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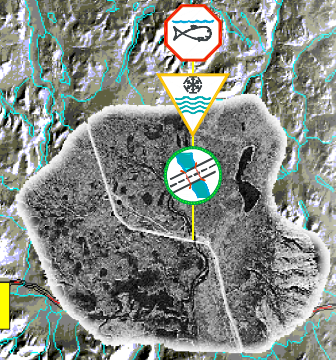
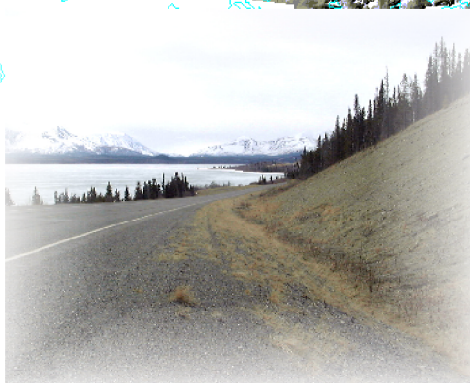
Community and Transportation Services

Shakwak Special Areas Maintenance Guidelines Project

Volume I Project Review and User Guide

September, 2001

Prepared By





Shakwak Special Areas Maintenance Guidelines Project

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






Prepared by:



















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VOLUME II – MAINTENANCE PRESCRIPTIONS AND FEATURES

Section 1: General Maintenance and Special Areas Maintenance Prescriptions
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and/or Management

VOLUME III – MAINTENANCE ATLAS

1.0 INTRODUCTION

1.1 PROJECT SCOPE AND MAJOR OBJECTIVES

The Shakwak Special Areas Maintenance Guidelines project is being undertaken in response to a recommendation of the 1978 Environmental Assessment Review Panel (“EARP Panel”), established for the Shakwak Highway Project.

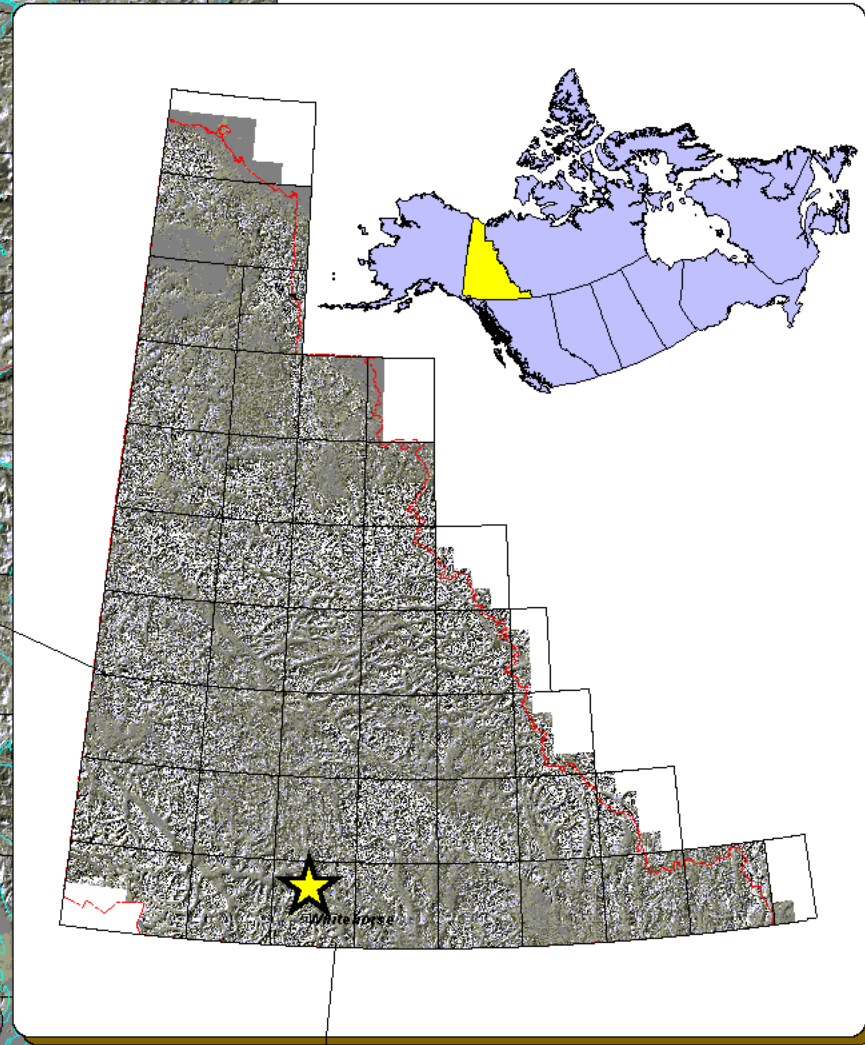
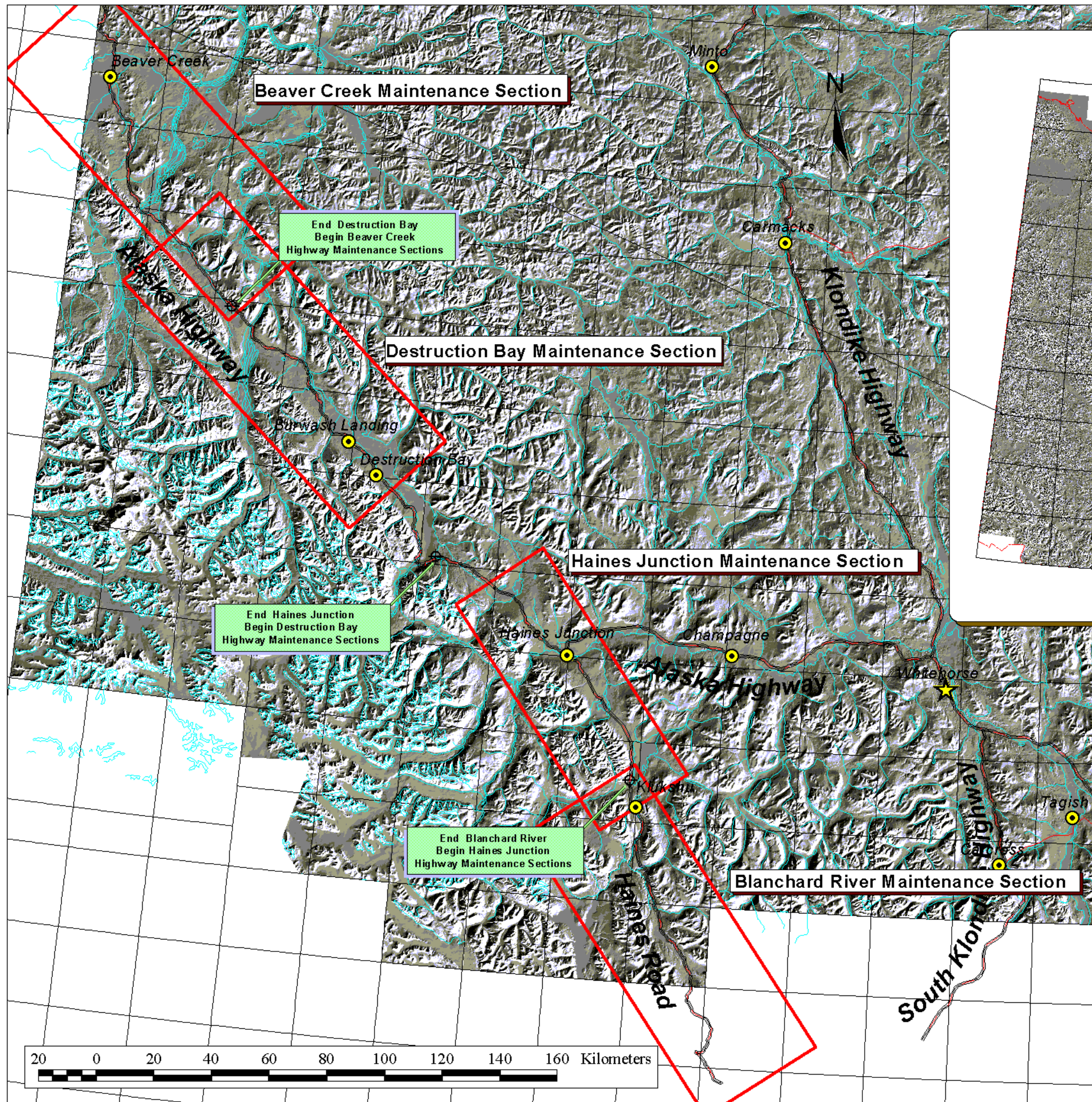
Specifically, the EARP Panel report recommended that,

"The proponent in consultation with the Yukon Department of Highways and Public Works, prepare comprehensive maintenance guidelines for each segment of the highway. The guidelines would explain particular design elements, especially aesthetic elements, which should be maintained on the highway and delineate where the nature of the road environment dictates special maintenance procedures or unique seasonal requirements. "







The project is also guided by the recognition of the Government of Yukon (“YTG”), Department of Community & Transportation Services (“C&TS”) that regular maintenance activities should be built into one document in order to address the environmental mitigative measures that are fundamental to the Shakwak Highway Project. This project also incorporates the existing Departmental policies and management systems, and suggestions and comments that emerged from communications with C&TS staff to ensure that the Special Areas Maintenance Guidelines are clear and relevant for all staff.

The study area includes the Shakwak Highway from km 71.3 to km 246.1 on the Haines Road, and from km 1635 to km 1965.7 on the Alaska Highway. The section of highway from km 1664.5 to km 1788.5 is currently under construction, and consequently has been excluded from the scope of this project. Figure 1 illustrates the overall Shakwak Highway Project. All pertinent as-built design drawings, reports, and documents were reviewed and assessed as part of compiling project information. The project area was inspected and assessed during winter and spring conditions to document all pertinent engineering, environmental, and aesthetic features for reconstructed segments of the highway.

The overall objective of the report is to produce a comprehensive Special Areas Maintenance Guidelines document that will guide the activities of YTG C&TS Highways Maintenance Branch. This product has been designed to ensure that it is relevant and useful for field maintenance personnel, maintenance management, engineering and environmental staff.



Shikwak Special Areas Maintenance Guidelines

- Legend:**
-  Territorial Capital
 -  Community
 -  Maintenance Section Break
 -  Extents of Index Map
 -  Main Road
 -  Secondary Road

General Location Map showing Shikwak Highway Project

Scale 1: 500 000 (main window)

Drawn By: JEA	Checked By: DDC
Date: 06/28/2001	Figure: 1

1.2 PROJECT METHODOLOGY

Project management was accomplished in close cooperation with the Shakwak Special Areas Maintenance Guidelines Steering Committee, through regular monthly meetings.

The data collection was accomplished in the following manner:

- All previous work and design drawings undertaken in conjunction with the Shakwak Highway Improvement Project was reviewed, as well as maintenance reports, policies and management systems and agreements. Pertinent information was made available to the Project Team.

Two field trips were taken along the entire Shakwak Highway to inspect and document seasonal maintenance issues, and to exchange information between the engineering, environmental, and maintenance experts within YTG C&TS:

- *Winter Conditions Field Inspection*, February 20 and 21, 2001, Attendees:
 - Paul Knysh, Shakwak Program Manager, YTG C&TS
 - Dan Profeit, Western Area Superintendent, YTG C&TS
 - Bruce Fulcher, Manager Geotechnical Services, YTG C&TS
 - Jane Koepke, Environmental Co-ordinator, YTG C&TS
 - Sam Dion, Blanchard River Maintenance Section Foreman
 - Ron Wilson, Haines Junction Maintenance Section Foreman
 - Jack Bilton, Destruction Bay Maintenance Section Foreman
 - Rick Weihers, Beaver Creek Maintenance Section Foreman
 - Rob McIntyre, Project Team Leader, Access Consulting Group
 - Jerry Quaile, Maintenance Specialist, Access Consulting Group

- *Spring/Summer Conditions Field Inspection*, May 14, 15 and 16, 2001, attendees:
 - Paul Knysh, Shakwak Program Manager, YTG C&TS
 - Dan Profeit, Western Area Superintendent, YTG C&TS
 - Jane Koepke, Environmental Co-ordinator, YTG C&TS
 - Sam Dion, Blanchard River Maintenance Section Foreman
 - Ron Wilson, Haines Junction Maintenance Section Foreman
 - Jack Bilton, Destruction Bay Maintenance Section Foreman
 - Rick Weihers, Beaver Creek Maintenance Section Foreman
 - Rob McIntyre, Project Team Leader, Access Consulting Group
 - Dan Cornett, Environmental & Aesthetics Specialist, Access Consulting Group
- As-built engineering drawings for the reconstructed highway segments were reviewed, and all pertinent information was noted;
- The following agencies were contacted to gain property ownership information for the Current Land Use/ Land Tenure identification exercise:
 - DIAND Land Resources, Land Dispositions
 - YTG Renewable Resources, Agriculture Branch
 - YTG Renewable Resources, Fish and Wildlife Branch
 - YTG Renewable Resources, Administration Branch,
 - YTG C&TS Land Development
 - YTG Dept. of Justice, Land Titles
 - DIAND Claims and Indian Government
 - B.C. Ministry of Environment, Lands, and Parks

- Interviews were conducted with appropriate Federal, Territorial, and First Nation Government Agencies. Every effort has been made to consult with the White River First Nation and Champagne and Aishihik First Nations; however no comments have been received to date.

