



Coffee Gold Mine
YESAB Project Proposal
Appendix 22-A Community Infrastructure and
Services Valued Component Assessment Report

VOLUME IV

Prepared for:
Kaminak Gold Corp. a subsidiary of
Goldcorp Inc.
Suite 3400-666 Burrard Street
Vancouver, BC Canada V6C 2X8

Prepared by:
Hemmera Envirochem Inc.
Suite 230, 2237 2nd Avenue
Whitehorse, YT Canada Y1A 0K7

File: 1658-003.01

Ver. 1.0

March 2017

TABLE OF CONTENTS

SYMBOLS AND UNITS OF MEASURE.....	V
1.0 INTRODUCTION.....	1.1
1.1 ISSUES SCOPING.....	1.3
1.2 COMMUNITY INFRASTRUCTURE AND SERVICES AS A VALUED COMPONENT	1.4
1.2.1 Candidate Valued Components	1.4
1.2.2 Community Infrastructure Valued Component Subcomponents	1.6
1.2.3 Community Infrastructure Indicators.....	1.6
1.3 ESTABLISHMENT OF ASSESSMENT BOUNDARIES	1.7
1.3.1 Spatial Boundaries.....	1.7
1.3.2 Temporal Boundaries.....	1.11
1.3.3 Administrative Boundaries	1.11
1.3.4 Technical Boundaries	1.11
2.0 ASSESSMENT METHODS	2.1
3.0 EXISTING CONDITIONS.....	3.1
3.1 REGULATORY CONTEXT.....	3.1
3.2 BACKGROUND INFORMATION AND STUDIES	3.1
3.2.1 Traditional Knowledge	3.2
3.2.2 Scientific and Other Information.....	3.2
3.2.3 Project-related Baseline Studies.....	3.2
3.3 DESCRIPTION OF EXISTING CONDITIONS.....	3.4
3.3.1 Housing and Accommodation	3.4
3.3.2 Physical Infrastructure	3.12
3.3.3 Community Services	3.16
3.3.4 Transportation.....	3.25
4.0 ASSESSMENT OF PROJECT-RELATED EFFECTS	4.1
4.1 POTENTIAL PROJECT-RELATED INTERACTIONS WITH COMMUNITY INFRASTRUCTURE AND SERVICES	4.1
4.2 POTENTIAL PROJECT-RELATED EFFECTS.....	4.4
4.2.1 Housing and Accommodation	4.4
4.2.2 Physical Infrastructure	4.4

4.2.3	Community Services	4.5
4.2.4	Transportation	4.6
4.3	MITIGATION MEASURES	4.7
4.3.1	Project Design.....	4.7
4.3.2	Local Hiring Practices	4.8
4.3.3	Education and Training Activities.....	4.9
4.3.4	Engagement Plan	4.10
4.3.5	Emergency Response Plan	4.11
4.3.6	Road Safety Measures	4.12
4.3.7	Flight Scheduling.....	4.13
4.3.8	Summary of Mitigation Measures	4.13
4.4	RESIDUAL EFFECTS AND THEIR SIGNIFICANCE	4.15
4.4.1	Residual Effects Characteristics and Significance Definitions.....	4.15
4.4.2	Housing and Accommodation	4.18
4.4.3	Physical Infrastructure	4.20
4.4.4	Community Services	4.21
4.4.5	Summary of Project-related Residual Adverse Effects and Their Significance	4.22
5.0	CUMULATIVE EFFECTS ASSESSMENT	5.1
5.1	PROJECT-RELATED RESIDUAL EFFECTS	5.1
5.1.1	Cumulative Effects Baseline Information	5.1
5.2	SPATIAL AND TEMPORAL SCOPE OF THE CUMULATIVE EFFECTS ASSESSMENT	5.2
5.3	EFFECTS DUE TO OTHER PROJECTS AND ACTIVITIES	5.2
5.4	POTENTIAL CUMULATIVE EFFECTS	5.4
5.5	MITIGATION MEASURES	5.5
5.6	RESIDUAL CUMULATIVE EFFECTS AND SIGNIFICANCE OF RESIDUAL CUMULATIVE EFFECTS....	5.5
6.0	SUMMARY OF EFFECTS ASSESSMENT ON COMMUNITY INFRASTRUCTURE AND SERVICES	6.1
7.0	EFFECTS MONITORING AND ADAPTIVE MANAGEMENT	7.1
8.0	REFERENCES.....	8.1
8.1	PERSONAL COMMUNICATION.....	8.11

List of Tables

Table 1.2-1	Candidate Valued Components for Community Infrastructure and Services – Evaluation Summary	1.5
Table 1.2-2	Subcomponents for the Community Infrastructure and Services Valued Component	1.6
Table 1.2-3	Indicators for Community Infrastructure and Services and Subcomponents.....	1.7
Table 1.3-1	Spatial Boundary Definitions for Community Infrastructure and Services	1.9
Table 3.2-1	Summary of Desktop and Field Studies for Community Infrastructure and Services.....	3.3
Table 3.2-2	Summary of Community Infrastructure and Services Interviews	3.3
Table 3.3-1	Whitehorse General Hospital Usage.....	3.17
Table 3.3-2	Dawson City Community Hospital Usage	3.18
Table 3.3-3	Average Daily Traffic Volume in Summer and Fall 2015	3.27
Table 4.1-1	Potential for an Interaction between Community Infrastructure and Services and the Project	4.1
Table 4.1-2	Project Valued Component Interaction Potential	4.2
Table 4.3-1	Summary of Potential Effects and Mitigation Measures for Community Infrastructure and Services	4.14
Table 4.4-1	Effect Characteristics Considered When Determining the Significance of Residual Effects to Community Infrastructure and Services.....	4.16
Table 4.4-2	Summary of Effect Characteristics for Increased Demand on Housing and Accommodation during Construction and Operation Phases.....	4.19
Table 4.4-3	Summary of Effect Characteristics for Increased Demand on Physical Infrastructure during Construction and Operation Phases.....	4.21
Table 4.4-4	Summary of Effect Characteristics for Increased Demand on Community Services during Construction and Operation Phases.....	4.22
Table 4.4-5	Summary of Potential Residual Adverse Effects on Community Infrastructure and Services	4.23
Table 5.1-1	Project-related Residual Effects Considered in the Cumulative Effects Assessment	5.1
Table 5.3-1	Potential Residual Adverse Effects of Other Projects and Activities on Community Infrastructure and Services	5.3
Table 5.6-1	Summary of Effect Characteristics for Cumulative Effects to Community Infrastructure and Services during Construction and Operation Phases.....	5.5

List of Figures

Figure 1.3-1	Community Infrastructure and Services Spatial Boundaries	1.10
--------------	--	------

Acronyms and Abbreviations

Acronym / Abbreviation	Definition
CEA	cumulative effects assessment
CKS	Conservation Klondike Society
FNNND	First Nation of Na-cho Nyäk Dun
KDO	Klondike Development Organization
LAA	Local Assessment Area
NAR	Northern Access Route
Project	Coffee Gold Mine
Proponent	Kaminak Gold Corporation, a wholly owned subsidiary of Goldcorp Inc.
RAA	Regional Assessment Area
RCMP	Royal Canadian Mounted Police
SFN	Selkirk First Nation
TH	Tr'ondëk Hwëch'in
TK	Traditional Knowledge
VC	Valued Component
WRFN	White River First Nation
YDA	Dawson City Airport
YESAA	Yukon Environmental and Socio-economic Assessment Act
YESAB	Yukon Environmental and Socio-economic Assessment Board
YG	Yukon Government (Government of Yukon)
YHC	Yukon Housing Corporation
YXY	Erik Nielsen Whitehorse Airport

SYMBOLS AND UNITS OF MEASURE

Symbol / Unit of Measure	Definition
km	kilometre
km/h	kilometres per hour
m	metre
m ³	cubic metres

1.0 INTRODUCTION

Kaminak Gold Corp., a wholly owned subsidiary of Goldcorp Inc. (Proponent or Goldcorp) is proposing to construct and operate a high-grade, open-pit gold mine in west-central Yukon, on its property located approximately 130 kilometres (km) south of the town of the City of Dawson (Dawson) by a 214-km Northern Access Route (NAR) in the White Gold District. The proposed Coffee Gold Mine (Project) is an open pit gold mine using a cyanide heap leach process to extract ore. Its temporal boundaries consist of a 30-month Construction Phase, followed by a 12-year Operation Phase with an average operation rate of five million tonnes per annum of heap leach feed.

The Mine Site is located on Crown land within the established Traditional Territory of the Tr'ondëk Hwëch'in (TH) and the asserted territory of White River First Nation (WRFN). The NAR is located within the Traditional Territory of TH, and portions are located within the shared Traditional Territories of Selkirk First Nation (SFN), the First Nation of Na-cho Nyäk Dun (FNNND), and the asserted territory of WRFN.

This report provides an assessment of the potential effects of the proposed Coffee Gold Mine (Project) on the Community Infrastructure and Services Valued Component (VC). Valued subcomponents and indicators are used to focus the assessment on information known to be important or of key interest to First Nations, government, and other technical reviewers. The report identifies and characterizes potential interactions between the Project and Community Infrastructure and Services, and describes the mitigation measures and protection plans that Goldcorp (Proponent) will implement to eliminate, reduce, or otherwise control adverse Project-related effects on Community Infrastructure and Services. This VC was selected because community infrastructure and services are an important socio-economic value to Yukon communities and support the general well-being and connection of individuals.

The information provided in this assessment supports the Project Proposal to be submitted to the Yukon Environmental and Socio-economic Assessment Board (YESAB) Executive Committee for screening under the *Yukon Environmental and Socio-Economic Assessment Act*, SC 20003, c. 7 (YESAA), and applications to be submitted for a Quartz Mining Licence from the Government of Yukon (YG) and Energy, Mines and Resources, and a Type A Water Licence from the Yukon Water Board, among other permits and licences.

This report is structured so that reviewers can find the information required to review the assessment of the Project's potential effects on Community Infrastructure and Services. The Introduction section provides the rationale for the selection of Community Infrastructure and Services as a VC, explains the selection of Community Infrastructure and Services subcomponents, and describes the scope of the assessment. It also identifies the indicators used to quantitatively and qualitatively assess the potential effects of the Project on Community Infrastructure and Services. The spatial, temporal, and technical boundaries of Community Infrastructure and Services assessment are also identified.

The Assessment Methods section describes the quantitative and qualitative approaches used to assess potential Project-related and cumulative effects on Community Infrastructure and Services. The methods used to predict effects on Community Infrastructure and Services rely on use of the best available information, environmental assessment best practices, and Project-specific technical analyses. While general methods of the overall assessment are described in **Section 5.0 Assessment Methodology**, the methods described in this section are specific to those used for Community Infrastructure and Services.

The Existing Conditions section describes baseline conditions for Community Infrastructure and Services to set the context for the effects assessment. The section includes a summary discussion of the regulatory context in which the Proponent has assessed effects; it also includes a summary section describing how Traditional Knowledge (TK), scientific, and other information, including the results of baseline studies conducted for the Project, informed the description of existing conditions.

The Assessment of Project-related Effects section describes the potential effects of the Project on Community Infrastructure and Services; identifies mitigation measures incorporated into Project design; and outlines other Community Infrastructure and Services specific mitigation measures to be implemented during Project design and management. In addition, the section describes the Proponent's commitments related to the elimination or reduction of adverse effects to Community Infrastructure and Services. Potential residual effects (i.e., adverse effects remaining following the application of mitigation measures) are identified and a determination of the significance of those effects is presented. The technical details of the effects assessment on subcomponents are provided in subsections.

The Assessment of Cumulative Effects section provides an overview of the potential combined effects of other past, present, and reasonably foreseeable future projects and activities on Community Infrastructure and Services. The section also characterizes the combined residual Project-related effects with the residual effects of other projects and activities that have occurred, are currently occurring, or are likely to occur to Community Infrastructure and Services. Where necessary, and if separate from Project-related effects, mitigation actions to address potential cumulative effects are described.

The Summary of Effects Assessment on Community Infrastructure and Services section provides an overview of the technical assessments described in the Project-related Effects and Cumulative Effects sections.

The Effects Monitoring and Adaptive Management section describes the approach that the Proponent will take to verify effects assessment findings and the effectiveness of mitigation measures, and to actively respond to and manage unexpected effects as the Project proceeds. It identifies how mitigation techniques may be modified in the event of unexpected Project-related or cumulative effects, and provides for continued collaboration with First Nations and regulators during Project monitoring and effects management decision-making. It demonstrates the Proponent's commitment to regular monitoring

and re-assessment, and the Proponent's willingness to implement changes necessary to effectively mitigate Project-related effects or cumulative effects on Community Infrastructure and Services.

The assessment of this VC is supported by the analyses in the Demographics Intermediate Component Analysis (**Appendix 19-A**) and the Economic Conditions Valued Component Assessment (**Appendix 20-A**). These linked assessments, along with this assessment for Community Infrastructure and Services, support the Education Services Valued Component Assessment (**Appendix 23-A**) and the Community Health and Well-being Valued Component Assessment (**Appendix 25-A**) (**Figure 1.3-1**).

1.1 ISSUES SCOPING

The scope of this assessment is based on various guidelines provided by YESAB and regulatory agencies. Through baseline studies undertaken during the Project's Feasibility Study (July 2014 to December 2015) and the subsequent Socio-economic Baseline Report (December 2015 to April 2016; see **Appendix 18-A**), the socio-economic Project team reviewed a mine plan and detailed technical information related to socio-economic values near the Project. Available information regarding other existing and proposed quartz mining projects in Yukon, including environmental and socio-economic assessments, was reviewed.

To support the scoping of issues for the Project, the Proponent has undertaken an engagement and consultation process, as defined under Section 50(3) of YESAA. **Section 3.0 Consultation and Engagement** of the Project Proposal summarizes the Proponent's consultation and engagement with First Nations, the public, and Yukon and federal government agencies. This engagement included affected First Nations and communities, government agencies, interested people, and other stakeholders who may be interested in the Project and its related activities. This consultation and engagement process included technical working groups established with First Nations and government departments; community meetings; one-on-one and small group meetings; and ongoing communications such as emails, phone calls, print communication, and newsletters.

A comprehensive primary data collection program identified issues and concerns through key informant interviews, focus groups, and surveys with communities, stakeholders, and First Nations. Concerns relevant to the assessment of Community Infrastructure and Services included social housing shortages. For example, the final report of the Klondike Development Organization Housing Strategy comments: "social assistance recipients are being forced down the housing quality ladder and safety is becoming an issue with individuals reported as living in buses and with unregulated heat sources" (KDO 2011b).

All of this information supported scoping of the effects assessment, including identification of candidate VCs, selection of the Community Infrastructure and Services VC and its subcomponents, and establishment of assessment boundaries for this VC assessment.

1.2 COMMUNITY INFRASTRUCTURE AND SERVICES AS A VALUED COMPONENT

Community Infrastructure and Services was selected as a VC based on the VC selection process set out in **Section 5.0 Assessment Methodology** of the Project Proposal. Community Infrastructure and Services was selected as a VC because the Project may attract individuals to relocate to communities for direct, indirect, and induced employment opportunities, which may increase demands on community infrastructure and services (including emergency and health services), housing, and traffic (including transportation infrastructure).

1.2.1 CANDIDATE VALUED COMPONENTS

In addition to professional knowledge and judgement, the selection process involved the consideration of available TK, scientific, and other information, input provided during the Project's consultation and engagement program, and discussions with other members of the Project team.

Community Infrastructure and Services was identified as a VC because there are distinct interactions between the Project and Community Infrastructure and Services, the Project's potential effects on Community Infrastructure and Services can be measured, and there are distinct pathways of effects (**Table 1.2-1**). The Project may result in an in-migration of workers, which may increase demand for local and regional infrastructure and services. The Project will also generate traffic, which has the potential for a direct effect on community infrastructure. Community Infrastructure and Services was selected as a VC to assess the Project's anticipated interactions with in-migration of Project employees and the resulting increased demand for infrastructure and services, thus reflecting local values; similarly, the feedback received during the consultation process also reflects local values, consultation, and Traditional Knowledge.

Table 1.2-1 Candidate Valued Components for Community Infrastructure and Services – Evaluation Summary

Candidate VC	Project Interaction			Third-party Input		Supports the Assessment of Which Other VC?	Selected as a VC?	Decision Rationale
	Interaction?	Project Phase / Project Component / Activity	Nature of Interaction	Source	Input			
Community Infrastructure and Services	Yes	Construction, Operation	The Project may influence community infrastructure and services in communities through Project-related population increase and effects from Project-related traffic (ground and air).	First Nation Government Public Stakeholder	Concerns related to: <ul style="list-style-type: none"> • Direct and indirect effects on local housing • Direct and indirect effects on community services and infrastructure (i.e., water, sewage, landfill, emergency and protective services, etc.) 	Community Health and Well-being	Yes	The Project may attract individuals to relocate to communities for direct and/or indirect employment opportunities, which may increase demands on community infrastructure and services (including emergency and health services), housing, and traffic (including transportation infrastructure). The Project will generate traffic directly through supply and resupply of mining consumable and equipment and indirectly through population increases.
Housing and Accommodation	Yes	Construction, Operation	The Project may influence community infrastructure and services in communities through a Project-related increase in demand for local housing and accommodation.	First Nation Government Public Stakeholder	Concerns related to direct and indirect effects on local housing	-	No	Included as a subcomponent in the Community Infrastructure and Services VC, as the driving force (population increase) for potential effects are similar for housing demand and infrastructure and services.
Transportation	Yes	Construction, Operation	The Project may influence community infrastructure and services in communities through Project-related population increase as well as through effects of Project-related traffic (ground and air).	First Nation Government Public Stakeholder	Concerns related to increases in air and vehicular traffic, and to access	-	No	Included as a subcomponent in the Community Infrastructure and Services VC. Access assessed as a part of the Land and Resource Use VC.

1.2.2 COMMUNITY INFRASTRUCTURE VALUED COMPONENT SUBCOMPONENTS

The Community Infrastructure and Services VC comprises four subcomponents to focus the assessment on issues raised during the consultation process: housing and accommodation; physical infrastructure; community services; and transportation (**Table 1.2-2**). These subcomponents collectively describe and facilitate the assessment of an important sector of the human environment that individuals rely on for their basic needs: the built environment, including housing, infrastructure, and services, was identified as a dimension of sustainability in the City of Dawson’s and TH’s Integrated Community Sustainability Plan (City of Dawson and TH n.d.); YESAA includes consideration of economies, health, culture, traditions, lifestyles, and heritage resources in its definition of socio-economic effects.

Table 1.2-2 Subcomponents for the Community Infrastructure and Services Valued Component

Subcomponent	Representative of	Rationale for Selection
Housing and accommodation	<ul style="list-style-type: none"> • Housing availability • Housing development • Housing cost • Non-permanent accommodation characteristics 	Housing and accommodation needs have received focused attention in Yukon communities. Project-related population increases have the potential to put pressure on existing housing demand.
Physical infrastructure	<ul style="list-style-type: none"> • Landfill and solid waste • Sewer system • Water system • Power supply and fuel sources • Communications infrastructure • Recreational infrastructure 	Project needs have the potential to affect the capacity of existing physical infrastructure. The Project may attract individuals to relocate to communities for direct and/or indirect employment opportunities, which may increase demands on community infrastructure.
Community services	<ul style="list-style-type: none"> • Health services • Fire protection services • Policing and by-law services • Social services 	Project needs have the potential to affect the capacity of existing community services, such as health care and social services. The Project may attract individuals to relocate to communities for direct and/or indirect employment opportunities, which may increase demands on community services.
Transportation	<ul style="list-style-type: none"> • Air traffic • Road traffic • Road network 	The Project will generate traffic directly through supply and resupply of mining consumables and equipment and indirectly through population increases.

1.2.3 COMMUNITY INFRASTRUCTURE INDICATORS

Indicators are quantitative or qualitative measures used to describe existing VC conditions and trends, and to evaluate potential Project-related effects and cumulative effects to the VC. Community Infrastructure and Services indicators and rationale for their selection are listed in **Table 1.2-3** for each subcomponent.

Table 1.2-3 Indicators for Community Infrastructure and Services and Subcomponents

Indicator	Rationale for Selection
Housing and accommodation	
Housing availability	This indicator provides information about the current demand for housing, and informs potential effects to housing supply as a result of Project-related increases in population. Increased demand for housing based on in-migration of Project employees may result in a decrease in housing availability.
Housing development	This indicator provides information about the addition of new housing units to the market, and informs potential effects on housing availability as a result of Project-related employment and population increases in Yukon communities.
Housing cost	This indicator provides information about house prices and median rent to inform housing affordability for residents. Increased demand for housing based on in-migration of Project employees may result in an increase in housing costs.
Non-permanent accommodation characteristics	This indicator provides information about non-permanent accommodation available in the community to inform potential effects of the Project-related demand for temporary accommodation that may compete with other needs, such as tourism.
Physical infrastructure	
Physical infrastructure	This indicator provides information about the condition and status of existing physical community infrastructure, such as water and wastewater facilities, to inform potential effects of increased population as a result of Project activities.
Community services	
Community services	This indicator provides information about the type of community services available and existing demand for services to inform potential effects of the Project to the capacity of community services.
Transportation	
Air traffic	This indicator provides information about existing air traffic volumes and potential effects resulting from Project-related air traffic.
Road traffic	This indicator provides information about existing road traffic volumes and potential effects resulting from Project-related road traffic.
Road network	This indicator provides information about existing road infrastructure and potential effects to road capacity resulting from Project-related traffic volumes.

1.3 ESTABLISHMENT OF ASSESSMENT BOUNDARIES

This section identifies the spatial and temporal boundaries established for the assessment of Community Infrastructure and Community Services, and discusses any administrative or technical boundaries considered.

1.3.1 SPATIAL BOUNDARIES

The study areas for the Community Infrastructure and Services VC consist of Local Assessment Areas (LAAs) and Regional Assessment Areas (RAAs) for the subcomponents, described in **Table 1.3-1** and shown in **Figure 1.3-1**. Due to the nature of data availability as well as anticipated Project interactions, the LAA and RAA reflect administrative boundaries described in **Section 1.3.3**.

