NUCLEAR WASTE MANAGEMENT ORGANIZATION
SOCIÉTÉ DE GESTION DES DÉCHETS NUCLÉAIRES

Canada's Deep Geological Repository for Used Nuclear Fuel: Modelling Economic Effects

Presented to: South Bruce Nuclear Waste Community Advisory Committee

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Introduction

- Context
- Background for economic modelling work
- Purpose of Update
- Methods Used
- Preliminary Findings
- Next steps

Focus of Discussion during Phase 2

- Can we identify a safe site?
- Is the project a good “fit” for the area?
- Is the project compatible with the area’s vision?
- How might the project foster well-being?

The Project will only proceed with the interested community, First Nation and Métis Communities in the area, and surrounding communities working together with the NWMO to implement it

Communities define Well-being

- NWMO committed to implementing project in a way that contributes to long-term well-being of area
- Communities encouraged to consider this project in the context of well-being as they define it
- And be involved in planning to leverage the project to enhance well-being

Many dimensions of well-being

- ***People:*** employment, training, opportunities for population growth
- ***Infrastructure:*** water and wastewater, schools and libraries, emergency services, roads
- ***Environment:*** land, livable communities, protection of environmental values
- ***Community and Culture:*** enhancement of community values, ways of life, cultural traditions
- ***Economics and Finance:*** economic diversity, revenue
- ***Spirit***

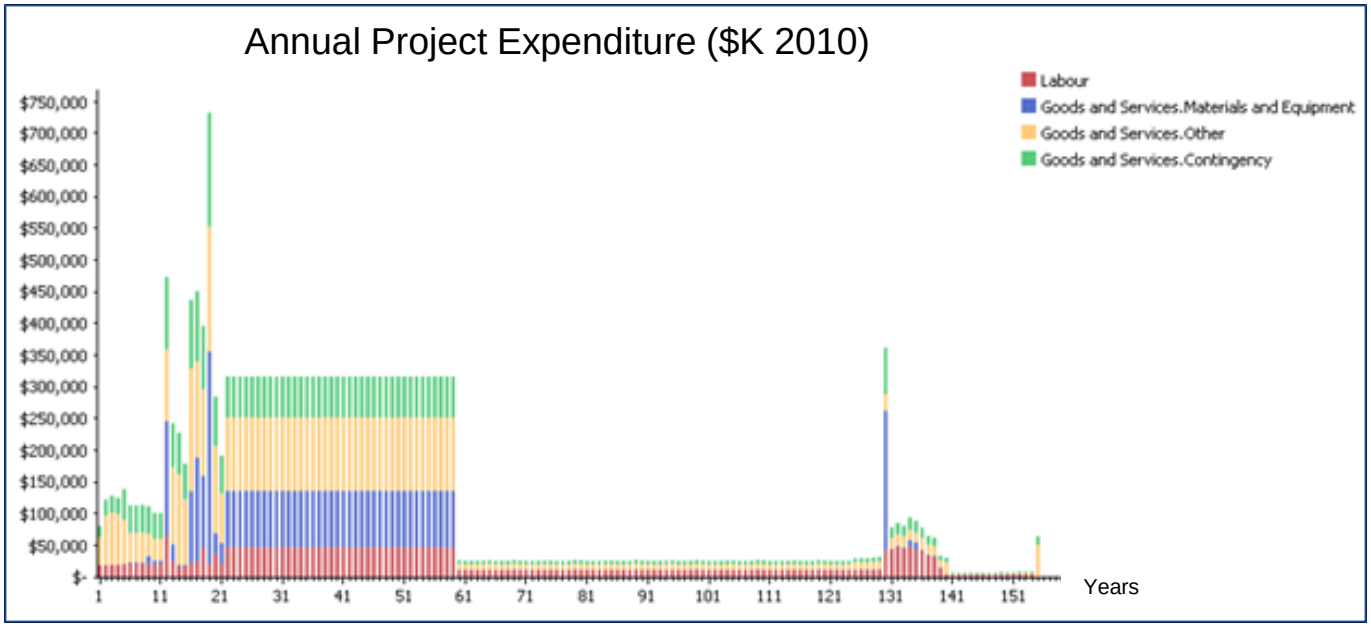
Preliminary Economic Analysis

Purpose of This Analysis

- To update previous “generic” estimates of benefit (2010) that are specific to the candidate host regions and communities of Ontario
- What is the magnitude and scale of benefit to Ontario from the APM project being located in the province? Three levels of assessment:
  - Province-wide benefits
  - Regional benefits – Economic Region
  - Host area benefits
- Focus on job creation opportunities
- Preliminary assessment: high-level, order-of-magnitude

