control of the effluent immediately before it enters the natural flow. The compliance point should be named, identified on a map, and coordinates provided. If the coordinates are unknown at the time of applying, a licence condition would require the information be submitted post-licensing.

6.5 Water Balance Model

Submit a comprehensive water balance model and modelling results incorporating all components, water uses, and waste deposits of the project. Clearly note and explain all model assumptions and calculations. The model results shall be of sufficient detail and precision to assess normal and extreme operations for all phases of the undertaking. The water balance model shall also consider the potential implications of climate change at an appropriate time and spatial scale for the undertaking.

6.6 Preliminary Designs

Submit preliminary designs of water and wastewater treatment infrastructure, storage facilities, conveyance structures, and other water management associated facilities. The Board presumes that the applicant has developed these designs from feasibility and/or conceptual studies that form the basis of the undertaking. The objectives of preliminary designs submitted to the Board are to provide evidence that the proposed project components can perform to specification within normal and extreme operational and environmental conditions during its projected life cycle.

To accomplish these objectives, preliminary designs for project components should be based upon engineering analysis and environmental impact assessments that establish the location, function, construction, and operation of the components. In addition, preliminary designs should identify provisions for either municipal facility lifecycle management (e.g. planned facility refurbishment) or projected decommissioning plans.

Preliminary designs of wastewater treatment systems, including the use of prefabricated mechanical treatment plants, are normally expected to be based on the results of specific site investigations. It is acknowledged that additional investigations may be required later in the detailed design process. The application may include either:

- preliminary design drawings sealed by a Professional Engineer licensed to practice in the Yukon. Design drawings may be stamped "*not for construction*"; or
- a preliminary design report, sealed by a Professional Engineer licensed to practice in the Yukon.

The Board requires that preliminary designs be based on the application of robust and proven technologies both in terms of the design methodology utilized and of the materials or components incorporated into the designed object. The use of more innovative approaches may also be acceptable; however, the proposed use of innovative approaches will require the Applicant to submit clear, technically defensible and comprehensive explanations and justifications to the Board to utilize an innovative or less proven technology. Regardless of whether a technology is considered to be proven or innovative, evidence of its applicability for the project environment will be required.

Preliminary design reports submitted as part of the application are evaluated with the same rigor as final designs and documents and are therefore expected to meet appropriate professional standards.

Preliminary design reports should include:

- a) a complete description of the designed project component and its intended function, the data and analysis supporting the design, and design standards, design assumptions, constraints and criteria utilized in the design,
- b) performance specifications of critical materials and equipment utilized in the component,
- c) detailed specifications of pre-fabricated systems or components,
- d) scaled preliminary plans showing layouts and general dimensions of structures and components,
- e) a project schedule covering further engineering, and construction activities, and
- f) where possible, references to existing or like-kind facilities currently in operation.

6.7 Monitoring Plan

6.7.1 Submit detailed monitoring plans and programs for all phases of the undertaking that allows for the collection of data to validate assumptions and predictions of:

- a) the climatic, geochemical, hydrologic, and hydrogeologic inputs affecting the undertaking,
- b) the quantity and quality of input waters diverted or consumed for use in the undertaking,
- c) the quantity and quality of wastewater effluent produced,
- d) the performance and efficiency of all treatment, storage and transmission infrastructures,
- e) the effectiveness of measures taken to mitigate any adverse environmental effects of the project, and
- f) the effects of water use and waste deposition on the environment.

6.7.2 Provide an overview of approaches and technologies to be used in monitoring and reporting. Include all aspects of the monitoring approach:

- a) Data Quality Objectives (DQOs) established for monitoring sites and stations,
- b) QA/QC and chain-of-custody approaches used to assure data veracity,
- c) brief description and locations of any telemetry and/or SCADA (Supervisory Control and Data Acquisition) systems used to automatically monitor sites and stations, and
- d) monitoring data storage and retrieval protocols.

If the Board approves a licence, clauses may be included that require further details of monitoring programs.

6.8 Operational Plan

Submit an operation plan that describes the facility operational features. This includes, but is not necessarily limited to a description of:

- a) process control measures,
- b) operations and maintenance tasks and schedules,
- c) physical monitoring program of the municipal wastewater system,
- d) emergency and spill plan, and
- e) describes health and safety measures.

6.9 Sludge Management Plan

Submit a sludge management plan detailing the following:

- a) practices to be used to minimize sludge accumulation,
- b) identification of sludge levels that would be considered an action level for removal,
- c) monitoring plan for sludge levels,
- d) method of removal of sludge, and
- e) method of disposal of sludge.

The plan must identify trigger levels for management actions that would be enacted based on the results of monitoring activities. The sludge management plan should focus on aspects of the project performance that can directly or indirectly lead to unexpected or unacceptable impacts to the aquatic environment.

6.10 Hazardous Materials Management Plan

Submit hazardous materials management plans for hazardous substances (e.g. petroleum hydrocarbons, solvents, reagents, etc.) that will or may be produced, transferred, stored, or utilized at the site. Such materials may include but are not limited to:

- a) reagents for water, wastewater, sludge and solids treatment processes,
- b) chemical or biological bi-products of treatment processes (e.g. trihalomethanes, microorganisms, etc.),
- c) petrochemicals, volatile and semi-volatile organic compounds,
- d) inorganic metals and contaminants,
- e) radiological isotopes and sources, and
- f) other forms of sludge or by-products.

The management plans will detail safe handling, storage, and disposal of such materials. The plans will also detail a response plan to contain and clean up any spills of hazardous materials. It is assumed that the majority of this information will have been generated for the YESAA process.

6.11 Decommissioning and Reclamation Plan

Submit a temporary closure plan and a decommissioning and reclamation plan that describes anticipated extension and/or closure of the project.

The Board advocates that facility decommissioning plans be based on the application of robust and proven science, technologies, and methodologies. The use of innovative approaches may also be acceptable; however, the Applicant will be expected to submit clear, technically defensible and comprehensive explanations and justifications to the Board to utilize innovative or less proven science, technology, or methods. Regardless of whether a decommissioning and reclamation approach is considered to be proven or innovative, evidence of its applicability for the project environment will be required.

