ENVIRONMENT ACT

PROPOSED TERMS OF REFERENCE

FOR

PUBLIC REVIEW AND COMMENT

NOVA SCOTIA DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS

Highway 104 at Antigonish, Antigonish County, N.S.

NOVA SCOTIA DEPARTMENT OF ENVIRONMENT AND LABOUR

November, 2001

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FOREWORD

On November 26, 2001, the Nova Scotia Department of Transportation and Public Works registered its Highway 104 at Antigonish Project with the Minister of Environment and Labour pursuant to provisions of Part IV of the *Environment Act* and Environmental Assessment Regulations.

The project is a Class II undertaking, therefore the Nova Scotia Department of Transportation and Public Works is required to prepare an Environmental Assessment Report for the proposed roadway construction and operation. Regulations require that Proposed Terms of Reference for the Environmental Assessment Report be prepared by the Environmental Assessment Administrator and made available for public review and comment prior to being finalized and provided to the proponent.

Transport Canada and Fisheries and Oceans Canada (Habitat and Coast Guard) have indicated that this project will likely require review under the *Canadian Environmental Assessment Act*. The Nova Scotia Department of Environment and Labour will coordinate ,where possible and practical, with the federal process. The final version of the Terms of Reference are expected to include environmental assessment requirements pursuant to the Nova Scotia Environmental Assessment Regulations and the *Canadian Environmental Assessment Act.*

This document presents the Proposed Terms of Reference for public review and comment. The Minister of Environment and Labour invites interested Nova Scotians to examine the Proposed Terms of Reference and provide comments on their adequacy and suggestions for their modification.

Comments must be submitted in writing on or before **January 17, 2002**, and addressed to :

ENVIRONMENTAL ASSESSMENT ADMINISTRATOR
NOVA SCOTIA DEPARTMENT OF ENVIRONMENT AND LABOUR
P.O. BOX 697
HALIFAX, NOVA SCOTIA
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E-MAIL ea@gov.ns.ca

1.0 INTRODUCTION

This section of the Report shall introduce the reader to the Report.

2.0 PROJECT DESCRIPTION

This section of the Report shall describe the project as it is planned to progress through the construction and operation phases of its life. Any assumptions which underlie the details of the project design shall be described, including impact avoidance opportunities inclusive of pollution prevention, and adherence to best management practices. Where specific codes of practice, guidelines and policies apply to items to be addressed, those documents shall be cited and included as appendices to the Report, including mapping at an appropriate scale.

Items to be addressed shall include, but not be limited to:

2.1 Highway Corridor Location

Ultimate boundaries of the proposed corridor and highway route in a regional context showing existing and proposed land uses and infrastructure such as road networks, railways, power lines, pipelines, proximity to settled areas, individual and community water supplies, wetlands, ecologically sensitive area and archaeological sites shall be described.

2.2 Construction Methods, Schedule and Other Constraints

This section shall include a description of the following:

2.2.1 general construction practices, including but not limited to:
- pit and quarry operations
- erosion and sedimentation control;

2.2.2 description of vehicle types, truck routes, hours of operation of vehicles to be used in highway construction;

2.2.3 proposed construction schedules, including proposed time frames for right-of-way clearing and slash disposal and timing of highway construction, and construction work adjacent to watercourses;

2.2.4 identification of areas requiring major cut and/or fill operations.

2.3 Structures

Describe the typical structures proposed for all watercourse and wetland crossings and for any proposed wildlife corridors.

2.4 Acid Producing Bedrock

Provide the location and an estimate of net acid producing bedrock to be disturbed.

2.5 Borrow Material

Describe the acceptable types of borrow material for highway construction and any currently identified sources likely to be used in the highway construction.

2.6 Paving Materials

Describe the proposed road paving materials.

2.7 Construction Waste Disposal

Describe the criteria for the selection of candidate sites for:

- the disposal of excess/waste excavated rock and overburden, including locations of any currently known planned disposal sites, including those for acid producing slates;
- the disposal of organic soil, slash, grubbing and wood fibre, including locations of any currently known or planned disposal sites.