Agency	Representatives	Date of Interview
Environment Canada	George MacKenzie-Grieve, Manager	June 7, 2001
DIAND Land Use	Marg White, Head	June 6, 2001
DIAND Water Resources	Dave Sherstone, Bill Slater	June 8, 2001
DFO	Brian Ferguson, Habitat Biologist	June 5, 2001
B.C. Parks	Bob Dalziel, Director, District Operations	June 7, 2001
Parks Canada	Ray Brenemen, Doug Clarke, Duane West	June 7, 2001
White River First Nation	Wilbur Smarch	Not Applicable
Champagne and Aishihik	Gord Allison	Not Applicable
Kluane First Nation	Robert Johnson, Chief	June 7, 2001
YTG Renewable Resources	Jon Bowen, Manager, Environmental Assessment Morris George, Environmental Assessment Analyst	June 5, 2001
Village of Haines Junction	John Farynowski, Mayor	June 7, 2001

Highway features were examined to identify, map, and develop monitoring/inspection procedures, including special maintenance measures to ensure long-term protection of important highway features for the traveling public and adjacent area users. All information sources were reviewed to gain a thorough understanding of the engineering and environmental components of any identified highway feature. This assessment included a review of contract plans and specifications, EARP and Canadian Environmental Assessment Agency (“CEAA”) screening reports, maintenance reports, Departmental policies and management procedures.

After reviewing the information that was gathered, a hierarchical classification system was developed to identify highway features by their general and sometimes unique nature, and to reflect a rationale for special maintenance and relative maintenance importance. Subsequently,

the highway features and the specific components were ground truthed for each reconstructed highway segment by undertaking field investigations. Recommendations for the monitoring and inspection for each reconstructed highway segment were developed through discussions with C&TS personnel. The effectiveness of current practices, as well as an evaluation of maintenance procedures practiced in other jurisdictions, led to the development of a standard set of procedures and frequencies of maintenance monitoring/inspections for the various features and components. In addition to the standard set of maintenance guidelines, there are those features and components that require special maintenance procedures at certain locations. The specific locations that required special maintenance monitoring/inspections procedures, frequencies, equipment and/or other specific requirements were identified during the information-gathering phase.

Environmental and aesthetic components were identified, described and mapped for each reconstructed segment of the Shawkak Highway Project. A rationale was provided for each component's inclusion in the special areas maintenance guidelines, and requirements for special maintenance and/or management, were documented. A classification system was developed to identify components by physical features and by their inherent environmental, aquatic, and human or cultural aspects. Verification of specific environmental and aesthetics components for each reconstructed highway segment was undertaken through discussions with government agencies and C&TS departments, as well as through field investigations.

Meetings with C&TS were also held to discuss existing maintenance monitoring/inspections procedures and frequencies, and their effectiveness, limitations, and areas for improvement. Maintenance procedures in other jurisdictions were considered for applicability, and through an integration of these new procedures with existing and/or modified procedures, a general maintenance monitoring/inspection procedure was developed for features and components within each reconstructed highway segment. Special maintenance procedures were developed for unique features and/or components that are over and above standard practices.

Construction and maintenance activities for the Shawkak Highway Project are, in many cases, subject to terms and conditions of various permits, licenses and authorizations. To ensure that obligations are not overlooked, relevant Federal, Provincial and Territorial legislation and resultant permits, licenses or authorizations have been compiled, and are presented in Volume II, Section 2. Consultation with appropriate agencies/First Nation governments is also essential

to the maintenance of continued good relationships, and ensuring all land use or water use obligations are met. To this end, all agencies involved in the issuance of permits, licenses and authorizations, including agencies of the Federal Government, Government of Yukon and the Government of British Columbia, were contacted as necessary.

Applicable terms and conditions of all existing licenses, permits, authorizations and agreements pertaining to the maintenance of the highway were documented, as well as regulatory requirements identified for any future highway maintenance activities. Included in the documentation process was the gathering of contact information for all groups, individuals and agencies in the project corridor.

The purpose of the field trips was two-fold. One objective was to ensure that local knowledge from maintenance, environmental and engineering personnel was incorporated. The other goal was to verify the relationship between desktop review of maps and written material corresponded to features observed in the field. The development of the atlas is a result of incorporation of information from various sources, and field verification during its evolution.

Field trips took place during the winter and spring in order to observe and document all pertinent highway features and engineering, environmental and aesthetic components. Two trips were taken for the purpose of observing seasonally varying characteristics such as drainage (DNG), icing control (IC), and road surface (RS). Conditions and locations were observed and recorded, both in writing and still/video camera, and GPS coordinate data was obtained for each pertinent feature. C&TS personnel from Transportation Maintenance and Transportation Engineering Branches provided their input during these trips, and stops were made along the highway to discuss all key features/components. On each field trip, the Maintenance Foreman for the pertinent highway maintenance section accompanied the group to provide detailed local knowledge.

Development of the Maintenance Atlas (Volume III) took place concurrently with the aforementioned work. A series of geo-referenced maps are incorporated into four volumes, which are based on existing Highway Maintenance sections. The precise location of each special maintenance target is indicated on a geo-referenced map to provide a spatial reference for individual features. The overall index map was created using mapping software, and the product was reviewed with team members and the Guidelines Steering Committee. Detailed

topographic information was obtained from digital satellite data; the highway was divided into segments 4.5 km long and 3.6 km wide for placement into individual drawings at a scale of 1:10,000 to 1:20,000 using AutoCAD mapping/GIS software. The resultant Detailed Maintenance Maps ("DMM"s) were reviewed by team members and the Guidelines Steering Committee. GPS data from field surveys for highway maintenance features and engineering and environmental/aesthetic components was imported, and sketches were scanned or digitized. AutoCAD/GIS data files containing all acquired component data were produced for use by C&TS. The entire Maintenance Atlas, therefore, is presented as a digital product on CD Rom. The electronic format of the end product may be updated by C&TS staff, on an as-needed basis, to reflect highway modifications.

All comments from the team members and Guidelines Steering Committee were discussed at regular meetings and during field trips and incorporated into the DMM. Appropriate sets of the DMM's were plotted and bound into sub-volumes for distribution to specific highway maintenance sections, and a master set of all sub-volumes was submitted to C&TS as a draft for use during field inspections. As well, a stand-alone CD Rom was created to incorporate all Index and Detailed Maintenance Maps. Volume III – Maintenance Atlas contains the entire set of DMM's for the project, complete with all highway features, engineering and environmental/aesthetic components and notations.

To remove any inconsistent methods of locating roads, road features, and location of events or special features requiring maintenance that occur on the highway, a GPS location referencing system was implemented.

1.3 REPORT AND PRODUCT ORGANIZATION

This report is compiled in the following three volumes, for ease of use:

Volume I – Project Review and User Guide. The volume is primarily a description of the methodologies employed in undertaking the project, as well as a guide to the use of Volumes II and III.

Volume II - Maintenance Prescriptions and Features. This volume is prepared in two sections:

- Section 1 is a compendium of detailed general maintenance procedures and Special Areas Maintenance Prescriptions.
- Section 2 is a Table presenting every highway feature on the constructed portion of the Shakwak Highway, as well as any associated engineering or environmental/aesthetic component.

Volume III - Maintenance Atlas: This is a series of 63 satellite image-based maps, based on YTG Highway Maintenance sections, as described in Section 5 of Volume I.

1.4 ACKNOWLEDGEMENTS

Access Consulting Group would like to thank the following individuals who contributed to this project:

Shakwak Special Areas Maintenance, Guidelines Steering Committee:

YTG C&TS Transportation Engineering Branch

Robin Walsh, Director

Paul Knysh, Shakwak Program Manager

John Jansen, Project Officer, Granular and Resource Management

Bill Stanley, Deputy Program Manager, Shakwak

Jane Koepke, Environmental Co-ordinator

Bruce Fulcher, Manager, Geotechnical Services

YTG C&TS Transportation Maintenance Branch

Bob Magnuson, Director

Dan Profeit, Western Area Superintendent

Greg Belisle, Maintenance and Planning Superintendent

Regulatory Agencies and First Nation Consultation

B.C. Parks: Bob Dalziel, Director, District Operations

Champagne & Aishihik First Nations: Bob Charlie, Chief

Dept. of Fisheries & Oceans: Brian Ferguson, Habitat Biologist

Dept. of Indian Affairs & Northern Development, Land Use: Marg White, Head
Dept. of Indian Affairs & Northern Development, Water Resources: Dave Sherstone, Regional Manager; Bill Slater, Head, Environmental Assessment
Environment Canada: George MacKenzie-Grieve, Manager
Kluane First Nation: Robert Johnson, Chief
Parks Canada: Ray Brenemen, Doug Clarke, Duane West
Public Works & Government Services Canada: Tom Sparrow, Director
Village of Haines Junction: John Farynowski, Mayor
White River First Nation: David Johnny, Chief
Yukon Government, Renewable Resources: Jon Bowen, Manager, Environmental Assessment; Morris George, Environmental Assessment Analyst

Access Consulting Group undertook this project through the following team of specialists:

Project Team Subconsultants

Ketza Construction Corp., Mike Johnson, Engineering Specialist
Yukon Engineering Services Inc., Jerry Quaile, Maintenance Specialist
Yukon Engineering Services Inc., Sylvain Lessard, Geodist/GPS Specialist

Access Consulting Group – Core Team

Rob McIntyre, Project Team Leader
Dan Cornett, Environmental & Aesthetics Specialist
Travis Ritchie, Land Use Specialist
Jason Adams, GIS/CAD Mapping Specialist
Colette MacMillan, Administrative




2.0 HIGHWAY FEATURES & COMPONENTS - IDENTIFICATION, MAPPING, & MAINTENANCE

2.1 MAINTENANCE ADVISORY SYSTEM

In order to portray the significance of highway features, and their associated engineering or environmental components, a Maintenance Advisory System ("MAS") was developed using a simple shape-based application to the icons for those features and/or components.

The MAS uses color-coded symbols similar to highway signage. The use of shapes is designed to ensure that the advisory level remains distinguishable on black and white photocopies.

There are three advisory levels:

- Maintenance Notification is the lowest and is indicated by a green circle, 
- Maintenance Caution is indicated by a yellow yield shaped symbol, and 
- A red octagon, the highest level of concern, indicates Maintenance Alert. 

The MAS is a flexible system that allows sensitive features and/or components to quickly and universally be identified by maintenance personnel using the Maintenance Atlas (Volume III). The strength of this system is the use of familiar visual cues that are associated with specific actions. The prescription for each highway feature, engineering component, and environmental component was developed for the notification level of each component and feature. Where there is a caution or alert indicated, applicable special maintenance procedures may be found in Section 1 of Volume II. The exceptions to this are water quality and fisheries concerns. The environmental feature of water quality is always considered to be a Caution, and the prescription in Section 1 of Volume II was developed with this level of concern in mind. Similarly, fisheries concerns are indicated with an Alert throughout the Maintenance Atlas and the prescription in Volume II reflects this level of concern.

In general, the maintenance prescriptions contained in Volume II, Section I are applicable to the 'notification' level of each feature or component. That is to say that when an identified feature or component has a green circle around it, the general maintenance prescription applies. In the instance that there is a 'caution' or 'alert' associated with the feature or component, there may have been a special maintenance prescription developed for that location; the special maintenance prescription is located at the end of the general maintenance section for that feature or component (Volume II, Section I).

As previously mentioned, the MAS is a flexible system and in certain cases the user will find that while a feature or component has been assigned a heightened level of concern (Caution or Alert), there is no specific/special maintenance prescription contained in the prescription manual.

The MAS has been developed and is employed:

- For the knowledge benefit of the maintenance operator by explicitly identifying on the Maintenance Atlas maps those features and/or components at that location that are of special concern;

and,

- In certain cases, report to the user that, in addition to the general prescription, there may be a specific/special maintenance prescription associated with the feature and/or component.

When a heightened level of concern is noted in the Maintenance Atlas for any given feature/component, the user should refer to the prescription manual to determine whether a specific/special maintenance prescription applies.

The following are examples of the MAS system, as portrayed on the Maintenance Atlas:



Maintenance Notification

Example: Highway Access point:

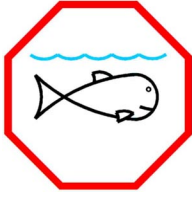
Notification that there is an access point on the highway at this location, which leads to either a residential or commercial property, or to a cultural use area, or to a YTG borrow source, or some other feature that is outside of the highway Right of Way. Maintenance personnel are notified to not disturb or hinder the access in any way during the course of routine maintenance activities.



Maintenance Caution

Example: Water Quality

For this example, the locations marked with the yellow caution symbol, there is a water quality issue to be aware of. An example of a maintenance activity that may interfere with water quality would be annual highway bridge washing, which should avoid depositing sediment into the watercourse. Specific highway maintenance prescriptions are outlined.