7 APPLICATION CONTENT AND FORMAT

The Board expects that water use licence applications for municipal undertakings will be accompanied by the following (* indicates mandatory form):

- a) Completed Schedule 4 application form* (available on the Water Board website)
- b) Copies of any approved regulatory authorizations
- c) Proof of business entity
- d) Environmental Health form for camps serving less than 50 occupants (available on the Water Board website)
- e) Applicable fees (contact the Yukon Water Board Secretariat for confirmation of fees)
- f) Agent Authorization form
- g) Completed Project Confirmation Form* (available on the Board's website), as well as a copy of the YESAA evaluation/screening report and the signed decision document(s)
- h) Proof of land ownership or agreements for use of the land. The agreement should have:
 - the applicants signature(s) and the signature(s) of the registered owner(s) of the property,
 - a list identifying the properties that are subject to the agreement, and
 - agreement to enter the property and to use the property for the activities described in the water use licence application,
 - indicate the duration that the agreement is in effect.

The above information would be included in an application report that presents at least the information identified in section 6 and that follows the general Table of Contents outlined in Appendix B of this information package. In addition to the application report, the Board expects that technical appendices would be provided to present detailed supporting studies and preliminary design reports.

The Board expects that the completed application report and technical appendices would be submitted in draft form for adequacy review by the Secretariat and that it would be resubmitted in final form

complete with any revisions, modifications, updates, or additions, resulting from the adequacy review by the Secretariat.

Both the draft and final application documents shall be provided in single-sided, unbound hard copy and unsecured, searchable electronic form such as PDF document(s). Numerical data associated with the application shall also be provided in useable electronic spreadsheet format.

8 POTENTIAL LICENCE CONDITIONS

There are a number of standard conditions that are included in all water use licences issued by the Board. These include:

- the expiry of the licence,
- reporting requirements,
- effluent standards,
- monitoring requirements,
- inspection requirements,
- conditions around water use or discharge (i.e. daily withdrawal quantities and timing restrictions)

Furthermore, the Board may also require some or all of the following post-licence submissions if sufficiently detailed information is not provided or available at the time of licensing:

8.1 Final Design Drawings

Requirements to submit to the Board, prior to the commencement of construction, the final detailed design drawings, construction plans and specifications for all proposed structures and facilities including, but not limited to:

8.1.1 Wastewater collection, storage and treatment systems,

- a) interim storage or retention structures and areas,
- b) treatment facility, and discharge routing systems,
- c) sludge treatment, holding and disposal systems,

8.1.2 site-wide infrastructures and configuration,

- a) containment, diversion and flood protection systems,
- b) dams, coffer dams, berms and impoundments,
- c) drainage works, diversions and spillways,

8.1.3 waste collection systems and collection network configuration, and any other structure or facility relevant to the conditions of the licence, for information purposes.

A detailed design is the last level of project design. It will integrate the results of any additional investigations identified during the preliminary design process and all of the final detailed drawings and specifications required to construct the project. All engineering drawings and specifications submitted to the Board must be sealed by a Professional Engineer licensed to practice in Yukon.

8.2 Monitoring Stations

Requirements for additional water quality and flow monitoring points in addition to the points proposed in the application and/or more frequent sampling of proposed monitoring points. Such modifications to the monitoring plan may be established for the purposes of monitoring the overall performance of the project, early stage identification of emerging problems, added protection for human and ecosystem health.

8.3 Modifications to Preliminary Designs

A requirement to submit to the Board details of any modifications to, or variations from the preliminary designs previously submitted, in advance of any related construction. Such submissions must include an explanation of the reasons for the change, and present evidence that the change results in water use and/or waste deposition that is already permitted under the terms of the issued licence.

Moreover, it is required that the licensee confirm that the modifications or variations do not require an additional assessment under YESAA. All such design modifications must be sealed by a Professional Engineer licensed to practice in Yukon.

8.4 Decommissioning Plans

8.4.1 **Large scale municipal water and wastewater facilities** - for facilities with anticipated operations lasting longer than the projected duty cycle of major infrastructures. Large scale municipal water and wastewater facilities are examples of this type of facility as the demand for potable water and wastewater disposal will typically extend in perpetuity, outlasting the engineering lifecycle of the component tanks, pipes, etc. a life cycle plan should be included with the decommissioning and reclamation plans.

8.4.2 **Temporary water/wastewater systems** - for fixed lifespan facilities (i.e. temporary/transient camp water/wastewater systems, etc.) not requiring major systems upgrades, a life cycle plan is not required to be submitted with the decommissioning and reclamation plans.

These plans will be based on the preliminary design submitted with the application, with requirements for periodic updates as circumstances warrant.

8.5 As-Built Drawings

It is a requirement to submit to the Board final record (as-built) drawings of all structures and facilities following the completion of construction. All drawings must be sealed by a Professional Engineer licensed to practice in Yukon.

8.6 Plans and Studies

A requirement to submit to the Board specific plans or studies in a time frame specified.

8.7 Operations Manual

A requirement to submit to the Board comprehensive Operations and Maintenance plans for the licensed facilities and systems, including monitoring systems. This manual will build on the preliminary operations manual provided at the time of application and will require finalization once the final design of the system is determined.

APPENDIX A:

Recommended Table of Contents for Water Use Licence Application for Municipal Undertakings



APPENDIX A:

**RECOMMENDED TABLE OF CONTENTS FOR
WATER USE LICENCE APPLICATION
FOR MUNICIPAL UNDERTAKINGS**

August 2013

Preamble

The Yukon Water Board (“the Board”) has developed this document to guide Applicants in the development of application reports required to support Type A and Type B water use licence applications for municipal undertakings. The document presents an annotated outline of the recommended table of contents and provides guidance in regards to the nature of information expected within identified sections of the application report.

Municipal undertakings may be comprised of several types of activities, ranging from simple extraction, treatment and consumptive uses of water to more complex and integrated water use and wastewater/sludge disposal systems. And accordingly, the amount and detail of information necessary to support the Municipal licensing process will also vary with the size and complexity of the undertaking.

However, regardless of size and complexity of the undertaking, the potential consequences to human health and the environment resulting from improper design and/or operation of water and wastewater/sludge systems may be extreme. It is for this reason that the Board requires that applicants carefully consider all possible factors that may affect their system along with the impacts to the environment.

To assure consistent assessment and licensing of the various types of municipal applications, the Board requires that the applicant considers a fairly broad range of potential factors and effects that may be relevant to their application. These items are found within the municipal undertaking application form. Large, complex projects will typically require more detailed information and assessment than small, simple initiatives. However, given the uniqueness of each application, all factors and items within the application process must at least be considered by the applicant and reviewed by the Licensing Officer in order to develop an appropriate license application.

In many circumstances, some of the supporting information requested for municipal undertaking applications may have no bearing upon the proposed project and may not be required for a license application to be considered. However, it remains the responsibility of the applicant to either provide supporting information for each application item or to provide a sound reason why that information does not apply to their project.