Adaptive Phased Management: Expenditure Profile

- Significant investment ($20 billion)
- Investment over many decades
- Project being considered in six phases: siting, initial licensing, construction, operations, extended monitoring and decommissioning
- Cost and schedule will be revised over project life



Cost Estimate and Schedule

- Economic modelling study uses 2010 cost estimate and a more detailed cost breakdown
- APM Project cost estimate is updated every five years
- Provides the basis for financial planning
- Cost and schedule change with each estimate
- Next cost estimate update expected 2016

Estimated APM Facility Expenditures by Project Phase ($M 2010)

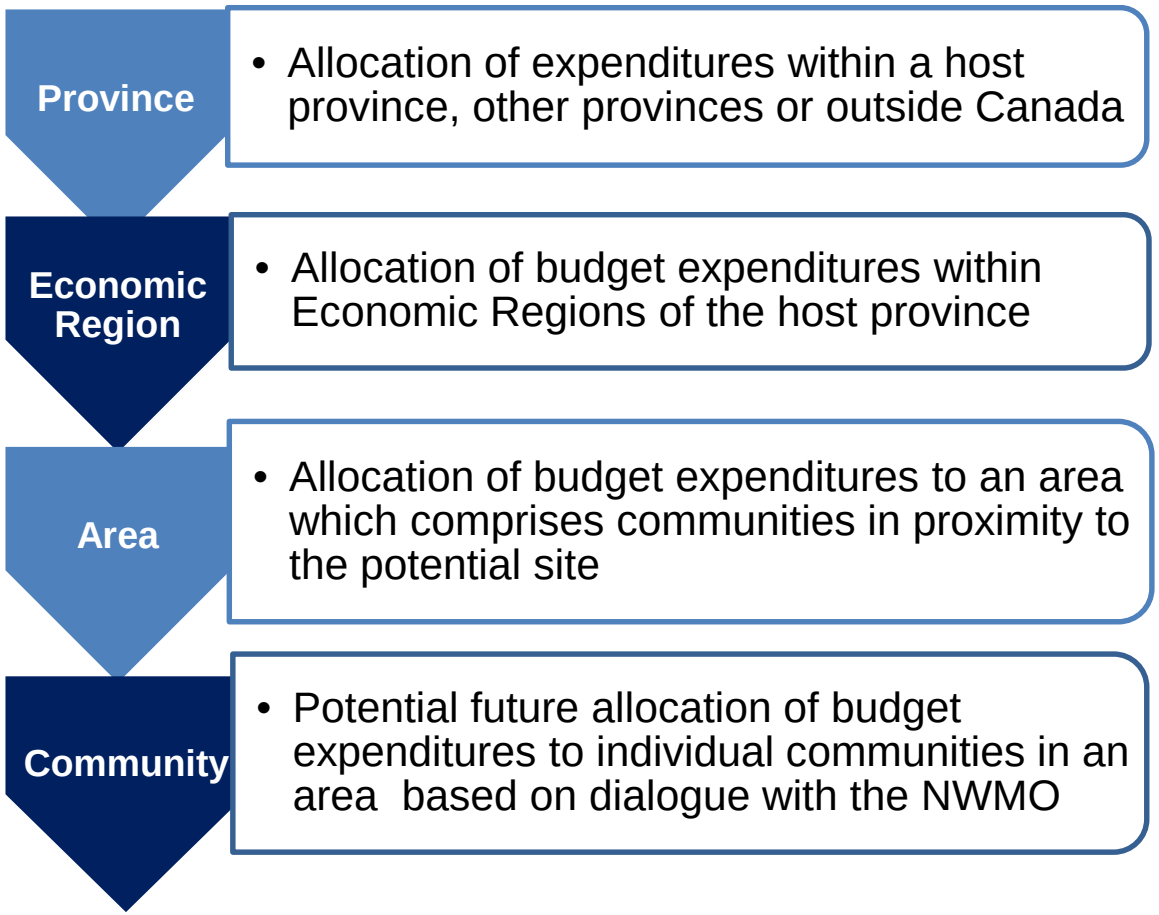
Phase	Timing (Years)	Budget				
		Labour	Materials and Equipment	Other	Contingency	Total
Siting	1 to 7	$141	$3	$450	$223	$817
Initial Licensing	8 to 11	$83	$25	$153	$165	$426
Construction	12 to 21	$297	$1,003	$1,378	$934	$3,611
Operations	22 to 59	$1,793	$3,373	$4,393	$2,465	$12,023
Extended Monitoring	60 to 129	$766	$23	$650	$365	$1,804
Decommissioning	130 to 159	$457	$251	$269	$246	$1,224
Total		$3,537	$4,677	$7,294	$4,938	$19,905

