Northwest Community Studies

Growing the Population and Opportunities

InterGroup

CONSULTANTS

Prepared for the Nuclear Waste Management Organization

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ACRONYMS AND ABBREVIATIONS

Term	Details
AECL	Atomic Energy of Canada Ltd.
APM	Adaptive Phased Management
CD	Census Division
IAWG	Ignace and Area Working Group
NHS	National Household Survey
NWMO	Nuclear Waste Management Organization
NWO	Northwestern Ontario
The Project	APM Project
Township of Ignace	The Township or Ignace
Wabigoon LSB	Local Service Board of Wabigoon

TABLE OF CONTENTS

1.0 Introduction 1
1.1 Background and Context 1
1.2 Purpose and Scope 3
1.3 Spatial Boundaries 4
1.4 Temporal Boundaries 6
1.5 Linkages to Other Studies 6

2.0 Methodology 7
2.1 General Approach 7
2.2 Data Collection and Information Sources 7
2.3 Assessment 10

3.0 Existing Conditions 13
3.1 Population 13
3.2 Baseline Population Trends 20

4.0 Change Analysis 25
4.1 APM Project Characteristics Relevant to Growing The Population 25
4.2 Anticipated Population Changes From the Project 28
4.3 Considerations for Growing the Population 32

5.0 Options Assessment 34
5.1 Options for Consideration 34

6.0 Summary 42
6.1 Key Findings 42

7.0 References 43

APPENDICES

APPENDIX A List of Northwest Ontario Socio-Economic Community Studies

APPENDIX B Additional Statistics Canada Data

APPENDIX C Data Limitations

APPENDIX D Knowledge Holder Organizations and What We Heard

APPENDIX E Population Projections Methodology

APPENDIX F Case Study Summaries

APPENDIX G Project Workforce Requirements

APPENDIX H Glossary of Terms

LIST OF TABLES

Table 2.2-1: Lessons Learned from Case Studies 10
Table 3.1-1: Population Change in Other Local Study Area Communities 15
Table 3.1-2: Change in Indigenous Identity in the Other Local Study Area Communities 19
Table 4.1-1: Labour Projection by Phase 27
Table 5.1-1: Overview of Potential Options 35
Table 5.1-2: Option 1: Capture the First Wave of In-migration 37
Table 5.1-3: Option 2: Promoting Operations Employment Opportunities Early 39
Table 5.1-4: Option 3: Planning for Diversity 41

LIST OF FIGURES

Figure 3.1-1: Total Population in Ignace and the Other Local Study Area Communities, 1986 to 2021 14
Figure 3.1-2: Ignace Youths as a Proportion of the Total Population, 1996, 2006, 2011, and 2016 16
Figure 3.1-3: Indigenous Identity in Ignace and the Other Local Study Area Communities, 1996 to 2016 18
Figure 3.1-4: Types of Census Families in Ignace and the Other Local Study Area Communities, 1996 to 2016 20
Figure 3.2-1: Ignace Baseline Population Projection, 2016 to 2046 22
Figure 3.2-2: Other Local Study Area Communities Baseline Population Projection, 2016 to 2046 23
Figure 4.1-1: Characteristics of the Workforce by Phase for the APM Project 26
Figure 4.1-2: APM Project Residency Employment Planning Assumptions, 2024 to 2088 28
Figure 4.2-1: Ignace APM Planning Assumption Population Projection, 2016 to 2046 30
Figure 4.2-2: Other Local Study Area Communities APM Planning Assumption Population Projection, 2016 to 2046 31

LIST OF MAPS

Map 1.3-1: Study Area Map 5

1.0 INTRODUCTION

1.1 BACKGROUND AND CONTEXT

Since 2010, the Township of Ignace (the Township or Ignace) has been involved in a process of learning about the Nuclear Waste Management Organization's (NWMO) Adaptive Phased Management (APM) Project (the Project) for the long-term management of Canada's used nuclear fuel. The two remaining siting areas in the process are the Ignace Area and the South Bruce Area. The NWMO plans to complete all preliminary assessment work and to select one siting area to host the APM Project by 2023. Preliminary studies suggest that the Project can be implemented safely in the Ignace Area for a repository that will contain and isolate used nuclear fuel from people and the environment for the long timeframes required.

Studies have been ongoing since 2010; however, further studies are required to fully assess the potential socio-economic impacts of the APM Project. Building on previous work and engagement completed to date, the NWMO and the Township of Ignace are working together to prepare a suite of community studies that will be shared. The list of socio-economic community studies is included in Appendix A. The information acquired through these studies is expected to help the Township of Ignace leadership and residents make informed decisions about whether the Project is a good fit for their community, and if they are willing to consider hosting it and under what circumstances and terms.

Community studies will ultimately inform the Project hosting agreement between the NWMO and the Township of Ignace. As well, they will provide pertinent information for agreements with the City of Dryden and potentially other regional agreements.

A glossary of terms used throughout this report can be found in Appendix H.

Note to Reader

This and other community studies are preliminary and strategic in nature, all intended to identify possible consequences (e.g., to vulnerable populations, to local business opportunities and for local and regional job creation) in the Township of Ignace, and other local and regional communities. Using information about the APM Project known at this point in time, these community studies will describe a range of possible consequences that are the subject of specific and separate studies. For each possible consequence, potential options and strategies will be offered to leverage opportunities and/or mitigate possible negative consequences/effects.

It is important to note that these community studies (developed collaboratively by NWMO and the Township of Ignace) being investigated at this time are not the formal or final baseline or effects studies that will be part of the Impact Assessment as conducted under the regulatory process for the APM Project governed by the Impact Assessment Agreement of Canada. Effects assessment will be undertaken at a later date following the conclusion of the siting process, and the initiation of the formal regulatory process.

Community studies will ultimately inform the APM Project hosting agreement between the NWMO and the Township as Ignace. As well, they will provide pertinent information for agreements with the City of Dryden and potentially other regional agreements. The study will:

a) Explore in more detail the questions, aspirations and topics of interest expressed by the community through the Township of Ignace project visioning process;
b) Assist the NWMO and the Township of Ignace in developing and identifying possible programs and commitments that ensure the Project will be implemented in a manner that fosters the well-being of the Township of Ignace and communities in the Ignace Area and the region;
c) Advance learning and understanding on topics of interest to communities in the Ignace Area and the region; and
d) Provide the community with information it has requested to help them make an informed decision in the case of the Township of Ignace and continue to inform dialogue with communities in the Ignace Area and region prior to the conclusion of the site selection process in 2023.

The NWMO is committed to working collaboratively to ensure questions, concerns, and aspirations are captured and addressed through continuous engagement and dialogue.

The NWMO will independently engage with Wabigoon Lake Ojibway Nation and other Indigenous communities to understand how they wish to evaluate the potential negative effects and benefits that the Project may bring to their communities.

1.1.1 Land Acknowledgement

It is acknowledged that the lands and communities discussed in this report are primarily situated on the traditional territory of the Anishinaabe people of Treaty 3, and the Métis Nation.

1.1.2 Ignace Project Vision

Through learning about the Project, Ignace residents undertook a Project visioning process from July to September 2020 to identify the community's priorities and objectives for the Project if it is sited in Northwestern Ontario. This includes priorities for the Project in five key well-being areas: People, Economics and Finance, Infrastructure, Community and Culture, and Natural Environment.

The Township aspirations relating to population growth are (InterGroup 2020):

- Growing the population to 2,500-3,000 residents;
- Developing strategies to support and retain a population across all age groups, and in particular families with children; and
- Developing strategies to attract and retain new permanent residents in the community.

1.2 PURPOSE AND SCOPE

This report is on one of multiple community studies undertaken by the Township of Ignace and NWMO. The objectives of this study are to:

- Describe the population baseline with reference to past and projected population dynamics without the Project;
- List population growth aspirations for Ignace and other municipalities and unincorporated municipalities in the Local Study Area;
- Describe how the APM Project might impact population growth relative to the baseline condition;
- Identify opportunities and challenges associated with population growth with reference vulnerable groups; and
- Based on research into best and promising practices, describe mitigation and enhancement options and ideas more broadly, including reasons for consideration, alignment with community aspirations, and likelihood of success.

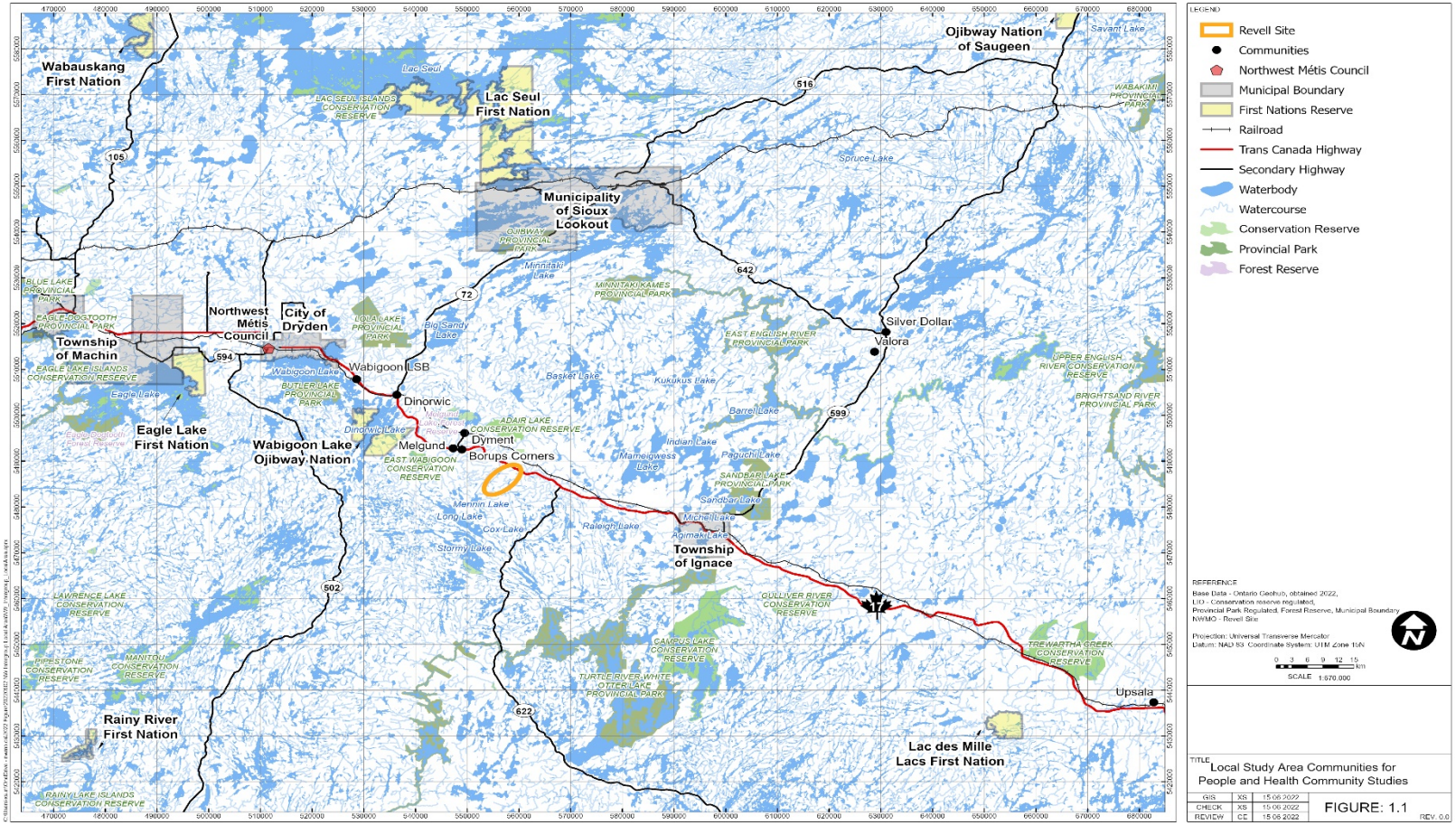
1.3 SPATIAL BOUNDARIES

The initial focus for the Growing the Population and Opportunities study is the Township of Ignace. Other communities included in the Local Study Area are within a one-hour drive from the Project Site, including the City of Dryden, Municipality of Machin, City of Sioux Lookout, Local Service Board of Wabigoon (Wabigoon LSB), and the Local Service Board of Melgund (including Dyment and Borups Corner).

Map 1.3-1 identifies the Local Study Area, and communities.[1]

[1] The Revell Batholith Temporary Withdrawal Area ('Revell Site' or 'Project Site') is the location of the primary APM infrastructure including the Deep Geological Repository, and ancillary infrastructure to support operations.

Map 1.3-1: Study Area Map



1.4 TEMPORAL BOUNDARIES

The temporal boundaries for the Growing the Population study are:

- **Pre-construction** (2024 to 2032), which begins with the siting decision and the first opportunity for the Township of Ignace and NWMO to start planning, includes construction of the Centre of Expertise in Ignace (construction to be completed by 2028), and ends with the beginning of construction;
- **Construction** (2033 to 2042), which begins in 2033, sees the focus of the Project at the APM Revell Project Site and lasts until 2042; and
- **Operations** (2043 and beyond), which begins with the end of construction and continues for over 40 years.

Since the lifespan of the Project is long, the Growing the Population study is primarily focused on the first few years of operations as it represents the best window of opportunity for attracting new residents to Ignace.

1.5 LINKAGES TO OTHER STUDIES

The Growing the Population study is closely linked with other community studies that consider the implications of the Project to Ignace and other communities in the Local Study Area, including:

- The People and Health and the Local and Regional Economics and Finance studies, includes a joint study on Workforce Development, and the Local and Regional Economics and Finance study, includes a study on the Labour Baseline. These studies examine opportunities to attract and develop a local workforce which can contribute to population growth.
- People and Health, Local and Regional Economics and Finance, and Infrastructure studies include a study on Community Health and Protection (including consideration of vulnerable populations), Housing, and Recreation and Social Services, respectively. Population growth will result in an increase in use of health, recreation, and social services and demand for housing.
- Community and Culture study includes a study on Community Identity and Resiliency. Ignace residents have indicated a desire to maintain a small-town feel which can be affected by population growth.

These studies should be read in conjunction with the Growing the Population study for a full appreciation and understanding of potential changes associated with growing the population.

2.0 METHODOLOGY

2.1 GENERAL APPROACH

The general approach for this community study involves the following steps:

1. **Existing Conditions**: Gathering information and data to characterize existing population dynamics, conditions, and future trends without the Project. Data collection is described in more detail in Section 2.2.
2. **Community Engagement**: Engaging with the Ignace and Area Working Group (IAWG) at key intervals to confirm findings, test assumptions, and discuss options.
3. **Change Analysis**: Completing a change analysis that summarizes the potential population change due to the Project. The change analysis considered additional population projection scenarios. These scenarios were informed by the findings from other community studies and case studies from other communities that experienced population growth related to a large infrastructure project.
4. **Options Assessment**: Describing potential options to maximize population growth opportunities that the Project presents and minimizing potential negative effects and constraints.

2.2 DATA COLLECTION AND INFORMATION SOURCES

2.2.1 Knowledge Holder Interviews

Interviews were conducted with Ignace and Local Study Area knowledge holders who have information and insight about changing population dynamics in the context of the area. The selection of knowledge holders was undertaken through an iterative process among the Township of Ignace, the NWMO, and the consulting team. Interviews were scheduled by NWMO staff who were also responsible for taking notes to ensure consistency across interviews. An NWMO staff member participated in the interviews to answer questions about the Project and go through the consent protocol. Members of the consulting team developed questions to guide the interviews. Appendix D provides a list of organizations the knowledge holders represent and a summary of what we heard.

Key information gathered from the interviews includes:

- Drivers influencing recent population trends;
- Information not captured by Statistics Canada or community reports; and
- Options to manage population growth.

2.2.2 Ignace and Area Working Group

To support the baseline and community studies work, the IAWG was established and membership consists of representatives from the Township of Ignace and other Local Study Area

municipalities and communities, service providers, businesses, civil society, and other interests - both local and regional. The Township of Ignace and NWMO have prepared reports noting the IAWG's input.

The IAWG provided community knowledge throughout the community studies to ensure local perspectives were considered. IAWG meetings relevant to the Growing the Population study took place on:

- August 2021 (IAWG 2021a): IAWG reviewed the scope of work for the People and Health, Community and Culture, and the Economics and Finance studies.
- October 2021 (IAWG 2021b): IAWG reviewed objectives and study areas for each of the community studies.
- December 2021 (IAWG 2021c): IAWG reviewed the key steps and schedules for each community studies and reviewed initial population projections without the Project for Dryden and Ignace.
- February 2022 (IAWG 2022a): IAWG reviewed population projections with the Project for Ignace and the other communities in the Local Study Area.
- April 2022 (IAWG 2022b): IAWG reviewed the final draft of the change analysis for Growing the Population, which included updated population projections with the Project. The updates reflected feedback IAWG members shared at the February 2022 meeting.

2.2.3 Other Information and Data Sources

Key information and data sources used in the Growing the Population study include:

- Statistical sources, including the Census of Population, the National Household Survey (NHS), population projections for Indigenous populations in Canada (Statistics Canada 2021), and Ministry of Finance (2020) population projections for Ontario Census Divisions (CDs);
- Planning documents for communities in the Local Study Area, including strategic plans (MDB Insight 2019; Sioux Lookout 2020), official plans (Dryden 2012; MHBC 2018; WSP 2020), and community safety and well-being plans (Ignace 2021; MNP 2021);
- Regional economic and planning documents from the Northern Policy Institute (2019) and the Northwest Training and Adjustment Board (2022);
- Project-related documents, including the Ignace Project Vision Report (2020), the Lifecycle Cost Estimate Update Cost Summary Report (NWMO 2021a), and NWMO Project Parameters memo (NWMO 2021b); and
- Documents relevant to the case studies, including academic literature, municipal and provincial websites, and newspaper articles.

2.2.4 Case Studies

Research into managed and sustainable population growth led to the selection of three case studies of municipalities who dealt with population growth from project development differently and with varying degrees of success:

- **Pinawa, Manitoba** grew from 1960 to 1964 because of planned growth to establish a workforce for the nearby Whiteshell Laboratories, a nuclear research and test facility that operated for approximately 40 years. The site is currently being decommissioned, which began in 2003, requiring the community to develop plans to ensure its sustainability.
- **Williston, North Dakota** experienced rapid population growth (increasing 67% between 2010 and 2014) because of increases in commodity prices for oil, which made adequate planning challenging. The median age in Williston during the same timeframe decreased from 55 to 30 years old. This required the community to plan for a different future than anticipated, and then resulted in further adjustments when commodity prices for oil fell.
- **Tumbler Ridge, British Columbia** grew because of planned growth initially to serve a coal mine. Construction of the town began in 1981 and continuously grew until 1999. Since 1999, the community has experienced multiple boom-bust cycles. The initial involvement of municipal and provincial governments has allowed the community to transition from the resource sector to other sectors, including tourism and green energy.

Table 2.2-1 describes lessons learned from the case study examples. Lessons were used to describe potential changes from the Project and inform options. More detail on case studies can be found in Appendix F.