To assist an applicant in better understanding their information requirements, the following table provides a general listing of background materials necessary for typical project types. This table is provided to assist the applicant in considering their license application submission and does not constitute a specific checklist or set of requirements. The Licensing Officer will work with the applicant to develop the final information package for their project.

Example Project Scenarios:

- 1) Small scale water withdrawal for consumptive use(s):
 - A surface and/or ground water extraction system (pump, diversion channel, etc...)
 - Piping or open channels for moving raw water from the source
 - Tanks or open impoundments for storage and treatment
 - Treated water storage and distribution systems

- 2) Camp-sized combined septic and wastewater collection, treatment and disposal:
 - Waste collection system and transfer system
 - Tanks or impoundments for biological and/or chemical waste treatment
 - Post treatment sludge/water separation
 - Treated wastewater and sludge disposal

- 3) Combined municipal/industrial wastewater collection, treatment and disposal:
 - Combined sewage and waste collection system and transfer system
 - Tanks or impoundments for multi-stage filtration and biochemical treatment processes
 - Post treatment sludge/water separation
 - Sludge stabilization, thickening and treatment technologies
 - Treated wastewater and sludge disposal

Example Scenario	Project Assessment Background Information Requirements								
	Location	Climate	Geology	Surface Water Hydrology and Quality	Ground Water Hydrology and Quality	Fish and Aquatic Habitat	Wildlife and Wildlife Habitat	Vegetation	Social Environment
Small scale water withdrawal for consumptive use(s).	●	○	○	●	●	●	○	○	◐
Camp-sized combined septic and wastewater collection, treatment and disposal	●	◐	◐	●	●	●	◐	◐	◐
Combined municipal/industrial wastewater collection, treatment and disposal	●	●	●	●	●	●	●	●	●

- Detailed information likely necessary
- ◐ Selected or summary information likely necessary
- Cursory or limited information likely unnecessary

The Board recognizes that each municipal undertaking is a unique project. However, the requirement for a consistent table of contents will aid the Board and third parties in efficiently reviewing applications. Moreover, the guidance provided within this document should allow Applicants to prepare applications that more readily meet the Board's information requirements and therefore shorten the adequacy review period.

The Board expects the application report to be a summary document for the detailed plans, studies, assessments, and preliminary designs that have been completed to advance and support the project. It is expected that the supporting documents that present the evidentiary basis of the project will be included as appendices to the application report.

Water Use Licence Application Report TABLE OF CONTENTS

Front Matter

Section i: Transmittal & Cover Letter

Section ii: Mandatory Forms

The mandatory forms section must include the following Yukon Water Board forms:

- Schedule 4
- Agent Authorization Form (if applicable)
- Project Confirmation Sheet (only if the Decision Document has been issued)

Section iii: Executive Summary

Section iv: Abbreviations and Acronyms

Report Body

1. INTRODUCTION

a. PROJECT OVERVIEW

Provide a high level, concise overview of the project including:

- a description of the planned water, wastewater and sludge processing activities and technologies including transmission venues
- projected facility life cycle and a maintenance management overview
- description of site location
- a summary of the magnitude and scope of any associated activities, and
- summaries of uses of water and deposits of waste associated with the undertaking.

A more detailed project description is required under section 4.1 of the Table of Contents.

b. APPLICANT INFORMATION

Provide a description of the Applicant organization.

c. REGULATORY AUTHORIZATIONS AND APPROVALS

The proponent should be aware that both a YESAA assessment (and subsequent decision document(s)) and a Yukon Water Board license will be necessary for their project to proceed. The sequence of submission of materials to YESAA and the YWB is at the discretion of the applicant.

i. SUMMARY OF YESAA PROJECT ASSESSMENT

Provide a concise summary of relevant *YESAA* assessment materials that have been completed for the project. This should include the Project Evaluation, Project Screening Report and Decision Document.

ii. SUMMARY OF POST ASSESSMENT STAKEHOLDER ENGAGEMENT

Provide a summary of stakeholder contacts and discussions that has occurred since and/or concurrent to the *YESAA* project assessment. Stakeholders should include but not be limited to: First Nations governments; federal and territorial regulators; non-government organizations; and any other interested parties identified through the *YESAA* assessment process.

iii. EXISTING REGULATORY APPROVALS

List the Applicant's currently held regulatory approvals and submitted regulatory applications that pertain to water and waste related aspects of the project. These may include DFO site-specific authorizations, Environmental Health authorizations, etc... Define the scope (term, spatial limits, and enabled activities) of all held approvals.

iv. EXISTING WATER USERS

List existing water use licences or pre-existing water use licence applications held by other parties within the area that could potentially be affected by the proposed project and/or contribute to potential cumulative effects to the water source(s) or receiving environment(s) that will be utilized for this project. Also list un-licensed water users including domestic users or traditional First Nation water users that may be affected by the project.

A conservative approach should be utilized in this section to define the spatial limits, both upstream and downstream, of potential water licences or water users.

In the event that significant numbers of water users need to be identified, summary information can be presented and detailed information attached as an appendix to the application report. A map may be appropriate to display the locations of the other users relative to the project area.

v. REQUESTED WATER USES AND WASTE DEPOSITS

Identify all proposed water uses and waste deposits that require a Type A or Type B water use licence to authorize as defined by the licensing criteria presented in Schedule 8 of the *Waters Regulation*. For direct water use identify the method, volume, frequency, source, and timing of the water withdrawal. For other water uses (watercourse crossings, watercourse training, flood control or diversions) provide general information on the nature of the use.

For proposed waste deposits identify the location, rate, timing, frequency, and duration of the deposit. Also identify the anticipated constituents of the deposit and the concentration (or anticipated range of concentrations) of the constituents. State any assumptions, and provide the referenced source when applicable.

For both water uses and waste deposits that may vary significantly in nature or magnitude over the course of the project identify the anticipated nature and/or magnitudes at key stages over the course of the life cycle of the project.

2. PROJECT LOCATION & BACKGROUND

a. LOCATION

Provide a description of the project location(s) including but not limited to information such as:

- Geographic Location;
- Legal Land Description;
- Study Area Boundaries for YESAA effects assessments;
- Proof that the Applicant has the right to use the land for the activities proposed in the application. If the Applicant is not the registered owner, provide an agreement with the registered property owner; Land Tenure within the area(s), including First Nation Traditional Territory and First Nation Settlement Lands and known First Nation uses;
- Access roads and public highways serving the location;
- Overlapping Quartz and Placer Claim holders;
- Registered Trapline Concessions; and
- Outfitting Concessions.