Maintenance Alert

Example: Fish Habitat

Maintenance personnel are directed to the presence of fish habitat in the watercourse. There may also be a Fish Habitat Authorization, issued by the Department of Fisheries and Oceans, in place at the location, as well as possible Water Use Licence Terms and Conditions attached to any work in the watercourse. In some cases, in particular older reconstructed sections, the Licence in effect at the time of reconstruction has expired. However, Maintenance Personnel are advised that any work within the wetted perimeter of the stream would be subject to the same terms and conditions. For this reason, our listing of Permits and Licences includes those Licences that have expired. Maintenance personnel should contact the Environmental Coordinator of the YTG C&TS Transportation Engineering Branch prior to conducting any activities located near the wetted perimeter of the stream, creek, or river in these locations. Seasonally restricted construction windows may be in effect at these locations, which may impact the timing of maintenance activities. In certain circumstances, such as culverts and multiplate locations, certain engineering features may have been incorporated into the design feature to enhance fish habitat, or to compensate for the disruption of fish habitat that was caused by the highway construction. These features, for example rock weirs placed to create resting pools, may be impacted by maintenance activities.

Caution Bar



In order to draw attention to ‘caution’ or ‘alert’ level MAS on each map, a clearly visible yellow and black hazard bar appears along the bottom of the image, above the legend, directly beneath the pertinent feature on the highway. This has been included simply as a visual cue to the reader.

2.2 HIGHWAY FEATURES

The highway features that are identified in the Maintenance Atlas are the end result of consultation in the field and consideration in the office. Initial ideas of what may comprise highway features were revised under the direction of various agencies and as a result of field checking. The highway features that are included in the Maintenance Atlas reflect the key activities that must take place in order to maintain the safety and convenience of highway users.

The symbols are based on, and were developed from icons gleaned from the Manual of Uniform Traffic Control Devices for Canada, prepared by the National Committee on Uniform Traffic Control, September, 1998, and the Driver’s Basic Handbook, YTG C&TS, 1999. In some cases, icons were developed by the Project Team where there was no appropriate example from either of these two publications. These symbols are highly recognizable and transferable – this serves to increase the ease of understanding of people from varied backgrounds.

2.2.1 **AC = Access Points**

2.2.1.1 *Identification and Mapping*

The AC symbol is located at specific points of entry and/or exit from the highway right of way. Access points are typically associated with highway features, engineering and environmental components that are located off of the right of way. These features and components will include: Recreation, Residential/Commercial Property, Rest Areas, Borrow Pits and Granular Sources. Access Points are included in the Maintenance Atlas because they have been identified as highway features that may be impacted by regular maintenance.

2.2.1.2 *General Maintenance, and Inspections Prescriptions*

A prescription has been developed and is included in Volume II, Section 1. The prescription for Access Points was written for the Maintenance Notification level of the MAS, and there were no deviations from this level throughout the mapped area.

2.2.2 **BP = Borrow Pits**

2.2.2.1 *Identification and Mapping*

The BP symbol indicates the location of the highway access to a borrow pit, as well as the YTG C&TS identifier number associated with the specific Borrow Pit. Borrow pits are developed outside the right of way and are found in conjunction with Access Points (AC), and Revegetation (RV) where there has been reclamation. Borrow Pits have been included because they are an important source of granular material for road maintenance activities.

2.2.2.2 *General Maintenance, and Inspections Prescriptions*

A prescription was developed for Borrow Pits based on the Granular Resource Management Plan (Yukon Community and Transportation Services, Transportation Engineering, 1996). This prescription was written for the notification level of the MAS, and there were no deviations from this level throughout the mapped area.

2.2.3  **BR = Bridge**

2.2.3.1 *Identification and Mapping*

The BR symbol is located at sites where bridges are associated with engineering and/or environmental components that require special maintenance procedures. All bridges along the right of way have been included in this project because of their importance for people using the highway and for issues related to water quality. For this reason, bridges are typically associated with Water Quality (WQ) and Fish and/or Fish Habitat (FH).

2.2.3.2 *General Maintenance, and Inspections Prescriptions*

A general prescription for bridges was developed at the 'alert' level of concern according to the MAS. Special prescriptions for bridges at the 'caution' level are included at the end of the general prescriptions section for bridges in Volume II, Section 1.

2.2.4  **CV = Culvert**

2.2.4.1 *Identification and Mapping*

Culverts have been included in this project because they are an important highway feature for drainage and fisheries concerns. Culverts included in the Maintenance Atlas may be present due to associated engineering and/or environmental concerns, or, their identification was requested for purposes other than maintenance procedures. Culverts that have a high level of concern and/or require special attention by maintenance personnel are denoted by 'alert' or 'caution'. These culverts may have special engineering or environmental components associated with them, such as Water Quality (WQ), Fish and/or Fish Habitat (FH) or Icing Control (IC). These associated components may or may not be associated with a high level of concern.

2.2.4.2 *General Maintenance, and Inspections Prescriptions*

A prescription for a culvert at the 'notification' level was developed and is included in Volume II, Section 1. Where there is a culvert that was rated as 'alert' or 'caution', a special maintenance procedure was developed. These special prescriptions may be found at the end of the general prescription for culverts in Volume II, Section 1.

2.2.5 **DNG = Drainage**

2.2.5.1 *Identification and mapping*

Placement of the DNG symbol indicates the location of drainage measures, which may include roadside ditches, run-off control structures, etc. Drainage structures have been included as a highway feature because they are important for the stability of the roadbed and removal of water. Drainage is not typically associated with other highway features, engineering components or environmental components.

2.2.5.2 *General Maintenance, and Inspections Prescriptions*

The prescription for Drainage is included in Volume II, Section 1. This prescription was developed for the notification level of the MAS. There were no 'caution' or 'alert' MAS levels associated with drainage in the area covered by the Maintenance Atlas.

2.2.6 **GS = Granular Source / Stockpile**

2.2.6.1 *Identification and Mapping*

The GS symbol indicates locations where there is a granular source / stockpile, and provides the identifier number associated with the site. Granular sources and stockpiles have been included because they may be an important source of material for road maintenance activities. These sites are typically associated with Access Points (AC) because they are located away from the right of way. Vegetation (RV) may also be present as there is ongoing reclamation at the site.

2.2.6.2 *General Maintenance, and Inspections Prescriptions*

A general maintenance prescription has been developed from Granular Source/ Stockpile areas, and this is included in Volume II, Section 1. This prescription is written for the ‘notification’ level of concern, which is the only MAS associated with Granular Stockpiles/Sources.

2.2.7 **IS = Insulated Structure**

2.2.7.1 *Identification and Mapping*

The IS symbol indicates the location of an insulated structure that will not likely to be impacted by regular maintenance activities (owing to the fact that they are usually buried 3 m deep), but it is presented on the detailed maintenance maps to advise Maintenance personnel of their existence at these locations. This highway feature was included because it is important for the integrity of the roadbed. Insulated structures may be associated with Road Surface (RS) or Geotextile / Granular Filters (GT)

2.2.7.2 *General Maintenance, and Inspections Prescriptions*

A general prescription was developed for Insulated Structures and is located in Volume II, Section 1. This prescription reflects the ‘alert’ level of concern. There were no insulated structures that had a ‘caution’ level of concern, so it was not necessary to develop a special prescription.

2.2.8 **MP = Multiplate**

2.2.8.1 *Identification and Mapping*

The MP symbol is an indicator of sites that require special maintenance procedures for multiplates. Multiplates are an important road feature for drainage and fisheries concerns. Multiplates have been included in the Maintenance Atlas because of special engineering or environmental components associated with them, or because maintenance personnel have

simply requested their identification. Multiplates are commonly associated with Water Quality (WQ) and Fish and/or Fish Habitat (FH).

2.2.8.2 *General Maintenance, and Inspections Prescriptions*

A prescription for multiplates at the ‘notification’ level was developed and is included in Volume II, Section 1. Where there is a multiplate that was rated as ‘alert’ or ‘caution’, a special maintenance procedure was developed. These special prescriptions may be found at the end of the general prescription for multiplates in Volume II, Section 1.

2.2.9 **PO = Pull Out**

2.2.9.1 *Identification and Mapping*

The PO symbol indicates a location on the highway right of way where shoulders are wide enough to safely accommodate parked vehicles beside the highway. Pull outs are identified in the Maintenance Atlas because of their importance to highway maintenance. In general, pull outs on the Alaska Highway are plowed in winter to accommodate transport trucks that use the pull outs for overnight stops, and pull outs on the Haines Road are not plowed in winter. Pull outs may be associated with environmental or engineering components such as Boat Launch (BL) or Waste Management (WM), or they may appear on their own.

2.2.9.2 *General Maintenance, and Inspections Prescriptions*

The prescription developed for Pull Outs is based on the ‘notification’ level of the MAS. This prescription is included in Volume II, Section 1. Special maintenance prescriptions were not necessary because there are no Pull Outs identified with a higher level of concern. Specific pull outs have been identified for winter maintenance.

2.2.10 **Q = Quarries**

2.2.10.1 *Identification and mapping*

The Q symbol indicates the precise location of a quarry, as well as the identifier number associated with the specific quarry. Quarries were included in this project because of their potential for supplying road maintenance materials, and their high level of interest to special

interest groups. Quarries are typically associated with Access Points (AC) because of their distance from the right of way. There may also be a Vegetation (RV) component associated with borrow pits if revegetation was part of a reclamation plan.

2.2.10.2 *General Maintenance, and Inspections Prescriptions*

The general prescription developed for Quarries is included in Volume II, Section 1. This prescription was developed for the 'notification' level of the MAS, and there were no deviations from this level of concern throughout the mapped area

2.2.11 **RA = Rest Area**

2.2.11.1 *Identification and Mapping*

The location of the RA symbol on the Detailed Maintenance Maps indicates the location of a rest area along the right of way. Rest areas are typically associated with Pull Outs (PO), Access Points (AC), Waste Management (WM) and Outhouses (OH). Their maintenance was identified as important for the comfort and convenience of those travelers using the highway.

Maintenance of Rest Areas is the responsibility of C&TS with the exception of the Spruce Beetle Trail (HJ078). There is a rest area coincident with the Pull out associated with the Spruce Beetle Trail head; this site is maintained by Renewable Resources.

2.2.11.2 *General Maintenance, and Inspections Prescriptions*

A general prescription for Rest Areas is included in Volume II, Section 1; this prescription was developed for the 'notification' level of the MAS. There are no higher levels of concern associated with Rest Areas in the mapped area

2.2.12 **RC = Rock Cuts/Slide Areas**

2.2.12.1 *Identification and mapping*

Specific locations and/or areas where there have been rock cuts as part of highway reconstruction or there is a mass movement or spalling of rocks onto the traveled portion of the highway, or there is a potential for maintenance in the future, are denoted by the RC symbol. A

hachured line along the bottom of the satellite image indicates areas, whereas a line from the symbol to a specific location indicates a discrete geographic location. Rock Cuts and Slide Areas are included in the Maintenance Atlas because of the potential hazard that is posed as well as the high level of monitoring and maintenance required at these sites. These areas and/or sites typically appear in the absence of other features or components.

2.2.12.2 *General Maintenance, and Inspections Prescriptions*

Rock Cuts/Slide Areas correspond to an ‘alert’ on the MAS throughout the mapped area, and the general prescription reflects this elevated level of concern.

2.2.13 **RS = Road Surface**

2.2.13.1 *Identification and Mapping*

Where there are specific locations or areas with maintenance concerns regarding the road surface, the RS symbol appears in the Maintenance Atlas. The RS symbol may be associated with another highway feature, an engineering or environmental feature, or may stand alone as an indicator of special interest to personnel for reasons other than maintenance. The RS symbol is typically associated with Geotextile / Granular Filters (GT).

2.2.13.2 *General Maintenance, and Inspections Prescriptions*

A general prescription was developed for Road Surfaces at the ‘caution’ level; this prescription is included in Volume II, Section 1.

2.2.14 **UC = Utility Encroachment/Crossing**

2.2.14.1 *Identification and Mapping*

At locations where the right of way passes beneath a utility encroachment/crossing, or where there are known buried utilities, special maintenance procedures may be required; this location is indicated by the UC symbol. Utility encroachment/crossing (UC) were included in this project because extra safety precautions must be taken when working in the vicinity of utilities. The UC

symbol does not appear in conjunction with other highway features, engineering or environmental components.

2.2.14.2 *General Maintenance, and Inspections Prescriptions*

A prescription for utility corridors was developed at the 'notification' level and is included in Volume II, Section 1. There are no deviations from this level of concern; consequently no special prescriptions were developed.

2.2.15 **WX = Wildlife Crossing**

2.2.15.1 *Identification and Mapping*

The WX symbol is placed at locations where there is known increased site specific wildlife activity, and where the highway right of way is frequently crossed by wildlife. This was included in the Maintenance Atlas because noting the locations of wildlife crossings is important for the safety of motorists. Maintenance prescriptions for wildlife typically include a higher level of brushing concern to preserve greater sight lines. Wildlife crossings are not typically associated with other highway features, engineering or environmental components.

2.2.15.2 *General Maintenance, and Inspections Prescriptions*

A general prescription has been developed for the 'notification' level of Wildlife Crossings. This prescription is included in Volume II, Section 1.

2.3 ENGINEERING COMPONENTS

Maintenance prescriptions were developed for each engineering component and are included in Volume II Section 1. These prescriptions were developed through consultation with various resources, including experts within YTG C&TS, Transportation Maintenance Branch and Transportation Engineering Branch, other provincial maintenance specifications, and the professional experience and knowledge of the project team. Prescriptions are presented in such a way that people new to the highway maintenance profession or persons unfamiliar with local maintenance conditions and practices will easily understand them.

The symbols are based on, and were developed from icons utilized by from the Transportation Association of Canada. These symbols are highly recognizable and transferable – this serves to increase the ease of understanding of people from varied backgrounds.

