PART A - Overview

1.0 INTRODUCTION

1.1 Purpose of the report

The purpose of this report is to provide an initial state of knowledge for identified Valued Components[1] (VCs) under the NWT Cumulative Impact Monitoring Program (NWT CIMP) and Audit. It has also helped form the foundation for the first NWT Environmental Audit and State of the Environment report (2005). Ultimately, state of the environment reporting will contribute to the environmental audit function required under Part 6 of the *Mackenzie Valley Resource Management Act* (MVRMA).

A draft 5-Year work plan was prepared by the NWT CIMP and Audit Working Group (2005), outlining tasks to be undertaken to guide the development of the program. The present report addresses Task 3 in particular, and elements of Tasks 1, 3, 4 and 6 of the draft work plan[2]. It will serve as a working document, providing preliminary information on the state of knowledge of the VCs identified by the Working Group. Reviews of these VCs are provided in Part B of the report.

1.2 The context of the NWT CIMP and Audit

The NWT-wide CIMP and Audit address the needs expressed by a number of organizations. It is a requirement of the Gwich'in, Sahtu and Tlicho Agreements and the MVRMA (Part 6, section 146) where it is stated that:

> "The responsible authority shall, subject to the regulations, analyze data collected by it, scientific data, traditional knowledge and other pertinent information for the purpose of monitoring the cumulative impact on the environment[3] of concurrent and sequential uses of land and water and deposits of waste in the NWT[4]."

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[1] The term Valued Component (VC) encompasses any part of the environment considered important based on economic, social, cultural, community, ecological, legal or political concern (CIMP 2000). It also accounts for Valued Social Components (VSCs).

[2] The tasks are: Task 1 – Operation of the RA/NWT CIMP and Audit Working Group, Task 2 – Development of a Permanent Responsible Authority, Task 3 – Establishment and Operation of Valued Component Advisory Groups, Task 4 – Monitoring and Research Programs, Task 5 – Workshops and Training, and Task 6 – Information Management, Synthesis and Reporting.

The draft work plan (finalized in 2005) was developed by the NWT CIMP Working Group.

[3] 'Environment' has been broadly defined by the NWT CIMP Working Group as "...the Earth, and how land, water and air and all living and non-living things depend on each other". It is intended to include both the natural and social/cultural environment (CIMP 1999) and is based on the definition in the MVRMA.

[4] As defined, the Mackenzie Valley does not include the Inuvialuit Settlement Region or Wood Buffalo National Park. However the NWT CIMP Working Group sees the MVRMA as providing the minimum requirements for a cumulative impact monitoring program, and has developed a program which addresses the entire NWT. Therefore, monitoring programs which were/are undertaken in the Inuvialuit Settlement Region and Wood Buffalo National Park are being included in this report. Additionally, programs related to effects of climate change and effects caused by activities outside the NWT are being included in this report.

In Part 6, Section 148 (3) of the MVRMA the legislated public environmental audit is discussed. It is to be conducted at least every 5 years by an independent person or body, and includes both state of the environment reporting and performance auditing. The first NWT Environmental Audit was completed in 2005. Kennett (2001a) provides a very detailed discussion of possible institutional arrangements for Part 6 of the MVRMA.

1.3 The structure of the NWT CIMP and Audit

Initially the focus of the CIMP was on the Gwich'in and Sahtu Settlement Areas. However in April 2000, representatives from the other regions within the Northwest Territories were invited to participate in the development of the program. Presently, the NWT CIMP and Audit Working Group is composed of members or observers from the following organizations:

- Gwich'in Settlement Area
- Sahtu Settlement Area
- Inuvialuit Settlement Region[5]
- Government of Canada[6] (through Indian and Northern Affairs Canada)
- Government of the Northwest Territories
- Dehcho First Nation
- Akaitcho Territory Government
- Tlicho First Nation
- North Slave Metis Alliance
- Northwest Territory Metis Nation
- Mackenzie Valley Environmental Impact Review Board
- Parks Canada
- Environment Canada
- Department of Fisheries and Oceans

When fully implemented, the NWT CIMP and Audit will be a community based monitoring program which will incorporate scientific and traditional knowledge in the Northwest Territories. It will include the collection of baseline data as well as ongoing monitoring seeking to identify environmental change from cumulative impacts. The Working Group has confirmed that the CIMP will sponsor new monitoring initiatives, assist in the coordination of existing programs and provide a "one-window" information source.

[5] Although not part of the Mackenzie Valley, the Inuvialuit Settlement Region (ISR) participates in the NWT CIMP Working Group. The integration of monitoring in the ISR with the NWT CIMP remains to be determined, however provisions for coordination of monitoring will be made.

[6] Environment Canada and Fisheries and Oceans Canada have also participated in all Working Group meetings as observers.