Provide scaled, geo-referenced figures conveying the above information.

b. PROJECT BACKGROUND

i. PAST DEVELOPMENT

Describe the rationale and any related developments at the project site.

ii. EXISTING MUNICIPAL WORKINGS AND WASTE STORAGE AND DISPOSAL AREAS

Identify the nature and extent, if any, of existing municipal works facilities, infrastructures and waste emplacements at the project site.

3. PROJECT ENVIRONMENT

Provide detailed descriptions of the project environment in the context of pre-development or of the current development status if development already exists. The amount of information presented should be sufficient to establish baseline conditions for all relevant parameters of the project environment. The information provided to YESAB during the environmental and socio-economic assessment process can be summarized and submitted for water licensing purposes.

Depending on the level of information available for each aspect of the environment and the complexity of the environment and/or the project, it is also likely that additional subsections will be necessary for each of the primary topics identified below; the subsections should be grouped or split so that the information is logically presented.

For each section also provide a summary of the sources of data that have been used to develop the description of the project environment. This should include listing public data sources (regional climatic records, etc.) and project specific data collection programs undertaken by applicant.

For data highly relevant to water licensing, such as water quality, water quantity, aquatic biota, provide details on data collection methodologies, quality assurance and limitations.

Also summarize site specific data and data collection programs (if any) undertaken by others at the site as part of previous studies or site developments. Where such historical data are known to exist and are not being used in the development of baseline conditions or for the prediction of project effects identify why it is not being considered (for example insufficiently sensitive detection limits, etc.).

Contemporary and historical data collection reports should be included as appendices to the application report. For historical reports that contain significant amounts of information that is not relevant to the application, or is excessively repetitive, a summary of the completed program(s) and excerpts of relevant data can be provided.

a. CLIMATE

In situations where variations in climate may play a role in the operation of the proposed undertaking, the Board will wish to consider this as an additional factor. An example of circumstances where climate may affect an undertaking includes the installation and operation of lagoons, discharges into surface waters, sizing of open channels, etc.

Provide an overview of the regional and local climate setting, temperature and precipitation statistics and trends based on regional and project- specific climate station data. Use tables and figures to help summarize and depict data.

For precipitation, provide statistics on:

- the proportion of precipitation occurring as snow,
- snow depth and water content,
- magnitude and timing of the snow melt,
- other major runoff events; snow-free period, and
- estimates of evapo-transpiration.

The Board expects that the site specific climate dataset will build upon data presented during the preceding project assessment phase conducted under YESAA. Data acquired after or not considered during the Project Assessment by YESAB is expected to be incorporated into any description or analysis of the climatic environment.

The Board also expects a discussion of the projected variability due to climate change, the possible implications on key climatic parameters, and how that variability will be addressed in the context of the project life cycle.

b. GEOLOGIC SETTING

Present descriptions of the regional and project-specific geologic setting. Use maps, air photomosaics, tables, and summary figures to help summarize and depict data and information. Include:

- Physiographic features - topography, relief, drainage patterns,
- Soils and bedrock geology
- Tectonic and geo-hazard features
- Permafrost and significant cryogenic features

c. WATER AND WATER QUALITY

i. SURFACE WATER

Describe the surface water environment including surface water bodies, water courses, and drainage systems. Water bodies that will be either water sources or receiving environments for the project should be specifically identified. Key subsections are to include hydrology and water quality.

For surface water, the Board expects that near continuous flow monitoring data will be provided for key watercourses at the site unless it can be shown that the stream flows are such that near continuous monitoring was/is not feasible. Such flow information will normally be required to be based on measurements and/or observations from a period of at least two consecutive years, inclusive of all available monitoring programs conducted at the site by the Applicant and/or past parties managing the site.

Based on the collected dataset provide representative measurements of annual stream flow/volume distribution including annual peak and low flows. The measurements should be sufficient to develop proper stage-discharge curves.

For surface water quality, the Board expects that sampling will encompass conditions representative of the range of seasonal flow conditions that have occurred at the site over at least two consecutive years of monitoring. Moreover, it is expected that more intense sampling will have been conducted during the higher discharge periods of the project's water courses. Best efforts should also be made to sample during storm events or during the flow recession from storm events.

Finally, the Board also expects that surface water data collection (both for flow and quality) will be continued during and subsequent to the YESAA project assessment and that data collected after the submission of the Project Proposal will be incorporated into the water use licence application.

ii. GROUNDWATER

Establish and map flow rate and gradient of groundwater within project watersheds including measurement of spatial and temporal variability. Groundwater aquifers that will either be used for water supply or for disposal of project wastes should be specifically identified.

The frequency of the baseline/monitoring will be relative to the flow rate and should be sufficient to adequately define the baseline physical hydrogeological conditions at the site. Identify linkages between hydrogeological and surface flows particularly for base flow conditions and where groundwater reports to surface. Identify if, and where, permafrost may affect groundwater flows.

Baseline groundwater quality sampling should characterize spatial and temporal (seasonal) variation in groundwater quality over the project area. Sampling stations should be established at sites suitable as future monitoring and compliance points. Sampling stations should be situated to provide adequate spatial coverage relative to the project including both reference/control locations and potentially affected stations. Provide measurements of baseline water quality where project-affected groundwater reports to surface (i.e., seeps).

At a minimum the Board expects that characterization of groundwater will require monitoring over at least two consecutive years. Regardless of the period of monitoring prior to assessment of the project under YESAA, the Board also expects that groundwater data collection (both for flow and quality) will be continued during and subsequent to the YESAA project assessment and that data collected after the submission of the Project Proposal will be incorporated into the water use licence application.

d. FISH AND FISH HABITAT

Describe the aquatic organisms and aquatic habitat in the environmental assessment study area, including in waterbodies on the site, as well as upstream and downstream watercourse and water bodies that may be affected by the development. Describe the following for key aquatic species:

- seasonal and life cycle movements;
- local and regional abundance and distribution;
- known or suspected sensitive habitat areas for different development stages and times of year;
- the food chain that supports the species
- the effects of the water use on fish and their habitats, as per section 14.8.4.1 of the First Nation Final Agreements; and
- any known issues currently affecting fish and other aquatic life forms in the area.

e. WILDLIFE AND WILDLIFE HABITAT

The Board anticipates that wildlife and wildlife habitat descriptions provided during the project assessment by YESAB are sufficient to utilize for this section. Regardless, the Board recommends that added emphasis be placed on describing wildlife interactions with water resources, as well as the effects of the water use on wildlife and its habitat, as per section 14.8.4.1 of the First Nation Final Agreements.

f. VEGETATION

The Board anticipates that vegetation descriptions provided during the project assessment by YESAB are sufficient to utilize for this section. Regardless, the Board recommends that added emphasis be placed on describing riparian vegetation and wetland vegetation that may be affected by the project.

g. SOCIAL ENVIRONMENT

The Board anticipates that the socio-economic descriptions developed for the YESAA project assessment supplemented with reference to any compensation or benefits agreements developed subsequent to the project assessment can be summarized in this section. Regardless, the section should specifically focus on the relationship between the project and existing water users including First Nations traditional use of water resources. In particular, it is required that the nearest and/or most potentially affected First Nation Settlement Lands for each watershed of the project are identified and if deemed necessary, any compensation plans with First Nations or other users be identified.

