TERMS OF REFERENCE

AS REQUIRED BY

THE ENVIRONMENT ACT AND
THE CANADIAN ENVIRONMENTAL ASSESSMENT ACT

NOVA SCOTIA DEPARTMENT OF
TRANSPORTATION AND PUBLIC WORKS

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

NOVA SCOTIA
DEPARTMENT OF ENVIRONMENT AND LABOUR
in cooperation with
TRANSPORT CANADA & FISHERIES AND OCEANS CANADA

February, 2002

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FOREWORD

Presented in this document are the Terms of Reference for the Environmental Assessment Report ("Report") required for the Highway 104 at Antigonish Project in accordance with the requirements of Part IV of the *Environment Act* (1995). The Nova Scotia Department of Transportation and Public Works ("Proponent") must include the information requested within the Terms of Reference in the Report and prepare the Report in accordance with the Environmental Assessment Regulations pursuant to Part IV of the *Environment Act*.

This Terms of Reference includes typical Valued Environmental Components (VEC's) associated with highway construction projects which must be adequately addressed in the Report. The Proponent must identify any additional VEC's to be examined during the assessment process.

The order in which information is presented is at the discretion of the Proponent, however, a concordance table will be required to indicate where the information is presented. The Proponent may provide additional information where considered appropriate. Since the Report is intended for public review, the information should be presented in non-technical language wherever possible and appropriate, including a non-technical executive summary. The Proponent will be required to submit an electronic copy of the Report in WordPerfect and PDF format, for publication on the Department's website. Any images contained within the Report shall be submitted as either .jpg or a .gif file format or some other electronic format as determined by the EA Branch

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 (CEAA)*. 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 includes environmental assessment requirements pursuant to the Nova Scotia Environmental Assessment Regulations and the *CEAA*. The Nova Scotia Department of Transportation and Public Works must make provision for meeting with federal and provincial departments to review expectations for the environmental assessment as set out in the Terms of Reference and as set out in detailed supporting guidance provided by expert federal and provincial authorities. This detailed supporting guidance can be accessed from the Federal Environmental Assessment Index (FEAI) maintained by the Canadian Environmental Assessment Agency.

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 particularly as it is planned to progress through the construction and operation phases of its life. The description should also address other phases of the project as can reasonably be foreseen including modification, decommissioning and abandonment. 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 areas and archaeological sites shall be described.

2.2 Construction Methods, Schedule and Other Constraints

This section shall include, but not necessarily be limited to, a description of the following, including locations, scheduling details and estimates of magnitude or scale where possible:

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.

2.2.5 timing and extent of surveys for flora, fauna, and ecologically sensitive areas.

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 the volume 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, including the “less expensive and less disruptive” alignment indicated in Section 3.4 of the registration document. The environmental and socio-economic selection criteria (e.g., construction costs, fuel savings, technical factors) for the preferred corridor and alternative

corridors 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, as required by federal departments under the *CEAA.*

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

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[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.

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

This section of the Report shall identify the study area and shall describe the existing environmental components, their interrelationship and their sensitivity to disturbance. This information shall reflect four seasons in the study area where appropriate, through the use of original baseline studies of 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. Provide baseline water quality and quantity studies which will form the basis for a subsequent environmental effects monitoring program. 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, and assess water quality over four seasons prior to construction. Based on seasonal flow estimates, and on prior salt loading data for the area, estimate salt and budget loading to the surface waters and potential change in water quality.

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, including but not limited to, the identification of any subdivisions or trailer courts which have their own water supply. Identify potential areas for groundwater supply development within the study area.

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.

8.8.1 Identify typical species of flora, flora species-at-risk, and potential habitat for flora species-at-risk in the study area. Current information 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. Field surveys and investigations required to supplement the available data shall be completed in a manner that is acceptable to the Nova Scotia Department of Natural Resources (Wildlife Division). Available data,

survey results, and detailed mitigation measures that demonstrate a special emphasis on avoidance of impacts shall be included in the EA documentation.

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 typical species of fauna (including migratory species), fauna species-at-risk , and potential habitat for fauna species-at-risk in the study area. Current information 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; the latest Committee on the Status of Endangered Wildlife in Canada (COSEWIC) list, and the *Atlas of Breeding Birds of the Maritime Provinces*, and local naturalists and interest groups. Field surveys and investigations required to supplement the available data shall be completed in a manner that is acceptable to the Nova Scotia Department of Natural Resources (Wildlife Division). When surveys are necessary to supplement the available data and adequately describe the use of the area by migratory birds during different times of the year (breeding season, migration, winter), emphasis will be placed on determining whether any bird species-at-risk, colonial nesting species, species particularly vulnerable to habitat fragmentation, etc., occur or breed in or near the study area, as required by federal departments under the *CEAA*. Available data, survey results, and detailed mitigation measures that demonstrate a special emphasis on avoidance of impacts shall be included in the EA documentation.

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. The true ecosystem value of each wetland shall be examined through on-site investigations using comprehensive valuation methodology that assesses component, functional and attribute values. Field surveys and investigations required to supplement the available data shall be completed in a manner that is acceptable to the Nova Scotia Department of Natural Resources (Wildlife Division) and the Nova Scotia Department of Environment and Labour.

The Federal Policy on Conservation of Wetlands, as required by federal departments under the *CEAA*, will be taken into account on all wetlands which will be potentially impacted directly or indirectly. The importance of salt marsh in the area will be reflected and discussed in the analysis.