The LAA encompasses the area closest to Project activities in which both direct and indirect effects are most likely to be experienced. The LAA for both the housing and accommodation, and community infrastructure and services subcomponents comprises the municipal boundaries of Whitehorse and Dawson, as well as the community boundaries of Beaver Creek, Pelly Crossing, and Mayo. Whitehorse, which is Yukon's largest population centre, is expected to grow in population as a result of the Project, resulting in an increased demand for housing and infrastructure. In addition, Whitehorse is a designated pick-up point for the Project's fly-in, fly-out (FIFO) work force. Dawson was also chosen for inclusion in the LAA for its potential to experience some population increases as a result of the Project, which may result in interactions with these two subcomponents (see **Figure 1.3-1**). Beaver Creek, Pelly Crossing, and Mayo are included as the administrative centres of WRFN, Selkirk First Nation (SFN), and First Nation of Na-cho Nyäk Dun (FNNND), respectively. The RAA is Yukon, selected to provide context for the potential effects in the LAA. Refer to **Appendix 19-A Demographic Intermediate Component Analysis**, which details the Project's potential effects to the Demographics Intermediate Component (IC).

The LAA for the transportation subcomponent is defined as the road network within the municipal boundary of Dawson and the existing road network extending south from the North Klondike Highway. This LAA was selected based on anticipated Project-related traffic and changes to the existing road network, which are anticipated to affect the subcomponent. The NAR will use existing government-maintained roads, which extend south from the North Klondike Highway, 16 km southeast of Dawson, including Hunker Creek Road and existing roads to Sulphur Creek. Beyond that point, the route will generally follow existing roads used by placer miners with construction of additional new connecting road. For the purposes of this VC report, the LAA for the transportation subcomponent will include an area within 1 km of this existing road network as well as the North Klondike Highway in proximity to Dawson (See **Figure 1.3-1**).

The RAA for transportation is considered to be Yukon as Project-related traffic will use the existing Yukon highway infrastructure to deliver goods, supplies, and equipment. Specific roadways of interest include the Alaska Highway from the Yukon border to the junction with the North Klondike Highway and the North Klondike Highway based on expected routes to be used by Project-related truck traffic.







Table 1.3-1 Spatial Boundary Definitions for Community Infrastructure and Services

Spatial Boundary	Description of Assessment Area
Housing and accommodation; physical infrastructure; and community services	
Local Assessment Area	The LAA comprises the municipal boundaries of Whitehorse and Dawson, and the communities of Beaver Creek, Pelly Crossing, and Mayo.
Regional Assessment Area	Yukon
Cumulative Effects Assessment area	An area inclusive of active and proposed major mine projects, as shown in Appendix 5-B .
Transportation	
Local Assessment Area	The transportation LAA is Dawson and area within 1 km of the NAR (including existing government-maintained roads) and the North Klondike Highway in proximity to Dawson.
Regional Assessment Area	Yukon

COFFEE GOLD MINE

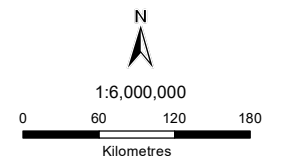
Community Infrastructure and Services Spatial Boundaries

Legend

-  Highway
-  National/International Border
-  Project Footprint
-  Local Assessment Area
-  Infrastructure and Community Services and Transportation Local Assessment Area
* The Infrastructure and Community Services Regional Assessment Area is the same as the Infrastructure and Community Services Local Assessment Area.
-  Transportation Regional Assessment Area

Notes

1. This map is not intended to be a "stand-alone" document, but a visual aid of the information contained within the referenced Report. It is intended to be used in conjunction with the scope of services and limitations described therein.



NAD 1983 UTM Zone 8N

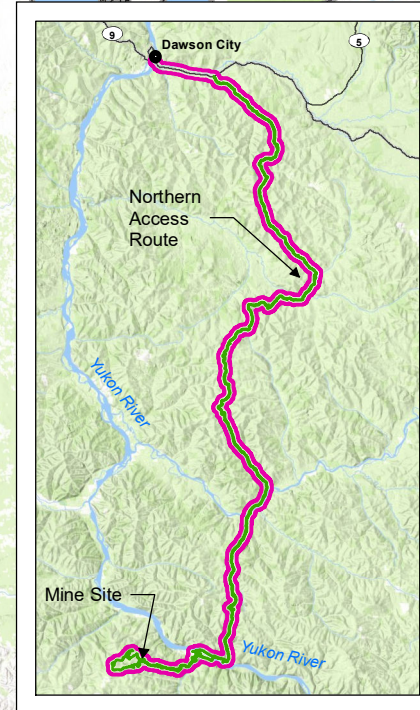
Page Size: 8 1/2" x 11"

Figure 1.3-1

Date: Mar 28, 2017

Drawn by: JS

Reviewed: DP



Path: O:\116200\16559003\01\mxd\CommunityInfrastructureAndServices\Fig_1.3-1_1655_003_01_CASVC_170322.mxd

1.3.2 TEMPORAL BOUNDARIES

The temporal boundaries established for the assessment of Project-related effects on the VC Community Infrastructure and Services include all phases of the Project, as described in the Project Proposal (**Section 2.0 Project Description**). These include:

- Construction Phase: 30 months
- Operation Phase: 12 years
- Reclamation and Closure Phase: 11 years
- Post-closure Phase: Year 24 onwards as determined to be required.

Baseline data were gathered, at a minimum, for 10 years (wherever possible and applicable). This will support subsequent effects assessments to be conducted that consider a comparative temporal period, allowing consideration of baseline data trends and variations.

1.3.3 ADMINISTRATIVE BOUNDARIES

The LAA and RAA spatial boundaries for housing and accommodation and Community Infrastructure and Services have been defined based on the municipal boundaries of Dawson and Whitehorse.

The administrative boundaries are consistent with those municipal boundaries for Dawson and Whitehorse. Dawson's city limits include some areas beyond the townsite, including approximately 10 km of the Bonanza Creek Road and Callison (the industrial area of Dawson). Whitehorse city limits extend roughly in a rectangle following the Alaska Highway, extending southeast just beyond the intersection of the Alaska Highway and the South Klondike Highway, and northwest past the intersection of the Alaska Highway and North Klondike Highway (City of Whitehorse 2016).

The LAA spatial boundaries for transportation include Dawson as well as the area within 1 km of existing roads that will comprise the proposed NAR; therefore, this subcomponent includes the municipal boundaries of Dawson as well as the local road system. Please refer to **Figure 1.3-1** for maps of the spatial area boundaries.

1.3.4 TECHNICAL BOUNDARIES

Technical boundaries refer to the constraints imposed on the assessment by limitations in the ability to identify and assess the potential effects of the Project. The assessment of Project-related effects on the Community Infrastructure and Services VC was limited by a lack of available written reports and statistical data on Dawson. The assessment attempted to address this boundary by prioritizing primary data collection through interviews (see **Table 3.2-2**) and by taking a precautionary, conservative approach to identifying interactions and determining significance.

2.0 ASSESSMENT METHODS

The Community Infrastructure and Services assessment, including the assessment of Project-related effects and cumulative effects, was conducted according to the methods set out in **Section 5.0 Assessment Methodology** of the Project Proposal. The assessment has been informed by input (e.g., TK, statistical, and other information) provided through consultation and engagement with government agencies, affected First Nations, and the public.

Assessment methods for the ICs and VCs supporting the Infrastructure and Community Services VC, as noted in **Section 1.2.2**, are included in those sections.

3.0 EXISTING CONDITIONS

3.1 REGULATORY CONTEXT

The following legislation, regulations, and government-led programs are relevant to the Community Infrastructure and Services VC, which considers the following subcomponents: housing and accommodation; physical community infrastructure; community services; and transportation.

Yukon legislation applying to housing includes the *Building Standards Act*, RSY 2002, c.19 amended by SY 2013, c.3, and supporting regulations, which provides legislation for the construction, occupancy, and use of a building, and the installation and use of any component, fixture, or system of a building. The *Residential Landlord and Tenant Act*, SY 2012, c.20 and supporting Regulation (OIC 2015/193) provides legislation for home rental.

The *Municipal Act*, RSY 2002, c.154; amended by SY 2003, c.11; SY 2007, c.13; SY 2008, c.18; SY 2012, c.14; SY 2014, c.15; SY 2015, c.12, governs the way local governments operate in the territory. It was most recently amended by Bill No. 89 *Act to Amend the Municipal Act*. Official community plans, which address land use policy including infrastructure for municipalities are enacted under this legislation.

Physical community infrastructure for Dawson is guided by the City of Dawson Official Community Plan (2013), which provides guidance regarding land use and community development, including municipal infrastructure, housing, and transportation. Dawson's Integrated Community Sustainability Plan (City of Dawson and TH n.d.) outlines the community's values and priorities for sustainability, framed around built environment, governance, social, natural environment, culture, and economy.

The City of Whitehorse is guided by its 2010 Official Community Plan (2013). This plan contains 22 objectives related to community development, including achieving zero waste; ensuring sustainable land development; providing land for commercial, mixed commercial-residential, residential, industrial, and institutional development; and improving transportation.

Transportation is regulated by the federal *Motor Vehicle Transport Act*, RSC 1985, c. 29 with sub-section Commercial Vehicle Drivers Hours of Service Regulations (SOR/2005-313); the Yukon *Highways Act*, RSY 2002, c.108; SY 2013, c.11 and supporting regulations; and the Yukon *Motor Vehicle Act* and general regulations.

3.2 BACKGROUND INFORMATION AND STUDIES

This section presents the background information and Project-related studies that have informed the assessment of potential effects to the Community Infrastructure and Services VC. The study team consulted available TK, as well as scientific and other information, in addition to conducting primary

research and baseline studies. Details of the background information and studies used for this assessment are presented below.

3.2.1 TRADITIONAL KNOWLEDGE

As part of Project data collection, available TK from the TH, SFN, FNNND, and WRFN was compiled (i.e., the Project TK database) and reviewed for this assessment. Traditional Knowledge was identified from such sources as secondary reports, Project-specific reports primarily related to TK collected in the Coffee Creek area (TH 2012; Dobrowolsky 2014), and primary data collection, as described in **Section 3.2.3**. Traditional Knowledge provides an understanding of values and priorities, which are considered to be related to water and wastewater services, solid waste disposal, and other community infrastructure that protects the environment. It is important to note that a lack of information specifically regarding community infrastructure and services does not indicate a lack of value with regard to TK.

3.2.2 SCIENTIFIC AND OTHER INFORMATION

Baseline conditions were identified through desktop research, as well as through primary research activities, including focus groups and interviews with key informants.

Existing baseline conditions for Community Infrastructure and Services in the LAA and RAA have been documented from statistical data sources including Statistics Canada and various published reports from the Yukon Bureau of Statistics. Local published reports prepared by organizations in the LAA and RAA have also provided detailed existing conditions information.

3.2.3 PROJECT-RELATED BASELINE STUDIES

The Socio-economic Baseline Report (**Appendix 18-A**) describes the existing socio-economic and health conditions for the Project (**Table 3.2-1**). The baseline report was developed to support the assessment of potential Project-related socio-economic and health effects, including Community Infrastructure and Services; it was informed by local secondary and primary data, as well as by consultation with regulators, First Nations, and communities. Primary research was conducted, where possible, to address data gaps and enhance desktop research results. Specific primary data collection methods have included semi-structured information interviews, focus groups following a semi-structured group interview format, and paper and digital surveys.

Table 3.2-1 Summary of Desktop and Field Studies for Community Infrastructure and Services

Study Name	Study Purpose, Duration, and Spatial Boundaries
Socio-economic Baseline	The Socio-economic Baseline Report (Appendix 18-A) describes the existing socio-economic and health conditions for the Project. Through this report, the existing socio-economic and health landscape is introduced, and the Project's socio-economic and health Intermediate Component and VCs are described. The study began in December 2015 and was completed in April 2016.

Semi-structured information interviews were conducted with representatives from government departments, various agencies, and organizations to enhance the understanding of and confirm desktop research findings (**Table 3.2-2**). For more details regarding interview methodology, please see **Appendix 18-A Socio-economic Baseline Report**. Information related to community infrastructure and services were discussed as well as the related socio-economic factors that influence these conditions.

Table 3.2-2 Summary of Community Infrastructure and Services Interviews

Organization	Date of Interview	Type of Interview
Emergency Medical Services	January 13, 2016	In-person Interview
Yukon College	February 8, 2016	In-person Interview
Dawson City Community Hospital	February 8, 2016	In-person Interview
City of Dawson Public Works	February 8, 2016	In-person Interview
City of Dawson Protective Services (Fire Protection)		
TH Health and Social	February 9, 2016	In-person Interview
City of Dawson Community Development and Planning	February 9, 2016	In-person Interview
TH Housing	February 9, 2016	In-person Interview
Canadian Prenatal Nutrition Program/Healthy Families, Healthy Babies	February 9, 2016	In-person Interview
Conservation Klondike Society	February 10, 2016	In-person Interview
Environment Yukon	February 12, 2106	In-person Interview
Trapline Concession Holder	February 11, 2016	In-person Interview
Dawson's Women Shelter	February 11, 2016	In-person Interview
TH Education and Robert Service School	February 11, 2016	In-person Interview
City of Dawson Chamber of Commerce	February 11, 2016	In-person Interview
Klondike Development Organization	February 23, 2016	Phone Interview
Dawson Real Estate	February 17, 2016	Phone Interview
Klondike Outreach	March 1, 2016	In-person Interview
Klondike Visitors Association	March 2, 2016	In-person Interview
Royal Canadian Mounted Police	March 2, 2016	In-person Interview
Klondike Development Organization	March 4, 2016	Phone Interview
Yukon Wide Adventures and Yukon River Quest	March 22, 2016	Phone Interview
Yukon River Quest	March 23, 2016	Phone Interview
Yukon Women's Transition Housing	December 16, 2015	In-person Interview

Two focus groups were conducted in February 2016 in Whitehorse and Vancouver for users of the proposed NAR. The focus groups discussed existing conditions along the route and raised issues of concern surrounding Project activities.

3.3 DESCRIPTION OF EXISTING CONDITIONS

This section describes the Community Infrastructure and Services setting and dynamics, specifically in the LAA but also contextualized in the RAA, by subcomponent.

The section provides a description of conditions prior to interaction with the Project, based on TK, scientific, and other information, and baseline studies undertaken during the Project's Feasibility Program.

3.3.1 HOUSING AND ACCOMMODATION

This section presents information on housing availability, costs, and temporary or non-permanent housing resources available in the Project's LAA and RAA.

Yukon Housing Corporation (YHC) was created in 1972, resulting from the *Housing Corporation Act*. The YHC owns and rents affordable housing units throughout Yukon. YHC also administers the Government of Yukon's rural staff housing program where YHC owns housing units that are rented to Yukon government employees in rural communities (YG 2017a). The purpose of the YHC is to provide social and staff housing and lending programs, promote community and industry partnerships, and be an information resource for all aspects of housing in Yukon.

3.3.1.1 Housing Availability

Whitehorse

According to the 2011 Census, the Whitehorse Area had 10,510 dwellings in 2011, with an average of 6.1 rooms per dwelling; of the 10,510 homes in the Whitehorse Area, 7,240 (68.8%) are owned and 3,125 (29.7%) of homes are rented (Statistics Canada 2015c). Per Census data released for 2016, the total number of private dwellings in the Whitehorse Area has increased to 12,516 (Statistics Canada 2017a).

In Whitehorse, only 12.5% of homes were constructed before 1960 and 12.2% were constructed between 2006 and 2011 (Statistics Canada 2015c). Eleven percent of Whitehorse Area homes required major repairs for the same reporting period and 16% for the territory as a whole (Statistics Canada 2015c).

The City of Whitehorse's 2010 Official Community Plan calls for more land for residential development and secondary suites to increase housing stock. Construction for the third phase of the Whistle Bend development is likely to take place in the summer of 2016; this neighbourhood is projected to have 3,900 housing units when completed (City of Whitehorse 2013).

The 2015 Northern Housing Report for Whitehorse indicated that residential construction would decrease from 2014 to 2015, with 95 single-detached starts and 90 multi-family starts expected in 2015. In 2014, there were 212 housing starts (109 single detached and 103 multi-family), which was an increase of 31% from the previous year (Lis 2015).

Dawson

In 2011, there were 680 dwellings recorded in Dawson, with an average number of 4.8 rooms per dwelling; of the 680 homes in Dawson, 260 were owned (38%) and 415 were rented (61%) (Statistics Canada 2015d), which represents a lower proportion of home ownership as compared to the territorial rate of 66.4%. The rate of rental tenure is reflective of the seasonal population fluctuation of Dawson. According to Census data released for 2016, the total number of private dwellings in Dawson has increased to 756 (Statistics Canada 2017b).

In Dawson, 36% of homes were constructed before 1960, with 5.1% being constructed in the most recent period between 2006 and 2011 (YG 2015h). In the 2011 Census, of 680 total dwellings in Dawson, 495 needed only regular maintenance or minor repairs, whereas 185 or 27.2% needed major repairs (YG 2015h). Even when housing is available, it is not necessarily appropriate for winter use in terms of having adequate heat (Interview 2, Pers. Comm. 2016).

Many primary data contributors cited housing in Dawson as the most important socio-economic issue in the community (Interview 4, Personal Communications 2016; Interview 6, Personal Communications 2016; Interview 23, Personal Communications 2016; Interview 28, Personal Communications 2016). A Statistics Canada 2011 Household Survey found that housing (24%) was the primary change recommended to improve the Dawson area; 37% of respondents noted that more available housing would increase the community's ability to attract more year-round residents (Statistics Canada 2013a; KDO 2014). Dawson has one of Yukon's largest needs for new housing resulting from natural population growth (Zanasi and Pomeroy 2013). The housing shortage is exacerbated in the summer, when seasonal employment increases requirements for accommodation (YHC 2013). Shortages have also been attributed to mining company rentals removing usual rental housing from the market (KDO 2011).

Housing in Dawson is available through the Yukon Housing Corporation (YHC), the Klondike Development Organization (KDO), the TH, and private sources. YHC charges rent as a percentage of income, and both YHC and TH had waiting lists as of 2016 (Interview 6, Personal Communication 2016; Interview 21, Personal Communication 2016).

In 2011, Yukon Housing Corporation (YHC) had 64 social housing and 27 staff housing units in Dawson, all of which were full. At that time, YHC had a waiting list of approximately five people for both social and staff housing (KDO 2011b). In 2014, YHC's housing composition in Dawson had changed to 58 social

housing units and 40 staff housing units (YHC 2014). Shortages in social housing have raised concern in the community. According to the KDO's Housing Strategy final report, "...social assistance recipients are being forced down the housing quality ladder and safety is becoming an issue with individuals reported as living in buses and with unregulated heat sources" (KDO 2011). Housing adequacy and appropriateness are also issues: for example, homes used in the summer might not have adequate heating or insulation for the winter (Interview 2, Personal Communication 2016; Interview 21, Personal Communication 2016; Interview 23, Personal Communication 2016).

Dawson businesses said that housing is the primary issue they face (Interview 19, Personal Communication 2016; Interview 23, Personal Communication 2016; Interview 28, Personal Communication 2016). There can be substantial delays in filling positions because people considering relocating to Dawson for work do not want to live in substandard housing (Interview 21, Personal Communication 2016). Some staff housing is provided; for example, YHC has reserved units for health care workers; but most employees must make their own arrangements (Interview 21, Personal Communication 2016). During a recent exploration boom in 2013, when the price of gold was high and there was a great deal of staking activity, people who came to Dawson for work wanted to move to the community, but couldn't because of lack of housing (Interview 7, Personal Communication 2016). Housing is also a barrier for TH citizens living outside of Dawson who want to return to the community; they may be able to find jobs but not adequate housing (Interview 6, Personal Communication 2016). The YHC has initiated a municipal matching program that provides funding to increase rental housing supply (Interview 7, Personal Communication. 2016). Although there is interest in building rental housing, securing financing has been a barrier to development, and existing grants have not been sufficient (Interview 21, Personal Communication 2016). The City also permitted staff housing in the industrial area (Interview 7, Personal Communication 2016).

Tr'ondëk Hwëch'in Housing is non-profit organization, and operates on a break-even or cost-recovery basis. Water, sewer, insurance, and property taxes are all covered by rent. Since 2002, Tr'ondëk Hwëch'in Housing has built 32 new residential units, including:

- 6 one-storey regular housing units
- 6 one-storey flexible¹ housing units
- 4 duplex units
- 16 duplex flexible units (Interview 8, Personal Communication, 2016).

This has helped to halve TH's housing wait list since 2009, which had 34 citizens; in 2015, 16 were on the wait list (Interview 8, Personal Communication 2016). There is a mismatch between the type of housing available and housing needs, with a shortage of dwellings suitable for a single occupant, such as

¹ Flexible housing allows for interior configurations to be changed based on the needs of the homeowner.

TH citizens returning to the community, recent graduates, and older people looking to move to town from rural homes (KDO 2011, YHC 2013).

Land availability and building costs are constraints on expansion of the current housing stock in Dawson (Interview 4, Personal Communication 2016). Land lotteries have generated more interest than availability (Interview 4, Personal Communication 2016). Although the cost to build has fallen somewhat in recent years, there is still an extra expense associated with building in Dawson that serves as a disincentive for contractors (Interview 21, Personal Communication 2016).

Despite increasing demand for housing in Dawson, few new homes are being constructed. A substantial barrier for expanding the existing housing stock is high building costs, partly due to a lack of qualified tradespeople in town (Interview 8, Personal Communication 2016). There are only a few plumbers and electricians living locally, and local contractors are often too busy to take on new projects (Interview 21, Personal Communication 2016). This means expertise needs to be brought in from elsewhere, which introduces additional costs associated with transportation and housing (Interview 8, Personal Communication 2016). Building materials are also expensive due to freight costs (Interview 8, Personal Communication 2016).

The City of Dawson relaxed regulations for garden suites to try to increase the availability of rental housing, but there was little uptake among homeowners, possibly because their properties were not suited to that purpose (Interview 8, Personal Communication 2016). The City also allowed housing of workers in the industrial zone south of the Klondike highway (Interview 8, Personal Communication 2016).

Although some interviewees cited availability of land as a limitation, there is good land for housing in West Dawson, which could be developed if a link across the river was made (Interview 20, Personal Communication 2016) and there is potential for other subdivisions outside of town (Interview 21, Personal Communication 2016). As of May 6, 2016, 14 standard sized, serviced residential lots and two double lots were available in town, with an additional country residential lot available in the Dome Road Subdivision (KDO 2016).

The KDO is currently developing an eight-unit, year-round apartment complex housing unit, to be purchased in the future by the City of Dawson. Its plans have received an initial positive response for funding through the YHC's Northern Housing Trust (Interview 28, Personal Communication 2016). The KDO is expecting to receive tax incentives from the City of Dawson to support the development, and will secure a mortgage to cover the remaining funds required.