Table 2.2-1: Lessons Learned from Case Studies

Lessons Learned to Manage Population Growth	Successes/Challenges Addressed
Plan well in advance to accommodate a growing population	• Communities should have housing ready in advance with various housing options, including single-detached dwellings, to attract families. • Pressures on health care, education, retail, childcare, and other services should be predicted and addressed proactively to ensure demands for services do not exceed capacity at the outset.
Ensure there is a balance between policies targeted towards specific populations (e.g., current residents, new residents, across age groups)	• A large influx of a workforce that is comprised of young adults and their families can result in the tendency for current residents (e.g., seniors) to be overlooked during policy planning. • Seniors' housing is important to have available, so residents can downsize and gradually transition to full care accommodations and grow old in the community where they have spent their adult lives and often have family.
Transition to a sustainable economy by planning for diversification (e.g., economic development plans, community sustainability plans)	• Important to lower the dependency on one industry or employer's success through diversification of the economy to ensure a sustainable economy and population through planning for a sustainable community.

2.3 ASSESSMENT

To complete the assessment of this study, analysis of existing conditions and trends without the Project and characterization of the potential changes because of the APM Project were completed.

Existing conditions and change analysis assessments involved analysis of primary and secondary data sources for key themes that included: underlying reasons for population change and reasons for attraction to a community; and changes that could be caused by the Project and experience with addressing those changes.

Once existing conditions were understood, information supplied by the NWMO about the Project, which it developed with the Township where relevant, and information from knowledge holders, members of the IAWG, and the consulting team was used to identify and confirm potential Project-related changes.

Changes were characterized in the context of the opportunities and challenges they present the Township of Ignace and other communities in the Local Study Area. Options were then developed to address Project-related impacts with the objective of maximizing potential benefits and opportunities and minimizing constraints and negative consequences.

2.3.1 Population Projections

A key step in the assessment was the development of population projections. They were completed for Ignace and the Local Study Area. This included baseline population projections (i.e., the potential future without the Project) and Project-related population projections (i.e., the potential future with the Project).

Typical drivers of population change are fertility rates, mortality rates and net migration. These drivers are affected by multiple factors including the age structure of the current population, government initiatives (e.g., programs to promote migration such as the Rural and Northern Immigration Pilot), and economic opportunities. Economic opportunities, in particular, require consideration of multipliers as the creation of new jobs may generate additional growth. As such, two sets of multipliers were considered relative growth driven by economic opportunities:

- **Family multiplier:** the family multiplier accounts for family members who migrate to the area with their spouses/partners/parents/children. Baseline population projections (i.e., population projections without the Project) use a family multiplier that is derived from the projected average household size in 2046. The family multiplier used for the Project accounts for a somewhat younger population consistent with overall trends in the Kenora CD, which is more consistent with Ignace's aspirations for the Project: attracting families and young professionals.
- **Economic multiplier**: Private (e.g., retail, accommodation) and public (e.g., health care, educational services) sector jobs are created in response to economic development and the associated increased in population. The economic multipliers are used to estimate the number of indirect and induced jobs that are created because of those direct jobs, and thus potentially add to population growth. The population projections with and without the Project use the same economic multiplier except for the lower bound of the conservative projections for the future without the Project. A more conservative economic multiplier was selected to reflect the potential for lower economic opportunities or other potentially less favourable economic circumstances. Other scenarios capture different levels of economic growth and therefore use a higher economic multiplier.
    - The economic multiplier is applied to the direct Project employees and their families to capture the creation of new jobs to serve the growing population that in turn increase migration. The economic multiplier is applied only to the direct employees and their families but is not applied to the new economic migrants to avoid over-estimating growth. With that said, when projecting for growth relative to things like infrastructure, the precautionary approach is to overestimate demand to ensure that the basic needs of the community can be met.

Overall, the population projections with the Project attempted to balance the potential opportunities while allowing for consideration of a growing population's needs. Appendix E presents more detail on how the multipliers were derived for population projections.

3.0 EXISTING CONDITIONS

Existing population conditions and trends observed in the Local Study Area include:

- The population in Ignace has remained stable but flat for the last 10 years and the population in some Local Study Area communities has been increasing.
- The populations in Ignace and the other Local Study Area communities have been diversifying (e.g., growth in the proportion of the population that identifies as Indigenous or as a visible minority).
- The number of census family couples with children at home has declined more in Ignace compared to the other municipalities in the study area.
- The Township of Ignace has expressed a desire to grow the population to 2,500-3,000 residents.
- Aspirations related to population growth identified by other communities in the Local Study Area include:
    - Dryden has identified measures to ensure their population growth targets are being met, including an increase in rental housing units to support new residents, working-age families, and youths (MDB Insight 2019).
    - Sioux Lookout has identified a priority to proactively invest in the community to encourage growth. Goals outlined to achieve this include providing infrastructure and housing to meet the needs of the community, enable community growth through innovating and proactive planning, and strengthening and enhancing Sioux Lookout's status as "Hub of the North" (Sioux Lookout 2020).
    - Machin identified the desire to ensure there is sustainable growth and the need to focus on elders' and youths' well-being to ensure sustainability (MNP 2021).

3.1 POPULATION

The Township of Ignace had 1,206 residents in 2021 (Statistics Canada 2022). While this is a decrease from 2,314 residents in 1986, the population has remained stable yet flat since 2011 (1,202 residents). The long-term decrease is a result of an aging population, mine closures, forestry-sector decline, and residents leaving the community. Residents leave to pursue employment, training, and education and most do not return because of limited opportunities in the area (Northwestern Ontario [NWO] Community and Baseline Studies Knowledge Holder Interviews 2022).[2]

The population of Ignace fluctuates seasonally. In the summer, cottagers add to the population. Currently there are approximately 60 seasonal cottage dwellings, which is estimated to represent approximately 125 seasonal residents if using the average household size for Ignace (Statistics

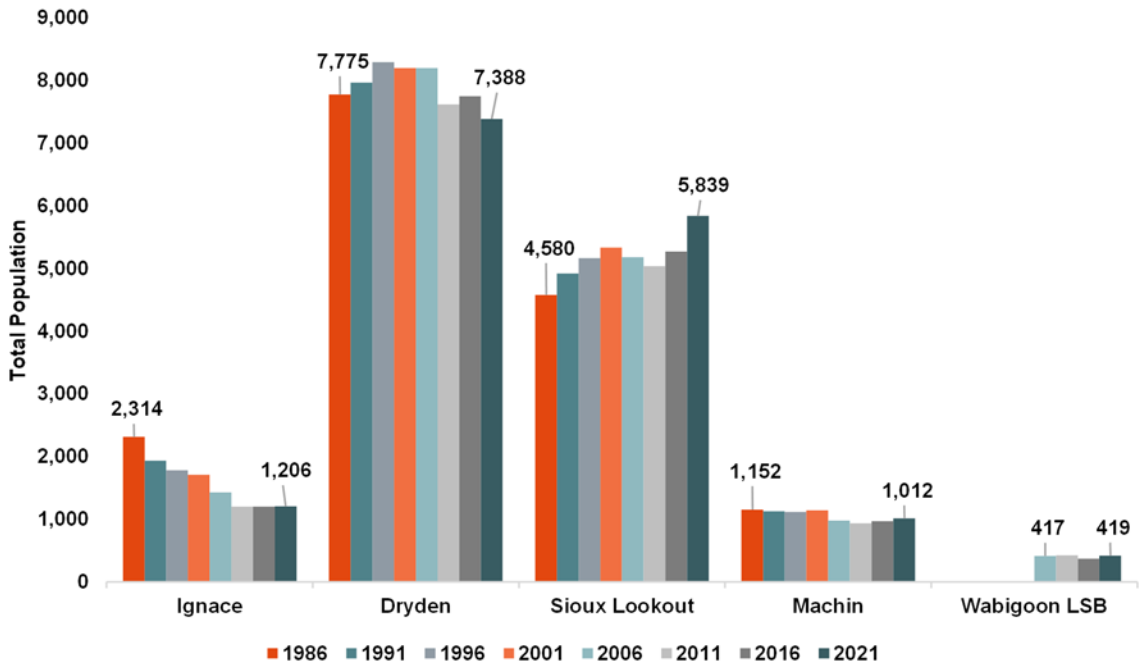
[2] Figure B-1 in Appendix B shows the age and sex distribution for Ignace in 1996 compared to 2016.

Canada 2017; NWO Community and Baseline Studies Knowledge Holder Interviews 2022). Some of the cottagers support the local economy by paying property taxes, water fees, and sewer fees.

Canadian Pacific Railway and Ricci Trucking have temporary accommodations in Ignace for their workforce. The bunkhouses for Ricci Trucking employees are used year-round. They accommodated up to 24 individuals before COVID-19. Currently, they accommodate up to 12 employees. Employees typically stay in the bunkhouses for four nights, arriving on Monday and departing on Friday (NWO Community and Baseline Studies Knowledge Holder Interviews 2022).

In the Local Study Area, other communities have not experienced the same degree of population decrease. Sioux Lookout has experienced a substantial population increase (Figure 3.1-1).

Figure 3.1-1: Total Population in Ignace and the Other Local Study Area Communities, 1986 to 2021



Source: Statistics Canada Census 1986-2021.
Notes: See Appendix C for detailed information on data limitations.

Table 3.1-1 summarizes population trends from 1986 to 2021 for other communities in the Local Study Area.

Table 3.1-1: Population Change in Other Local Study Area Communities

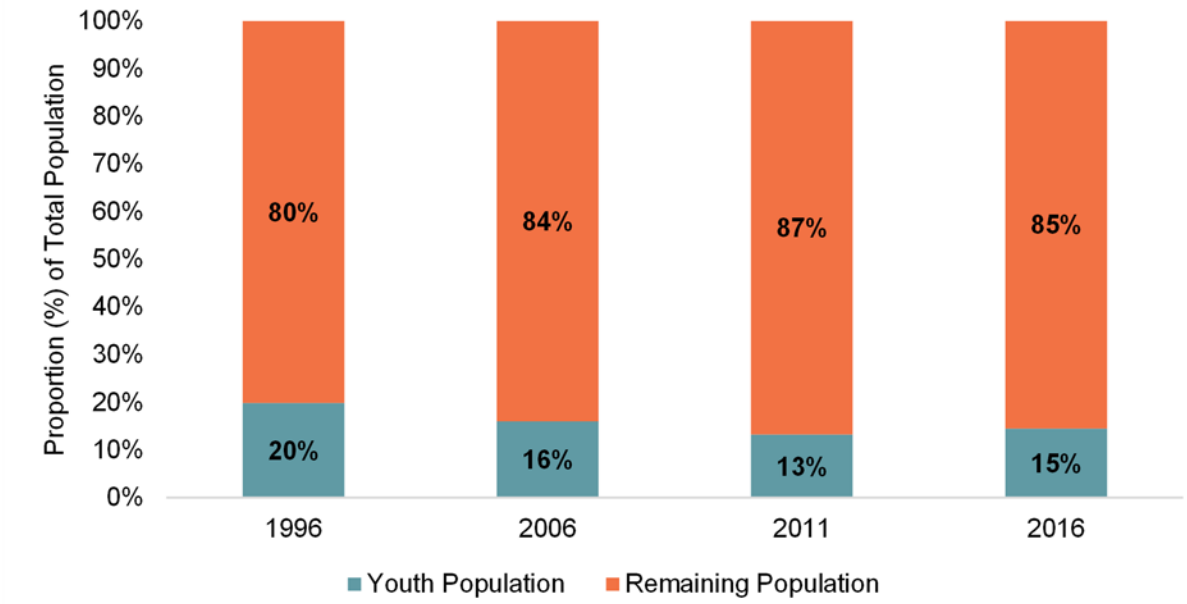
Community	Population Change
City of Dryden	• The population in Dryden decreased slightly from 7,775 in 1986 to 7,388 in 2021 (Statistics Canada 2020, 2022). • Dryden had the largest decline in population of -4.7% among municipalities in Ontario from 2016 to 2021 (NWO Community and Baseline Studies Knowledge Holder Interviews 2022; Forbes 2022).
Municipality of Sioux Lookout	• The population in Sioux Lookout has steadily increased from 4,580 in 1986 to 5,839 in 2021 (Statistics Canada 2020, 2022). • From 2016 to 2021, the Municipality of Sioux Lookout had its largest population growth of 10.8% over the last 25 years (5,272 in 2016 to 5,839 in 2021) (Statistics Canada 2017, 2022). • Population growth was attributed to the availability of jobs in the municipality and members of First Nations with reserves north of the municipality moving to the community (NWO Community and Baseline Studies Knowledge Holder Interviews 2022).
Municipality of Machin	• The population in Machin has decreased slightly from 1,152 in 1986 to 1,012 in 2021 (Statistics Canada 2020, 2022).
Local Service Board of Wabigoon (Wabigoon LSB)	• The population in the Wabigoon LSB has been relatively stable since 2006 with a population of 417 to a population of 419 in 2021.

Source: Statistics Canada Census 1986-2021.
Notes: See Appendix C for detailed information on data limitations.

From 1991 to 2011 there was a large out-migration of families in Ignace which resulted in a decline in the youth population (540 families in 1991 to 255 in 2011) (Statistics Canada 1992, 2012). Participants in the Knowledge Holder Interview Program noted that youth are leaving communities in the Local Study Area to pursue education and employment opportunities and often not returning (NWO Community and Baseline Studies Knowledge Holder Interviews 2022). Ignace experienced a decline in the total number of youths between 1996 to 2016 (355 youths in 1996 to 175 in 2016). This represented a 51% decline in the total number of youths. Over this period there was also a 5% decline of youths as a proportion of the total population (Figure 3.1-2). Other communities in the Local Study Area experienced a 10% increase in the total number of youths over the same timeframe, although youths as a proportion of the total population declined by 2%[3] as a proportion of the total population (Statistics Canada 1998, 2017).

[3] Youth are residents who are in the labour force and younger than 30 years old (i.e., ages 15 to 29 years old).

Figure 3.1-2: Ignace Youths as a Proportion of the Total Population, 1996, 2006, 2011, and 2016



Source: Statistics Canada Census 1996, 2006, 2011, 2016.
Notes: See Appendix C for detailed information on data limitations.

3.1.1 Population Mobility

The proportion of the Ignace population that are 5-year migrants[4] has increased in each census since 2006. Mobility statistics[5] for Ignace show a five-year in-migration rate between 2001-2006 of 10% (140 migrants) and 2011-2016 of 23% (280 migrants) (Statistics Canada 1998, 2017).[6] This corresponds with the period when the population in Ignace has stabilized. A knowledge holder suggested that the increasing five-year in-migration rate may be due to the aging population slowly putting more homes on the market and younger families with children are moving in (NWO Community and Baseline Studies Knowledge Holder Interviews 2022). The trend would still be limited by the housing shortage for both permanent and rental housing in the Local Study Area (see Housing study for more information) (NWO Community and Baseline Studies Knowledge Holder Interviews 2022).

[4] 5-year migrant status refers to the status of a person with regard to their place of residence on the Census reference day and is then within a different census subdivision in relation to their place of residence on the same date five years earlier.
[5] Mobility status refers to whether a person's usual place of residence changed in relation to their place of residence one or five years earlier. Migrant mobility status is synonymous to in-migration and refers to if a person lived in a different census subdivision one or five years prior to the Census reference day (Statistics Canada 2008).
[6] Figure B-4 in Appendix B shows the 5-year migrant mobility (in-migration) for Ignace and the Local Study Area for 1996, 2006, 2011, and 2016.

Knowledge holders identified out-migration as a concern in the Kenora CD (NWO Community and Baseline Studies Knowledge Holder Interviews 2022). The Northwest Training and Adjustment Board reported a net migration of 807 residents leaving the Kenora CD from 2014 to 2019 (NTAB 2022). There was a net out-migration of 435 residents aged 65 years and older, while 231 residents aged 25 to 44 years old moved into the Kenora CD (NTAB 2022). The positive net migration for individuals aged 25 to 44 years old suggests that younger families are moving into the region.

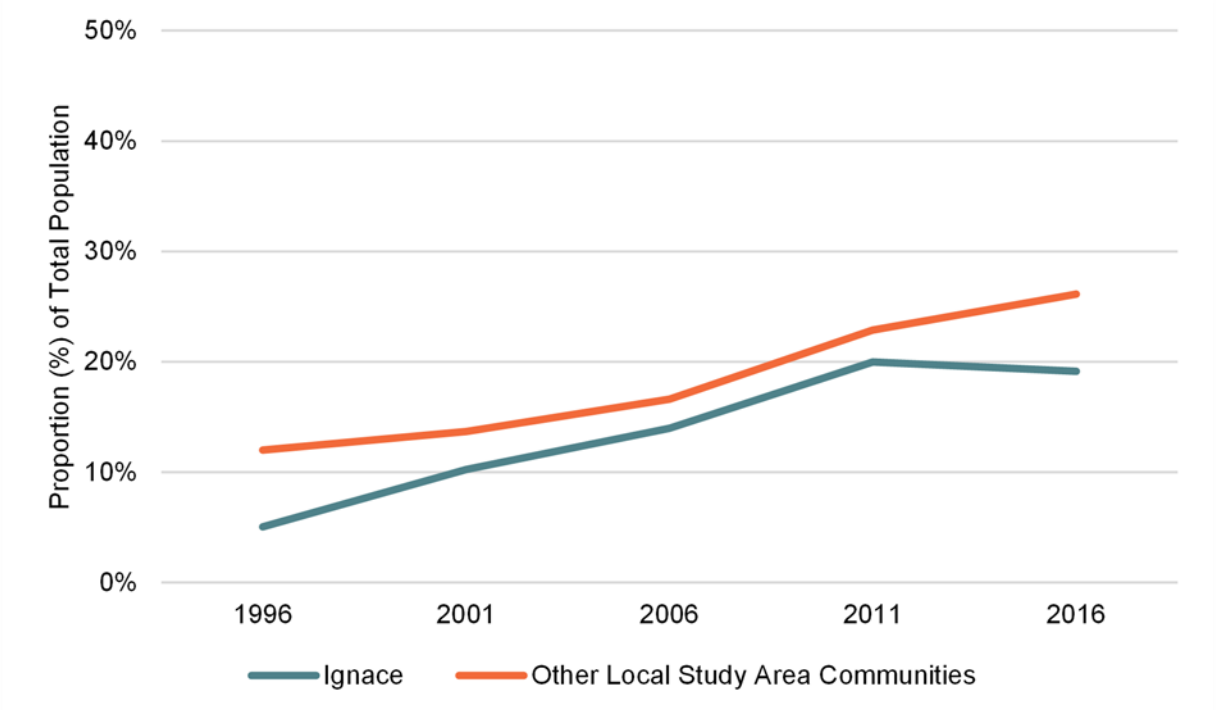
3.1.2 Population Diversity

Ignace and other Local Study Area communities have shown an increase in residents who belong to visible minorities or identify as Indigenous. In 1996, approximately 1% of the total population were visible minorities in Ignace (15 residents) and the Local Study Area (135 residents) (Statistics Canada 1998).[7] By 2016, the proportion increased to over 2% for Ignace (25 residents) and nearly 3% in the Local Study Area (425 residents) (Statistics Canada 2017).

Since 1996, the proportion of Ignace residents who identify as Indigenous has increased from 5% in 1996 (90 residents) to 19% in 2016 (230 residents) (Figure 3.1-3). The increase mirrors population trends noted by Statistics Canada (2021), which projects that the Indigenous identity population in Canada will increase at a faster rate than the non-Indigenous population through 2041. Reasons include a higher fertility rate and changes in self-reporting. For example, legislative changes have allowed more individuals who live off reserve to apply for Registered Indian status.

[7] Table B-2 in Appendix B shows the proportion of visible minorities for communities in the Local Study Area from 1996 to 2016.

Figure 3.1-3: Indigenous Identity in Ignace and the Other Local Study Area Communities, 1996 to 2016



Source: Statistics Canada Census 1996, 2001, 2006, 2016. Statistics Canada 2011 NHS.
Notes: See Appendix C for detailed information on data limitations.