1.4 Requirement for the NWT CIMP in a cumulative effects management context

Cumulative effects management is at the forefront of environmental management issues in the Northwest Territories, particularly with increased development pressures. This is one of the reasons that the NWT Cumulative Effects Assessment and Management (CEAM) Strategy and Framework was announced in 1999 and developed. The document "A Blueprint for Implementing the Cumulative Effects Assessment and Management Strategy and Framework in the NWT and its Regions" is available on the CEAM website at www.ceamf.ca . A significant component of the CEAM is baseline studies and monitoring for the purpose of understanding cumulative effects. The NWT CIMP and Audit will be a primary contributor of regional monitoring information to the CEAM. These two programs are closely linked and where work plan tasks overlap, such as information management, they will be addressed jointly.

2.0 STATE OF KNOWLEDGE REPORTING

State of knowledge reporting can be used to document baseline information/data and identify significant knowledge gaps for a given geographical area. A specific approach or method for state of knowledge reporting does not exist. In the case of the present report the state of knowledge of VCs with respect to monitoring is being documented, and gaps and recommendations for further monitoring are highlighted. An example of a large scale state of knowledge report in the Northwest Territories is the West Kitikmeot / Slave Study (WKSS) area state of knowledge (Sly et al. 1999). It represents a "big picture" of the natural and socio-economic environment for the entire WKSS area (see Appendix A for more information on WKSS). It emphasizes areas where information is incomplete, and it identifies further research requirements.

Once information gaps are identified in a state of knowledge report, and steps are taken to fill these gaps, state of the environment reporting is the next step. The distinction between state of knowledge and state of the environment reporting is sometimes blurred, however state of the environment reporting is generally a more comprehensive undertaking which can be supplemented by state of knowledge reporting. In the Yukon, for example, regular state of the environment reporting is legislated under the Yukon *Environment Act* (Yukon Territorial Government 2000).

2.1 Approach used for reporting

Initially for the development of this preliminary overview of the state of knowledge of VCs under the NWT CIMP, individuals contacted were limited to government researchers/employees specializing in specific VCs. Due to time and research constraints it was determined that this would be the most efficient method for obtaining information as government departments are aware of most programs/studies being undertaken. Through broad reviews by government departments, Aboriginal governments, co-management bodies, academic institutions, industry and non-government organizations, the preliminary state of knowledge of VCs presented in this report can be further refined and updated.

3.0 VALUED COMPONENTS (VCs)

Valued components are aspects of the environment which have particular importance, based on economic, social, cultural, community, ecological, legal or political concern, in a given

geographical area. As discussed in the NWT CIMP draft work plan 'priority'[7] VCs have been identified as starting points for the development of the program. The NWT CIMP and Audit Working Group reviewed these VCs and some minor changes were made. The following list represents the VCs agreed upon by the Working Group as starting points for the development of the NWT CIMP, and focus points for the collection and reporting of monitoring information. The following Valued Components are the focus of this report:

- *Water and Sediment Quality*
- *Water Quantity*
- *Snow, Ground Ice and Permafrost*
- *Fish Habitat, Population and Harvest*
- *Fish Quality*
- *Caribou*
- *Moose*
- *Other Mammals (Terrestrial)*
- *Marine Mammals (added February 2005)*
- *Other Wildlife (Avian)*
- *Vegetation*
- *Climate*
- *Air Quality*
- *Human Health and Community Wellness*

In Part B of this report, the preliminary state of knowledge for each of the VCs is reviewed. The focus is on the state of monitoring for each VC, thus annotated lists of key monitoring activities and key documents are provided. Several questions associated with individual VCs were listed in the NWT CIMP draft work plan to serve as guides for determining the state of knowledge of the VCs. These questions were used as a basis for the VC[8] reviews.

3.1 Indicators

Indicators are used to determine measures or trends of effects on specific environmental components. When indicators are tracked over time effects on particular VCs can be observed. There have been several reviews of the role of indicators in both general and cumulative impact

[7] 'Priority' VCs are simply referred to as VCs throughout this report. These VCs were termed 'priority' as the NWT CIMP Working Group agreed they should be immediately focused on. It is agreed that other VCs should also be considered in the future.

[8] Not all questions are specifically answered in the VC reviews. For some VCs answers are combined under one broad question, or divided into headings appropriate to the VC.

monitoring (ESSA 1994, Geomatics 1999, Hegmann et al. 1999, MacDonald 1998, CIMP 2000, Pembina 2000). The common characteristics/requirements of indicators are presented below:

- ✓ relevant and meaningful (both ecologically and socially)
- ✓ measurable
- ✓ reliable and objective
- ✓ sensitive
- ✓ cost-effective
- ✓ supported by historical data
- ✓ non-destructive
- ✓ non-redundant
- ✓ of appropriate scale
- ✓ interpretable
- ✓ anticipatory
- ✓ practical and timely

Key monitoring indicators are presented for each of the VCs reviewed in Part B. These indicators are based on actual monitoring and research and are known to be relevant for each individual VC. Indicators may be either general/broad or specific, and have varying levels of applicability depending on the specific purpose of monitoring. The lists of indicators provide a necessary starting point from which future monitoring needs can be determined.