4. PROJECT DESCRIPTION

a. INFRASTRUCTURE DEVELOPMENT PLAN

Provide a narrative overview of the municipal development, operation, and life-cycle phases of the project. The narrative overview should include descriptions of development activities, schedules and required infrastructure for the project.

The narrative should include figures and tables sufficient to present the information. In regards to figures, an overall development site plan or plans at a scale not less than 1:5000 should be included in the application report. This site plan or site plans should show the locations of all of the main components of the project, including all treatment, storage, transmission and disposal areas and any other facilities proposed to be licensed through this application.

b. DESCRIPTION OF PROJECT COMPONENTS

Following from the narrative description, this section should include more detailed descriptions of the project components. Where appropriate, the descriptions should draw from completed preliminary designs that will be included as appendices to the report. No significant changes to project components should be made after the completion of the preliminary design, although it is anticipated that additional details of the design will be developed. Significant changes to project components are likely to require licence amendments, as well as a requirement for further assessment under YESAA.

Note that preliminary designs submitted to the Board will be required to be sealed by Professional Engineers registered to practice in Yukon.

Where a given project component has a hazard classification of high, very high, or extreme based on the hazard classification system of the Canadian Dam Association or similar relevant hazard classification system, the Board will expect that a Failure Modes Effects Assessment ("FMEA"), or similar hazard/risk study will be completed as part of

the preliminary design process for that infrastructure. Such studies normally involve the participation of a wide range of stakeholders and the Board would expect that the Applicant has made and or can show that best efforts have been made to include stakeholders in any FMEA studies completed to support the submitted application.

i. DESIGN AND PERFORMANCE CRITERIA

Include an overview of the design and performance criteria (codes, standards, guidelines, and specific performance criteria including selected hazard or risk classifications) that have been adopted for the project. Key points can be summarized and additional details provided in an appendix.

For criteria related to risk, such as the selection of the inflow design flood and design earthquake ground motion parameters, provide the rationale for the selection of the criteria. The rationale should be linked to the risk level of the project component and should reference criteria for similar infrastructure in Canada.

The Board believes that the Applicant should be forward looking in terms of risk criteria and should utilize more stringent risk tolerances where international trends indicate a movement towards increasingly protective tolerances.

ii. WASTE EMPLACEMENTS

Provide a description based on developed preliminary engineering plans for all proposed waste emplacements that should be attached as appendices to this application.

The Board looks favourably upon waste emplacement designs that:

- a) eliminate the long term geological risk posed by water/fluid retaining structures; and
- b) that create landforms with similar or better potential for long term performance with respect to erosion and other mass wasting phenomenon as exhibited by stable natural landforms in the development area. The Board also views the underground and sub-aqueous disposal of reactive waste materials as prudent where it is possible to do so.

Where the Applicant presents designs contrary to the above preferences of the Board it is expected that strong rationale will be supplied by the Applicant to justify the use of the submitted designs.

iii. TREATMENT AND PROCESSING FACILITIES

A description of the process is required. Flow sheets that indicate process streams, quantities and significant equipment can be used to describe the process(es). The chemicals or reagents that will be used in the process must be identified and the use of any particularly hazardous products must be noted, and the corresponding Material Data Safety Sheets (MSDS) provided as part of the Application.

iv. WATER MANAGEMENT STRUCTURES

Include descriptions of all water management structures including, but not limited to, water supply dams, water intake structures, groundwater supply wells, water conveyance systems, water diversion systems, water storage, treatment ponds and sewage lagoons, underground sumps, water treatment plants and treated wastewater discharge facilities.

All such structures and infrastructure must, at a minimum be described on the basis of completed preliminary designs that must be attached to the Application report.

v. ADDITIONAL INFRASTRUCTURE

Any additional structures, including on-site accommodations and offices, workshops, storage facilities, fuel storage facilities, chemical/reagent storage and/or manufacturing facilities must be described in terms of location and construction. Items of particular relevance to the reclamation plan are locations, foundations, and nature of construction (e.g. movable modular units or 'permanent' structures).

Access and transportation modes and routes for facility personnel and supplies and products must be described. Specific mention must be made of any requirements that restrict road access.

5. PREDICTED PROJECT PERFORMANCE

In this section the predicted performance of the project, as well as the tools and analytic models used to predict the performance will be presented.

a. PRODUCTION OF PRODUCTS AND WASTES

On the basis of the water/wastewater and sludge management plan, describe the products (treated water, process water) and the waste streams that will be produced by the project over its life cycle. All of the water products and waste must be characterized in sufficient detail to assess their potential health and/or environmental impacts. Furthermore, the characterization is necessary to support monitoring activities that are proposed during the project life and to provide bench marks for potential adaptive response plans.

Characterization of products and wastes should include volumes, composition, presence of reagents and/or biochemical residuals, physical properties and depositional form, volumes and tonnages, and production schedules over the life cycle of the project.

b. PREDICTION OF DRAINAGE CHEMISTRY FROM WASTE STREAMS

In the context of a water use licence application, drainage chemistry includes the water quality of surface or groundwater originating from waste emplacements at the project site. These flows are considered to be the inputs into project effluent treatment systems or if suitable direct effluent releases into the environment.

For the application report predict the drainage chemistry for each waste stream.

This will entail the application of bio-chemical and engineering modelling of water/wastewater and sludge treatment processes to predict resulting effluent chemistry. Various modelling and chemical speciation methodologies may be used for this purpose. A detailed discussion of the modelling process, parameters, confidence/uncertainties and sensitivities is required.

c. WATER BALANCE MODELLING

Water balance modelling is necessary for applications that include impoundments or water storage systems requiring controlled volumes and/or flow rates for successful operation. In these instances, the Applicant must present a summary of a developed site-wide water balance model for the project and the results of modelling. A comprehensive report on the development and application of the model must be included as an appendix to the application report.