Beaver Creek

According to the 2011 NHS, the community of Beaver Creek's housing by tenure consists of 15 dwellings by owner, 20 by renter, and Band housing consists of 20 dwellings. The last major period of construction took place between 1991 to 2000, with 15 private dwellings constructed (Statistics Canada 2015a). Twenty percent of homes were constructed before 1960, with 0% being constructed in the most recent period between 2006 and 2011 (YG 2015i). In the 2011 Census, of 50 total dwellings in Beaver Creek, 40 needed only regular maintenance or minor repairs, whereas 15 needed major repairs (YG 2015i).

The Yukon Housing Corporation has 3 staff units located in Beaver Creek, which are housing units provided to rural Government of Yukon staff to assist in recruiting and retaining staff members (YG 2015a).

White River First Nation is responsible for administering housing and community infrastructure services to its members (whom account for about half the population) within the community of Beaver Creek, with the majority of residential lots located on the western side of the Alaska Highway (Inukshuk Planning & Development 2009).

Per the 2009 WRFN Comprehensive Community Development Plan, the housing supply was noted as “generally adequate to meet immediate needs.” The Plan found that without expanded economic activity in Beaver Creek, it is unlikely that the demand for new housing would exceed one or two houses per year. The building expansion of a nearby lot was noted to likely meet the projected demand for the next 5-8 years. The estimated cost to construct 4 homes within 5 years would be approximately \$1 million (Inukshuk Planning & Development 2009).

Pelly Crossing

According to the 2011 NHS, the community of Pelly Crossing housing by tenure consists of 55 dwellings by owner, 20 by renter, and Band housing consists of 60 dwellings. Between 2006 – 2011, 20 single-family homes were built (YG 2015b). Zero percent of homes were constructed before 1960, with 15% being constructed in the most recent period between 2006 and 2011 (YG 2015j). In the 2011 Census, of 680 total dwellings in Pelly Crossing, 495 needed only regular maintenance or minor repairs, whereas 185 or 27.2% needed major repairs (YG 2015j).

The Yukon Housing Corporation has 10 staff units located in Pelly Crossing, which are housing units provided to rural Government of Yukon staff to assist in recruiting and retaining staff members (YG 2015a).

The Selkirk First Nation Capital Department manages the housing units in Pelly Crossing. The department “works to provide adequate and safe housing for SFN Citizens and Staff by providing units, encouraging home ownership and facilitation renovations when appropriate” (SFN 2017a).

Mayo

In 2011 the NHS recorded 115 private households in the village of Mayo. Housing, tenure, condition, period of construction and structural type data for the 2011 NHS was suppressed due to data quality and confidentiality reasons (Statistics Canada 2013b). Census data on housing condition and period of construction were not available for Mayo.

The YHC has a community office located in Mayo, including 20 social units that rented from the YHC at an affordable rate, and six staff units that are provided to rural Government of Yukon staff to assist in recruiting and retaining staff members (YG 2015a).

The First Nation Na-Cho Nyäk Dun provides housing to FNNND citizens (YG 2014a). Services offered through the Housing & Capital Department include operations, maintenance, and renovations. The Housing & Capital Department is currently creating a 10 Year Capital Plan to define community infrastructure needs, as well as operation and maintenance needs over the next 10 years. FNNND hopes the Plan will result in a stable housing stock, and increased revenues to bring all homes up to standard code as well as update infrastructure throughout the community (FNNND 2017a)

3.3.1.2 Housing Costs

Whitehorse

Median rent in Whitehorse was \$969 per month in October 2015, with a vacancy rate of 3.4%. Median monthly rent for a bachelor apartment was \$775, a one-bedroom was \$925, a two-bedroom was \$1,025, and a three- to four-bedroom was \$1,500 (YBS 2015). The median rent of \$969 would require a salary of approximately \$38,760 per year to meet the affordability standard of 30% of gross income (depending on the cost of heating and other utilities).

As described by YHC, “the increasing population has resulted in...tightening in rental vacancy rates, accompanied by rising rents and a very large increase in home prices” (YHC 2013). Because rents are relatively high, it can be difficult for lower-income households to find affordable housing (YHC 2015). A recent report found that over 40% of tenant households were spending more than 30% of their income on rent (YG 2015c).

Over the past decade, housing prices in Whitehorse have increased at a far greater rate than household incomes (YHC 2015). According to the most recent Yukon Real Estate Survey for the third quarter of 2015, the average cost of a single detached house in Whitehorse was \$419,700; a mobile home was \$218,000; a condominium was \$318,100; and a duplex was \$310,600 (YHC 2015).

Dawson

A 2013 survey found that the average income of all renters in Dawson was \$38,800 and the average rent paid was \$703 per month, or 22% of their average income” (KDO 2013). Median rent in Dawson was \$800 in October 2015, with a median of \$600 for a bachelor apartment, \$800 for one bedroom, \$1,200 for two bedrooms and \$1,244 for three to four bedrooms (YBS 2015) The median rent of \$800 would require a salary of approximately \$32,000 per year to meet the affordability standard of 30% of gross income (depending on the cost of heating and other utilities).

Despite the tight housing market, Dawson has better housing affordability, both for renting and ownership, than across Yukon and Canada (KDO 2011). An estimate of cost ranges for Dawson-area properties suggests that a cabin in West Dawson (with no running water and an outhouse) would cost approximately \$125,000; a finished house with septic and water storage would cost approximately \$180,000 to \$280,000; a smaller, older house in town needing some repairs would cost approximately \$180,000 to \$220,000; a better-quality house would be approximately \$220,000 to \$275,000, or \$280,000 to \$380,000 for homes with a better view; and an executive-style home would cost between \$350,000 and \$500,000 (Interview 21; Personal Communication 2016).

Beaver Creek

As of 2011, the average value of a single-family home in Beaver Creek was \$155,717. Single family homes are rented for an average of \$467 per month, and subsidised tenants accounting for 75% of housing in the community (Statistics Canada 2015b).

Pelly Crossing

As of 2011, the average value of a single-family home in Pelly Crossing was \$274,106. Single family homes are rented for an average of \$404 per month (YG 2015d).

Mayo

Housing and Shelter Cost data for the 2011 NHS was suppressed due to data quality and confidentiality reasons (Statistics Canada 2013b).

3.3.1.3 Non-permanent Accommodation Characteristics

Whitehorse

Whitehorse offers temporary accommodation through hotels and motels that are open year-round, as well as bed and breakfasts, lodges and cabins, and two hostels, in addition to campgrounds owned privately and by the YG, which operate seasonally. Rentals are also available from homeowners through online agencies such as Vacation Rental By Owner (VRBO) and Airbnb (as of April 20, 2016). The tourism department provides information about vacancies during busy periods to facilitate finding accommodation, but people are generally able to find accommodation in Whitehorse (Saunders J, Personal Communication 2016).

Dawson

Dawson offers accommodation options during the summer months including a rustic hostel (no electricity or running water), two YG campgrounds and a privately owned RV park, as well as bed and breakfasts, inns, cabins, hotels, and motels. Many facilities close in the winter months, and accommodation is limited at that time.

Temporary accommodation in Dawson is expensive² and heavily booked during the summer months (Interview 29, Personal Communication 2016; Interview 30, Personal Communication. 2016). For long weekends and special events such as Yukon River Quest and Discovery Days, it is recommended to book accommodation several months in advance (Interview 30, Personal Communication 2016).

Beaver Creek

Beaver Creek's location along the Alaska Highway and proximity to the Canada/US border results in a range of visitor services, including various options for accommodation. The Discovery Yukon Lodgings and RV Park offers 50 full service RV sites, tent camping sites, and three log cabins. Prices range from \$20 - \$140 per night (Tourism Yukon 2017a). Buckshot Betty's is a local hotel and campground, ranging from \$89 - \$149 per room. Ida's Motel and Restaurant starts at \$99 per night and also offers RV parking (Tourism Yukon 2017b). The 1202 Motor Inn offers hotel rooms ranging from \$50 - \$130, as well as RV parking and camping sites starting at \$15 (1202 Motor Inn n.d.).

Pelly Crossing

Information regarding non-permanent accommodations in Pelly Crossing was unavailable.

Mayo

Mayo reputation as a popular tourist location means there are a number of accommodation options. There are several bed and breakfasts in the area; Gold and Galena, which offers rooms from \$100 - \$120 per night, as well as Silver Trail Inn and B&B, and Moose Creek Lodge both starting at \$125 per night. The Bedrock Motel offers rooms ranging from \$10 - \$25 per night, and the North Star Motel has rooms ranging from \$110 - \$120 per night. There are two Municipally run campgrounds in Mayo; McIntyre Park and Campground, which has 5 free camp sites, and Gordon Park Campground that has 10 free camp sites. There is also the Whispering Willows RV Park and Restaurant (Travel in the Yukon 2017; Tourism Yukon 2017c).

² The Westmark Hotel in Dawson City has rooms from \$149-169 per night during summer months.

3.3.2 PHYSICAL INFRASTRUCTURE

Physical infrastructure includes the basic physical and organizational infrastructure required for a community's operation to ensure its residents' quality of life. This section includes a description of the current condition of landfill and solid waste disposal, including recycling and composting, and water and wastewater services in the LAA and RAA.

3.3.2.1 *Solid Waste Disposal and Recycling*

The Solid Waste Regulations set out by the *Environment Act* are adhered to within Yukon territory regarding standards for building and operating dumps and landfill operations in the territory. These regulations include a permitting process for designing, operating, maintaining, and closing dumps and landfills on most land in Yukon. There are disposal sites located near most Yukon communities, of which 19 of 26 sites are operated by the Department of Community Services, with incorporated municipalities managing the remainder (YG 2016a).

All designated recyclable materials from across Yukon are collected and stored at depots and solid waste facilities. Yukon government then pays for transportation to a registered facility in western Canada or the United States. This contract is awarded through a public tendering process to ensure it is fair and that the contractor works within established social and environmental laws (YG 2017b).

Whitehorse

Whitehorse is served by a municipal landfill located on the Alaska Highway within the City. It offers a Free store, where people can leave and pick up free items for re-use, as well as recycling, and charges a tipping fee of \$94 per tonne (City of Whitehorse n.d.b.). Households receive weekly pick-up service that alternates between solid waste and compost (City of Whitehorse n.d.c). In addition, household hazardous waste drop-off days are held twice per year, when Whitehorse residents can bring dangerous waste such as compact florescent light bulbs, liquid paint, cleansers, motor oil, solvents, rechargeable batteries, pesticides, and aerosol cans to the landfill for disposal (City of Whitehorse n.d.d).

Recycling services are provided by the non-profit Raven Recycling Society and the for-profit facility, P&M Recycling. The Raven Recycling Society accepts refundable recyclables and the P&M Recycling facility accepts refundables, as well as paper, cardboard, and plastics (Raven Recycling n.d.). Recycling pick-up is available by Whitehorse Blue Bin Recycling at a cost of \$21 per month (City of Whitehorse n.d.e). Curbside recycling is being considered by the City of Whitehorse (City of Whitehorse n.d.e).

Dawson

The Quigley Landfill is the regional landfill that services Dawson, the Klondike Valley, the Dempster Highway, and the North Klondike (City of Dawson 2016a). Located on the Klondike Highway south of

Dawson, the landfill is a joint venture between the City of Dawson and the YG. In order to discourage illegal dumping, the landfill does not charge tipping fees (Interview 4, Personal Communication 2016).

Garbage collection of residential solid waste takes place weekly. Commercial solid waste is collected as frequently as six times per week during peak periods (City of Dawson 2016a). The Quigley Landfill is limited in the types of waste that it can accept. Currently, the landfill does not accept liquid wastes (Interview 4, Personal Communication 2016). Until 2015, some garbage was burned during the winter at the landfill, but this is no longer practiced (Interview 4, Personal Communication 2016).

The landfill is currently approaching maximum capacity, and is estimated to have approximately five years of life remaining using the current waste management approach (Interview 4, Personal Communication 2016). The facility is limited in its capacity to expand due to adjacent land use needs. With the implementation of waste diversion, including composting and recycling, the remaining life of the landfill could be extended to 14 years (Interview 4, Personal Communication 2016). The City of Dawson is actively working to identify ways to extend the life of the landfill.

In addition to solid waste disposal, the landfill offers the following services: a small recycling facility, composting, and a Free store (City of Dawson 2016a). A second, larger recycling facility is located within Dawson. Both recycling facilities are operated by the Conservation Klondike Society (CKS). Dawson's recycling facility is operating on the threshold of its capacity (Interview 11, Personal Communication 2016). The main recycling facility is supplemented by a small cardboard recycling facility at the landfill, operated by CKS and funded by the YG, which opened in the summer of 2015 (Interview 11, Personal Communication 2016). Diverted materials are shipped to Whitehorse weekly; however, because of cost, CKS is investigating the possibility of shipping recyclables directly to facilities in Alberta (Interview 11, Personal Communication 2016). Currently, the diversion rate in Dawson is approximately 30% to 40%, and the target diversion rate is 70% to 80% (Interview 11, Personal Communication 2016).

The City of Dawson and the CKS are currently collaborating to build a new recycling facility; the land is fenced and prepared, and they are currently seeking funding from the YG and other grants for building costs (Interview 11, Personal Communication 2016). The City of Dawson is interested in introducing curbside recycling.

Beaver Creek

The Government of Yukon is responsible for all community services in Beaver Creek, including solid waste disposal. The Beaver Creek Landfill operates seven days a week, 24 hours a day and accepts household garbage, waste metals, tires, construction and demolition waste, household hazardous waste, brush and clean wood, vehicle bodies and eWaste (YG 2016a).

Pelly Crossing

Pelly Crossing Modified Transfer Station is open seven days a week, 24 hours a day and accepts household garbage, recyclables, waste metals, tires, construction and demolition waste, household hazardous waste, brush and clean wood, vehicle bodies, and eWaste (YG 2016b).

Selkirk First Nations Capital Department also provides waste management services (SFN 2017a).

Mayo

The Village of Mayo operates the Mayo Solid Waste Management Facility, which requires a permit for residential and commercial customers to dispose solid waste (Village of Mayo n.d.a). All recyclables can be brought to the Mayo Recycling Center.

3.3.2.2 *Water Supply and Wastewater Treatment*

The Yukon Water Board and Environmental Health Service regulate the territorial and federal drinking water standards. The Yukon government creates partnerships with Canada, First Nations and municipalities to ensure adequate drinking water infrastructure. The Yukon Water Board is also responsible for issuing water licences regarding water use and deposit of waste (YG 2017c).

Whitehorse

The water supply for the City of Whitehorse is obtained from the municipal wells located in Riverdale, which is chlorinated and then transported to residents via a 160-km pipe network (YG 2014b; City of Whitehorse n.d.f). Water quality is tested weekly at approximately 20 locations (City of Whitehorse n.d.f). Some pipes and sewer mains have been replaced, and the Selkirk pump house has been replaced with a water station and chlorination facility (YG 2014c).

The City of Whitehorse's wastewater system includes a lagoon system, four major lift stations with a flush tank, and five minor lift stations (City of Whitehorse n.d.f). Wastewater is transported to the Livingstone Trail Environmental Control Facility, which has two 115,000-cubic metre (m³) primary lagoons with a combined retention time of 20 days, four 293,000-m³ secondary lagoons with a combined retention time of 100 days, and a 5.813-m³ long-term storage pond with a one-year retention time (Johnson 2005). The long-term storage area is a wetland that is 3 km long and 2 km wide, which can fill to a depth of 6 metres (m). The Livingstone Trail Environmental Control Facility operates primarily as a closed system, meaning effluent dissipates through evaporation and infiltration rather than other forms of release (City of Whitehorse n.d.f). Treated water is released from the system annually to allow room for more water in the system (CBC 2015a).

Dawson

The City of Dawson water system includes water supply, storage, treatment, and distribution infrastructure. Four infiltration wells were drilled in July 2014 (City of Dawson 2016b), and provide sufficient water capacity to meet Dawson's current demands as of 2016 (Interview 4, Personal Communication 2016).

Water is currently stored in two reservoirs with a combined capacity of approximately 1,300 cubic metres (m³) (City of Dawson 2016b). Dawson's northern climate requires the use of a bleeder system to prevent freezing in the winter, which generates higher flow (Interview 4, Personal Communication 2016). Water is chlorinated prior to distribution.

Several projects are also underway to improve Dawson's physical infrastructure. Identified shortages include water storage, which is not currently sufficient for fire flow; water distribution, and pressure; and the sewer system, as one of the five lift stations is increasingly loaded and the sewage system is undersized (Interview 4, Personal Communication 2016). A loop system to upgrade the existing piping is currently being planned (Interview 7, Personal Communication 2016).

Although water and sewer lines have been added, some lines are currently at capacity, and a population increase in the City of Dawson would require expansion of water and sewer infrastructure (Interview 7, Personal Communications 2016). Homes at the north end of Dawson that are not serviced by the City of Dawson's water and sewage infrastructure currently receive water delivery and have septic fields, or pump-out, for waste management (Interview 7, Personal Communication 2016). New residential developments outside of the main town site, such as country residential lots on the dome (a hilltop adjacent to Dawson, popular for sightseeing) or properties on the hillside in the north end of Dawson, also require a septic system and private water (water delivery or well water), and therefore will not be reliant on or affecting the municipal water and sewer system (Interview 7, Personal Communication 2016). The YG is responsible for inspection and approval of septic fields (Interview 7, Personal Communication 2016).

Dawson has had water and sewer lines for over 100 years (Interview 7, Personal Communication 2016). Currently, the City of Dawson's sewage system is in need of upgrades; the sewer system is undersized and consists of older, thin-walled pipes (Interview 4, Personal Communication 2016). The City of Dawson's Public Works Department is currently exploring the potential to replace the thin-walled pipe with a thicker-walled pipe, wherever it still exists (Interview 4, Personal Communication 2016).

A wastewater treatment facility was completed in 2012, and met testing requirements in February 2015 (YG 2016c). Ownership of the facility has been transferred to the YG and it is currently being operated under contract by Corix Utilities, the company that constructed the plant (YG 2016c). Another contractor will take over operation of the facility at the end of the warranty period in 2017. The current capacity of

this facility is 4,300 m³/day. In winter, wastewater flows are higher due to the use of a bleeder system to prevent the water lines from freezing and peak flows of approximately 3,100 m³/day are reached, as compared to 2,200 m³/day in the summer (Interview 4, Personal Communication 2016). The plant, which was commissioned in 2012, has been the source of a dispute between the territorial government and the contractor that built it over the quality of water that the plant produces. This dispute is now the subject of a lawsuit, in which the territorial government is seeking \$39.5 million in compensation from the builder (CBC 2017).

Beaver Creek

White River First Nation and the Government of Yukon are in a partnership to administer community infrastructure such as water, sewer, local road maintenance and community recreation to Beaver Creek residents. In 2009, under the Indian & Northern Affairs Canada First Nation Water Management Strategy, the existing water supply system was overhauled (Inukshuk Planning & Development 2009). The new system consists of two separate systems, both of which include new pump houses and standby generators. New wells were also drilled at each pump house, with water now being chlorinated by plant operators (Inukshuk Planning & Development 2009). Some homes continue to be served by individual wells, until it becomes economically viable to extend services (Inukshuk Planning & Development 2009).

Pelly Crossing

Selkirk First Nation Capital Department is responsible for the management of SFN infrastructure. The department also manages the water plant, which includes bi-weekly water testing, and provides essential services such as waste management (SFN 2017).

Mayo

The Mayo Environmental Health Department is responsible for the maintenance of the water system, sewer system, lift station, and sewage lagoon. The facilities include drinking water wells, warm water wells, pump house, water reservoir, valve chamber, lift station, sewage lagoon and many kilometers of water/sewer main lines. Bi-weekly testing of the drinking water is completed to ensure the water is free from contaminants. Environmental Health staff also maintain the main sewer lines (Village of Mayo n.d.b).

Mayo has an agreement with the FNNND for the provision of water and sewer services (Village of Mayo n.d.b).

3.3.3 COMMUNITY SERVICES

Community services consist of the services provided by the municipal governments in the LAA and RAA. A description of the current condition of the following community services is provided below, including: health services; fire protection services; policing and by-law services, and social services.

3.3.3.1 Health Services

Whitehorse

Whitehorse General Hospital serves the population of Whitehorse and Yukon, providing 24-hour acute care; laboratory and medical imaging services including x-ray, ultrasound, and MRI; and clinics for visiting specialists (Yukon Hospitals 2016). From April 1, 2014 to March 31, 2015, the hospital had a staff of 486 people (Yukon Hospitals 2016) (**Table 3.3-1**). The Whitehorse General Hospital expansion is slated for completion in December 2017. Hospital occupancy averaged 86% as compared to 80% in the previous fiscal year (Yukon Hospitals 2016).

Whitehorse General Hospital receives patients from other Yukon communities for specialist care, births, chemotherapy, and surgeries. There were more than 70 physicians licensed in Whitehorse in 2014 and 2015, with the largest practices being Klondyke Medical Clinic and Whitehorse Medical Services Ltd. (Yukon Medical Council 2015). Two new clinics, the Yukon Sexual Health Clinic and the Yukon Women’s MidLife Health Clinic, offer drop-in access to a nurse practitioner (YG 2014d).

Table 3.3-1 Whitehorse General Hospital Usage

	Emergency Visits	Admissions	Medical Imaging Visits	Lab Visits
April 1 2014 – March 31 2015	32,797	3,172	17,323	26,549

Source: Yukon Hospitals 2016.

It has been difficult to find a family doctor in Whitehorse for some time (Kerr 2012, CBC 2014). As of April 1, 2016, Whitehorse Medical Clinic was accepting new patients and River Valley Clinic was accepting walk-in patients; in addition, Sage Maternity and Crocus Maternity were accepting new prenatal patients (YG 2016d).

Emergency wait times were available for Whitehorse General Hospital. The average wait, based on the 90th percentile, was 1.7 hours, compared to 3.2 hours nationally (CIHI 2016).

Dawson

Dawson and surrounding area are served by the Dawson City Community Hospital, which opened at the end of 2013. This medical treatment centre has an emergency room that provides 24-hour acute care, x-ray and laboratory services, and a retail pharmacy. From April 1, 2014 to March 31, 2015, the hospital had a staff of 28 people (Yukon Hospitals 2016). There were six licensed physicians in Dawson for this period (Yukon Medical Council 2015).

The hospital does not provide maternity care. Expectant mothers travel to Whitehorse for low-risk pregnancies; expectant mothers travel to British Columbia or Alberta for high-risk pregnancies (**Table 3.3-2**).