Other communities in the Local Study Area have also experienced an increase in the proportion of residents who identify as Indigenous (Table 3.1-2).[8]

[8] Figure B-3 in Appendix B presents the change in individuals identifying as Indigenous for communities in the Local Study Area from 1996 to 2016.

Table 3.1-2: Change in Indigenous Identity in the Other Local Study Area Communities

Community	Population Change
Dryden	• The proportion of the population in Dryden who identify as Indigenous has increased from 6% in 1996 (385 residents) to 19% in 2016 (1,465 residents).
Sioux Lookout	• The proportion of the population in Sioux Lookout who identify as Indigenous has increased from 28% in 1996 (965 residents) to 37% in 2016 (1,955 residents).
Machin	• The proportion of the population in Machin who identify as Indigenous has increased from 12% in 1996 (130 residents) to 24% in 2016 (230 residents).
Wabigoon LSB	• The proportion of the population in the Wabigoon LSB who identify as Indigenous was 51% in 2016 (190 residents) and was not reported in previous Census periods.

Source: Statistics Canada Census 1996, 2001, 2006, 2016. Statistics Canada 2011 NHS.
Notes: See Appendix C for detailed information on data limitations.

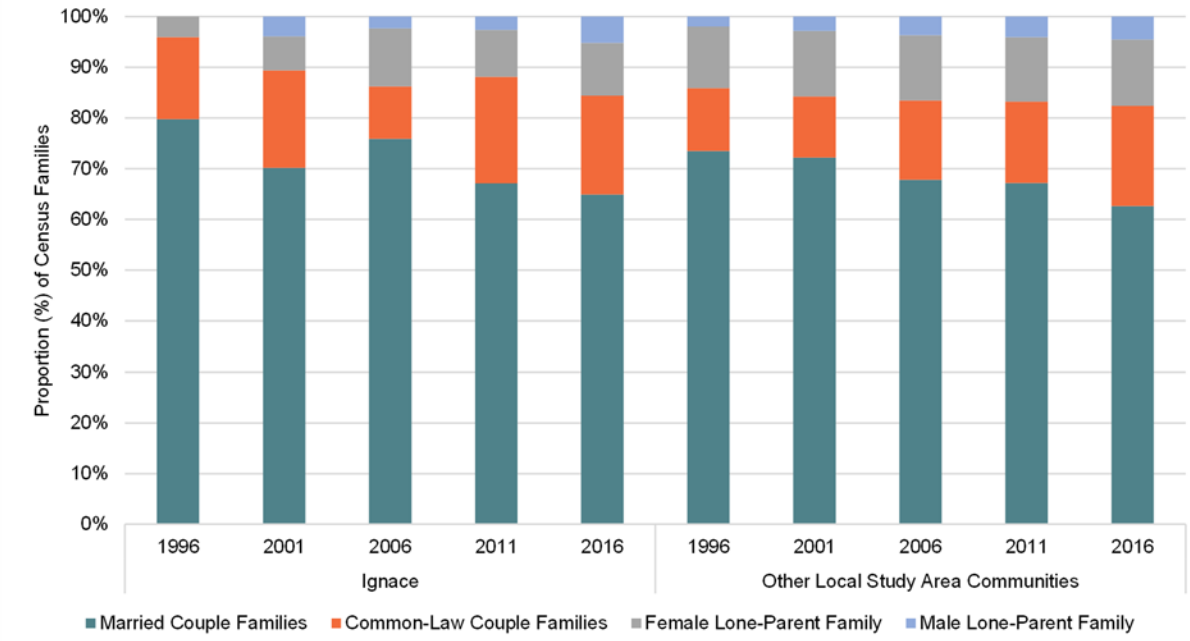
3.1.3 Family Dynamics

In Ignace and other Local Study Area communities, the size and structure of families has changed since 1996. In 1996, there were on average 2.8 persons per household in Ignace, which was slightly more than the average persons per household in the Local Study Area (2.7) (Statistics Canada 1998). By 2016, the average persons per household decreased to 2.1 in Ignace, which is lower than the average persons per household in the Local Study Area (2.4) (Statistics Canada 2017). The larger decline in the average persons per household for Ignace compared to the Local Study Area may be due to the aging population. The median age in Ignace increased from 37 years old in 2001 to 53 years old in 2016 (Statistics Canada 2002, 2017).

The change in average household size may also reflect changes in family structure. In Ignace, the proportion of census families that are married couples declined by nearly 15 percentage points since 1996 (80% [395 families] in 1996 to 65% [250 families] in 2016). Similarly, the proportion of census families that are married couples declined by over 10 percentage points in the Local Study Area (2,265 families in 1996 to 2,595 families in 2016) over the same period (Figure 3.1-4). There was also a decline in the proportion of census family couples (i.e., married and common law families) who have children living at home in Ignace (66% [315 families] in 1996 to 31% [100 families] in 2016) and the Local Study Area other communities (56% [1,480 families] in 1996 to 46% [1,555 families] in 2016). At the same time, the proportion of lone-parent families increased by 12 percentage points in Ignace (20 families in 1996 to 60 families in

2016) and 4 percentage points in the Local Study Area (435 families in 1996 to 730 families in 2016).[9]

Figure 3.1-4: Types of Census Families in Ignace and the Other Local Study Area Communities, 1996 to 2016



Source: Statistics Canada Census 1996-2016.
Notes: See Appendix C for detailed information on data limitations.

3.2 BASELINE POPULATION TRENDS

This section describes potential future population trends without the Project in Ignace and other Local Study Area communities, referred to here as the baseline population trend.

Typical drivers of population change are fertility rates, mortality rates and net migration. These drivers are affected by multiple factors including the age structure of the current population, government initiatives (e.g., programs to promote migration such as the Rural and Northern Immigration Pilot), and economic opportunities. Three population projections are presented in Figure 3.2-1 and Figure 3.2-2.

- **Conservative projection** predicts a declining population in Ignace and minimal population growth for other Local Study Area communities due primarily to age structure and out-

[9] Table B-3 in Appendix B shows the change in family structure for communities in the Local Study Area besides Ignace from 1996 to 2016.

migration. The conservative projection also assumes a downturn in forestry and no new mining activity in the region.

- **Potential projection** assumes modest growth in Ignace and other Local Study Area communities. It does not account for potential changes in age structure and uses historical growth rates from Statistics Canada, which are based on trends from 1996 to 2021. This scenario assumes that vacancies at Domtar from retirement will be filled by residents of the Local Study Area. It also assumes that Bending Lake Mine, Treasury Metals Goliath Gold Complex, and other mining projects that are less likely to move forward, will come online.
- **Optimistic projection** uses the same assumptions for net migration and economic development as the potential projection but uses the average historical growth rate for Ontario according to Statistics Canada. The optimistic projection serves as upper bound to baseline population projections.

The potential and optimistic projections would require in-migration to meet labour demands as the existing labour force does not have sufficient capacity to meet demands. Housing availability limits the potential for in-migration. It is assumed direct employees who in-migrate will bring their families (i.e., family multiplier), and the overall increase in direct employment jobs and jobs filled by family members will grow the economy further resulting in more jobs (i.e., economic multiplier) in private (e.g., retail, food, and accommodation) and public (e.g., public administration, health care) sectors.[10]

The baseline family multiplier is 1.9[11] persons per household and is the projected persons per household size for Ignace, Dryden, and Sioux Lookout in 2046 based on the observed change in average household size from 2011 to 2016 (Statistics Canada 2013, 2017).

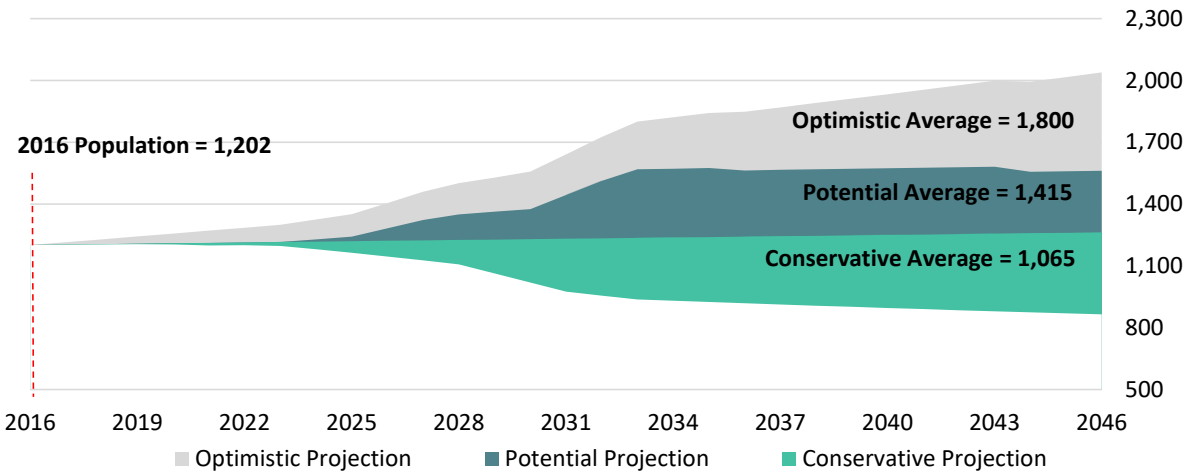
[10] The family and economic multipliers are assumed to have an interaction where the creation of a job and ensuing migration of the employee with their family (i.e., family multiplier) will generate an increase in demand for private and public services (i.e., economic multiplier). In other words, both the new worker and the additional family members are subject to the economic multiplier. For example, 300 new jobs will result in the migration of 570 residents (given a family multiplier of 1.9) and will demand an increase in private and public services, which will result in a total of 821 residents (given an economic multiplier of 1.44).
One limitation to this assumption is it assumes the new jobs created from the economic multiplier will be resourced exclusively by residents living outside of Ignace or the Local Study Area. This creates an upward bias for the number of residents migrating to Ignace or the Local Study Area by assuming all new jobs will be filled by residents not currently residing in the respective area. The economic multiplier is applied only to the direct employees and their families, but is not applied to the new economic migrants to avoid over-estimating growth and could represent a downward bias.

[11] The family multiplier used for baseline population projections is 1.9 persons per household based on the projected persons per household by 2046. For the population projections with the Project, a family multiplier of 2.3 is used to reflect objectives and strategies of the Township of Ignace to improve the ability to retain youth and young families.

The economic multiplier is 1.44[12] additional jobs for every new job created and is the industry average for the Kenora CD, Rainy River CD, and the Thunder Bay CD (NPI 2019) for all scenarios except for the lower bound of the conservative projection.[13]

More details on the population projection methodology and the multipliers can be found in Appendix E.

Figure 3.2-1: Ignace Baseline Population Projection, 2016 to 2046

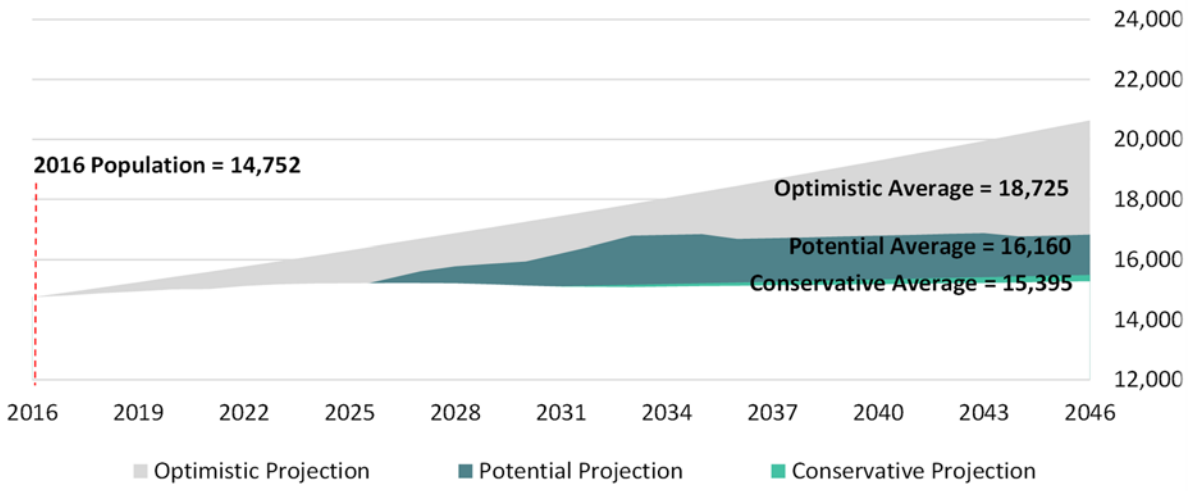


Notes: See Appendix C for detailed information on data limitations.

[12] The economic multiplier is based on estimates for the Kenora, Rainy River, and Thunder Bay CDs and could be higher or lower than the 1.44 industry average used in the analysis. Different factors could influence the economic multiplier selected, for example economic multipliers are typically smaller for smaller geographical areas and might suggest a downward adjustment could be appropriate. However, a large proportion of the jobs during pre-construction, construction, and operations are anticipated to be in the professional; scientific; and technical services industry which has a multiplier of 1.83 for the Kenora CD and could indicate an upward adjustment. The selection of the industry average was made to reflect a balance between these competing influences and given the absence of more specific publicly available information.

[13] The economic multiplier for the lower bound of the conservative projection is 1.31. A more conservative economic multiplier is used to reflect the potential for lower economic opportunities as the result of an economic downtown or other potentially less favourable economic circumstances.

Figure 3.2-2: Other Local Study Area Communities Baseline Population Projection, 2016 to 2046



Notes: See Appendix C for detailed information on data limitations.

The effects of COVID-19 to the population are not fully understood yet. Knowledge holders noted that in some instances local jobs have remained vacant as options to work remotely have increased. Certain local businesses, such as those serving tourists, have been affected by travel restrictions and a lack of clientele coming from outside of Canada (NWO Community and Baseline Studies Knowledge Holder Interviews 2022).

3.2.1 Community Aspirations

Ignace would like to see the community grow while maintaining a small-town feel and be an appropriate size for the Township. A population between 2,500 and 3,000 people was thought as an appropriate range to achieve this outcome (InterGroup 2020), while planning by the Township accommodates for a wider range of growth (up to 5,000). Vacant land and infrastructure can currently support a population growth between 3,500 and 4,000 (NWO Community and Baseline Studies Knowledge Holder Interviews 2022; Urban Systems 2021). Goals for growth include protecting Ignace's natural heritage and beauty (WSP 2020) and attracting new residents while retaining current ones (InterGroup 2020). To attract and retain residents more services and amenities for all age groups should be offered, along with affordable and suitable housing (NWO Community and Baseline Studies Knowledge Holder Interviews 2022).

Dryden reported growth targets of 9,000 residents with 4,090 households by 2031. To meet the current growth target of 9,000 residents, a range of population projections were presented including an average model that predicted 9,582 residents by 2041 due to major resource developments and the NWMO selecting Ignace as the host community for the Project (Explorer Solutions 2022).

In their Growth Management study (MHBC 2018), Sioux Lookout projected a population of 6,200 by 2038 and the required increase in residential housing to support the projected increase in population. Sioux Lookout in their 2020-2025 Strategic Plan highlight proactive investment in the community to encourage growth and enhance quality of life for residents as a priority. They outlined other goals to achieve growth targets and improve economic activity including (Sioux Lookout 2020):

- Providing infrastructure and housing to meet the needs of the community;
- Collaborating with community partners to foster growth and economic development;
- Enabling community growth through innovation and proactive planning; and
- Strengthening and enhancing Sioux Lookout's status as "Hub of the North."

The Municipality of Machin identified the desire to ensure there is sustainable growth (MNP 2021). They also identified the need to focus on elders' and youths' well-being to ensure sustainability (MNP 2021). Currently, Machin is trying to grow the population by securing seasonal development lots within the municipality; many of which are on Crown Land and difficult to receive approval for development (NWO Community and Baseline Studies Knowledge Holder Interviews 2022).

4.0 CHANGE ANALYSIS

The labour demands on the Project are a driving factor for changes to the population within Ignace and the Local Study Area. This section provides an overview of the potential population characteristics and changes for the pre-construction, construction, and operations phases of the Project, which are combined with the aspirational residency planning assumptions developed in collaboration between the NWMO and the Township of Ignace.

4.1 APM PROJECT CHARACTERISTICS RELEVANT TO GROWING THE POPULATION

Each phase of the Project has the potential to change population dynamics within the Local Study Area, along with having distinct characteristics, which are summarized in Figure 4.1-1.

Figure 4.1-1: Characteristics of the Workforce by Phase for the APM Project

Pre-Construction (2024-2032)

- Construction for the Centre of Expertise will be completed in 2028.
- Around 180 direct employees will work at the Centre of Expertise upon completion in 2028.
- About 20 staff will be working at the Deep Geological Repository (DGR) site making preparations for construction.
- Majority of workers will be managers and professionals.

Construction (2033-2042)

- Majority of employees (300 surface construction trades and 130 underground trades) will be engaged in construction activities at the Revell DGR Site.
- Some employees will reside in Ignace and in other communities in the Local Study Area and will commute on a daily basis.
- It is expected that most skilled trades will commute from outside of the Local Study Area to the construction camp located at site and will work a rotation schedule.

Operations (2043-2088)

- The operations workforce will consist of natural resource workers, professionals, managers, and technicians who will work at the Revell Site, along with the staff employees at the Centre of Expertise.
- The majority of the workforce will reside in Ignace or the surrounding Local Study Area (550 of the 700 total direct employees).
- Accomodation will be required for the anticipated 150 non-local workforce members required during operations.

4.1.1 Workforce Assumptions

Based on the planning assumptions, the following broad types of employment are anticipated (Table 4.1-1).

Table 4.1-1: Labour Projection by Phase

Phase	NWMO Staff	Surface Trades	Underground Trades	Total
Pre-construction	200	-	-	200
Construction	210	300	130	640
Operations	630	10	60	700

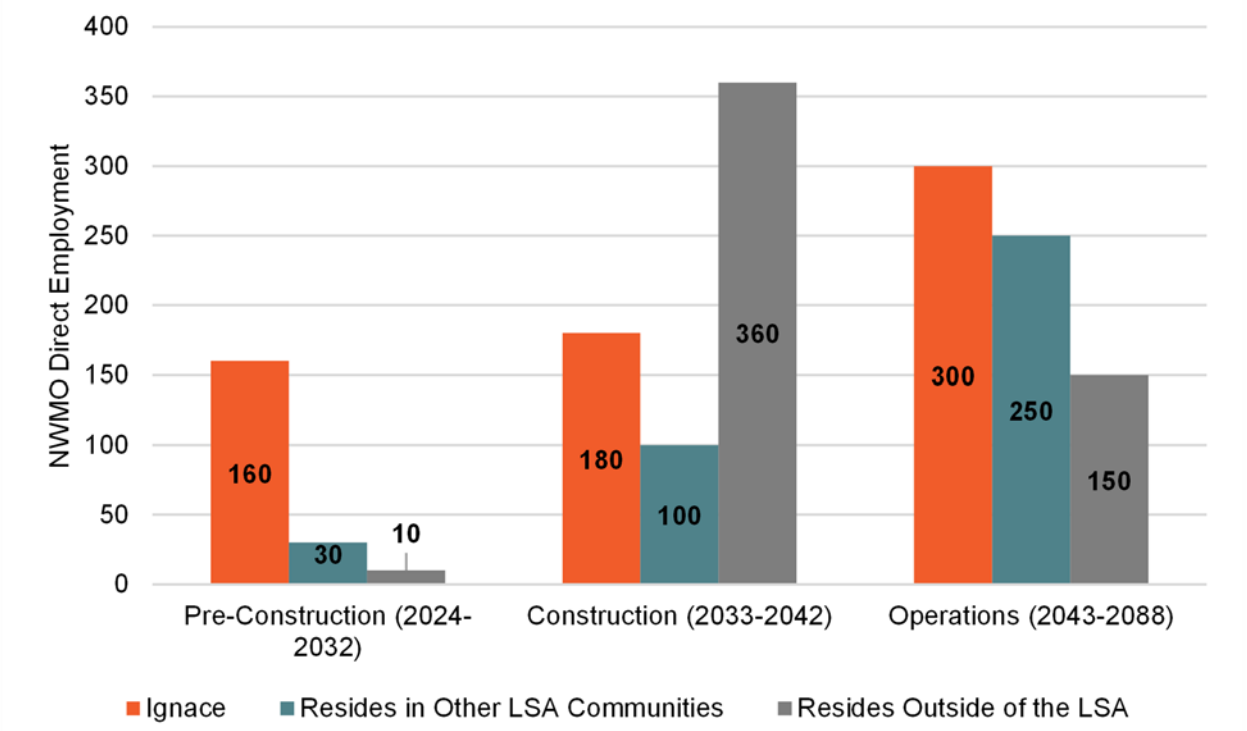
These positions will include senior management, professional occupations, and technical occupations. A detailed list of National Occupational Classifications is included in Appendix G.