The developed model will need to incorporate, where appropriate:

- wastewater inputs into the lagoons, impoundments, tanks, etc...
- precipitation inputs and evaporation outputs,
- existing and project-affected runoff conditions,
- influence of project components that could affect the water balance, such as storage of water in sludges or other wastes,

The water balance model must be used to develop results and projections for a variety of operating and climatic scenarios including specific consideration of all key stages of the facility life cycle and variations on climatic cycles (dry, normal, and wet years or periods). The rationale for the selected scenarios that have been modelled must be provided. In particular the return period of selected wet and dry years/scenarios must be presented and defended.

Where information is available, the water balance model should also include a discussion on future climate trends and climate change projections. The implications of how these future trends and projections have been incorporated into the water balance scenarios should also be discussed. Reference to the specific climate change scenarios, trends and projections used for this analysis should be provided if available.

Output from the model must specifically identify transfers of water from one watershed to another (if any) and must explicitly identify and quantify the reuse and recycling of water that will occur. In this context reuse is where water from one process is used in a subsequent process without treatment and recycling is where water from one or more uses is collected and treated so that it can be used again for some purpose at the site. The Board expects that reuse and recycling of water will be maximized wherever possible in proposed activities for municipal undertakings.

d. WASTEWATER DISCHARGE

i. WASTEWATER AND SLUDGE TREATMENT

Describe the wastewater and sludge stabilization processes that will be applied to wastewater discharges that will be released to the environment. The description should build upon the drainage chemistry and water balance predictions to show the resulting water quality of all discharges from all

discharge locations to the receiving environment(s) throughout the life of the project.

The predicted water quality of contaminants and potential contaminants of concern must be provided both in terms of mean expectations as well as potential variance. The predictions should identify achievable outcomes for the applied processes and not just back calculated maximum concentrations that may allow for maintenance of receiving water quality objectives. The sensitivity of predicted outcomes to changes to input water quality or quantity should be discussed.

It is expected that wastewater and sludge treatment technologies that are proposed will be supported by at least bench scale trials and preferably by field-scale trials or applications of similar scale to that being proposed. Evidence from such trials must be provided in appendices to the application report.

ii. RECEIVING ENVIRONMENT(S)

Provide a summary of the characterization of the receiving environments for the project. The characterization should include identification of critical species and water quality objectives suitable for those species. If site specific water quality objectives are proposed the development of those objectives should be summarized. If standard water quality objectives such as CCME objectives are proposed these should be identified and their applicability discussed.

Any proposed degradation of the background water quality in the receiving environments must be identified and the rationale for the level of degradation provided.

Relevant studies and analysis supporting the selection of proposed water quality objectives must be included as appendices.

The Board advises Applicants that water quality objectives are normally considered by the Board in the context of evaluating and establishing effluent discharge criteria that will be included as conditions in the water use licence.

iii. WATER QUALITY MODELING

This section should summarize and describe a water quality model or models developed for the project and present the results of water quality modelling for a robust set of development, operational, and closure scenarios considered for the project.

The water quality model or models must be developed utilizing the predicted or measured stream chemistry, water balance and predictions of water treatment processes, to predict the resultant water quality of receiving environment(s) proposed for this project. The water quality model(s) must be clearly coupled to the water balance model and must be suitable to make accurate predictions for all phases of the project life cycle. The model(s) should account for variability in both the discharge effluent streams and the

receiving environment water quality and quantity parameters. The sensitivity of the model to its input parameters and assumptions should be examined and reported.

Full details on the development of the model and the applicability of the modelling methodology should be included with the full results of completed modelling in an appendix to the Application report.

iv. PROPOSED EFFLUENT DISCHARGE STANDARDS

Proposed discharge standards for effluent discharges from the project need to be presented and substantiated. The proposed standards shall identify all contaminants of concern and potential contaminants of concern and at a minimum meet the applicable regulations. The standards shall also include release timing and quantity elements as may be required as part of the effluent discharge strategy. If applicable, proposed standards for various phases of the project must be presented. Depending on the size and characteristics of the proposed wastewater treatment system, effluent may be required to meet the effluent standards listed in the *Wastewater Systems Effluent Regulations* under the federal *Fisheries Act*.

The proposed effluent discharge standards must be compared to the identified water quality objectives for the receiving environment and shown through completed water quality modelling to be protective of the receiving environment(s).

As previously noted the proposed effluent discharge standards should be based on achievable outcomes of proposed treatment processes as determined by suitable scale testing and not just back calculated maximum concentrations that may allow for maintenance of receiving water quality objectives. The rationale for selecting the scale of testing completed for proposed treatment processes must be provided.

e. PREDICTED EFFECTS ON SETTLEMENT LAND AND TRADITIONAL WATER USES

Chapter 14 of the Umbrella Final Agreement (“UFA”) and specific Yukon First Nation Final Agreements between the Government of Canada, the Government of Yukon and the Council of Yukon First Nations creates specific duties that the Board must fulfill in terms of considering the possible effects that proposed water uses (including deposit of a waste in water) may have on First Nation Settlement Lands and on the traditional use of water by a Yukon First Nation people on non-Settlement Land.

Specifically a Yukon First Nation has the right to have water which is on or flowing through or adjacent to its Settlement Land remain substantially unaltered as to quantity, quality, and rate of flow, including seasonal rate of flow.

Also where an applicant is proposing to substantially alter the quantity, quality, or rate of flow, including seasonal rate of flow, in a drainage basin such that the traditional use of water by a Yukon First Nation person in that person’s Traditional Territory will be adversely affected, a First Nation can request that the Water Board consider alternatives and reasonable measures to avoid the adverse impact.

Therefore, in this section the applicant must provide the results of analyses that show whether:

- a) The quantity, quality, and rate of flow, including seasonal rate of flow of water through or adjacent to Settlement Lands will be substantially altered; and
- b) Traditional uses of water by a Yukon First Nation person (or people) will be adversely affected by a proposed substantial alteration of the quantity, quality, or rate of flow, including seasonal rate of flow in that person's Traditional Territory.

The analyses must be accompanied by sufficient drawings or figures to clearly define the Settlement Lands and Traditional Territories that will be potentially affected by the project. The analyses must also be explicit, based on evidence, and continue downstream to the extent that any reasonably predicted substantial alteration of quantity, quality, and rate of flow, including seasonal rate of flow is expected to occur. The analyses must consider all drainage basins or watersheds that may be affected by the proposed municipal undertaking activity. Finally the analysis must describe the definition(s) of "substantial alteration" used in evaluating the results of completed analyses and the rationale supporting that definition(s).