Notes: 1. The expenditure profile and schedule that drive benefits by project phase are under revision.
2. Column and row totals are subject to rounding error.
3. Transportation costs not included.

Assessing Benefits

- Estimate of direct, indirect, and induced economic benefits derived from the Interprovincial Input-Output (I/O) Model, which is annually updated by Statistics Canada from National Accounts information
- I/O Model is the sole independent model for producing economic benefits for Canada and provinces based on projected spending in specific industries and/or commodities. Economic benefit outputs include GDP, tax revenues, number of jobs, labour income, etc.
- Model is used exclusively by federal, provincial and territorial governments to determine the economic benefit of different investments in their economies
- Uses current Statistics Canada datasets to generate multipliers
- Economic benefits for Ontario produced by the I/O Model are allocated to regions and siting areas

Method: Tiered Analysis



Process repeats applied for each phase of the Project:

- Siting
- Initial licensing
- Construction
- Operations
- Extended monitoring
- Decommissioning

"AREA" = Communities near potential sites which is a subset of the Economic Region

Preliminary Initial Findings - Ontario

Top Line Findings

- Project size and scale brings potential to significantly affect economic opportunity and diversity over extended period
- Significant job creation in a range of skills areas in the siting area
- Significant employment opportunities extend across the province
- Benefits realized within a community/region are influenced by many factors:
  - Geographic location
  - Population size, dynamics, and characteristics
  - Proximity to supporting services and industry

Jobs Categories – Three Categories

- **Direct jobs** result from NWMO expenditures for labour, for example labour hired to manage the project, or labour wages paid during operations and expenditures to firms for transporting inputs (construction materials) to the site
  - Direct jobs are expected to be located primarily at or near the project
- **Indirect jobs** result from project expenditures which include inter-industry purchases in the supply chain
  - Indirect jobs would provide support, products and services such as food and accommodation
- **Induced jobs** result from direct and indirect employees purchasing goods and services at the household level
  - Induced jobs include doctors, lawyers and retail

Estimated Average Annual Employment – Ontario

Project Phase	Years	Direct Jobs per year	Indirect Jobs per year	Induced Jobs per year	Total Jobs per year
Siting and Initial Licensing	1 to 11	215	540	190	**945**
Construction	12 to 21	795	1,430	575	**2,800**
Operations	22 to 59	720	1,205	495	**2,420**
Extended Monitoring	60 to 129	135	100	70	**305**
Decommissioning	130 to 159	290	115	100	**505**

Conclusion:

- This is a major infrastructure project with dedicated funding that will generate sustained benefits (jobs) for Ontario and the area communities for more than 100 years
- This meets the aspirations of area communities seeking to:
  - Build community vitality and growth
  - Build or maintain infrastructure
  - Attract new businesses
  - Provide career opportunities for youth across the area communities