3.0 REGULATORY ENVIRONMENT

Describe the existing regulatory environment (Federal, Provincial, Municipal) including all permitting, licensing and regulatory requirements, appropriate guidelines and Municipal Planning Strategy and Land Use Bylaw requirements that apply to all phases of this proposal.

4.0 REASON FOR THE UNDERTAKING

In recognition of the fact that the project has a potentially negative impact upon the environment, this section shall discuss the public need for the undertaking.

5.0 A DESCRIPTION OF ALTERNATIVES TO THE UNDERTAKING

This section of the Report shall describe functionally different ways to meet the project need and achieve the project purpose. This discussion shall address but not necessarily be limited to other modes of transportation, upgrading of existing roadway and the null (do nothing) alternative.

6.0 OTHER METHODS FOR CARRYING OUT THE UNDERTAKING

This section of the Report shall detail the process the proponent undertook to determine the proposed corridor, including a discussion of other alignments considered. The environmental and socio-economic selection criteria (e.g., construction costs, fuel savings, technical factors) for the preferred corridor shall be provided. The Report shall discuss other methods for implementing the registered undertaking, including, but not necessarily be limited to, items such as adjusting median width and different methods for watercourse crossings.

7.0 ASSESSMENT METHODOLOGY

This section shall include the study strategy, methodology and boundaries, within which the Report will be prepared.

The following must be clearly defined:

a) The Valued Environmental Components (VEC's)[1] within the study boundaries and the methodology used to identify the VEC's. The methodology shall include input from members of the public, government department and agencies and other interested parties.

b) The temporal boundaries (i.e. duration of specific project activities and potential impacts) for construction and operation.

c) The study boundaries or project area and all space that will be potentially impacted by the project as proposed or subject to subsequent modifications and the methodology used to identify the study boundaries.

d) The strategy for investigating the interactions between the project and each VEC and how that strategy will be used to coordinate the individual studies undertaken.

e) The strategy for assessing the project's contribution to cumulative impacts on each VEC.

f) The strategy for predicting and evaluating project impacts upon the environment; determining necessary mitigation, remediation and/or compensation; and evaluating residual impacts.

The following sections outline specific concerns and requirements related to the existing environment, adverse effects and environmental effects assessment, proposed mitigation, residual environmental impacts, proposed compliance and effects monitoring and the public information program that are to be addressed in the Report for the proposed undertaking.

8.0 EXISTING ENVIRONMENT

[1]Within the Nova Scotia Environmental Assessment Regulations, Valued Environmental Components are interpreted as environmental, socio-economic, human health, reasonable enjoyment of life and property, cultural, historical, archaeological, paleontological and architectural features that may be impacted, whether positive or negative, by the proposed undertaking.

This section of the Report shall identify the study area and shall describe the existing environment over four seasons where appropriate in the study area through the use of original baseline studies or existing data.

The Report shall clearly indicate baseline data/information which is not available or existing data which cannot accurately represent environmental conditions in the project area over four seasons.

If the background data have been extrapolated or otherwise manipulated to depict environmental conditions in the project area, modeling methods and equations shall be described and shall include calculations of margins of error.

All categories and constraints covered in the Highway Environmental Database Study screening matrix shall be included in this section of the Report.

The components of the environment to be discussed shall include identified VEC's and the following:

8.1 Area Geography

Describe the study area geography and topography including features such as lakes, streams, wetlands, and topography within a minimum of five hundred (500) meters of the centerline of the proposed alignment and those features outside 500 meters which influence features within the proposed corridor.

8.2 Existing and Planned Land Uses

Describe the patterns of current and planned land use and settlement along the proposed highway corridor including, but not limited to, planning strategies, proposed development, utilities (including natural gas pipelines) and development boundaries. Describe any current land uses by First Nations along the proposed highway corridor.

Discuss plans for a survey of structures along the highway route where blasting is planned. The survey shall include structures and building foundations which may experience damage or impact due to seismic vibration or air concussion.

8.3 Socio-Economic Conditions and Recreational Opportunities

Describe the current socio-economic conditions of the area along the proposed highway corridor. Include population demographics, economic conditions , and recreational opportunities in the area.