4.1.2 Residency Planning Assumptions

The NWMO worked with the Township to develop aspirational residency planning assumptions. The residency planning assumptions identify the total number of direct employees required for the Project and the desired number of direct employees to move to Ignace during each phase (Figure 4.1-2) The residency planning assumptions are (NWMO 2021b, 2022):

- In the pre-construction phase, 160 of the 200 direct employees may reside in Ignace and 30 employees may reside in other communities in the Local Study Area;
- In the construction phase, the number of direct employees who reside in Ignace is expected to increase by 20 to 180, 70 more employees (100 total) will reside in other communities in the Local Study Area, and 360 employees will travel from communities outside the Local Study Area to work on rotation; and
- In the operations phase, 120 more direct employees are expected to resettle in Ignace bringing the total to 300 direct employees and 150 more employees (250 total) will likely reside in other communities in the Local Study Area.

Figure 4.1-2: APM Project Residency Employment Planning Assumptions, 2024 to 2088



Source: NWMO (2022) Workforce Residency Scenarios for Ignace Area 2022.
Notes: See Appendix C for detailed information on data limitations.

4.2 ANTICIPATED POPULATION CHANGES FROM THE PROJECT

Population projections were completed based on the aspirational residency planning assumptions and incorporated current population trends (baseline population), potential in-migration, potential household size (family multiplier), and potential induced growth (economic multiplier). To meet the planned labour demand of the Project, it is assumed that in-migration will be required as the current population cannot meet all the anticipated labour demands of the Project.

The projections in Figure 4.2-1 are consistent with Ignace's vision to attract and retain families and youth associated with the Project. It is assumed that each direct employee could result in additional family members in-migrating with a family multiplier of 2.3[14] was used. The economic

[14] For the population projections with the Project, a family multiplier of 2.3 (the average of Ignace, Sioux Lookout, and Dryden average persons per household in 2016) reflect potential policy and objectives set out in the hosting agreement by the Township and the NWMO intended to attract young families into Ignace. The family multiplier used for baseline population projections is 1.9 persons per household based on the projected persons per household by 2046.

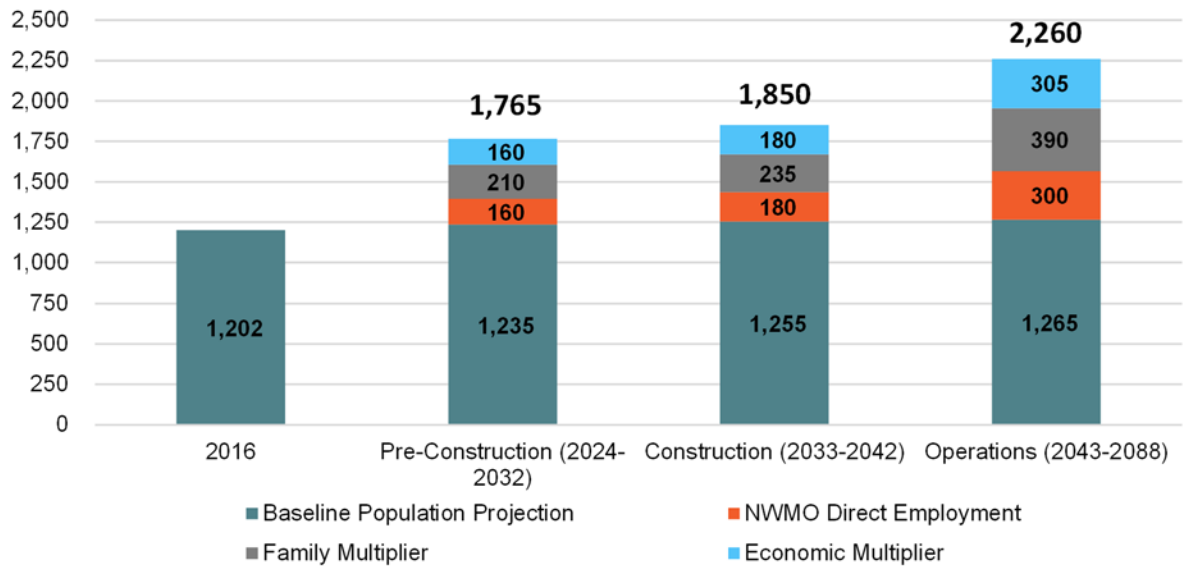
multiplier assumes the creation of new jobs in the region reflective of an increased need for private (e.g., retail) and public (e.g., health care) services and amenities to serve the growing population and associated increased purchasing power. The economic multiplier used a rate of 1.44.[15,16] To be conservative, in-migration of family members was not added to the growth associated with the economic multiplier. More details on the population projection methodology and the multipliers can be found in Appendix E.

Figure 4.2-1 shows population growth in Ignace of 1,058 residents (2.56% average annual growth) by 2046 resulting from direct employment for the APM Project if the planning assumptions are realized. The initial growth would coincide with the Centre of Expertise opening in 2028, with a material change anticipated as 160 direct employees are expected to move to Ignace. Growth may plateau somewhat over the course of construction (anticipated 20 additional direct employees), while increasing materially again with another 120 direct employees anticipated to move to Ignace during operations.

[15] The economic multiplier is based on estimates for the Kenora, Rainy River, and Thunder Bay CDs and could be higher or lower than the 1.44 industry average used in the analysis. Different factors could influence the economic multiplier selected, for example economic multipliers are typically smaller for smaller geographical areas and might suggest a downward adjustment could be appropriate. However, a large proportion of the jobs during pre-construction, construction, and operations are anticipated to be in the professional; scientific; and technical services industry which has a multiplier of 1.83 for the Kenora CD and could indicate an upward adjustment. The selection of the industry average was made to reflect a balance between these competing influences and given the absence of more specific publicly available information.

[16] The economic and family multipliers are assumed to have an interaction where the creation of a job and ensuing migration of the employee with their family (i.e., family multiplier) will generate an increase in demand for private and public services (i.e., economic multiplier). In other words, both the new worker and the additional family members are subject to the economic multiplier. For example, 300 new jobs will result in the migration of 570 residents (given a family multiplier of 1.9) and will demand an increase in private and public services, which will result in a total of 821 residents (given an economic multiplier of 1.44).

Figure 4.2-1: Ignace APM Planning Assumption Population Projection, 2016 to 2046[17,18]

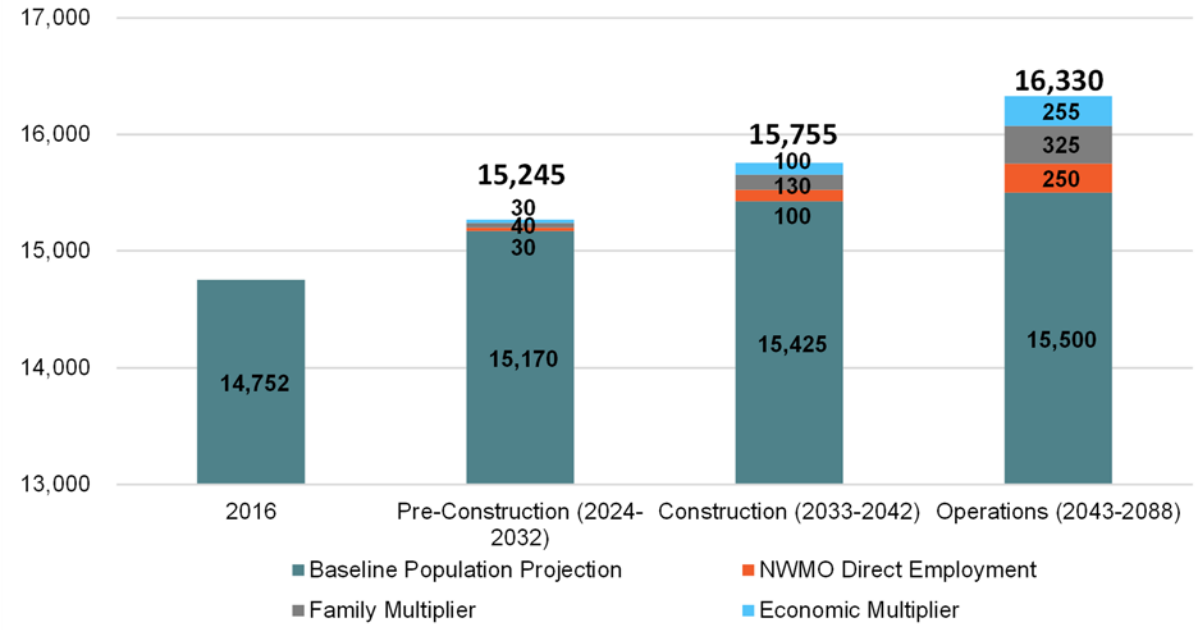


Notes: See Appendix C for detailed information on data limitations.

Other communities in the Local Study Area are also expected to experience growth, as direct employees may choose to locate in these communities. Figure 4.2-2 shows an increasing population in the Local Study Area. The population projections based on the planning assumptions assume a growth of 1,578 residents (0.41% average annual growth) by 2046 from direct employment for the APM Project.

[17] The baseline population projection is based on the historical Kenora CD 25-year average annual growth rate from 1996 to 2021 (0.165% average annual growth). More details can be found in Appendix E.
[18] The baseline projection using the Kenora CD historical growth rate was chosen because it reflects the current trend that the population in Ignace is beginning to gradually increase.

Figure 4.2-2: Other Local Study Area Communities APM Planning Assumption Population Projection, 2016 to 2046[19,20]



Notes: See Appendix C for detailed information on data limitations.

[19] The baseline population projection is based on the historical Kenora CD 25-year average annual growth rate from 1996 to 2021 (0.165% average annual growth). More details can be found in Appendix E.
[20] The baseline projection using the Kenora CD historical growth rate was chosen because it reflects the current trend that the population in the Local Study Area is gradually increasing.

4.3 CONSIDERATIONS FOR GROWING THE POPULATION

The Project could be a catalyst for substantial population growth in Ignace. Working towards the residency planning assumptions and achieving the associated population growth (Section 4.2) will require coordinated advanced planning to ensure that Ignace is an attractive community for new residents. Key factors to consider in planning for each Project phase include:

- **During pre-construction**, population growth is expected to be rapid as it is associated with completing the Centre of Expertise. The place of work for most NWMO staff will be in Ignace. This has implications for readiness such as a variety of accommodations, support services, and amenities.
- **During construction**, the residency planning assumptions note that most of the workforce resides in communities outside the Local Study Area and will commute to a construction camp on a rotational basis. Currently, the NWMO is planning on a construction camp at the Project Site to accommodate this non-local workforce. Once construction is complete the camp will cease to operate.
- **During operations**, a large, skilled workforce will be required to staff both the Project site operations and the Centre of Expertise. Some staffing at the Centre of Expertise will gradually shift to the Project site. The planning assumptions indicate most NWMO employees will live in Ignace and the Local Study Area communities; however some temporary accommodations could be required for the non-local workforce throughout this phase.

The unique characteristics of each phase of the Project, combined with Ignace's desire to grow and sustain their population should be considered in developing growth-related options. There are valuable lessons to be learned from other project examples, and an examination of several case studies noted the following insights:

- Mining and forestry operations, which tend to be cyclical in nature, within the Local Study Area rely on the use of camps to house employees as there is a lack of suitable housing within the Local Study Area to accommodate their respective workforces. This both normalizes participation in a rotational employment model (e.g., two weeks-on/off), while minimizing the potential benefits of developing a population locally. Housing, combined with suitable amenities and services to promote in-migration are central to achieving the planning assumptions.
- Managing population growth needs to consider the establishment of new residents, while building in considerations for the existing population. If policy and programming is focused too narrowly on the new population (e.g., young families), the existing population (e.g., generally aging and more seniors) may not experience the same benefits (NWO Community and Baseline Studies Knowledge Holder Interviews 2022).
- Planning for growth should establish clear roles, responsibilities, and processes to guide both a Project proponent and a host community in development to create a safety-net to avoid unforeseen circumstances (e.g., bankruptcy) (McGrath 1985; NWO Community and Baseline Studies Knowledge Holder Interviews 2022).

- Growth is difficult to predict with accuracy and rate of growth and potential shift in demographics may result in unforeseen outcomes. Establishing clear monitoring and reporting mechanisms are important for all stakeholders to be responsive as issues arise (participatory monitory and feedback mechanisms are described in the Community Health Protection study).

Details on the case studies considered in completing the change analysis and options assessment are provided in Appendix F.

4.3.1 Key Considerations

Based on the population projections, Project phase characteristics, and lessons learned from knowledge holders and other projects, the key considerations from the change analysis are:

- The location of the Centre of Expertise in Ignace is the place of work for 180 NWMO staff during pre-construction. This is a major opportunity for Ignace to transition most of these staff into full-time residents of the community. The current planning assumption is 160 of 200 NWMO staff will reside in Ignace.
- There is limited time to prepare for new residents expected during the pre-construction phase. Preparations should include expansion and building local accommodations and enhancing community facilities and services.
- Increased housing stock, enhanced facilities and services, and a diverse economy could attract new residents beyond NWMO staff to Ignace and other Local Study Area communities.
- By 2043, the Project has the potential to almost double the population of Ignace (Figure 4.2-1). It also has the potential to add an additional 830 residents to other Local Study Area communities (Figure 4.2-2). Population growth could be a catalyst for increasing housing stock, enhancing facilities and services, and stimulating economic diversification.
- The Project has a long lifecycle, which provides economic opportunities for individual residents and for Local Study Area communities. Individuals can take advantage of employment and entrepreneurial opportunities. For communities, the presence of the Project and new facilities and services could be a catalyst for economic diversification through sustainable private- and public-sector services. The Project's multi-generational lifecycle spanning 150 years provides a stable economic generator that could attract further business development and growth, which can be built on to diversify the economy.
- Small communities that experience substantial and rapid population growth can require proactive planning to socialize newcomers and local residents to one another.

The options presented in Section 5.0 address the identified opportunities and challenges to maximize the benefits of the opportunities while addressing the constraints that could inhibit the opportunities noted.

5.0 OPTIONS ASSESSMENT

Options for managing population growth are listed in Section 5.1 and assessed in Section 5.1.1.

5.1 OPTIONS FOR CONSIDERATION

Note to Reader

This section provides an overview of possible options to mitigate negative consequences or to enhance positive outcomes. They are presented by the authors to foster discussion only. They do not represent commitments or actions for the NWMO, the Township of Ignace, or other parties. The final decisions on actions and commitments will be made at a future date.

Table 5.1-1 presents an overview of options included in the assessment.

Table 5.1-1: Overview of Potential Options

Potential Options	Considerations for Developing Potential Options
Option 1 – Capture the first wave of in-migration: The Township could develop and implement a coordinated plan with the appropriate partners to ensure that Ignace is an attractive community to live in.	• The primary place of work for most NWMO staff during pre-construction will be at the Centre of Expertise located in Ignace. • Staff have options regarding where they will choose to reside in the Local Study Area. • If Ignace can attract the majority of NWMO staff to Ignace during pre-construction, then the Project becomes a catalyst for community development of accommodations, services, and facilities. Success also lays the groundwork for Ignace to attract other NWMO staff in future phases of the Project.
Option 2 – Promoting operations employment opportunities early: Each phase of the Project represents an opportunity to recruit and retain the workforce to reside in Ignace or Local Study Area communities over the long-term. This is particularly true of the construction phase, in which a portion of the non-local workforce could transition to long-term operations employees if they are qualified, trained and interested in making Ignace and area their home.	• As the Project transitions to operations in 2043, a labour force of about 700 people will be required for over 40 years. • The operations phase provides long-term sustainable career opportunities. • Broadly promoting operations employment opportunities early in the process presents an opportunity to recruit some people with familiarity with the site and/or the region, thus contributing to sustainable population growth.
Option 3 - Planning for diversity: In Ignace and other communities in the Local Study Area, the Township could work with partner organizations to support a safe and inclusive municipality with programs and policies to support diverse populations to foster social cohesion.	• The Project is a catalyst for growth and change in Ignace and other Local Study Area communities. • Changing population dynamics and diversity poses new opportunities and challenges. • A thriving, diverse community is more attractive to new residents and businesses, but may require deliberate actions to support social cohesion in parallel with population growth.

The options presented are reflective of these potential outcomes and are assessed based on four criteria:

- **Ease of implementation:** includes demonstrated success on other projects if known and the degree of complexity required to implement, which may consider number of required partners and current municipal and provincial policies;

- **Degree of effectiveness:** considers the conditions required for effectiveness as per understanding of the community needs and aspiration;
- **Cost, if known:** will document costs for implementation if known; and
- **Ability for the NWMO or the Township of Ignace to implement:** considers if the NWMO or the Township of Ignace alone or in partnership can implement an option or if another responsible authority needs to be involved.

5.1.1 Option 1: Capture the First Wave of In-migration

Option 1 focuses on the first wave of in-migration during pre-construction. The planning period is brief for this option, but its success is key for the Project to serve as a catalyst for population growth and service enhancement over the long-term. The next large influx of NWMO staff is not expected until operations in 2043. However, the ability to achieve the residency aspirations of Ignace across all Project phases hinges on the ability to attract the majority of NWMO staff to Ignace during the pre-construction phase, referred to here as the "first wave".

Option 1 addresses some of the challenges identified in the knowledge holder interviews and other community studies, along with some of the biases against moving to small population centres and rural areas. Biases are driven by the perception that a community's economic possibilities and social vibrancy and are linked to its size or proximity to a major centre (Esses and Carter 2019). Based on the experience of Tumbler Ridge, British Columbia, which was a planned community to meet resource development needs, special attention needs to be paid to social planning and physical space to foster attraction to the location (Halseth et al 2017). The opportunity and challenge for Ignace centres around making the community attractive to new residents.