Initial Estimates for South Bruce and Area

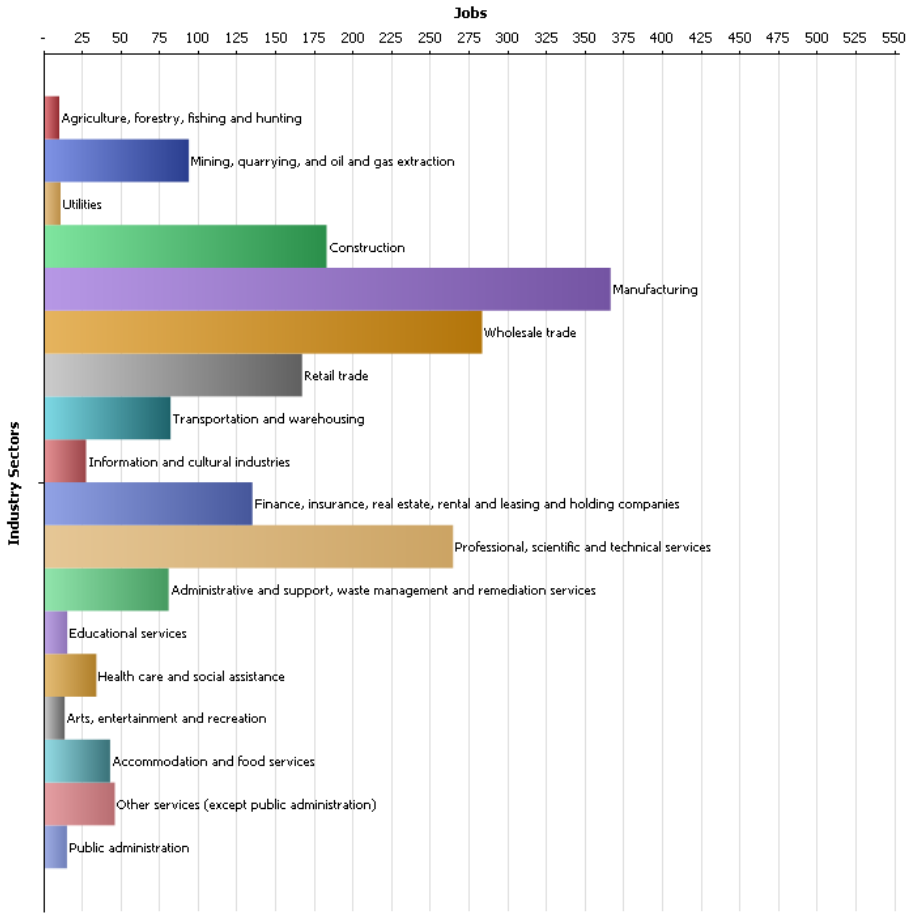
Estimated Annual Average Employment – Stratford-Bruce Peninsula Economic Region

Project Phase	No. of Years	Direct Jobs per year	Indirect Jobs per year	Induced Jobs per year	Total Jobs per year
Siting and Initial Licensing	11	20	55	20	95
Construction	10	410	770	300	1,480
Operations	40	650	1,100	450	2,200
Extended Monitoring	70	130	90	70	290
Decommissioning	30	250	100	90	440

Employment Opportunities in Stratford-Bruce Peninsula Economic Region – Sample Construction Year

Key opportunity sectors:

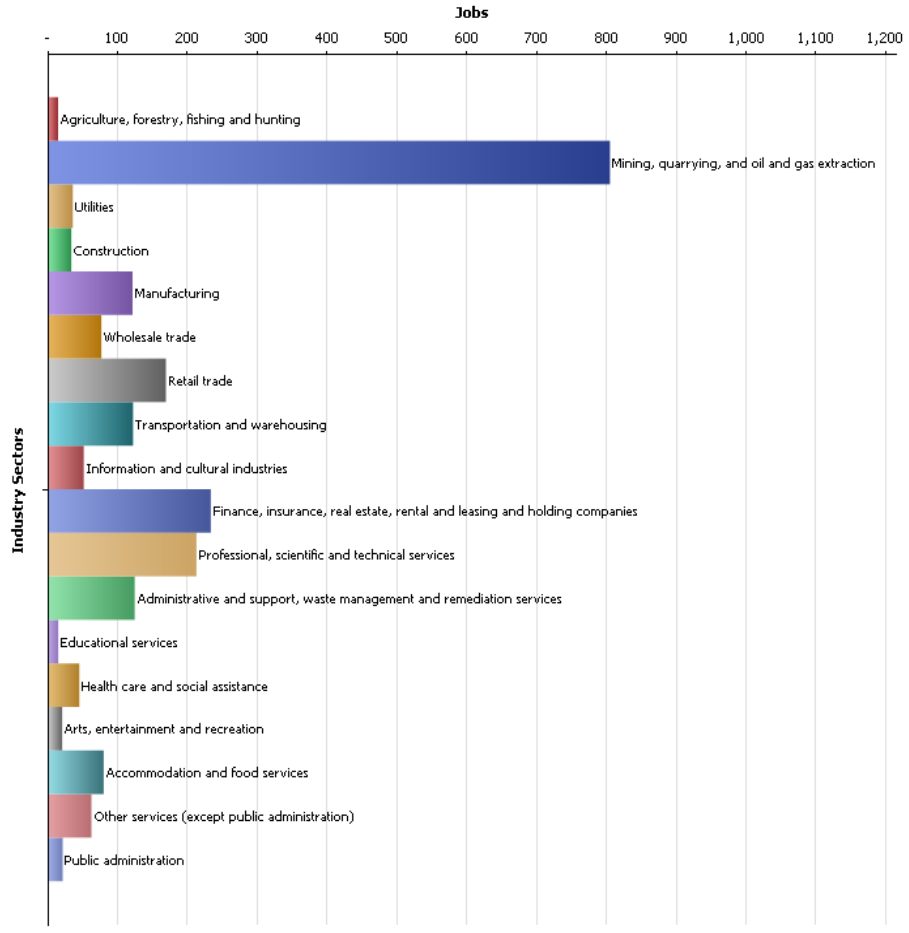
- Manufacturing
- Wholesale and retail trades
- Professional, scientific and technical services, finance, insurance, and real estate services
- Construction
- Mining and quarrying
- Transportation and warehousing
- Administrative and support, waste management and remediation services



Employment Opportunities in Stratford-Bruce Peninsula Economic Region – Sample Operations Year

Key employment sectors:

- Mining and quarrying
- Finance, insurance, real estate
- Professional, scientific and technical services
- Retail trade
- Manufacturing
- Administrative and support, waste management and remediation services