Table 3.3-2 Dawson City Community Hospital Usage

	Emergency Visits	Admissions	Medical Imaging Visits	Lab Visits
April 1 2014 – March 31 2015	2,810	92	475	1,932

Source: Yukon Hospitals 2016.

The hospital building also houses the Dawson Medical Clinic, which provides primary care services, and the Dawson Community Health Centre, which provides public health and home care programs and services from allied health professionals. An extended care facility, the Alexander McDonald Home for Seniors, has 11 residential beds (YG, n.d.c.).

Ambulance services are coordinated by the YG's Emergency Medical Services in Whitehorse. In Dawson, there are two full-time Emergency Medical Responders supplemented by trained volunteers (Interview 1, Personal Communication 2016).

Medevac services are typically provided by fixed-wing flights using specially equipped planes from by Alkan Air, based in Whitehorse. Three aircraft are dedicated to use by EMS: one King Air 200 capable of landing on gravel runways for shorter flights to Yukon communities; and a King Air 300 and 350 for longer flights to major medical centers, typically in Vancouver, Edmonton, and Calgary (Alkan Air 2016). Where fixed-wing access is not possible, helicopter evacuations are occasionally performed; however, due to space constraints, limited medical treatment is possible in a helicopter; additionally, when a physician provides helivac care, another physician needs to fill in at the hospital to ensure adequate coverage (Interview 3, Personal Communication 2016).

Beaver Creek

The Beaver Creek Community Health Centre has one nurse practitioner on call 24 hours a day, 24-hour volunteer ambulance services, and a doctor that visits once every two weeks (YG 2005). The health centre offers physicals and electrocardiograms (EKGs), as well as pregnancy, prenatal and parenting programs (YG 2005). Other services such as x-rays, pharmacy, dental, and detox/alcohol and drug are offered in Whitehorse and/or Haines Junction.

Pelly Crossing

The Pelly Crossing Community Health Centre has two nurse practitioners on call 24 hours a day, 24-hour volunteer ambulance services, and does not have a visiting doctor (YG 2005). The health centre offers physicals and electrocardiograms (EKGs), pregnancy, prenatal and parenting programs, blood tests, pregnancy tests and specimen collection (YG 2005). There are other limited services, such as a visiting dentist, x-rays on limbs only, and home care visits. Other services such as pharmacy, and detox/alcohol and drug are offered in Whitehorse and/or Haines Junction.

Mayo

The Mayo Health Centre has two nurse practitioners on call 24 hours a day, 24-hour volunteer ambulance services, and a resident doctor (YG 2005). The health centre offers physicals and electrocardiograms (EKGs), pregnancy, prenatal and parenting programs, blood tests, pregnancy tests and specimen collection, x-rays, and a dentist that visits every three months (YG 2005). Other services such as pharmacy, detox/alcohol and drug are offered in Whitehorse and/or Haines Junction.

Mental health counselling is offered as a toll-free phone service for residents of the Yukon, Nunavut, and Northwest Territories (YG 2016e). Counsellors and therapists from Mental Health Services also travel to communities outside of Whitehorse on a regular basis. Child & Adolescent Therapeutic Services (CATS) is a child welfare counselling service for children, youth, and their families that have experienced child maltreatment. CATS counsellors are based in Whitehorse, but travel to communities across the Yukon on a regular basis (YG 2015e).

3.3.3.2 Fire Protection Services

Whitehorse

The City of Whitehorse established its fire department in 1901. There are two fire halls: one co-located with City Hall at 2121 2nd Ave and one in the Public Safety Building at 305 Range Road (City of Whitehorse n.d.g.). The department's responsibilities include urban and wildland fire suppression, fire prevention, training, fire safety inspections, rescue, and building plan reviews (City of Whitehorse n.d.g.). The department consists of both full-time firefighters and volunteers; there are 6 firefighters on duty at any given time, with 24 staff members supported by approximately 10 to 15 volunteers (City of Whitehorse n.d.h.).

The Yukon Fire Marshal's Office and the YG's Wildland Fire Management are both based in Whitehorse. The Fire Marshal's office is responsible for public education as well as funding, training, and administering the fire departments in the communities of Beaver Creek, Burwash Landing, Carcross, Golden Horn, Hootalinqua, Ibex Valley, Keno City, Klondike Valley, Marsh Lake, Mendenhall, Mt. Lorne, Old Crow, Pelly Crossing, Ross River, Tagish, and Upper Liard (YG 2015f).

Dawson

Dawson is served by a volunteer fire department of approximately 25 to 35 members (Interview 4, Personal Communication 2016). Fire response equipment to support Dawson includes three fire engines, one bush truck, and one command truck; the capacity and equipment of the Fire Department currently exceeds code (Interview 4, Personal Communication 2016). The Fire Department responds 24 hours a day to incidents within its jurisdiction, including the area within the Dawson's municipal limits, with the exception of an agreement with the YG to provide additional support to neighbouring fire departments, if necessary (Interview 4, Personal Communication 2016). A second department, the Klondike Valley Fire

Department, serves the area outside of municipal limits of Dawson, with restrictions. In addition to fire-related services, the fire department also responds to motor vehicle incidents, hazardous materials incidents, utility emergencies, and carbon monoxide alarms, and performs rescue services (Interview 4, Personal Communications 2016).

The position of the Fire Chief is the only paid position within the City of Dawson Fire Department. The fire chief also serves as the territorial coordinator for Emergency Measures (City of Dawson 2016c).

The YG has a northern detachment of Wildland Fire Management based in Dawson. In addition to providing wildland fire management, the detachment is also responsible for enforcing the *Forest Protection Act*, RSY 2002, c. 94. The goal of fire management activities is to prevent injury and loss of life and reduce social and economic disruption of fires, with consideration to fire ecology, in that fires serve an important ecological purpose and do not always need to be extinguished (YG 2016f). Yukon works collaboratively with other jurisdictions in sharing resources based on need, via Mutual Aid Sharing Agreements through the Canadian Interagency Forest Fire Centre.

Beaver Creek

In 2015, a new fire department was built in Beaver Creek that includes space for training, as well as providing a home for Emergency Medical Services volunteers (CBC News 2015b). The police chief noted hopes that the new fire department will attract additional volunteers to add to departments five current volunteers (CBC News 2015b).

Pelly Crossing

Pelly Crossing has a volunteer fire department; however, the number of volunteers is unknown. A CBC News article from 2013 identified Pelly Crossing as one of two rural communities in the greatest need of volunteer fire fighters within the Yukon (CBC News 2013).

Mayo

Mayo has a volunteer fire department made up of 12 volunteer members, a fire chief, deputy fire chief, and a fire training officer (Village of Mayo n.d.c). The department is comprised of a fire hall, two fire trucks, one emergency vehicle, various fire related equipment, as well as a fire hydrant system that runs throughout the community (Village of Mayo n.d.c). The Mayo volunteer fire department has a joint agreement with FNNND to provide fire protection services for First Nation's buildings that are located outside of the community's boundaries. Mayo also contains one of six regional fire management offices within the territory that are responsible for forest fires (YG 2016g).

3.3.3.3 Police Services

Whitehorse

The City of Whitehorse is served by Royal Canadian Mounted Police (RCMP) detachment located at 4100 4th Avenue, headed by a Detachment Commander. The Whitehorse Detachment's jurisdiction extends north along the North Klondike Highway past Lake Laberge, southeast along the Alaska Highway to Tagish, and west along the Alaska Highway to Kusawa Lake.

Located in the Public Safety Building, the City of Whitehorse Bylaw Services is responsible for the investigation and enforcement of all city bylaws, including animal control, property maintenance issues, parking enforcement, all-terrain vehicle and snowmobile education and enforcement, and bicycle safety (City of Whitehorse n.d.i.). Bylaw Services also operates the City's Animal Shelter, overseeing bylaws and regulations around care of animals, licensing of cats and dogs, and limits on the number of animals permitted (City of Whitehorse n.d.a.). This office also regulates taxis and provides parking enforcement.

Dawson

The Dawson City RCMP detachment provides policing services within its jurisdiction, which include: the Dempster Highway as well as the City of Dawson area, extending from the Northwest Territories border in the north to the Alaska border when the Top of the World Highway is open, and east to the Yukon border (Interview 26, Personal Communication 2016). Their jurisdiction also includes the Goldfields area, including the proposed NAR and Project area. The Dawson City RCMP Detachment currently consists of one sergeant, one corporal, and five constables (Interview 26, Personal Communication 2016).

The RCMP's jurisdiction includes waterbodies. Though the detachment does not have sufficient staffing to conduct routine patrols on waterbodies, they do conduct some patrols on surrounding waterbodies (e.g., the Yukon River) throughout the summer in addition to responding to calls (Interview 26, Personal Communication 2016). Canoe traffic is high in the summer as the Yukon River is a popular paddling route. On average, the Dawson RCMP receives one call per week in the summer months from someone on a waterbody requiring help (Interview 26, Personal Communication 2016). The most common types of calls received include missing or delayed paddlers, or overturned canoes (Interview 26, Personal Communication 2016).

The RCMP's call volume increases in the summer with an influx of tourists and seasonal workers for both tourism and mining (Interview 26, Personal Communication 2016). Occasionally, additional RCMP personnel are brought in for specific events, such as the Dawson City Music Festival, which takes place each summer. Generally, calls received in the summer months are associated with transient people and seasonal workers; these calls are frequently related to substance abuse-related incidents (Interview 26, Personal Communication 2016). The RCMP partners with local and territorial agencies, including Alcohol

and Drug Services, to assist people in finding support for substance use issues; RCMP members also deliver some programming to Robert Service School regarding alcohol and drug use.

Bylaw services provide enforcement of municipal bylaws and Council policies, guidelines, and resolutions within the municipal boundaries of the City of Dawson, with an approach that focuses on education and providing information (City of Dawson 2016c).

Beaver Creek, Pelly Crossing, and Mayo

Beaver Creek, Pelly Crossing, and Mayo each have their own RCMP detachments to service their communities (RCMP 2017). As of 2009 there was 122 RCMP officers, 24 civilian members, and 36 support staff working in RCMP attachments across the Yukon (Yukon News 2009). Specifically, this accounts two RCMP officers in Beaver Creek, three in Pelly Crossing, and three in Mayo, as well as one clerk (Yukon News 2009; Scott Clark Consulting Inc. 2006).

Rural Yukon RCMP detachments are facing increased pressure to serve rural communities, but note they are not adequately staffed for the population and caseload (Yukon News 2009). This is further complicated by a 2007 policy that now requires “multi-member responses” to violent calls, meaning two or more officers must attend calls together. This is especially difficult for detachments like Beaver Creek, Pelly Crossing, and Mayo that have no more than three RCMP officers working at each detachment (Yukon News 2009).

3.3.3.4 Social Services

Whitehorse

Whitehorse has 26 licensed day cares and 24 licensed family day homes (YG 2016g). With an increase in the number of children born in the city, day care has become more difficult to obtain (CBC 2012). Services for young children are offered through the Child Development Centre, which has a main location in Whitehorse and a satellite office in Dawson, includes physiotherapy and occupational therapy, developmental therapy and psychological services, and speech-language pathological services (YG 2013).

The Healthy Moms, Healthy Babies program is offered in Whitehorse at the Victoria Faulkner Women’s Centre and the Skookum Jim Friendship Centre, the Centre de la Francophonie, and the Teen Parent Centre. The Whitehorse Health Centre also offers in-home support to eligible families through its Healthy Families program, which has been in operation since 1999 (YG n.d.a.)

Seniors are supported through the Seniors’ Information Centre, funded by Yukon Health and Social Services, which provides information and assistance to seniors such as pension and housing applications, health issues, and referrals to other agencies and organizations (YG n.d.b.). Assisted living

is provided through the 96-bed Copper Ridge Place, 44-bed MacAulay Lodge, and the 29-bed Thompson Centre (YG n.d.c.). A new 150-bed facility is being constructed in Whistle Bend (YG n.d.d.).

Whitehorse-based Kaushee's Place provides emergency shelter for women and their children, as well as advocacy and support services. It serves Whitehorse as well as outlying communities because sometimes even when a shelter is available locally, women cannot stay there for safety reasons (Interview 31, Personal Communication 2015). Kaushee's Place has 15 emergency beds and five apartment units for longer-term housing. Similarly, Betty's Haven provides 10 units for longer-term housing. Between April 1, 2014 and March 31, 2015, 288 women were admitted to Kaushee's Place, accompanied by 171 children (Yukon Women's Directorate 2016). Yukon women's shelters are run independently, but work closely and coordinate funding priorities and requests (Interview 31, Personal Communication 2015).

Dawson

Dawson is currently experiencing a shortage in child-care availability. In June 2015, the wait list at the Little Blue Early Child Care and Learning Centre was longer than the number of spaces (Windeyer 2015a), and the lack of child care has been adversely affecting people's ability to work (Windeyer 2015b). The Centre has 20 spaces for children.

Tr'ondëk Hwëch'in operates a daycare facility, Trinke Zho, which offers care for both First Nation and non-First Nation children, including the Headstart Program. Trinke Zho can accommodate 60 children.

Young families in Dawson are also serviced by Healthy Families, Healthy Babies, which is part of the Canadian Prenatal Nutrition Program funded by the Public Health Agency of Canada. This program currently offers programming for approximately 40 families with children up to the age of 2, and has two staff members, each working 30 hours per week. The program's coordinator is responsible for programming, coordinating lending resources such as breast pumps and other higher-cost baby-related equipment, securing funding, and providing support for families. A respite worker provides individual support and respite care for participating families, and can support up to six clients at a time. The program also offers Handle with Care workshops, which are designed for parents and caregivers to support the mental health of children from birth to 6 years (Interview 9, Personal Communication 2016).

Tr'ondëk Hwëch'in citizens are also supported by a prenatal group offered through the Community Centre. In addition, many Elders care for children in the community.

The TH government provides support for pregnant women, families with young children, Elders, and others needing support, working in collaboration with other resources in the community. Elders receive support with health needs, practical needs such as completing tax returns, and activities and outings (Interview 6, Personal Communication 2016). Seniors can also receive assistance when they can no

longer live in their homes through the newly opened 15-bed Alexander McDonald Lodge continuing care facility, which is located adjacent to the new hospital.

The Dawson women's shelter provides emergency housing for women in transition and experiencing temporary homelessness, and prioritizes offers of shelter and safety to women and children fleeing from abuse. Established in 1989, the shelter currently has four bedrooms, including one double family room with 2 bunk beds. The shelter holds four families with a maximum of 18 people. Boys under 17 are permitted to stay with their mothers. Although statistics are confidential, the demand for emergency housing and services has been increasing in recent years (Interview 16, Personal Communications 2016).

Beaver Creek, Pelly Crossing, and Mayo

Beaver Creek does not have a licensed child care centre. Pelly Crossing has one licensed child care centre, Dunya Ra K'ats 'Inte'Ku Daycare, however, limited information is available regarding its services (YG 2017d). Mayo also has one licensed child care centre, Dunena Ko'Honete Ko Daycare, a "First Nation supported daycare service to all community members" (FNNND 2017b).

Health and Social Services offers a home care, regional therapy, and palliative care program that help individuals live independently in their homes. Residents of Pelly Crossing and Mayo are eligible to request these services (YG 2016h).

In Beaver Creek, WRFN provides elder care to its members (Yukon Community Profiles 2014). SFN in Pelly Crossing is currently restructuring their Community Care/Home Support Worker Program, however the program is committed to supporting the entire community, from infants to elders, including short-term home care for elders and individuals with disabilities or injuries (SFN 2017b). In the community of Mayo, FNNND runs a Social Assistance Program that supports individuals and families by providing financial benefits and services, including access to basic and supplementary needs, shelter, an allowance, clothing, medical and dental attention, and so on (FNNND 2017c).

In 2015, Mayo opened a new seniors housing residence that includes six rental units that aims to improve the quality of life of elderly residents of Mayo (YG 2015g). The units are affordable, and allow elderly residents to live independently in their homes, while remaining in the community with friends and family.

There are no women's shelters in Beaver Creek, Pelly Crossing, or Mayo. The closest women's shelters are the Dawson City Women's Shelter, or Kaushee's Place/Yukon Women's Transition Home in Whitehorse (YG 2016i).

Information on social services in Mayo, Pelly Crossing, and Beaver Creek was not available as of March 10, 2017.

3.3.4 TRANSPORTATION

This section describes the current condition of transportation topics in the LAA and RAA, including: air traffic, road networks, and road traffic.

3.3.4.1 Regional Assessment Area

Air Traffic

Whitehorse and Yukon are served by the Erik Nielsen Whitehorse Airport (YXY), a controlled international airport operated by the YG that supports commercial traffic, including Air North and Air Canada year-round and Condor and WestJet seasonally. It is staffed by the Canada Border Agency and is a NAV CANADA airport of entry. It has two paved runways, with the longest being 9,500 feet (2,900 m) (Acuwick n.d.). The control tower is in operation from 7:00 a.m. to 9:00 p.m., seven days a week. This airport is certified for Instrument Flight Rules and night flying. Aviation fuel and jet fuel are available for purchase (Acuwick n.d.). In 2015, 271,673 passenger movements and 22,897 aircraft movements were reported at XYX (YG n.d.e.).

Road Traffic

The Yukon highway system has 12 highway routes including core, northern, and remote networks. The highway systems of interest for this Project include the Alaska Highway to the North Klondike Highway and the North Klondike Highway to Dawson. Due to the climate, the road system is subject to freezing and thawing cycles that result in damage from heavy traffic or vehicle weights (YG 2016j).

The Alaska Highway extends from Watson Lake through to Whitehorse, and continues to Haines Junction and on to Alaska. Traffic for the Project will turn north from the Alaska Highway to the North Klondike Highway at the junction just west of Whitehorse. Upgrades to the highway for the section through Whitehorse are currently underway.

The North Klondike highway travels from its junction with the Alaska Highway through the communities of Carmacks, Pelly Crossing, and Stewart Crossing, and turns west north of the Stewart River to the Dempster Highway and Dawson. It is primarily sealed with Bituminous Surface Treatment (YG, 2008).

Between 1992 and 2011, traffic volume on the Alaska Highway at the North Klondike Highway (north side) had the highest average traffic volumes in July (1,727 vehicles per day on average) and lowest average in January (699), amounting to an overall average of 1,119 vehicles per day (YG 2011).

3.3.4.2 Local Assessment Area

Air Traffic

Dawson is served by a Transport Canada-certified regional airport, Dawson City Airport (YDA), which is owned and operated by the YG, Aviation Branch. It is an uncontrolled airport with a single unpaved runway approximately 5,000 feet (1,500 metres) long. Because of the surrounding terrain, YDA cannot be certified for Instrument Flight Rules or night flying (Aviotec et al. 2013). Aviation fuel is available for purchase, and Air North has reserve jet fuel for its aircraft (ibid.). The airport has a small terminal building.

Passenger volumes increased steadily at YDA between 2002 and 2012, with 11,285 passengers in 2012, and a corresponding increase in aircraft movements of 8.2% (Aviotec et al. 2013).

A business case to pave the runway found that an economic benefit would exceed the cost of construction, with an anticipated 76 jobs being created in the first year of construction; after construction completion, approximately 40 jobs are anticipated to be sustained annually (Peak Solutions 2016).

Road Network

The road network, comprising Hunker, Sulphur, Dominion, Black Hills, and Maisey May Roads, extends from the Klondike Highway, and is used seasonally, with no road clearing in winter. There are 93 existing placer operations using this road system, which has been reported to have had heavy use since 2011, and maintenance from both the YG and the placer miners has not been sufficient to keep up with road use (T. Christie, Personal Communication 2016). Several road locations are costly to maintain due to flooding, ice, and other chronic issues, leading to insufficient resources for basic maintenance activities, since the maintenance budget is fully expended each year (T. Christie, Personal Communication 2016). These sections can be improved with more stable materials that can withstand rainfall and weathering (Road Users Focus Group Whitehorse, Personal Communication 2016). Some sections can be dangerous after large rain events or due to snow conditions. Blind corners on the single-lane road have contributed to head-on collisions due to reduced visibility. Previously, VHF radios were used for communication along the road, but the service is no longer available and only satellite radio towers currently serve the area.

Because the road network in this area is discontinuous, some operations currently need to transport personnel and equipment by helicopter, or occasionally by barge (Road User Focus Group, Burnaby, Personal Communication 2016).

Road Traffic

Road traffic may consist of pedestrians and private, commercial, or public vehicles using the public road system for travel. For the purposes of this report, road traffic is considered to be vehicular traffic.

Between 1992 and 2011, traffic volume on the Klondike Highway at the turnoff to the Dempster Highway (north side) had the highest average traffic volumes in the summer, with the highest average of 583 in July and lowest average of 87 vehicles in January, resulting in an overall average of 247 vehicles per day (YG 2011). The Klondike Highway at Dome Road (north side) also had the highest average in July of 3,599 vehicles and the lowest average in January of 992, with an average of 2,097 vehicles per day (YG 2011). For the same period, traffic was measured on Hunker Road at the Klondike Highway for the months of May through September, with an overall average of 231 vehicles per month (maximum 425) (YG 2011). Locations of traffic volume count sites are provided in **Figure 11-12 of Appendix 18-A Socio-economic Baseline Report**.

Seasonal traffic on the Hunker Road system includes semi-trucks for both local and external haulage, fuel trucks, and light vehicle traffic. Road users include people involved in mining and exploration (placer and quartz); television crews from reality shows; hunters, trappers, and berry pickers; recreational users; and tourists. Road use is somewhat limited by the generally rough condition of the roads (T. Christie, Personal Communication 2016).

A Project-specific baseline study on existing traffic levels along various sections of this road system started in June 2015 using remote trail cameras to collect information on both traffic levels and current wildlife use. Data is currently available from June 16, 2015 to February 24, 2016 (**Table 3.3-3**). Cameras were installed on Sulphur Road; Eureka Ridge; Henderson Road; and Maisy May in mid-June 2015 for all locations, with the exception of Sulphur Road, which was installed on August 25, 2015. Traffic volume was highest in September (Eureka Ridge 7.6 passes per day; Henderson Road 2.5 passes per day; and Maisy May 0.9 passes per day on average) with the exception of Sulphur Road, which had a high of 38.8 passes per day on average in August (**Appendix 16A: Wildlife and Wildlife Habitat Baseline Report**).