8.4 Atmospheric Conditions

8.4.1 Describe the air quality to include but not necessarily be limited to wind speeds and directions, precipitation amounts and precipitation chemistry. Particular attention is to be paid to ambient dust levels in areas where construction activities may contribute to increased dust levels.

8.4.2 Describe the weather patterns along the proposed route as they relate to highway operation and maintenance. Include how snow, ice and wind conditions may be expected to change with geographic conditions and seasons, and how these relate to the proposed project.

8.4.3 Describe what Probable Maximum Precipitation levels are used and how they relate to the proposed project.

8.5 Ambient Noise Levels

Provide a baseline study of all residential and other sensitive areas (i.e., commercial, recreational and institutional) within two hundred (200) meters of the proposed right of way and at any other areas where traffic noise could be expected to have a significant negative impact. Background ambient noise levels should be characterized for various locations along the corridor where traffic noise on the proposed highway could be expected to be heard and felt to be a negative impact, i.e., residential areas, commercial areas, recreational, institutional areas and sensitive wildlife habitats.

8.6 Surface Water

Provide a general hydrologic, hydraulic and water quality description of all surface water bodies in the vicinity of the project, especially downstream of the project. The drainage areas of individual streams both above and below the proposed highway shall be described. This description shall include the calculation of the drainage area upstream of each watercourse crossing.

Existing uses and users of the watercourses shall be identified.

8.7 Groundwater

Provide a general hydrologic, hydrogeologic, and water quality description of the groundwater in the study area.

Provide plans for a well water quality and quantity survey of all domestic and other wells within the expected impact area of the highway corridor. Locations of all wells in the anticipated impact area shall be identified and plotted.

8.8 Flora, Fauna and Habitat Evaluation

Identify the following types of flora, fauna and habitat. Appropriate field surveys agreed to by the Nova Scotia Department of Natural Resources, Wildlife Division shall be conducted as part of the evaluation. Current information on species of concern, including species at risk, shall be obtained from the Nova Scotia Department of Natural Resources, Wildlife Division; the Atlantic Canada Conservation Data Center; Environment Canada; the Nova Scotia Museum of Natural History and local naturalists and interest groups.

8.8.1 Identify the species of flora as determined by current information from the Nova Scotia Department of Natural Resources, Wildlife Division, that are typically found in the area. Identify any flora species at risk found in the area, as well as any potential habitat for these flora species, including old growth forests.

8.8.2 Identify any wildlife management areas, ecological reserves, wilderness areas, managed wetlands and significant wildlife habitat, including areas with high wildlife concentrations, wildlife corridors or habitats rare to Nova Scotia.

8.8.3 Identify the species of fauna (including migratory species) as determined by current information from the Nova Scotia Department of Natural Resources, Wildlife Division, that are typically found in the area. Identify any fauna species at risk found in the area, as well as any potential habitat for these fauna species, including old growth forests.

8.8.4 Identify fish habitat that includes, but is not restricted to, stream size, bottom composition, stream gradient at each potential watercourse crossing, and annual temperatures and sediment loading where data is available from appropriate regulatory and resource agencies, including, but not limited to, the Nova Scotia Department of Agriculture and Fisheries, Fisheries and Oceans Canada, and the Nova Scotia Museum of Natural History. Fish spawning, rearing nursery, food supply and migration areas are to be evaluated within the predicted zone of influence. Describe the criteria utilized for determining the zone of influence this project has on the fish habitat of the watercourse involved.

8.8.5 Describe the relative distribution, abundance, composition and socioeconomic importance of valued fish resource components within the predicted zone of influence of all proposed watercourse crossings. Fish species, age, health and diversity shall be described. Electrofishing shall be carried out as per Fisheries and Oceans Canada's permits and requirements.

8.9 Forestry Resources

Describe any forestry resources and forestry uses within the proposed corridor.