In the event that the completed analyses find that:

- 1) the quantity, quality, or rate of flow, including seasonal rate of flow will be substantially altered where water flows through or adjacent to Settlement Land, or
- 2) that the traditional use of water by a Yukon First Nation person in that person's Traditional Territory will be adversely affected by a substantial alteration of quantity, quality or rate of flow, including seasonal rate of flow, in that person's Traditional Territory,

Then this section should include or reference evidence and arguments showing that:

- a) there is no alternative which could reasonably satisfy the requirements of the applicant, and
- b) there are no reasonable measures whereby the applicant could avoid the interference.

In addition, this section must also provide or reference evidence regarding the effect of the proposed water uses on fish, wildlife and their habitats and the effect of the water use on the Yukon First Nation or on a Yukon Indian Person enrolled pursuant to that Yukon First Nation Final Agreement.

Finally, if the applicant is proposing water use resulting in an adverse effect to the water rights of a First Nation or First Nation person, then the Board would expect that a compensation agreement would be provided as part of the application and summarized in this section of the Application report.

6. WATER, WASTEWATER AND SLUDGE MANAGEMENT PLANS

Water and waste management plans are documents that outline the objectives, strategies, activities and methods to manage water and waste either produced or affected by the project. The plans should highlight the use of strategies for source reduction of potential contaminants, potential reuse or recycling of waste products, the

treatment of waste products (before or after placement) and the application of diversions and barriers to prevent contaminants from entering the receiving environment. Achievable management objectives based on the results of modelling and testing should be proposed.

For most municipal applications, the Board anticipates that waste management plans would be required for, but not limited to, residual process waters, sludge and bio-solids. The water management plan must be integrated with the various waste management plans to show how water will be managed from sources to discharge from the site. It is expected that the various plans will be included as standalone appendices and that summaries of the various waste management plans and of the integrated water management plan will be presented in this section and its subsections.

In describing the water and waste management plans, the emphasis can be placed on the development, operations and projected project lifecycle phases.

7. HAZARDOUS MATERIAL MANAGEMENT PLAN(S)

The applicant is required to develop management plans for the transportation, storage, use and disposal of all hazardous materials to be used in the municipal undertaking. This will also include all potential or anticipated bio-hazards, such as infectious agents and halogenated organic compounds. In addition, contingency plans to respond to, contain, and treat spills of these materials must also be developed.

It is anticipated that a single overarching plan may be suitable for smaller or less complex projects. For larger or more complex projects or projects utilizing very hazardous or reactive materials, such as chlorine or permanganate, standalone plans for various categories of materials are likely required.

In either case, the plan or plans should be summarized in this section of the application report and the full plans included as appendices. The applicant is cautioned that hazardous material management plans must be consistent with any applicable Federal or Territorial legislation governing the management of hazardous materials. It is the duty of the applicant to ensure this consistency irrespective of the decision of the Board to accept (or not) the management plans submitted as part of this application.

8. DECOMMISSIONING AND RECLAMATION

If the proposed municipal undertaking is anticipated to have a fixed lifespan, decommissioning and reclamation planning is also required.

During the project assessment process undertaken by YESAB, the applicant will have developed and submitted a preliminary decommissioning and reclamation plan that accounts for both potential temporary closures and the ultimate permanent closure of the proposed development. It is generally expected that such a plan would have been based upon conceptual planning of the project.

The Board expects that this original “conceptual” plan will have been expanded or revised to include any changes or additions of detail necessary or beneficial as a result of:

- the findings of the project assessment (i.e. Conditions within a Decision Document),
- the implications of expanded environmental data sets,
- the input of further stakeholder engagement, and
- the knowledge of more advanced engineering designs that has been completed or in progress since the original plan was prepared for the project assessment.

The updated preliminary decommissioning and reclamation plan must be included as a supporting document to the application report and in this section of the application report, key aspects of the preliminary decommissioning and reclamation plan must be summarized. In particular the following must be presented:

- Statements of the overarching reclamation goal(s) and the specific objectives needed to achieve that goal(s),
- Measurable closure criteria that are proposed to identify when the component specific objectives have been achieved and the rationale for those criteria,
- Realistic descriptions and expected results of proposed reclamation activities,
- Conceptual descriptions of proposed contingency measures to augment proposed activities if required,
- A description of the evidentiary basis that shows the stated reclamation objectives can be achieved through the described activities and proposed contingency measures,
- The need and plans for reclamation research necessary to further refine the proposed closure activities and contingency plans, thereby reducing the level of uncertainty regarding the likelihood of these activities achieving the closure criteria selected for the project,
- The proposed post-closure monitoring requirements and the rationale for the selection of those monitoring activities,
- The schedule of proposed reclamation activities, including studies associated with refinement of the plan, with specific identification of progressive reclamation activities proposed for the operational phase(s) of the municipal undertaking,
- Projections of the likely post-reclamation risks to the aquatic environment resulting from completion of the proposed decommissioning and reclamation plan. The projections to include consideration of uncertainty in at least a qualitative level, and
- Reclamation liability costs and financial security estimates to a level of detail consist with the preliminary engineering designs completed and scientific understanding available. The Board requires that the security estimates be based on third parties undertaking the closure activities and include incidental costs, such as project familiarization,

mobilization/demobilization, and project management, for third parties to complete the tasks.

In addition to these requirements, the Board also requires the applicant to include a specific summary of the temporary or interim closure planning that is also detailed in the preliminary decommissioning and reclamation plan. Specifically the following must be provided:

- Statements of the temporary closure goal(s) and objectives,
- Measurable temporary closure criteria that are proposed to confirm that the component specific objectives are being achieved and the rationale for those criteria,
- Realistic descriptions of activities necessary during temporary closure, including identification of systems and processes (water treatment, heating, dewatering, water collection, snow removal, etc.) that must be maintained during the temporary closure period,
- Expected staffing requirements and identification of required consumables necessary to maintain the site,
- Conceptual descriptions of proposed contingency measures to augment proposed activities if required,
- The proposed monitoring and reporting requirements during temporary closure and the rationale for the selection of those monitoring activities, and
- An estimate of the cost of maintaining the site during temporary closure with the cost estimate to include staffing, consumables, and external resources. The cost estimate shall be based on annual time units and shall incorporate costs that may be associated with specific seasonal activities, for example management of the annual freshet or winter operations. A range of potential costs that might be expected based on the point in time that the temporary closure occurs can also be provided. Lacking this level of detail, the costing should be specific to the most critical time that a temporary shutdown could occur.