Table 3.3-3 Average Daily Traffic Volume in Summer and Fall 2015

Road Location	Average Daily Traffic Volume Summer / Fall 2015 (passes / day)					
	June	July	August	September	October	November
Sulphur	--	--	38.8	27.0	6.5	0.8
Dominion	31.1	--	--	--	--	--
Eureka Ridge	3.2	3.6	4.1	7.6	6.5	0.7
Henderson	1.4	0.8	2.0	2.5	0.8	0
Maisy May	0.7	0.6	0.5	0.9	0	0

During the summer, this road system has tourism-related traffic, particularly on the Bonanza loop because there are some attractions on that section of road (Interview 13, Personal Communication 2016; Interview 15, Personal Communication 2016). Upper Sulphur has been identified as an area of concern in terms of safety due to high traffic volumes (Interview 15, Personal Communication 2016). The Henderson Dome area is popular for moose hunting in the fall, and the roads have increased traffic at this time (Interview 15, Personal Communication 2016). Hunters from Dawson use the area for both day and overnight camping trips (Interview 15, Personal Communication 2016).

Wildlife collision fatalities are reported to Conservation Officers (Interview 13, Personal Communication 2016). Because traffic tends to drive slowly, there are few collisions other than the occasional moose or bear, and they tend to occur in narrow areas of road where vegetation is present to the edge of the road (Interview 13, Personal Communication 2016).

On the Gold Field Loop, the RCMP currently receives many calls about impaired driving (Interview 26, Personal Communication 2016). Calls to RCMP currently received from placer miners along the proposed NAR are generally related to theft as well as occasional disputes over claim boundaries and contracting or agreements (such as trading use of an excavator for labour), in which case the RCMP tends to play a mediation role (Interview 26, Personal Communication 2016).

4.0 ASSESSMENT OF PROJECT-RELATED EFFECTS

This section describes the potential interactions between Project-related activities and the Community Infrastructure and Services VC, as well as mitigation measures to avoid and reduce potential interactions, and residual effects and their significance.

4.1 POTENTIAL PROJECT-RELATED INTERACTIONS WITH COMMUNITY INFRASTRUCTURE AND SERVICES

Potential interactions are anticipated to occur between Project-related activities and housing and accommodation, community infrastructure and services, and transportation during the Construction, Operation, Reclamation and Closure, and Post-closure Phases. This section focuses the assessment on those interactions of greatest potential consequence to the Community Infrastructure and Services VC. To accomplish this task, the potential for interactions between Community Infrastructure and Services and identified Project activities is considered. Each potential interaction is rated using the terms provided in **Table 4.1-1**.

Table 4.1-1 Potential for an Interaction between Community Infrastructure and Services and the Project

Term	Definition
No Interaction	Project activity will not interact with the VC.
Negligible Interaction	Interaction with the Project activity will not have a substantive influence on the short or long-term integrity of the VC (i.e., not measurable / not detectable using the identified indicator). The potential effect(s) of the interaction is not considered further in the effects assessment.
Potential Interaction	Interaction between the Project activity and the VC may have a substantive influence on the short- or long-term integrity of the VC (i.e., measurable or detectable using the identified indicator). The potential effect(s) of the interaction is considered further in the effects assessment.

Potential Project interactions with Community Infrastructure and Services are presented in **Table 4.1-2**. When no interaction between the Project and Community Infrastructure and Services is anticipated, or the interaction is considered negligible (i.e., not likely to have a substantive influence on the short- or long-term integrity of the VC and would not be measurable or detectable using the identified indicator), it is not considered further in the assessment.

Potential interactions are anticipated to occur primarily due to two factors:

1. Population changes resulting from the Project demands for employees, goods and services.
2. Traffic related to Project activities, primarily during the Construction and Operation Phases.

Table 4.1-2 Project Valued Component Interaction Potential

Project Phase	Interaction Rating	Nature of Interaction
Construction Phase		
Overall Construction Phase	Potential Interaction	There is a potential interaction with housing and accommodation, physical community infrastructure, and community services based on potential demand for housing and services due to the temporary in-migration of the Project-related workforce during the Construction Phase. Additionally, there is a potential interaction with transportation as a result of Project-related traffic for construction activities during the Construction Phase.
Operation Phase		
Overall Operation Phase	Potential Interaction	Increases in demand and use of housing and accommodation; physical community infrastructure; community services; and transportation are anticipated to occur as a result of an interaction between Community Infrastructure and Services and the overall Operation Phase of the Project.
Reclamation and Closure Phase		
Overall Reclamation and Closure Phase	Potential Interaction	No measurable changes in housing and accommodation; physical community infrastructure; community services; and transportation are anticipated as a result of an interaction between Community Infrastructure and Services during the overall Reclamation and Closure Phase.
Post-closure Phase		
Overall Post-closure Phase	Negligible Interaction	No measurable changes in housing and accommodation; physical community infrastructure; community services; and transportation are anticipated as a result of an interaction between Community Infrastructure and Services during the overall Post-closure Phase.

The main drivers for the interactions with the Community Infrastructure and Services subcomponents are the potential population increases related to the Project’s demand for goods and services, and an increase in traffic due to Project-related transportation of goods and personnel to the Mine Site. Each of these drivers are described below as supporting information for the effects assessments in **Section 4.2**.

By subcomponent, the interactions may result in the following potential effects:

- Housing and accommodation – Increased demand for housing
- Physical infrastructure – Increased demand on physical infrastructure
- Community services – Increased demand on community services
- Transportation – Effect of increased vehicle traffic on transportation infrastructure; effect of increased air traffic on aviation infrastructure.

Project-related Population Change

The Project is anticipated to generate an increase in population including both Project employees and local service providers. This population increase is likely to begin during the Construction Phase, and will continue through the Operation Phase with in-migration of Project employees and potential population

increases, particularly in Dawson. This effect is likely to decrease at the end of the mine life, as activities transition to Reclamation and Closure and employment levels decrease. Predicted population increases (including families) range from 37 to 71 persons in Dawson, and 530 to 1,001 persons in Whitehorse, assuming a proportionate split between the two communities, with the maximum population increase in 2019 during Construction. Detailed information regarding demographics and population change as a result of the Project are provided in **Appendix 19-A Demographic Intermediate Component Analysis**.

The Demographics analysis (**Appendix 19A**) found that a clear trend on population growth was not evident in Beaver Creek, Mayo, and Pelly Crossing. Because the population changes could not be predicted, the related changes to housing, accommodation, and community infrastructure and services in Beaver Creek, Mayo, and Pelly Crossing could not be assessed. As a result, potential effects to these communities were not carried forward in the assessment.

Project-related Traffic

The proposed NAR will connect the Project with the North Klondike Highway using the existing road system, with 177 km of existing road and 37 km of new construction. The NAR extends from the junction of the North Klondike Highway and Hunker Creek Road, 16 km southeast of Dawson, to the Coffee airstrip on the south side of the Yukon River (see **Appendix 2-A Detailed Figures**). From its junction with the North Klondike Highway, the NAR will follow existing government maintained roads up to Sulphur Creek. Beyond that point, the route will generally follow existing roads used by placer miners. An additional 37 km of new construction will be needed along several sections of the NAR, including between Maisy May and the north side of the Stewart River (8 km), between Barker and Ballarat (16.7 km), and from Ballarat to the north side of the Yukon River (7.8 km).

Project-related truck traffic is anticipated to have an maximum volume of approximately 8 trucks per day from Year –1 (completion of NAR) to Year 15 (NAR decommissioned). Staff will be transported by air, reducing Project-related traffic volumes.

During the Post-closure Phase, long-term monitoring is the only activity anticipated to occur. Due to limited expected employment and negligible traffic levels associated with long-term monitoring, interactions between Community Infrastructure and Services and Post-closure-Phase Project activities are anticipated to be negligible.

Interactions likely to result in potential effects to Community Infrastructure and Services are discussed further in **Section 4.2**.

4.2 POTENTIAL PROJECT-RELATED EFFECTS

This section considers potential adverse Project-related effects on Community Infrastructure and Services arising from potential interactions in relation to the indicators listed in **Table 1.2-3**.

4.2.1 HOUSING AND ACCOMMODATION

This subsection describes the nature of potential effects to be considered with respect to housing and accommodation. Mitigation measures for each potential effect are described in **Section 4.3**.

4.2.1.1 *Increased Demand for Housing*

Project-related in-migration may affect the demand for housing during the Construction and Operation Phases in Whitehorse and Dawson.

The Proponent is perceived to potentially having a positive effect on the community, provided that Project-related housing needs are met and planning and support are adequate (Interview 21, Personal Communication 2016; Interview 23, Personal Communication 2016).

The increased demand for housing is anticipated to materialize through a decrease in housing availability. It is possible that an increased population will generate demand for housing stock, resulting in new construction. An increase in housing construction may result in an increase in construction waste deposited at the Dawson landfill; however, if the planned recycling facility is constructed, it will divert waste from the landfill (Interview 11, Personal Communication 2016).

4.2.2 PHYSICAL INFRASTRUCTURE

This subsection describes the nature of potential effects to be considered with respect to Physical infrastructure. Mitigation measures for each potential effect are described in **Section 4.3**.

4.2.2.1 *Increased Demand on Physical Infrastructure*

Population growth resulting from Project activities during the Construction and Operation Phases will increase the demand on physical infrastructure, including water and wastewater infrastructure, solid waste disposal, and electrical and communications infrastructure in the LAA.

The effect on physical infrastructure is anticipated to be more pronounced in Dawson because existing physical infrastructure, especially water lines, is nearing capacity. Physical infrastructure in Whitehorse such as water and wastewater services can accommodate modest population growth (See **Appendix 18-A Socio-economic Baseline Report**).

Project hazardous waste as well as recyclable waste will be back-hauled for disposal at appropriate facilities off-site where practical (see **Section 2.0 Project Description** in the Project Proposal); this may

affect waste management facilities in Whitehorse. The planned construction of a new recycling facility in Dawson will accommodate an increase in recyclables from an increase in population in Dawson (Interview 11, Personal Communication 2016).

4.2.3 COMMUNITY SERVICES

This subsection describes the nature of potential effects to be considered with respect to Community services. Mitigation measures for each potential effect are described in **Section 4.3**.

4.2.3.1 Increased Demand on Community Services

Population growth resulting from Project activities during the Construction and Operation Phases is anticipated to increase the demand on community services, including services for families with young children (e.g., day care and family support) and health and social services.

These effects are anticipated to be more pronounced in Dawson because existing resources are nearing or at capacity; however, the new community hospital was designed to accommodate population growth related to a resource development project with sufficient time and resources to increase staffing levels. Dawson currently has six physicians, which represents a population-to-family physician ratio well below the Canadian average of 875 in 2014 (CMA 2016a).

Whitehorse has experienced shortages of family physicians in recent years, although the population-to-family physician ratio in 2014 was 590, which was better than the Canadian average (CMA 2016a). It is likely that the Project-related population increase (1.7 % to 3.2%) will not affect primary care; however, the territory is currently experiencing shortages in specialist care. Canada has an average of 110 specialists per 100,000 persons, whereas Yukon has 27 (CMA 2016b). Although for some specialties, the population is not sufficient to support a resident specialist, for others, such as psychiatry, the territory is under-served (Joannou 2015). This shortage is currently addressed through visiting specialists and by sending Yukon residents to other centres in southern Canada for specialist care.

The proposed NAR may lead to increases in non-Project-related traffic, which may in turn affect RCMP, search and rescue, and other first responders through issues such as lost or stranded drivers; impaired driving; people lost on hunting or hiking trips; as well as motor vehicle collisions (Interview 26, Personal Communication 2016).

Having one or more members of a household working on rotation, which would take them away from their families and community, may affect the entire family. This change may have effects on social services including mental health services and services for families, as some families would need support in addressing family changes due to a parent being alternately present and absent while on rotation (Interview 17, Personal Communication 2016). These types of supports are perceived to be lacking in

Dawson, and the Project may widen the gap that already exists (Interview 17, Personal Communication 2016). A detailed discussion of community services, including mental health services and supports for families (Healthy Families, Healthy Babies programming and day care), is provided in **Appendix 25-A Community Health and Well-being Valued Component Assessment Report** as well as in **Appendix 18-B Health Impact Assessment Report**.

4.2.4 TRANSPORTATION

This subsection describes the nature of potential effects to be considered with respect to transportation within the LAA and RAA. Mitigation measures for each potential effect are described in **Section 4.3**.

4.2.4.1 *Effect of Increased Vehicle Traffic on Transportation Infrastructure*

Transportation of fuel, equipment and materials, and supplies will increase overall traffic volumes, and may therefore increase the risk of motor vehicle collisions within the LAA. An increase in the number of collisions will affect first responders (ambulance, fire, RCMP) and health services in Dawson and Whitehorse.

During the busiest period for truck traffic, Years 1 through 8 of the Operation Phase, anticipated traffic is a maximum of approximately 8 trucks per day travelling to the site (see **Table 4.3-1**); an equal number of trucks will be travelling back out of the site each day. Existing roads on the proposed NAR currently experience light use in the summer months (7.6 passes per day on Eureka Ridge, 2.5 passes per day on Henderson, 0.9 passes per day on Maisy May). While this represents a large percentage increase in traffic volume, the absolute traffic numbers remain low, (See **Appendix 18-A Socio-economic Baseline Report** section 7.4.4, which describes existing traffic conditions).

An increase in road traffic will also have an effect on road maintenance due to increased wear on road surfaces. The NAR currently experiences weathering and flooding that will require upgrading as part of road improvements (see the Road Traffic section in **Appendix 18-A Socio-economic Baseline Report**).

Transportation of supplies and consumables poses a risk of spills of non-hazardous and hazardous materials (e.g., cyanide). An incident involving a spill will affect first responders (ambulance, fire, RCMP) and health services in Dawson and Whitehorse.

The presence of the Fortymile caribou herd in the area, together with the addition of wintertime road traffic, may contribute to a greater number of wildlife-vehicle collisions; however, improving visibility by removing roadside vegetation will result in a decrease in wildlife-vehicle collisions (Interview 13, Personal Communication 2016).

Improvements to the road system and regular road maintenance would likely have a positive effect on safety (Interview 15, Personal Communication 2016).

4.2.4.2 Effect of Increased Air Traffic on Aviation Infrastructure

Project employees will be transported to the Project site via air, with pick-up and drop-off points anticipated to be Dawson, Whitehorse, and potentially other communities based on where employees reside. Incidental freight and primarily catering supplies will also be transported by air during seasonal road closures. During the Project's Operation Phase, 117 to 188 flights are expected per year, primarily out of YXY. Crew changes are anticipated to be made using a 40-passenger Hawker Siddeley 748 or similar aircraft. This increase in air traffic may have effects on air transportation infrastructure, including both physical infrastructure (e.g., increased maintenance for runway and taxiway surfaces) and services (e.g., Air Traffic Control in Whitehorse).

4.3 MITIGATION MEASURES

This section describes mitigation measures for the elimination, reduction, or control of adverse effects on Community Infrastructure and Services, including applicable standards, guidelines, and best management practices. This section also describes enhancements for beneficial effects.

The selection of mitigation measures for Community Infrastructure and Services was informed by a review of mitigation measures and follow-up programs undertaken for past projects; regulator, First Nation, and public input; scientific information; and internal evaluation of technical and economic feasibility.

Mitigation measures to address potential adverse effects to Community Infrastructure and Services discussed in **Section 4.2** are described below and summarized in **Table 4.1-2**. Potential residual effects are described in **Section 4.4**.

4.3.1 PROJECT DESIGN

Potential adverse effects to Community Infrastructure and Services have been eliminated or reduced to the extent possible through Project design, including:

- Minimize vehicle traffic – Most personnel will operate on a two-week-on, two-week-off shift rotation on a fly-in/fly-out basis.
- Project siting – From its junction with the North Klondike Highway, the NAR (214 km) will follow existing government maintained roads up to Sulphur Creek. Beyond that point, the route will generally follow existing roads utilized by placer miners. In addition to upgrades and realignment along certain portions of the route to meet design criteria and make it suitable for year-round access, 37 km of new road construction will be required. This will minimize potential disruptions to vehicle traffic due to road construction during the Project's Construction Phase.
- Mine infrastructure – The mine will include waste management infrastructure comprising, but not limited to: sewage treatment, waste management (incineration landfill and land farm), recycling with final off-site disposal (to Whitehorse), special waste disposal on- and off-site.

4.3.2 LOCAL HIRING PRACTICES

Mitigation measures associated with local hiring practices are intended to address the following potential effects for Community Infrastructure and Services throughout all phases of the Project, by reducing Project-induced population influx:

- Increased demand for housing and accommodation
- Increased demand for physical infrastructure
- Increased demand for community services.

Local hiring mitigation measures comprise several components, including the following:

- The Proponent will develop a Local Employment Strategy to encourage the recruitment of local and territorial labourers in accordance with the Proponent's internal sustainability management system.
- The Proponent will provide first consideration for employment opportunities to qualified local, regional, and First Nations residents with appropriate skills and qualifications.
- The Proponent will communicate typical job descriptions, employment requirements (including skills and qualifications), and other information in a timely manner to enable local residents to prepare and seek any required training or experience in advance of Project Construction and Operation.
- The Proponent will develop a program for First Nations' employees to encourage work site integration and retention.
- The Proponent will advertise employment opportunities with appropriate local organizations and through appropriate venues.
- The Proponent will implement a Community Feedback Protocol to respond to questions and concerns regarding Project employment opportunities.
- The Proponent will engage with local businesses, industry partners, and organizations if potential concerns are identified related to local or regional labour competition. The Proponent will work with these groups to identify appropriate means to offset any challenges.
- The Proponent will engage educational bodies in the LAA and RAA to promote opportunities for experiential learning that will allow students to consider potential career paths within the mining industry.

The mitigation measures associated with local hiring practices will be implemented in conjunction with other Human Environment mitigation, such as education and training activities, an Engagement Plan, local contracting and procurement practices, and Workforce Transition Strategy, among others. Several of the measures proposed were informed by primary data collection and other Project communications. The local hiring mitigation measures are generally standard in the industry, and reflect the Proponent's commitments to continue to work closely with local communities and maximize local benefits associated with the Project.

Some local hiring measures are likely to begin implementation before the Project's Construction Phase begins. As part of the proposed socio-economic monitoring (refer to **Section 7.0**), the Proponent will track the effectiveness of the mitigation measures, and will adapt its strategies as needed based on feedback received.

4.3.3 EDUCATION AND TRAINING ACTIVITIES

Mitigation measures associated with training activities are intended to address the following potential effects for Community Infrastructure and Services throughout all phases of the Project, by enhancing local communities' ability to take on Project related employment, thereby reducing Project-induced population influx:

- Increased demand for housing and accommodation
- Increased demand for physical infrastructure
- Increased demand for community services.

Training measures comprise several components, including the following:

- The Proponent will communicate with local education and training organizations and institutions to identify and encourage availability of programs or courses necessary for Project employment to local and regional residents.
- Limited on-the-job training will be available for employees who identify a need or who express an interest in furthering their career.
- Career development opportunities will be available to encourage retention of employees and further develop the skills of the local labour force.
- New employee orientation will include cultural awareness training (refer to **Section 4.3.4**).
- The Proponent will provide or facilitate training opportunities for under-represented groups in the mining sector, such as First Nations and women.
- The Proponent will offer an Employee Assistance Program (EAP) which provides support for career development.

Developing training measures will assist in maximizing direct employment and employment-related incomes of LAA and RAA labour. In addition, developing and implementing education and training programs specific to affected First Nations will assist in addressing under-representation by identifying strategies for capacity building and overcoming barriers to employment. The measures associated with training activities will be implemented in conjunction with other Human Environment mitigation, such as a development and implementation of a Communication Plan and local hiring practices, among others. Several of the training measures were informed by primary data collection and other Project communications.

The training measures are generally standard in the industry, and reflect the Proponent's commitments to continue to work closely with local communities and maximize local benefits associated with the Project. Some training measures are likely to be implemented before the Project's Construction Phase begins. Uncertainty regarding the effectiveness and the ability to implement training measures are largely associated with the dynamic nature of labour markets, other project demands for labour in the region and territory, and individual choices. As part of the proposed socio-economic monitoring (refer to **Section 7.0**), the Proponent will track the effectiveness training measures, and adapt its strategies as needed based on feedback.

4.3.4 ENGAGEMENT PLAN

The Proponent recognizes the importance of engaging and consulting First Nations, on whose Traditional Territory the Project is proposed to be located, as well as engaging with local communities, and in establishing long-term, good-neighbor relationships. As part of this recognition, and the Proponent's commitment to engagement, the Proponent will develop and implement an Engagement Plan for the Project. Mitigation measures associated with the Engagement Plan are intended to address the following potential effects for Community Infrastructure and Services throughout all phases of the Project by enhancing local communities' awareness of and ability to apply for Project-related employment opportunities, thereby reducing Project-related population influx:

- Increased demand for housing and accommodation
- Increased demand for physical infrastructure
- Increased demand for community services
- Increased vehicle traffic and effect on transportation infrastructure
- Increased air traffic and effect on aviation infrastructure.

The Engagement Plan will comprise several specific measures, including the following:

- The Proponent will continue to communicate the status and schedule of the Project with local communities, residents, and organizations.
- The Proponent will implement a Community Response Protocol to respond to questions and concerns regarding Project. The Engagement plan will lay out the strategy and actions required to publicize this protocol through the course of ongoing engagement.
- The Proponent will communicate with its contractors and employees, as well as the governments of all assessment area communities regarding the Project's status and schedule. The Proponent will communicate any temporary and seasonal closure.
- The Proponent will communicate with representatives from the Yukon Government, including Health and Social Services and Community Services, to help inform planning for services based on hiring practices and anticipated in-migration for Project staffing and contracted services.

Successful engagement and consultation has and will continue to lead to First Nations and local communities' understanding the Project, and facilitate sharing. It will also allow the Proponent to have first-hand knowledge of the concerns and priorities First Nations and local communities about the Project. The measures associated with the Engagement Plan will be implemented in conjunction with other Human Environment mitigation such as local hiring practices, local procurement practices, and a Workforce Transition Strategy, among others. Several of the Engagement Plan measures were informed by primary data collection and other Project communications. The Engagement Plan measures are generally standard in the industry, and reflect the Proponent's commitments to continue to work closely with First Nations and local communities.

Some Engagement Plan measures are likely to be implemented before the Project's Construction Phase begins. Communications regarding status and schedule as the Project transitions from the Operation to Reclamation and Closure Phases will allow employees and local businesses to begin planning employment and other contracts as labour and goods and services needs on the Project diminish. Uncertainty regarding the effectiveness and the ability to implement Engagement Plan measures were not identified. In the event the Engagement Plan measures are not effective, potential benefits associated with the Project may not be realized to their fullest extent by local communities and residents, and miscommunications may occur. As part of the proposed socio-economic monitoring (refer to **Section 7.0**), the Proponent will track the effectiveness of Engagement Plan measures, and adapt its strategies as needed based on feedback received.