8.11 Fishery Resources

Describe any commercial fisheries, including marine fisheries and aquaculture, 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 Historical, Archaeological, Paleontological and Architectural Resources

Identify any locations containing sites or features of historical, archaeological, paleontological, or architectural importance, including First Nations, in a manner acceptable to the Nova Scotia Museum. The archeological assessment shall be conducted under the terms of a Heritage Research Permit for Archaeology issued under the *Special Places Protection Act* ,and in conjunction with the Nova Scotia Museum and Mi'kmaq. Describe the nature of the sites or 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 significance of project impacts, both positive and negative, on the environment. "Adverse effects" and "environmental effects" are defined under the *Environment Act* and under the *CEAA.* This section shall specifically address the environmental effects of malfunctions or accidents that may occur in connection

with the project and any cumulative environmental effects[2] that are likely to result from the project in combination with other past, present and reasonably foreseeable projects or activities, as required by federal departments under the *CEAA.* This section shall also 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. Discuss the impacts of the project on local climate, including cold-air drainage patterns, as they relate to other resource-use activites (e.g. agriculture),as required by federal departments under the *CEAA.*

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, including the effects on aesthetics (view planes etc) and ramifications to ecotourism.

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' current uses of land and resources for traditional purposes and on land claims within the proposed highway corridor.

9.3 Impacts on Atmospheric Conditions

[2] Ref: Cumulative Effects Assessment Practitioners Guide, February, 1999; available from the Canadian Environmental Assessment Agency

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.

9.3.3 Description of the management strategy to reduce Greenhouse Gas (GHG) emissions related to the project. Estimate GHG emissions associated with various project phases, including site preparation, construction, and maintenance phases of the project. Discuss the potential loss of carbon sinks, as required by federal departments under the *CEAA.*

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 changes 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. If the use of road salt is proposed, discuss the impacts in the context that road salt is now recognized as toxic under the

Canadian Environmental Protection Act , as required by federal departments under the *CEAA.*

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 Indicate and discuss the probabilities of spills/accidents and the environmental consequences of such events. Discuss the potential impact of contaminated run-off on the environment, including the accidental release of a hazardous substance.

9.5.8 Identify the amount of flood plain to be infilled adjacent to each of the proposed watercourse crossings and discuss the potential for downstream destabilization of stream channels and associated fish habitat.

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. If the use of road salt is proposed, the impacts shall be discussed in the context that road salt is now recognized as toxic under the *Canadian Environmental Protection Act*, as required by federal departments under the *CEAA.*

Indicate and discuss the probabilities of spills/accidents and the environmental consequences of such events. 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 terrestrial and aquatic 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 fisheries, including marine fisheries and aquaculture, 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 Historical, Archaeological, Paleontological and Architectural Resources

Predict the project related impacts to all structures, sites, resources or things of historical, archaeological, paleontological or architectural significance.

9.13 Impacts on Transportation

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

9.14 Impacts of the Environment on the Project

9.14.1 Discuss the effect the environment may have on the construction and operation phases of the project, including weather and climate elements. Any necessary climate information to validate statements made in the assessment will be provided.

9.14.2 Discuss how the project accommodates the potential effects of climate change in its design considerations, such as culvert design specifications.

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. This section shall include a detailed description of the methodologies used to describe or predict these results. Assessment objectives for each VEC will be articulated to guide the interpretation of assessment findings.

11.0 PROPOSED MITIGATION

The Report shall describe all measures that are technically and economically feasible that have or will be taken to avoid or mitigate significant negative impacts and maximize the positive environmental effects of the project, with emphasis on pollution prevention, impact avoidance, 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 impacts 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.

Particular attention shall be given to those areas which are expected to present significant challenges for sediment and erosion control. Most notably, the South River

bridge crossing which will require excavation of large amounts of highly erodable soil on steep approaches to the bridge. The South River supports a diverse and healthy freshwater fisheries resource and the crossing is in an area of salt marsh which is critical to both freshwater and marine fisheries resources. Other crossings, such as tributaries to the Briley Brook system are in areas of highly erodable soil and are the sites of extensive and highly successful fish habitat restoration projects.

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.

If road salt is to be used, establish a road salt management strategy for the project.

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.

If road salt is to be used, establish a road salt management strategy for the project.

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. Demonstrate how a priority will be placed on the use of native species for revegetation efforts.

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 or 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. Identify plans for the preservation of existing wetlands and compensation for loss or degradation of the functional values of wetlands impacted by the project. Also include plans to monitor the success of mitigative action. Due to the location of the project, demonstrate how an emphasis will be placed on avoidance of potential losses of wetland function, particularly in salt marsh function.

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 Historical, Archaeological, Paleontological and Architectural 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. The Report shall note where uncertainty exists regarding the significance of the residual impacts. 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/benefit of the project.

Any changes to the project that may be caused by the environment and the significance of those changes should be described in this section of the Report.

The Report shall contain a concise statement and rationale for the overall conclusion relating to the significance of the residual adverse environmental effects. The Report shall, for ease of review, include a matrix of the environmental effects, proposed mitigation and residual adverse effects.

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. In addition, the Report shall also describe a program, including regular inspections and periodic biological investigations, designed to monitor the accuracy of predicted impacts, as required by federal departments under the *CEAA*. Effects monitoring during all phases of this project, including post completion, shall include avifaunal surveys for waterfowl, raptors, or any species of concern.

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.