Capturing the first wave of in-migration will require the Township to implement coordinated planning initiatives to address the housing shortage and gaps in amenities and services. Noted gaps include recreational facilities and services, health care and social services, and retail services. Options to address the housing shortage are described in the Housing Community study. Options to address gaps in amenities and services are provided in the Community and Culture study (recreational services and social services), Community Health Protection study (health care services), and Municipal Infrastructure study (recreational and social service infrastructure and aesthetics). In addition to these studies, the Workforce Development study describes options to potentially attract and retain direct NWMO employees to Ignace.

To take full advantage of the opportunities the Project may present, capturing the first wave of in-migration is critical. A larger population base will facilitate the enhancement and expansion of amenities and services to attract future residents. If the initial window for in-migration is missed, new residents would likely settle in other communities and population growth would be dispersed throughout the Local Study Area.

Table 5.1-2 presents an assessment of **Option 1: capture the first wave of in-migration**.

Table 5.1-2: Option 1: Capture the First Wave of In-migration

Factors	Key Considerations for Option
Ease of implementation	• The primary place of work for NWMO staff during pre-construction will be in Ignace at the Centre of Expertise. This offers the best opportunity to attract staff to reside in the Ignace and could provide great benefits in future Project phases. • The Township and NWMO could continue to work collaboratively to enhance the attraction of Ignace and to incent new residents, including newcomers. • The Township could continue to plan for and implement investments in infrastructure and services with the knowledge of a new major employer. • The NWMO could provide incentives to staff to reside locally.
Degree of effectiveness with consideration of community needs and aspirations	• A jointly planned approach, similar to planning for Tumbler Ridge, could be effective. • The likelihood of approaching residency planning assumptions for all phases might be enhanced if the first wave of NWMO staff make Ignace their new home, assuming services, accommodations, and supporting amenities are in place. • Successfully establishing Ignace as the primary place of residence for most NWMO staff at the outset would enhance the fulfillment of other community goals and aspirations.
Costs (if known)	• To be determined.
Ability of the NWMO and/or the Township to implement the initiative or if other parties are required	• The Township would need to work with partners, such as contractors and developers, to facilitate building houses and apartments to address the current housing shortage. • Programs to enhance service provision and infrastructure in areas such as social services, recreational services, and health care would require the involvement of other responsible authorities. • The NWMO would be able to implement policies and programs that apply exclusively to its employees at the workplace.

5.1.2 Option 2: Promoting Operations Employment Opportunities Early

The operations phase provides the largest and longest opportunity for full-time employment on the Project, which could have material implications for population growth. To maximize the opportunity and work towards achieving the residency planning assumptions, efforts should be made to promote the long-term opportunities for the Project early.

For example, the presence of a non-local workforce during construction represent a potential captive audience to promote future opportunities. During construction, there are expected to be 300 surface trades workers and 130 underground trades workers (Table 4.1-1), some of whom may have transferable skills between construction and operations jobs. There may be opportunities to promote and transition some of the non-local workforce to longer-term operations positions since they will already be familiar with the Project and the Local Study Area. This also becomes an opportunity to attract new families to Ignace and other Local Study Area communities choosing to develop supporting businesses to the Project throughout all phases.

The following programs and policies would facilitate this transition:

- Developing a human resources plan to inform the non-local construction workforce about future opportunities and guiding transitions. The plan might include transferrable skills between construction jobs and operations jobs, education and training requirements, and timing. Based on the criteria, the plan might identify which positions would be most suited to making the transition.
- Providing incentives for relocation as described in the Workforce Development study. Where additional training or certification may be required, provision of scholarships or bursaries followed by guaranteed employment may make the transition easy.
- Providing on the job training that might be relevant to the operations phase or apprenticeship hours for those positions also required during operations.
- Providing opportunities for construction workforce members to interact with the residents of Local Study Area communities, including organized sports leagues (e.g., softball and curling) and participation in local events like the Agimak Ice Fishing Derby. Interactions should be structured and designed to promote community cohesion and well-being.

Table 5.1-3 presents an assessment of **Option 2: promoting operations employment opportunities early.**

Table 5.1-3: Option 2: Promoting Operations Employment Opportunities Early

Factors	Key Considerations
Ease of implementation	• The NWMO could develop a human resources transition plan to inform people of the opportunities and associated transferrable skills between construction and operations. • Most trades have unique skills and experiences that may not be appropriate for operations. Training and transitioning interested individuals to different jobs could be supported along with efforts to make Ignace and area communities attractive to new families. • Incentives that are exclusively the responsibility of the NWMO, such as bursaries for training and recruitment incentives, would be simple to implement. • Construction contractors may resist attempts or actions that diminish their workforce, but some positions would likely be temporary to these companies typically retained through union halls. • There is a widespread labour shortage region-wide and competition for skilled trades will continue to be aggressive.
Degree of effectiveness with consideration of community needs and aspirations	• If this option is available it could help attract some labour and new residents to the Ignace and area communities. • In parallel with other workforce development options, it could help develop the local labour supply and secure high-quality jobs for residents of Ignace and other Local Study Area communities. • Even a small number of positive transitions would contribute to the overall growth aspirations of Ignace and the Local Study Area.
Costs (if known)	• To be determined.
Ability of the NWMO and/or the Township to implement the initiative or if other parties are required	• Policies and programs, such as a human resources plan, could be developed and implemented by the NWMO. • Additional training opportunities may need to partner with educational institutions and contractors, although requirements for contractors could be built into requests for proposals.

5.1.3 Option 3: Planning for Diversity

The Project is a potential catalyst for substantial population growth in Ignace and other Local Study Area communities. In-migration could contribute to existing population trends (Section 3.0), such as a greater proportion of the population identifying as Indigenous or a visible minority, and could result in new shift in demographics, such as lowering the median age of residents. In Ignace, the following policies and programs could be implemented to support diverse populations and retain residents:

- Planning for long-term residents by providing services across age groups. In many resource-based communities, retirement is limited by the availability of housing or the provision of services to an aging population, which should be considered to complement existing and currently planned developments by the Township of Ignace and other regional organizations from the outset of Project planning.
- Attracting a diverse population may result in the need for more culturally sensitive and appropriate services and facilities that may not be available locally, including programming to support newcomers and their successful integration into the community. Factors affecting retention in small population centres and rural areas include a lack of religious and cultural amenities, social isolation, the absence of settlement services, and racism and intolerance (Esses and Carter 2019).
- An influx of new residents could change the social cohesion of Ignace. While traditionally implemented within the context of newcomers to Canada, an “adopt-a-new-resident” program led by the Township of Ignace and encouraged by NWMO could facilitate social cohesion and integration by establishing meaningful connections among different social groups and helping new residents adjust to life in Ignace. Policies and programs to support diversity would begin during pre-construction and continue through the life of the Project.

Table 5.1-4 presents an assessment of **Option 3: planning for diversity**.

Table 5.1-4: Option 3: Planning for Diversity

Factors	Key Considerations
Ease of implementation	• Strategies to provide services across age groups could be led by the Township but will require partnerships with service providers and other responsible authorities. • Strategies to support diversity and inclusion in Ignace would require partnerships, although there are existing organizations in the region that provide settlement services. • An “adopt-a-new-resident” program could be led and supported by the Township. The program could be encouraged by the NWMO to help establish connections in a new community.
Degree of effectiveness with consideration of community needs and aspirations	• Would increase the likelihood of meeting residency planning assumptions and therefore help Ignace towards meeting its population goal.
Costs (if known)	• To be determined.
Ability of the NWMO and/or the Township to implement the initiative or if other parties are required	• Programs to attract and retain diverse populations in Ignace will require partnerships with social service providers and organizations that help with newcomer settlement, such as the Multicultural Organization of Kenora and District and Association des francophones du Nord-Ouest de l’Ontario.

6.0 SUMMARY

The current population trends suggest the Ignace population is stable but could start to see a gradual increase if forestry operations continue and some of the mining projects in Northwestern Ontario come online. For some of the other communities in the Local Study Area, the population has been gradually increasing. Many of the communities in the Local Study Area wish to increase their population and grow their economies through the support of local businesses, tourism, and the attraction of youths and young families into the communities.

The population projections using the potential baseline projection (i.e., historical Kenora CD population growth rate) and the Project results in a projected possible increase of more than 1,000 residents in Ignace and potentially more than 1,500 residents for the other communities in the Local Study Area because of the Project.

6.1 KEY FINDINGS

The Project is estimated to increase the population of Ignace to 2,260 residents by 2046, which is a major contribution to the community's ultimate population vision. Without the Project and in the absence of other major economic drivers, the population in Ignace is not anticipated to grow much and could decline with time.

The Project is estimated to increase the population in the other communities in the Local Study Area by 1,578 residents to 16,330 by 2046. The Project can be a catalyst for population growth and support multi-generational economic development in the Local Study Area.

Programs and policies to enhance Ignace's attractiveness as a home community should be led by the Township in collaboration with the NWMO and would require a diverse range of partnerships.

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APPENDIX A:
List of Northwest Ontario Socio-Economic Community Studies

Table A-1: List of Northwest Ontario Socio-economic Community Studies

Study Name	Study Proponent	Lead Consultant
Community and Culture	NWMO	InterGroup Consultants Ltd and Scatliff+Miller+Murray
Local and Regional Economics and Finance	NWMO	Hardy Stevenson and Associates Ltd
People and Health	NWMO	InterGroup Consultants Ltd
Infrastructure	Township of Ignace	WSP
Tourism	Township of Ignace	Urban Systems

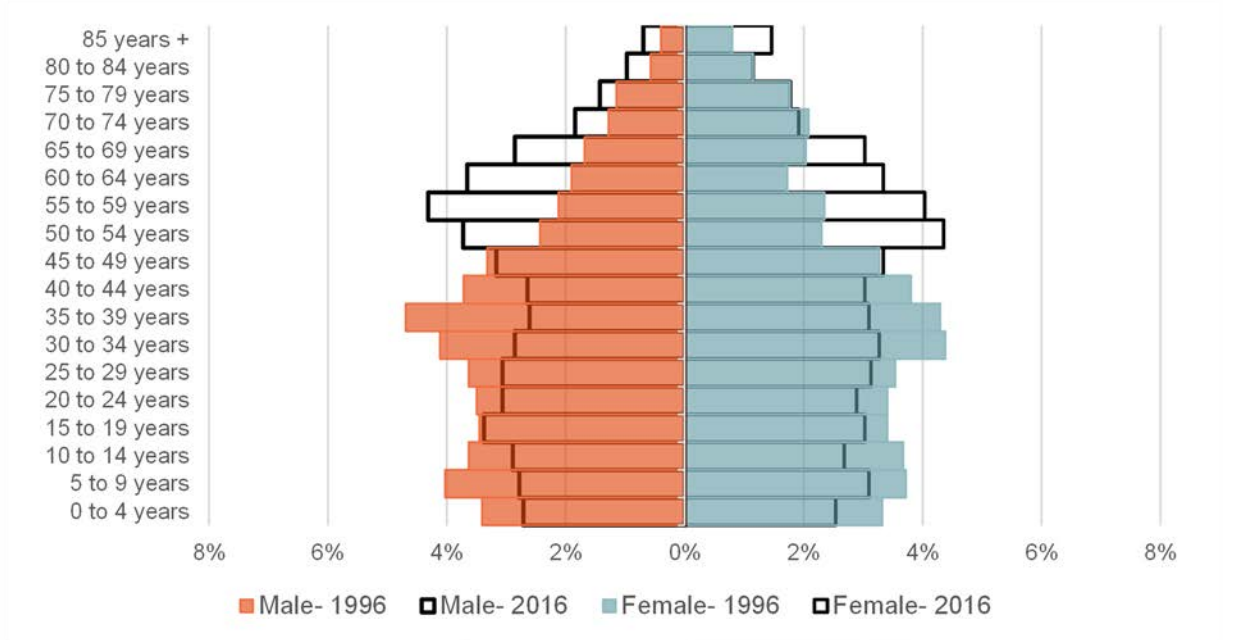
APPENDIX B:
Additional Statistics Canada Data

B1.0 ADDITIONAL STATISTICS CANADA DATA

Figure B-1 and Figure B-2 compare the proportion of the population by age and sex at two different points in time (i.e., 1996 and 2016). The age cohorts are presented along the vertical axis with each block representing the proportion of males or females for the corresponding year. The horizontal axis presents the proportion of the total population with the female population presented on the right side of 0% and the male population on the left side.

Figure B-1 shows an aging population in Ignace. In 1996, only 8% (135 residents) of the population were 65 years and older compared to 24% (285 residents) in 2016. The population that was between 0 and 19 years old comprised 31% (560 residents) of the total population in 1996 compared to 17% (205 residents) in 2016.

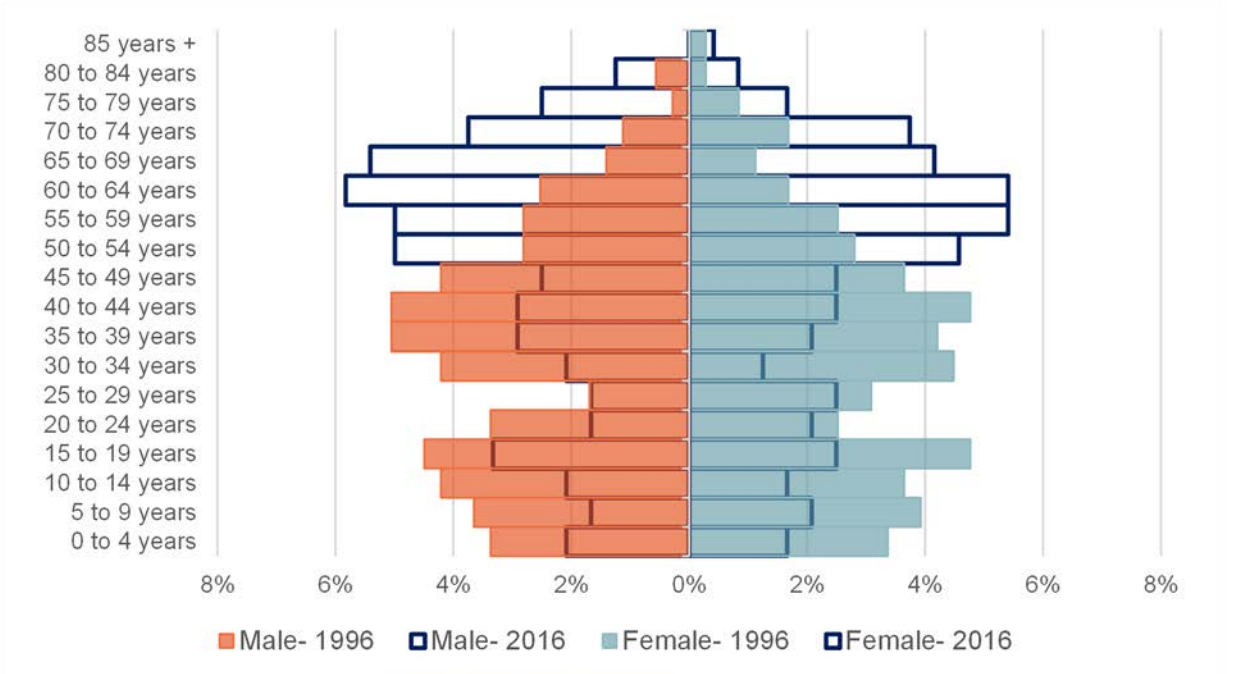
Figure B-1: Ignace Age and Sex Distribution, 1996 and 2016



Source: Statistics Canada Census 1996, 2016.
Notes:
1. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5 and in some cases 10.
2. Percentages calculated by InterGroup Consultant Ltd. were derived from Statistics Canada data.

Figure B-2 shows the population in the Local Study Area communities excluding Ignace has gotten slightly older with a larger proportion of seniors (i.e., residents aged 65 years and older). In 1996, 13% (2,425 residents) of the population were 65 years and older compared to 17% (2,740 residents) in 2016. The population that was between 0 and 19 years old comprised 29% (3,340 residents) of the total population in 1996 compared to 23% (3,425 residents) in 2016.

Figure B-2: Other Local Study Area Communities Age and Sex Distribution, 1996 and 2016

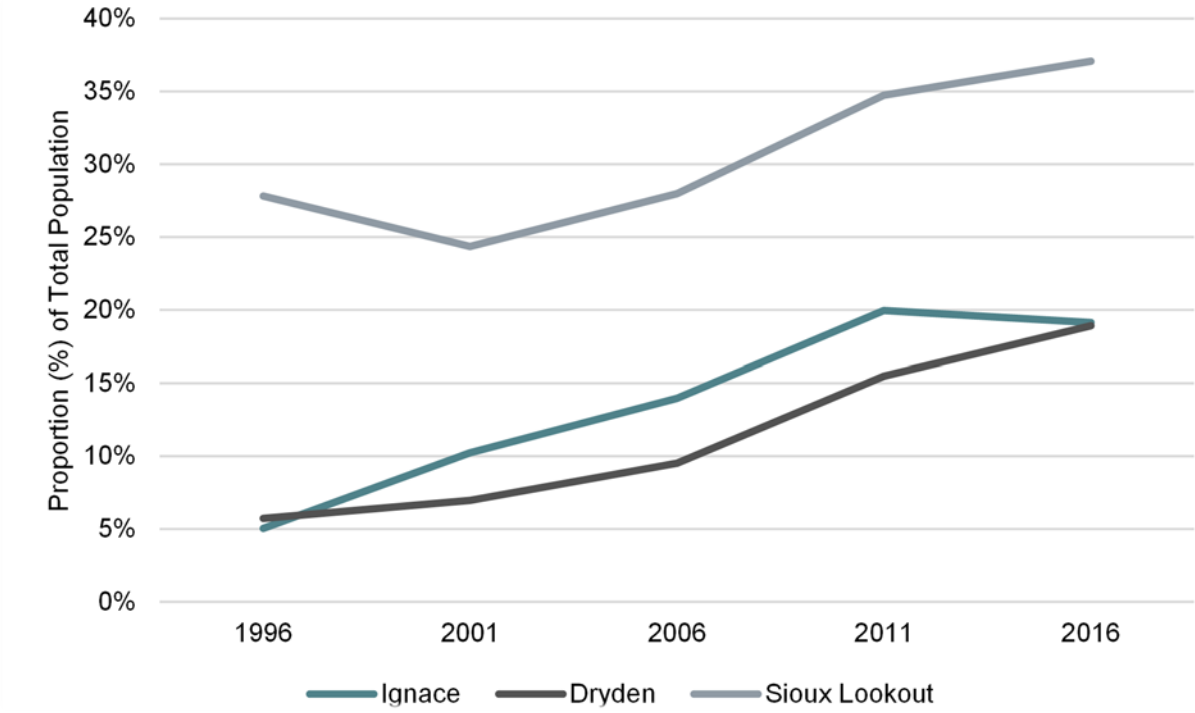


Source: Statistics Canada Census 1996, 2016.
Notes:

1. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5 and in some cases 10.
2. Percentages calculated by InterGroup Consultant Ltd. were derived from Statistics Canada data.
3. The Local Study Area are the Local Study Area communities excluding Ignace and Indigenous communities (i.e., Dryden, Sioux Lookout, Machin, Wabigoon LSB). This does not include communities which are included in the Kenora Unorganized subdivision.
4. Data for Wabigoon LSB are not reported in 1996.

Figure B-3 shows the proportion of the population that identifies as Indigenous has increased for Dryden, Sioux Lookout, and Ignace. The proportion of the population who identified as Indigenous in Machin increased from 12% (130 residents) in 1996 to 24% (230 residents) in 2016 (Statistics Canada 1998, 2017). The proportion of the population who identified as Indigenous in the Wabigoon LSB was 51% (190 residents) in 2016 and was not reported in any previous census periods (Statistics Canada 2017).