4.3.5 EMERGENCY RESPONSE PLAN

To address the possibility of Project-related accidents and malfunctions, the Proponent will develop an Emergency Response Plan in collaboration with local first responders and health administrators (see **Section 28 Accidents and Malfunctions** for more information). The Emergency Response Plan will include information about on-site personnel, equipment, and services available to address a potential emergency. It will be updated as needed and shared with the hospitals in Dawson and Whitehorse, as well as with emergency services.

The Proponent will not allow staff to leave the Project site while on their in-rotation, and will prohibit hunting and fishing to mitigate calls to emergency services for lost and injured parties.

The Proponent will have a zero tolerance policy for alcohol and drug use; will actively promote workplace safety, including transportation safety (speed limits, safe driving practices); and will provide on-site medical services to mitigate calls for medical emergencies.

The Emergency Response Plan or Spill Contingency Plan will contain contingencies for the following events, which are considered most likely to occur:

- Vehicle collisions that may result in personal injury or spillage of potentially harmful materials such as fuel, lubricating fluids, reagents, etc.
- Contact between vehicles and wildlife that may result in harm to wildlife, personal injury, or spillage of potentially harmful materials
- Single-vehicle accidents that may result in personal injury or spillage of potentially harmful materials
- Spills of harmful materials onto the land or into water courses.

4.3.6 ROAD SAFETY MEASURES

The Proponent will implement the following road safety measures for the NAR:

Communication Protocols

To address effects of increased vehicle traffic on existing NAR users, the Proponent will develop and communicate traffic management protocols during the Project's Construction and Operation Phases. All Proponent vehicles using the road will be equipped with a radio set to the NAR frequency. Prior to opening the road, the Proponent will advertise and hold at least one public meeting in Dawson to explain to the public the hazards of using the road and review safety procedures and rules, including right-of-way standards.

The Proponent will work with appropriate stakeholders including the YG's Highways and Public Works and RCMP to develop traffic management protocols for the NAR, including speed restrictions. Speed limits for the NAR will be 50 km per hour (km/h).

Mitigation measures to reduce the likelihood of incidents and accidents include limiting use of the road under poor weather or road conditions; carrying emergency roadside kits and emergency spill kits in all Proponent vehicles, including contractor vehicles; and having spill kits at all four barge landings.

Access Restriction

Access control will be implemented at the Stewart and Yukon River barges and ice road crossings. Only authorized vehicles will be permitted on Proponent-operated barges and ice bridges on the Stewart and Yukon Rivers.

Driver Training

The Proponent will have safety induction training for all applicable employees and contractor's employees on road safety rules, with training on defensive driving practices, driving in winter conditions and on gravel roads, and spill response. Topics will include the use of seat belts; observing posted speed limits; wildlife protection protocols, and improving visibility for others by wearing reflective clothing at all times.

Safety Policies

Use of seat belts will be mandatory for all Proponent drivers and passengers. Driving under the influence of alcohol or intoxicating drugs will be prohibited. All Proponent drivers will possess a valid driver's licence from a Canadian province or territory for the appropriate class of vehicle. All Proponent vehicles using the road will have radio contact capabilities, meet vehicle maintenance requirements, and will be familiar with spill response systems.

Signage

The Proponent will post appropriate signage along the road. Typically, these signs will advise drivers of the posted speed limits, approaching bridges, curves, or areas of low visibility. Signs will be posted to advise drivers of safety rules and road conditions. The Access Route Operational Management Plan provides more information about road signage.

4.3.7 FLIGHT SCHEDULING

To reduce a potential effect on aviation infrastructure in Whitehorse, the Proponent will consult with local authorities and airline companies regarding routine flight scheduling for crew changes during the Construction and Operation Phases. If needed, the Proponent will adjust flight timing to allow a spread between aircraft to minimize effects on air traffic control and reduce airport and passenger congestion.

Communication Protocols: For uncontrolled airports where flights will operate (e.g., Dawson), the Proponent will communicate schedule information for crew change flights to Community Aerodrome Radio Stations so local users are aware of when to expect traffic. Community Aerodrome Radio Stations provide aviation weather and communications services, including airport and traffic information and flight planning assistance.

Car Pooling and Staff Shuttle: The Proponent will encourage car-pooling through a staff message board. Employees will be able to post their neighbourhood and shift information to connect with other employees for ride sharing to the airport using a private social media group.

4.3.8 SUMMARY OF MITIGATION MEASURES

The mitigation measures are considered effective in avoiding or minimizing residual effects, however residual effects are still likely, as shown in **Table 4.3-1**.

Table 4.3-1 Summary of Potential Effects and Mitigation Measures for Community Infrastructure and Services

Summary of Potential Effect	Project Components	Contributing Project Activities	Proposed Mitigation Measure	Detectable / Measurable Residual Effect (Yes / No)
Construction Phase				
Housing and accommodation: Increased demand for housing and accommodation in LAA.	All construction activities	In-migration of workers (staff and contractors)	Local Hiring Practices Training Activities Engagement Plan	Yes
Physical infrastructure: Increased demand for physical infrastructure in LAA.			Local Hiring Practices Training Activities Engagement Plan	Yes
Community services: Increased demand for community services			Local Hiring Practices Training Activities Engagement Plan Emergency Response Plan	Yes
Transportation: Increased vehicle traffic and effect on transportation infrastructure	All construction activities	Transportation of equipment, material, and supplies for mine and road access	Road Safety Engagement Plan	No. The implementation of standard mitigation measures to manage transportation will likely avoid effects to transportation infrastructure.
Transportation: Increased air traffic and effect on aviation infrastructure	Mine Site construction activities	Transportation of personnel and material for mine	Flight Scheduling Engagement Plan	No. The implementation of mitigation measures to coordinate Project flights will likely avoid effects to aviation infrastructure
Operation Phase				
Housing and accommodation: Increased demand for housing and accommodation	Mine Site	In-migration of workers (staff and contractors)	Local Hiring Practices Training Activities Engagement Plan	Yes
Physical infrastructure: Increased demand for municipal physical infrastructure	Mine Site	In-migration of workers (staff and contractors)	Local Hiring Practices Training Activities Engagement Plan	Yes

Summary of Potential Effect	Project Components	Contributing Project Activities	Proposed Mitigation Measure	Detectable / Measurable Residual Effect (Yes / No)
Community services: Increased demand for community services	Mine Site	In-migration of workers (staff and contractors)	Local Hiring Practices Training Activities Engagement Plan	Yes
Transportation: Increased vehicle traffic and effect on transportation infrastructure	Northern Access Route	Transportation of equipment, material, supplies for mine	Road Safety Engagement Plan	No
Transportation: Increased air traffic and effect on aviation infrastructure	Mine Site	Transportation of personnel and, material for mine	Flight Scheduling Engagement Plan	No
Reclamation and Closure Phase				
No potential effects (negligible interactions were identified).				
Post-closure Phase				
No potential effects (negligible interactions were identified).				

4.4 RESIDUAL EFFECTS AND THEIR SIGNIFICANCE

This section describes anticipated residual effects of the Project (i.e., effects anticipated to occur subsequently to the application of mitigation measures) to Community Infrastructure and Services, and determines the significance, and likelihood of each residual effect for VC subcomponents, as well as the level of confidence associated with the determinations of significance.. The determination of significance for the potential residual effects on the VC is based on a consideration of the residual effects characteristics and socio-economic context of Community Infrastructure and Services subcomponents.

Residual effects for the Construction and Operation Phases have been assessed together, recognizing that the location decisions may vary between phases, but that the population driver for the potential effects to the subcomponents is the same. Effect characteristics will be similar, with the duration of the effect extending from Construction into Operation although the individual workers and their families may differ.

4.4.1 RESIDUAL EFFECTS CHARACTERISTICS AND SIGNIFICANCE DEFINITIONS

This section provides definitions for the effects characteristics that that are used to describe residual effects, and the definitions for the significance of the residual effects.

4.4.1.1 Residual Effects Characteristics

Definitions for ratings applied to residual effects characteristics developed with specific reference to the Community Infrastructure and Services VC are presented in **Table 4.4-1**.

Table 4.4-1 Effect Characteristics Considered When Determining the Significance of Residual Effects to Community Infrastructure and Services

Residual Effect Characteristic	Rating	Rationale
Direction	Identifies whether the residual effect will be adverse or positive.	<ul style="list-style-type: none"> • Adverse – the trend of the effect is considered undesirable or worsening from baseline conditions • Neutral – the trend of the effect is considered neither a worsening nor improvement from baseline conditions • Positive – the trend of the effect is considered desirable or an improvement from baseline conditions.
Magnitude	Size or severity of the residual effect – generally measured in terms of the proportion of the VC affected within the LAA, relative to the range of historic variation.	<ul style="list-style-type: none"> • Negligible – no effect is detectable from baseline conditions, or is in the normal range of variability in the human environment • Low – effect is detectable, but is not likely to be experienced at the community-wide level. The effect is limited to an inconvenience or nuisance, and is compatible with existing available policy guidance • Moderate – effect will result in demonstrable change and is possible at the community-wide level, but remains within historic change rates and does not present a management challenge • High – effect will result in changes beyond historic change rates, and presents a management challenge.
Geographic Extent	Spatial scale over which the residual effect is likely to occur.	<ul style="list-style-type: none"> • Local (limited to LAA or portion of LAA) • Regional (RAA or beyond RAA).
Timing	Occurrence of the residual effect with respect to the summer peak season in Dawson.	<ul style="list-style-type: none"> • Seasonal: correlates with summer peak season in Dawson • Not seasonal: No correlation with summer peak season.
Frequency	How often the residual effect is likely to occur.	<ul style="list-style-type: none"> • Infrequent – occurs once • Frequent – occurs at irregular intervals • Continuous – occurs on a regular basis and at regular intervals.
Duration	Length of time over which the residual effect is likely to persist.	<ul style="list-style-type: none"> • Short-term – occurs during the Construction Phase • Long-term – occurs throughout the Operation and Reclamation and Closure Phases • Permanent – extends to the Post-closure Phase and beyond.
Reversibility	Whether or not the residual effect can be reversed once the activity causing the residual effect ceases. Irreversible effects are considered to be permanent.	<ul style="list-style-type: none"> • Reversible – effect can be reversed to baseline or equivalent conditions, considering non-Project-related change in the human environment • Partially reversible – effect can be reversed partially to baseline or equivalent conditions • Irreversible – effect is permanent.
Probability of occurrence	Likelihood that the potential residual effect will occur.	<ul style="list-style-type: none"> • Likely – past experience indicates that the effect is likely to occur as a result of the Project • Unlikely – past experience indicates that the effect is not likely to occur as a result of the Project.

Residual Effect Characteristic	Rating	Rationale
Context	The extent to which the VC has been affected by past and present socio-economic processes and conditions, its potential sensitivity to the Project-related residual effect, and its ability to recover from that effect (i.e., resilience).	<ul style="list-style-type: none"> • Low – limited ability of community infrastructure and services to respond to disturbances. • Moderate – moderate ability of community infrastructure and services to respond to disturbances. • High – strong ability of community infrastructure and services to respond to disturbances.

In addition to the effect characteristics defined in **Table 4.4-1** above, the introduction to the residual effects for a subcomponent includes a narrative description of the context of the subcomponents. High resilience of subcomponents, or their ability to counteract or adapt to disturbances (natural, economic, social, or political) describes a community with strong resources and assets, such as infrastructure and services systems, including the ability to maintain and repair these systems (International Federation of Red Cross and Red Crescent Societies 2012).

4.4.1.2 Significance Definition

The significance of potential residual effects was determined based on the residual effect characteristic rating, a review of secondary data sources, consultation with government agencies, feedback obtained through primary data collection, and professional judgement. The level of each residual effect has been rated as not significant or significant, as follows:

Not Significant Effects determined to be not significant are those that are greater than negligible but that do not meet the definition of significant. Residual effects that are determined to be not significant are carried forward to the cumulative effects assessment (CEA).

Significant Effects determined to be significant are those characterized as high magnitude, any geographic extent, continuous frequency, long-term duration, and likely to occur. Context, and in particular low or moderate resiliency, is also considered. Significant residual effects are carried forward to the CEA.

The levels of confidence (i.e., low, moderate, high) for each potential Project-related effect is discussed to characterize the level of uncertainty associated with significance determinations. Level of confidence is typically based on expert judgement and is characterized as follows:

- **Low** – Judgement is hampered by an incomplete understanding of the cause-effect relationship, or a lack of data or primary data feedback on a specific topic.
- **Moderate** – Reasonable understanding of the cause-effect relationship exists, and there is adequate data; however, outcomes may be influenced by external influences, preferences, and choices.
- **High** – There is a good understanding of the cause-effect relationship and ample data, including regular feedback during primary data collection.

Predications regarding the characterization of residual effects on Community Infrastructure and Services as a result of the Project carry an element of uncertainty due to the dynamic nature of the human environment, including external influences such as global markets and individual choices.

For Human Environment VCs, standards, guidelines, objectives, and thresholds are not well defined, understood, nor agreed-upon (YESAB 2006). Characterizing the significance of residual human environment effects is more subjective, therefore, and relies on professional judgement, as well as feedback and input from primary data collection. The challenges include a lack of defined thresholds, integration of community context, resiliency, and perceptions, and inherent uncertainty regarding the dynamic nature of the human environment. The Proponent has taken a qualitative assessment approach when identifying and assessing the Human Environment VCs, using both quantitative and qualitative data.

4.4.2 HOUSING AND ACCOMMODATION

This section presents the potential Project-related residual effect on housing and accommodation, which consists of: increased demand on housing and accommodation during the Operation Phase.

As a result of population growth, Dawson has one of the largest needs for new housing in relation to other Yukon communities. Currently, housing needs are partially met by Yukon Housing Corporation, TH Housing, and private developers. Yukon Housing Corporation provides social housing opportunities for the general community and staff housing specifically for hospital staff. Operating as a non-profit on a break-even basis, TH Housing provides housing opportunities for TH citizens, and includes water, sewer, insurance, and property taxes in the rents it charges to occupants. Private developers provide housing opportunities on a for-profit basis to the general community.

4.4.2.1 Increased Demand for Housing during Construction and Operation Phase

Although the Proponent will prioritize local hiring, it is anticipated that some positions will be filled by people relocating to Yukon. Although a prediction cannot be made as to the number of out-of-territory hires, their family compositions, and where they choose to relocate, changes in population are anticipated to occur in the LAA as a result of direct Project employment, as well as indirect and induced employment resulting from Project expenditures and purchases of goods and services, which will result in increased demand on housing and accommodation.

As previously noted, Dawson housing needs are being partially met, and it is likely that even a modest population increase (such as predicted) would increase pressures on housing stock. Conversely, Whitehorse has had housing starts consistent with modest population growth, and after several years of a tight rental market, the vacancy rate has recently been increasing.

The potential Project-related effects on housing and accommodation during the Construction and Operation Phase are summarized in **Table 4.4-2**. It is likely that an increased demand on housing and accommodation will be experienced as an adverse, not significant effect of the Project that is moderate in magnitude, local in geographic extent (Dawson), seasonal in timing, continuous in frequency, long-term in duration, fully reversible, and likely to occur.

Table 4.4-2 Summary of Effect Characteristics for Increased Demand on Housing and Accommodation during Construction and Operation Phases

Residual Effect Characteristic	Rating	Rationale
Direction	Adverse	Dawson has experienced a chronic shortage in housing, and housing has been identified as a key concern for the community. Increased demand for housing stock will have an adverse effect in terms of reducing housing availability and possibly increase housing prices for rent and for purchase.
Magnitude	Moderate	The Proponent will prioritize hiring within Yukon, and will support local procurement. The number of employees relocating to the LAA is likely to represent population increases within historic change rates; therefore, this does not present a management challenge. Magnitude of the effect is likely higher in Dawson than in Whitehorse.
Geographic Extent	Local	Population growth will be noticeable in the LAA, primarily Dawson where new home construction is adequate for modest population growth and where the vacancy rate has been increasing in recent years.
Timing	Seasonal	An effect on housing will be more pronounced in summer months due to existing seasonal employment patterns in LAA.
Frequency	Continuous	Housing and accommodation demand will be reasonably steady throughout the Construction and Operation Phases.
Duration	Long-term	Housing and accommodation needs will be ongoing for workers throughout the Operation Phase.
Reversibility	Fully reversible	Population changes are anticipated to return to pre-Project levels following the Operation Phase of the Project.
Probability of occurrence	Likely	It is likely that a change in demand for housing and accommodation will occur as a result of the Project based on past experience with a quartz mining project in the vicinity (Brewery Creek).
Context	Moderate	Dawson has experienced boom and bust cycles in the past and therefore has a moderate ability of community infrastructure and services to respond to disturbances.

4.4.3 PHYSICAL INFRASTRUCTURE

This section presents the potential Project-related residual effect on Physical infrastructure, which consists of: increased demand on physical infrastructure during the Project's Construction and Operation Phases.

Current challenges related to expanding physical infrastructure in Dawson include high building costs, and securing knowledgeable contractors who can provide design and building services that reflect northern climate considerations. Whitehorse also faces challenges in that much of its infrastructure is aging and needs to be replaced.

4.4.3.1 Increased Demand on Physical Infrastructure during Construction and Operation Phases

Similarly to the residual effects for housing and accommodation, residual effects for physical infrastructure are likely to extend from the Construction Phase through the Operation Phase, with no effect anticipated during the Reclamation and Closure Phase due to low employment numbers. As discussed above, although the Proponent will prioritize local hiring, population increases are anticipated, resulting in an increased demand on municipal physical infrastructure in Dawson and Whitehorse.

Dawson has been experiencing capacity issues for its municipal infrastructure. Its landfill is nearing the end of its life span; in addition, the aging water pipe system is currently being upgraded, but requires additional improvement. The city is planning infrastructure upgrades to address these issues, but improvements may not take place in time to accommodate the Project. (Interview 7, Personal Communication 2016).

Conversely, Whitehorse has been in the process of expanding and improving its municipal infrastructure and has the capacity to accommodate modest population growth. It is unlikely the Project-related increase in population will have a measurable effect on municipal physical infrastructure in Whitehorse.

It is likely that an increased demand on physical infrastructure in Dawson during the Construction and Operation Phase will be experienced as an adverse, not significant effect of the Project that is low in magnitude, local in geographic extent, seasonal in timing, continuous in frequency, long-term in duration, fully reversible, and likely to occur.

Table 4.4-3 Summary of Effect Characteristics for Increased Demand on Physical Infrastructure during Construction and Operation Phases

Residual Effect Characteristic	Rating	Rationale
Direction	Adverse	Dawson has been in the process of upgrading physical infrastructure such as water and wastewater pipes. New wells have recently been installed and a new wastewater facility is in operation; however, the local landfill is nearing capacity and is limited in its ability to expand, and recycling needs to be trucked to Whitehorse.
Magnitude	Low	The Proponent will prioritize hiring within Yukon and will support local procurement. Additionally, it is likely that the number of employees relocating to the LAA and RAA will represent population increases within historic change rates; therefore, this does not present a management challenge.
Geographic Extent	Local	Population growth will likely be noticeable in the LAA, specifically Dawson, but will not be likely to have an effect in the Whitehorse, where municipal infrastructure is adequate for modest population growth.
Timing	Seasonal	An effect on physical infrastructure will likely be more pronounced in summer months due to seasonal workers and tourism in the LAA.
Frequency	Continuous	Physical infrastructure will be affected steadily throughout the Construction and Operation Phases.
Duration	Long-term	Physical infrastructure will be affected throughout the Construction and Operation Phase.
Reversibility	Fully reversible	Population changes are anticipated to return to pre-Project levels after the Operation Phase of the Project.
Probability of occurrence	Likely	It is likely that a change in demand on physical infrastructure will occur as a result of Project-related population growth.
Context	Moderate	Dawson has experienced boom and bust cycles in the past and therefore has a moderate ability for community infrastructure and services to respond to disturbances.

4.4.4 COMMUNITY SERVICES

This section presents the potential Project-related residual effect on community services, which consists of: increased demand on community services in the LAA and RAA during the Construction and Operation Phases.

4.4.4.1 Increased Demand on Community Services during Construction and Operation Phases

As discussed above, although the Proponent will prioritize local hiring, changes in population are anticipated to occur in the LAA as a result of direct Project employment, as well as indirect and induced employment resulting from Project expenditures and purchases of goods and services, which will result in increased demand on community services. Primary and acute health care services typically have the capacity to accommodate population increases associated with resource development; however, Dawson has been experiencing shortages in community services such as day care, family support, and mental health services (Interview 3, Personal Communication 2016; Interview 6, Personal Communication 2016; Interview 17, Personal Communication 2016).

With the implementation of mitigation measures, residual effects are likely to be not significant. **Table 4.4-4** summarizes the potential residual effects resulting from an increased Project-related demand on community services. It is likely that an increased demand on community services will be experienced as an adverse, not significant effect of the Project that is low in magnitude, local in geographic extent, season in timing, continuous in frequency, long-term in duration, fully reversible, and likely to occur.

Table 4.4-4 Summary of Effect Characteristics for Increased Demand on Community Services during Construction and Operation Phases

Residual Effect Characteristic	Rating	Rationale
Direction	Adverse	Dawson has adequate primary and acute care capacity, but is at or near capacity for several other services, e.g. day care.
Magnitude	Low	The Proponent will prioritize hiring within Yukon and will support local training. Additionally, it is likely that the number of employees relocating to the LAA will represent population increases that fall within historic change rates, and thus will not present a management challenge.
Geographic Extent	Local	Increased demand for services may be evident in Dawson
Timing	Seasonal	An effect on community services will be more pronounced in summer months due to regular seasonal workers and tourism in the LAA.
Frequency	Continuous	Community services will be affected steadily throughout the Construction and Operation Phase.
Duration	Long-term	Community services will be affected throughout the Construction and Operation Phase.
Reversibility	Fully reversible	Population changes are anticipated to return to pre-Project levels after the Operation Phase.
Probability of occurrence	Likely	A Project-related change in demand on community services will likely occur as a result of population growth.
Context	Moderate	Dawson has experienced boom and bust cycles in the past and therefore has a moderate ability of community infrastructure and services to respond to disturbances.