3.2 Thresholds

Once indicators are defined the use of thresholds can be examined. Thresholds provide limits of acceptable change for VCs. For example, an adverse response by a VC may result if a threshold is surpassed.

A few examples of the relationship between VCs, indicators and thresholds are shown below:

VCs =>	Indicators =>	Thresholds
e.g. Air quality	Sulphur dioxide quantity	Acceptable level under NWT Environmental Protection Act
e.g. Caribou	Calf/cow ratio	Minimum calf/cow ratio for healthy population size

Three types of thresholds - ecological, activity-based and social - have been described (AXYS 2000). Work on the identification of wildlife and avian thresholds for the Yukon is underway. Initial results suggest that activity (infrastructure) based thresholds are easier to define and implement than biological or social thresholds (AXYS 2000). (Reports from this work will be circulated to the Working Group for review and application to the Northwest Territories).

Determining and subsequently enforcing thresholds will be imperative in managing against adverse cumulative impacts. Threshold determination will be based in part on the results of key monitoring under the NWT CIMP and Audit; however it is not the focus of the program. Other parties, particularly regulatory agencies, will be involved in setting thresholds. It is important to stress that unless thresholds are determined, monitoring results alone may not lend to quality decision-making. Thus, as discussed by Kennett (2001a), the link between thresholds and regulation needs to be developed.

4.0 STEPS/MECHANISMS REQUIRED TO ESTABLISH MONITORING PROGRAMS

4.1 Advisory teams

As proposed in Task 3 of the NWT CIMP draft work plan, an important step in designing and establishing the program is the formation of advisory teams for each VC or similar groups of VCs. Teams would be composed of individuals with expertise in scientific and traditional knowledge for the various VCs, including representatives from government departments, Aboriginal governments, co-management bodies, academia, industry, and environmental non-government organizations.

Advisory teams can review/confirm the preliminary state of knowledge for specific VCs, and subsequently work towards implementing recommendations for future monitoring programs. Based on the VC reviews they can provide advice on important communication, consultation and education initiatives, such as the design of plain-language summaries. Advisory teams will also be useful in guiding future work on state of the environment reporting.

Establishing advisory teams would provide "quality assurance/quality control" in determining key monitoring programs for each VC. Teams would be required to report back to the Secretariat/responsible authority. In addition one general advisory committee could be struck to approve recommendations for monitoring programs proposed by the individual advisory teams.

4.2 Key steps

The "who", "what" and "how" for establishing monitoring programs is addressed below:

Who will monitor?

The current monitoring section in the VC reviews provides references to monitoring groups/bodies. Advisory teams can use this information to help recommend future "leads" for monitoring programs. The use of partnerships to ensure costs and responsibilities for monitoring are shared can be discussed by advisory teams. Co-management boards and community members will also have a key role to play in monitoring, and where possible, monitoring programs should be designed to increase community capacity.

What needs to be monitored?

The gaps and recommendations section in the VC reviews provides a list of important monitoring needs. These needs have not been prioritized. Advisory teams can play an important role in verifying and prioritizing monitoring needs for each VC.

Methods for monitoring?

Specific methods for monitoring are presented in the current monitoring and recommendations sections for the individual VC reviews. Advisory teams will provide recommendations on new and established methods for monitoring. The use of both traditional knowledge and scientific approaches for monitoring will also be considered for each VC.

5.0 ONGOING ACTIVITIES:

- Yearly updates from advisory teams for each VC or similar groups of VCs in the form of the revised State-of-Knowledge report.

- Continued use of the State of Knowledge report as a baseline component for environmental audit activities

- Maintenance of NWT CIMP-Tariuq Inventory and website

- Promotion of community involvement in monitoring activities

- Coordination with other monitoring and state of the environment initiatives

- Use of the State of Knowledge report as the basis for the State of the Environment reports and trends reporting as outlined in the NWT CIMP and Audit Draft Five-Year Work Plan

- Independent environmental audit to be conducted every 5 years.

6.0 FUNDING REQUIREMENTS

Initial estimates suggest that the NWT CIMP and Audit will require a minimum of $3 million annually. This will also cover much of the monitoring component of the CEAM. An additional $2 million will be required for cumulative effects activities outside the scope of the NWT CIMP, such as thresholds research. These estimates have been supported by the National Round Table on the Environment and Economy (NRTEE) report (Kennett 2001). The recommendations in this report will be reflected in the short and long term work and budget planning to be initiated by the Working Group.

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