8.10 Wetland Resources

Identify the location, size and class of any wetland within the predicted zone of influence and conduct a wetland evaluation (pursuant to the Nova Scotia Wetlands Directive and North American Wetlands Conservation Council (Canada) Wetland Evaluation Guide) on all wetlands which will be potentially impacted directly or indirectly.

8.11 Fishery Resources

Describe any commercial, recreational and First Nations fishing in the area of the undertaking. Describe the commercial and recreational species caught, fishing locations, amount caught, and fishing methods used.

8.12 Bedrock and Surficial Geology

Provide a general description of the bedrock and surficial geology of this study area, to include but not necessarily be limited to a discussion of:

8.12.1 The bedrock geology along the proposed corridor.

8.12.2 Acid production/consumption data for all potential acid generating bedrock formations that will be encountered and disturbed by the highway proposal.

8.12.3 The surficial cover including overburden depth, soil types, permeability and porosity, and areas of high erosion risk.

8.12.4 The potential for disturbance of contaminated soils.

8.12.5 Any areas having known or proven economic mineral deposits, areas under advanced mineral exploration, and the location and extent of existing and abandoned mines, pits and quarries.

8.13 Archaeological and Paleontological Resources

Identify any areas containing features of historical, paleontological, cultural or archaeological importance, including First Nations, in a manner acceptable to the Nova Scotia Museum. Describe the nature of the features located in those areas.

8.14 Transportation

Describe the existing road conditions in the area, including class of road, traffic volumes and traffic types, and the road surface conditions.

9.0 ADVERSE EFFECTS AND ENVIRONMENTAL EFFECTS ASSESSMENT

The Report shall identify and predict the magnitude and importance of project impacts, both positive and negative, on the environment. This section shall address impacts on identified VEC's, as well as, but not limited to, the following socio-economic, community and bio-physical environmental impacts.

9.1 Impacts on Land Use

Predict the impacts of the highway, including the effects of fragmentation of landholding, on the existing and planned land uses, including, but not limited to planning strategies, proposed development, utilities (including natural gas pipelines) and development boundaries. Discuss the potential for the impact on structures along the highway route where blasting is planned.

9.2 Impacts on Socio-Economic Conditions and Recreational Opportunities

9.2.1 Discuss the impact on residential property values.

9.2.2 Discuss the effect of proposed interchange locations and grade separated crossings on present and future expansion of commercial/residential/institutional/recreational and resource land uses within the study area.

9.2.3 Discuss the impact on recreational opportunities.

9.2.4 Discuss the impact on proposals for hiking trail development, especially for any developments proposed for abandoned railways.

9.2.5 Discuss the impact on First Nations' land uses and land claims within the proposed highway corridor.

9.3 Impacts on Atmospheric Conditions

9.3.1 Discuss the impact of dust generated from highway construction on residential, agricultural, recreational and institutional areas.

9.3.2 Discuss the potential for micro-climate modifications in the vicinity of the project.

9.4 Noise Impacts

Discuss any predicted increase and impact of background noise levels from highway construction activity and from traffic on residential, commercial, recreational and institutional areas and sensitive wildlife species.

9.5 Impacts on Surface Water and Run-off

9.5.1 Identify receiving waters and associated watersheds for run-off during construction and operational phases, and discuss all associated impacts to surface water quality, fish habitat and groundwater. The CCME Canadian Water Quality Guidelines as they pertain to aquatic life

and existing ambient water quality shall be used as a context for addressing the magnitude and importance of the predicted impacts.

9.5.2 Discuss the potential for soil eroding from the highway into adjacent watercourses.

9.5.3 Discuss the criteria used for design of run-off control features, i.e., expected run-off volumes, storm design data, etc. This section shall indicate if allowance has been made for potential increases in precipitation due to climate change.

9.5.4 Provide the predicted impacts on surface water and vegetation resulting from the use of ice and snow control procedures, and from other maintenance activities.

9.5.5 Discuss the predicted impacts resulting from the disturbance of contaminated soils.

9.5.6 Indicate the watercourses to be impacted and provide a description of the impacts.

9.5.7 Discuss the potential impact of contaminated run-off on aquatic habitat, including the accidental release of a hazardous substance.