Figure B-3: Indigenous Identity in Ignace and Other Local Study Area Communities, 1996 to 2016



Source: Statistics Canada Census 1996, 2001, 2006, 2016. Statistics Canada 2011 NHS.
Notes:
1. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5 and in some cases 10.
2. Percentages calculated by InterGroup Consultant Ltd. were derived from Statistics Canada data.
3. Indigenous Identity (known as Aboriginal identity) refers to whether a person self-identifies with the Aboriginal people of Canada (First Nation, Métis, Inuk [Inuit]), registered or treaty Indian, or those who have membership in a First Nation or Indian band).

Table B-1 shows the median age in Ignace is increasing proportionally to years elapsed. Dryden and Sioux Lookout have seen gradual increases to the median age over the 15-year span. Machin and the Wabigoon LSB had increases to the median age similar to Ignace, but neither increased by 15 years over the 15-year span.

Table B-1: Median Age in Local Study Area Communities, 2001 to 2016

Community	Median Age			
	2001	2006	2011	2016
Ignace	37.0	42.5	48.1	52.5
Dryden	41.8	45.0	46.2	46.2
Sioux Lookout	33.5	35.1	36.1	35.9
Machin	39.8	43.3	47.0	50.6
Wabigoon LSB	Not Reported	Not Reported	43.4	48.0

Source: Statistics Canada Census 2001 to 2016.
Notes:
1. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5 and in some cases 10.

Table B-2: Change in Visible Minorities in the Local Study Area Communities

Community	Population Change
Ignace	• The proportion of the population in Ignace who are visible minorities has increased from 0.8% (15 residents) in 1996 to 2.1% (25 residents) in 2016.
Dryden	• The proportion of the population in Dryden who are visible minorities has increased from 0.9% (60 residents) in 1996 to 2.8% (220 residents) in 2016.
Sioux Lookout	• The proportion of the population in Sioux Lookout who are visible minorities has increased from 1.9% (65 residents) in 1996 to 3.9% (205 residents) in 2016.
Machin	• The proportion of the population in Machin who are visible minorities has decreased from 0.9% (10 residents) in 1996 to 0% in 2016.
Wabigoon LSB	• The proportion of the population in the Wabigoon LSB who are visible minorities was 0% in 2016 and was not reported in previous Census periods.

Source: Statistics Canada Census 1996, 2016.

Notes:

1. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5 and in some cases 10.
2. Percentages calculated by InterGroup Consultant Ltd. were derived from Statistics Canada data.
3. The Wabigoon LSB only reported data on visible minority in the 2016 Census of Population.
4. Visible minorities are defined as persons other than Indigenous peoples who are non-white in race or non-white in colour and includes: Chinese, South Asian, Black, Filipino, Latin American, Southeast Asian, Arab, West Asian, Korean, Japanese and others.

Table B-3: Change in Family Structure in the Local Study Area Communities

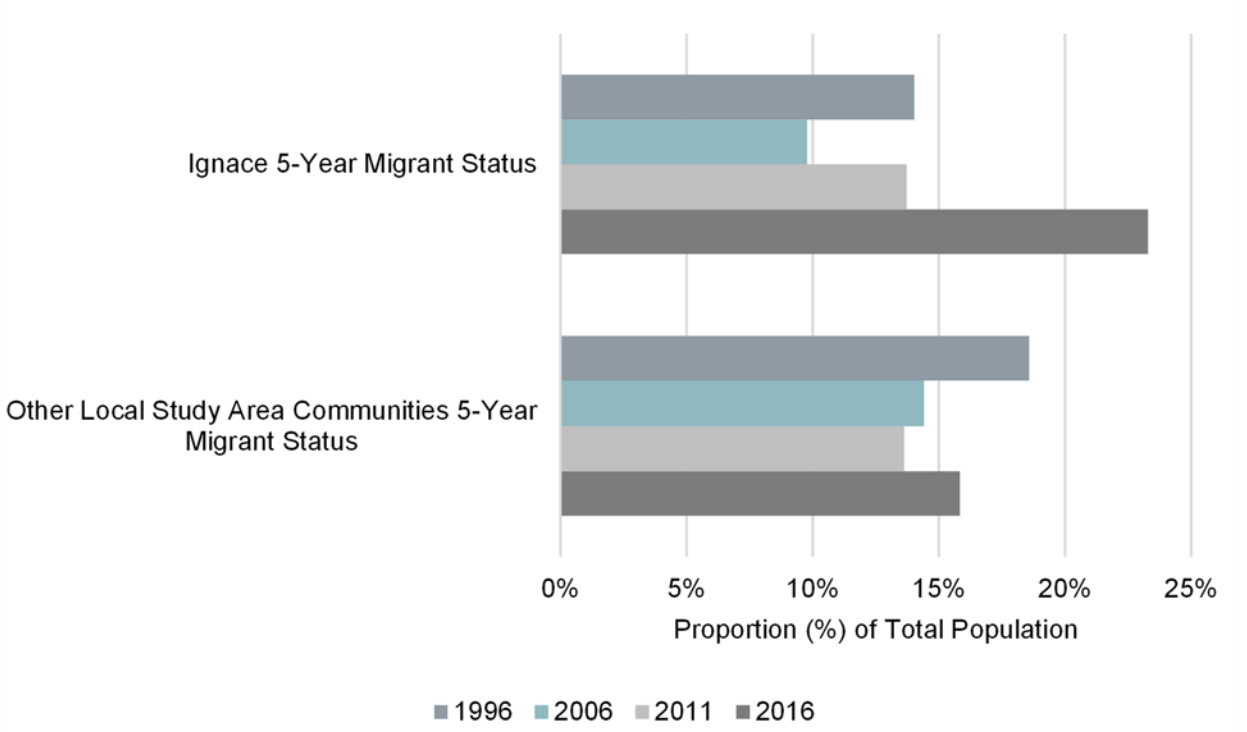
Community	Population Change
Dryden	• The proportion of census families that are married couples decreased from 79% (1,455 families) in 1996 to 66% (1,495 families) in 2016. • The proportion of couple families (i.e., married and common-law families) who have children living at home decreased from 55% (895 families) in 1996 to 42% (800 families) in 2016. • The proportion of census families that are female lone-parent increased from 10% (195 families) in 1996 to 17% (295 families) in 2016. • The proportion of census families that are male lone-parent increased from 1% (20 families) in 1996 to 4% (95 families) in 2016. • The average persons per household decreased from 2.5 in 1996 to 2.3 in 2016.
Sioux Lookout	• The proportion of census families that are married couples decreased from 63% (570 families) in 1996 to 57% (840 families) in 2016. • The proportion of couple families who have children living at home decreased from 60% (430 families) in 1996 to 53% (630 families) in 2016. • The proportion of census families that are female lone-parent decreased from 17% (155 families) in 1996 to 15% (215 families) in 2016. • The proportion of census families that are male lone-parent increased from 3% (30 families) in 1996 to 5% (70 families) in 2016. • The average persons per household decreased from 2.8 in 1996 to 2.6 in 2016.
Machin	• The proportion of census families that are married couples decreased from 74% (240 families) in 1996 to 69% (200 families) in 2016. • The proportion of couple families who have children living at home decreased from 54% (155 families) in 1996 to 37% (90 families) in 2016. • The proportion of census families that are female lone-parent increased from 8% (25 families) in 1996 to 10% (30 families) in 2016. • The proportion of census families that are male lone-parent increased from 3% (10 families) in 1996 to 4% (10 families) in 2016. • The average persons per household decreased from 2.7 in 1996 to 2.2 in 2016.
Wabigoon LSB	• The proportion of census families that are married couples decreased from 76% (95 families) in 2011 to 63% (60 families) in 2016. • The proportion of couple families who have children living at home decreased from 50% (55 families) in 2011 to 44% (35 families) in 2016. • The proportion of census families that are female lone-parent decreased from 12% (15 families) in 1996 to 5% (5 families) in 2016. • The proportion of census families that are male lone-parent increased from 4% (5 families) in 1996 to 11% (10 families) in 2016. • The average persons per household was 2.5 in 2016.

Source: Statistics Canada Census 1996, 2011, 2016.
Notes:
1. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5 and in some cases 10.

2. Percentages calculated by InterGroup Consultant Ltd. were derived from Statistics Canada data.
3. The Wabigoon LSB only reported data in the 2011 and 2016 Census of Population.
4. The 1996 Census of Population reports total husband-wife families and breaks them down to now-married and common-law couples which leads to further rounding errors.
5. Census family couples include common-law and married couple families. Census family couples were not disaggregated by the presence of children living at home in the 2001 or 2006 Census of Population.
6. There are no age restrictions for children living at home.
7. Sons and daughters who are living with their married spouse or common-law partner, or with one or more of their own sons and/or daughters, are not considered to be members of the census family of their parent(s), even if they are living in the same dwelling. In addition, sons and daughters who do not live in the same dwelling as their parent(s) are not considered members of the census family of their parent(s). Concepts such as 'foster children,' who are considered as 'other relatives' in an economic family, comprise part of the population in private households, but are not considered as 'children' in census families (Statistics Canada 2017).

Figure B-4 shows an overall increasing migrant mobility (in-migration) which coincides with the population decline slowing down over time in Ignace since 2011. A similar trend of in-migration occurred in the Local Study Area and coincided with a decline in the total population from 2001 to 2011 and then an increase thereafter (Statistics Canada 1998, 2002, 2012, 2017). A resident is considered a migrant if that person lives at an address in a different census subdivision than where they lived five years ago (5-year migrant mobility). (Statistics Canada 2008). From 1996 to 2016, the proportion of the total population who were migrants increased in Ignace (14% [250 residents] in 1996 to 23% [280 residents] in 2016). Over the same period, the proportion of the total population who were migrants decreased slightly in the other communities in the LSA (19% [2,100 residents] in 1996 to 16% [2,275] in 2016). (Statistics Canada 1998, 2017).

Figure B-4: Ignace and the Local Study Area Mobility Status, 1996, 2006, 2011, and 2016



Source: Statistics Canada Census 1996, 2006, 2016. Statistics Canada 2011 NHS.
Notes:

1. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5 and in some cases 10.
2. Percentages calculated by InterGroup Consultant Ltd. were derived from Statistics Canada data.
3. The Local Study Area population are the Local Study Area communities excluding Ignace and Indigenous communities (i.e., Dryden, Sioux Lookout, Machin, Wabigoon LSB). This does not include communities which are included in the Kenora Unorganized subdivision.
4. Population proportions for the 5-year migrant status are generated using the total number of migrants in the previous five years (5-year migrant mobility) divided by the current census population.
5. Migrant data are not available for 2001 Census of Population. Non-migrant movers and migrant movers within the province are grouped together, therefore data for total migrants is not obtainable.

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APPENDIX C:
Data Limitations

C1.0 DATA LIMITATIONS

DATA LIMITATIONS FOR SECTION 3.0 EXISTING CONDITIONS

Figure 3.1-1/ Table 3.1-1

1. The Local Study Area are communities within a one-hour drive of the Project site excluding Ignace (i.e., Dryden, Sioux Lookout, Machin, Wabigoon LSB, Wabigoon Lake Ojibway Nation, Eagle Lake First Nation). This does not include communities which are included in the Kenora Unorganized census subdivision. Only total population and population projections include Wabigoon Lake Ojibway Nation and Eagle Lake First Nation in the Local Study Area.
2. In 1998, the Town of Dryden and Municipality of Barclay were amalgamated. Population totals for Dryden are aggregated with Barclay for any Census prior to the 2001 Census.
3. In 1998, the Town of Sioux Lookout was expanded to include some of the unincorporated area round Sioux Lookout. In the 2001 Census of Population, an adjusted 1996 Sioux Lookout population was reported. To obtain the adjusted population for 1991 and 1986 backwards calculations used the change in population reported for Sioux Lookout and applied it to the 1996 adjusted population to obtain the adjusted 1986 and 1991 population counts.
4. The Wabigoon LSB was not enumerated separately from the Kenora Unorganized census subdivision prior to 2006 and resulted in an increase of 417 residents to the Local Study Area population in 2006.

Figure 3.1-2

1. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5 and in some cases 10.
2. Percentages calculated by InterGroup Consultant Ltd. were derived from Statistics Canada data.
3. The Local Study Area are the Local Study Area communities excluding Ignace and Indigenous communities (i.e., Dryden, Sioux Lookout, Machin, Wabigoon LSB). This does not include communities which are included in the Kenora Unorganized census subdivision.
4. Data for the Wabigoon LSB was not available in 1996.
5. Youth are defined as residents who are in the labour force and younger than 30 years old (i.e., ages 15 to 29 years old).

Figure 3.1-3/ Table 3.1-2

1. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5 and in some cases 10.
2. Percentages calculated by InterGroup Consultant Ltd. were derived from Statistics Canada data.

3. The Local Study Area are the Local Study Area communities excluding Ignace and Indigenous communities (i.e., Dryden, Sioux Lookout, Machin, Wabigoon LSB). This does not include communities which are included in the Kenora Unorganized census subdivision.
4. The Wabigoon LSB only reported data on Indigenous identity in the 2016 Census of Population.
5. The Wabigoon LSB and Machin had no data in 2011 because the data in the NHS were suppressed for confidentiality reasons.
6. Indigenous Identity (known as Aboriginal identity) refers to whether a person self-identifies with the Aboriginal people of Canada (First Nation, Métis, Inuk [Inuit]), registered or treaty Indian, or those who have membership in a First Nation or Indian band).

Figure 3.1-4

1. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5 and in some cases 10.
2. Percentages calculated by InterGroup Consultant Ltd. were derived from Statistics Canada data.
3. The Local Study Area are the Local Study Area communities excluding Ignace and Indigenous communities (i.e., Dryden, Sioux Lookout, Machin, Wabigoon LSB). This does not include communities which are included in the Kenora Unorganized census subdivision.
4. The Wabigoon LSB only reported data in the 2011 and 2016 Census of Population.
5. The 1996 Census of Population reports total husband-wife families and breaks them down to now-married and common-law couples which leads to further rounding errors.
6. Census family couples include common-law and married couple families. Census family couples were not disaggregated by the presence of children living at home in the 2001 or 2006 Census of Population.
7. There are no age restrictions for children living at home.
8. Sons and daughters who are living with their married spouse or common-law partner, or with one or more of their own sons and/or daughters, are not considered to be members of the census family of their parent(s), even if they are living in the same dwelling. In addition, sons and daughters who do not live in the same dwelling as their parent(s) are not considered members of the census family of their parent(s). Concepts such as 'foster children,' who are considered as 'other relatives' in an economic family, comprise part of the population in private households, but are not considered as 'children' in census families.

Figure 3.2-1/Figure 3.2-2

1. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5 and in some cases 10.

2. Percentages calculated by InterGroup Consultant Ltd. were derived from Statistics Canada data.
3. The Local Study Area are communities within a one-hour drive of the Project site excluding Ignace (i.e., Dryden, Sioux Lookout, Machin, Wabigoon LSB, Wabigoon Lake Ojibway Nation, Eagle Lake First Nation). This does not include communities which are included in the Kenora Unorganized census subdivision. Only total population and population projections include Wabigoon Lake Ojibway Nation and Eagle Lake First Nation in the Local Study Area.
4. A family multiplier of 1.9 was used to account for spouses and children who would migrate with new residents who are migrating into the region due to the creation of new jobs.
5. An economic multiplier of 1.44 was applied to new jobs from developments in the region. In the conservative projection a multiplier of 1.31 was used for the forestry downturn out-migration.
6. The economic multiplier is based on estimates for the Kenora, Rainy River and Thunder Bay Census Divisions. Economic multipliers are typically smaller for smaller geographical areas but are reflective of the income spending multiplier and could be higher or lower than the 1.44 industry average used in the analysis.
7. The assumption that the family and economic multipliers interact assumes that the new jobs created from the economic multiplier will be resourced exclusively by residents living outside of Ignace or the Local Study Area. This creates an upward bias for the number of residents migrating to Ignace or the Local Study Area by assuming all new jobs will be filled by residents not currently residing in the respective area.
8. The baseline growth rate in the conservative projection range uses the Ontario Ministry of Finance age-cohort model.
9. The baseline growth rate in the potential projection range uses the historical average annual growth rate observed in the Kenora CD (0.165%) from 1996 to 2021.
10. The baseline growth rate in the optimistic projection range uses the historical average annual growth rate observed in Ontario (1.13%) from 1996 to 2021.

DATA LIMITATIONS FOR SECTION 4.0 CHANGE ANALYSIS

Figure 4.1-1 / Figure 4.1-2

1. Data are based on Residency Employment Planning Assumptions which are subject to the hosting agreement that would be formed between the NWMO and the Township of Ignace if Ignace is chosen for the Project.
2. The Local Study Area are communities within a one-hour drive of the Project site excluding Ignace (i.e., Dryden, Sioux Lookout, Machin, Wabigoon LSB, Wabigoon Lake Ojibway Nation, Eagle Lake First Nation). This does not include communities which are included in the Kenora Unorganized census subdivision. Only total population and population projections include Wabigoon Lake Ojibway Nation and Eagle Lake First Nation in the Local Study Area.

3. The regions outside of the Local Study Area (e.g., Manitoba, Northeast Ontario) are regions where the NWMO will need to resource from to meet the labour requirements for certain occupations where there is not a large enough labour supply in the Local Study Area.

Figure 4.2-1 / Figure 4.2-2

1. Data have been subjected to a confidentiality procedure known as random rounding whereby values are rounded either up or down to a multiple of 5 and in some cases 10.
2. Percentages calculated by InterGroup Consultant Ltd. were derived from Statistics Canada data.
3. Direct employment assumptions are based on Residency Employment Planning Assumptions which are subject to the hosting agreement that would be formed between the NWMO and the Township of Ignace if Ignace is chosen for the Project.
4. The Local Study Area are the Local Study Area communities excluding Ignace and Indigenous communities (i.e., Dryden, Sioux Lookout, Machin, Wabigoon LSB). This does not include communities which are included in the Kenora Unorganized census subdivision.
5. The regions outside of the Local Study Area (e.g., Manitoba, Northeast Ontario) are regions where the NWMO will need to resource from to meet the labour requirements for certain occupations where there is not a large enough labour supply in the Local Study Area.
6. A family multiplier of 2.3 was used to account for spouses and children who would migrate with new NWMO employees and the efforts by the NWMO and the Township to attract families to migrate into Ignace.
7. An economic multiplier of 1.44 was applied to new jobs from developments in the region.
8. The economic multiplier is based on estimates for the Kenora, Rainy River and Thunder Bay Census Divisions. Economic multipliers are typically smaller for smaller geographical areas but are reflective of the income spending multiplier and could be higher or lower than the 1.44 industry average used in the analysis.
9. The assumption that the family and economic multipliers interact assumes that the new jobs created from the economic multiplier will be resourced exclusively by residents living outside of Ignace or the Local Study Area. This creates an upward bias for the number of residents migrating to Ignace or the Local Study Area by assuming all new jobs will be filled by residents not currently residing in the respective area.
10. The baseline growth rate is the potential projection range from Section 3.2 which uses the historical average annual growth rate observed in the Kenora CD (0.165%) from 1996 to 2021.