In evaluating the plan, the Board will be conscious of whether the applicant has clearly designed and planned the undertaking for closure without imposing undo levels of risk as to the potential success of closure. The Board will expect that to the extent possible closure will achieve a “walk away” solution that requires only minimal future management and monitoring. Where passive treatment options of long term site discharges are proposed the Board will seek strong evidence that such options can be expected to perform as required.

Moreover, the Board will expect that field trials of proposed closure measures and technologies, for example cover systems and passive water treatment technologies, will be proposed and scheduled for as early as possible in the project life cycle.

9. MONITORING AND REPORTING PLAN

Monitoring and reporting is an essential part of managing municipal projects; therefore, the Board requires that applicants develop and submit a detailed monitoring and

reporting plan as part of the Application report. Monitoring and reporting plans are expected to include various monitoring programs designed to monitor different aspects of the project performance. These programs may be relatively straight forward or extremely complex depending upon:

- the nature and scale of the proposed municipal activities;
- the nature, complexity, and sensitivity of the project and receiving environments; and
- the potential challenges associated or anticipated with the project.

Depending on the complexity of the developed monitoring and reporting plan, the plan can either be presented in its entirety in this section of the application report, or summarized in this section with the full plan presented in an appendix to this report. Regardless of how it is presented it is essential that the developed plan state the objectives of its component programs and include the justification for its proposed program activities. Moreover, the developed plan should utilize descriptive figures, tables, and plain language descriptions to convey the plan to the Board and third parties. In respect to the Board's expectations for a monitoring and reporting plan, the Board expects that the monitoring programs comprising the plan will encompass all phases of the undertaking and that they will be sufficient to ensure the collection, analysis, and reporting of data necessary to validate assumptions and predictions of:

- a) The nature and quantity of effluent produced,
- b) The quality, quantity, and time history of water use and waste deposition,
- c) The performance of water and waste management infrastructures and technologies,
- d) The effectiveness of measures taken to mitigate any adverse environmental effects of the project; and
- e) The effects of water use and waste deposition on the receiving environment.

With respect to monitoring of infrastructure, the monitoring effort should be designed to reflect the hazard associated with potentially poor performance of the infrastructure. Therefore, visual inspection of a diversion ditch, for example, may be acceptable whereas detailed instrumentation would likely be expected for elements such as reaction tanks and larger water and sludge storage units.

The monitoring program must also be designed to guide management decisions related to the environmental performance of the project. Accordingly, the monitoring plan shall include programs designed to capture data related to, but not necessarily be limited to:

- Surface water quality and quantity,
- Influent quantity,
- Effluent quality and quantity,
- Physical performance and inspection of water retaining and waste containing structures, including any embankments, liners, covers, and water management systems associated with those structures,

- Physical performance of flow conveyance infrastructure,
- Project effects on the receiving environment.

The individual programs developed to monitor these aspects of the project shall detail sampling or measurement locations, sampling media, procedures, frequency, analytical techniques – including expected precision and accuracy, and monitored parameters for both field and, if relevant, subsequent laboratory measurement. Programs shall identify quality control and quality assurance processes, means of recording and managing collected data, and internal and external reporting protocols that will be followed to utilize and present the collected data.

For each program it is expected that an annual or more frequent reports will be prepared and that the report(s) will include analysis of the collected data that interprets any implications that the data may imply with respect to the current and future performance of the project. Irrespective of proposed reporting frequencies, the Board encourages Applicants to include provisions in its monitoring plan to release monitoring data, in its raw form, in a publicly accessible media, such as websites, on a timely and routine basis.

10. ADAPTIVE MANAGEMENT PLAN

The Board accepts that planning for a municipal undertaking will contain uncertainties that may result in the unexpected performance of the project leading to impacts of some magnitude in the aquatic environment. The monitoring plan developed for the project must be designed to monitor the performance of the project and thereby directly or indirectly allow for the potential impacts of the project on the aquatic environment to be determined. However, the monitoring plan does not necessarily describe the actions that will be taken and the trigger levels to initiate those actions if or when unexpected and/or more significant impacts are or may be indicated based on the results of monitoring.

In order to ensure that the applicant can reasonably foresee and prepare for potential variations in the performance of the project and the potential resulting changes to aquatic impacts that may occur, the Board requires that an adaptive management plan be prepared and submitted with the application. In this section of the application report, the adaptive management plan must be summarized and the basis for its development presented.

To assist in completing this section and the required adaptive plan document, the Board notes that the purpose of the adaptive management plan will be to identify the response of the applicant to monitoring results that could be suggestive of a future adverse impact on the receiving environment. In particular, the plan must identify trigger levels for management actions and potential management actions that would be enacted based on the results of monitoring activities.

Therefore, the contents of an adaptive management plan will include the following:

- a summary of environmental interactions and predictions of project-related effects on the aquatic environment;
- a summary of monitoring programs and how monitoring results are linked to potential effects on the aquatic environment;

- a description of how environmental change in the aquatic environment will be measured and considered;
- a description of significance thresholds for valued aquatic ecosystem components and/or contaminants of potential concern, where the significant thresholds represent the on-set of adverse impacts on valued aquatic ecosystem components;
- a description of appropriate action levels, specific to monitoring results, that would be set well below significance thresholds so that action is necessarily taken prior to an adverse impact arising; and
- a description of the management response plans that would be enacted if a given action level is reached.

With respect to action levels and management response plans, the Board expects that action levels may be tiered for any given monitoring result or group of results. For example, a lower action level may lead to a management response such as repeating the monitoring activity and re-assessing results. A higher action level may lead to a management response that includes changes in the monitoring program or in the operations of the project. In either case all action levels must be set below the significance threshold(s).

Supporting Documents

The following is a list of generally expected categories of supporting documents that will provide much of the evidentiary support for the proposed project. These supporting documents should be grouped into appendices as indicated below. It is expected that many of the appendices will include multiple reports in sub-appendices. As an aid to the Board and third parties, appendices with multiple documents should include an overall summary document that describes in general the contents and purpose of the various sub-appendices included.

- Appendix 1: Decision Document and YESAB Screening or Evaluation Report
- Appendix 2: Project Environment Baseline Data Reports
- Appendix 3: Preliminary Design Reports
- Appendix 5: Water Balance Modelling Reports
- Appendix 6: Wastewater Treatment Reports
- Appendix 7: Receiving Environment Reports
- Appendix 8: Water Quality Modelling Reports
- Appendix 9: Sludge Management Plans
- Appendix 10: Hazardous Material Management Plans
- Appendix 11: Temporary Closure, Preliminary Decommissioning and Reclamation Plan
- Appendix 12: Monitoring and Reporting Plan