As with the highway features identification and mapping, there is a Maintenance Advisory System (“MAS”) designation associated with each engineering component, indicating the level of concern related with the specific component.

2.3.1 **EC = Erosion Control**

2.3.1.1 *Identification and Mapping*

The engineering objective of erosion control is to implement whatever means necessary to minimize erosion and possible failures to the road structure. The presence of the erosion control symbol (EC) on the map indicates where engineering measures have been taken to control erosion (these include, but are not limited to, revegetated side slopes, special ditching/ditch blocking, etc.) Maintenance activities in the vicinity of erosion control measures must be aware of these engineering structures and be careful not to circumvent their effectiveness. Erosion control is most often related to issues pertaining to water management. As such, EC is typically associated with Geotextiles (GT), Drainage (DNG) and Road Surfaces (RS).

2.3.1.2 *General Maintenance, and Inspections Prescriptions*

A general maintenance prescription for erosion control has been developed and is included in Volume II, Section 1. This prescription was written for the ‘caution’ level of concern; any EC symbols that appear with the ‘alert’ level of concern have had a special prescription developed. The special prescription is included at the end of the Erosion Control section in Volume II, Section 1.



2.3.2 **ECP = Erosion Control Protected by Geotextile**

2.3.2.1 *Identification and Mapping*

Side slopes and other portions of the highway right of way that are protected by geotextiles require special attention during maintenance activities. Erosion control structures must remain intact to fully carry out the function that they were engineered for. The symbol identifies to maintenance personnel areas that require careful consideration along the right of way, in particular, to avoid disruption of the geotextile by heavy equipment. Erosion control measures protected by geotextile are typically associated with features/components that are related to water management; most commonly ECP is found in conjunction with Road Surface (RS) and Geotextile (GT) features in the Maintenance Atlas.

2.3.2.2 *General Maintenance, and Inspections Prescriptions*

A general maintenance prescription for erosion control protected by geotextile (ECP) has been developed and is included in Volume II, Section 1. This prescription was written for the ‘caution’ level of concern. Any ECP symbols that appear with the ‘caution’ level of concern have had a special prescription developed. The special prescription is included at the end of the Erosion Control section in Volume II, Section 1.

2.3.3 **GT = Geotextile/Granular Filters**

2.3.3.1 *Identification and Mapping*

Geotextiles and Granular filters (GT) are engineering components that are used in conjunction with other structures for purposes of engineered drainage and erosion control. These fabrics require special awareness and care when maintenance work is occurring within the vicinity. The symbol on the map is there to alert maintenance personnel to the presence of Geotextiles and/or granular filters in the area. Geotextiles are most often found in conjunction with Road Surface (RS) features.

2.3.3.2 *General Maintenance, and Inspections Prescriptions*

A general prescription has been developed for Geotextile/Granular Filters for a “caution” level of concern. Where a higher MAS rating has been determined, a special maintenance prescription has been developed, and is included at the end of the general prescription in Volume II, Section 1.

2.3.4 **IC = Icing Control**

2.3.4.1 *Identification and Mapping*

The purpose of icing control is to identify to maintenance personnel areas where there are special problems due to the glaciation of streams within culverts. More recent construction of culverts has incorporated icing control features into the culvert and its emplacement in the streambed. These can include the hand placement of rock weirs a few feet downstream of the culvert to create a deeper water pool so that ice will form on the top of the water rather than from the streambed upwards. It is important to flag such features for Maintenance personnel so that routine maintenance activities do not disturb such engineering features. At some locations, steaming and/or electrical heat trace cables are employed to melt in-culvert ice formation to ensure the utility of the culvert during spring freshet. In some cases, a pipe or pipes are set into the stream bed underneath multiplates, to ensure that water will flow through the stream beneath the surface ice continually throughout the winter. These pipes required cleanout with eduction trucks from time to time. The icing control symbol indicates areas where drainage

structures must be opened to prevent water and ice build-up on the roadway. This engineering feature is typically associated with culverts (CV) and multiplates (MP) and reflects a seasonal safety concern for motorists.

2.3.4.2 *General Maintenance, and Inspections Prescriptions*

A general prescription for icing control has been developed and is included in Volume II, Section 1. This prescription addresses the ‘caution’ level of concern, which is what all IC has been classified as in the Maintenance Atlas.



2.3.5 **OH = Outhouse**

2.3.5.1 *Identification and Mapping*

Outhouses are an engineering component that will require seasonal attention (regular inspection and pump out by education truck on an as-needed basis). The symbol on the map indicates where Outhouses (OH) are located. This engineering component has been included for the comfort and convenience of motorists traveling the highway. Outhouses are most often associated with Rest Areas (RA), Access Points (AC) and Waste Management (WM).

2.3.5.2 *General Maintenance, and Inspections Prescriptions*

A general maintenance prescription for Outhouses is included in Volume II, Section 1. This prescription was developed for the ‘notification’ level of the MAS. There are no higher levels of concern associated with Rest Areas in the project area.



2.3.6 **RV = Revegetation**

2.3.6.1 *Identification and Mapping*

Revegetation special maintenance areas have been identified where normal road maintenance activities occur in close proximity to revegetated areas. All right-of-ways have been revegetated; the objective is to maintain areas that are vegetated and minimize disturbance in areas where vegetation is being re-established. This engineering feature is associated with borrow pits, quarries and/or granular stockpiles/sources that are have been/are being reclaimed.

It is important to include this feature so as not to defeat the purpose of revegetation / reclamation efforts.

2.3.6.2 *General Maintenance, and Inspections Prescriptions*

Revegetation has been classified as ‘notification’ according to the MAS throughout the mapped area, and a general prescription has been developed for that level of concern. The prescription is included in Volume II, Section 1.

2.3.7 **SF = Snow Fence**

2.3.7.1 *Identification and Mapping*

The snow fence symbol (SF) indicates an area that requires a snow drifting control structure. Snow fences are included in the Maintenance Atlas so that new personnel will know where to set up the snow fence and where drifting snow may pose a problem to motorists. Snow fences are not associated with other highway features, engineering or environmental components.

2.3.7.2 *General Maintenance, and Inspections Prescriptions*

Snow fences are classified at a ‘notification’ level of concern throughout the Maintenance Atlas. The general prescription that was developed for this component reflects this MAS rating. The maintenance prescription may be found in Volume II, Section 1.

2.3.8 **SR = Snow Removal**

2.3.8.1 *Identification and Mapping*

The objective of the snow removal engineering component is to maintain roads to a standard that reflects the priority needs of the community and traveling public. Snow removal may be carried out by a Grader, truck with a plow and with sand and/or salt. The SR symbol is only used at specific sites where the requirement to remove snow is unique. Snow removal for the entire road surface is a given; therefore, it is not applied to the entire Shakwak Highway. Snow

removal is typically not associated with other highway features, engineering or environmental components.

2.3.8.2 *General Maintenance, and Inspections Prescriptions*

Snow removal is classified at a 'notification' level of concern throughout the Maintenance Atlas and the general prescription that was developed reflects this MAS rating. The maintenance prescription may be found in Volume II, Section 1.

2.3.9 **US = User Safety**

2.3.9.1 *Identification and Mapping*

User safety engineering features are used to make those people that use and maintain the highway aware of potential hazards, which may include avalanches and wildlife on the road. The symbol has been placed on the map to indicate areas where there is a threat to user safety and is associated with features that pose a threat to the safety of motorists and/or maintenance personnel.

2.3.9.2 *General Maintenance and Inspections Prescriptions*

User safety is associated with a 'caution' level of concern. The general prescription that is included in Volume II, Section 1 reflects this status and specific prescriptions have been developed where required for a 'caution' level of concern.

2.3.10 **WM = Waste Management**

2.3.10.1 *Identification and Mapping*

The placement of the waste management symbol in the Maintenance Atlas indicates where waste buckets/bins are located, and is also used to indicate small municipal landfill sites. Waste management bins located at rest areas require regular repair and emptying, particularly during the high travel periods. This engineering component has been included for the comfort and convenience of motorists, as well as maintaining the aesthetic integrity of the right of way.

Waste management is typically associated with Rest Areas (RA), Access Points (AC) and Outhouses (OH).

2.3.10.2 General Maintenance, and Inspections Prescriptions

A general prescription for Waste Management is included in Volume II, Section 1. The maintenance prescription was developed for the 'notification' level of the MAS. There are no higher levels of concern associated with Rest Areas in the project area.

2.4 ENVIRONMENTAL/AESTHETIC COMPONENTS

The symbols used are based on, and were developed from icons gleaned from, the Manual of Uniform Traffic Control Devices for Canada, prepared by the National Committee on Uniform Traffic Control, September, 1998, and the Driver's Basic Handbook, YTG C&TS, 1999. These symbols are placed at specific sites and, in conjunction with the Maintenance Advisory System, indicate where each environmental component is located and the level of concern associated with it.

The Maintenance Atlas and guidelines are flexible enough to address environmental/aesthetic components that span a wide geographic area (continuous), as well as discrete locations (point). Where the environmental/aesthetic component is not tied to a specific point along the highway designated by a connecting line to the symbol, the component is then applicable to the area denoted by the hachured line at the bottom of the Maintenance Atlas.

The criterion for including each environmental/aesthetic component in this project was developed through consultation with concerned parties and through field trips. In order for an environmental/aesthetic component to be included in the atlas, it must require a unique maintenance prescription, or be of particular interest to maintenance personnel. Including an environmental or aesthetic component in the Maintenance Atlas does not always mean that this component of interest requires special maintenance; it may simply be identified to provide a notification to atlas users that there may be an environmental or aesthetic concern in the area (through it may be of greater or lesser sensitivity).

The following general Environmental/Aesthetic Components have been identified along the highway right-of-way, mapped in the Maintenance Atlas (Volume III), and have been given general and specific maintenance prescriptions (Volume II):


2.4.1  **BL = Boat Launch**

2.4.1.1 *Identification and Mapping*

The boat launch component is intended to identify to maintenance personnel the presence of public marine facilities close by. Boat Launches are typically associated with Access Points (AC).

2.4.1.2 *General Maintenance, and Inspections Prescriptions*

A general maintenance prescription for Boat Launches has been developed that reflects the 'notification' level of concern; this prescription may be found in Volume II, Section 1.

2.4.2  **CU = Cultural Use**

2.4.2.1 *Identification and Mapping*

The cultural use symbol indicates a location of special interest for First Nations. Cultural Use (CU) encompasses a broad spectrum of sites, and may include traditional fishing/hunting areas, cemeteries, lodges, hunting camps, etc. This environmental component has been included for information purposes so that maintenance personnel will be aware of culturally significant sites adjacent or close to the highway. Cultural use sites are typically associated with Access Points (AC) if they are located at a discrete site and near the highway right of way.

2.4.2.2 *General Maintenance, and Inspections Prescriptions*

A general maintenance prescription has been developed for cultural use that reflects the 'caution' level of concern. The prescription may be found in Volume II, Section 1.

2.4.3  **FH = Fish and/or Fish Habitat**

2.4.3.1 *Identification and Mapping*

This environmental component indicates streams or watercourses that have fisheries concerns related to them and require special attention during maintenance procedures. Fisheries concerns are intimately related to water quality issues and degradation of habitat. The

alteration or disturbance of fish or fish habitat is regulated by Federal legislation, including the Fisheries Act and Yukon Waters Act. Failure to comply with legislative requirements may result in non-compliance and subsequent enforcement actions. For this reason, all time limitations on in-stream work must be adhered to, and all measures designed to protect water quality must be followed. ** Fish and fish habitat is an important issue for the Transportation Maintenance Branch, as routine maintenance activities can easily impact fish habitat if care is not taken. It was an issue of concern during the environmental assessment of the project in 1978, and remains an issue of concern for Regulatory Agencies and First Nations. Fisheries (FH) concerns are typically associated with Bridges (BR), multiplate culverts (MP), and Water Quality (WQ) in the Maintenance Atlas.

*** Disclaimer: although every effort was made to document all of the known fish habitat stream crossings, it is entirely possible that some stream crossings may have been omitted, and that, some crossings that are not denoted with a maintenance alert symbol may become important fish habitat over time. Maintenance personnel are advised to use caution whenever activities may interfere with watercourse crossings. As the slogan commonly used by utility companies for buried cables goes, "Call Before You Dig".*

2.4.3.2 General Maintenance, and Inspections Prescriptions

The general maintenance prescription for Fish and/or Fish Habitat (FH) was developed for a 'caution' level of concern. Where there is an "alert" MAS associated with FH, a special maintenance prescription has been developed specifically for that site. The special maintenance prescription may be found at the end of the general prescription in Volume II, Section 1. The special maintenance prescription identifies concerns related to Water Licences and constraints, such as time limits on instream works.

2.4.4 HTG = Heritage

2.4.4.1 Identification and Mapping

This environmental/aesthetic component indicates the location of a specific site or area that has historical significance for First Nations. This environmental/aesthetic component has been included for information purposes so that maintenance personnel will be aware of culturally

significant heritage sites adjacent or close to the highway. Heritage sites are typically associated with Access Points (AC) if they are located at a discrete site and near the highway right of way.

2.4.4.2 *General Maintenance, and Inspections Prescriptions*

A general maintenance prescription has been developed for Heritage areas that reflect the ‘notification’ or ‘caution’ level of concern. The prescription may be found in Volume II, Section 1.