APPENDIX D:
Knowledge Holder Organizations and What We Heard

Table D-1: List of Knowledge Holder Interviews

Knowledge Holder Organizations	
Alterna Credit Union	Ignace Resolute Sawmill
City of Dryden	Keewatin Patricia District School Board (KPDSB)
City of Kenora	Kenora District Municipal Association (KDMA)
City of Williston	Kenora District Services Board (KDSB)
Community Living Dryden-Sioux Lookout	Ministry of Natural Resources and Forestry (MNRF) Fire Centre
Confederation College	Municipality of Atikokan
Crossroads Training and Employment Centre	Municipality of Machin
Domtar	Municipality of Sioux Lookout
Dryden Native Friendship Centre	Northwest Business Centre
Dryden Regional Airport	Northwest Training and Adjustment Board (NTAB)
Dryden Regional Mental Health	Ontario Provincial Police (OPP)
FedNor	Patricia Area Community Endeavours (PACE)
Hoshizaki House	Ricci's Trucking
Ignace Area Business Association (IABA)	Sioux Lookout Friendship Accord Economic Development Corporation - Sioux Lookout Mining Centre of Excellence
Ignace Healthy Community Working Group	Thunder Bay Chamber of Commerce
Ignace Public Library	Thunder Bay Homebuilders Association
Ignace Public School	Township of Ignace
Ignace Recreation Committee	Treasury Metals

Table D-2: What We Heard from Knowledge Holder Interviews

Knowledge Holder Organizations Relevant to Growing the Population	
City of Dryden	Kenora District Municipal Association (KDMA)
Dryden Native Friendship Centre	Kenora District Services Board (KDSB)
Dryden Regional Mental Health	Municipality of Machin
FedNor	Municipality of Sioux Lookout
Hoshizaki House Dryden District Crisis Centre	Patricia Area Community Endeavours (PACE)
Ignace and Area Business Association (IABA)	Ricci Trucking
Ignace Recreation Committee	Township of Ignace

What we Heard about Population Growth in Ignace and the Remaining Local Study Area

- Most youths did not return to Ignace after completing schooling because of a lack of opportunities in the area.
- Currently there are 60 seasonal cottage dwellings around Agimak Lake in Ignace.
- Employees for Ricci Trucking typically stay in the bunkhouses for four nights, arriving on Monday and departing on Friday.
- Population growth was attributed to the availability of jobs in the municipality and members of First Nations with reserves north of the municipality moving to the community.
- The growth in population would still be limited by the housing shortage for both permanent and rental housing which has led to an increase in prices and further reducing affordability in the Local Study Area.
- The trend in Ignace is also apparent in the Kenora Census Division (CD), where out-migration has also been a concern.
- Residents with families have been expressing an interest in returning to Ignace.
- There is an abundance of vacant jobs due to individuals pursing other opportunities.
- An increase of young families moving into Ignace is due to feeling safer in a smaller town.
- Tourism sector has struggled (e.g., restaurants, camps, outfitters) and due to a lack of clientele from the United States resulted in a need for some to leave the Local Study Area.

Knowledge Holder Organizations Relevant to Growing the Population
• The current growth plans by the Township of Ignace have identified that vacant land and infrastructure can support a population of 3,500-4,000 residents. • Population growth should be achieved by attracting new residents to the community and retaining current residents, including youth and seniors. • To attract and retain residents more services and amenities for all age groups should be offered, along with affordable and suitable housing. • Machin is trying to grow the population by securing seasonal development lots within the municipality; many of which are on Crown Land and difficult to receive approval for development. • Housing availability and the rising value of homes has been identified as a concern in communities in the Local Study Area. • Increases to disposable income can result in increased substance use. • Mental health and addictions services are already facing capacity constraints. • The two-weeks on two-weeks off schedule is ideal for some individuals who prefer the extended period off-work in a rotation schedule. • A non-local workforce could negatively affect a community and in particular its vulnerable populations (e.g., women, youth, Indigenous people, LGBTQ2S+ identifying individuals).

APPENDIX E:
Population Projections Methodology

E1.0 POPULATION PROJECTIONS METHODOLOGY

E1.1 INTRODUCTION

Population projections were completed for Ignace and the Local Study Area with and without the APM Project. The Local Study Area is defined as communities the residents of which need to drive an hour or less to the Project Site and includes Dryden, Sioux Lookout, Machin, Wabigoon LSB, Wabigoon Lake Ojibway Nation, and Eagle Lake First Nation. Ignace was excluded from the Local Study Area population projections to isolate the changes for the other Local Study Area communities.

E1.2 POPULATION PROJECTIONS WITHOUT THE APM PROJECT

Three growth scenario projections without the Project (i.e., baseline population projections) in Section 3.2 reflect a range of growth because there are numerous potential influences on population control that cannot be controlled or known (e.g., changes in forestry operations). The three scenarios are as follows:

- The conservative projection predicts the smallest change in population. It uses an age cohort model that projects a decrease in population for Ignace and a slight increase in population for the Local Study Area. The decline in population for Ignace is due to an aging population and a negative net migration rate. The age cohort model is described in Section E1.4.1.
- The potential projection is the middle projection and uses the regional historical average annual growth rate for the Kenora Census Division (CD) (0.165%) from 1996-2021. This projection is based on the observed population trend over the previous 25 years but does not consider the current age structure of the population. More detail on using regional historical trends is in Section E1.4.2.
- The optimistic projection predicts the most population growth and uses the regional historical average annual growth rate for Ontario (1.13%) from 1996-2021. This projection range uses a robust growth rate and assumes several developments required (e.g., robust economic development). Similar to the potential projection, this projection is based on the observed trend over the previous 25 years but does not consider the current age structure of the population. More detail on using regional historical trends is in Section E1.4.2.

Each of the three projections in Section 3.2 contains assumptions about potential economic drivers that help define the upper and lower bounds of the projections. The bounds for the projections are as follows:

- The lower bound of the conservative projection using the age cohort model assumes a downturn in the forestry sector and no new mining activity in the region;
- The upper bound of the conservative projection is the regional historical average annual growth rate for the Kenora CD (0.165%) from 1996-2021 and assumes no additional economic developments;

- The upper bound for the potential projection is the regional historical average annual growth rate for the Kenora CD (0.165%) from 1996-2021 and includes the following economic assumptions: vacancies at a paper mill will be filled by residents who will migrate into Ignace or the Local Study Area, that two mines will come online, and three mines that have a smaller likelihood of moving forward will also come online; and
- The upper bound for the optimistic projection is the regional historical average annual growth rate for Ontario (1.13%) from 1996-2021 and assumes the same economic assumptions as the upper bound for the potential projection.

Each of the projections include economic assumptions for possible drivers or contractions to the economy that are subject to a family multiplier and economic multiplier. More details on economic assumptions and multipliers are discussed below (Section E1.4.3 and E1.4.4, respectively).

The use of multipliers was also used to account for the family members who migrate with their spouses (i.e., family multiplier) and from more jobs being created due to the increase in economic activity from the creation of new jobs (i.e., economic multiplier). The economic and family multiplier assumptions are as follows:

- An economic multiplier of 1.44 is used for projections both without and with the Project. A family multiplier of 1.9 persons per household is used for the baseline projections and a family multiplier of 2.3 persons per household is used for the direct employment residency for the Project. More details on multipliers are discussed below.

E1.3 POPULATION PROJECTIONS WITH THE APM PROJECT

The first step in developing the population projections with the Project was the selection of one baseline population projection (i.e., population change without the APM Project) to add the APM project direct employment residency scenarios onto (NWMO 2022). The decision for the baseline population projection was between the age cohort model and the historical average annual growth rate for the Kenora CD. Both models are realistic because they do not predict dramatic growth or decline in population, which is consistent with recent trends. However, the age cohort model assumes a negative migration rate and no change in the age structure of Ignace and other communities in the Local Study Area. If the Project were to be sited at the Revell Site, there would be in-migration and the age structure of communities would likely change.

The Kenora CD historical growth rate from the potential projection in Section 3.2 was chosen as the baseline projection for the change analysis projections with the Project in Section 4.2. This growth rate was chosen due to the assumption that net migration will be positive with the Project moving forward, recent trends in Ignace that reflect a slight increase in the population, and because there was no notable difference between the two models for other communities in the Local Study Area. We assume the Project direct employment residency scenarios (NWMO 2022) are filled by residents who will migrate into Ignace or the Local Study Area. These individuals who migrate into the region will come with their families and based on Ignace's goals to attract, recruit, and retain youths and families. For the population projections with the Project, a family multiplier of 2.3 is used to reflect objectives and strategies of the Township to improve

the ability to retain youth and young families. Similar to the baseline population projection, an economic multiplier of 1.44 new jobs will be created from the new direct NWMO employees and their families moving into the region.

The projections with the Project forecast a population of 2,260 by 2046 which is below Ignace's goal of 2,500-3,000 residents. To achieve Ignace's vision of a population of 2,500-3,000 residents, a higher baseline growth rate will need to be achieved or additional economic drivers which are discussed in the economic assumptions will be required to come to fruition. Some economic drivers which could result in a larger population are as follows:

- Retirements at Domtar being filled by residents outside of Ignace or the Local Study Area and Resolute mill returning to full capacity (IAWG Economy Workshop 2021);
- Treasury Metals Goliath Gold Complex and Bending Lake Mine recruiting individuals to migrate into Ignace or the Local Study Area (CEAA 2019; IAA n.d.); and
- Potential mines, such as St. Anthony Mine, Raleigh Lake Lithium Project, and Gossan Sturgeon Lake Property, reopening or coming online (Junior Mining Network 2018; The Northern Miner 2020; International Lithium n.d.).

E1.4 DETAILED METHODOLOGIES

E1.4.1 Age Cohort Model Projection

The age cohort model projection for the Kenora CD was the starting point for the population projections. This model was derived from the Ontario Ministry of Finance population projections (Ministry of Finance Ontario 2020) determined the growth rate by using the fertility rate of females ages 15-49 years old, the observed death rates by age and sex, and net migration rate by CDs. The net migration was disaggregated by immigration, emigration, non-permanent residents, interprovincial migration, and intraprovincial (i.e., movement from one census sub-division to another within the province) migration. Data provided by the Ministry of Finance included:

- Death rates by age and sex;
- Projected number of births; and
- Projected net migration.

Due to confidentiality and the complexity of some of the data (e.g., non-permanent residents, intraprovincial migration), only some of the data were provided by the Ontario Ministry of Finance. Through backwards calculations approximations for a constant fertility rate and migration rate was obtained which yielded similar results to the Ontario Ministry of Finance for the Kenora CD.

The first step for using the age cohort model for Ignace was to obtain a single age breakdown for Ignace residents. This was done by using the population breakdown by single-age in the Census of Population. Due to random rounding the numbers reported in the total population by single age are rounded to a multiple of five and does not equal the total population which leads to some

inaccuracies for this breakdown for smaller communities. For Ignace, an adjustment factor of 0.005 is used to obtain the same total population that was reported in the Census of Population. This adjustment factor was used to account for the small population and larger effects from random rounding on the single-age breakdown. For the other communities in the Local Study Area, similar methods are done with an adjustment factor for 0.026 for Eagle Lake First Nation and 0.1 for Wabigoon Lake Ojibway Nation. For the Wabigoon LSB, there was no single-age breakdown, so a five-year age group by population breakdown was used. To obtain single-age population a function was used to randomly assign numbers by age which resulted in a population of 11 less residents than reported for the total population. The Local Study Area communities were then aggregated, and the total population was five less residents than was reported for the total population, which is an accurate approximation.

The age cohort projection for Ignace resulted in a slight downturn because of a negative net migration and aging population. For the other communities in the Local Study Area, there was a slight increase in population due to a younger population and net migration which fluctuated above and below zero. These projections are realistic, but the downturn was reflective of historical trends and did not account for the possibility of a positive net migration and slow increase to the population in Ignace. Due to assumed negative net migration, other methods were investigated to find other potential projections.

E1.1.2 Population Projections Using Regional Historical Trends

Other population growth rates were calculated by using historical annual growth rates for the Kenora CD and Ontario from 1996 to 2021. The average annual growth rate for the Kenora CD was 0.165% and was assumed to be a potential growth rate as it projected a modest increase of about 65 residents in Ignace from 2016 to 2046. On the other hand, the Ontario historical growth rate was very optimistic and there would be several developments required for there to reach a growth rate as robust as the 1.13% average annual growth observed from 1996 to 2021.

The baseline projections are based on set assumptions which with additional stimuli could result in a population in 2046 somewhere within the three ranges shown in Figure 3.2-1 and Figure 3.2-2. The assumptions that will influence the projections are as follows:

- Whether the base growth rate using the historical population growth rate for the Kenora CD holds over the 25-year projection;
- If the direct employment for the major resource developments and potential mines move forward and are filled by individuals who will migrate into the area;
- If the economic multiplier of 1.44 is a good approximation over the next 25 years; and
- If the family multiplier of 1.9 is a good approximation even if some of the projects have on-site camps and a non-local workforce.

E1.4.3 Economic Assumptions

Population projections for Ignace (Figure 3.2-1) and other communities in the Local Study Area (Figure 3.2-2) requires additional economic growth to reach above the lower bounds for each of the three ranges. The assumptions are as follows:

- The lower bound for the conservative projection, which is the lower bound to the entire projection range, assumes a contraction of employment at Domtar and Resolute mills and no new mining activity. This downturn assumes a different economic multiplier of 1.31 which is based on the CD average for the agriculture; forestry; fishing and hunting industry (NPI 2019).
- Economic assumptions are that vacancies at Domtar from retirement will be filled by Ignace residents with most being filled by residents of other communities in the Local Study Area and Resolute Mill returning to full capacity of 65 employees. It is also assumed that Bending Lake Mine and Treasury Metals Goliath Gold Complex which have already completed or have an environmental impact statement underway will come online (IAWG Economy Workshop 2021; CEAA 2019; IAA n.d.).
- There are also some mining projects which have a smaller likelihood of moving forward with operations and include two former mines which might reopen and one potential mine that still requires an environmental impact statement completed (Junior Mining Network 2018; The Northern Miner 2020; International Lithium n.d.).

E1.4.4 Multipliers

Secondary research was completed for potential developments in the region that could also affect population growth. These baseline economic developments were due to developments in the forestry and mining sectors in the region and factored into the population projection ranges used for the baseline scenarios in Section 3.2. The use of multipliers was also used to account for the family members who migrate with their spouses (i.e., family multiplier) and from more jobs being created due to the increase in economic activity from the creation of new jobs (i.e., economic multiplier). The economic and family multiplier assumptions are as follows:

The use of the economic multiplier captures the effect that when there are more available jobs in a region, it will increase the overall purchasing power of the community. Additionally, these jobs might be filled by residents who migrate into the region, which will result in an increased demand for all the services and amenities an individual accesses in their everyday life. This increase in demand and purchasing power incentivises other businesses to expand services to meet the increased demand and to capture this assumption we used an economic multiplier of 1.44. The economic multiplier is derived from the Statistics Canada Input/Output employment multiplier. The economic multiplier is 1.44 additional jobs for every new job created and is the industry average for the Kenora CD, Rainy River CD, and the Thunder Bay CD (NPI 2019). The economic multiplier is based on estimates for the Kenora, Rainy River, and Thunder Bay CDs and could be higher or lower than the 1.44 industry average used in the analysis. Different factors could influence the economic multiplier selected, for example economic multipliers are typically smaller for smaller geographical areas and might suggest a downward adjustment could be

appropriate. However, a large proportion of the jobs during pre-construction, construction, and operations are anticipated to be in the professional; scientific; and technical services industry which has a multiplier of 1.83 for the Kenora CD and could indicate an upward adjustment. The selection of the industry average was made to reflect a balance between these competing influences and given the absence of more specific publicly available information.

The economic and family multipliers are assumed to have an interaction where the creation of a job and ensuing migration of the employee with their family (i.e., family multiplier) will generate an increase in demand for private and public services (i.e., economic multiplier). In other words, both the new worker and the additional family members are subject to the economic multiplier. For example, 300 new jobs will result in the migration of 570 residents (given a family multiplier of 1.9) and will demand an increase in private and public services, which will result in a total of 821 residents (given an economic multiplier of 1.44).

One limitation to the assumption that the family and economic multipliers interact is it assumes that the new jobs created from the economic multiplier will be resourced exclusively by residents living outside of Ignace or the Local Study Area. This creates an upward bias for the number of residents migrating to Ignace or the Local Study Area by assuming all new jobs will be filled by residents not currently residing in the respective area. The economic multiplier is applied only to the direct employees and their families, but is not applied to the new economic migrants to avoid over-estimating growth which could create a downward bias. Multipliers operate in a continuous cycle but are usually diminishing each iteration because the economic multiplier is responding to a smaller increase in population and becomes increasingly more difficult to quantify. With that said, when projecting for growth relative to things like infrastructure the precautionary approach is to overestimate demand to ensure that the basic needs of the community can be met.

The lower bound of the baseline conservative projection range assumes a different economic multiplier for the downturn of the forestry sector of 1.31 which is based on the census division (i.e., Kenora CD, thunder Bay CD, Rainy River CD) average for the agriculture; forestry; fishing and hunting industry (NPI 2019). A more conservative economic multiplier is used to reflect the potential for lower economic opportunities as the result of an economic downtown or other potentially less favourable economic circumstances.

The family multiplier for the baseline projections without the Project is 1.9 persons per household and is the projected persons per household size for Ignace, Dryden, and Sioux Lookout in 2046 based on the observed change in average household size from 2011 to 2016 (Statistics Canada 2013, 2017).

For the population projections with the Project, a family multiplier of 2.3 (the average of Ignace, Dryden, and Sioux Lookout average persons per household in 2016) is used to reflect objectives and strategies of the Township to improve the ability to retain youth and young families. The family multiplier used for the Project accounts for a somewhat younger population consistent with overall trends in the Kenora CD (average persons per household of 2.7 in 2016), which is more consistent with Ignace's aspirations for the Project: attracting families and young professionals (Statistics Canada 2017).

E1.5 APPENDIX E REFERENCES

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APPENDIX F:
Case Study Summaries

F1.0 CASE STUDY SUMMARIES

Research into best and promising practices for managed and sustainable population growth led to the selection of three case studies of municipalities who dealt with population growth from project development differently:

Pinawa, Manitoba - which grew because of planned growth to establish a workforce for the nearby Whiteshell Laboratories site, which operated from 1963 to 2002 and is currently being decommissioned, requiring the community to develop plans to ensure its sustainability.

Williston, North Dakota - which experienced rapid population growth and decline because of changes in commodity prices for oil.

Tumbler Ridge, British Columbia – was a planned community, with heavy provincial and municipal involvement at the outset, to serve a coal mine. The municipality experienced population growth and decline over the last couple of decades due to the boom-bust cycle inherent in the natural resources sector. Due to the initial involvement by governments, the municipality was able to transition away from reliance on the natural resource industry in recent years.

Pinawa, Manitoba

In 1959, the federal government identified the need for a new federal research laboratory and Manitoba was chosen as the host. Atomic Energy of Canada Ltd. (AECL) established the Whiteshell Nuclear Research Establishment on the Winnipeg River near Pinawa. (Whiteshell History Committee 2016). Negotiations with Manitoba resulted in the decision to establish a “new Pinawa” close to the site of “old Pinawa,” a town which had been abandoned after the Pinawa dam was decommissioned in 1951 (LGD of Pinawa n.d.). The Province of Manitoba assumed responsibility for maintaining the infrastructure (e.g., roads, bridge across the Winnipeg River). In July 1963, Pinawa was designated a Local Government District (LGD) (an area that is wholly or partly in unorganized territory or in a disorganized municipality with inhabitants) and was appointed a Resident Administrator.