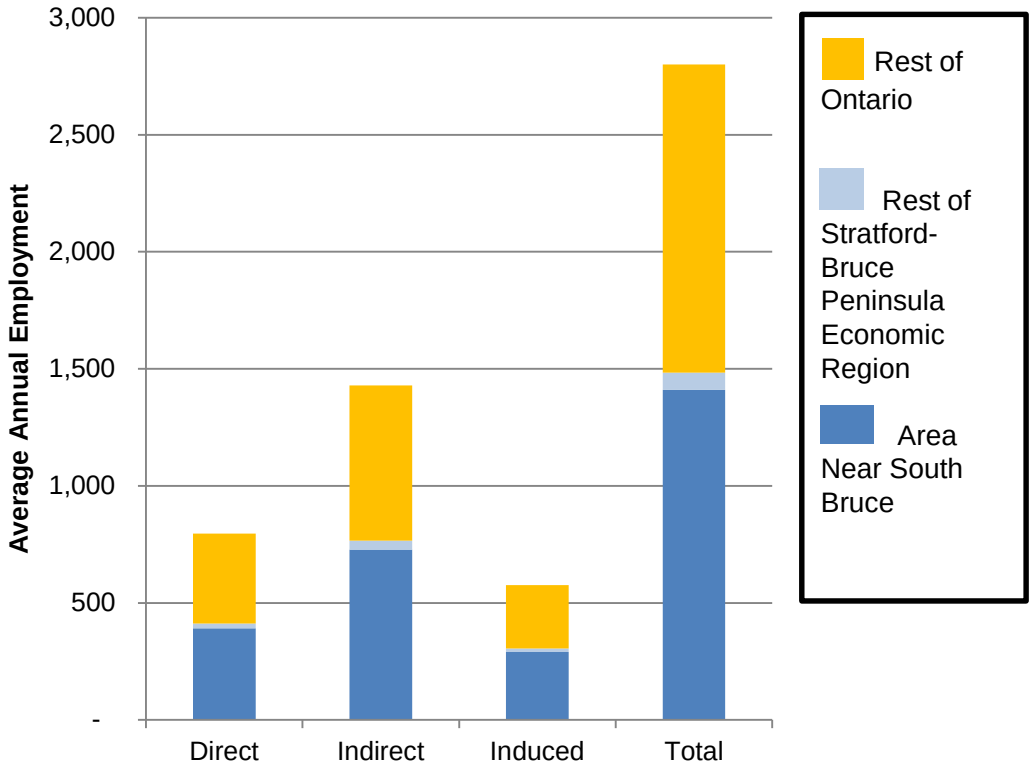


Estimated Annual Average Employment – Area Near South Bruce

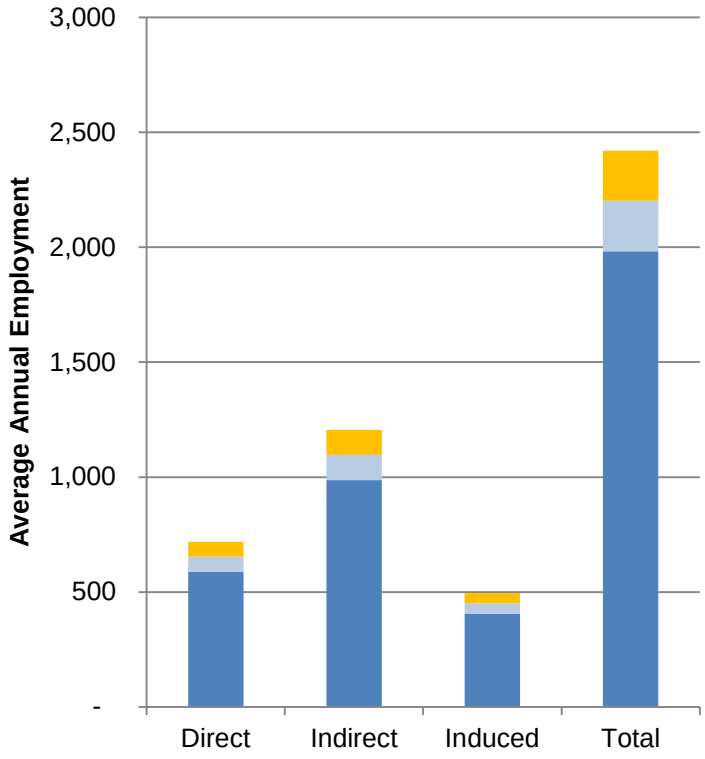
Project Phase	No. of Years	Direct Jobs per year	Indirect Jobs per year	Induced Jobs per year	Total Jobs per year
Siting and Initial Licensing	11	20	55	20	95
Construction	10	390	730	290	1,410
Operations	40	590	990	400	1,980
Extended Monitoring	70	120	90	60	270
Decommissioning	30	240	90	90	420

Area Near South Bruce – A Closer Look at Annual Average Jobs

Construction Phase (10 Years)