2.4.5 **RCP = Residential/Commercial Property**

2.4.5.1 *Identification and Mapping*

The placement of this symbol indicates the location of residential or commercial properties that access the highway right of way. These symbols are plotted in the atlas to alert maintenance personnel to the level of service required by these access points.

2.4.5.2 *General Maintenance, and Inspections Prescriptions*

A general maintenance prescription for RCP was developed and is included in Volume II, Section 1. This prescription is applicable for the ‘notification’ level of concern – which was the only level of concern identified for RCP.

2.4.6 **REC = Recreation**

2.4.6.1 *Identification and Mapping*

The recreation symbol (REC) is intended to identify to maintenance personnel the presence of recreational facilities and individuals using these facilities in the area.

2.4.6.2 *General Maintenance, and Inspections Prescriptions*

A general prescription for the ‘notification’ level of concern has been developed and is included in Volume II, Section 1. There were no higher levels of concern identified in the project area.

2.4.7  **SV = Scenic Viewing**

2.4.7.1 *Identification and Mapping*

The scenic viewing (SV) symbol is placed at sites where exceptional scenic quality has been recognized by highway designers through the incorporation of interpretive signage at viewing opportunities. This aesthetic component was included at the request of maintenance personnel, and has been identified for aesthetic and tourism purposes.

2.4.7.2 *General Maintenance, and Inspections Prescriptions*

A general maintenance prescription was developed for scenic viewing and is included in Volume II, Section 1. This prescription is appropriate for the 'notification' level of concern associated with all Scenic Viewing environmental/aesthetic components.


2.4.8  **WH = Wildlife Habitat**

2.4.8.1 *Identification and Mapping*

This environmental symbol indicates an area that is known to be used by wildlife or an area with significant wildlife habitat in higher concentrations than the surrounding area, or as an important movement or migration corridor. Specific maintenance procedures in these areas would include a more frequent brushing control of the highway right of way.

2.4.8.2 *General Maintenance, and Inspections Prescriptions*

A general maintenance prescription was developed and is included in Volume II, Section 1. This prescription was written for the 'notification' level of concern; there were no higher levels of concern expressed in the mapped area.

2.4.9  **WQ = Water Quality**

2.4.9.1 *Identification and Mapping*

The water quality (WQ) symbol will appear at locations where there are concerns about the impact of road maintenance activities on stream or watercourse water quality. For example, annual bridge washing would cause a deposit of a deleterious substance into streams if not conducted with care.

2.4.9.2 *General Maintenance, and Inspections Prescriptions*

A general maintenance prescription has been developed for water quality at the 'caution' level of concern according to the MAS. Where there is an 'alert' associated with water quality, a special prescription has been developed for that specific site. The special prescriptions are included at the end of the general prescriptions, which may be found in Volume II, Section 1.

3.0 CURRENT LAND USE/LAND TENURE

The main objective for the current land use identification and compilation was to document current land use/land tenure activities along the highway alignment, within a 3.6 km wide corridor, that was pertinent to highway maintenance. The identification of this information will provide the maintenance operators with appropriate maintenance prescriptions for these areas. Any potential impacts to current and potential land users with respect to highway maintenance were examined, and mitigation measures have been developed into simple maintenance prescriptions and advisory indicators (as shown in the Maintenance Atlas). Current land tenure and land use highway access points were field-inspected and documented with information presented in the Maintenance Atlas (Volume III).

First Nation Settlement Land for the Champagne and Aishihik First Nations has been indicated at the appropriate locations in the Atlas. The Champagne and Aishihik FN Settlement Lands may be found on the following map sheets: 12 to 23 inclusive, and page 25. Traditional territories of Yukon First Nations and Settlement Areas of Inuvialuit and Tetlit Gwich'in are illustrated on page 45 of Volume I. Areas that are part of the Kluane Wildlife Sanctuary or have mineral claims have also been indicated in the Atlas. Current land use in British Columbia (e.g. grazing tenures and residential property) has been noted and appears in the maintenance atlas where applicable.

Residential and commercial properties have been listed in Table 1: Shakwak Highway Current Land Use/Tenure Information. The outline of each specific Land Tenure associated with these properties, have not been depicted on the atlas.

Much of the current land use/tenure along the highway consists of seasonal tourist activity, residential properties and commercial businesses which support highway traffic demands by providing fuel, food, and lodging. Recreational and cultural/social uses of the off right of way area by local residents are varied and may include various types of resource extraction such as berry picking, fishing, and hunting. Other recreational land uses include hiking, skiing, snowmobiling, boating. Outfitting and trapping concessions in the area provide local employment and draws numerous tourists/hunters. Many of these land uses in the study area are located off-highway. Access to these areas is deemed important and has been identified on

the Maintenance Atlas (Volume III) maps and addressed in the Maintenance Prescriptions and the Features Classification Tables (Volume II, Section II).

Key findings/products resulting from the current land use/tenure examination included:

- Identification of land uses in the study area including tourism, mining, forestry, agriculture, trapping and outfitting, residential/commercial land uses, recreational uses, traditional and cultural uses, hunting and fishing;
- The main impacts associated with current land tenure and use is retention of continued access to existing business, private residences, local land uses and recreational highway access points.
- Description, mapping, and geo-reference of project-pertinent current land tenure and land use access points are provided in the Features Classification Tables (Volume II, Section II) and the Maintenance Atlas (Volume III).
- In addition to identifying access points to areas of current land use and land tenure in the Maintenance Atlas, general and specific prescriptions were developed to mitigate any potentially adverse impacts to users/owners as a result of the maintenance of the highway. These are provided in Volume II, Section I – General Maintenance and Special Maintenance Prescriptions.

During interviews, some stakeholders stated that so-called ‘local access’ intersections should not be maintained so as to encourage tourist traffic. That is to say, they wished the access be allowed to degrade to the point where tourists would be discouraged from attempting to travel down the road. Some local residents consider these roads as semi-private, and do not wish to open up their ‘special’ places to local tourist traffic. While these concerns and comments were recorded, none have been incorporated into the Maintenance Atlas and have been left to the YTG C&TS staff to implement on a case-by-case basis.

The maintenance of the highway inevitably leads operators through the various communities along the highway; however, the specifics of maintenance at these locations has not been addressed here.

While some current land use/tenure information is depicted graphically in the Maintenance Atlas (locations of residential and commercial properties, recreational and cultural land use locations),

much of the current land use/tenure information has been compiled within the Features Classification Tables and in Table 1 below. The tables that make up Volume II, Section II include a sequential listing of the features approximately located by the Feature Identification Number (e.g. HJ001) found on the maps in the Maintenance Atlas and generally include a land use/tenure Environmental/Aesthetic Component (and where appropriate Engineering components), where Access Points are identified. Please refer to the following example of what the reader will find in Volume II, Section II Tables.

Follow General Prescription for Access Point Maintenance with Snow Removal Activities Not to Block Access to a Residential Property

Follow General Prescription for Access Point Maintenance with Snow Removal Activities Not to Block Resort Access

Follow General Prescription for Access Point Maintenance Considering that the Access is to an Area With Cultural Use and Heritage Values

Indicates Whether an Existing or Expired Land Use Permit or Water Licence Applied to this Feature/Component

Features are Either Located at a Single Point or Continuous Along a Certain Length of the Highway

Feature ID	Highway Feature		Engineering Component		Environmental Component		Licences		Point or Continuous Feature	X,Y Coordinates (UTM Zone 7)		Comment
	Feature 1	Feature 2	Component 1	Component 2	Component 1	Component 2	Water Use Licence	Land Use Permit		Easting	Northing	
	HJ21	AC	-	SR	-	RCP	-	-		-	P	
HJ22	AC	-	SR	-	RCP	-	-	-	P	xxxxxx	xxxxxx	Access to Comercial Lot J&J Resorts - Jack & Jane Doe
HJ23	AC	-	-	-	CU	HTG	-	-	P	xxxxxx	xxxxxx	Access to Kluane First Nation Fish Camp Land Selection (R44A)
HJ24	AC	RA	SR	WM	REC	CU	-	-	P	xxxxxx	xxxxxx	Access to Lake (Winter Snowmobiling and Ice Fishing)
HJ25	AC	-	OH	-	BL	-	-	-	P	xxxxxx	xxxxxx	Access to Desadeash Lake Boat Launch


Features: AC = Access Points, BP = Borrow Pits, DNG = Drainage (Roadside Ditch, Run-off Control Structures, etc.), Q = Quarries, RA = Rest Area, RC = Rock Cuts/ Slide Areas, PO = Pull Out, CV = Culvert, MP = Multiplate, BR = Bridge, UC = Utility encroachment /Crossing, IS = Insulated Structure, RS = Road Surface, GS = Granular Source / Stockpile, WX = Wildlife Crossing; **Engineering Components:** US = User Safety (e.g. Avalanche / Wildlife Area), IC = Icing Control, RV = Vegetation (Existing Material, Revegetating & Reclaimed Areas), SF = Snow Fence (drifting control structure), SR = Snow Removal, EC = Erosion Control, ECP = Erosion Control Protected by Geotextile, WM = Waste Management, OH = Outhouse, GT = Geotextile / Granular Filters; **Environmental Components:** CU = Cultural Use, HTG = Heritage, BL = Boat Launch, FH = Fish and/or Fish Habitat, RCP = Residential / Comercial Property, WQ = Water

General Prescription for Access Point Maintenance to be followed here to Ensure Boat Launch Accessible (Note: Outhouse Maintenance Also Required)

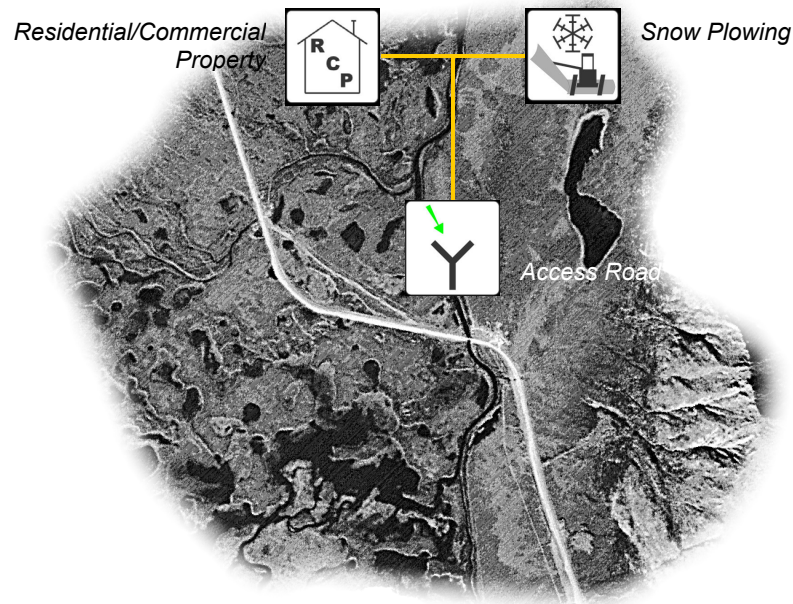
General Maintenance Prescription for Access Point (with Snow Removal) and Rest Area (with Waste Management) to be followed. Area used for Recreation and Cultural Use as well

Indicates the Geographic Location of the Feature for GPS or Topographic Map Field Acquisition



To provide clarity of maintenance tasks with respect to this project, the maps have focused on identifying highway access points of each land use/land tenure, rather than graphically depicting each land use itself, on the maps. Highway access points, identified by a  symbol may or may not have an engineering and/or environmental/aesthetic component attached. When they do have an environmental/aesthetic component included, it generally serves to indicate the type of land use that the access road is supporting and any specific maintenance required (in addition to the general prescription for Access Points), indicated by an engineering component such as Snow Removal. In the cases where no components (engineering or environmental) are attached, the general prescription for Access Points should be followed. The operator should refer to each of the prescriptions (for the feature(s) and/or component(s) identified) in Volume II, Section I that are included at any point on the maps (see example below) to review general and/or specific information regarding maintenance at a locations of this nature.

Example



This example of a highway feature (an *Access Point*) is identified because of the existence of access to a *Residential or Commercial Property* at this location. There is also an engineering component (*Snow Removal*) here, to guide maintenance at this feature.