4.4.5 SUMMARY OF PROJECT-RELATED RESIDUAL ADVERSE EFFECTS AND THEIR SIGNIFICANCE

The potential residual adverse effects to Community Infrastructure and Services as described above include effects to housing and accommodation, municipal physical infrastructure, and community services. These effects are anticipated to be experienced primarily in the LAA, during the Construction and Operation Phases.

Significant residual effects on Community Infrastructure and Services subcomponents are not likely, as anticipated population increases will fall within historic population change rates. **Table 4.4-5** summarizes potential adverse Project-related residual effects on Community Infrastructure and Services.

Table 4.4-5 Summary of Potential Residual Adverse Effects on Community Infrastructure and Services

Potential Residual Adverse Effect	Contributing Project Activities	Proposed Mitigation Measure	Residual Effects Characterization										
			Direction	Magnitude	Geographic Extent	Timing	Duration	Frequency	Reversibility	Likelihood	Context	Significance	Level of Confidence
Construction and Operation Phase													
Housing and accommodation: Increased demand for housing	Mine operation	Local hiring practices Local procurement practices Communication Plan	A	MM	LAA	S	LT	CF	R	L	M	NS	M
Physical infrastructure: Increased demand for physical infrastructure	Mine operation	Local hiring practices Local procurement practices Communication Plan	A	LM	LAA	S	LT	CF	R	L	M	NS	M
Community services: Increased demand for community services	Mine operation	Local hiring practices Local procurement practices Communication Plan	A	LM	LAA	S	LT	CF	R	L	M	NS	M
Closure and Reclamation Phase													
None													
Post-closure Phase													
None													

Notes: Direction: Positive (P) Adverse (A).
 Magnitude: NM = Negligible, LM = Low magnitude, MM = Moderate magnitude, HM = High magnitude
 Geographic Extent: No = none, Site = negligible, LAA = low, RAA = regional, T = territorial
 Timing: S= seasonal YR= Year Round
 Duration: LT = Long-term, MT = Moderate-term, ST = Short-term, TT = Transient term
 Frequency: CF = Continuous, FF = Frequent, UF = Uncommon, RF = Rare
 Reversibility: R = Reversible, I = Irreversible, C = Change but may fluctuate from positive to adverse for the duration
 Context: L=Low, M=Moderate, H=High
 Likelihood: L=Likely, U=Unlikely
 Significance: NS = Not-Significant, S = Significant
 Level of Confidence: L=Low, M=Moderate, H=High

5.0 CUMULATIVE EFFECTS ASSESSMENT

This section presents an assessment of potential cumulative effects to the subcomponents of Community Infrastructure and Services. Cumulative effects result from interactions between Project-related residual effects and the incremental effects on the VC of other past, present, and reasonably foreseeable projects and activities. These projects and activities are identified in the Project and Activity Inclusion List provided in the Project Proposal (**Section 5.0 Assessment Methodology, Appendix 5-A**). The cumulative effects assessment (CEA) is consistent with guidance provided in the *Proponent’s Guide to Information Requirements for Executive Committee Project Proposal Submissions* (YESAB 2005), other widely accepted Canadian guidance documents (e.g., *Cumulative Effects Assessment Practitioners’ Guide* (Hegmann et al. 1999)), and the language regarding CEA in YESAA (section 42(d)).

5.1 PROJECT-RELATED RESIDUAL EFFECTS

Project-related residual effects on Community Infrastructure and Services, and rationales for their inclusion in or exclusion from the CEA is provided in **Table 5.1-1**.

Table 5.1-1 Project-related Residual Effects Considered in the Cumulative Effects Assessment

Project-related Residual Effect	Included in Cumulative Effects Assessment	Rationale
Increased demand for housing and accommodation during Operation Phase	Yes	Increased demand for housing and accommodation during the Construction and Operation Phase is likely to be an adverse residual effect.
Increased demand for physical infrastructure during Operation Phase	Yes	Increased demand for physical infrastructure during the Construction and Operation Phase is likely to be an adverse residual effect.
Increased demand for community services during Operation Phase	Yes	Increased demand for community services during the Construction and Operation Phase is likely to be an adverse residual effect.

5.1.1 CUMULATIVE EFFECTS BASELINE INFORMATION

Primary data collection activities were used to inform the Community Infrastructure and Services subcomponents. Other baseline information used to inform the CEA is provided in **Section 1.0 Introduction, Section 3.0 Existing Conditions**, and the **Socio-economic Environment Baseline Report (Appendix 18-A)**.

5.2 SPATIAL AND TEMPORAL SCOPE OF THE CUMULATIVE EFFECTS ASSESSMENT

As described in **Section 1.3.1**, the spatial boundaries of the CEA for the housing and accommodation, physical infrastructure, and community services subcomponents are defined as the Cumulative Effects Study Area in Figure 5B-1.

The temporal boundaries within which cumulative effects will be considered are defined as the life of the Project, including its Post-closure Phase. This temporal scope is the same as described in **Section 1.3.2**.

5.3 EFFECTS DUE TO OTHER PROJECTS AND ACTIVITIES

Other relevant projects and activities within the spatial and temporal scope of the CEA that may result in residual adverse effects to housing and accommodation, physical infrastructure, and community services and interact with the Project-related residual adverse effects are identified in **Table 5.3-1**. An overview description of each of these projects and activities is provided, along with relevant potential residual effects. Other projects and activities were identified from the Project and Activity Inclusion List in the Project Proposal (**Section 5.0 Assessment Methodology**). The other projects and activities have been grouped into general categories for an initial screening.

The following definitions were used to classify the status of projects and activities that may interact with the Project:

- Past — projects and land use activities that occurred in the past and are no longer active.
- Present — existing and active projects and land use activities; all projects or land use activities that applied for approval or permitting prior to 2015 are assumed to be present projects or land use activities.
- Future — reasonably foreseeable future projects or land use activities for which proposals have been submitted to YESAA (subsection 50(1)), or have entered into a formal approval or permitting process; applications submitted in 2015 and 2016 are assumed to be future projects or land use activities.

The effects of past and present projects and activities have been captured in the description of existing conditions (**Section 3.0**); therefore, the CEA focuses on interactions with reasonably foreseeable future projects and activities. Mineral exploration and placer mining projects have and will likely occur in, the Project region. Although the claim blocks can be very extensive and numerous, actual works are likely to be limited to a few focal areas for either a short period of time, or seasonally for many years, as is the case for several quartz claims in the area. Projects in each category summarized in **Table 5.1-1** were assessed in relation to the type of disturbance and potential interaction with each subcomponent.

Table 5.3-1 Potential Residual Adverse Effects of Other Projects and Activities on Community Infrastructure and Services

Other Project / Activity Category	Description	Potential Residual Effects
Quartz projects	Hard rock mining of ore bodies; activities include quartz exploration and quartz mining	Yes. Quartz projects can substantially affect in-migration, and therefore will be likely to measurably affect Community Infrastructure and Services.
Placer projects	Mining of alluvial deposits for minerals; activities include placer exploration, and placer mining	Yes. Placer projects may potentially affect in-migration, and subsequently affect Community Infrastructure and Services.
Transportation	Access road construction and upgrades, bridges, and culverts	No. Transportation projects are not anticipated to substantially affect in-migration, and therefore will be unlikely to measurably affect Community Infrastructure and Services.
Utilities	Water supply wells, wastewater treatment, and on-site sewage disposal systems	No. Utility projects are not anticipated to substantially affect in-migration, and therefore will be unlikely to measurably affect Community Infrastructure and Services.
Energy	Electric power transmission lines	No. Energy projects are not anticipated to substantially affect in-migration, and therefore will be unlikely to measurably affect Community Infrastructure and Services.
Forestry	Timber harvesting activities for commercial purposes or clearing of forest resources incidental to other activities	No. Forestry projects are not anticipated to substantially affect in-migration, and therefore would be unlikely to measurably affect Community Infrastructure and Services.
Agriculture	Soil-based agricultural land applications and livestock grazing land applications	No. Agriculture projects are not anticipated to substantially affect in-migration, and therefore will be unlikely to measurably affect Community Infrastructure and Services.
Settlements	Residential and commercial land use, community infrastructure, and historic sites	No. Settlements are not anticipated to substantially affect in-migration, and therefore will be unlikely to measurably affect Community Infrastructure and Services.
Industrial	Installation and upgrade of oil and solid fuel burning appliances and fuel oil storage tanks	No. Industrial projects are not anticipated to substantially affect in-migration, and therefore will be unlikely to measurably affect Community Infrastructure and Services.

5.4 POTENTIAL CUMULATIVE EFFECTS

This section identifies and discusses the potential interactions between Project-related residual effects and those of other projects and activities, as identified in **Table 5.3-1** and **Section 5.3**. Potential and residual effects are assessed for the VC as a whole, rather than subcomponents, due to the uncertainties in predicting future employment numbers, population increases and timeframes for other projects and activities.

Cumulative changes to the population driver for changes to the subcomponents are presented in **Appendix 19- A Intermediate Component Analysis Report Demographics**. The greatest increase in population due to other projects within the Yukon is anticipated to occur between 2020 and 2023 where workers (direct employment only) may add an average of 6,750 people to the total population. The predictions assume that all workers are bringing three dependents, one adult and two minors, and workforce estimates are based on publicly available information, and therefore subject to change based on other proponents' business decisions and market conditions.

Over the ten year period from 2018 to 2027, all cumulative projects (other projects including Coffee) are estimated to account 7.5 % to 16.1 % of the total Yukon population. Of this proportion, the Coffee project will account for approximately 2.0% of the anticipated future population size. As with all other projects, the greatest cumulative increase in worker's population will occur from 2020 to 2023 while all projects are in operation. Peak population will occur in 2021 with accumulative workers and dependents accounting for 16.1% (8,316 persons) of the total Yukon population. Workforce demand, and related population estimates are anticipated to drop beyond 2024 as some projects complete operations and move into closure and reclamation phases, which do not require the same level of personnel.

The larger population of Whitehorse provides resiliency to increased migration into the community, and cumulative changes are not considered likely. Smaller communities and Dawson have a lesser resilience for cumulative effects. The closest new mine, Casino Mine Project Proposal, is currently in the review stage under YESAA. The proposed mine site is located approximately 30 km away from the proposed Coffee Mine Site. The proposed access road for the Casino Mine, however, is via an extension off the Freegold Road from Carmacks and will not affect Dawson.

With this cumulative population increase, cumulative effects to the Community Infrastructure and Services VC subcomponents are also likely.

5.5 MITIGATION MEASURES

No additional mitigation measures are proposed to reduce the Project’s contribution to a cumulative, adverse, effects beyond those already proposed to mitigate changes likely to result from the Project for the Demographics IC and this VC. There is a lack of information about the mitigation measures for past, current, and future projects, however, it is assumed that other projects of similar size and scale have implemented or will implement appropriate mitigation measures to eliminate, reduce, or control project-specific adverse changes to demographics.

5.6 RESIDUAL CUMULATIVE EFFECTS AND SIGNIFICANCE OF RESIDUAL CUMULATIVE EFFECTS

Residual adverse cumulative effects to Community Infrastructure and Services will be moderated by the mitigation measures for local hiring practices to reduce in-migration, an engagement plan with local communities, and Project measures to provide travel options from both Whitehorse and Dawson, thus distributing population changes. Other mining projects will likely also have commitments that will reduce in-migration, and require engagement and coordination with potentially affected communities. The contribution of the Project to the not significant residual effect is low (approximately 2% of the population increase), The level of confidence in the assessment is low, given the uncertainties with other projects and activities. To address the uncertainties, the **Environmental and Socio-economic Management Program (Section 31.0** of the Project Proposal) will include adaptive management measures to develop and address reasonably foreseeable growth scenarios.

Table 5.6-1 Summary of Effect Characteristics for Cumulative Effects to Community Infrastructure and Services during Construction and Operation Phases

Residual Effect Characteristic	Rating	Rationale
Direction	Adverse	Demand for services is likely to adversely affect current services
Magnitude	Moderate	The number of employees relocating to the LAA will represent population increases that fall within historic change rates, and thus will not present a management challenge.
Geographic Extent	Regional	Population growth will be noticeable in the CEA based on the larger relative population size.
Timing	Seasonal	An effect on the VC will be more pronounced in summer months in Dawson due to regular seasonal workers and tourism; however, seasonal trends may not be evident in Whitehorse.
Frequency	Continuous	Community services will be affected steadily
Duration	Long-term	Community services will be affected throughout the Operation Phase.
Reversibility	Reversible	Reversibility of the population changes is dependent on market conditions in the future. .
Probability of occurrence	Likely	A Project-related change in demand on community services will likely occur as a result of population growth; however, the magnitude of the effect is dependent on investment decisions, market conditions and timing of other projects.
Context	Moderate	Communities in the RAA have experienced boom and bust cycles in the past and therefore have a moderate resiliency to changes in demand for community infrastructure and services

6.0 SUMMARY OF EFFECTS ASSESSMENT ON COMMUNITY INFRASTRUCTURE AND SERVICES

Overall, the Project has the potential for adverse residual effects on the housing and accommodation, physical infrastructure, and community services subcomponents. Adverse residual effects are not anticipated for the transportation subcomponent. Potential effects may be mitigated by Project design measures such as transporting personnel via air and by structural improvements to the NAR. Proposed mitigation measures include prioritizing local hiring to reduce the effects resulting from in-migration, particularly to Dawson. Ultimately, the smaller populations, labour forces, and focused local economies of the small communities in the LAA render these communities less resilient than the Dawson and Whitehorse, but still capable of responding to influences from Project mitigation. The LAA's smaller communities (Beaver Creek, Mayo, Pelly Crossing) may experience effects of uncertain size or direction as a result of the Project. Monitoring and adaptive management will be designed to address potentially adverse changes.

The residual cumulative adverse effects are anticipated to materialize in different ways depending on the community. The contribution of the Project to cumulative effects is likely to be low, based on the projected cumulative population changes from other projects

7.0 EFFECTS MONITORING AND ADAPTIVE MANAGEMENT

Due to the dynamic nature of the human environment, the Proponent will develop a socio-economic monitoring program to 1) verify the accuracy of the residual effects predictions, and the value of proposed mitigation measures; 2) assess the efficacy of proposed mitigation measures and the need for modifications to those measures to confirm effects predictions remain valid; 3) identify unexpected socio-economic outcomes or problems; and 4) implement additional mitigation measures as per adaptive management plans. A coordinated monitoring program will be developed for the Human Environment VCs, as well as for the Community Infrastructure and Services VC.

The socio-economic monitoring program will track and respond to various topic areas, including but not limited to:

- Local government expenditures or net costs as a result of the Project, related to service provision, housing, physical infrastructure, and community services
- Service shortages as a result of the Project, e.g. increased wait times for health and social services
- Local hiring practices
- Local contracting and procurement practices
- Transportation infrastructure- maintenance costs, collisions, injuries, or fatalities.

The approach and methods, including data sources, will be developed in conjunction with the City of Dawson, First Nations, and the YG. Common topics will include:

- Objectives of the program
- Proposed timing, frequency, and duration
- Implementation approach, including roles and responsibilities, potential community involvement, and mechanisms to compile, interpret, report, and maintain data and information
- Triggers or indicators to be used to signify the need for implementation of remedial measures, and the regulators to be involved in these decisions.

8.0 REFERENCES

1202 Motor Inn. n.d. 1202 Motor Inn, Beaver Creek Yukon. 1202 Motor Inn.

<<http://www.1202motorinn.ca/>>. Accessed 13 Mar 2017.

Alkan Air. 2016. Air Ambulance King Airlifts. Available at http://alkanair.com/alkanair_fleet/air-ambulance-king-airlifts/. Accessed April 2016.

Aviotech International Inc., DKMA Inc., and T-Square Architecture Ltd. 2013. Infrastructure Needs Assessment Study, Dawson City Airport. Prepared for Yukon Aviation Branch, Yukon Highways and Public Works and Government of Yukon.

Canadian Medical Association (CMA). 2016a. Physician Data Centre: Canadian physician statistics. Population per GP/FP by province/territory, 1986-2016. Available at https://www.cma.ca/Assets/assets-library/document/en/advocacy/17-Pop_per_FP.pdf. Accessed May 2016.

Canadian Medical Association (CMA). 2016b. Physician Data Centre: Non-primary care specialists per 100,000 Population by Province/Territory, 1986-2014. Available at https://www.cma.ca/Assets/assets-library/document/en/advocacy/15-Spec_per_pop.pdf. Accessed May 2016.

CBC News (CBC). 2017. Yukon gov't sues builder of Dawson City's troubled sewage treatment plant. Available at: <http://www.cbc.ca/news/canada/north/yukon-sues-dawson-city-sewage-plant-corix-1.3993381>. Accessed March 2017.

CBC News (CBC). 2015a. Whitehorse Discharges Treated Sewage into Yukon River Annually. Available at <http://www.cbc.ca/news/canada/north/whitehorse-discharges-treated-sewage-into-yukon-river-annually-1.3226024>. Accessed April 2016.

CBC News. 2015b. Beaver Creek fire department hopes new building lures volunteers. Available at: <http://www.cbc.ca/news/canada/north/beaver-creek-fire-department-hopes-new-building-lures-volunteers-1.3195511>. Accessed March 2017.

CBC News (CBC). 2014. Whitehorse Residents Line Up for Chance at Family Doctor. Available at <http://www.cbc.ca/news/canada/north/whitehorse-residents-line-up-for-chance-at-family-doctor-1.2519448>. Accessed April 2016.

CBC News. 2013. Yukon communities seek volunteer firefighters. Available at: <http://www.cbc.ca/news/canada/north/yukon-communities-seek-volunteer-firefighters-1.2432930>. Accessed March 2017.

- CBC News (CBC). 2012. Whitehorse Baby Boom Means Daycare Crunch. Available at <http://www.cbc.ca/news/canada/north/whitehorse-baby-boom-means-daycare-crunch-1.1297200/>. Accessed May 2016.
- Canadian Institute for Health Information (CIHI). 2016. Your Health System. Available at <http://yourhealthsystem.cihi.ca/hsp/indepth?lang=en#/indicator/034/2/C99003/>. Accessed March 2016.
- City of Dawson. 2016a. Landfill and Recycling Webpage. Available at <http://cityofdawson.ca/landfill-and-recycling>. Accessed April 2016.
- City of Dawson. 2016b. Public Works Webpage. Available at <http://www.cityofdawson.ca/municipal-info/city-departments/public-works>. Accessed April 2016.
- City of Dawson. 2016c. Protective Services. Available at <http://www.cityofdawson.ca/municipal-info/city-departments/protective-services>. Accessed April 2016.
- City of Dawson and Tr'ondëk Hwëch'in (TH). n.d. After the Gold Rush: The Integrated Community Sustainability Plan. Available at http://www.infrastructure.gov.yk.ca/pdf/icsp_dawson.pdf/ Accessed April 2016.
- City of Whitehorse. 2016. GIS Open Data. Available at <http://data.whitehorse.ca/>. Accessed June 2016.
- City of Whitehorse. 2013. 2010 Official Community Plan. Updated 2013. Available at <http://www.whitehorse.ca/home/showdocument?id=728> Accessed April 2016.
- City of Whitehorse. n.d.a. Animal Shelter Webpage. Available at <http://www.whitehorse.ca/departments/bylaw-services/animal-shelter> Accessed April 2016.
- City of Whitehorse. n.d.b. Waste Management Facility Webpage. Available at <http://www.whitehorse.ca/departments/water-and-waste-services/waste-management-facility>. Accessed April 2016.
- City of Whitehorse. n.d.c. Collection Schedule. Available at <http://www.whitehorse.ca/departments/water-and-waste-services/curbside-collection/collection-schedule>. Accessed April 2016.
- City of Whitehorse. n.d.d. Blue Bin Recycling. Available at <http://www.whitehorsebluebins.com/>. Accessed April 2016.
- City of Whitehorse. n.d.e. Curbside Recycling FAQ. Available at <http://www.whitehorse.ca/departments/environmental-sustainability/recycling>. Accessed April 2016.

City of Whitehorse. n.d.f. Water System. Available at <http://www.whitehorse.ca/departments/water-and-waste-services/water-system>. Accessed April 2016.

City of Whitehorse. n.d.g. Fire Department Webpage. Available at <http://www.whitehorse.ca/departments/fire-department>. Accessed April 2016.

City of Whitehorse. n.d.h. Volunteer Firefighters Webpage. Available at <http://www.whitehorse.ca/departments/fire-department/volunteer-firefighters>. Accessed April 2016.

City of Whitehorse. n.d.i. Bylaw Services. Available at <http://www.whitehorse.ca/departments/bylaw-services>. Accessed April 2016.

First Nation of Na-Cho Nyak Dun (FNNND). 2017a. First Nation of Na-Cho Nyak Dun; Capital Housing. First Nation of Na-Cho Nyak Dun. <<http://www.nndfn.com/departments/capital-housing/>>. Accessed 13 Mar 2017.

First Nation of Na-Cho Nyak Dun (FNNND). 2017b. Dunena Ko'Honete Ko – Mission Statement. Available at: <http://www.nndfn.com/departments/daycare/>. Accessed March 2017.

First Nation of Na-Cho Nyak Dun (FNNND). 2017c. Health & Social – Mission Statement. Available at: <http://www.nndfn.com/departments/social-health/>. Accessed March 2017.

Government of Yukon (YG). 2017a. Yukon Housing Corporation. Yukon Housing Corporation. Government of Yukon (YG). <http://www.housing.yk.ca/about_yhc.html>. Accessed 13 Mar 2017.

Government of Yukon (YG). 2017b. Recycling in Yukon. Recycling in Yukon - Department of Community Services- Government of Yukon. Government of Yukon (YG). <<http://www.community.gov.yk.ca/cd/recycling.html>>. Accessed 13 Mar 2017.

Government of Yukon (YG). 2017c. Water Management - Department of Community Services- Government of Yukon. Yukon Government Department of Community Services. Government of Yukon (YG). <http://www.community.gov.yk.ca/cd/water_management.html>. Accessed 13 Mar 2017.

Government of Yukon (YG). 2017d. Yukon Licensed Child Care Centres and Family Day Homes. Available at: <http://www.hss.gov.yk.ca/pdf/licensedchildcarecentres.pdf>. Accessed March 2017.

Government of Yukon (YG). 2016a. Yukon - Managing Solid Waste Sites. Government of Yukon - Environment. Government of Yukon (YG). <http://www.env.gov.yk.ca/air-water-waste/solid_waste_regs.php>. Accessed 14 Mar 2017.