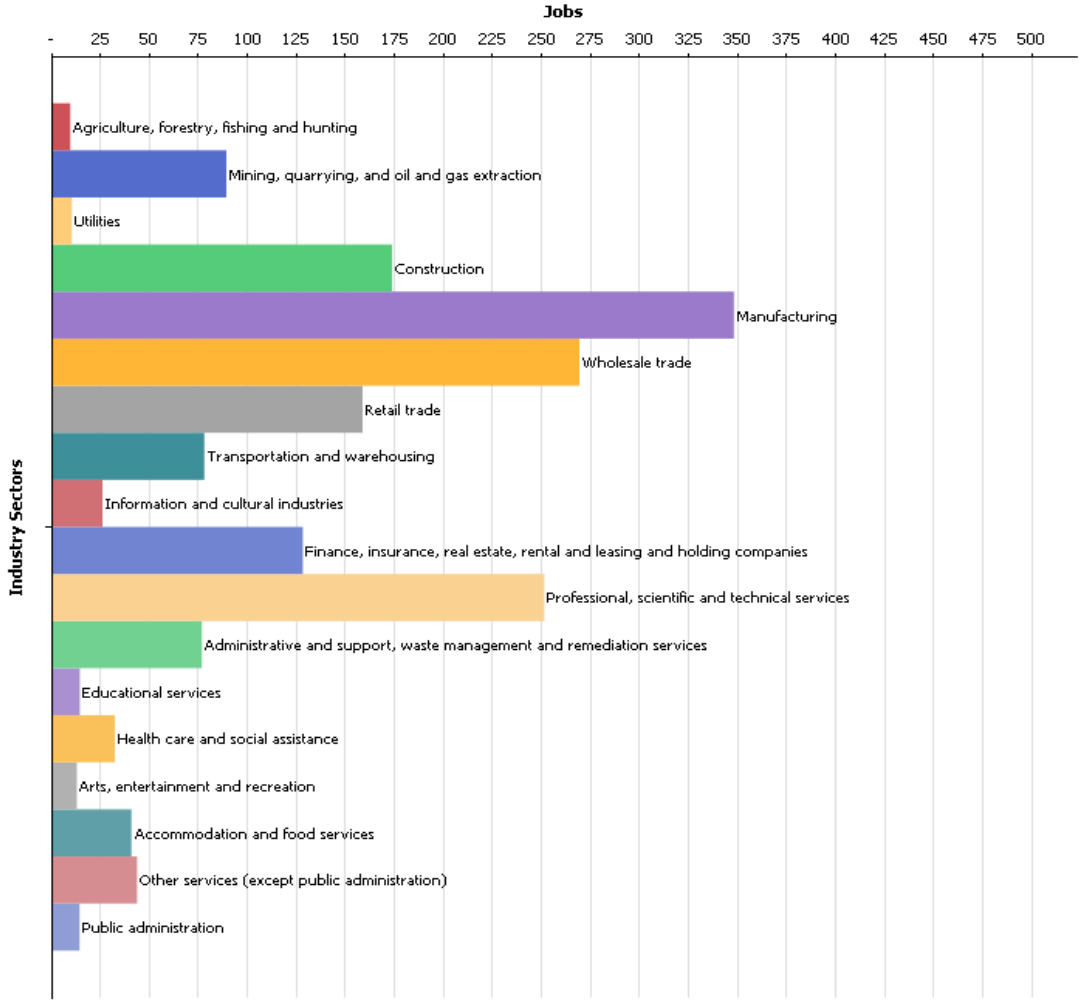
Operations Phase (40 Years)



Employment Opportunities – Area Near South Bruce During Construction (sample year)

Key Opportunity Sectors:

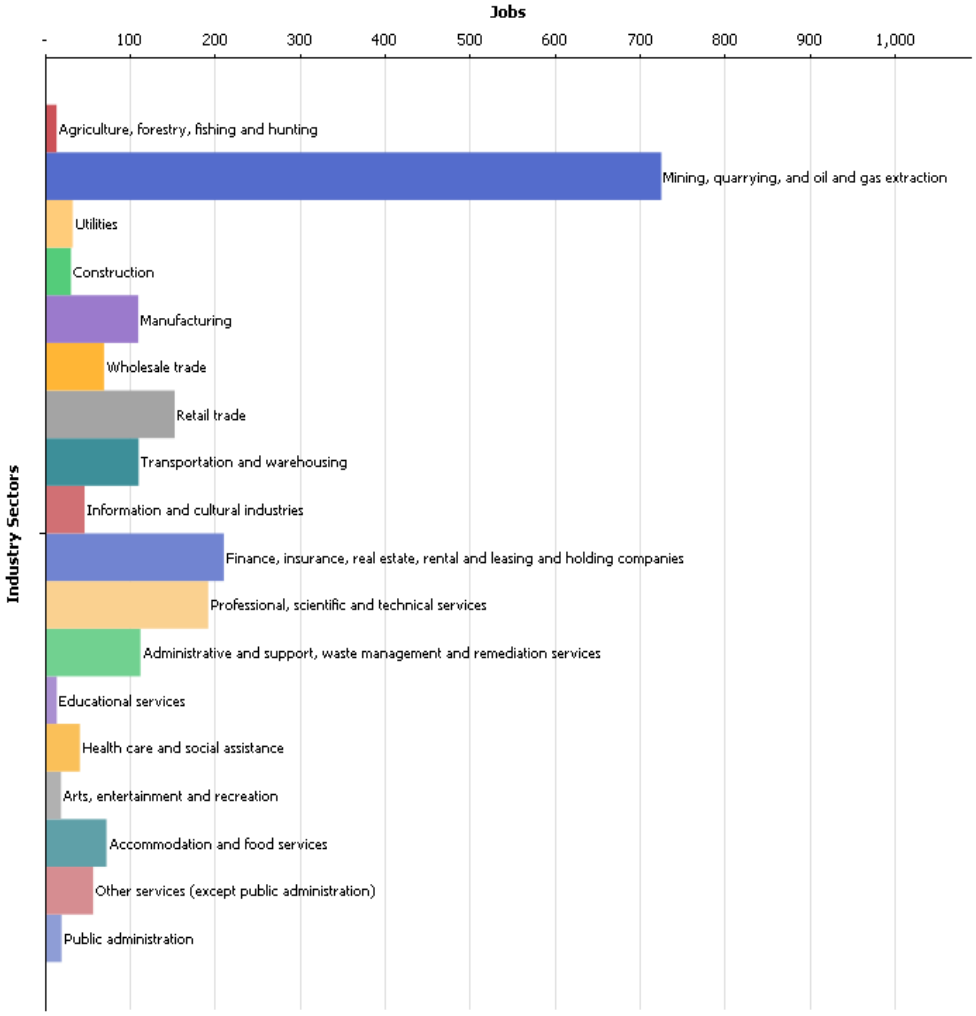
- Manufacturing
- Wholesale and retail trades
- Professional, scientific and technical services, finance, insurance, and real estate services
- Construction