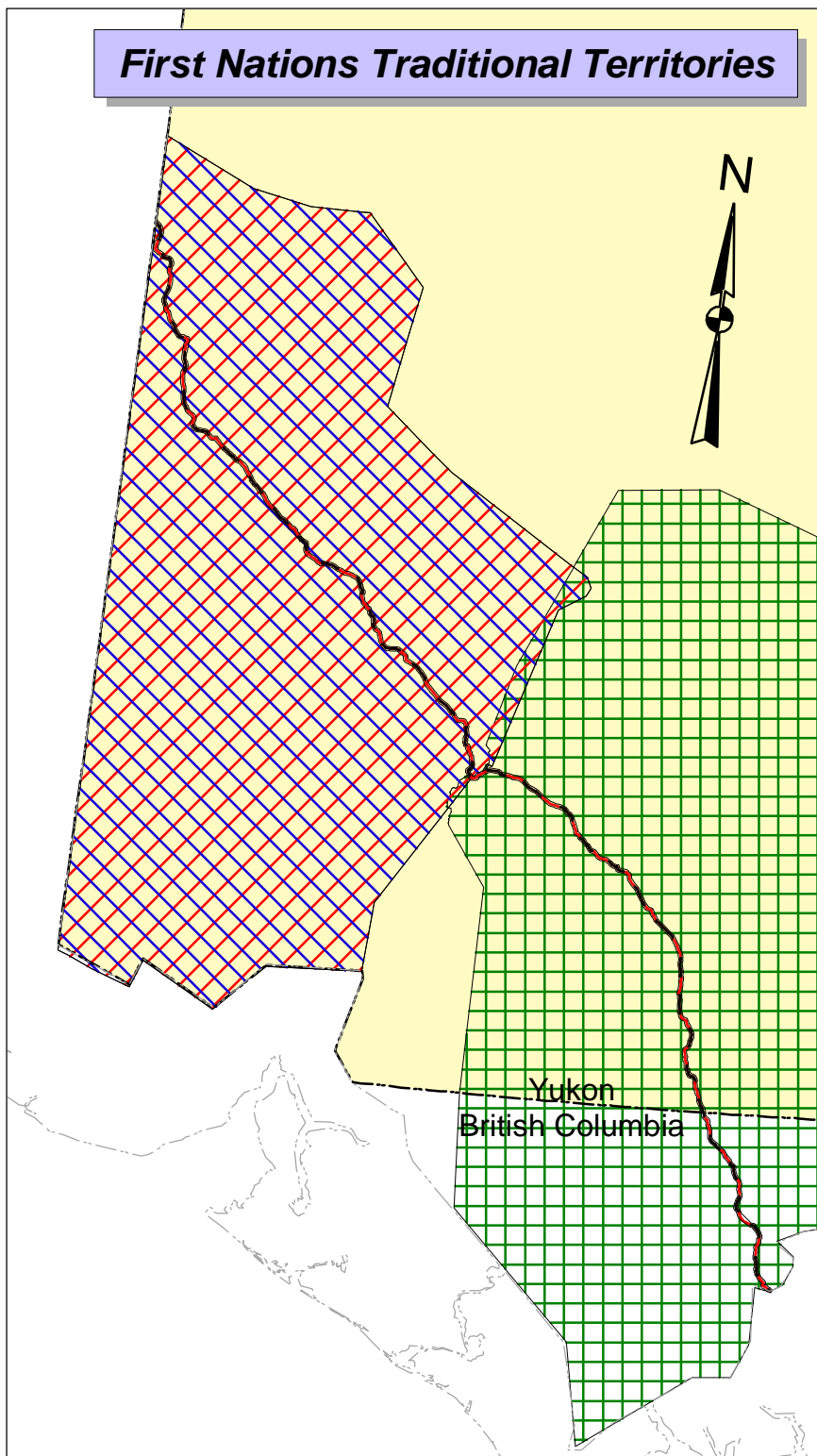
To complete the current land use/tenure compilation and for general information purposes, Table 1, below, identifies the trapping concessions, outfitting concessions, and the active untitled agricultural undertakings (i.e. grazing leases) along the highway. Additionally, Figure 2 below, visually depicts the locations of the registered trapping concessions, registered outfitting concessions, and the First Nations Traditional Territories along the highway.

Table 1: Shakwak Highway Area - Listing of Trapping and Outfitting Concessions and Agricultural Development

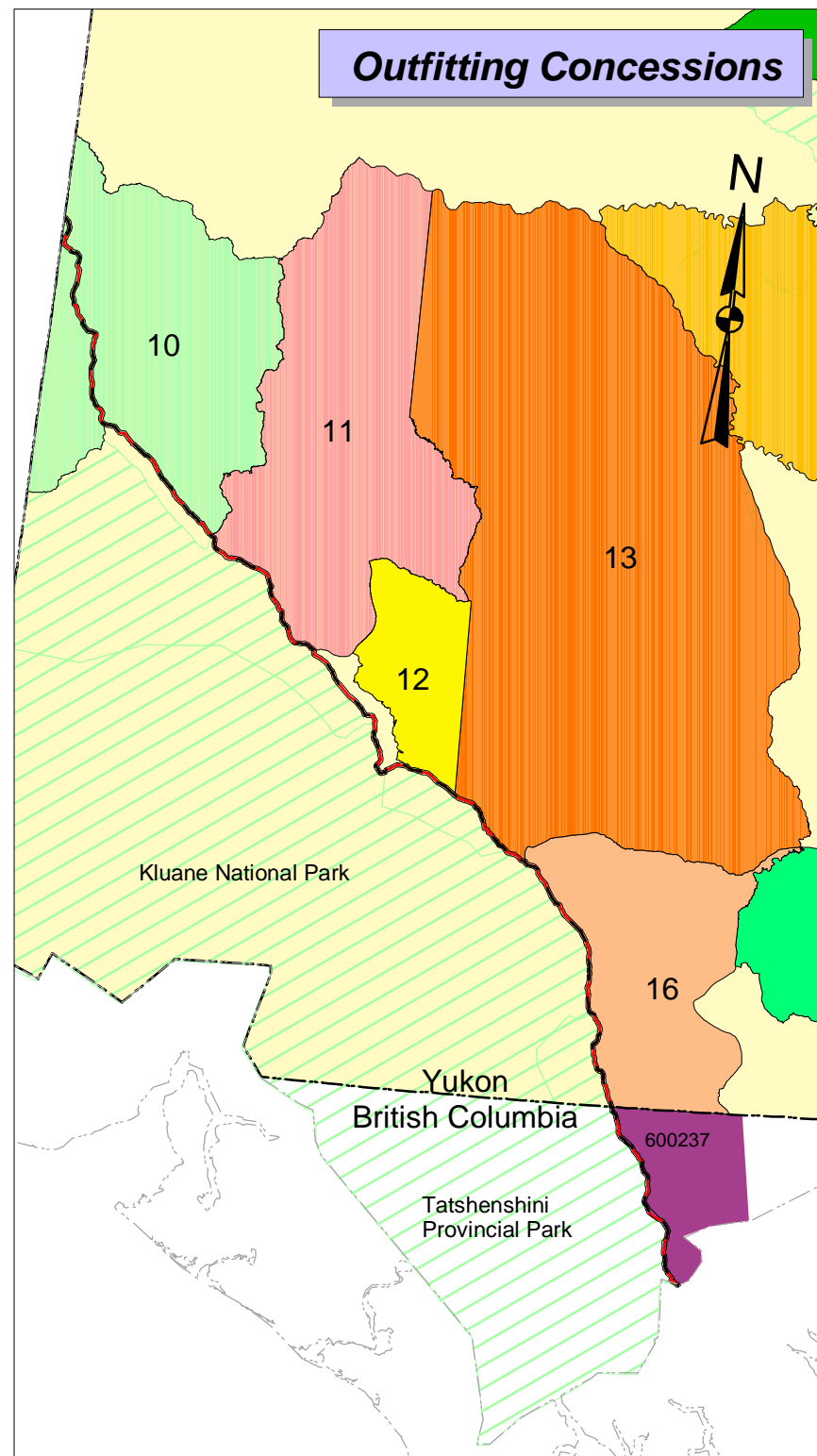
	Designation	Map Number(s)	Comments
Trapping Concessions	RTC # 117	61-63 (RHS)	David Johnny, General Delivery, Beaver Creek, YT Y0B 1A0
	RTC # 123	61-63 (RHS)	Victor Sembsmoen, General Delivery, Beaver Creek, YT Y0B 1A0
	RTC # 124	57-61 (RHS & LHS)	Steve Cross, Box 5651, Whitehorse, YT Y1A 5L7
	RTC # 125	53-56 (RHS)	Rosemarie Blair-Smith, General Delivery, Beaver, Creek, YT Y0B 1A0
	RTC # 126	48-52 (RHS)	Billy & Larry Blair, General Delivery, Beaver Creek, YT Y0B 1A0
	RTC # 127	48-52 (RHS)	David Dickson, Box 9130 - 29 Wann Rd., Whitehorse, YT Y1A 4A2
	RTC # 175	43-47 (RHS)	Open
	RTC # 176	43-47 (RHS)	Robert Johnson, Box 1, Burwash, YT Y1A 3V4
	RTC # 177	37-43 (RHS)	Kirk Johnson, General Delivery, Burwash Landing, YT Y0B 1V0
	RTC # 180	33-36 (RHS)	Kluane Tribal Council, Burwash Landing, YT Y0B 1H0
	RTC # 187	27-32 (RHS)	James Allen, Box 2104, Haines Junction, YT Y0B 1L0
	RTC # 188	27-32 (RHS)	Agnes MacDonald, Box 2015, Haines Junction, YT Y0B 1L0
	RTC # 265	22-26 (RHS)	Annie Holm, Box 5315, Haines Junction, YT Y0B 1L0
	RTC # 271	18-23 (RHS)	Sadie Brown, Box 5374, Haines Junction, YT Y0B 1L0
	RTC # 277	18-22 (RHS)	Marge Jackson, Box 5347, Haines Junction, YT Y0B 1L0
	RTC # 280	13-17 (RHS)	Kathy & Paul Birckel, 164 Alsek Dr., Whitehorse, YT Y1A 3V7
	RTC # 281	10-14 (RHS)	Champagne/Klukshu Gr, c/o CAFN, Box 5309, Haines Junction, YT Y0B 1L0
	RTC # 282	10-14 (RHS)	Barbara Hume, Box 5387, Haines Junction, YT Y0B 1L0
	RTC # 404	43-48 (RHS & LHS)	Kluane First Nation Council, Burwash Landing, YT Y0B 1H0
	RTC # 410	18-26 (RHS)	Radius Area, Dept. of Renewable Resources, Whitehorse
RTC # 417	32-33 (RHS)	Josie & Jimmy Sias, Box 5457, Haines Junction, YT Y0B 1L0	
RTC#629T001	1-9	Lance Goodwin, Haines Junction	
Outfitting Concessions	ROC#10	43-63	Dickson Outfitters Ltd., David Dickson, Box 9130-29 Wann Road, Whitehorse, YT Y1A 5A6
	ROC#11	41-48	Kluane Outfitters, Ken Reeder, Box 3995, Whitehorse, YT Y1A 5M6
	ROC#12	26-40	Ruby Range Outfitters 1989 Ltd., Shane Buchanan, Box 5449, Whitehorse, YT Y1A 5X5
	ROC#13	23-25	Mervyn Yukon Outfitting, Tim D. & Jen Mervyn, Box 33036, Whitehorse, YT Y1A 5X5
	ROC#16	10-22	Devil Hole Outfitters Ltd., Archie Lang, 29 Lewes Blvd., Whitehorse, YT Y1A 4S5
	ROC#600237	1-9	Dave/Jack Goodwin, Atlin BC
Grazing Leases	1020	23-25	R. & D. Hotte, Haines Junction

RTC: Registered Trapping Concession
 ROC: Registered Outfitting Concession

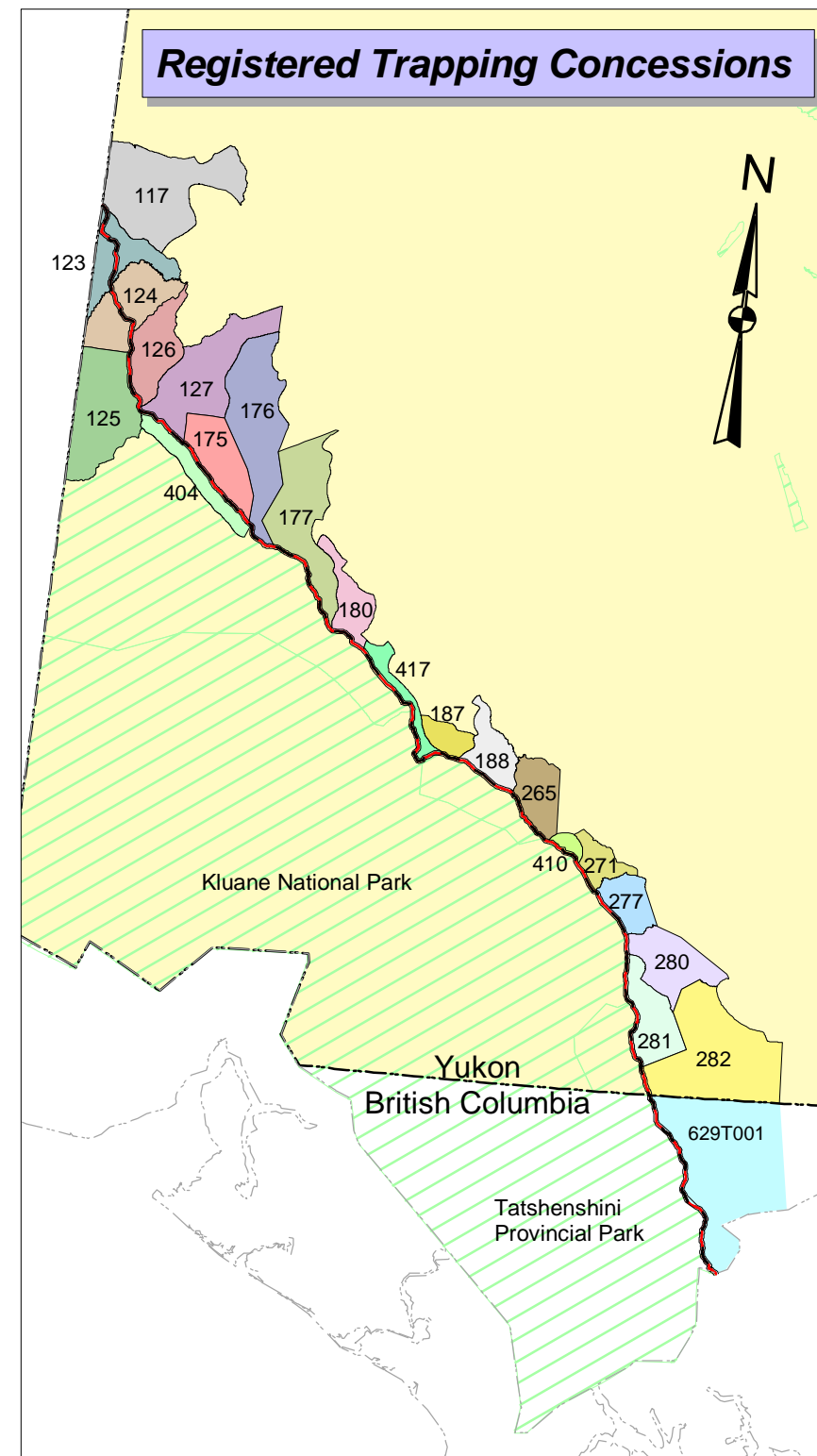
First Nations Traditional Territories



Outfitting Concessions



Registered Trapping Concessions



Shakwak Special Areas Maintenance Guidelines

Legend:

- Yukon Border
- Shakwak Highway
- Champagne and Aishihik First Nations
- Kluane First Nation
- White River First Nation
- Outfitting Concession #10 (Dickson Outfitters Ltd.)
- Outfitting Concession #11 (Kluane Outfitters)
- Outfitting Concession #12 (Ruby Range Outfitters Ltd.)
- Outfitting Concession #13 (Mervyn Yukon Outfitting)
- Outfitting Concession #16 (Devil Hole Outfitters Ltd.)
- Dave Goodwin (Atlin)
- Trapping Concession # (see Table 1.)