9.6 Impacts on Groundwater

Predict any anticipated changes to groundwater quality and quantity and the significance of the anticipated changes including impacts of groundwater contaminated from road de-icing practices.

Discuss potential impacts of contaminated groundwater on fish, fish habitat and water quality.

9.7 Impacts on Flora, Fauna and Habitat

Predict the impacts of construction and operation of the project on flora, including a full accounting of impacts on species of concern and significant habitat.

Predict the impacts of construction and operation of the project on terrestrial and aquatic fauna, including avifauna, and include a full accounting of impacts on species of concern and significant habitats. Discuss the impacts of fragmentation on

wildlife populations and habitats including any interruption, alteration or destruction of wildlife corridors. The potential impacts on migratory bird habitat shall be assessed.

9.8 Impacts on Forestry

Predict the impacts on any forestry resources within the project area.

9.9 Impacts on Wetlands

Predict the impacts to all wetlands which may be affected by the proposed project including wetlands which may be created through the construction of the highway.

9.10 Impacts on Fishery Resources

Predict the impacts on commercial, recreational and First Nations fishing which may be impacted by the proposed project.

9.11 Geological Impacts

Discuss the potential for the impact of acidic water run-off from bedrock disturbed by highway construction on Valued Environmental Components.

9.12 Impacts on Archaeological and Paleontological Resources

Predict the impacts to all archaeological and paleontological resources that will be affected by the project.

9.13 Impacts on Transportation

9.13.1 Discuss the anticipated changes in traffic speed and density in adjacent residential and commercial areas.

9.13.2 Discuss the effect of the proposed interchange and connector location on local and regional traffic types, patterns and volumes.

10.0 EVALUATION OF THE ADVANTAGES AND DISADVANTAGES TO THE ENVIRONMENT

This section shall present an evaluation of the advantages and disadvantages to the environment, including the VEC's during the construction and maintenance phases of the undertaking.

11.0 PROPOSED MITIGATION

The Report shall describe all measures that have or will be taken to avoid or mitigate negative impacts and maximize the positive environmental effects of the project, including pollution prevention and best management practices (as described in Section 9.0, Adverse Effects and Environmental Effects Assessment). Mitigation includes the elimination, reduction or control of the adverse effects or the significant environmental effects of the project and may include restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

Describe compensation that will be provided when environmental damage is unavoidable or cannot be adequately mitigated by any other means. This section shall address, but not necessarily be limited to the following:

11.1 Regulatory Compliance

Describe any legislation, regulations, guidelines, policies and specifications will be adhered to during design and construction of the roadway, that will lead to mitigation of environmental impacts.

11.2 Existing and Planned Land Uses

Describe the corridor selection process and indicate how the chosen alignment minimizes/mitigates impact on existing and planned land uses.

Discuss the plans for mitigating potential impacts on structures along the highway route where blasting is planned.

11.3 Socio-Economic Conditions and Recreational Opportunities

Describe actions that will be taken to mitigate adverse impacts on private and commercial property and on human activities, including First Nations. Discuss plans for compensation for any possible loss of property or property value.

Provide a dispute resolution policy for addressing project related complaints and concerns that may be received from nearby land owners or residents.

11.4 Air Quality

Describe measures that will be taken to control dust during highway construction.

11.5 Noise Impacts

Describe measures that will be taken to mitigate increased noise levels during highway construction and operation.

11.6 Surface Water Quality and Quantity

Present an outline of siltation, erosion and run-off control features, storm drainage management procedures and mitigation measures including specific references to seasonal variation, that will be used in the following situations: (a) clearing and grubbing of the proposed corridor, (b) installation of watercourse structures, (c) subgrade work, (d) construction of service roads, and (e) highway maintenance. The Report shall also provide a commitment that the Nova Scotia Department of Transportation and Public Works will prepare an Environmental Protection Plan for the above activities.

If contaminated soils are to be disturbed, discuss methods to minimize adverse impacts.

Discuss commitments to provide contingency and remediation plans for any contamination of or drainage to surface water resources, including decrease of water quality.