- Government of Yukon (YG). 2016b. Solid Waste Facilities: Southwest Yukon. Yukon Government Department of Community Services. Government of Yukon (YG).
<http://www.community.gov.yk.ca/cd/solidwaste_southwest.html>. Accessed 13 Mar 2017.
- Government of Yukon (YG). 2016c. Agreement Reached on Dawson Wastewater Treatment Plant. Available at <http://www.gov.yk.ca/news/16-048.html#.V5ZntVUrKUK>. Accessed July 2016.
- Government of Yukon (YG). 2016d. Health and Social Services. Phone recording of clinics accepting new patients. Available at (867) 393-6980. Called April 2016.
- Government of Yukon (YG). 2016e. Mental Health Services. Available at:
http://www.hss.gov.yk.ca/mental_health.php. Accessed March 2017.
- Government of Yukon (YG). 2016f. About Yukon Wildland Fire Management. Available at:
<http://www.community.gov.yk.ca/firemanagement/about.html>. Accessed April 2016
- Government of Yukon (YG). 2016g. Yukon Licensed Child Care Centres and Family Day Homes. Available at <http://www.hss.gov.yk.ca/pdf/licensedchildcarecentres.pdf>. Accessed May 2016.
- Government of Yukon (YG). 2016h. Home care program. Available at:
<http://www.hss.gov.yk.ca/homecare.php>. Accessed March 2017.
- Government of Yukon (YG). 2016i. Yukon women's shelters. Available at:
<http://www.womensdirectorate.gov.yk.ca/shelters.html>. Accessed March 2015.
- Government of Yukon (YG). 2016j. Highways and Public Works. Weight Restrictions. Available at:
<http://www.hpw.gov.yk.ca/trans/transportservices/carriercompliance/weightrestrictions.html>. Accessed May 2016.
- Government of Yukon (YG). 2015a. Yukon Housing Corp. Annual Report 2015. Whitehorse, Yukon Territory, Canada.
- Government of Yukon (YG). 2015b. Pelly Crossing: Housing Tenure, Condition, Period of Construction and Structural Type NHS 2011. Government of Yukon Socio-Economic Web Portal. Government of Yukon (YG).
<http://www.sewp.gov.yk.ca/data?regionId=YK.PC&subjectId=POPCOM&groupId=POPCOM.DWELL&dataId=NHS_2011_HOUSING_TENURE&tab=region>. Accessed 13 Mar 2017.
- Government of Yukon (YG). 2015c. Yukon Housing Corporation. Housing Action Plan for Yukon 2015 – 2025. Available at http://static1.squarespace.com/static/54f8a9eee4b08027c3d3ebf0/t/5579c83ce4b0a256bd005d2f/1434044476918/HAP_Report.pdf. Accessed April 2016.

- Government of Yukon (YG). 2015d. Pelly Crossing: Housing and Shelter Costs NHS 2011. Government of Yukon Socio-Economic Web Portal. Government of Yukon (YG). <http://www.sewp.gov.yk.ca/data?regionId=YK.PC&subjectId=POPCOM&groupId=POPCOM.DWELL&dataId=NHS_2011_HOUSING_COSTS&tab=region>. Accessed 13 Mar 2017.
- Government of Yukon (YG). 2015e. Child & Adolescent Therapeutic Services. Available at: <http://www.hss.gov.yk.ca/cats.php>. Accessed March 2017.
- Government of Yukon (YG). 2015f. Department of Community Services. Fire Marshal's Office. Available at <http://www.community.gov.yk.ca/firemarshal/index.html>. Accessed April 2016.
- Government of Yukon (YG). 2015g. Mayo seniors' residence officially opened. Available at: <http://www.gov.yk.ca/news/15-258.html#.WMg5ZTsrKUK>. Accessed March 2015.
- Government of Yukon (YG). 2015h. Dawson City Housing Tenure, Condition, Period of Construction and Structural Type National Household Survey 2011. Available at: http://www.sewp.gov.yk.ca/data?regionId=YK.DW&subjectId=POPCOM&groupId=POPCOM.DWELL&dataId=NHS_2011_HOUSING_TENURE&tab=region. Accessed April 25, 2016.
- Government of Yukon (YG). 2015i. Beaver Creek Housing Tenure, Condition, Period of Construction and Structural Type National Household Survey 2011. Available at: http://www.sewp.gov.yk.ca/data?regionId=YK.BC&subjectId=POPCOM&groupId=POPCOM.DWELL&dataId=NHS_2011_HOUSING_TENURE&tab=region. Accessed March, 2017.
- Government of Yukon (YG). 2015j. Pelly Crossing Housing Tenure, Condition, Period of Construction and Structural Type National Household Survey 2011. Available at: http://www.sewp.gov.yk.ca/data?regionId=YK.PC&subjectId=POPCOM&groupId=POPCOM.DWELL&dataId=NHS_2011_HOUSING_TENURE&tab=region. Accessed March, 2017.
- Government of Yukon (YG). 2014a. Mayo - Housing Services. Yukon Community Profiles. Government of Yukon (YG). <<http://www.yukoncommunities.yk.ca/mayo/community-and-government/housing-services>>. Accessed 13 Mar 2017.
- Government of Yukon (YG). 2014b. City of Whitehorse. Available at <http://www.infrastructure.gov.yk.ca/201.html>. Accessed April 2016.
- Government of Yukon (YG). 2014c. Community Services. Yukon Projects. City of Whitehorse. Available at <http://www.infrastructure.gov.yk.ca/201.html>. Accessed April 2016.

- Government of Yukon (YG). 2014d. New health clinics offer patients collaborative care and drop-in evening hours. News Release #14-220. Available at <http://www.gov.yk.ca/news/14-220.html#.VxkeEk8rLIU>. Accessed April 2016.
- Government of Yukon (YG). 2013. Health and Social Services. Yukon Communicable Disease Control. Available at: <http://www.hss.gov.yk.ca/ycdc.php>. Accessed April 2016.
- Government of Yukon (YG). 2011. Highways and Public Works. Yukon Traffic Count Summary. Available at <http://www.hpw.gov.yk.ca/pdf/traf2011.pdf>. Accessed April 2016.
- Government of Yukon (YG). 2008. Northern Connections: A Multimodal Transportation Blueprint for the North. Available at <http://www.hpw.gov.yk.ca/pdf/northernconnections.pdf>. Accessed March 2017.
- Government of Yukon (YG). 2005. Community Hospitals & Health Centres. Available at: http://www.ykhealthguide.org/community/community_centres/. Accessed March 2017.
- Government of Yukon (YG). n.d.a. Health and Social Services. Healthy Families. Available at: <http://www.hss.gov.yk.ca/healthyfamilies.php>. Accessed May 2016.
- Government of Yukon (YG). n.d.b. Health and Social Services. A Guide to programs and services for Yukon Seniors & Elders. Available at: <http://www.hss.gov.yk.ca/pdf/ycoaprogramsandservcies.pdf>. Accessed May 2016.
- Government of Yukon (YG). n.d.c. Health and Social Services. Residential Care Facilities. Available at: <http://www.hss.gov.yk.ca/residentialcare.php>. Accessed May 2016.
- Government of Yukon (YG). n.d.d. Health and Social Services. Whistle Bend Care Facility. Available at: <http://www.hss.gov.yk.ca/whistlebend/>. Accessed May 2016.
- Government of Yukon (YG). n.d.e. Highways and Public Works. Enplaning/Deplaning Passenger Statistics/ Aircraft Moves. Available at http://www.hpw.gov.yk.ca/pdf/yxy_stats_2015.pdf. Accessed April 2016.
- Hegmann, G., C. Cocklin, R. Creasey, S. Dupuis, A. Kennedy, L. Kingsley, W. Ross, H. Spaling and D. Stalker. 1999. Cumulative Effects Assessment Practitioners Guide. Prepared by AXYS Environmental Consulting Ltd. and the CEA Working Group for the Canadian Environmental Assessment Agency, Hull, Quebec.
- International Federation of Red Cross and Red Crescent Societies. 2012. Characteristics of a Safe and Resilient Community. Available at: http://www.ifrc.org/PageFiles/96986/Final_Characteristics_Report.pdf. Accessed November 2016.

- Inukshuk Planning & Development. 2009. White River First Nation Comprehensive Community Development Plan. <http://www.infrastructure.gov.yk.ca/pdf/wrfn_icsp.pdf>.
- Joannou, A. 2015. Territory struggles with psychiatrist shortage. Yukon News. Available at: <http://www.yukon-news.com/news/territory-struggles-with-psychiatrist-shortage>. Accessed May 2016.
- Johnson, K. 2005. Livingstone Trail Environmental Control Facility (LTECF). Journal of the Northern Territories Water & Waste Association. Whitehorse, Yukon. September 2005, pp33–35. Available at http://www.maca.gov.nt.ca/resources/NTWasteWater_2005_Web.pdf. Accessed April 2016.
- Kerr, J. 2012. Territory moves to fix doctor shortage. Yukon News. Friday, November 9, 2012. Available at <http://www.yukon-news.com/news/territory-moves-to-fix-doctor-shortage>. Accessed April 2016.
- Klondike Development Organization (KDO). 2016. Property Search tool. Available at: <http://www.klondikedevlopment.com/propertymap/>. Accessed May 2016.
- Klondike Development Organization (KDO). 2014. Residential Land Demand: And Quarterly Activity Update. Available at http://www.klondikedevlopment.com/wp-content/uploads/2011/03/KDO_Land-Survey-Update.pdf. Accessed October 2015.
- Klondike Development Organization (KDO). 2013. Dawson Employer Labour Market Survey Report (July, 2013). Available at <http://www.klondikedevlopment.com/wp-content/uploads/2011/03/Dawson-Employer-Labour-Market-Survey-Report-2013.pdf>. Accessed October 2015.
- Klondike Development Organization (KDO). 2011. Klondike Development Organization Housing Strategy: Final Report (March 2011). Available at <http://www.klondikedevlopment.com/wp-content/uploads/2011/05/kdohousingstrategy.pdf>. Accessed October 2015.
- Lis, A. 2015. 2015 Whitehorse Housing Market Forum (Presentation). Available at http://www.housing.yk.ca/pdf/Northern_Roundtable_CMHC_Presentation_2015.pdf. Accessed April 2016.
- Peak Solutions Consulting Inc. 2016. Dawson City Airport Runway Paving Business Case Evaluation. Available at <http://www.dawsoncitychamberofcommerce.ca/wp-content/uploads/2015/02/Dawson-City-Airport-Paving-Business-Evaluation-January-29-FINAL-2016.pdf>. Accessed April 2016.
- Raven Recycling. n.d. About Raven Recycling. Available at <http://www.ravenrecycling.org/>. Accessed April 2016.

Royal Canadian Mounted Police (RCMP). 2017. Find a detachment. Available at: <http://www.rcmp-grc.gc.ca/detach/en/find/YT>. Accessed March 2017.

Scott Clark Consulting Inc. 2006. Policing in the Yukon: Report on a Public Consultation Process. Available at: http://www.justice.gov.yk.ca/fr/pdf/Yukon_Police_Review.pdf. Accessed March 2017.

Selkirk First Nation (SFN). 2017a. Selkirk First Nation: Housing. Selkirk First Nation. <<http://www.selkirkfn.com/government/departments/capital/housing/>>. Accessed 13 Mar 2017.

Selkirk First Nation (SFN). 2017b. Home & Community Care. Available at: <http://www.selkirkfn.com/government/departments/health-and-social-programs/kathleen-thorpe-scholarship-2/>. Accessed March 2017.

Statistics Canada. 2012. Census Profile – Dawson City, Yukon. Catalogue no. 98-316-XWE. Available at: <http://www12.statcan.gc.ca/census-recensement/2011/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=6001029&Geo2=PR&Code2=01&Data=Cout&SearchText=Dawson&SearchType=Begins&SearchPR=01&B1=Families%20and%20households&Custom=&TABID=1>. Accessed August 7, 2016.

Statistics Canada. 2017a. Whitehorse – Census of Population. Catalogue no. 98-316-X2016001. Available at: <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=6001009&Geo2=PR&Code2=60&Data=Cout&SearchText=Whitehorse&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=6001009&TABID=1>

Statistics Canada. 2017b. Dawson – Census of Population. Catalogue no. 98-316-X2016001. Available at: <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=6001029&Geo2=PR&Code2=60&Data=Cout&SearchText=Dawson&SearchType=Begins&SearchPR=01&B1=All&GeoLevel=PR&GeoCode=6001029&TABID=1>

Statistics Canada. 2015a. Beaver Creek; Housing Tenure, Condition, Period of Construction and Structural Type NHS 2011. Government of Yukon Socio-Economic Web Portal. <http://sewp.gov.yk.ca/data?regionId=YK.BC&subjectId=POPCOM&groupId=POPCOM.DWELL&datald=NHS_2011_HOUSING_TENURE&tab=region>. Accessed 13 Mar 2017.

Statistics Canada. 2015b. Beaver Creek; Housing and Shelter Costs NHS 2011. Government of Yukon Socio-Economic Web Portal. <http://sewp.gov.yk.ca/data?regionId=YK.BC&subjectId=POPCOM&groupId=POPCOM.DWELL&datald=NHS_2011_HOUSING_COSTS&tab=region>. Accessed 13 Mar 2017.

- Statistics Canada. 2015c. NHS Profile, Whitehorse, CA, Yukon, 2011. Available at <http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CMA&Code1=990&Data=Count&SearchText=Whitehorse&SearchType=Begins&SearchPR=01&A1=Housing&B1=All&Custom=&TABID=1>. Accessed October, 2016
- Statistics Canada. 2015d. NHS Profile, Dawson, T, Yukon, 2011. Available at <http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/details/page.cfm?Lang=E&Geo1=CSD&Code1=6001029&Data=Count&SearchText=Dawson&SearchType=Begins&SearchPR=01&A1=Housing&B1=All&Custom=&TABID=1>. Accessed October, 2016
- Statistics Canada. 2013a. NHS Profile, 2011. Catalogue no. 99-004-X. Available at: <http://www12.statcan.gc.ca/nhs-enm/2011/dp-pd/prof/index.cfm?Lang=E>. Accessed October 9, 2014.
- Statistics Canada. 2013b. Mayo: Private Household Size and Type Census 2011. Government of Yukon Socio-Economic Web Portal. Government of Yukon (YG). http://www.sewp.gov.yk.ca/data?regionId=YK.MO&subjectId=POPCOM&groupId=POPCOM.DWELL&dataId=CENSUS_2011_HOUSEHOLDS&tab=region. Accessed 13 Mar 2017.
- Tourism Yukon. 2017a. Discovery Yukon Lodgings & RV Park. Travel Yukon. <http://www.travelyukon.com/Plan/Operators/discovery-yukon-lodgings-rv-park>. Accessed 13 Mar 2017.
- Tourism Yukon. 2017b. Beaver Creek Hotels & Motels. Travel Yukon. <http://www.travelyukon.com/Plan/Accommodations/Hotels-and-Motels>. Accessed 13 Mar 2017.
- Tourism Yukon. 2017c. Mayo: Hotels & Motels. Travel Yukon. <http://www.travelyukon.com/Plan/Accommodations/Hotels-and-Motels>. Accessed 13 Mar 2017.
- Travel in the Yukon. 2017. Mayo Accommodations. Travel in the Yukon. <http://www.travelintheyukon.com/Mayo.cfm>. Accessed 13 Mar 2017.
- Tr'ondëk Hwëch'in (TH). 2012. Coffee Creek Traditional Knowledge Survey, Final Report. Private report prepared for Kaminak Gold Corporation.
- Village of Mayo. n.d.a. Village of Mayo: Landfill. Village of Mayo. Municipal Website. <http://villageofmayo.ca/landfill/>. Accessed 13 Mar 2017.

Village of Mayo. n.d.b. Mayo: Environmental Health. Village of Mayo. Municipal Website.

<<http://villageofmayo.ca/environmental-health/>>. Accessed 14 Mar 2017.

Village of Mayo. n.d.c. Protective Services. Available at: <http://villageofmayo.ca/protective-services/>.

Accessed March 2017.

Windeyer, C. 2015a. Dawson City needs new daycare to keep up with demand. CBC News. Available at:

<http://www.cbc.ca/news/canada/north/dawson-city-needs-new-daycare-to-keep-up-with-demand-1.3120017>. Accessed April 2016.

Windeyer, C. 2015b. Dawson City daycare crunch means choice between work and kids. CBC News.

Available at: <http://www.cbc.ca/news/canada/north/dawson-city-daycare-crunch-means-choice-between-work-and-kids-1.3129642>. Accessed April 2016.

Yukon Bureau of Statistics (YBS). 2015. Yukon Rent Survey October 2015. Available at:

http://www.eco.gov.yk.ca/stats/pdf/rent_Oct15.pdf. Accessed April 2016.

Yukon Community Profiles. 2014. Beaver Creek. Available at:

<http://www.yukoncommunities.yk.ca/beaver-creek/community-and-government-services/healthcare-services>. Accessed March 2017.

Yukon Environmental and Socio-economic Assessment Board (YESAB). 2005. Proponent's Guide to Information Requirements for Executive Committee Project Proposal Submissions. 2005.11.

Available at <http://www.yesab.ca/wp/wp-content/uploads/2013/04/Proponents-Guide-to-Info-Requirements-for-EC-Project-Submission.pdf>. Accessed December 2015. Accessed April 2016.

Yukon Hospitals. 2016. Our Hospitals. Available at: <https://yukonhospitals.ca/yukon-hospital-corporation/our-hospitals>. Accessed April 2016.

Yukon Housing Corporation (YHC). 2015. Housing Action Plan for Yukon 2015-2025. [Whitehorse]

Available at:

http://static1.squarespace.com/static/54f8a9eee4b08027c3d3ebf0/t/5579c83ce4b0a256bd005d2f/1434044476918/HAP_Report.pdf Accessed April 2016.

Yukon Housing Corporation (YHC). 2014. Yukon Housing Corporation Annual Report: for the year ended March 31, 2014. Available at http://www.housing.yk.ca/pdf/2014_YHC_annual_report.pdf.

Accessed October 2015.

Yukon Housing Corporation (YHC). 2013. Comprehensive Review and Assessment of Housing Issues in Yukon: Final Report, March 31, 2013. Presented to Yukon Housing Corporation by Luigi Zanasi

and Steve Pomeroy. Available at http://www.housing.yk.ca/pdf/comprehensive_analysis_yhc_issues_2013.pdf. Accessed October 2015.

Yukon Medical Council. 2015. 2015 – 2016 Physician Listing. Available at http://www.yukonmedicalcouncil.ca/pdfs/licensed_physicians.pdf. Accessed April 2016.

Yukon News. 2009. RCMP shortage in rural Yukon. Available at: <http://www.yukon-news.com/news/rcmp-shortage-in-rural-yukon>. Accessed March 2017.

Yukon Women's Directorate. 2016. Shifting Territory: Indicators of Yukon Gender Equality. Available at: <http://www.yukongenderequality.com/>.

Zanasi, L., and S. Pomeroy. 2013. Comprehensive Review and Assessment of Housing Issues in Yukon. Prepared for Yukon Housing Corporation (YHC). Available at http://www.housing.yk.ca/pdf/comprehensive_analysis_yhc_issues_2013.pdf. Accessed October 6, 2015.

8.1 PERSONAL COMMUNICATION

Interview 1, Coyne, J. January 13, 2016. Manager, Yukon EMS Community Operations, Whitehorse, Yukon.

Interview 2. February 8, 2016. Anonymous Contributor. Yukon College, City of Dawson, Yukon.

Interview 3, February 8, 2016. Anonymous Contributor. Dawson City Hospital, City of Dawson, Yukon.

Interview 4, Gerberding, L., Lancaster, J., Regimbal, J. February 8, 2016. Building Maintenance, Public Works Lead Head, Fire Chief, City of Dawson Public Works Department, Dawson City Fire Department, City of Dawson, Yukon.

Interview 6, February 9, 2016. Anonymous Contributors. Tr'ondëk Hwëch'in (TH) Health & Social Department, city of Dawson, Yukon.

Interview 7. Olesh, M. February, 9 2016. Development Officer, Community Development and Planning Services, City of Dawson, Yukon.

Interview 8, February 9, 2016. Anonymous Contributors. Tr'ondëk Hwëch'in (TH) Housing and Infrastructure Department, Dawson City, Yukon.

Interview 9, Van Nostrand, A. February 10, 2016. Program Coordinator, Canada Prenatal Nutrition Program, City of Dawson, Yukon.

Interview 11, Hastings, D., Van Enderslev, E., Guimoni, S. February 10, 2016. President, Vice-President, Board Member, Conservation Klondike Society (CKS), City of Dawson, Yukon.

Interview 13, Meister, K. February 12, 2016. Manager, Conservation Officer Services, City of Dawson, Yukon.

Interview 15, Dubois, M. February 11, 2016. Registered Trapping Concession #58, City of Dawson, Yukon.

Interview 16, Diles, K. February 11, 2016. Assistant Director, Dawson Women's Shelter, City of Dawson, Yukon.

Interview 17, Kendrick, B. February 12, 2016. TH Lands and Resources, City of Dawson, Yukon.

Interview 19, Mather, M., Nostrand, D. February 11, 2016. Vice President, President, City of Dawson Chamber of Commerce, City of Dawson, Yukon.

Interview 20, February 12, 2016. Anonymous Contributor. Klondike Development Organization (KDO), City of Dawson, Yukon.

Interview 21. Thompson, A. February 17, 2016. Realtor, Coldwell Banker Redwood Realty, City of Dawson, Yukon.

Interview 23, March 1, 2016. Anonymous Contributor. Klondike Outreach, City of Dawson, Yukon.

Interview 26, Morin, D. March 2, 2016. Sergeant, RCMP Dawson City Detachment, City of Dawson, Yukon.

Interview 28, Wickham, M. March 4, 2016. Project Manager, Klondike Development Organization (KDO), City of Dawson, Yukon.

Interview 29, de Jager, T. March 22, 2016. Owner, Yukon Wide Adventures, Whitehorse, Yukon.

Interview 30, Kern, H. March 23, 2016. President, Yukon River Quest, Whitehorse, Yukon.

Interview 31, Peterson, R. March 1, 2016. Councillor, Tr'ondëk Hwëch'in (TH) Council, City of Dawson, Yukon.

Road Users Focus Group, February 24, 2016. Westmark Whitehorse Hotel and Conference Centre, Whitehorse, Yukon.

Road Users Focus Group, February 24, 2016. MetroTower III, Burnaby, British Columbia.

Saunders J, Whitehorse Visitor Centre, Personal Communication June 9, 2016

Christie T., January 17, 2016. Email.