* For details refer to Section 1, Table 1.



First Nation's Traditional Territory, Outfitting Concessions, and Trapping Concessions along the Shakwak Highway Project

Scale 1 : 2 500 000

Drawn By: JEA Checked By: DDC

Date: 06/28/2001 Figure: 2

File: D:\project\YT\GIS\SAMG\Basedata\AV\Ciu.apr /Figure 2

4.0 REGULATORY PERMITTING AND CONSULTATION

4.1 PERMITS/LICENCES/AUTHORIZATIONS

The various permits held by C&TS for the operation and construction of the highway have been included here to provide the user with additional information with respect to maintenance activities at certain locations along the highway. These permits were reviewed during the course of this project to aid in the identification of special areas and in order to develop general and special maintenance prescriptions.

Table 2, below, presents a comprehensive listing of all active permits, licences, and/or authorizations currently held by C&TS for the operation and maintenance and/or construction of the highway. This listing includes the highway location referred to in the permit, and a description of the nature of the permit, including a summary of any specific terms and conditions of the permit.

This listing is subject to change as new highway maintenance/construction activities are undertaken. Therefore the user is urged to consult with the maintenance managers and the Environmental Coordinator for C&TS if there is any concern, comment, or clarification required with respect to these aspects of highway maintenance.

**Shakwak Project
Special Areas Maintenance Guidelines**

Table 2 Licenses and Permits Table for Special Maintenance and/or Management - Shakwak Highway

Maintenance Section	Land Use Permit or Water Licence Number	Design Chainage (km)	Effective Dates	Land/Quarrying or Water Use Description	Terms and Conditions
Blanchard River (BR)	LUP - YA8Q527	157.2-190.0	02/10/98 to 01/10/01	Authorized to take 50,000 cubic metres of granular material	Upon completion of operation, all cut banks three metres or more will be backsploped to a two horizontal to one vertical slope
BR	LUP	79.9 to 88.5	9-Jul-79	Highway Reconstruction	N/A
BR	LUP	96 to 122.2	7-Feb-84	Highway Reconstruction	N/A
BR	LUP , project number 745066	122.2 to 150.8	7-Mar-86	Highway Reconstruction	N/A
BR	LUP - YA8E220	149.9 to 162.4	01-Jun-88 to 31-Oct-89	Construction and Quarry	N/A
BR	LUP - YA6X843	150.0 to 179.6	01-Apr-86 to 30-Nov-86	Right of way and borrow pit clearing, Right of Way ditching	N/A
BR	LUP - YA7E029	180.9 to 205.2	01-June-87 to 31-Oct-88	Reconstruction	N/A
BR	LUP - YA6E964	180.9 to 205.2	01-Oct-86 to 30-May-87	Right of way clearing	N/A
Haines Junction (HJ)	LUP - YA8Q528	215.3, 232.7 and 17.6 Aishihik Road	02-Oct-98 to 01-Oct-01	Quarry operations for maintenance activities and routine maintenance	Upon completion all cut banks three metres or over will be backsploped to a two horizontal to one vertical slope
HJ	LUP - YA8H273	230.4 to 254.8	20-June-78 to 20 June-80	Highway Reconstruction	N/A
HJ	YA8Q528	1580 to 1693	02-Oct-98 to 01-Oct-01	Quarry operations of Maintenance activities and routine Maintenance	Upon completion all cut banks three metres or over will be backsploped to a two horizontal to one vertical slope
Destruction Bay (DB)	LUP - YA8Q529	1716 to 1821.5	02-Oct-98 to 01-Oct-01	Quarry operations of Maintenance activities and routine Maintenance	Upon completion all cut banks three metres or over will be backsploped to a two horizontal to one vertical slope
DB	LUP - YA0E706	1804.4 to 1820.4	03-Apr-00 to 02-Apr-02	Highway reconstruction, grubbing and stripping or row, quarry from existing pit, disposal of ice rich waste material, installation of drainage structures and rip-rap and camp	Maintain and decommission all temporary and permanent structures placed in streams for fish passage
DB	LUP - YA5E953	1831.3 to 1843.4	19-July-95 to 18-July-97	Highway reconstruction, waste disposal sites, two temporary ridges over Edith Creek and Lake Creek, Infilling at Edith Creek and Andrew Lake and Replacement of Drainage Structures	N/A
DB	LUP - YA9E590	1787.5 to 1797.9	01-May-99 to 30-April-01	Highway reconstruction, development of borrow pits, disposal of ice rich waste material, installation of drainage structures and rip-rap, can, construct second access into quarry at km 1794.35 LHS & 1793.8 RHS	Ongoing site rehabilitation is recommended to continue
DB	LUP - YA8E455 - A1 (MS98-101)	1820.5	EA Start: 06-July-98	Highway reconstruction, pit development, quarry, campsite, disposal of ice rich waste, crushing, drainage structures and rip-rap.	Pit to be reclaimed within two years of pit abandonment, Standing water in the pit may be connected to the open waters of the Donjek upon decommissioning if the potential exists for the creation of important fish habitat
DB	LUP - YA8E445 (MS97-094)	1822.7 to 1831.3	EA Start date: 24-March-98	Highway reconstruction, pit development, quarry, campsite, disposal of ice rich waste, drainage structures, rip-rap and installation of drainage structures including a culvert and groundwater pumping.	Instream working window of July 01 to October 15 when channel is dry have been established by proponent. Reclamation of pit area after reconstruction work is completed will return the area to a stable and productive state. Final reclamation of the pit should ensure that it is free draining upon abandonment. Vegetate the channel banks and worksite areas with reclamation seeds/plants
DB	LUP - YA8E445	1822.7 to 1831.3	01-June-98 to 30-June-00	Highway reconstruction, pit development, quarry, campsite, disposal of ice rich waste, drainage structures and rip-rap, installation of drainage structures including a culvert and groundwater pumping	Establish vegetation to a minimum of 70% coverage
DB	LUP - YAOE705	1797.4 to 1804.4	03-Apr-00 to 02-Apr-02	Highway reconstruction, grubbing and stripping or row, quarry from 3 existing pits, disposal of ice rich waste material, excavation of fish habitat replacement area, installation of drainage structures and rip-rap and camp	Ensure that Caribou Impact Mitigation Measures are observed during periods of caribou activity. Upon completion all banks over three metres will be backsploped to a two horizontal to one vertical slope
DB	WL - MS98-125	1788.5 and 1791.0	28-May-99to 31-Dec-04	Installation of culverts at Quill and Glacier Creek, construct diversion at Quill and Glacier creeks, remove bridge at Quill Creek, withdraw water from Glacier Creek and/or Kluane River for roadway construction purposes	All ground disturbed will be stabilized and recontoured in such a manner as to prevent erosion and surface runoff. An existing culvert at Glacier Creek is proposed to be left in place to provide continued access to traditional fishing areas along the old highway.
DB	WL - MS95-007	1831.3 to 1843.4	14-July-96 to 31-Oct-97	Highway reconstruction including culvert installation, infilling and temporary bridge installation	All ground disturbed will be stabilized and recontoured in such a manner as to prevent erosion and surface runoff
DB	WL - MS99-141	Swede Johnson Creek - KM 1798.9, Unnamed Creed KM 1799.2, Unnamed Creek KM 1800.9, Swede Johnson Wetland KM 1799.025 to 1799.15, Glacier Creek KM 1791, Kluane River KM 1795, Borrow Pit KM 1819, Donjek Pit KM 1820.4, Donjek River 1820.4	24-May-00 to 1-Apr-05	Installation of culverts, removal of existing culverts, construction of watercourse diversions, construction of associated earthworks, shoreline infilling, and water use for roadway construction, km 1797.4-1804.4, all as proposed in Water Use Application MS99-141	Work shall be carried out in the dry, except for connecting new chanel to old channels which shall only be carried out after all other channel construction work is complete. Work in watercourses shall only be carried out during the period of July 1 to March 15. Work shall be carried out during low flow periods whenever possible. All disturbed ground surfaces shall be stabilized in a manner which prevents erosion and surface runoff.

**Shakwak Project
Special Areas Maintenance Guidelines**

Table 2 Licenses and Permits Table for Special Maintenance and/or Management - Shakwak Highway

Maintenance Section	Land Use Permit or Water Licence Number	Design Chainage (km)	Effective Dates	Land/Quarrying or Water Use Description	Terms and Conditions
DB	WL - MS99-142	1804.4 to 1820.4; Glacier Creek KM 1791, Klwane River KM 1795, Swede Johnson Creek KM 1798.9, Unnamed Creek KM 1799.2, Unnamed Creek KM 1800.9, Borrow Pit KM 1819, Donjek Pit KM 1820.3, Donjek River KM 1820.4	18-May-00 to 31-Dec-01	Withdrawal of water from several sources for roadway construction purposes, including dust control and soil compaction as proposed in Water Use Application MS99-142.	All work should be done in the dry, and no equipment should be allowed to work within the wetted perimeter of the stream.
DB	WL - MS97-094	Hard Luck Creek	14-July-98 to 31-Dec-03	Culvert installation and pit dewatering as proposed in water use application MS97-094	Fish baffles shall be installed in the new culvert as proposed in water use application MS94-094, Instream works may be conducted from July 1 to October 15, 1998. New channel banks and disturbed work site areas shall be vegetated with reclamation seeds or plants. Upon completion of the works and annually thereafter, the project area shall be inspected to ensure the successful revegetation of the reclaimed areas and ensure that it is in a physically stable condition. Reclamation shall be completed within two years of abandonment of the pit. At decommissioning the channel joining the pit to the Donjek River shall be constructed so that any sediment generated during channel construction is deposited in the pit, and the channel itself does not seal off due to sloughing of the channel walls.
DB	WL - MS98-125	Quill Creek, Glacier Creek, Klwane River	28-May-99 to 31-Dec-04	Installation of culverts, diversions, removal of an existing bridge, withdrawal of water for roadway construction purposes as proposed in Water Use Application MS98-125	After removal of the Quill Creek Bridge, the abutment areas and other areas disturbed during the work shall be re-contoured in a manner which is stable and consistent with the general topography of the site. All water supply intakes shall be screened in accordance with the requirements with the Fisheries and Oceans Canada.
DB	WL - MS00-153 (amendment for WL MS97-094)	1828.2, 1819	5-Jul-00	Installation of culverts, store ground water, discharge water into Donjek River	Cease pumping or decanting and take remedial action before resuming pumping or decanting if there is significant alteration to the leave strip and/or bed or bank of the water channel
DB	WL - MS99-143	Shakwak Project BST Surfacing, KM 1822.7-1831.7 and KM 1862-1868.5. Water courses: Donjek Pit KM 1820.3, Donjek River KM 1820.4, Unnamed Creek KM 1824.8, Hard Luck Creek KM 1828.2, Andrew Lake KM 1836, Pickhandle Lake KM 1865, Wolverine lake KM 1867, Koidern River KM 1872	18-May-00 to 01-Sept-01	Withdrawal of water for roadway construction purposes including dust control and BST application as proposed in Water Use Application MS99-143	All water supply intakes shall be removed upon completion of the work. Water Supply Intakes shall be screened according to the following requirements: minimum of 8 openings per lineal inch, no openings greater than 1/8 inch along any given side. There shall be no less than one square foot of open screen for every 45 imperial gallons per minute of water withdrawn from the water source. Screens will be monitored and maintained to ensure the function effectively at all times when water is being withdrawn.
DB	WL - MS00-154 (amend. To MS99-141)	1797.4-1804.4	01-Dec-00 to 01-Apr-05	Fish Habitat Protection	Excavation may only take place between Oct.15 and April 1 of any year until 01-Apr-05. Material excavated from creek must be deposited in waste disposal area in such a manner as to remain in a stable condition; disturbed areas must be seeded. Visual inspections shall be carried out monthly during construction and June, July August and September following the year of construction for each year authorized by this licence, and shall include a report on the inspections as a component of the annual report. The report will include a summary of inspection activities, and assessment of long term stability of the excavations and waste piles, an assessment of the success of re-vegetation activities and details of any maintenance activities that have been accomplished or proposed.
DB	WL - MS98-101	Donjek River	20-Aug-98 to 31-Dec-02	Dewatering of gravel pit as proposed in water use application MS98-101	All works associated with the undertaking shall be maintained in good repair. Stumps and grubbing material shall be disposed of in a dry pit or stockpiled and spread over the area during reclamation. The licensee shall complete reclamation of the site within two years of pit abandonment.
Beaver Creek (BC)	LUP - YA6E117	1852.1 to 1862.1	17-April-96 to 16-April-98	Highway reconstruction, pit development, quarry, waste disposal sites and a campsite	N/A
BC	LUP - YA5E878	1844.2 to 1852.1	07-Apr-95 to 06-Apr-97	Highway reconstruction, pit expansion, replacement of drainage structures, campsite and quarry	All banks three metres or over will be backsloped to a two horizontal to one vertical slope. The permittee shall construct and maintain all structures placed in streams frequented by fish, in such a manner that will not obstruct passage of fish
BC	LUP - YA8E514	1862.1 to 1868.4	15-Sept-98 to 14-Sept-00	Highway reconstruction, clearing, construction of sub-grade, replace drainage structures, rip-rap, application of calcium chloride, disposal of waste and a campsite	Restoration of trails, establish vegetation on all areas stripped of vegetation during this land use operation
BC	LUP - YA8Q530	1835.5	25-Sept-98 to 24-Sept-01	Quarry and routine maintenance and settling pond	Upon completion, all cut banks three metres or over will be backsloped to a two horizontal to one vertical slope.
BC	LUP - YA7E292	1868.1 to 1871.9	01-Apr-97 to 31-March-99	Highway reconstruction, deposit ice rich waste, quarry and camp	Revegetate stripped areas