11.7 Groundwater Quality and Quantity

Describe actions that will be taken to moderate any negative impacts on groundwater quality and quantity.

Describe measures to be employed in the event of accidental dewatering of domestic water supply wells through highway construction activity including compensation for loss or degradation of domestic water supplies.

Discuss commitments to provide contingency and remediation plans for any contamination of or drainage to groundwater resources, including decrease of water quality.

11.8 Flora, Fauna and Habitat

Discuss measures that will be taken to minimize the impacts of road construction and operation on flora species. Include any plans for landscaping and preservation of existing vegetation.

Describe the measures that will be taken to minimize the impacts of road construction and operation on terrestrial and aquatic fauna (including avifauna). Include any plans for preservation of existing habitat and compensation for loss or degradation of aquatic and terrestrial habitat (i.e.,habitat rehabilitation/replacement).

Discuss commitments to provide contingency and remediation plans for drainage to aquatic and terrestrial habitat as a result of accidental events.

11.9 Forestry Resources

Discuss measures that will be taken to minimize the impacts of road construction and operation on forestry resources.

11.10 Wetland Resources

Discuss avoidance of wetland de-watering and mitigation measures to maintain ecological and hydrological integrity of any wetlands in the area.

11.11 Fishery Resources

Describe the timing of work in and immediately adjacent to watercourses, and fish passage at watercourse crossings.

11.12 Geological Resources

Describe alternatives to disrupting net acid producing bedrock. When no practical alternative to exposing this bedrock exists, mitigation plans shall be developed for minimizing the impacts on the aquatic environment.

Discuss commitments to provide contingency and remediation plans for watercourses that have been degraded due to the disturbance of acid-generating bedrock of tills.

11.13 Archaeological and Paleontological Resources

Describe mitigation measures to preserve, protect, or recover any features of socio-economic, cultural, archaeological or paleontological value that are identified in the proposed highway corridor.

11.14 Transportation

Discuss the mitigation measures planned to address anticipated impacts from any predicted changes in traffic speed and density in adjacent residential and commercial areas.

12.0 RESIDUAL ADVERSE EFFECTS AND ENVIRONMENTAL EFFECTS

This section of the Report shall list and contain a detailed discussion and evaluation of residual impacts, including the criteria for determining significance. Residual impacts are those adverse effects or significant environmental effects which cannot or will not be avoided or mitigated through the application of environmental control technologies or other acceptable means. Those impacts that cannot be mitigated or avoided shall be clearly distinguished from those impacts that will not be mitigated or avoided. Positive residual impacts will also be discussed and evaluated.

These impacts become important in the evaluation of a proposed project as they represent the environmental cost of the project.

13.0 PROPOSED COMPLIANCE AND EFFECTS MONITORING PROGRAMS

The Environmental Assessment Report shall include a framework upon which compliance and effects monitoring will be based throughout the life of the proposed project, including abandonment. The discussion of compliance monitoring shall include, but not necessarily be limited to, plans and procedures for water quality compliance monitoring, especially for suspended sediment and pH levels, during construction. Monitoring programs must be designed to determine the effect of the implemented mitigation measures.

This section shall also include, but not be limited to, commitments to undertake the following surveys prior to blasting operations in the corridor or at associated quarry sites.

13.1 Pre-Blast Survey

Discuss plans to follow-up on the pre-blast survey, including a survey of structures along the highway route where blasting wells, building foundations, etc. may have experienced damage or impact due to seismic vibrations or air concussion.

13.2 Well Water Survey

Discuss plans for periodic monitoring of water quality and quantity of springs (if used as a water supply), and domestic and other wells where blasting operations are proposed and where significant roadway cuts that do not involve blasting are planned.

14.0 PUBLIC INFORMATION PROGRAM

This section of the Report shall detail the public information program initiated by the Proponent. The Proponent shall describe in detail the opportunities that have been or will be provided to allow the public to express their concerns and receive information on the various phases of project development including planning design, environmental assessment review, operation, abandonment, site rehabilitation, post abandonment and monitoring.

The results of public participation and information sessions shall detail how public comments were addressed, including any commitments made by the Proponent.