An agreement was made in July of 1960 to host the Whiteshell Nuclear Research Establishment in Pinawa with an initial target of having 146 houses built by 1963 (Whiteshell History Committee 2016). The AECL built a staff hotel, gas station, shopping mall, municipal building, marina, motor inn, schools, and a hospital (LGD of Pinawa n.d.). The short timeframe during which the community was established and the nature of the organizational structure of the town led to some initial complications and developments over the years faced by the residents of Pinawa:

Pinawa was designed to accommodate AECL employees and their families and had a limited commercial base. There were also residents engaged in contractor, public service, and consultant occupations and related services (LGD of Pinawa n.d.; Whiteshell History Committee 2016).

By fall of 1963 there was already a notable back log of nearly finished construction, which resulted in the Whiteshell Nuclear Research Establishment site being used to house many of the

contractor's staff in temporary bunkhouses. Operations staff for Whiteshell Nuclear Research Establishment moved to Pinawa in 1964 (Whiteshell History Committee 2016).

Over the next few decades, the Whiteshell Nuclear Research Establishment maintained its spot as Pinawa's main employer with over 1,000 employees at its peak (LGD of Pinawa 2020).

In 1995, the AECL divested their assets publicly after initially owning most housing and infrastructure in Pinawa (The Canadian Encyclopedia 2015).

In 1998, the federal government announced reduced funding to the AECL resulting in employment declining from 850 employees. In 2003, site decommissioning began. In 2021, only 300 employees remained, and the number will gradually fall to zero by fall of 2027 when decommissioning is completed (LGD of Pinawa 2021).

Despite Pinawa being a Local Government District established to primarily serve the Whiteshell Nuclear Research Establishment, the community has maintained a stable population. The efforts to avoid a sudden decline in the community's population are ongoing and a Sustainability Strategy was published in December of 2021. The Sustainability Strategy outlines several visions and goals for Pinawa to ensure sustainable and affordable growth through managed planning. The goals are (LGD of Pinawa 2021):

- Affordable housing;
- Growing the population;
- Protection of the natural environment, natural resources, and open spaces;
- Optimizing the commercial, natural, and intrinsic value of the Waterfront District;
- Well developed investment and business portfolios; and
- Year-round recreation and tourism opportunities, with facilities and businesses to support it.

Table F-1 provides the description of lessons learned from Pinawa.

Table F-1: Lessons Learned from Pinawa

Policies/Programs to Manage Population Growth	Descriptions of Success/Challenges
Creation of the Local Government District	• AECL built several service infrastructures to support AECL employees and their families. • The target of 146 homes in three years was met with some delays but accommodations of temporary bunkhouses were put in place to house the contractors during construction.
Initial monopoly on services to ensure basic services and facilities were available to the workforce.	• By constructing a staff hotel, gas station, shopping mall, municipal building, marina, motor inn, schools, and a hospital (LGD of Pinawa n.d.), the AECL established a monopoly in the community for services and amenities to ensure the workforce had access to basic services within the community given the remote location of the town.
Divesting of assets by the AECL Crown corporation	• The AECL divested their assets to the public allowing the community to ensure less dependency on the Crown corporation and to further expand existing services. • Divesting the assets to the public encouraged competition among businesses in Pinawa, allowing the economy to grow.
Transitioning to a sustainable economy	• Pinawa has maintained a stable population and has goals to grow the population by ensuring a sustainable community. • By promoting competitive businesses, affordable housing, protection of public spaces and the natural environment, and promoting recreation and tourism, Pinawa is diverging from the dependence on the Whiteshell Nuclear Research Establishment and focusing on sectors they have identified are competitive relative to other municipalities.

Williston, North Dakota

Until 2007, Williston, North Dakota was a small agricultural town with a population around 12,000 residents. However, the Bakken rock formation and increase in oil prices resulted in North Dakota becoming the second largest oil-producing state, with Williston located at the centre of the oil base. In Williston, the population grew by 67% from 2010 to 2014 (Millsap 2016), with 25,000 jobs created and 1,300 businesses launched. In 2014, the price of oil dropped from highs of over $100 to less than $40 per barrel (Quick 2016). Due to the boom-and-bust economy and rapid population changes Williston encountered the following challenges:

The boom created housing shortages with job seekers sleeping in their vehicles, those employed in the industry lived in large trailer parks, temporary housing facilities of over 1,000 beds, neighbourhoods of prefabricated ready-to-move homes, and apartments were completely leased before their construction even finished (Johnson 2012).

The boom resulted in the median age dropping from 55 to 30, which led to an overload on health care infrastructure from the sharp rise in the number of births and an increasing demand for schools to support the influx of children (Associated Press 2021).

Population declines after the bust of the oil market led Williston to support new infrastructure and buildings that had to be managed with a much smaller tax base (sales tax receipts fell by 47% from 2015 to 2016) (Millsap 2016).

The unexpected spike in the price of oil did not allow Williston to plan for the surge of population growth. However, the planning department expedited a comprehensive master plan related to community growth based on community needs that strategized how to manage the growth and how much land was available for development (NWO Community and Baseline Studies Knowledge Holder Interviews 2022). Despite having a thorough plan, Williston still did not have the infrastructure, available housing, childcare, public services (e.g., police, education), or the skilled trades required to meet the pace of population growth (NWO Community and Baseline Studies Knowledge Holder Interviews 2022).

The effects of the oil boom and the increase to the population had a notable effect on health care and emergency rooms. Due to the time it takes to plan and construct a health care facility, over 10 years after the initial growth in population, Williston is currently set to open a new hospital in spring of 2022 (NWO Community and Baseline Studies Knowledge Holder Interviews 2022).

Increased rental costs and the cost of living drove a portion of the senior population out of there homes as they needed to downsize but no affordable housing was available. More recently, measures are in place to care for the seniors by having homes in a senior community available. Now seniors can move to some level of assisted living and then full nursing home care.

The provision of senior housing accommodations and a new health care facility were met with prolonged delays due to the shift in age structure and the increased demand for services to meet the needs of younger individuals and families. The young male non-local workforce shifted the age structure in Williston and resulted in policy that addressed capacity constraints to meet the needs of young individuals and families (e.g., schools, child care, recreation). This led to policy that would address senior housing constraints and health care to be less of a priority. This imbalance of policy for specific populations had lasting effects and suggests the importance of having a balance of policy which is targeted towards new and current residents (NWO Community and Baseline Studies Knowledge Holder Interviews 2022).

In 2019, there was another surge in demand for oil. Since Williston was more prepared, the immediate focus was on housing and retail (NWO Community and Baseline Studies Knowledge Holder Interviews 2022). The population in Williston has increased from 14,716 in 2010 to 29,160 in 2020 (Census Bureau n.d.). Despite the contraction in population from 2014 through 2016, there was still an overall increase in the non-local workforce and temporary housing over time with continued pressures on services and infrastructure which were near capacity (Millsap 2016).

Table F-2 provides the description of lessons learned from Williston.

Table F-2: Lessons Learned from Williston

Policies/Programs to Manage Population Growth	Descriptions of Success/Challenges
Development of the town to support the rapid expansion of the population	• The sudden boom in oil prices did not allow Williston to plan for the sudden increase in population. • There were housing shortages that led to a sharp increase in rental costs. • Accommodations were provided by temporary housing facilities of over 1,000 beds and neighbourhoods of prefabricated ready-to-move homes but did not meet the overall demand.
Unplanned growth is not sustainable without proper planning and support	• The lack of available housing for seniors to downsize into and single-family houses to attract permanent residence was a missed opportunity for growing the population further. • Pressures were put on health care, education, retail, and other services required to support the population which took time to be able to meet the demand.
Preparing for the next surge in oil demand	• The growth in the economy and the population has led to further cultural diversity which the community welcomes. • Development of single-family homes is a priority for attracting families which will settle down permanently. • A focus on ensuring public services, childcare, and other services can accommodate any further growth in population to support community well-being.

Tumbler Ridge, British Columbia

Coal prices spiked in the mid-1970s resulting in exploration in northeastern British Columbia. In 1976, the government made plans for a town to house a mining workforce and their families. In 1981, the construction of “instant town” Tumbler Ridge began to support the Bullmoose and Quintette mines operated by Teck Corporation and Denison Mines, respectively. A Local Government Department was developed to provide oversight and support to the community in its growth as opposed to a crown corporation to oversee the initial development of the community (McGrath 1985). The government, municipality, and several companies designed a conceptual plan to establish an incorporated, self-governed community by ensuring the following objectives (McGrath 1985):

1. Risk protection, ensuring costs don’t accrue to the municipality or province if the mining project fails;
2. Equity between communities;
3. Compensation for costs accrued to accommodate the population due to large resource projects;
4. Equity between companies;

5. Self-governed communities;
6. Integrated housing market;
7. Viable and competitive commercial service providers;
8. Level and timing of services corresponding to community needs; and
9. Physical environment, making it safe, economic, and attractive.

By 1999, Tumbler Ridge had grown to a community of 4,500 residents with over 50 organizations in the community engaged in health, social services, economic development, and youth and senior sports and recreation. After a lengthy period of sustained economic and population growth, Tumbler Ridge went through a typical boom-and-bust cycle, characteristic of the natural resource sector. The struggles Tumbler Ridge faced over the next two decades are as follows:

- In 2000, the closure of the Quintette mine was announced two years earlier than anticipated, resulting in the loss of 70% of local jobs and 65% of the municipal tax base. This was followed by the closure of the Bullmoose mine in 2003.
    - When the Quintette mine closed in 2000, the town created the Tumbler Ridge Revitalization Task Force composed of local and regional politicians, community and business leaders, and provincial officials. Revitalization was led by the Ministry of Community Development, Cooperatives, and Volunteer's Community Transitions Branch (Government of British Columbia n.d.).
    - The province assumed the municipality's debt and dedicated funding for services. The Canada Mortgage and Housing Corporation guaranteed mortgages and acquired houses that were later bought by the municipality and resold on the market at lower prices. This helped the municipality to avoid bankruptcy and stabilize the population (Government of British Columbia n.d.).
- In 2003-2004, Duke Energy expanded oil and gas pipelines and processing plants in the Tumbler Ridge area. In 2004, Western Canadian Coal Corporations opened the Wolverine mine, signalling recovery in the region. This was followed by the opening of three more mines over the following five years (Halseth et al 2017).
- In 2014, there was a collapse in global energy prices resulting in one mine closure and another idling with 800 jobs lost and 90 workers laid off by Teck Corporation. The population in Tumbler Ridge was 2,710 in 2011 (Statistics Canada 2012).

The current population in Tumbler Ridge has grown from 1,987 residents in 2016 to 2,399 in 2021 (Statistics Canada 2017, 2022). Currently, Tumbler Ridge is attempting to diversify the economy in several ways by promoting tourism, a destination for those who work remotely/virtually, wind energy generation, natural gas extraction and LNG pipeline, forestry, and being a host for conferences and meetings (Invest Tumbler Ridge n.d.).

Table F-3 provides the description of lessons learned from Tumbler Ridge.

Table F-3: Lessons Learned from Tumbler Ridge

Policies/Programs to Manage Population Growth	Descriptions of Success/ Challenges
Development of "instant town" Tumbler Ridge	• The province financed most of the infrastructure and intended Tumbler Ridge to be a fully functional community. Special attention was paid to social planning in addition to physical place which included community and recreational infrastructure, and funding for a social planner to help residents organize civil society groups (Halseth et al 2017). • The balance of physical and social planning to ensure a sustainable community has allowed Tumbler Ridge to be resilient throughout the boom-and-bust cycle the mining industry has experienced in the region.
Intervention to alleviate the contraction to the local economy	• The rapid contraction of 70% of local jobs and 65% of the municipal tax base led to the possibility of bankruptcy for Tumbler Ridge. • The Revitalization Task Force with the support of the Canada Mortgage and Housing Corporation took on the liability of mortgages until the municipality could repurchase them. • The municipality put homes back on the market at a reduced price, which allowed the population to stabilize. • In addition to support from the Canada Mortgage and Housing Corporation, the province also assumed the municipalities debt and dedicated funding for services to help support the recovery of the local economy.
Diversification of the economy	• Tumbler Ridge more recently is promoting entrepreneurship, tourism, clean energy, and conference gatherings. • The goal is to stabilize the economy and lower the town's dependency on the success of the natural resource sector.

Table F-4 presents a summary of the lessons learned from the case studies described above.

Table F-4: Lessons Learned from Case Studies

Policies/Programs to Manage Population Growth	Descriptions of Success/Challenges
Plan well in advance to accommodate a growing population	• Need to have housing ready in advance with various housing options including single-detached dwellings to attract families. • Pressures on health care, education, retail, childcare, and other services must be predicted and addressed proactively to ensure services do not exceed capacity. • Important to establish guidelines and mandates for how the government and/or NWMO will step in to support the Township of Ignace during unforeseen circumstances to avoid bankruptcy or any other detriments to the Township (e.g., forest fires, union strikes, delays in the Project from new regulations).
Ensure there is a balance between policies targeted towards specific populations (e.g., current residents and new residents)	• A large influx of a workforce which is comprised of younger individuals and their families results in the tendency for current residents (e.g., seniors) to be overlooked during policy planning. • Senior housing is important to have available, so residents are able to downsize and gradually transition to full care accommodations before a large influx of residents occurs.
Transitioning to a sustainable economy through diversification	• Important to lower the dependency on one industry or employer's success through diversification of the economy to ensure a sustainable economy and population.

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APPENDIX G:
Project Workforce Requirements

G1.0 PROJECT WORKFORCE REQUIREMENTS

The positions required by the Project are varied. They are assumed to include the following types of positions based on the National Occupational Classifications (NWMO 2021):

- Senior Management (NOC 00) and specialized middle management (NOC 011, 021, 073, 081, 097);
- Professional occupations related to natural and applied sciences: physical science professionals; civil, mechanical, electrical, and chemical engineers (NOC 21);
- Technical occupations related to natural and applied sciences: technicians and technologists in a range of fields, including physical science, life science, engineering, land surveying, mathematics, statistics, actuarial science, and computer and information systems (NOC 22);
- Maintenance and equipment operation trades (NOC 73);
- Transport and heavy equipment operation, includes truck transport drivers and heavy equipment operators (NOC 75);
- Supervisors and technical occupations in natural resources, includes underground production and development miners (blasters, drillers, miner) (NOC 82);
- Natural resources workers, includes underground mine service and support workers (crusher operator, helpers) (NOC 84);
- Processing, manufacturing, and utilities supervisors and central control operators (NOC 92);
- Processing and manufacturing operators and related production workers (NOC 94); and
- Other direct positions in response to procurement of construction and other services, including industrial, electrical, and construction trades (NOC 72).

Appendix G References

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APPENDIX H:
Glossary of Terms

Table H-1: Glossary of Terms

Term	Definition
Adaptative management	Adaptive management is defined consistent with the CNSC's definition of adaptive management (REGDOC-3.6): A planned and systematic process for continuously improving management practices (primarily environmental) by learning from their outcomes. For an environmental assessment it involves, among other things, the implementation of new or modified mitigation measures over the life of the Project to address unanticipated environmental effects. Note: the need to implement adaptive management measures may be determined through an effective follow-up program.
Adaptive Phased Management (APM) Project	The Deep Geological Repository and other required infrastructure for the safe, long-term management of Canada's used nuclear fuel.
Community	The use of the term 'community' (a group of people living either in the same place or having a particular characteristic in common) will be qualified to specify the specific community of reference.
Community Studies Purpose	Community studies will inform the primary APM Project hosting agreement between the NWMO and the Township of Ignace. In addition, they will provide pertinent information for agreements with the City of Dryden as well as other potential regional agreements.
Ignace Area	Delineates the general area surrounding the potential APM Project location Deep Geological Repository in Northwestern Ontario; mainly comprising of City of Dryden, Machin, the Local Service Board of Wabigoon, the Local Service Board of Melgund (Dyment and Borups Corner), and Sioux Lookout. The area is located in Treaty #3 within the traditional territories of multiple Indigenous and Métis communities.
Ignace and Area Working Group	The Township of Ignace and the NWMO have established a working group inclusive of the Township of Ignace, Wabigoon Lake Ojibway Nation, and other Indigenous and non-Indigenous local and regional community members and observers to collaboratively design and implement baseline and community studies to provide a basis for achieving informed decision making related to the APM Project.

Term	Definition
Local Study Area	The Local Study Area refers to the communities/areas most likely to experience future direct, indirect, and induced impacts of the APM Project - both positive and negative. For the purposes of the baseline studies, the potential "host" community (i.e., Ignace) is considered central to the Local Study Area, while other communities may be included on a topic-by-topic basis relative to potential future impacts and cumulative impacts. The Local Study Area will vary by baseline component/study as well as phase of the Project. For example, for workforce the Local Study Area includes communities that can commute to the Revell Site or the Centre of Expertise within an hour drive. This means that Ignace, Dryden, Sioux Lookout (for the Revell Site) and Machin (for the Revell Site) and unincorporated municipalities constitute the primary Local Study Area (micro labour-shed). This micro labour-shed includes settlement areas (unincorporated communities) between Dryden, Ignace, and Sioux Lookout. The preliminary spatial boundaries are as follows: • Ignace; • Dryden; • Machin; • Sioux Lookout; • The Local Service Board of Melgund; and • The Local Service Board of Wabigoon.
Neighboring Community	Communities in Northwestern Ontario surrounding the Project or included in both Local and Regional Study Areas (i.e., Dryden, Sioux Lookout, Machin, and unincorporated municipalities).
Neighboring Community Leadership	For the purpose of engagement on draft materials, neighboring community leadership in this context refers to municipal administrative leadership inclusive of the Local Service Board of Wabigoon, the Local Service Board of Melgund, etc.
Potential Municipal Host Communities	Two municipal siting communities remain in the process. These are the Township of Ignace and the Municipality of South Bruce. Ignace has participated in the NWMO's site selection process since initiation in 2010.
Project Site	Used to describe the location of the primary APM infrastructure including the Deep Geological Repository, and ancillary infrastructure to support operations.

Term	Definition
Regional Study Area	The Regional Study Area refers to the area used to provide context for each component and may also experience future impacts of the APM Project (both positive and negative). During the future impact assessment, cumulative effects will be considered within the Regional Study Area. The Regional Study Area will also vary by baseline component/study as well as phase of the Project. In some instances, the regional boundaries are either narrowly defined by the area within the Kenora District or more broad in scope such as the labour baseline for example: • Atikokan; • Kenora; • Thunder Bay; • Steinbach; and • Winnipeg.
Revell Site	Revell Batholith Temporary Withdrawal Area.
Rights Holders	First Nation and Métis communities who have asserted and or hold recognized treaty and/or Indigenous rights and whose Traditional Territories include the Project site.
Siting Area	In the context of the Community Studies for Northwestern Ontario, 'siting area' refers to the Ignace Siting Area defined above for 'Ignace Area'.
South Bruce Area	Delineates the general area surrounding the potential APM Project location in southwestern Ontario; mainly comprising Bruce County (excluding the South Bruce Peninsula) and northern portions of Huron County, but not extending to the shores of Lake Huron. The area is located in Treaty #45 1/2 in the traditional territory of the Saugeen Ojibway Nation as well as the asserted traditional territories of Métis communities.
Spatial Boundaries as defined in Baseline Design Report	Spatial boundaries vary by topic and will be refined over the course of engagement. It is anticipated spatial boundaries will reflect inputs from local governments, the public, Indigenous communities, federal and provincial government departments and agencies, and other interested parties, consistent with the Tailored Guidelines template. Two general spatial study areas are considered as part of the Community Studies that referred to as the Local Study Area and Regional Study Area.

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