Employment Opportunities – Area Near South Bruce During Operations (sample year)

Key Opportunity Sectors:

- Mining
- Finance, insurance, real estate, rental and holding companies
- Professional, scientific and technical services
- Wholesale and retail trades
- Manufacturing



Influencing Benefits

- NWMO committed to work with communities to plan implementation of the project
- Work to create a common economic development strategy, which may include:
  - Training
  - Local hiring and procurement programs
  - Fostering business development and infrastructure

Next Steps

Focus of Discussion during Phase 2

- Is the project a good “fit” for the area?
- Is the project compatible with the area’s vision:
  - considering the many aspects of well-being, including people, environment, infrastructure, community and culture, Spirit, and economics and finance?
  - from the perspective of interested community, First Nation and Métis Communities in the area, and surrounding communities?

Next steps

1. Explore economic benefits at regional level and how this might advance other important aspects of well-being
2. Explore the different components of the project and implementation scenarios
3. Envision the Centre of Expertise
4. Begin to prepare for implementation through training and capacity building

Regional picture

- Explore priorities, objectives and vision at the area level
- Explore potential to advance the vision for the area, and address the priorities and objectives of communities
- The model will help explore economic impact of various implementation plans

Project Components and Scenarios

- Updated Project Description describes key components of the project
- There are options for how project components would be implemented that would effect economic benefits
- This includes where different project components could be located
- Project components include surface facilities such as:
  - Used Fuel Container Factory
  - Used Fuel Packaging Plant
  - Sealing Material Compaction Plant/ Concrete Batch Plant
  - Centre of Expertise

Designing and Developing Centre of Expertise

How might the Centre be designed and developed

- Where might we wish to locate the Centre of Expertise if our area hosts the APM Project?
- What would we like the Centre to look like? What architectural style?
- What kinds of facilities and meeting venues would the community find useful if available for general purpose?
- What other opportunities are there for the Centre of Expertise to contribute to community priorities?
- How might we like to see local history and culture reflected in the design?
- How might we like to see indigenous knowledge and local First Nation and Métis cultures reflected?
- How will we involve local people in the day-to-day operation of the Centre and how can we plan for this?
- What other decision points would the community like to be part of?

Preparing for the project: Building Local Capacity and Employment Opportunities

- Development of jobs and skill inventory
- Implement hiring plan to build locally based staff
- Discuss priority steps for developing skills and job opportunities
- Discuss plan for investments in training, hiring, business development and begin implementation focussed on transferable skills

Beginning the Discussion

- Review initial findings and report from economic modelling with CLC, community members, others in the area in 2016
- Share initial findings with community in an open house as part of an update on the project
- Continue discussion about fostering well-being including new project description, Centre of Expertise and training