**Shakwak Project
Special Areas Maintenance Guidelines**

Table 2 Licenses and Permits Table for Special Maintenance and/or Management - Shakwak Highway

Maintenance Section	Land Use Permit or Water Licence Number	Design Chainage (km)	Effective Dates	Land/Quarrying or Water Use Description	Terms and Conditions
BC	WL - MS93-012	1893.7 to 1915.7	11-May-94 to 30-Sept-96	Highway reconstruction, including culvert installation and infill	Little Sanpete Creek is known to be utilized by fish at the highway crossing.
BC	WL - MS98-124	Beaver Creek, KM 1932	28-May-99 to 31-Dec-04	Channel maintenance at Beaver Creek Bridge	All works associated with the undertaking shall be maintained in good repair. Works associated with the undertaking shall be carried out only in the dry. All disturbed ground surfaces shall be stabilized.
BC	WL - MS93 - 011	1871.9 to 1890.2, various watercourses	11-May-94 to 30-Sept-95	Various works connected to highway reconstruction, including culvert installation, diversion and infilling	N/A
BC	WL - MS99-143	Shakwak Project BST Surfacing, KM 1822.7-1831.7 and KM 1862-1868.5. Water courses: Donjek Pit KM 1820.3, Donjek River KM 1820.4, Unnamed Creek KM 1824.8, Hard Luck Creek KM 1828.2, Andrew Lake KM 1836, Pickhandle Lake KM 1865, Wolverine Lake KM 1867, Koidern River KM 1872	18-May-00 to 01-Sept-01	Withdrawal of water for roadway construction purposes including dust control and BST application as proposed in Water Use Application MS99-143	All water supply intakes shall be removed upon completion of the work. Water Supply Intakes shall be screened according to the following requirements: minimum of 8 openings per lineal inch, no openings greater than 1/8 inch along any given side. There shall be no less than one square foot of open screen for every 45 imperial gallons per minute of water withdrawn from the water source. Screens will be monitored and maintained to ensure they function effectively at all times when water is being withdrawn.
BC	WL - MS00-147	1835.3 - Unnamed stream	30-June-00 to 31-Dec-05	Amendment to existing land use Permit YA8Q530. cleaning culvert and construction of settling pond	Reseed area with standard highways grass mix. Construction is scheduled for September or October during low flow conditions. It is anticipated that the settling pond will need to be cleaned once every 5 years, however, this could vary depending on flow conditions and sediment transport within the stream. The Government of Yukon has applied for a 5 year licence to allow for at least annual cleaning of the settling pond.
BC	WL - MS94-024	1844.2 to 1852.1	18-May-95 to 4-Sept-96	Highway reconstruction, including culvert installation and in full	Construction activities which could result in the release of sediments above background levels in any stream may only occur between July 1 and September 15 of any year.
BC	WL - MS97-088	Sanpete Creek	16-Dec-97 to 31-Oct-22	Perform channel work and dike reinforcement activities	Property which YTG has a right to enter upon.
BC	WL - MS93-001	Enger (KM 9125.375, KM 1923.75) and Little Scottie (KM 1964.3, KM 1961.2, KM 1960.3)	13-Aug-93 to 1-Aug-94	Various culvert installations at locations indicated on Little Scottie Creek and Enger Creek	Potential concerns are fisheries habitat disruption and long-term monitoring and maintenance of fish passage components of structures.

Notes: BR = Blanchard River
HJ = Haines Junction
DB = Destruction Bay
BC = Beaver Creek

4.2 MAINTENANCE CONSULTATION

Consultation may be required when questions arise about highway maintenance practices, procedures and/or protocol. There are many government agencies and First Nations regulating and affected by highway maintenance procedures. Concerned parties must be able to contact the appropriate individual who will be able to answer their query in a satisfactory manner. To this end a comprehensive list of contacts has been developed and is compiled in Table 3.

A list of contacts is contained in Table 3, and included in the Maintenance Atlas (Volume III) to guide operators and managers to those individual/organizations that may be required for consultation during the course of maintenance planning and/or carrying out general and special maintenance activities. The listing includes telephone, facsimile, and address information for Regulatory Agencies, such as the Federal Department of Fisheries and Oceans, DIAND Land Resources, Water Resources, YTG Renewable Resources, First Nations, and other Local Governments.

SPECIAL NOTES:

1. Chain of Contact

The publication of this comprehensive contact list does not imply that normal policy and procedures for contacting individuals outside C&TS is not valid. The first contact that any operator makes must be with either the Maintenance Section Superintendent and/or the Environmental Coordinator of C&TS Highways Maintenance Branch. The Superintendent or Environmental Coordinator will respond to the initial contact, and follow up with further investigation if required. Senior maintenance personnel will review matters on a case-by-case basis and proceed as the situation requires.

2. Spills/Emergencies

Some of the activities or accidents that may occur during the course of highway maintenance (e.g. fuel spill) will require immediate reporting to the responsible regulatory authority, therefore it is extremely important that all users are familiar with the contents of this contact listing and the reason(s) for their inclusion herein.

Table 3 List of Contacts

Activities	Regulatory Agency	Contact Position	Contact Number
Land Use Activities on Crown Land, or that derive access via Crown Land. Any work outside highway right of way.	Department of Indian Affairs & Northern Development, Land Use	Head	Tel: (867) 667-3173 Fax: (867) 667-3214
Maintenance activities/events that have the potential to affect water quantity/quality, significant direct water use and the deposit of any waste that may enter (directly or indirectly) surface waters.	Department of Indian Affairs & Northern Development, Water Resources	Regional Manager, Water Resources	Tel: (867) 667-3145 Fax: (867) 667-3195
Maintenance activities/events that have the potential to impact fish and or fish habitat including the watercourse itself and the riparian (shoreline) habitat.	Department of Fisheries & Oceans Canada	Habitat Biologist	Tel: (867) 393-6722 Fax: (867) 393-6738
Maintenance activities/events that may impact the Park, Sanctuary areas, or park use areas, or access to them and any other Parks Canada considerations.	British Columbia Parks	Director, District Operations	Tel: (250) 387-4509 Fax: (250) 356-0509
Maintenance activities/events that may impact the Park, Sanctuary areas, or park use areas, or access to them and any other Parks Canada considerations.	Parks Canada	Superintendent, Yukon Field Unit	Tel: (867) 667-3910 Fax: (867) 393-6701
Maintenance that may impact settlement lands or access to them, other traditional territory consultation such as activities/events in areas of cultural/historical use, archaeological discoveries/concerns, etc.	White River First Nation	Band Manager	Tel: (867) 862-7802 Fax: (867) 862-7806
Maintenance that may impact settlement lands or access to them, other traditional territory consultation such as activities/events in areas of cultural/historical use, archaeological discoveries/concerns, etc.	Kluane First Nation	Band Manager	Tel: (867) 841-4274 Fax: (867) 841-5900
Maintenance that may impact settlement lands or access to them, other traditional territory consultation such as activities/events in areas of cultural/historical use, archaeological discoveries/concerns, etc.	Champagne & Aishihik First Nations	Band Manager	Tel: (867) 634-2288 Fax: (867) 634-2108
Maintenance Activities/Events with consideration to fuel handling (storage) and spills, contaminated sites/materials, air emissions, pesticides/herbicides, solid/special wastes, recycling, etc.	Yukon Territorial Government, Renewable Resources, Environmental Protection and Assessment Branch	Manager	Tel: (867) 667-5409 Fax: (867) 667-3641
Maintenance Activities within the Village of Haines Junction that have the potential to affect Village infrastructure, businesses, individuals, etc. Billboards, solid/special waste areas within the Village.	Village of Haines Junction	Village CAO	Tel: (867) 634-7100 Fax: (867) 634-2008

5.0 MAINTENANCE ATLAS

This section includes a brief description of the Maintenance Atlas (Volume III) and the individual map contents.

The Maintenance Atlas (Volume III) forms the central, user-friendly product for the Highway Maintenance field personnel. The Atlas consists of a series of georeferenced maps, using digital satellite imagery for the base mapping, incorporated into four sub-volumes, one for each Highway Maintenance Section. The 1:20,000 scale maps within each sub-volume are arranged as follows:

- **Blanchard River Highway Maintenance Section: Sheet 1 through 15**
- **Haines Junction Highway Maintenance Section: Sheet 16 through 30 ***
- **Destruction Bay Highway Maintenance Section: Sheet 31* through 46**
- **Beaver Creek Highway Maintenance Section: Sheet 47 through 63**

Note: Sheets 26 to 40 are included, but no information has been presented as the highway reconstruction has not been completed on this portion of the Alaska Highway.

Each map presents geographic location information for highway features such as: general highway maintenance activities, engineering components (such as icing control, snow removal, or erosion control), special maintenance areas, and environmental/aesthetic components for maintenance (such as current land use, trapping, wildlife, vegetation and revegetation, archaeology and traditional land use and aesthetics) for approximately 5 km highway section.

The location specific depiction of the engineering and environmental/aesthetic information has been accomplished through icons and symbols developed for the aforementioned highway features, engineering and environmental/aesthetic highway components.

All data was collected through a combination of field trips, discussion and guidance from Steering Committee and Maintenance personnel, as well as discussions with specialist regulatory agencies such as Department of Fisheries and Oceans, the Department of Renewable Resources, and First Nation Lands & Resources offices. The information was geo-

referenced and was presented on the Atlas maps using the icon symbols developed for the features and components listed above. Features are located on the appropriate left-hand side (LHS) or right hand side (RHS), facing up-highway chainage.

The features and components have been depicted on the Maintenance Atlas and have been presented in the previous sections of this user guide. Each individual feature and component contained in the Maintenance Atlas has been listed in the Classification Tables provided in Volume II, Section II, and includes a geo-reference point for precise geographic locating.

6.0 REFERENCES

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Shakwak Special Areas Maintenance Guidelines Project

Volume I – Appendix I Project Photos

September, 2001

Prepared by:





129 Hill, showing ditch blocking, Feature HJ007



Culvert at Flying Squirrel Creek, showing beaver deterrent structure, Feature BR168



Icing Culvert, Feature HJ047



Icing Culvert with rock weir, Feature BC037



Longs Creek culvert, Feature BC044



Swede Johnson Ck. multiplate with fish weir, Feature DB027



Pullout at Canada/USA Border, Feature BC200



Snow Plowing on Haines Road Blanchard Maintenance Section



Super Blower working between snow poles, Haines Road, Blanchard Maintenance Section



Three Guardsmen Peak, Haines Road, Blanchard Maintenance Section



Grader with wing blade attachment, Blanchard Maintenance Section



Grouse Lekking, Alaska Highway #1, Feature DB033



Icefield Ranges Lookout, DB047



Raven's Rock, Feature BC010



Multiplate - Enger Creek, Feature BC143



Rock Glacier Trail Head, Feature HJ010



Snag Creek, showing armoured bank, Feature BC167



Snag Creek Multiplate, showing headwall, Feature BC167



Automatic Thermistor, Haines Junction, Feature HJ052



White River Guidebank, Feature BC075



Old bridge abutment at White River, Feature BC075